## A STUDY OF SOME TASMANIAN ONISCOIDEA (CRUSTACEA. ISOPODS).

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& \text { By Julie her } \\
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For degree of $M S c$ 1960

## Abstract.

The occurrence in tasmania of seven of itho elgin opectes proviously recosded is confinmed. If io recograzed thas Amradiliddium volmare (Latreillo) has beon recorded under a oynonym. Six lmow species; Styloniscus thorsoni(Chilion), Ste phozninaus
 Acinecia pallida Wicholis and Barnes, and Elum caelatum (fiers), aro
 the havin opocien is given. Tho posieson of Mqua ougtralionoin Dana is clamified. Ghatonolla nammaca (Chilton) is Exanoforred to geaus Botoniang Chition. Ton nou apecics axc eatablished one of thome Inclutics apockens ubich Sormeriy have beon urongly asosgaed to Ontscus mantatus monson. Tho position of the Sollowing genern: Styloniscus Dan, Blotoniscus Chilton, Chilionolin Vandel, Plymodiloscis
 Ls reviewed.

## Introduction.

The earliest record of the occurrence of Oniscoidea in Rasranis is given by Haewell (1882). He (p. 280) doscribes Porcellio graniger Miers 1876, and (pe 279) a new specics, Ammainlidium gubdontatum, and includes Masmania in the distribution of both.

Eudde-Iund (1885, pe 285) describes a new apecies, Armadillo misellus, from a specimen collected in Tasrania.

Three previously established species are recorded from Tasmania for the first time by Thomson (1893). He describes two of these, Actaecia euchroa Dana 1853, (see pp. 56-57, pl. 2, figs. 1-E), from spocinens collected at Eaglehauk Neck, and Oniscus munctatus Thomson 1879, (see pp. 54-55, p1. 1, figs. 6-13), from specinens collected on Mt. Wollington. He ( $p$. 55) records LApia australiensis Dana 1853 from the neighbourthood of Hobart. Thomson (pp. 72-73) also publishes an Engllsh translation of Budde-Luna's (1es5) description of Armadillo misellus.

Chilton (1901, pp. 134-135) reallizes that Thonson's (1893) apecimens of oniscus panctatus from int. Wellington difier from those found in Hew zealand, and suggests that the formor should perhaps be placed in genus philogefin Latreille 1804. Ho (pp. 139, 140) recognizes Porcollio aranifer Milers to be a synony of Porcellio scaber Latroillo 1804, and notes that P. scabor has thus been recorded fron Tasmania.

Budde-Iund (1904, p. 93) tranofcrs Armadilio misollus to gemas Sphemillo Dans 1852, and places it in his own scection XIII of that genus.

He ( p , 87) includes Smhorilio misellua in a loy to som of the apecies in this section.

Chilton (1909, pp, 661, 662) mentions that ho has an undescribed apccies of eenus faplophtalman Sohobl 1860 Iron Tanvania,

Cbilton (1911. Ep. 568-569) atakes that he bas apecinena Irom Hobart which bo considers to be IApia gugeraliensis Dana.

Ch4iton (1915 a, g. 424, f1. 37, fig. 23) deacesbes a new epecies, Haplomehalmas tosmonicus, from a speolmen collected at Fexm Tree Gully, Hobert. He notes, borever, that this apecies difiers in sone characters from the defiaftion of gemus Ganlophthanus given by Sars (1899). Arcangeli (1923, p.314) considers that those difforences are sufficient to distinguish I. tasmantcug as the type of a new gonus, which he nanos chilionia. He (pp; 31.-315) gives an Italian franalation of Chilton's (1915 g) description of Che tammica.

Jackson (194, p. 3) proposes that Sphoeri11g Verhoerf 1926 (non Sphomil19 Dana 1852) be metained as the genoric name for the opecied included in Buade-Inad's (1904) 日ection XIII of Sphoxillo; this 2apisos the transfereace of Spheril10 miselius to genus Sphaerilo Verthoorg.

Vandel (1945; p. 236) notes the occurrence in Tasmania of a species, Gbiltonella tasmanica (Chiton). In a later paper, he (Vandel, 1952, p. 96) statos that Areangels (1923, p. 314) establiohes gomus Chiltonelia for Haniophehalms kagmanicua Chilton 1915. Vandel (1952, pp. 30-36, sig. 21-28) desoribes a now species, 3qulonigcus nichollas, Iron specimens collected at Guide Rtvor Falls, near Bumie.

Gusiar (1952, ppe 24-25), in a list of tho Crustacea of Tasmania, Includos the Polloung apccies of Oniscoidea :- Oalscus munctatus,

Ligha qustraliensis, Roxcollio prander (which ie risspelled as "pranifer"), Armadilidiun gubdentatur and Actnecis eachnaz.

In the present paper the occurrence in Tosmanin of seven of the oight specios previously recordicd is confircod, Arradillidiun subdentatum Haswell 1802 baing reearded as a synosyr of the cosmopolitan spocies Armadillidiun puleare (Latreille 1504). The one species not represonted in uy collection is Sphaerille miseilus (Ducide-Iumd 15e5). Fifteon species are recorded from Rasmania for tho Pirst tire. Pive of these; Styloniscua thonsoni (Cbiliton 1885). St. phomiams (Chiliton 1901), Hotoniscug auatzalis (Cbilton 1909), Doto maring (Chiliton 1884) and Actaesia pallide Iicholls and Earnes 1927, have been recorded from the mainland of Australis, Hew Zealand, or Subantarctic iolanda, or from noro than one of these places. Eluma caelatum (iliers 1877) occurs in western Europe ond has probably been incroduced into Therania. Ten species are believed to be new. One of these, Elymonhiloscie thomsoni n.sp., includes the specimens wifict Thomson (1693) wroagly asiigns to Onlocus punotatus Thonson 1879.

The position of aix of the genera represented Styloniscus Dana 1852, Chiltonolla Vandel 1952 ( $=$ Chintonia Arcangeli 1923), Gotoniscue Chilton 1915, Plymophiloscia Wahrberg 1922, Gubanis Brandt 1833, stostr. after Vertoeff 1926, and Sphacrillo Vorhooff 1926 (ron Sphorillo Dana 1852), is investigated. The validity of Vondel's (1952) use of the name Styloniscus is discussed. The confusion rocarding the names Chileonia Areangeli and Chilionolla Vandel is pointed out. Chiltonalla Vandel is classed as a synemy of Motoniscus Chilton, and the

Latter genus is rediagnosed accordingly. Verhoeffis (1926) linitis of Plymophiloseis are videned slightidy to include species shlich are closest to this gerus. The atains of plymophlioscia in relation to philloscia Latreille 1804 and sone of its subdivisions is consldered. The position
 of the apecies placed in Gubaris solat. nay remin in Cubaris a.0tr. The
 dypmans Vorboosf 1926 is nominated as the type species of geaus Sphaezinio.

The position of lifia gustralionsis Dana, vaich is regarded as uncertain hy some authors; is clarified by a comparison of thio opecies with Lifgia norge-zealondiae Dana 1053.

Detailed descriptions are given of all new species and of the following established species :- Lisquan autraliensis Dana, Sôloniscus micholles Vandel, Hotoniscus qustralis (Chilton) X. taspanicus (Chilton). Actaciln euchros Dana, A. pallids Micholls and Baznes. Briefer accounts are given of the romining specios.

A liat of the species of Oniscoidea nou known to be repreaented in Tasmania is as follous :-

Lipia ausiralionsis Dana 1853.
Sivioniscus thomoons (Chsiton 1885) Vandel 1952.
Stxloniscus phormisanug (Chilton 1901) Vandel 1952.
Styloniscus nichol1si Vaxiel 1952.
Styloniscus maculosus n.sp.
StyIonisous gavazrosus mosp.
Hotomisaus australig (Chiltion 1909) Chilion 1915.

## Motoniscug tasmanicus (Chilton 1915).

Deto mayng (Chiliton 1884) Budde-Innd 1906.
Actaecia suchros Dam 1853.
Actaecis milidg Nicho11s and Bames 1927.
Plymophiloscia thoment nosp.

Plymophiloscis notleyensis nosp.
Plypophiloncis ulyeretonengis n.sp.
Poxeolle meaber Latreille 1804.
Arpadiludijus yulpare (Latrellie 1804) Milno-Edvards 1840.
Elumi caelstury (Miers 1877) Collinge 1917.
Gubarie hick nini nosp.
Gubarif tasmanienala noap.
Cubarla gulcifrons n.ap.
Gubaris tamarenais n. $3 p_{0}$
Sphgerillo miaelius (Budde-Iund 1885) Jackson 1941.

## Typa specimens.

Holotype male and allotype female of all new species, together with paratype material, some of which is in the form of slides, are, at the time of writing, lodged in the Zoology Department of the University of Tasmania.

## Moterial and Methods.

Specimens used in this study have been foupd in a variety of habitats including mountain regions, rain forest, drier eucalypt forest, grassiand, gardens in populated areas, aituations immediately Inland fros the sea ahore, and the sbore itself. Colloction of opecimons ham been campied out mainly in the middle region of northern Tamanis, in the mouth-eastern part of the state, and in some areas of central Tampania.

Specinens are preserved in $80 \%$ alcohol: Structures exmmined microscopicaliy have been further dehydrated in absolute.alcohol and mounted in euparal.

The descriptions of specias are each based on a amall number of apecimens ealectedifor detailed examination from among examples of the apecies collected in one locality. The factors which have been taken into account in this selection are largest sise, mogt comon coloration, and absence of matilation.

Length of specimens is measured along the mid-1ine of the body from the anterior border of the cephaton to the posterior border of the terminal segmant; breadth is measured across the 4th segment of the pereion. Measurements of the length of atructurea which bear terminal processes or tuftm of setae, 2.e. the terminal axticle of the flagellum of the 2nd antenna and the rams of the uropod, do not incluaie the length of such processes or setae.

In all cases where the sex of the animal is not specificaliy stated, drawing illustrate structures taken Prom male mpecinens.

## Acknouledgements.

I am grateful to members of the Zoology and Botany Departmants of the Univeraity of lasmania, to my father, and to many of 叫 friends, for their assistance in the collection of specimens. In particular I wish to thank Professor V.V.Hicknan and Kr. J.L.Hickman for their help in this regard.

I should like to express my thanks to Professor Hickman for his assiatance and advice, and for reading the manuscript.

This work was carried out in the Zoology Department of the Oniversity of Tasmania, whilst I was in receipt of a C.S.I.R.O. Senior Post-Graduate Studentship.

Rev to Parilieb of Oniccoldea hnow to be represented in Thsmania,

1. Flagellum of 2nd antenna composed of numerous articles, (more than 10); male organ double . . . . . . . . . Ligildne. Flagellum of and antenna composed of fever articles, (not pore than 10): male organ single - - . - . - - - . - - - 2 .
2. Mandible with a triturating molar process; laner lobe of list maxdils with 3 setose processes; cale organ expanded diatally - -


Mandible with nolar process represented ky a tuft of setae; inner lobe of lst maxilla with 2 setose processes; male organ not expanded distally - - - - - - . - - - - - - - 3 .
3. Lifitoral spocies; flagellum of and antenna, in species known to occur in Tasmania, composed of 4 articleas endopodite of maxilliped well-developed, markediy larger than endite - . . . -


Inland speciea; flagellun of 2nd antenna conposed of 3 or fewer articlea; endopodite of maxililiped reduced, not markedly

4. Flagellum of 2nd antenna composed of 3 articles; exopodites of all pleopods without pseudotracheas - . - . - - Oniscidne.

Flagellum of 2nd antenna composed of 2 articles; exopodites of at least lat and and pairs of pleopods uith

5. Species knoun to occur in Tasmanis not able to enrolls exopodite of uropod projecting far beyond posterior border of terminal segrent - . . . . . . . . . . - . Porcellionidae. Specios able to enroll; exopodite of uropod not, or scarcely, projecting beyond posterior border of terminal

6. Pocudotracheae present only in exopodites of lst and 2nd paixe of pleopods; exopodite of uropod broad and laminar, occupying space between terminal segnent and 5 th pleuron of


Pseudotrachese present in exopodites of lst to 4th pairs or all pairs of pleopods; expoodite of uropod reduced, space between terminal segrent and 5th pleuron of pleon being occupied by protopodite of uropod - . - . . - Armadillidae.

## Family Lisqidao.

Synonver. Ligydidae, Richardison 1905.
The characters of the fanily are defined by Sars (1899, p. 155) as Pollows -
"Body oval, more or less conver above, with the latoral parts of the segnents lanellar: Cephaion without any lateral lobes, frontal pant rounded and not distinctily defined from the opistome. Eyes well developed or wanting. Antennulae with the last joint very cnall and without distinctiy developed sensory Pllaments. Antennac well doveloped, with multiarticulato flagellum. Guccal mass rather prominent. Mandibles with the molar expansion laxge and broad, exhibiting a finely-filuted, triturating aurface. Inner masticatory lobe of the antorior maxillae with 3 thick, baixy bristies. Posterior maxillae with 2 similar bristles inside. Mexillipods with the torminal part distinctiy 5-articulate, masticatory lobe truncato at the tip, epignath rather short. Exiernal eexual appendages in male double. Inner ramas of lat pair of pleopoda of a similar atructure in the 2 sexes, that of 2nd pais in male terminating in a long stylet, olightily dilated at the t1p; opercular plate of pleopoda without air-chambors. Uropoda frooly projecting behind, both rand styliforme"

The following coments on tile diagnosis ghould be noted.
Chilton (1901, p. 206) poinss out that Lipia noynemeainndiae
Dans 1853 differ fron the characters of the fardiy in that the two haixy bristles are absent from the second aaxilla, and the torainal part of the maxilliped, although showing evidence of five articles, has tho
midale threo articles fused together, with the autures between thom only partiaily indicated. He notes that in these points L. guatraliensis Dans 1853 closely resembles I。 naveemezlandises bowever ho considers'that these apecies are novertheless true LAriag.

Wahriberg (1922, p. 67) atates that aensory setae are present on the antennulae in the Ligaidae, but they are so small that they are apparent only under strong magnification.

Jackson (1927, p. 133) notes that, in the genus Iferia, it is the most comon condition for the cecond maxilis to lack the two setose bristiles.

Genus Lepig Fabricius 1798.

## Synonywry. Lisyda Rafinesque 1814.

The name Lisfa Fabricius 1798, given to a genus of Isopods, 1s predated in Lifis Weber 1795, whioh is used Por a Decapod genus. Consequentiy sone authors, o.g. Richardson (1905), apply the name Lispda Rafinasque 1814, to the Isopod genus. Hovever the generic name Ligh Weber is suppressed and that of Ligin Fabricius validated according to Opinion 330 of the International Comission on Zoological Nomenclature (see Hemming 1955).

A part of the definition of genus LAges given by Sars (1899, pp. 155-156) is amended by Jackson (1927, p. 133) as follows:-
"Body regularly oval or oblong-oval, moderately convex above, metasome confluent with mesosone or abruptly contracted. Head with occipital groove not obscured above by occiput, supramantennal and. frontal lines both present. Eyes large and convex. Antennulae snall, last aegnent small or vestigial. Antemnae strong, elongated. Mandible with a aetose plume behind the lacinis mobilis and usually mumerous pancilili between it and the molar process. Maxdllipedes comparatively ahort and stout, endopodite large, five distinct or indicated segments, ondite large, epipodite rounded."

The remainder of the definition, as given by Sars, is as follows:-
"Legs graduaily increasing in length posteriorly, dactyius diatinctiy bi-unguiculate. Opercular plate of uropoda sub-branchial. Uropoda more or less elongated, basal part not produced inside, ranil
narrow, styliforn, sub-aqual, each with a single apical spine." Prearably Sars' reference to the "opercular plate of the uropoda" is meant to appily to the pleopoda.

Lipia gustralienals Dana 1853.
(Figg. 1-14).

The original description of Hiph gustraliensis given iod Dana (1853, p. 740, ple 49, fig. 3) is brief and is based on a matilated apecimen, which was colleoted in Now South Wales. Descriptions of South Australian examples of the species given by hale (1927, pp. 320-321, ILg. 7), (1929; p. 340, fig. 341) are also brief. The following account of Tasmanian material which I assign to do australiensis 1s therefore given.

## Male.

Lengith of largeat apeciment 19 nimo, breadths 8 wan
Colour. Live apecimen is yellowish-green, densely spoticd with dark brown chromatophores. Overall colour of animal varies according to degree of expansion of chronatophores.

Gephalon (fige 1). Maxillipedal somite is marked off from rest of cephalon by an occipital groove. Antennary tubercles are amall, not visible in dorsal view. Eyes are compound and sub-quadrangular, with the inner border forming a right angle. As seen in dorsal view of cephalon, eyes are separated by nore than twice wdith of each eye; distance between inner angles of eyes: 2.5 mmog transverse whith of eye from inner angle to outer edge of cephalont 0.9 mm . Posterior to inner angles of eyes, vertex is indented by 2 post-orbital pits.

Fixat antenna (fie. 2). Triaxticulaio, with 3rd articlo very small. On outer side, and article projects beyond base of 3 rd , and this protuberance bears 3 long, fine setae. On dorsal surface of 3xd article
there are 3 coarse sensory setae, together with a long fine seca situated bolow and to inner asde of coarse setas.

Second antenna (fig, 1). When aftachod, antenna reaches back approximately to base of and segrent of pleon. Length of peduncle: 9.3 mmo . length of flagellums 7.5 cm . Peduncle and flagellum are set whith skort apines, each of which consists of an outer sheath, split at the top into 2 points, and a central sota, clubsed at its apax. Flagellum is conposed of 20 articlesg thoso vary sliehtly in length but are all longer than broad. Terminal article onds in a tuft of short setae.

Mandimeg. Lort mandibles- Incisor process has 4 teeth. Lacinia mobsilis ends in 3 teeth. Bohind base of lacinin mobilis is a rounded lobe, apex of which is covered with fine setae, while its under surface bears about 9 slender pencils of setae. Holar process is well developed and densely setose. Right mandible (fig. 3):- Apical border of lacinia mobilis is serrated on ventral side, while on dorsal side it is produced into a blunt point; there is a constriction in wiath of lacinta mobilis behind its apical region. In other respects, right mandible is similar to loit.

Pirst maxilia. Outer lobe (rig. 4) ends in 11 teeth and 2 setose processes. The 5 outer teeth are large and almple. Of the 6 amaller inner teoth, the outermost and innernost are single, the rest have seall lateral pointa. The outer setose process is slender and feathery, the inner one is broader and nore tootimiske. Near distal end, outer margin of lobe is fringed ulth setae. Apox of inner lobe is rounded and setose; apical region is not narked off by a suture fron
remainder of lobe. On inner side of lobe there are 3 setose processes, the distal one being short and the other 2 progressively longer.

Second maxilia (fig. 5). A divicion into 2 lobes is indicated by an indentaition in distal margin of aaxdlla and/auture line on ventral surface. Ismer lobe is about 3 times as wide as outer lobe. Apex of outer lobe bears fine setae. Apex of inner lobe is densely covered with short setaes most of these are directed inwards, but on dorsal surface there is a conspicuous oblique band of upright eetae. On inner side of lobe there is a dense brush of long simple setae, but there are no setose processes. There is a U-shaped band of chitin on dorsal surface of inner lobe.

Maxilliped (fig, 6). Epipodito is small and sub-triangular. Two articles of endopodite, ischion and dactylos, are distinct; divisions separating meros, carpos and propodos are distinct on inner side, but towards outer side of endopodite these articles are delinitedfrom each other by suture lines uhich are apparent only on ventral surface. Two spines occur on outor border of endopodite, one below each of these lines. Dactylos is small and rounded. Nurerous short, spiny setae are present on inner marginal region of meros, carpos and propodos, and on apex of dacíylos. Endite is sub-quadrangular with its outer margin curved outwards and its apical margin straight. Apical region and inner aurface of endite have a covering of fine setae. Two stout apines occur on dorsal surface near apical border; one is situated on inner corner, the oîher towards centre of endite. Near inner opine there is a small setose process.

Pereion. First segment is slightiy produced forwards on each
side to Plank cephalon. Epimera of 1 se and 2 nd segments are nearly transverse with posterior angles right-angled, those of 3rd segnent slope sliehtis backwards with angles sub-acute, those of 4th to 7th segments slope increasingly fuxther backwards and have angles progressively more acute. Definite coxal grooves are not present. Dorsal surface of pereion is finely granulate. Each granule bears a scale-seta (fig. 7) having a long, narrow scale portion and a seta clubbed at its apex. Several broad, strongly ohitinized, overlapping scales cover base of scale-seta. Between granules, tergites have a covering of saill, simple scales. Seattered scalemetae are present along lateral borders of segments.

Pereiopods. First legz- Carpos is swollen and oval in shape; propodos and dactylos are bent under it to form a aubchelate hand (fic. 8). Opposing faces of carpos and propodos are finely striated. To outer side of striated region, under surface of these articles is indented. There is no alstinctive process on propodos. Spines on leg each consist of an outer sheath, split at the end into 2 points, and a centrili seta, clubbed at the apex. Dactylos (fig. 9) onds in a large terminal claw, below which is a much narrower accessory clave On outer side there are 2 spines against base of terminal claw. "Dactylar seta" is long and narrow, alrost uniform in width and not clubbed at the apex.

Second leg is aimilar to 1st. Third leg is also subchelate, but carpos is less swollen than in 1st leg. In 4th to 7th lege carpos is aub-cylindrical, and propodos and dactylos are not bent under to form a subcholate hand. Second to 5th legs each have aingle "dactylar seta" as in lat leg. On 6th and 7th lega there is a group of numerous auch
long, narrov setae on upper aurface of dactylos near base of terminal clav. (Dactylos of 7th leg is Iigured, fig. 10).

Male orpans (fige 11). A pair of long, narrow structures which extend backnarde almost to posterior angle of exopodite of 5 th pleopod. The two male organs are fused at the base but their ducta remain aeparate, Organs are slightily sinuous; their apices are bluntily rounded and curve intards. Areaw covered with fine setae occur near apear of each organ. On dorsal surface, towards base of organ, there is a wide, curved band of chitin. Posterioriy this is continuous with a narrow ridge which extends down midale third of organ and which is ornamented along its outer aide with amall, oblique strips of chitin. Towards inner side, another ridge xuns parallel to first midge for most of its length and extends beyond it distally; this second ridge beara fine setae. A ridge down outer side of ventral surface of organ is not ornamented.
pleon. Not abruptis narrower than perelon. Pleura of 3rd to 5th segments are well developed, are directed bactwards and have acute posterior angles.

Terminal segnent (fige 12):- Postero-lateral angles are short and aub-acute; they do not extend back as far as does centre of segment. Outer accessory processes are absent, inner accessory processes are bluntly rounded. Posterior border between inner accebsory processes Porms a very obtuee median angle. Jackson (1922, p. 686) recognizes acong species of higis two main types of terninal segment, "triangulate", In which this border has a median process, and "arcuate", in which it is evenly rounded. Because of its slight median angle the terminal segment
of L. gustraliensis may be classed as triangulate; however the angle is so obture that it very nearly approaches the arcuate type.

Dorsel surface of pleon is finely granulate. Arrangement of sceles and calo-setae is almilar to that on pereion.

Pleopods. Pirst pleopod:- Outer side of protopodite beara a lobe wich is twisted and irregular in shape and lacks setae: Exopodite is aub-oval; its imer and posterior borders are fringed whth plumose betae. Conspicuous large blood vessela ramify through exopodite. Endopodite is aub-tyiangular but very short. It is branchial in nature, not gexalily differentiated; it encloses blood lacunse instead of large blood vescels.

Second pleopod (fig. 13):- Outer side of protopodite bears a narrow mbetriangular lobe whose iree margins are Iringed with setae. Exopodite is aub-quadrangular; plumose setae fringe its posterior and lateral margins. Conspicuous blood veseels ramify through exopodite, however, these are omitted from fig. 13 so that the underlying portion of the endopodite may be nore cleariy shown. Endopodite is biarticulate; length of articles: 1st 1.12 mime, 2nd 5.10 mmo pirst articie lies transversely, 2ma article is at right angles to 1st. Second article taperz to an acute apex which is permanentiy twisteds ita apical region 1s ormanented with very fino setae. There is a wide groove down ventral surface of article. Outer wall of this groove, along its midide thind, is set with blunt spines. Beyond this spinose portion, arilcle twists and groove opens on outer side of endopodite. Whan in position on the animal, male organ fits into this ventral groove in 2nd article. Where groove: opens outwarde, endopodite twiats to inner side of male organ, across
its ventral surface, and finaily its apical point curves round outer side of apex of male organ.

Third pleopod:- Inner posterior corner of protopodite is produced to fori a lobe fxinged with plumose setae. Eropodite (fig. 14) is sub-quadrangulary its posterior and lateral margina are fringed with plumose setae. The pattern of blood vessels varies in mall details in different exppodites, but that show in fig. 14 respresents their general arrangement in the 3 rd pleopod and is similar to that found in other pleopode. Endopodite is sub-quadrangular with its posterior margin indented. Fourth and 5th pleopods are similar to 3rd except that their rami are more triangular.

Uropod. Protopodite is sub-cylindrical with its inner aurface convex and bearing apines; its outer posterior corner is prolonged a 1ittle beyond base of exopodite. Rami are long and atyliform. Endopodite has a long terminal mpine; exopodite ends in a tuft of ahort setae. Length of articles: protopodite 2.3 mane, endopodite 3.7 mise exppodite 3.4 min. Maximan with of protopodites 1.0 min.

## Pemsie.

Length of largeat epeciment 18 mioe lreadth 8 mm .
Female differs from male in the following structurent -
Second antennai- When attached, $2 n d$ antonna reaches back approximately to base of 7th segment of pereion. Length of peduncle: 7.5 mina; length of flagellums 6.6 ym.

Perelopodis: - First to 3rd legs are not subchelate but are of the same form as remaining legs, which are similar to corresponding pairs
in male.
Second pleopodi- Endopodite is sub-exiangular and branchial.
Uropod:- Proportions of lengths of axticles of uropod, relative to each other and to length of body, are slightiy different to thoge in male.

Lengtha: protopodite 1.9 mine, endopodite 2.8 mmes exopodite 2.7 Maximum width of protopoditer 0.9 ши.

## Habitgt.

This description is based on specimens collected on 19th April. 1956, from under stones and seaweed near high tide level on a rocky shore at PIrater' Bay, Eaglehawk Neck; 72 wales and 131 ferales were obtained.

Other specimens were found under similar conditions at Uverstone, Devonport, Hawley and Iow Head, East Tamar, in northern Tasmania, and at South Axm, Minderbox and Adventure Bay, Brury Ialand, in the south-east. Examplea wore also found under stones and debris on the shore of the Bamar River at Sandy Beach and Gravelly Beach, and the Derwent River at Hobart and East Risdon. However the anidrals were not as numerous along these estuaries as on the neariby aea coast at lou Head and Eaglehawis Neck respectively.

Ifigin australiensis is reconded from the neighbourbood of Hobart by Thomson (1893, p. 55) and Chilton (1911, pp. 563-569).

## Variation.

The usual number of articles in the flagelimm of the $2 n d$ antenna appears to be 20 , but it is observed to vary from 18 to 22 in specimens collected at Eaglehawk Leck.

## Renarks.

As the Tasmanian specimens of Linia which I have collected agree With the original descritpion of Lipia australienais Dana 1853, I assign then to this species. (It is noted that Dana spells the generic name as Iychat. However, Dana"s description 1s briof and is based on a matilated speoimen. Consequentiy the position of Le gustraliensis is regarded by some authors as uncertain. Jackson (1922, p. 701) includes Le australiensis in a 1ist of species of Liets which are insufficientiy described or of doubtful validity. Vondel (1945, p. 229) precedes this species with a question mark.

Reference to Jackson's (1922) descriptions of adequately know apecies in his revision of genus Lifgig, and to deseriptions of apecies of Ifeig given in the following later works:- Verhoeff (1926), Edmondmon (1931), Barmard (1932), Jeckson (1933 b), Van Mame (1936), Jackson (1938), Collinge (1946), Vandel (1948); indicnees that Lo australiensts has the most charactors in comon with I noveemealandiae Dana 1853. Chilton (1911, pp. 568-569) states that he has specimens from Victoria and Hobart which he has considered to bo $I_{0}$ australiensig and which differ from I. novaemealandiae in a fow details in the appendaceo.

A conparison of charactors of ny masmanisn specimens of Le guatraliensta with those of Io novaerzealandige Dana, as doscribed by Chilton (1901, pp. 107-114, pl. 11), shows that constant differences do occur between the two species. These differences are given in the following table:-

| Ligia australienais Dana. | Ligia noveezer Jandise Dana. |
| :---: | :---: |
| Second maxilia with division into 2 lobes indicated by a suture line. | Second maxdlla with no indication of division into 2 lobes. |
| Firgt to 5th perelopods aach with a single "dactylar seta", uniform in width; 6th and 7th pereiopods with many such setae on dactylos. | Firet to 7th pereiopods each with a gingle "dactylar seta", clubbed at the end. |
| Male organs curved inwards at the end, with apices bluntiy rounded. | Male organs, (according to 11ge. I plp. 1 , I plp. $\left.1 \sigma^{\gamma} *\right)$, curved outwards. at the end, with apices acute. |
| Pleon not abruptly narrower than pereion. | Pleon abruptiy namrower than pereion. |
| Posterior border of temminal segment produced into a very obtuse median angle. | Posterior border of terminal segment evenly curved in the centre. |
| Distal region of endopodite of and male pleopod permanontily twisted. | Enclopodito of 2nd male pleopod, (according to fige. I plp. 2 万, I plp, $2 \boldsymbol{\sigma}^{7} x$ ), not twisted. |

I therefore regard Io gustreliengif Dana as a distinct and
valid species.
Chilton (1901, p. 113,/14ge. I plp. 1 $\sigma^{7}$, I plp. 1 $\sigma^{7} *$ )
describes and figures the male organs of Lu novae-zealandise as being adherent to the lat male pleopods and grooved on the dorsal surface.
 in this regand, as the male organs of the formor are not attached to the lat pleopode, nor are they so grooved down the dorsal surface. Hovever, Barnand (1932, pp. 185-186) queries these observations of Cbilton's. Also when aeen under very low magnification, the two ridges the on/dorsal surface of each male organ in Lo australiensis might appear to form the walls of a groove, although examination under higher magnification shows that surface of the organ between these ridges is not indented. Verhoeff (1926, pp. 347-348) divides Ligis Fabricius 1798 into five genera, and denotes L. povaempalandiae, which he attributes to Chilton instead of Dana, as the type speeies of one of his new genera, Negoligiae Use of Verhoeff's key to these genera indicates that L. gustraliensts oan also be included in Nesoligit. However, Verhoeff's sub-divisions are criticised by Jackson (1938, p. 175). Hesoligia is regarded as a mb-gemus of Lisig Fabricius by Van Mana (1936) and Jackson (1941). In the present paper, L. sustraliensis is therefore retained in Ligig Fabricius.

Tasmanian specimens of $\mathrm{L}_{\mathrm{o}}$ eustreliensis differ in the rolative length of the $2 n d$ antennas from the South Australian examples described by hale (1927, 1929). In describing a male specimen, Hale (1927, p. 320) states that the $2 n d$ antennae are distinctiy longer than the body, exclusive of the uropods. In the Tasmanian specimens, the 2nd antennes of both aexes are shorter than the body.

Bamand (1932, p. 186) refers to a South Australlan apecies of Kigig which he states is diatinct from ${ }_{10}$ novae-zealandiae as show in the
stylet on and pleopod. The male organs of this species, which ho Pigures (fig. 1 c ) in outiline, are the same shape as those of L. gustraliensis, which has been recorded from South Australia. Thus it is probable that this unidentified species of Lisia mentioned io Barnand is L. australiengis.

McNeill (1948) publishes photographs of L. augtraliengis and Porcellio geaber, but the captions appliod to them bave been reversed. Specimons in his photograph on p. 261, the caption below which roads "Garden Woodlico (Porcellio scaber)", belong to gemus lidet, whereas specimens in his photograph on p. 259, which are labolled as Ls guatraliensis, appear to be belong to gemus Porcellio Latrille.

## Mpla australtensis Dana.

| Pig. 1. | Cephalon, 2nd antennae and lst segment of perelon of nalo, dorsal view. |
| :---: | :---: |
| Fig. 2. | Diatal part of laft list antenna, dorsal view. |
| Fig. 3. | Distal part of cight mandible, ventral view. |
| Fig* 4* | Distal part of outer lobe of right list maxilla, vontral view. |
| PiE. 5. | Distal part of left 2nd maxilla, ventral view. |
| F1ge 6. | Distal part of loft maxiliiped, ventral view. |
| Fige 7. | Scale-seta on a gramule on 5th tergite of pereion, dorsal view. |
| Fig. 8. | Subwcholate part of loft lat leg of male, antemor view. |
| Pig. 9. | Dactylos of might lat leg, anterior view. |
| Pig. 10. | Dactylos of left 7th leg, anterior view. |
| F1E. 12. | Male organs, dorsel view. |
| Fig. 12. | Terminal segment, dorsal view. |
| P2E. 13. | Loft 2nd pleopod of male, ventral view. (Blood vessels in exppodite are not shom). |
| FiE. 140 | Exopodite of left 3nd pleopod of male, ventral view. |



## Fanily Styloniscidog.

Synonvily. Patagoniscidee, Verhoeff 1939.
Verhoeff ( 1939, pp. 302-305) reallzes that species found in South America, New Zealand and Australla which were formerly referred to genus Trichoniscus Brandt 1833, namely Tx. magellanicus (Dana), Irs murravi Dollfus, In phormianue Chilton and Iss thomsoni_(Chilton), do not even belong in the family Trichoniscidae. He erects a new family, Patagoniscidae, and new genus, Patagoniscus, in which be places these apecies, and on p. 306 he notes the characters in which patagoniscus differs from the Trichoniscidae. Actually Verhoeff states (p. 305) that he has already erected Pataponiscus in an essay on Oniscoidea from South America which is being published in Stockholm, but this paper was not published until 1951.

Vandel (1952; p. 14) considers Ratagoniscus Verhoeff to be a synonym of an earlier genus, Strloniscus Dana 1852, and on p. 94 he states that the Panily which possesses as its type the genus Styloniscus should bear the name Styloniscidae. Also (p. 15) he considers that the family Patagoniscidae is not solidis established, and criticises Verhoeff's interpretation of the characters on which he diagnoses Patagoniscus.

In Chapter I of his paper, Vandel discussea in detail one of the characters, namely the mesculature of the pleon, which distinguish the Styloniscidae from the Trichoniscidae. The following atatement on p. 12 illustrates a feature of this distinctions-
"Il est légltime de considérer comme inverses et en quelque sorte
complémentaires, les dispotifs musculaires propres au genre maichoniscus a'une part, aux Trichoniscide de 2 'hémisphère austral, d'autre part. Le premier pléopode de Trichonisicus possède des muscles extenseur et fléchisseur de l'appendice relativement faibles, mais la macuiature du protopodite est puissamment développóe. Cher les Irichoniscides de I'hémisphère austral, la , musculature générale atteint un volune exceptionnel, tandis que celle du protopodite est faible ou sêne xulle."

Vandel (195i, pp. 94-95) deíines family Styloniscidae as follows:-
"Cette famille est essentiellement caractérisée par la structure du premier pléopode mîle et des dispotifes musculaires qui en commandent les moxvesents. Ins ont été décrits on détail dans le Chapitre I de ce mémoire.

Ajoutons comme critères de moindre valeurs tâte de type trichoniscion. Mandibule droite avec un, mandibule gauche avec deux pénicilles: très généralement, il existe en plus un pénicille nolaire. L'apoplayee génitale est renflée à con extrémité et se termine par un petit appendice conique."

The two genera of family Styloniscidae represented in Tabmania may be distinguishod as Sollows-

Pereion nithout tubercles or inth tubercies not arranged in longitudinal rows; 3xd to 5th pleure of pleon small and adpressed - -


Pereior with tubercles arranged in longitudinal rows;
3 xd to 5th, or 4 th and 5th, pleura of pleon large and expanded laterally


## Gems Styloniscus Dana 1852.

## Syporvery. Nepatyichoniscus Jackaon 1938. <br> Patagoniscus Verhoeff 1939. <br> Antarctoniticue Paulian de Félice 1940. <br> 2 Oxteontecus Dollfun 1890 .

Dana (1852, p. 302) dofines a new gemus, Styloniscue, thich be includes in his new mub-Pamily, Soyphacinae, of Pamily Oniacidae, but be makes no reference to its species. In another paper (Dane 1853) he places in this genus two now apecies, Styloniscur mapellantcun (see ppe 736-737, pl. 48, fig. 7) from Tlerra del Fuego, and St. Joneigtrifis (seo pp. 737-738, pi. 48, IIg. 8) Irom Tongatabu, Friendiy Is. Dana (1854, p. 176) later establishes a third species, St. gracilitg, from California.

Sare (1899, p. 155) includes Styloniscus in family Lidgisdae. Stebbing (1900 , p. 564) raallses that St, manilanicus and St, longatyis are gecerically distinct. On the evidence of Dana's description, he transferw Sta maxllantcul to gems ixichoniscuis Brandt 1833 in Pamily Trichonisoidae, and he ( p .566 ) deacribes apecimens from the Falkland Ia. under the name trichontscus mapellanicus (Dana). Stebbing retains St. donpativiis and St. pracilis in Styloniscut, which he consicere may atili beiong in the Ligilidae, but he atates that the genus romains obecure, covering two species which axe very doubtifilly congeneric. Bichardson (1905, p. 690) transfers St, gracille to gems Iforitium Brandt 1833. Budde-Iund (1906, p. 83) ranke Stxlonitecus as a sub-gemus of Ixichoniscur, and retains in it Ir. (Sta) magellanicus. He (p. 84) conaiders that $\mathrm{St}_{\mathrm{e}}$ donotistylit is probably a Spherillo.

Jackson (1938, p. 176) includes tra mepellanicus in Meratrichoniscus, a new sub-genus of Trhehoniscus. Verhoeff (1939) realises that four species from the southern henisphere, which were formerly placed in trichoniscus, do not even belong in the Trichoniecidae, and he erects a new fanily, Patagoniscidae, and now gemus Patasoniscus, in which he places Ix. magelignicus.

Jackson (1941, p. 7), in a check-1ist of Isopoda of Occania, designates St: longatolis, the only species then remaining in the gems, as the type apecies of Styloniscus, which he includes in family ingildae. In this paper he follows his eariler procedure in placing tre mapellanicus in ryichonisous (Megatrichoniscus); he makes no refercnce to Verhoeff's paper.

Vandel (1943, po 116) atates that Patagoniscus Verhoelf appears to be synozymous with Stvioniscus Dana 1852. In another paper; (Vandel 1945, p. 234), he retains Patagoniacus and includes in it additional speciea from the southern hemisphere which were fomeris placed in Trichoniscues: however he refers to the cenus as "patagoniscus Verhoeff, 1939 ( $=$ Styloniscus Dana, $1852=$ Antarctoniscus Paulian de Félice, 1940 )." Vendel (1952, p. 14) aubsequentis recognizes that Styloniscus Dana has priority over Pataponiscus, He include Meratrichonlscus Jackson and Patagonfiscus Verhoers in the synonymy of Stolioniscus: in this synonyay he precedes Antarctoniscun Paulian de Félice by a question mark. Vandel (p. 14) quotes St mapellanicus as the type species of Styloniscus, which he places in a new family; the Styloniscidae. Ho states that the position of St, longlatylis remains \%obscure. Vandel notes Jackson's (1941) reference to this apecies but does not discuss his designation of

## Ste Ioneristrils as the type of Strionsiscus.

On p. 18, Vandel states that the Isopods from the Falleland Ialands describod by Stebbing (1900 a, p. 566) undor the name Trehoniacus magellanicus correapond in Sact to Doto garing (Chilton). I cannot aupport Vandel In this statenont. Stebbing decaribes bia opecimens as having eyes with three visual elemanis, flagellum of $2 n d$ antennes ufth 7-8 articles, mandibles with a molor process, and inner lobe of lat madilae with 3 plumose sotae. These characters do: not agree with those of Dete maxing, but they are consistent with those of a species of Styloniscus. As the FalkJand Islands are situated in the Vicinity of the type locality of Merma del Fuego, it seems reasonable to assume that Stebbing's apecimens do indeed belong to St, mprellanicus Dans.

Jackson (1941) appears to be the first author to designate a type species for Strloniscus. Therefore Vandel's Iater desiqnation of St. magellenicus as the type species would appear to be a contravention of the Rulew of Zoological Homenclature, Articie 30, II, $g$, (as reproduced In Schenk and Noliasters, 1936, pe 35), which states that if an authors in publishing a genus with more than one valid species, falle to designate or indicate its type, any subsequent author may select the type, and auch designation is not subject to change. It ahould be noted that Jackson's designation of St, Lonnistrifa as type is probably due to the lact that in 1941 this was the oniy species of styloniscus which had not been placed. in another genus. (Type ky elinination; see Article 30, III, k; Schenk and Hekastorm, 1936, p. 35).

But the identity of St, longistylis is very uncertain. The oxiginal description given by Dana indicates that this species probably belongs to the Lighidge, but it is not sufficientiy dotailed to confirm this. To 4 knowledge, the species has not been recorded since, nor has the original material been redescribod. On the other hand, St. macelilconys is recoxded and described by several authors since Dana, including Dollius (1891), Stebbing (1900 a), Gianbiagi de Calabrese (1939), and Vondel (1952). The material examined by Vandel was collected from one locality in Argentina and four localities in Chile, one of which, Natales, is situated on the mainland adjacent to Nlemp del Fuego. Vandel includes in Styioniscus several species which wero formeriy placed in Imichoniscus. His atudy of members of the irichoniscid group from the nouthern hamaphere is of value in clarifying the aystematic position of these Isopods, and the ecnus Siploniscus, as he defines it, includes an assemblage of closely related speoies. Thus, although it would appear correct to follow Jackson in recording St. 1onetistriss as the type of Strioniscing, and 00 to roname the genus based on Sta pacellanicus as type, in ny opinion thic procedure would only cause further confusion. Therafore, in the present paper, I propose to follow Vandel in uaing the name Styloniscus for the genus whose type is St. magellanicus Dana.

Vandel (1952, pe 17) considers that 0llconiscus zonocellatus (Dollfus 1890 a) Dollfus 1890 it probably belonge in Strloniscus. If this is so, as 0 . monocellatus is the only species in its gemus, 0liconiscus Dollfus would bocome a synomy of Styloniscus Dana.

## Gonemic diagnonis.

Vandel (1952) places Styloniscus in his new sub-family, the Styloniscinae, the characters of which are therefore exhibited by the gemus. His ( $p, 95$ ) definition of this sub-family is as followis-
"Corpa lisse ou tuberculé, mais jamais garni de côtes longitudinales. Neopleurons l-5 étroits, appliqués, on sorte quitun hiatus sépare le péréion du pléon."

The revised derinition of gerus Stuloniscus given by Vandel (1952, pp. 15-16) is as follous:-
"1). raille souvent grande (jusqu'à 14 mm ): mais quelque eapèces sont de potit taille (par exemple phormianus chilton, maumitianus Barnard, affinis $n_{*} s p_{0}$ ).
2) Appareil oculaire forwé de trois ormatidies nettement séparées (d'après Zerhoeff, certaines espèces posséderaient une seule ormatidie):
3) Céphalon de type trichoniscien normal.
4) Mandibule droite avec un, mandibule gauche avec deux pénicilles. La mandibule droite porte un pénicilile molaire chea toutes les espèces (etudiés par moi), à l'exception de mauxitiensis (sous-genre Indoniscur).
5) Apophyse génitale élargie à son extrémité, et terminée par un petit appendice conique.
6) Pléopode 1 घâlet protopodste très allongé dans le sens transversal; exopodite simpie, dépourru de tige; endopodite cyindrique, terminé par une longua tige, non ciliée, immobile (car dépourvue de muscles). Les macles extenseur et Sléchisseur de I'appendice sont
extrêmement longs et forts et sinnserent à la base de l'endopodites ils sont soutenus par un apodèm détaché du atemite."

There appear to be two exrors in paragraph 1) of this diagnoais. The name manitiengis Barnard (1936) is misspalled as mauritianut. Alao Vandel mentions gifinis nelp. but no species of this name is deacribed In his paper. This reference may be intended to appil to albidug, a new mub-species of $\mathrm{St}_{\mathrm{a}}$ mauritiengig, which he establiahes on p .61 .

Vandel (1952, p.16) places definitely in Stplonsscus the Sollowing elght species of which he has examined epecimens:St. macellonicmis Dana 1853. St thonsoni (Chilton 1885), $\mathrm{St}_{\mathrm{e}}$ phormiames (Chilton 1901), St, otakensis (Chilton 1901), St. gpinogus (Patience 1907), St. tabulae (Barnard 1932). St mayritiensis. (Banara 1936) and Ste nicholisi Vandel 1952.

He atates that, due to insufificiency of descriptions, the assignment of numerous species to this genus is uncertain. However, he considers that, according to the descriptions and figures given ty their authors, the following ninoteen apecies very probably belong in StiylonisoystTrichoniscus Vempucosus Budde-Iund 1906; Tre bottontoti; In natelensis.

 Barnard 1932; Patagoniscus norienskiblds, P- pallidus Po araucanious, g. simothi, D. ihemingi, go schuabei, Verhoeff 19398 Tr. (Antarctoniscus) Seameli Paulian de Félice 1940. It should be noted that Verhoeff (1939) Indicates that he has already established three of his apecies of Patanoniscuse g. nordenskiolds, Po pallidus and go ihoming, in an essay
on Oniscoidea from South America which is being publishod in Stocitholm, but this paper was not gublished until 1951.

Vandel states that the following four apecies posaibly bolong
 monocellatus (Dollfus 1890 g ) Dollius 1890 b ) Tra kermadecensis Chilton 1911. He bolieves that tre commensalis chilton 1910 a probably represents the type of a special genus. However I suggest that if ir. kemmadecensis is to be considered as possibly belonging in Styloniscug then Tre compenealis, which has characters in comon uth this species, e.g. pleon not abruptif narrower than pereion, should also be considored here.

St. Lonpistyils Dana 1853 probably doos not belong in gomus Scyloniscus as defined by Vandel (1952); its position bas already been discussed.

Thus altogether there are thixty-two estabilabed species which appear to belong in genus Stploniscug. Reference to descriptions given by Fandel (1952) and by the original authors of the apecies indicates that two of the flve apecies of Styloniacys which I have collected in Tasmania can not be identified with any of these. Dus to the brevity of aome accounts, it ia not possible to demonstrate the diasinction of the two new species from all of the established apecies by means of a single key. Consequentig the six apecies dosaribed by Verhoofi (1939, 1951) under the name gataponiscug are omitted from a hey dealing with the majority of the apecies in Strioniscus, key 1, and are considered aeparately in key 2.

## Key 1.

1. Eye composed of one ocellus -. - . - - - St.? monocellatus (Dollfus).


Pereion tuberculate or uneven - . - . . . . . . . . . . - - - - 6 .
2. Ocelli of eye contiguous, or arranged in a line, or both.
 St• pottentoti, Sta natalensia, Sta austro-africanus, (Barnard). Ocelli of eye separated and arranged in a triangle . . . . . . - - 4 .
3. Flagelliform process of endopodite of lst male pleopod lacking setae - - - - - - - Sta magellanicus Dana, Ste phorgianus (Chilton). Flagelliform process of endopodite of list male pleopod bearing

4. Ischion of 7th leg without sexual differentiotion . . . . . . . -


Iāchion of 7th leg showing sexual differentiation - - - - - - -

6. Pleon not abruptiy narrower than pereion - - - Star cormensalis, Star kermadecensia, (Chilton).

Pleon abruptly narrower than poreion - . . . . . . . . . . . . . . . 7 .
7. Pleon with dorsal surface of all or majority of ite segments tuberculate or uneven - - - - - St. ofalienale (Chilton) St. spinosys (Patience); St. Michollsi Vandel; St, georfensis, Ste avellendant, St. givergdalei, (Barmard); St. jeannoli (Paulian de Félice); St.? mprrayl, St. 8 australls, (Dollfus). Pleon with dorsal surface of all segments, or all but 3xd segment, scooth -......-..................................... 8 .
8. Ocelli of oye contiguous, or arranged in a line, or both $-\ldots-$ - - - - St. yenfosus, St. caponais, St. womulicons, St. bozae, St. cestus, (Bamard).

Ocelli of eye separated and arranged in a triangle - . - . - - 9 .
9. Dorsal surface of 3xd segrent of pleon smooth … . . . . . . -
 Dorsal surface of 3rd segment of pleon with a row of tubercies - -


## Kor 2.

1. Bye composed of one ocellus - - - - St. araucanicus, Stoschushei, (Vorhoerf).
Eyo conposed of 3 ocelli . . . . . . . . . . . . . . . . . . - 2 .
2. Terainal process of male organ in form of a blunt knob - . -- - - - Ste pallidus, St. iheringh, Ŝ. sinrothi, (Veriooff). Terninal process of male organ in form of a cone - - - - - - 3 .
3. Exopodite of lâ sale pleopod with its outer border not indented -


Exopodite of lat aale pleopod with its outer bonder indented - -

4. Ischion of 7th leg of male with its under surface incurved; terainal process of male organ provided with smail teeth .-........... -. . . . . . . . . . . . . . . . . . . - St nomionskilaldi (Verhoeff).

Ischion of 7th leg of male with its under surface not incurved, so that its lower border is straicht; torminal process of rale organ without teath - - - - - - - - - - - - - Stis scuarzosus nosp.

## Key to species of Strioniscus represented in Inomula.

1. Second article of endopodito of 2nd male pleopod with imer side curved in abruptiy at about $1 / 4$ of its lengtio from aper, so that its apical point is asymontrical, continuous with outer half of exiopodite $-m-\infty-m$ - - - St. nicholisi Vondel. Second arificle of endopodite of znd malo pleopod with inner aide noi curved in abruptiy at a diotance from apex; apical point is alrost symentrical with romainder of ondopodite $-\ldots-2$.
2. Cephaion and peroion with transverse rows of tubercles $-\ldots \ldots \ldots$


3. Cephaion and pereion set whth monous large serne; Plagelisform process of ondopodite of lat male pleopod lacking setae $\ldots \ldots \ldots$


Cephalon and pereion with few or no setae; ilagelliform process of endopodite of lat male pleopod bearing setae $-\ldots-\ldots-\ldots-4$.
4. Ischion of 7th leg without semal differentlations flagelifform process of endopodite of lat vale pleopod having setae reatrioted to a tuift at apex and lacking setose pencils $-\cdots-c_{-}$ - - - - - - - - - - - - - - - - - - - - - St Sthomsong (Ohilton)

Ischion of 7th leg showing sexami differentiationg flagelliform procens of endopodite of lat male pleopod having its distal quarter Betose and bearing 3 setose pencilo at apex $-\ldots-\ldots-m^{-}$ - - - - - - - - - - - - - - - - - - - - Stn gaculosus nosp.

## Styloniscus thomsons (Chilton 1885) Vandel 1952.

(Figs. 15-17).

Synonyw. Philourxia Thonson Chilton 1885.
$=$ Ehiliverde Tromsons Chilton 1886.
Irichoniscus Thomeng (Chilton 1885) Chiliton 1901. Tetchontacyis (Moratrichoniacus) thomsons (Chilton 1885) Jacizson 1938.

Pataroniscus thomsoni (Chilton 1885) Verhooff 1939.
The Tasmanian apecinons assigned to Styloniscus thonsoni are not described in dotall in the present papor, as the opecies is characterizod in provious 11 terature: - Chilton (1886, pp. 159-161, p1. 5, 19ge. 1-6), (1901, p. 118, pl. 13, fig. 1): Budde-Lund (1906, pl. 4 ", Pigs. 22-24); Jackson (1938, p. 176, Pig. 3); Vandol (1952, pp. 36-42, 8igs. 29-34).

St, thonsons may be distinguibhed from other specios of Strioniscus represontca in iasnanis on the following combination of charactersi-

Longth of largost male speciman: 6 mmoj breadth: 2.7 mm .
( Length of largest fenale speciment 6.4 msoj breadth : 3.2 ma .
Bacleground colour of live affmals is variable; some opecifens are light brown mariced with patches of daris brow, some are orange with darls brow patches, others are red uth the daris naritngs alnost bleck. The unpigented patches on cephaion and body are not conspicuous in live animals, but in most apecizens there are mumarous small, opaque, white spots scaitered on dorsal surface.

Surface of body is smooth. Each eye is composed of 3 large
ocolld which are vory cridely separeted iron ono anothor and arranged In a friangle. Terasmal segreni 10 traperoidal usin its posterior Border straight.

Firat malo pleopod (fig. 15):- nopodito 80 oub-לriangular with its outer marcin noi indomied. Rnapodito terninatos in a Plagelliforn procegs uhsch tears at its apax (2ig. 16) a whde tuit of setne; thoze are no other sotac on proceso apart 8 roi theo opqeal tuit.
 1st 0.25 mm, and 1.05 mm . Sccond artscle tapers to a narros point wasch io cearcoly bont ouforde. on ventral suríace, an oblifuc chitinous thickoning is situated at about $2 / 5$ of loagth of aficiclo bohtma apax. Haliuay betreon this throlooming and apex thore lo a conotriceloa In width of exdopodite. On dorsal sursace, a groove with stroagdy chitinized nalls axtends oblsquely dom losigh of arsilcle. Groovo adens suddenly in conero of ito leagith, ethon narrors acoin. In apical region itbore are several longhtudimal ridges of chatin. A seu groups of sotae occur on taner surface or article near its baco. pirtia male pleopodi- Groove for recoption of ondopodite of rad ploopad extonds down trolo longth os oxppodite.

Second remalo pleopod:- Loagith of exopodite 20 approseractely $2 / 3$ that of endopodito; length (alorg innor border): oropodito 0.40 man ondopodste 0.62 man.

## rabsiat.

These observations are bascd on apocirons found undor docaying nood and in dobris lying on the exound at aleztudes of 1900-3900 ft. on

Mt. Wellington. Examples were collected on the Solloung dates:15th Sisy, 1956, 2 rales, 9 ferales; 2nd October, 1956, 3 males, 9 fenales; 6th Karch, 1957, 8 males, 11 fenales; 28th Kay, 1957, 12 males, 42 fomales.

Specimans were also found in decajing wood and forest debris at Collinsvale and Tarraleah, and in Rt. Field National Park and the Florentine Valley.

Styloniscur thomsoni has not previousis been reconded sron Tasmania.

Strioniscy thomsoni (chilton).

Pig. 15. Left lat pleopod of male, dorsal 7 Hew.
Fig. 16. Distal part of ondopodite of left lat pleopod of male, dorsel view.

Fig. 17.: Laft 2nd pleopod of male, doral view.


Styloniscus phormianus (Chilton 1901) Vandel 1952.
(Figs. 18-19).

Synonytiv. Philougzia rosea Ghilton 1883 (in part) - non ( Koch 1835-44). $=$ Philygria cogea Thomson and Chilton 1886 (in part). Trichoniscus phomiams_chilton 1901. Patseoniscus phozmianus (Chilton 1901) Verhoeff 1939.

The Tasmanion apecimens assigned to Styloniscus phornianus are not described in detail in the present paper, as the apecies is characterieed in previous iiteraturei- chiliton (1901, pp. 215-117, pl. 12, Plg. 1); Vandel (1952, pp. 47-51, f1gs. 40-4/N)

St. phormianus may be distinguished from other apecies of Strioniscus represented in Tasmania on the following combination of characterat-

Length of largest male spocimen (collected at Collinsmale): 2.0 mmo 3 breadths 0.9 mm .

Length of largest Iemals specimen (collected at Collinsvale): 2.5 min. ${ }^{5}$ breadth: 1.2 man.

Dorsal surface of live apecimens is purpitish-brown in colour with numerous conspicuous unpigmented patches. A pigmented band extends down centre of pereion. Surface of body is amooth. Cephaion and pereion bear large acattered actae (see fig. 18), which are viaible under a binocular dissecting microscope (X20). Eyes are each composed of 3 ocelli which are separated from each other and arranged in a triangle. Terminal segment is trapezoidal with its posterior angles slightly rounded.

Pirst male pleopodi- Exopocite is sub-triangular with an indentation in its outer marging its apex is slightiy bent outwards. Endopodite terpinates in a Plagelliform process which is sinpiy pointed at its apex, and lacks setae. Second male pleopod (ifg. 19):Length of articles of endopodite: 1st 0.1 man 2nd 0.33 me Wiath of 2 nal article is almost uniform until just before apex, where it narrows to a blunt point thich is silightiy bent outwards. On dorsal aurface, a groove with etrongly chitinlised walls extends obliquely down length of articie. In niddie thind the walls of this groove besr grall, backrardiy-sioping chitinous zidges. At base of article, innar wall of groove is set with a row of blunt, setase processer. Fifth male pleopodi- Groove for reception of endopodite of 2nd pleopod occupies approximately half length of exopodite.

Second femele pleopodi- Length of exopodite is approximately $3 / 5$ that of endopodites length (along inner border): expopite 0.14 mio, endopodite 0.23 mis.

## Habstat.

These observations are based on specimens collected on 19th June, 1957, from among debrie lying on the ground in a myrtle gully at Collinsvales 5 males and 23 females were obtaincd.

Other epecimens were found in forest debris at Fern Iree and also highor up on Mt. Wellington at an altitude of about 1,900 ftes and at Darraleah.

Styioniscus phormigmus has not previously been recozded from Tasmaia.

## Remarks.

In one reapect the specimens from Collinsvale diffor from the New Zealand specimens described by Chilton and Vandel. According to Chilton (1901, p. 116) the pereiopods of the male are not specially modifiled, and Vandel (1952, p. 51) states that the lat male pereiopod lacks sexual differentiation. In the male specimens from Collinsvale, the under surface of meros and carpos of the lst and 2nd pereiopods bears hyaline scales, which are not present on the corresponding pereiopods in the female.

On 7th October, 1957, 15 males and 19 females were callected from debris lying on the ground in a forest of eucalypts and treeforns at Tarraleah. These specimens are considerahly larger than those found at Collinevale and on Mt. Wellington, and 4 of the males and 11 of the females are more extensively plgmented.

Length of largeat male specimen from Rarraleahs 4.8 mmoj breadth: 2.4 mim.

Length of largest fensle specimen from Tarraleah: 7.2 mmos breadth: 3.6 mm

Chilton (1901, p. 116) gives the size of his specimens as "about
4 mim." Vandel (1952, p. 49) states the length of his apecimens to be 2 mm . None of the female specimens from collinsvale is carrying enbryos, but anong specimens from Mt. Wellington there are 3 ovigerous Pemales, of which one is 2.1 mm . long, the other two are each 2 zm. long. It is therefore likely that the specimens from Collinsvale are at least mature, even if not fully grown.

However, in spite of the difference in aize between animals from the two localities, I can find no morphologicel distinction between the large apecimens from Tarraleah and the amall specimens from Collinsvale. Thus I assign the former also to Styloniscus phorminnus.

## Styloniscus phormianus (Chilton).

Fig. 18. Loft opinors of lat and 2nd segments of pereion, dozal view.

Pig. 19. Left 2na pleopod of male, dorsal viewe
$1.9$

## Styloniscus gichol1si Vandel 1952. <br> (Fige. 20-22).

As the description of thls species given by Vandel (1952, pp. 30-36, ilgs. 21-28) is not readily available in Australia, the following description, based on Iurther Tasmanian material assigned to the species, is given for the beneift of local atrudents.

Male.
Length of laxgest speciment 3.1 mmes breadths 1.5 rum.
Colour. In live specimen, dorsal surface is dariz brown, with conspicuous unplgmented patches on cephalon, pereion and pleon. These patches are especially large on $18 t$ to 4th perelal targites and at bates of pereial epimera.

Cephalon. Dorsal surface of vertex is alightily roughened. Antennary tuberclea are right-angled and prominent in dorsal view. Eyes are each composed of 3 ocelli which are separated from each other and arranged in a triangle.

First antonng, Apex of 3xd article bears 5 large sensory setae, which are of different lengths.

Second antenne. Iength of peduncle: 1.23 ma. flagellum: 0.38 mm . Thero are two long spines on distal border of 4th article of peduncle and one apine on each of 3nd and 5th articles. Apex of outer sheath of each spine is divided into several ine points surrounding a coarser central seta. on anterior border of 5th article are tubercles arranged in 2 rows, 6 in ventral zow, 2 in dorsal rows each tubercle bears a large hyaline scale. Flagellum has 4 aricicies,
and ends in a very long pencil of notae.
Finnithicg. Laft madibles- Inciaor process conalots of one unid tooth and 2 aimple teoth. Iactata mobilis eads in 3 teoths behind its mase there are 2 pencils of setie. Holor procens hav no pencil of setae. Alght madibler- Incisor process consiets of 3 olmple teoth. Lacinia mobilis is club-shaped uith a ring of tootb-18iro proceason at its apex; thore is ono poncll oi oova bohtind its bace. Molar process has a peacil of cotac.

Pirat masilia. Onter lobe bears 11 staple tooth and 2 loag, raxyou processes. The laiter are set at an anelo to loag asd of lobe and their diotal regions beam sphnules. Groups of netao ocour on dorsal surface of lobe near its outer border. Inner lobe bears 3 conical secose processes; tho two more diokal ones are nub-oqual in lengit, tho third is longer.

Second maxi13g. Apical region ia bilobed. Apex of ouror Iobo bears 3 coazso setac; outer margin of lobe is fringed utth rino setac. Apor and innor maghal region of innor lobe bear deveral coarse sotac and numerous ifino sotac.
faril1ined. Epipodite raperv to an acute apaze Outer side of baska projecta boyond ase of endopodito an a rowaded lobe rininged utin long sotac. In ondopodito, ischion is tho ony axticle diatincts there are 2 ghort apinea on its ventral surface. Romainder of endopodito is aub-conical, Nth ita immer oddo near apox shoung indications of division snto 3 lobes. These lobes bear setae of approsinately egual tbicheos. Inaer margia of enoloposito beario comb-12ke groups of petaes on outer margin are 2 large sotwe, vith a
pencil of fine setae in the angle of the lower one. Endite is sub-conical with its inner and outer sides setose. It terminates in a conical setose process, below base of which are 3 spines.

Pereion. First eegment is produced forwards on each aide to flank cephalon. Posterior borders of lst to 3rd segments are nearly straight, those of 4th to 7th segmenta are produced progressively further backwarde. Epimera are broad. Coxal suture 2 nes are evident on 2nd to 7th segments, but are inconspicuous. Dorsal surface Of tergites is slightiy roughened but is not conspicuously tuberculate. Tergites have a covering of ovoid, atriated scales (fig. 20). Scalesetae are present on dorsal surface of all tergitess scattered aimple setae also occur, but these are not visible under a binocular dissecting microscope. Lateral margins of segmente are bordered with amall, triangular scale-setae.

Perolopods. First legi- Spines on under surface of articles each have apes of outer sheath divided into aeveral ifine points surrounding a coarser central seta. Dactylos terminates in a simple claw. "Dactylar seta" divides into 2 rami, one of which sub-dividea dichotomously while the other has branches amising from a main axis. Large hyaline scales are present on under surface of carpos.

Hyaline acales are also present on under sunface of carpos of are 2nd leg but/abeent from this position in remaining lege. Outer margin of propodos on 6th and 7th legs has a Iringe of elongated scales. Seventh leg shows no sexual asferentiation.

Kale organ. Dietal region is broadered and rounded, and is terminated by a mall conical process with solded wils. On ventral mpface there is a $\nabla$-ahaped ridge at base of rounded portion. The two ducts which enter male organ unite inside it to form one.

Pleon. Abruptiy narrover than pereion. Ploura of 3rd to 5th segnenta are anall and adpressed but viaible in dorsal view. Torminal segrent is trapesoidal with its postero-lateral borders incurved and its posterior border straight. Dorsal surface of pleon is slightily roughened. Ornamentation of tergites is sinilar to that of pereion.

Eleopodg. First pleopod (fig. 2l):- Protopodite is broad; Its outer mareinal region bears tyaline scales. Exopodito is aubtriangular with an indentation in its outer border; its apex is slightiy crenafe. Endopodite is sub-oylindrical and terminates in a long flagelifform process which is simply pointed at its apex and lacks setae. Well-developed muscles are inserted at base of endopodite. Second pleopod (fig. 22):- Outer side of protopodite is produced into a sub-triangular lobe with its apex setose. Eixopodite is sub-rectangular and has a fringe of setae on its outer posterior angle. Endopodite is biarticulate; length of articles: lat $0.18 \mathrm{mmo}$, 2 nd 0.63 mm . Inner alde of 2 nd article durves inwarde abruptiy at about $1 / 4$ of its length from aper, so that the apical point is asymatrical, contimuous with outer half of endopodite. A groove with strongly chitinised wells extends obliquely down dorsal burface of 2nd article. Near base of article, inner border of this groove is set with a row of blunt, toothilike processes.

Third pleopod:- Exopodite is oub-quadrangular, with posterior marein indented; its lateral margins are setose, there is a large plumose seta on apical angle, and a few long, simple setae on ventral suriace near posterior margin. Endopodite is sub-triangular, much
amaller than exopodite. Fourth pleopod is eimilar to third.
Fifth pleopodi- Exopodite is sub-triangular, with comb-like groupe of setae on lateral borders, a large plumose seta at aper, and a few long, simple setas on ventral gurface near outer borier. A groove for reception of endopodite of 2nd pleopod extends down whole length of exopodite. Region in which this groove lies is heavily pigmented. Endopodite is latger in comparison to exopodite then in 3rd and 4th pleopods.

Uropod. Protopodite is aub-triangulars its posterior border La level with that of terminal segment. Both rami are conical, covered with scales, and have a fev long terminal setae. Length of rami: exopodite 0.47 mmo endopodite 0.3 mime

## Female.

Length of largest speciment $4.6 \mathrm{~mm} \cdot$; breadth:2.3 mm .
Female differs from male in the Pollowing atructuress-
Perelopods:- Large hyaline scales are not present on under surface of carpos of lat and 2nd perelopode.

First pleopodi- Exopodite is small and triangular, with its outer border nearly etraight; endopodite is rounded and much maller than exopodite. There are no well-developed muscles attachea to endopodite.

Second pleopodi- Exopodite is quadrangular; endopodite is elongated and conicaly its distal half bears comb-like groups of setas. Length of exopodite is approximately that of endopodite; length (along Inner border): exopodite $0.22 \mathrm{~mm}_{\mathrm{c}}$, endopodite 0.43 mm .

Fifth pleopod:- Innor side of exopodite has no eroove and is not heavily pigmented.

## Habitat.

This description is based on specimens collected on 26th June, 1957, from loas littor and decaying wood lying on the ground at an altitude of about $1,900 \mathrm{ft}$. on Mt. lellington; 8 males and 11 females were obtained.

Other apocimons were foum in grass tussocks on Queen's Donain, Hobart, under stones in the Oniversity Park, Sandy Bay, Hobart, in forost debris in Mt. Field National Park and at Iarraleah, in damp eucalypt leaven at Rrospect, near Launceston, and under pheces of wood lying on the groumid near a beach at West Ulverstone.

Vandel (1952; p. 30) states that bis specimens were collected in mosses, along a strean, at Gulde R. Falls, ton miles from Burnie, in the northmest of Tasmania.

## Yariations.

The specimens from Sandy Bay are a ilighter and more redalioh brown than those from Mt. Wellington.

The amall elevations on the dorsal auriace of the cophalon and pereion in the specimens from West 01verstone are more pronounced than those of the specinens from lit. vellingtons cephalon and pereion of the former thus appear einely granulate.

## Roparks.

Vandel (p. 32, fig. 24, c) describes and figures the outer lobe
of the list mavdila as baving 10 teeth as woll as/setose processes. In the specinons from Mt. Wellington this structure has 11 teeth, 10 corresponding to those figured by Vandel, and one other small tooth aituated towarde the outer side of the lobe.

Vandel ( $\mathrm{p}_{.} 30$ ) states that the scales on the carapace of his specimens are not striated, and (p. 31) indicates that scale-setae are absent from the 3rd to 7th perelal tercites. In the apocimons from Mt. Wellington, acale-setae ocour on all peraial tergites, and striations are apparent on the ovoid scales uhich cover the dorsal surface of the pereion. However, due to the agreement of other characters, especially those of the lst and 2nd male pleopods, of the specimens from Mt. Wellington with Vandel's description of specimens from Guide Raver Falls, I have no hesitation in assigning my specimens to Styloniscus Michollai.

## Strlontscus nichollasi Vandel.

Fig. 20.

Pig. 21.

Fig. 22.

Scalea on dorsal aurface of 7th terete of pereion, dorsel view.

Right lat pleopod of male, domal view.
Right 2nd pleopod of maie, dorsal view.


# Styloniscus meculosus n.sp. 

(Figs, 23-41).

## Male.

Length of largest speciment $4.9 \mathrm{mmo}_{0} ;$ breadthi 2.25 mme
Golour: Background colour of dorsal surface in live animal Is dark brova. Conspicuous unpigwented patches are present on cephalon, pereion and lat to 3rid segnants of ploon. On all pereial tercites there is a large unpigmented patch on each side near base of epimeron, with an area of smaller patches between this and centre of tergite. A $\mathbf{V}$-shaped unpigmented patch occurs in mid-line of anterior region of 2nd to 7th pereial tergites and lst tergite of pleon. These patches together form a conspicuous yow down mid-line, while the parches at base of epirera form a similar row on each side. Distribution of unpdemented areas on 4th and 5th pereial tergites is figured (fig. 23).

Cephaion. Surface of verter is smooth. Frontal line is not developed. Supra-antennal line curves downaxds in centre. Antennary tubercles are obtuse-angled when seen in dorsal view of cepbaion. Eyers are each composed of 3 ocelli which are distinctily separated from each other and arranged in a triangle.

Eirat antenna (ifg. 24). Triarticulate and uneveniy tapering, with 2nd and 3rd articles each abruptly narrower than preceding article. Third article is spatulate; its apical border boars 6 long asonsory netae and another such weta is set on its inner border.

Second antenna (fig. 25). Length of podunclet 1.78 nim.; length of flagellum: 0.60 mm . Long spines occur on distal borders of
articles of peduncle; 2 each on 3xd and 4th articles, one each on 2nd and 5th articles. Each apine is formed of an outer sheath, split at the apax into geveral fine points, which surrounds a coarser central seta. All articles of peduncle boar a covering of scales. Antorior surface of 5 th axticlo is undulating. It bears groups of hyaline wcale-setae which form 2 series, a dorsal row of 5 groups and a ventral row of 4. Flagellua is evenly tapering and composed of 6 articles, all of which havo a covering of scales. On anterior surface, one or 2 long sensory setac are present on distal borders of each of 2nd to 5th articles. Terminal article has an apical tuft of long sotae.

Landibles. Left mandible (iig. 26):- Incisor process consists of an outermost bifid tooth and 2 aimple teethe Lacinia nobilis ends In 3 teeth; at its base there is a tuff of simple setae, behind which are 2 pencils of setae. Molar process has a ridged triturating surface bordered with a fringe of simple setae; there is no molar pencil. Bicht mandible (fige 27):- Incisor process consists of 3 simple teeth. Lacinia mobilis is club-shapod with a ring of tooth-like processes at'its apex; one pencil of setaeoccurs behind the base of lacinia nobsilis. There is a pencil of setae on molar process.

Fixat maxilis, Outer lobo (Pig. 28) onds in 11 ainple teoth and 2 slender processes; the latter are inserted at an angle to lone axds of lobe and their distal ends are set uith short setae. Comb-like groups of setae, present dom outer alde of dorsal surface of lobe, project beyond outer border. Inner border bears 3 conical setose processes on its Inner surface near apax; the 2 noro distal processes are aub-equal in length, the 3rd is longer.

Second maxilla (fig. 29). Apical region is divided into 2 rounded lobea, outer lobe being about balf width of inner lobe. Three opines occur on apex of outer lobe, and fine setae fringe its outer margin. Aper and inner marginal region of inner lobe bear several coarwe setae and numerous fine setae. A suture line extends from angle between lobes for a short distance down ventral surface of maxilla. An area around terndnation of this line is covered with long setae.

Maxdiliped (iig. 30). Epipodite tapers to a abarply rounded apex; its outor margin at its base is curved outwards. Inner region of basis is thicker than outor region, thicker part being delimitod ky a ridge on dorsal aurface. Comb-1iks groups of setae occur on lateral bonders of basis. Outer side of basis is produced beyond base of endopodite as a rounded lobe fringed uith long aetae. Ischion is the only article of endopodite nhich in distinot there are 2 short epines on 1ts ventral surface. Remainder of endopodite is sub-conical in outiline and lacks suture lines. Its inner side near aper shows indications of division into 3 lobes. These lobes bear long aetae wish differ in thickness. Inner margin of endopodite bears comb-1ike groupa of setao. Two long setae occur on outer marging there is a large pencil of fine actae in angle of the lower one. Endite is sub-conical, continuous with thicker part of basis; its inner and outer surfaces are setose. Findite terminates in a conical, setose process, below base of which are 3 apines.

Perelon. Firat segment is slightiy produced sorvards on each side to Plank cephalon. Posterior borders of lst to $3 x d$ segnents are nearly transverwe with posterior angles of opimera bluntiy rounded.

Epimora of 4 th segnent are slightig produced backuards with posterior angles right-angled. Epimera of 5th to 7th aegnents are more markedly produced backwards uith angles sub-acute. Coxal suture lines are evident on 3rd to 7th segments but are inconspicuous. Dorsal surface of pereion is mooth. Tergites have a covering of pointed acales, which do not appear to be atriated, and also bear wcale-aetae (fig. 3i) each of which has a narrow, pointed scale portion. Large simple setae are not present.

Rerelopods. First legi- Majority of opines on leg are each composed of an outer sheeth, apilit at its apex into several fine points, and surrounding a coarwer central seta. A covering of hyaline scalea is present on under aurface of meros and under and inner sumfacea of carpos. Propodos has abort ainple spines on under surface as vell as hyaline scales on inner surface. Dactylos bears long curved scales and a few long setas; it terminates in a simple claw with a long seta set below 2t. The "dactylar mata". bifurcates, and one rame continues to sub-divide dichotomousily while the other has branches arising from a main axis. (Dactylos of 4 th leg is figured, fige 32).

Simple spines are absent from propodos of 2nd to 7th leg. Distribution of hyaline scales on and leg 2 a similar to that on 1 ist. Such acales are present on under eurface of meros and carpos of 3rd leg and neros of 4 th leg, but are absent from under surface of renaining legs. Outer aurface of propodos in 6th and 7th lege has a fringe of elongatod acales.

Seventh leg ahows maxisil differentiations lower region of ischion (fig. 33) forms a lobe which projects forwards below meros, and
as a result, under surface of ischion is shallowiy indented. Thus it differs from ischion of lat to 6th legs in which lower part of its distal border slopes back towards basis and its urder surface is not Indented.

Hgle orran. (fig. 34). Distal region is wroadened and rounded; it tominates in a median conical process with folded nalls. A slight ridge ercoses ventral surface at base of rounded portion. The two ducts which entor base of organ unite inside it to form one.

Pleon. Abruptily narrower than pereion. Pleura of 3rd to 5th segnents ase amall, acute and adpressed but visible in dorsal view. Terminal segment is trapezoidal with postoro-lateral borders Lacurved and posterior boxder very slightily curved outvards. Surface of pleon Is smoothe Tergites bear scales and scalemsetae like those on pereion.

Pleopods. First pleopod (fise 35):- Protopodite is broads Lits outor surface is rounded and bears hyaline scales. Exopodite is srall and sub-iriangular, uith apex bluntiy rounded and alightily cresato, and outer border not indonted. There are a fow comb-like groups of amil sotac down its inner margin. Endopodito la sub-cylindricals it torninates in a long flageliliforn process. Distal quartor of thas
 has 3 sparmoly setose poncils projecting boyond it. Well-dovoloped muscles, supported by a prolongation of list stornite of pleon, are inserted at base of endopodite.

Second pleopod (ifg. 37)i- Outor side of protopodita is produced into a sub-triangular lobo unth apex setose. Exopodsto is sub-quadrangular; it bears sotao along innor margin and on outor
posterior angle. Endopodite is blarticulates length of articleas Ist 0.27 mmog 2 nd 1.24 mm . First axticle is submegindrical and has woll-developed longetudinal muscles; there is a broad chitinous thickoning on its inner surface. Second article tapers to a narrow point, and is slightly curved outwards. At base of 2nd artiale, on inner sumface, there is a broad chitinous thickening which is corrugated on margin. Groupa of setae occur on inner suxface of article beyond this thickening. There is a narrow oblique chitinous thickening on ventral aurface of article at about $2 / 5$ of ita length behind apex: A groove with strongly chitinized walls extends obliquely down dorall surfaces groove widens suddeniy in centre of it length, then narrows again. Apical region of article is ornamented with several longitudinal ridges of chitin.

Thind pleopodi- Inner posterior corner of protopodite is produced into a sub-triangular setose lobe. Exopodite is sub-quadrangular with apex sharply rounded and posterior border slightly indented. Comb-1ike groups of setae occur on and near inner margin and around outer posterior angle. There la a large plumose seta on inner posterior angle and a few long, simple setae on ventral burface near posterior bordor. Endopodite is sub-triangulax, such smallor than exopodite. Fourth pleopod is eimilar to 3 xd , except that ita apex is more dram out.

Fifth pleopodi- Setowe lobe on protopodite is long and narrouExopodite (fig. 38) is sub-trdingular, with comb-like groups of setae on lateral bordera, a large pluniose sota at apex, and a few long, almple setae on ventral surface near outer border. On dormal surface, a setose

Groove for reception of endopodite of 2nd pleopod extends down inner aide of expodite for alnost its whole length. Region occupied ly proove is hearily pignented. Endopodite is larger in comparison with exopodite than in 3rd and 4th pleopods.

Uropes. Posterior border of protopodite is level with that of terninal megment. Both raml are conical, have a covering of mcales. and terrinate in a few long aetae. Langth of ramis exopodite 0.88 ma, endopodite 0.70 men

## Ferato.

Length of largest mpecimens 6.4 nimoj breadth: 2.6 mm
Fenale differs from male in the folloving atructuress-
Perelopodsi- Hyaline scales are not present on under aurface of Ist to 4th lege. Onder murface of lachion of 7th leg (fig. 39) is not indented, and lower part of its distal border alopen back towards basis. Ischion of 7th leg of female is therefore similar to those of lat to 6th legs in both aexes and different to that of 7th leg of male.

Firat pleopod (iig. 40) i- Exopodite is small and auk-triangular with outer border scarcely indented. Endopodito is sub-triangular, much emaller than exppodita. There are no well-developed mascles attached to endopodite.

Second pleopod (1ige 41):- Exopodite is sub-quadrangular. Endopodito is namrow and conicaly its distal balf beare comb-1ike groupe of setae. Iength of exopodite is approxinatoly $2 / 3$ that of endopodites Length(along Inner border): exopodite 0.42 umes endopodste 0.61 man

Fifth pleopod:- Exopodite has no groove and is not heavily pigmented.

## Hebitat.

Type locality:- This desdription is based on specinens found in debris collected on 7th October, 1957, from the ground under eucalypts and treeferns in forest at Tarraleah; 19 males and 26 Pewales were obtained.

Other lacalitiesis- Specinens were Iound in forest debris near the Lake Kighway at Golden Valley, at Notley Gorge (west of the Tamar River), on Mt. Barrow and in Mt. Field Hational Park, as well as in a decaying eucalypt $\log$ at Collinspale.

Variations. Background colour of some specimens from Tarraleah is purplish-brown instead of a true brow.

The number of articles in the flagellum of the 2nd antenna is not constant but appears to have some relation to the size of the animal. The following table shows a comparison between number of articles in ilagellum and length of body (to nearest 0.1 mm ) in 18 male specimens from Tarraleah.

| No. of articles <br> in flagellum. | Corresponding body lengths in <br> rm. (rith no. of specimens in <br> parentheses) |
| :---: | :---: |
| 6 | $4.9(1), 4.8(5), 407(2)$. |
| 5 | $4.8(1), 4.6(2), 4.5(1), 4.4(3)$ |
| 4 | $4.3(1), 4.1(1), 400(1)$. |

Fig. 23. Fourth and 5th tergites of persion, showing distribution of unpigmented areas.

Fig. 24. Right lst antonna, ventral view.

Fig. 25. Left 2nd antenna, ventral view'
P1g. 26. Distal part of left mandible, dorsal view.

Fig. 27. Distal part of right mandsble, dorsal view.

Flg. 28. Distal part of outer lobe of left lst maxilla, ventral view.

Fig. 29. Distal part of right 2nd maxilla, ventral view.
P1g. 30. Distal paxt of xight maxilliped, ventral view.
Fig. 31. Scalemeta from lateral border of lat segment of pereion, dorsal view.


Fig. 32. Dactylos of right $4 \mathrm{tb} \mathbf{l e g}$, anterior viens.
F1g. 33. Meros and ischion of right 7th leg of male, anterior view.

Fig. 34 ,
Male organ, ventral view.
Fig. 35. Left lat pleopod of male, dorsal view.
Fig. 36. Distal part of endopodite of right lat pleopod of male, doreal view.

Fig. 37. Left 2nd ploopod of male, dorsal vieve
Fig. 38. Exopodite of right 5th pleopod of male, dorsal view.
Fig. 39. Noros and ischion of right 7th leg of female, antorior view.

Fig. 40. Right lst pleopod of female, ventral view.

Fig. 41. left and pleopod of female, dorsal view.


## Striondicgu Bquarropus nosp. <br> (P1gs. 42-51).


Length of largest apecinen: 5.1 mmos breadth: 2.4 .
Colour. Bacliground colour of dorsal surface in live animal 2s purplishmbroum. Conspicuous unpignented patches are present on cephalon, pereion and lat to 3rd segments of pleon. On pereion thore is a large patch at base of each eptriorion, and other patches occur between this and mid-lines a pignented band extende down ceistre of pereion.

Cephalon. Vertox has 4 transverse rous of proninont rounded tubercles. Each tuberale is set uith a large hyaline scale-sota. Antennary tubercles are right-angled, promineat in dorsal view. Eyes are each conposed of 3 ocelli waich are separated from each other and arranged in a triangle.

Fixst antenng. Appendage tapers unevenily, 2nad and 3rd articles each being abruptly narrower than the preceding article. Third arisicle is spatulate; ait its apex it bears 9 long sansory setae.

Second antenns. Iongth of pedunclet 2.1 cmos length of flagellums 0.75 rin. Spines occur on distal borders of articles of peduncle, 2 on 3 ri article, one each on 2nd, 4th and 5th arificles. These spines each have apex of outer sheath split finto eeveral fino points sumpunding a coarser central seta. All articles of antoma have a donse covering of long scales. Anterior surface of 5 th article of peduncle is rafaed into 7 prondneaces which form two series, 5 in a
dorsal row, 2 in a ventral row. Each prominence is set with a group of large Lualine scale-setae. Flagellum is eveniy tapering and composed of 7 arificles; terminal articel has an apical tuft of long setae.

Yandibleg. Left mandible (fig. 43):- Incisor process conaisis of an outernost bifid tooth and 2 simple teeth. Lacinia mobilis ende in 3 simple teeth. At i.ts base there is a tuft of long, simple setae, behind which are 2 pencils of setae. Molar process is triturating: there is a slender, sparsely setose peacil on lite innor side. Richu mandible (fig. 44):- Incisor process conslate of 3 simple teeth. lacinia mobilis is club-shaped; its apex is encircled by a ring of amall, tooth-like processes. Behind bane of lacinla mobilis there is one pencil of setaes there is no tuft of almple setae. On inner side of molar process is a pencil of setae which is longer and moro desisely setose than that on molar process of left mandible.

Firat raxilla. Outer lobe bears at its apex 11 sinple reert, and 2 long, narrow processes. These processes are inserted at an angle to long ads of lobes their distal regions are set with spinules. Comb-1ike groups of setae, situated near outer edge of doraal surface of lobe, extend beyond its outer margin. On inner aide of apical recion of inner lobe there are 3 conical setose processes; the two more distal ones are tub-equal in length, the third is longer.

Second narilla. Apical rogion is divided into 2 lobes, outer lobe being about half width of inner lobe. Apox of outer lobe is sharply rounded and bears 3 coarse setae; its outer nargin is fringed with fine setae. Inner lobe is nore bluntly rounded; its apox and

Inner carginal region bear several coarse setae and nunerous fine setae. Iong fine setae occur on rentral surface of naxilia in an arca bolow bare of lobes.

Farililingd. Bpipodite tapors to an acute apex; at its base the outer margin is produced into a rounded lobe. Inner side of basis is thicker than outer side, thicker region being delinited ty a ridge on dorsal surface. Iateral margins of basis bear comb-like groups of setae. Outer aide of basis projecte beyond base of endopoaite as a zounded lobe fringed with very long sotas. In endopodite, ischion is the onif article diatinctivy separated; on its ventral surface there are 2 ahort apines. Remainder of endopodite is sub-coniogl in outilne and without suture innes; its inner alde near apex shows indications of divieion into 3 lobes which bear numerous long setae of aiffering thickenespea, Innor margin below lobes bears comb-1ike eroups of fine setae. On outer margin there are 2 long metae, with a pencil of fine retae in the angle of the lower one. Endite in oub-onical, continuous with thicker half of balim. Its inner and outer eumfaces are setose and it terminates in a conical setose process, below which are 3 spines.

Pergiog. Firat segment is maricealy produced formards on cach side to flank cephalon. Posterior borders of lst to 3xd segments are neariy atraight, with posterior angles bluntis rounded. Epimera of 4 th egrant are slightily produced bacharcls, with posterior angles more right-angled; epinera of 5th to 7th segnents are nore markedly directecd backwarde uith posterior aneles sub-acute. Epimera of 2nd to 7th segmente are each marked off by an oblique tuberculate ridge extending fomardia and inwards fron posterior margin. Dorsal surface of pereion
between epinera boars numorous prominont rounded tubercles, which are axranged in transverse rows 5 rows on lat segrent, 4 rous on 2 nd , 3 rows on 3rd, and 2 rous each on 4th to 7th segronts. Set on each tubercie is a large hyaline scale seta (rig. 45), the scale part of which is finely atriated, while the seta is milightiy expanded at the end. Tergites have a dense covering of pointed, itriatod scales.

Poreiopods. First legz- Majority of spines aiturated on under surface of leg, each have the aper of the outer sheath divided into several fine points surrounding a coarsor central seta. Hyaline scales are present on under surface of meros and carpos. There is a dense covering of shorty simple apines on inner surface of propodos. Dactylos texninates in a simple claw and has a covering of elongated scalem and long setae. The "dretylar seta" bifuxcates, and one ramus. aub-divides dichotomously while the other has branches ariaing fron one main axde.

Sinple spines are absent from propodos of 2nd to 7th legs. Diatribution of hyaline scalea on 2nd and 3xd legs is aimilar to that on lat log. A covering of hyaline scales is found only on under surface of carpos on 4th leg, and 4 s absent from 5th to 7th lege. Outer surface of propodos of 6th and 7th legs is fringed with very long scales. Seventh log exhibita no sexual difforentiation; lower border of Lachion (fig. 46) is straight.

Wale oxpan (2ig. 47). Apex is rounded and terninates in a srall conisal process with folded unlls. Behind rounded portion, ventral auriace is crossed by a $\nabla$-shaped ridge. The two duces which
enter base of organ unite inside it to form one.
Pleon. Abruptiy narrower than pereion. Pleura of 3ra to 5th segments are small, acute and adpressed, but vialble in dorsal view. Tormanal megnent is trapesoidal, with postero-latoral borderm incurved and posterior border straight. There is a row of 4 tubercles across 3nd tergite; each tubercle beara a large scale-seta, Remainder of pleon is amooth. Pleon segments have a covering of pointed, atriated acales.

Pleopodg. First pleopod (fig. 48):- Protopodite is broad; its outer side forms a rounded lobe covered with haline scales. Exopodite 19 sub-triangular with an indentation in outer border near apax. Endopodite is sub-cyindrical and is tominated by a long plagelifiform process watch is almply pointed at ita apex and lacks setae. Well-developed muscles are inserted at base of endopodite.

Second pleopod (fig. 49)s- Outer side of protopodite is produced into a aub-triangular lobe with its apex setose. Eropodito in submquarangular with comb-1ike groups of setae on both of its posterior anglas. Endopodite is blarticulates length of articless lat 0.30 mano 2nd 0.85 mm . First article is sub-cylindrical and has well-developed longituatnal muscleas comb-like groups of sotae are present on diatal region of ite outer surface. Second article tapers evenity to a bluntly pointed apeax which is silightiy bent outwards at the tip. On dorsal eurface a groove with strongly chitinized walls extends obliquely dom length of 2nd article. At base of article, inner wall of this groove is ornamented with blunt, tooth-like procesmes. In middle third, walls of groove are aet adth emall, backwardiy-sloping, chitinous ridges.

Third pleopodi- Inner posterior corner of protopodite is produced into a rounded, setose lobe. Exopodite is aub-quadrangular with its apex sharply rounded and its posterior margin indented. Its Inner margin is met with comb-1ike groups of aetaes its outer angle is fringed with groups of setae. There is a large plumose meta on apical angle, and a few long simple setae are present on ventral marface, near postexior margin. Endopodite is sub-triangular, such smaller than exopodite. Fourth pleopod is similar to 3rd.

Fifth pleopodi- Lobe on protopodite is narrow and scute. Fropodite (fig. 50) is sub-triangular. Both of its lateral margins bear comb-ilike groups of setae, and in apical region these metas extend onto dormal surface. There is a large plumose neta at apex, and a few long, simple setae on ventral surface near outer margin. on inner ilde of dorall aurface there is a metome groove for reception of endopodite of and pleopod. This groove occuples about $1 / 2$ length of expopodite. Endopodite is larger in relation to exopodite than it is in 3rd and. 4 th pleopods.

Uroped. Posterior border of protopodite is level with that of terminal pegment; inner aurface is indented and covered uith long acalem. Both rami are conical, covered with pointed scales, and each has a fow long apical setae. Length of rami: expopodite 1.00 wine, endopodite 0.70 num

## Females

Length of Largeat apeciment 6.2 munoj breadth: 3.1 mme Female differs from mile in the follousing structurest-

Peresopodism There is no dense covering of nyaline scales on under surface of neros and caryos of anterior porolopods.

Firet pleopodi- Eropodite is submtriangular with itm outor margin scarcely indented. Eniopodite is sub-triangular with apex rounded, and is much amaller than exppodite. Thore are no well-developed muscles atiached to endopodite:

Second pleopod (IiE. 51) - Eropodite is sub-quadrangular. Endopodite is conicals its distal balf bears combilike groups of setae. Iength of exopodite is approximatoly $4 / 5$ that of endopodites leapth (along inner border) exopodite 0.35 mmeg endopodite 0.44 me.

Fifth pieopodi- Exopodite is not grooved.

## Habitata

Type Localitir:- This description is based on apecimens Iound under decaying wood and in debris lying on the ground at altituxies of 1,500-3,000 ft. on lit. Wellington. Franples were collectod on the Sollowing datems - 15th lfay, 1956, 2 males, 8 Comalea; 22na Octobor, 1956, 6 males, 5 females; 6th March, 1957, one males 28th May, 1957, 4 males, 3 Lemalos.

Other 1ocalitiesi- Other apecimons were Pound in a decaying oucalypt log at Collinsvale, and in Porest debris in the Arve Forest, near Geeveston.

## Varfations.

Background colour of tome apceimens is a 11 ght redaish-browe Some amallor spectmons are darik brown, with unpigrontod patches less conspicuous than in tho largor specinons.

The number of articles in the flagejlum of the 2nd antenna is not constant but appears to have some relation to the ine of the andmal. The following table shous a comparison of number of axticles in flagellum and longth of body (to nearest 0.1 man) in 10 male spocimens from Kt. Wellington.

| Ho. of axticles | Corresponding body lengthe in man |
| :---: | :---: |
| 7. | 5.1, 4.8, 404, 4.3, 4.0. |
| 6 | 3.9.3.9. |
| 5 | 3.6, 3.4. |
| 4 | 1.8. |

## Strioniscus souarrosua nem.

Pig. 42. Male apecimen, dorsal view.
Fig. 43. Distal part of left mandible, dorsal viewe.
Fig. 44. Distal part of sight mandible, dorsal view.
P1g. 45. Scale-seta on a tubercle on 5th tergite of pereion, dorsal view.

P1E. 46. Weros and ischion of right 7th leg of male, anterior view.

Fig. 47. Liale organ, ventral view.
Fig. 48. Laft ist pleopod of male, dorsal view.
Fig. 49. Right and pleopod of male, doreal view.
Fig. 50. Exopodite of right 5th pleopod of mele, dorsal view,
Fig. 51. Left 2nd pleopod of female, dorsal viev.


Cems Motoniscus Cbilton 1915.
Synozvis: Chiltonia Arcangoli 1923, (non Stobling 1899). Ghiltonella Vandel 1945, nozamad. Ghiltonolla Vandol 1952.

2 Paranotoniscus Barnard 1932.
Chiliton (1915a, p. 418) erects gome Hotomiscus Por two
 (Chilton 1909) from Cangboil Island, which ho previousis places in genus Hanlophthalrug Schdbl 1860. Ho noton that Dotoniacus differs from Haplophthaznug in the character of the eyes, i.e. in Hotoniscus each eye is composed of 3 ocelli inotead of one as in Haplophthalruan, and in the fact that the firwt three instoad of the Pirat two segments of the plaon have the pleura very small or absent.

In this sans paper, Chillton (1915a, p. 424, pl. 37, 2ig. 23) erects a new species, Haplophthalema tagmanicyg, iron tacmania. This species differs from Hotoniscus and agrees uth Yaplophtholrme in having large pleural expansions on the 3 rd pleon segrent as woll as on the 4th and 5th segnents. Howover Chilion states that it difions fron the description of Haplophthalpus given by Sars (1899) in having the eyes not exmple but composed of 3 ocelli and the segrants of the pereion not discontiguous latemily. Arcangeli (1923, p. 314) considers chat these cbaracter are sufficient to soparato H. tasmanicus fron gonus Hanlophthalma, and he designatos it as the fype of a new gemus which he namer Chiliontis.

Barnand (1932, p. 202) orects a now gorus, Paranotoniscus
which he 010 ofinguishos from Hotoniccur on tho fact that $2 \hat{4}$ bas bottor doveloped pleara on the 3rd segrent of tho pleon. Bamman's
 Arcangell; horcver be rakes no reforace to thic cems.

Jackson (19/2, p. 8) nozdmates H. bolmsidnchilion as the type specice of hotontacys.
 apeoics, Chiltonella iomanica (Casiton). In a 1 ator papor, Vondel (1952, p. 94) places in his new sub-iansiy zotoniccinae of fanily Ibyloniacidae, a cenus uhich he liots as "chilionelis Areangols". On p. 96 of this (1952) paper he statosi- "Arcanceli (1923, p. 31/) a crés le geare ghiltonelia pour y rangor Hanlophthalrme tasmanicus Chiliton, 1915, espèce dont on ne connait juaquilici qu'un souli axeagiaire. Chiltonolla diffère do totoniscus par la próscace de neophourons slem développés au troisième pléonste." Buß tho reference to Arcancolis (1923) listed by Vandel (1952) in his bithegrapizy io that in wisicin Arcangeli nama bis gomus Ghiltonia.

Roferonce to Heave (1939, vol. 1, p. 694) show that the nare Chilitonia was preoccupicd in 1923, havine beea uscal for a ceaus of Auphipods by Stobbing (209, pp. 397, 408). Hovevor, as Vandol eives no indication that ins roplacozont of Arcongels's nono is due to zonoucage of its preocergation, it would appens that his crediting of tho namo ghilengila to Arcancels is dono in orros. Gheteonelin is not Incluaded in the 14st of goneric nanes piven by nlave (1939-40, 1950), nor does it appoar in the zoological nocond for the yoars 1923-1954. The carliest pablished roference to Chifionella appears to bo that geven of

Vandel in 1945, and as it is not accompanied wory diagnosis or description, this referonce should be recardod as a nonen mudur. In 1952, Vandel characterises ghiltonella wo roferring to it

Haplophthelrun tagmanicunchilton and by noting its distinction from Hotonfacus. Chiltonis Arcangell and Chiltongila Vandel are abmolute myonymin, as both have been given to the one gemas which contains I. tapranticus as the type and only mpocies. Aa chiltonis in unavailable, I propose to refer to this gemus by the nane ghiltonella, regardlass of whether or not Vandel publishes this name in error.

Vandel (1952; p. 96) subeequently notes that, although the seanal characters of cha tarmanica are not know, it in probable that Chiltanelis belong in his aub-family Notoniscinae. I bave collocted and examined specimans which agree uith Cbilton's (1915月) description of He tarmanicin. The character of these spocimens, inoluding inle nanal obmeroters, agree with Vendol's (1952; pp. 94-95, 96) diagnomon of family Styloniscidae and mbefamily Hotoniscizaa. His inclusion of Ghiltonelin in those divialons is therofore confirnod.

In adaltion, I have collected in Tarnaria apecinens which I assign to lotoniecus motimile, after a comparimon of thoir charactore With Obilton's (19159) description of thim species. On coaparing the Tamanian exarpie of I. gustralis and che tagranica, I fincl, apart from the differing developnent of pleura on the 3nd segrent of ploon, only two major differcnces betwoen then, namels (1), the arrangonent of tubercles an cepkaion and pereion and (2), certain characters of thome pleopode which ahow sexual differentiation. A corparison of apecinens of gh. tasganica with Chilton's (1915a) description of It holmali
indicator that Che tarmonics duffers from this, the type specien of Rotonisen, in the ame reapect: as it differm from Io gustralis: I consider thase differences in tuberculation and secual characters of pleopods to be only of specific value. Suoh differences are regarded as specific uithin the allied gemus Stylontecve Dana 1852; also reference to Chilton': (1915) description and Ilgures (pi. 36, Iigw. 1,9) of I. helmeit and H , angtralle ahow that difforences in arrangement of tubercles distinguiah these two apecies.

In compuring characterm of H. tagnanicun with generic characterw of Haplophthalmy, Chilton (19159, p. 42h) claim that the segments of the pereion in this mpecien are not discontiguoun latexally, but in his actual description of the apecies he etates that ther are neariy contiguoum. In wy meciman of ghe tagmales the pereial -pimera are alightily discontiguous; therefore the apeaies does not differ from Hotonitavile in this regard.

There remains only the disference in the 3rd megmant of pleon to distinguish Ghiltonella from Hotonisone on a generic level; 1.0. in Chilitonalis the pleux of the 3xd segront are as well developod as thome of the it th and 5th eegments, whisio in Fotoniacy the 3xd pleura are omaller than the 4th and 5th pleurn. As tholr apociem are basically similar in other respecta, I do not conaidor that a separation of the monotypie gerum ghiltonells, due to this one distinctive charaoter, is wamanted. In aupport of thile viev I refor to Cbiliton's (1909) paper In which the (p. 662) considere erecting a now gemm for the Now Zoaland apocies included in Haplophthelmy, but prefere instead to widem tho genorle characters of the latter, atating thet he has an undescribed
species fron Tasmania (presurably H. Eosmanicus) which hao oniy the first two segrents of the pleon without expansions, wile H. australls Ie to mone extent internediate as recards charnctors of tho pleon. Thus in this paper he considess tho three apecica concorned to bo conceneric.

I therefore propose to extend the Linits of Hotoniscus to Include spectics in warch the pleura of the 3rd segnent of ploon are well dovelopod, and to tranafer cha tacmanics to this genus. As Gh. tasmanics is the type and only apecies oi Ghilitonella Vaxdel, this nane becomes a synonym of Hotoniscus Chilton. Although Chiliton uses the character of the pleon in distinguishing Hotoniscus from Hanlophting lrus, With the limita of Motoniscues ao extended these two gonera still reain clearly distinct, as they are clasoffied by Vandel (1952) in difforent fanilies, the Siyloniscidae and Trichoniscidae respectively, and are therefore distingushed by the characters which ceparare these fardilos.

In his diacmosis of Hotonisoug, Chiliton (1915a) describes the eyes as having more than one viaual elemont, but does not limit the number. However, oyes composed of 3 ocelli are exibibited by all three species now included in Motoniscus.

Chilton states that antennoules, antennae, mouth parts and dactylar seta of perelopods are as in ixichoniscus. It seens liflely that he. is coagaring these aitructures in Hotoniscus with those of lew Zealond spocios whiot he places in thichoniscys, and which are tranaferred by Vardel (1952) to Strioniscua Dana 1852. In tho apecies of Motoniscus and Strioniscus represented in Tasmania, these structures are very alike. Therefore, as mehchoniscus and Hotoniseus aro now
placed in dipfarent Samslics, in olagnosing lotonsacus I proposc to noto
 well as the structures 18sted hy Chilton, the male organ and male and ferale pleopods in Hotoniscun are of a similar kind to thone gound in Strionisery

I ethorefore propose the Pollowing diagnosis of Motomisous, which is amonted from that given by Chilton (1915a, p. 410) in tho points just discuseed.

## Cenozio diamosig.

Body oblongs central portion noderitoly convex, dortal surface sculptured and bearing ridges or tuborcles. Cephalon with tho iront triangalarly produced, antonnary tuborcies direcied downwards, rather amall, with exirenity subacuto. Epinera lanallarly expanded, projectine almost hortsoncally, discontiguous. Plcon noi abraptily coaicictod; pleure of 3rd segront efther arall or well developed, those of 4 th and 5th segronts well doveloped, lanellows vorminal goppent irapozoidal With truncato posterior margin. Eyes sach composed of 3 ocells. Antennules, antemae and mouth parts as in Sivioniscus Dana 1852. Lege rathor short, not increasing much in lengith postorioriys dactyin socia as in Styloniscire Male organ and ploopods of toth saxes of the Bame kind as in Stylonsiscus. Uropoda with man wether viAcly separatod, misequal.

Genotype. Rotoni gan helmais (Chilion 1901) Obilton 1915.

Accomding to the foneric diagnosis civen by Bampard (1932, p.202), Whs gcnas Pamanoconscus is diacingrisized from fotoniscus, as dopined by

Chilton, oniy on the fact that the pleura of the 3rd begant of the pleon are expanded. Consequentiy; his diagnoais does not difierentiate Paranotonimey from Hotonsscus an I define it. Rarnard's diagnosis dow not even diatinguish Paxanotoniscus from Chiltonelias Vandel (1952, p. 96), in inoluding both chiltonolia and Paranotoniseyt as separato genera in the Dotoniscinas, makes no couparicon between thene Bamand's (1932, IIg. 6, a, o) figures of/R. capensin and Lo montanus whow that, although the pleura of the 3 xd segmant of ploon are expanded, they are narrower and more acute than those of the 4th and 5th segmenta. Hence the 3rd pleura of the pleon in these species are intermediate between those of N. helmais and M. australis on one hand and those of In. tasmanicus on the other. Thus it appeare likely that Paranotoniscus Bamard should also be regarded as a myonym of Notoniscus Chilton. However, as Barnard's descriptions of four of his Pive apecies are briei, I should hoaitate to consider this synonyry as definite without having had the opportumity to eramine spccinons asalgned to Paranotoniacus.

The two apecies of genus Hotoniscyen represented in Tasmanis may bo diatinguishod as follond:-

Tubercles on pereion lormang 4 rowi in male, 5 rows in Pemales 3xd pleurs of pleon amall compared with 4th and 5th ploura - - - - - - - - M. australie (Chilton) Tuberclea on pereion forming 6 rows in both sexess 3xd pleura of pleon as large as 4th and 5th pleura - - - -


Motoniscye austrailis (Chilton 1909) Chilton 1915.
(Fign. 52-56).

## spmonyse. Haplophthalmus gustrilis Chilton 1909.

The descriptions of examples of thia species from Canpboll Iuland given by Cbilton (1909, pp. 662-664, fige 17), (1915s, ppe 421-444,
 As Chiliton (1915s; po 423) himell pointil out, the appendage which be (1909; p. 664, IIg. 170) deseribes and Figurem as the 2nd pleopod of a mile in actually that of a females Cbiliton then utatos that he has not fromd a male apecimon. The following description of both male and female apooimons of Tasmanian matorial assigned to ID aytirelis is thorgiore given.

Nele (fig. 52).
Length of largest opecimens 3.0 mane; broadth: 1.5 mmo
Gotour. Dorsal aurface of live apeoimen ts dark brom in colour.

Gephaion. Centre of vertex is occupied ty a large pyramidal fuberclas mall tuborcies occur on remaindar of vertec. Anterior region of cephalon is produced forwarda at an acute triangular proceas. Antennary tubercles are acute-angled and peomfnent in doral viev. Byea are eech composed of 3 ocolli set on a romied prominence! the ocelli of each eye ara cleariy separated from one anothor and arrangod in a triangle.

## First antenna. Unoveniy tapering and componed of 3 articles.

 Apax of 3rd article in obllque, with one alde produced to a sharp points thile oblique odge bears 3 large mansory setae.Second antanis. Lengti of peduncle 0.71 mmoj length of flagellums 0.22 mm Spines, each of which has apex of its outer Heath divided into numerous fine point arurounding a coarter central seta, occur on distal bordere of articles of peduncle, 2 anch on 3 rid and 4th articles, one each on 2nd and 5th. All articles of antonna have a covering of scales, but prominent groups of large hyaline ceales do not occur on anterior bonders of 4 th and 5th articles of peduncle, Flagelium is composed of 4 articless terminal article has an apical tuft of long setae.

Mandiblea left mandible:- Inoisor process is composed of an outermost bifid tooth and 2 aimple teeth. Incinia mobilise ende in 3 teeth behind ita base there are 2 pencils of setae. Molar process hat no molar peacil. Right mandiblefo Incisor procoss contists of 3 simple teeth. Lecinis mobills lis elub-shapod and has a ring of tooth-like processes at its apex behind its base there is one penill of aetae. A slender pencil of setae la present on molar procesid.

Pirat maxilis. Apex of outer lobe has 11 armpla teeth and 2 long, nariou processed distal regions of these processes are set tith apinules." Comb-lilze groups of setae, present on outer side of dorsal surface of lobe, project beyond its outer margin. Apical region of inner lobe has 3 conical, setoge procesmess the two more distal onos are sub-equal in length, the third is longere.

Second maxiling Apical region is divided into 2 rounded lobes; Wath of outer lobe is about hale that of inner lobe. Apex of outer. lobe bears 3 coarae setae, and outer margh of lobe is fringed udth Pine
setae. Apex and inner marginal recion of inner lobe bear several coarse setae and numerous finer setae. Iong, fine setae are present on ventral surface of maxilla below base of lobes.

Nexilinmed: Epipodite is widest at its base and tapers to a sub-acute apex. Lateral borders of basis are Iringed with setae. On outer side, besis projecta beyond base of endopodite as a rounded lobe with very long marginal setae. Ischion is the only article of endopodite which is diatinct; there are 2 short spines on its ventral surface: Resainder of endopodite is eub-conical in outilnes its inner margin near apex shows indications of dirision into 3 lobes. These lobes bear numerous setae which are of differing thickneswes. Inner margin below base of lobes beara combilike groups of setae. on outer margin of endopodite are 2 large aetae, with a pencill of fine seta in the angle of the lower one. Endite is sub-conical and setose. It teminnates in a conical; setose process, below base of which are 3 spines.

Rereion. Dorsal surface between epimera is strongly conves. Epimera are large, sub-rectangular and slightly discontiguous lateraliy. Anterior boxder of lat segment is produced forwards on each side to flank cephaion. Epimera of lat segmant are neariy transverse, those of 2nd segment alope slightly backwards, those of 3 rd to 7th segnents alope increasingly further backwards. Dorsal surface of each tergite bears 4 rounded tabercles which Eogether form 4 Ionghtudinal rowa down pereion. The 2 inner rows are made up of large tubercles, while those forming the 2 outcr rowa are srailer and less conspicuous. There of is no row/prominent tubercles down mid-line of pereion. Dorsal surface
of tergites bearw scattered acale-setae and a covering of rounded mcales. Lateral borders of megment are bordered with triangular meales.

Perelopodis. Firut legi- Majority of mpinea on under aurface of log each beve aper of outer whosth divided into numeroum fine points murrounding a comreer central aeta. There is no eovering of hyaline scalea on under murface of moros and carpos. An area on inner surface of propodo is covered with simple mpines. Dactylos boars several long setae and elongated scales; it terminates in a simple claw. The "dactylar meta" bifurcates, and one ramua continues to aub-divide dichotomousily wile the other has branchou ariaing from 2 main axis. There in no spinote area on inner suriace of propodos of 2nd to 7th legs. Mistal half of outer surface of propodos on 6th and 7th legs has a fringe of long setac. Seventh leg showa no sexural differentiation.

Yale orran. Apical region is broadened and rounded, and is termainatod by a median conical procems with folded waile. Ventral auriace behind roumed portion if croamed by a $V$-shaped ridge. The two duste which enter orgen at itw base unite inaide it to form one. Ploon. Not abruptly narrower than pereion and not tuborculate. Ploura are developed on 3xd aegnent, but they are nariow and acute; and do not extend outwards at far aa the genemal outline of the body. Pleura of 4th and 5th aegmente are large, semi-crescentic and sharply directed backwardes they form a part of general outline of body. Terminal megment is trapesoidal with ite postero-latoral bordera incurved, and ite posterior border metraight.

Tergites of pleon bosr scattored scalomotas and a covering of rounded scaless thelr lateral margins are bordered with triangranar scales.

Fleopodi. Flxat pleopod (Iig. 53):- Protopodito is broad: Ita outer alde is rownded and beare hyaline seales. Eropodito is sub-triangulat with an Indentation in its outor narging its aper is not orenate. Endopodite is sub-cylindricals it tormantes in a long Plageliform process which is oingly pointed at its apex and lacks sotae. Well-developod muscles, which are aupported by a prolongation of lat sternite of pleon, are insewted at base of ondopodite.

Second pleopod (fig. 54):- Outer elde of protopodite is produced into a sub-twiangular lobo with its aper setose. Exopodito Is mub-rectangular and has a fringe of aetae on ite outer posterior angle, Endopodite is biarticulates length of articless lat 0.16 mans 2ndi 0.56 mm . First article is aub-aylindrical. Innor side of 2nd axticie curves inuazde abruptiy at about $2 / 7$ of its length from apex, so that the latter is asymetrical, contimous with outer side of endopodite: apical region tapers to a sharp point. Just behind this point there is a rounded chitimous prominance on its outer side. 4 eroove with strongly chitinimed malls extends obliqualy down dorsal auriace of article. Near its bagal end, inner wall of this groove is set with blunt, tooth-14ise processes.

Thind pleopodi- Inner posterior angle of protopodito 18 produced into a lobe, apex of which is rounded and aetose. Exopodito 1. sub-quadranguliar with its poserexior borier indonted. There is a large plumose seta on apical angle and a fev long, sinple setae occur on
ventral surface near posterior margin. Outer rargin is fringed with Pine setaes inner marginal region bears comb-like groups of setae. Endopodite is sub-triangular; much smaller than exopodite. Pourth pleopod is simslar to 3xd.

Fifth pleopodi- Lobe on protopodite is long and narrow. Exopodite (fig. 55) is sub-triangular. Its lateral borders bear comb-1ike groups of setae, there is a large plunose seta at apex and a few long, simplo setae on ventral surface near outer margin. on inner side of its dorial surface, a groove for reception of endopodite of $2 n d$ pleopod extends down whole length of exppodite; inner border of this groove is setose. Area occupied by groove is heavily piemented. Endopodite is larger in relation to exopodite than it is in 3xd and 4th pleopode.

Dropog. Protopodite is sub-triangulars its outer border is fringed with long scalea, its posterior border is level with that of teminal segment. Exopodite is terninal in position on protopodite. Outer region of protopodste forms a narrow, flattened expansion which is delimited on doreal burface by a ridge in line with outer edge of exopodite. Endopodite is inserted on ventral suxface of protopodite; near its posterior margin. Both rani are conical, covered in elongated scales, and have a terminal thuft of long sotae. Length of rami: cexopodite 0.1 .5 mm , ondoppodite 0.19 mm

Female (fig. 56).
Length of largeat speciman 4.6 mmoj breadths $2.3 \mathrm{~mm} \cdot$
Female differe from male in the following atructures:-

Tuberclem on pereions- Dorsal surface of each pereial torgite baars 5 rounded tubercles which together form 5 longitudinal rows down pereion. Tubercles forming the outermost row on each side are more conspicuous than in the male. The median row of tuberales is not present in male spocimens.

Firat pleopodi- Exopodite is amall and aub-triangular with its outer margin not indented. Endopodite is rounded, much amaller than exopodite. Well-developed musoles are not present.

Socond pleopods- Exopodite is zub-rectangular. Endopodite Is conical and elongated; ita distal region beare comb-1ike groups of setae. Length of exopodite is approxinately $1 / 3$ that of endopodite; Length (along Inner border): exopodite 0.13 manos endopodite 0.38 mas

Firth pleopodi-. Exopodite is not grooved.

## Hatitat.

This deacription 1s based on mpecimens found in debris lying on the ground in a gyrthe guily at Collinsvale. Sixty males and 114 Pamales vere obtained from mamples of debris collected on 12th June, 1957, and 19th Jume, 1957, and another 60 males and 84 females were obtained from a sample collected on 13th November, 1957.

Only two female specimens were Sound elsewhere; one in forest debria at Tarraleah, the other in debris in the Arve Forest, near Geeveaton.

Notonsecus australis bas not previously been recorded fyom Tamanin.

## Hemation.

In small fenale apacimens, approsemately less than 2.3 mm longs
the median row of tubercles on the poreion is less conspicuous than the inner lateral rows. The tuberculation of these young females thus approaches the condition found in the males.

## Romarlas:

It is noted that the description given hy chiliton (1909, p. 663) of the left mandible appliea to the right mandible, and vice veraa.

Chilton (1909, p. 663) describes the outer lobe of the lat maxilla as ending in about a domen setae, waile he (19159, pp. 422m423) Iater states that it bears about eight or nine teeth. His figure of the let maxilia (1915s, pl. 37, Pig. 17) does not apecify this muber. In the Tasmanian specimens this etructure has 11 teeth and 2 long processes.

Chalton (1915., p. 423, pl. 37, fig. 18) describes and
figures the maxilliped as having-the opipodite rounded at its extremity and silightily narrower near its bane, and the ondopodite Formed of a Eingle article. In the Tasmanian epecimens the opipodite of the maxdiliped is widest at its base and its apex is sub-acutes also the Lachion is distinct from the reminder of the endopodite.

Cbiliton (1909, p. 662), with regard to specimens from Campbell Ialand, statear- "The animal suna with great rapidity*" However the apeed of welking of the specimens of f. austialis from Collinevale, Tasmania, is rather slow when conpared for example with that of apeoimens of Strionisous thomeons (chilton) which vere foum in the nem mamples or debris.

Hotensiscus australis (Chilton).

Fig. 52. Nale specimen, dorsel olew.
Fig. 53. Left lat pleopod of male, doreal view. Fig. 54. . laft 2nd pleopod of male, dormal view. 7ig. 55. Enopodite of left 5th pleopod of male, domal view. Fig. 56. Female specimen, dorsel view.


Hotoniscus tabrangcue (chatton 1915).
(Piga, 57-72).

Oniltonia tromaica (Cbalion 1925) Areangoli 1923. Cisiltonella tamanica (Clasitos 1915) Vandol 1945; non. max.
Cheqepaplla tocmatica (Chiriton 1915) Vandel 1952.
As cisilton had only one emaplo of this opecice, ha description ( 19153 , po 124, pi. 37, Pig. 23) Is maced on charcoters which corld be obsorved without diasceting the animat. The following augontod description of furthor tasmanian natorial asescred to the epectes is oberafore givon.

Fale (Fig. 57).
Length of largost specimoas $4.5 \mathrm{mm.j}$ ircadthis 2.25 mm
Colour. Dorsal surface of live opecima is daris browin in colour.
Cehpalon. Vertex is conspicuousiy corborcurate. ITcar its possorior margin thero are two large romaled triborcles with a pasp of owaller tubercles between then. In sront of these is a large, nedian, bituborculate proztnexce ufth a arall tuborcle situnted on each afde of 2t. Anterdor region of cepholon la produced formarie as an acizto erfongular procegs. Antonnary trixerclos are large and aightancled.
 of each eye belag aleariy soparated from cach othor and armance in a exiancza.

Eirget ancenn (2ig. 58). Chavenly toporilaz and conpoged of 3
axticlem. Third axticle is narrow and at its apex bears 3 long sensory natae.

Second entenme (fig. 59). Iength of peduncier 1.13 mmo ; Length of Plageliunt 0.37 min Slender mines, each with apes of its outer heath split into many eine point ourrounding a coarmer central eeta, are prosent on distal borders of 2nd to 5th articles of peduncles 2 each on 3 and and 4th axticion, and one each on 2nd and 5th articles. Peduncle has a covering of scales. Groups of larger hyaline sesies ano present on 4th and 5th articles, but thene ase not zaised on tuberciea. Flagellum hat 4 articles which are covered whth elongated ncales. Fourth articis bears a terminal pencil of Iong setae.

Xandible. Ieft mandible (fig. 60):- Incisor process consists of 3 teeth of which outermost is bifid, imer 2 are imple. Lacinia mobilis end in 3 teethy behind it base thert are 2 pencils of setae. Molar process has a ridged triturating aumiaces it has no molar pencil. Right mandible (fige 6i):- Incisor process in composed of 3 simple teeth. Iacinia mobilis is olub-shaped with a ring of tooth-1ike processes at its apecs; thore is one pencil of seta behind its base. Molar proceas beaze a slender pencil of setas.

Pixat madila. Onter 10be (fig. 62) terninates in 11 minplo teoth. Tw londer processan, differing in longth, are inserted on ventral maface behind taeth at an angle to long axis of lobe. Distal. regions of these procenges bear pinulap. Comb-like group of astae, axieling on outer side of doxal murface of lobe, project beyond ite outer rangin. Inner lobe at its apax bamra 3 conical setone processeas the two moxe asiatil ones are mb-equal in length, the thint is
conelderably longer.
Second maxila (21E. 63). Apical region is belobod, uth outer lobe about hali width of inner lobos aptcos of both lobes are rounded. Outer Lobe boars 3 large apical betac and its outor rargin 2s fringed with fine setae. Apex and innor marginal region of inner Lobe bear several coarse semsory sotas and mumorus finer setae. Scattered setae occur on ventral surface lelow base of lobes.

Yavilispeg (figo 64). Epipodito tapers to an acuto apax. Inner side of basis 18 thgcker than outor aide, thioker region boing delimited by ridge on dorwal muriace. Iateral borders of basis are Eringed with groups of aetae. Distaily, outer side of basis projects beyond base of endopodite as a mounded lobe wth very long marginal Eetae. Ischion is the only article of endopotite whoh is distinctily separateds thore are 2 amil pines on its vental suriace. Reraindor of ondopodite is subueonical, with its inner rargin near apex mowing slight indicationa of division into 3 lobes. Theae lobes bear long setae which are of differing eftichaseos. Inner margin below Lobes bears comb-114e groups of setae. On onter margin are 2 large setae; with a pencil of fine setae in angle of lowar one. Enoite ls aub-conleal, continuons with thicion part of basis. Its inner and outer surfaces are sotome, and it terminates in a conical sotose grocens, Delow inase of this procains are 3 apinen.

Pexpion. Dorwal maface between eptmex is atrongly convec. Epimars are large, sub-reotangulary vory slightiy aisoontiguous lateraliy. Anterios boxier of litt egment is romied on each asdo and produced
formards to flank cephalon. Epimera of lat segment are nearly transverse, those of and segment are slightly directed backwards, those of 3rd to 7th segments slope Increasingly further backwands. Dorsal sixfiace of each segmont is set with 6 prominont oval tubercles, which together form 6 longtudinal rowa down pereion. The 4 inner rowa are made up of large tubercles which occupy greater part of length of tergites. Aubercles forming outermost row on each slde are slightif oblique and smaller than those forming inner rows. Small tubercles are present between those of the main rows. Dorsal surface of tergites bears scattered scale-setae and a covering of small rounded scales. Lateral bonders of tergites have a dense fringe of long pointed scales.

Peretopods. First lege- Majority of apines, which are present on under muface of log, each have apox of outer sheath split into many fine points surrounding a coarser central seta. Large hyaline scales occur on under surface of meros and carpos. An area on inner surface of propodos ls set with ifimplo spines. Outer margin of propodos bears groups of hyaline scales, and at distal end, a few long setae. Dactylos is covered with long, Plattened setae, and it terminates in a simple claw. The "dactylar seta", bifuxcates and one ramus aub-divides dichotomousit, waile the other has branches arising from one main axis. (Dactylos of 7th pereiopod 1a figured, fig. 65).

A few havaline scales occur on under sumface of maros and carpos on 2nd leg, but they are absent from this position on remaining lege. Simple spines are not found on Inner aurface of propodos on 2nd to 7th legs. Long setae on distal part of propodos are more mumerous on 6th and 7th legs than on preceding legs. Seventh leg ahows no mexual

## differentiation.

Male_organ ( $\mathrm{IIg}^{(66 \text { ). Apical region is brosdened and }}$ rounded, and terminstes in a small conical process uith folded ralls. On ventral eurface, apical region is crossed by a ridge. The two ducts which enter base of organ unite inside it to form one.
pleon. Rot abruptif narrower than peraion, and not tuberculate. Pleura of $3 x d$ to 5 th segments are large, laterally contiguous, and stand out almost horizontally. They are similar to each other in shape, being semi-crescentic and siarply directed backuardes and all three form part of outlisne of body. Terminal segment is trapozoidal, with postero-lateral borders incurved and posterior border atralght, Dorsal surface of pleon tergites bears acattered scale-setae and a covering of small rounded scales. Lateral borders of segments bave a dense fringe of long pointed acalos.

Pleapode. First pleopod (fig. 67):- Protopodite is very broad; its outer marginal region bears hyaline scales. Exopodite is sub-triangular with an indentation in its outer margin; its apax is slightiy crenste. Findopodita is sub-cylindrical and terminates in a long flagelliform process which is aimply pointed at its apex and lacks setae. Welledeveloped ruscles, which are supported by a prolongation of Lat stemite of pleon, are inserted at base of endopodite.

Second pleopod (fig. 68):- Outer side of protopodite ia produced ints a tridangular lobe with its apex setose. Exopodite is aub-rectangular, with setae on margin at outer posterior angle. Endopodite is biarticulate; length of articlem: ist 0.25 min 2 ad 0.75 mu. First article is sub-cylindincal and has well-developed

1ongtitudinal muscles. A few comb-14ke groups of setios are presont on inner surface at distal end of article. Second article tapers ovenily to a bluntily pointed apex which is slightily bent outwards. an dormal surface, a groove with strongly chitinised nalls extonde obilquely doun ite whole length. Hear basal end of article, inner border of this groove is aet uth a yow of tooth-1ike processes. In madile third, both walls of groove bear amall, baokwardly-sloping chitinous ridges.

Third pieopods- Inner posterior angle of protopodite in produced into a lobe, apex of which is rounded and setome. Exopodite is sub-quadrangular with an indentation in poaterior margin. It Innor marginal region bears comb-1ike group of actae. There is a large plumowe weta on apical angle. A fer long, aimple setae occur on ventral surface near posterior margin, which is fringed with finer setae. Indopodite is sub-triangular, amaller than exopodite. Fourth pleopod is almilar to 3rd.

Fipth pleopods- Apex of lobe protopodite is very acute. Exopodite (fig. 69) is sub-triangular. Both of its latoral borders bear comb-1ike groups of sotae, and on dormal surface much metae axtond acrose apleal region of emopodite. There is a large plumose seta at aper and a few long simple aetae aro present on vontral aurface near apax. On dorsal surface, towned imer side of exopodito, thore is a metose grocve for reception of endopodite of and pleopods this groove occupies approximataly $\frac{1}{2}$ length of exopodite. Indopodite is largor in comparison to exopodite than in 3rd and 4th ploopode.

Eropog (fig. 70). Protopoilte is aub-triangular; its posterior border is level with that of torninal megnent. Exopodite is
inserted terninaliy on protopodite. Outor region of protopodite fomm a flationed expansion which is delinited on domal suriace by a ridge In line with outer edge of exopodite. Outer borier of protopodite has a dense fringe of pointed scales. Endopodite is insorted on ventral surface of protopodite near its posterior margin. Both rani, are conical, have a covering of scales, and torasinate in a fev long setae. Length of ranifi exopodite 0.23 mm ; endopodite 0.32 mm .

## Female:

Length of largest speciment 4.7 mino breadth: 2.4 mm . Female differs from thalo in the following structurest-Perelopodst- Large hyalsne scales are not presont on under surface of meros and carpos on lat and 2nd pereiopods. Firat pleopod (fige 71):- Exopodite is sub-triangular uith no indentation in its outer margin. Endopodite is rowided, wach smaller than exopodite. Well-developed ruseles are not present. Second pleopod (fig. 72):- Endopodito is conical and elongated; its diatal region beare comb-like groups of aetae. Iength of axopodite is approximately $1 / 2$ that of endopodite: length (along inner border): exopodite 0.27 mmo , andopodite 0.55 nme

Fifith"pleopod:*is Exopodite is not groovad.
Habitat.
This description is based on specimens found anong debris lying on the ground in a myrile gully at collinsvale. Samples of debria were collected on 12th June, 1957, and 19th June, 1957; 16 males and 26 females vere obtained.

Three fenale apecimens were collected by Proicspor Hicinan on 2st December, 1955, from moss in the Arve forcst, noar Geeveston.

The specimen described by chilton (1915g) was found "forder zotten Logs, Fern Iree Gilly, Hobart, Iosmania."

Variation.
The bodies of some specinens exhibit unpigmanted areas, which are particularly Erequent on and near the 5th segrent of the pereion.

Romarkg.
Chilton (1909, pi. 661, 662) montions an undosioribod apecies
of Hantophthalrus from Tamania; this species is presumebly H. tasmaniouti

The synoxydy of this species, and its position in Hotoniacus,
is discussed in the section on the genus.

## Notord che tamanicus (Cbsiton).

Fig. 57. Yale specisen, dorsal view.
Fig. 58. Left lat antema, ventral view.
Fig. 59. Left and antema, ventral view.
Fig. 60. Distal part of left mandible, dorsal view.
Fig. 61. Distal part of right mandible, doreal view.Fig. 62. Diatal part of outer lobe of left lat maxilla, ventralviewFig. 63. Distal part of right 2nd maxdlla, ventral view.
Fig. 64. Distal part of right maxililiped, ventral view.
Fig. 65. Dactylos of left 7tia leg, anterior view:


## Hotoniscus tasmandeus (Chilton).

Fig. 66. Male organ; ventral viev.
Pig. 67. Ieft lat pleopod of male, dorsal view.
Fig. 68. Laft 2nd pleopod of male, dorsal view.
Fig. 69. Exopodite of left 5th pleopod of male, dorsal view.
Fig. 70. Laft uropod, dorsal view.
P1g. 71. Left lst ploopod of female, Ventral view.
Fig. 72. Left 2nd pleopod of female, doraal view.


Pamily Scrphacidag.
$=$ Scyphacinae, Dana 1852 (in paxt).
$=$ Ammasilloniecinae, Soyphacinae and Detoninae, BuddemInnd 1904.

The characters of the family are defined by Chilton (1901. D.
121) as followit -

Mandiblea without molar tubercle, its place boing takon by a tuft of long atiff setas or bristles; inner lobe of first maxilia with two plumose bxistless maxillpedes with the terminal joints falrily vell developed, lamellar, longer than the masticatory lobes external male organ single.".

The following additional distinctions also apply to members of Pamily Scyphacidaefo

ISttoral apecies. Elagellum of 2nd antemn composed of 3 or 4 articles. Exopodites of pleopods without pseudotracheae.

The two genera of family Scyphacidae represented in Tasmania may be dimtinguished as qollowst-

Animals not able to enmoly dorsal surface of body


Animals able to enrolls dorsal aunface of body strongly


## Genus Deto Guérin 1836.

The characters of the eenus are dofined of chilton (1915b, p. 438) as followst-
"General shape of bock oblong-oval, somouhat depressed; animal not capable of rolling itsolf into a balis epimera lanellariy expanded; dorsal eurface usually with spines or tubercles which are better developed in the male than in the ferale; ploon not abruptily narrowar than peraeon; epinora of third, fourth and fifth segmenta well devoloped. Head with lateral processea Sorning broad 1obes.

Eyes of moderate size, uith many ocelll.
Antennae with flagellum four-jointed.
Mandibles with one pencil bebind the cutting-edge.
Madilipedes with paip longer than masticatory lobe, and showing indications of being formed of three or four joints.

Exopoda of the pleopods oporcular, and containing no apecial branchial organ.

Uropoda produced, reaching considerably beyond the terminal segrent."

Doto maning (Cbilton 1884) Budde-Iund 1906. (Figs. 73-74).

## Synonvay. philougris mazing Chilton 1884.

= phily
The Tasmanian specinens of Deto mering are not described in dotall in the present paper as the species is characterized in previous literatures- Chilton (1884, pp. 464-466, pl. 11): Budde-Luna (1906, p. 85, pl. 4i, Pige. 39-41): Ghilton (19150, pp. 444-445, pl. 39, figi. 19-23), (19179, pp. 401-403, flgs. 15-21) F Wahrberg (1922, pp. 11-12, 25, 44-45, 54, 81-86, fige. 4, 6.14, 6.15, 10, 19.2, 33, 34).

The following desoription of characters which may be observed without disaeoting the animal, is given here to onable Dato maxing to be distinguished from other oniscoidea found on the ses shore in Tasmania. Reference to descriptions given by Chiliton (1915b) hows that on these oharactery, D. mpang my elso be distinguished from other apecies in the gena Deto.

Length of largest male speciment 11 min breadth: 5.5 mme
Length of lergeat ferele specimens 10 man breadth: 5 mae
Live specimen is greenish-yeliow, dansoly mpotted udth black chromatophores, on dersal surface, conspicuous yellow patehes occur dow mid-line of body and at bases of pereial epimera, Animal is not able to enroll.

Vertex of cephaion (fig. 73) is covered with scalo-bearing tubercles. Antennary lobes are large, square in outhine, dorso-ventrally flattoned, and stend out obliquely fram cepbalone Eyes are compound. Flagollum of 2nd antema (fig. 73) has 4 articles.

Firat aegmant of pereion (fig. 73) is markodiy produced formarde on each side. Posterior borders of eplmora on all poroinl segmentsolope backnards at an angle to bonder of central part of sogrenty poaterior aaplem of apdmera are ahnrply rowied. An oblique, tuberenlate mage extende invarde and formarde from above poatorior angle of acah opimeron. Doreal aurface of persion exhibite mumorous large walo-bearing tubercles, but no long apines are prowent.

Pleon is not abruptily nariover than perition. Pleura of 3nd to 5th regmentim are large and directad backwands, with thoir posterior: angles sub-acute. Tercinal segnent (fig. 74) is triangular with its uldee ilightily indentod and its aper acute. Dorsal surface of pleon 18 eramulate. Eropodites of pleopods have no conspicucus hlood veasels and no perudotrachese.

Frotopodite of uropod (iig. 74) is quadrangular, Elattened on outer aide, and marked ty a longitudinal ridee dom dorsal burface. Inner border of the two protopodites do not meet in the mid-line. Exopocite is broad and Iancoolate, terminal in position on protopodite. Endopodite is narrow and conical, shorter thrn exopodites it is Inserted antoriorify on ventral aurface of protopoaita, near ita anner margin. In female, exopodite of uropod is abortor in relation to protopodite and ondopodite than in male. Lengths in a male opecimans protopodite 1.2 mme exopodite 1.2 mane, endopodile 0.60 ume Lengthe in a Semale specineni protopodite 0.9 zra , exopodite 0.68 cmos endopodite 0.45 mm

## Eabitat.

Theme observations are based on apecimons found undor atones
near high tide level on a rocky shore at Doaring Doach, South Arn. Eranples were collected on the following dates;- 20th February, 1957,
 1957, 14 males, 9 fomalos.

Other specinens were found under similar condiltiona at
Tinderbor and on the southorn shore of Ralph's Bay in southmeastern Tamania, and at Hauloy and Low Head, East Tamas ia the nortia of the state.

Deto manina hav not previously boen recorded fron haorania,

## Deis marian (chilton).

# Fig. 73. Cophalon, 2nd antonnae and lat segment of pereion, dorsal valow. 

Fig. 74. Fifth and terminal tegments of plean and uropode of mele, doxmal riew.


## Genus Actacis Dana 1853,

Smozy x. Gyliona Budde-Innai 1885.
The characters of the geme are defined by Chiliton (1901, pe 130) an followi-
*Body convex, capable of rolling into a ball, wurface apiny. Hetasome not abruptis contracted, termanal segnent very ahort. Flagelium of antennae h-jointed. Byes very large and prominent, on oval elevations along the sides of the boad. Maxillipedes sith the termal portion large, lamilar. Lege rather abort, not 1ncreasing meth in longth powteriorly. None of the opercular plates of the ploopode with airmeavities. Uropoda short, not projecting mach begond the outilne of the bodys bace laroad and Finttened, outer portion produced, outer ramus ahort, incorted at the end of the bese near the innar marging inner ramu alender."

Chilton conilderw Gyllong Budio-Iund 1885 to be synorymous with Actaceis.

Thomon's (1893, p. 57) muggestion that Aetoni coun Haxgor 1878 mant evidontly be relegented to Actaeais Dane is not aupportod; an
 other authors, e.g. Dudie-Iund (1885), Fan lame (1936).

The two species of geme Actasela represented in Tasmania may be distinguiahed as followis-

Fourth and 5th pleurs of ploon with posteromateral boxdexs rounded; protopodite of uropod, to outer slde of exopodite, rounded posterioriy - - - - - - - - - - - - - A. Auchxas Dana.

Fourth and 5th pleura of pleon with postero-lateral borders straight protopodite of uropod, to outer aide of expopite, straight posterioriy - - - - A. pailida Micholls and Bames.

Actapeis euchros Dana 1853.
(Figs. 75-90).

## Synonviry Armadilioniscus enchria Budde-Imal 1885.

A description given by Thomson (1893, pp. 56-57, p1. 2, figt. 1-8) of Tasmanian examples of Actsecia guchros from Eaglehawl Heck, in incomplete and contains sone erroxs. The most comprehenaive description of New Zoaland examples of A. euchnog, that given by Chilton (1901, pp. 130-132, pl. 15, Iig. 3), gives only a brief account of the mouth parta and pleopode. Ky rasmanian specimens differ in an Important character from these New Zealand exampion. The following account of further material from Eaglehawik Meck is therefore given.

## Nele.

Length of largest specimen; 5.6 mano $;$ breadths 2.7 mme Colowr. Dorsal surface of live animal is white, marked uth irregular groups of black and orange-brown chromatophorew.

Cephgion. Maxillipedal somite is mariked off from rest of cephalon. Surface of vertex is smooth. Frontal line forms a sharp, curved ridge, nilightily flattened in the centre, and bordered uth spines. A supra-antennal line is/clearly defined. Antennary tuberclew are not developed. Eyen (fig. 75) are oval, compound, and raised above surface of cephalon; each is composed of 14 oce111.

Firat antenng. Evenly tapering and composed of 3 articles. Third article beare 3 apical apines.

Second antenna. Length of pedunclet 2.51 meois length of flagellum 0.55 mm . Peduncle and Plagellum are aet ulth apines.

Each spine consists of an outer sheath, split near the end into several short points, and surrounding a central seta, clubbed at its apex: there is a large scale against base of opine. Flagellum (ifg. 76) is composed of 4 articles. Second and 3xd articles each have an indentation in outer surface in wifch is set a group of aimple spines. Fourth article is much smaller than the otheras it ends in a tuft of short setae. Length of 4 th article is less than twice its greatest breadth; length (excluding apical setae): 0.065 mmos breadth: 0.036 nm.

Mandinlese Ieft mandibles- Incisor process consists of one bifid tooth and 2 simple teeth. Lecinia mobilis ends in 3 teeth Below lacinia mobilis is a lobe bearing coarse, simple setae. At base of lobe there are 2 penclis of finer setae, and a third pencil is set further back on mandible. Molar process is represented by a short prominence bearing a large tuft of plumose setae. Right mandible (fig. 77):- Incisor process consists of 4 simple teeth. Lacinia mobilis divides into 2 processes which bear small, tooth-like projections. Setose lobe below lacinia mobilis has one pencil of setae at its base, ard there is another pencil further back on mandible. Molar portion is similar to that of left mandible.

Expat maxilia. Outer lobe (fig. 78) ends in 11 teeth of wifich the outer 5 and the second innermost one are aimple, the other 5 are bifid. There is aiso a long, slender process set among the teeth, and a short apine on ventral surface near bases of bisid teeth. Outer region of dorsal gurface of lobe bears groups of fine setas which project beyond its outer margin. Outer apical comer of inner lobe ends in a sharp
apine; to inner side of this, apex of inner lobe bears 2 large setose processea.

Second maxilla (Fige 79). Division into 2 lobes is indicated by a suture line extending obliquely inwards and backwards from an indentation in outer margin of maxiliag this suture line is apparent for a greater length on dorsal surface than it is on ventral ourface. Apex of outer lobe bears 3 spines. Inner lobe is bluntig rounded; its apeax and inner margin bear numerous coarse setae and a fringe of fine setaes fine setae also extend over dorsal surface of lobe. Maxilisped (fig. 80). Endite is elongated, reaching almost to distal border of basiss it tapers to an acute apex. Ventral suriace of basis bears several spines; its lateral margins are bcrdered with Ine setae. Iachion is the only arifcle of endopodite which is diatincts there are 2 whort spines on ies ventral. surfaces its outer border is fringed uith fins setae. Remainder of ondopodite is subtriangular in outisne with diviaions between its 4 articles indicated by lobes on inner margin and by oblique suture lines between these. Each lobe bears a tuft of coarse setae. Two apines are preseat on outer margin of endopodite. Suture line between meros and carpos is ehort, but the two lines separating carpos, propodos and dactylos extend acrose most of ventral surface of endopodite, each directed towards one of apinea on outer margin. Endite is sub-conical with a blunt apeas; 1te inner surface bears long setae. On apox of endite there is a large, conical, setose process and a short spine which is set to outer aide of the process. With setose process excluded, endite does not extend beyond basal lobe of endopodite.

Pereion. S4ies of lat secent are strongly producod forwards to Slank cepinion. Epimera of loe to 3 ra sochones slopo slightif molsaris and thoir postorior anclos are starphy rounced. Posterior margin of 4 th segment is straight ifith ito angles rouxded. Epimera of 5 th soguent aro direcied sisghty bacinards ard have thoir posterior borciors curved outraxte and postorior carcios submanito.
 also thet postorior angles subacueo. on vonital aurface, epancra of

 bordered uith short spines (fige 82), exch of rinich consists of an outor sheath, split at the end into sevoral ahort points, and surrounding a central seta, clubsod at its apex. Such spines also ocour on dorsal surface of epinera, but thore are an spines on central region of secrents. Dorsal surface of toritites bas a covoring of rounded scales and also bears stall, scâterod sealemsetac.

Perefonods. Pixst legz- Oucor ausecce of cosos in caricody convex. Portion of loe thich is distal to noros 20 curved doramsads. Vajority of spines on leg cach consist of an orior ahoathy ghlit ab discol ond into sevoral points, thich sumpoumals a central sota, clubbed af the apex. Thece opinos are of two typesy larger spines in tricis elmose hals longth of outer shorth 20 oplity and omilor aphes jn

 sotae and onds in a afrablo claw, Banal thint of "dactylar sota" is

broader than basal part, and is allechtily flattened, has a sharply rounded apex, and is densely covered ufth fine aletae. (Dactylos of 2nd leg in Iigured, fig. 83).

In 2nd to 7th legs, outer murface of meros is progressively less convax and distal region of leg is less curvac. Simple apinea are not present on propodos of 2nd to 7th legas apines on these lege axp mindlar to other mpines on lut leg. Seventh leg is weli doveloped but alightily thortor than remainder; longth: lat leg 2.5 mmos 6th $\log 2.6 \mathrm{~mm} . \mathrm{m}^{2} 7 \mathrm{th} \operatorname{leg} 2.3 \mathrm{~mm}$.

Male oxgan (fig. 84). Basal three-quarterm of male organ are expanded to form a sub-oval replon, beyond which projecte a narrower distal quarter having atraight sides and a truncato apax. In dorsal View, centre of oval ragion is seen to be thicker than sides, 1 imita of thils thicker portion being continuous with lateral margins of aistal quarter. The two ducte which enter base of organ rerain aistinot and open separately into a kollow in ite aper.

Pleon (fige 85). Pleon is semfoircular with its lateral boidere contimore with those of peraion. spimare of 7th aegment of perelion are sharply directed backwand to cover slden of lut and 2nd eegments of pleon and lie to outer side of 3xd segment. Pleura of 3xd to 5th segnents are bent sharply backwazisg those of 3xid megnent are narrow and acute with a Pew mpines at aper; those of 4th and 5th megmenta are large ufth their postero-lateral margins rounded and bordered with apines. A few apines are also present on both surfaces of these pleura but no apines occur on contral region of segmanta. Spines on pleon are similar to those on lateral margin of pereion.

Terminal segment is oub-twiangular when apex very shaypiy rounded; it lacks marginal opines. Dorsal surface of tergites bears scales and scalemsetae mindar to those on pereion.

Pleopode. First pleopod (ifg. 86): Protopodite is a narrow barg on outer aide it is produced into a small lobe. Exopodite Is sub-oval, sith antemor margin indented towards its outer alde and posterior margin less deepiy indented towards its inner side. Outer region of exopodite axticulates whth outer aide of protopodite. on dorsal armiace this outer region of exopodite is thickened and has 2 bands of thickening extending from its a curved band following part of anterior margin and a horizontal, band across midale of exopodite. Endopodite is styliform and is suspended from inner region of protopodito. It is grooved along its length, with groove beginning on inner gumace at base of endopodite and twisting onto its dorsal surface nearer apex; edges of distal half of groove are omsnented with short setae.

Second pleopod (fig. 87)s- Protopodite is a narrou bar with ite outer side produced Into a amall lobe. Exopodite $1 s$ irregularly Sour-sided, whanterior boxder neariy atraight, lateral borders curved outwardis, and posterior border indented on inner side while toraris outer side it forms an outwand curve conthmous with outer borders inner posterior angle is bluntiy rounded. There is a prominent ceta on indented part of posterior margin. An oblique band of thickening on dorsal muface begins at outer anterior angle where exopodite articulates with outer alde of protopodite. Endopodite is susponded from inner region of protopoditeg it is atyliform and curved outwands, much narrower than lat endopodites there is a chitinous thickening dow the greater part of its innor aurface. Endopodite is not divided into 2
aricices, although such a divimion is inclicated by a faint, incomplete suture line at a point where thore is a sudden decrease in width of endopodito. Ventral surface of basal region in raised into a curved ridge, arca to inner side of this ridge being indented.

Thind pleopod (fig. 88) i- Imer region of protopodite forms a broad, rounded lobe, inner surface of which beare comb-like groups of setas. Shape of exopodite is aimilar to that of 2nd pleopod, in particular its inner posterior angle is bluntily rounded. Band of thickening on dorsel surface of exopodite is ousved. Short setae occur down inner margin of expopolite; there ls a jarger seta on itm inner posterior angle and another on indented part of posterior margin. Endopodite is aub-triangular and is attached along most of length of protopodite. Fourth pleopod is almilar to 3rd.

Fifth pleopode- Eropodite differs a littie in shape from those of 2nd to 4 th pleopodss ita lateral margine are almont straight and ita innor posterierangle is sub-acute. Band of thickening on its dormal surface extende to posterior margin which is indented at this point.

Droped (flge. 85,89). Protopodite projects beyond torminal megment; ite inner margin lies adjacent to that of opposite uropod. Outer region of protopodite is produced backsarde into a broad lobe which forms part of general outline of body. Margin of this lobe is rounded, sllghtly crenate, and boars spines simblar to those on lateral borders of pereions much spine are also scattered over both surfaces of lobe. Inner margin of protopodite is incised near its base. Eropodite is inserted on dorsal surface of protopodite, near its posterior margin, to

Inner side of Lobe, beyond which it projecta for a short diatance. It Ls aub-cylindrical, bears several apines, and ends in an acentric tuit consiating of 3 long setae and several shorter setae. Endopodite is inserted on ventral surface of protopodite at its imer basal cornor. It is narrowis conical, bears sevoral apines and a covering of pointed scales, and has a long tormanal seta. On vontral aurface, region of protopodite to inner aide of insertion of axopodite is deoply indented down its whole length to form a groove to receive endopodite. Protopodite is longer than it is broad. Hardman length of protopoditos 0.62 mimos breadth of protopodite: 0.43 muen lenfth of ramis eccopodite 0.27 mano, endopodite 0.48 mme

## 


Female differs from male in the folloving atructures:-
First pleopodi- Protopodite and exopodite are ainilar to those of lat pleopod of mala; exdopodite is not developed. Second pleopod (fig. 90):- Protopodite and expopodite are aimilar to those of and pleopod of malos ondopodite is conical ndth apers bluntiy rounded and is almost the same length as exppodite.

## Habstat.

This description as based on specimens found on 3rd liay, 1957, enroiled in amall burrowa in the sand, under pleces of seaveed lying on the beach, or malking on the open beach near the edge of the incoming tide, at Pirates Bay, Eaglehawk Feck; 33 males and 38 fecalea were collected.

Specimons were aleo found under ainilar conditions in other
localities; mang exanples boing collected at Clifton Beach ( 23 nales, 66 Pemales) while a Peu apecimens wore found elsewhere; at incion Bay (1 male), Scren Mile Beach (1 female) and Roaring Beach, South Arm ( 1 Pomale), all in soutb-eastern Mamania, and at Haviey (1 malo, 1 female) in northern Tasmania.

Actaceia guchroa is recorded from Eaglehawt Heak by Thomson (1893, p. 56).

## 7ariations.

Some specinens from Clifton Beaih have reached a largor aize than the maxdram noted from Eaglehaulk Meck. Length of largest pale apecinon from Clifton Beachs 7 mmos length of largost formile: 7.3 mm In thase large specimens the 7th $\log$ is atill silghthy shorter than the 6th leg:

In one male apeciman from Eaglehank Neok the outer lobe of each lot maxilia has oniy one bilsd tooth, this being the second imermost tooth on the left appendage and the fifth innermost tooth on the right appendage.

## Remarles.

Dana (1853, p. 735) states that the flagellum of the and antenna of A. guchroa is indistinctis live or aix-jointed (he ingures (pl. 48, fig. 6 e) 20. tith 6 articles), whereas later authors (Thomson 1893, p. 56), (Chilton 1901, p. 131) recognize that it has oniy 4 arisicles. This ray be explained by the fact that there is an indentation in the outer surface of both the and and the 3rd arisicle of the flagellum which superficiality might appoar to indicaio a diviaion botwon articles. The description of specimens of A. guchnoa fron Raglehaule Hech
given by Thonson (1893; pp. 56-57, pi. 2, E1ge. 1-8); contains gome minor errore. His drawing of the mole animal in dorsal view (ife. 1) onits let, 2ad and torninal pegments of pleon. He describes and Ifguran (fig. 3) the 1st antonna as having 2 artioles inatead of 3, however the distal articulation in this appendage night easilis be overiooked. His description and figure (fig. 5) of "the nandibles" applies oniy to the loft mandible. As is noted by Cbiliton (1901, p. 131), the structure which Yhomson describes and Ifgures (fig. 6) as the inmer jobe of tho let maxilia is actualiy the and maxilla. Thonson statos that the lateral portions of the 3rd, 4th and 5th sogmants of the pleon have their margins rounded; this is true of the 4th and 5th segnents, but the pleusa of the 3 nd meement are acute. The apax of the termalnal aegment is more sharply founded than Thomson figures it (fige 8).

Chiliton (1901, p. 132) statea that the endopocite of the 2nd male pleopod of A. ouchroa ie 2-jointed, whereas in my specimens it is not dietinotif divided into 2 articles, but from bis drawing (pl. 15, fig. 3 plp. ${ }^{2}$ or ) of this atructure it appeara that he consider the protopodite as one article.

The ocelli of the eye in 聇 apecimans are not "vory muneroun" as is noted by Chilton ( $p$. 231) in his description of New Zealand examples of A. guchros. Also the eyes themselves are snallor and nore rounded than those figured for A. guchroa by Chiliton (pi. 15, 2ig. 3) and Jackson (1928, fige 10). However the eyes are corparable in size and hape to those of a specimen from Eaplehawit Neck Pigured. by Thomeon (1893, pl. 2, fig. 1). Chilton (p. 130) makes use of such a difference in the aise of the eyes in distinguishing A. opihensin

Chilton 1901 from A. aucluros. From this it night appear that tho Tamanian apecimons in question ahould alao be considored as apecifically diatinct from the New Zealand exaplem of A. suchrof. However Chilton (p. 101) notes that A. guchron Danm occurs in Tasmanta, and ho (p. 230) inoludes a reference to Thoman's (2893) description in his bibllograpto of this spociess honce it is ovident that accepta Thonson's Identification of his specimon from Eaglehant Hook as A. guchros. As Chiliton (p. 99) atates that he has the whole of Itr. G.M.Thomen's collection it is posisible that he has bad the opportunity to actually examin these specimans. Ny Tasmanian specimens agree ulth those from How Zealend described my Chilton in charecters othor than those of the eyes. In this paper I therefore follow Thowion (1893) in idontifying opecimens of Acienels Srom Kaglehavik Iock as A. suchrog Dann, but note that the Tasmanian reprosentatives of thile species probably constitute a diatinct variant of the New Zealand form.

## Actrocia puchron Dans.

| Fig. 75. | Cophaion, dormomateral view, whowing right eye. |
| :---: | :---: |
| F1g. 76. | Flagellum of right 2nd antema, dorsal view. |
| P1g. 77. | Distal part of zight mandible, dorasl view. |
| F1g. 78. | Distal part of outer lobe of right lst maxilis, ventral view. |
| 72g. 79. | Distal part of right 200 maxills, ventral view |
| Fig. 80. | Distal paxt of left masdiliped, vontral view |
| Fig. 81. | Left epimera of lat to 5th segments of pereion, ventral view, ahowing riages on 1st to 3xd epimera, |
| 7ig. 82. | Spine on lateral boxder of lat aegnent of pereion, dormal view. |



## Actaecia cuchroa Dana.

Fig. 83. Dactolos of left and leg, anterior Fiew. Fig. 84. Nale organ, ventral view.

Fig. 85. Seventh segment of pereion, pleon and uropods, dormal view.

Fig. 86. Rdght lat pleopod of male, dorsal view. Fig. 87. Left 2nd ploopod of male, ventral viers. Fig. 88.

Right 3rd pleopod of male, ventral view.
Fig. 89. Loft uropod, dorsal view.
Fig. 90. Ieft 2nd pleopod of female, dorsal view.


## Actaacis pallida Nicholls and Barnes 1927.

(Figs. 91-100).
Nicholls and Baxnea (1927, pp. 154-158, text Sig. 2, pl. 20) give a comprehensive account of West Australion male axmples of A. pallida. Hosever Tasmantan apecimens which I consider may be assigned to this species differ in a Pew details from the description of Nicholls and Baxnes. The following description of Tasmanian material is therefore given for comparison.

## Male.

Length of largest specimen: 4.4 mm - breadthi 2.2 mm . Colour. Dorsal surface of live animel is white, marked with groups of black and orange-brown chromatophores.

Cerahion. Naxillipedal somite is marked off from rest of cephalon. Vertex bears scattered simple spines. Frontal line forms a sharp ridge, slighti, depressed in contre, and edged with spines. A Vishaped ridge on Frons possibly represents supra-antennal line. Antennary tubercles are not developed. Eyes are oval, compound, and raised above surface of cephalonj each is composed of $14-18$ ocellis.

Fixat antenns: Triarticulate; 3rd article baars 2 apical spines.

Second antenna, Length of pedunclet 1.70 mm .9 length of flagellums 0.33 man. Peduncle and flagellum are set with spines. Each spine consists of an outer sheath, apilt near the and into several points, and surrounding a seta, clubbed at its apox; there is a large scale against base of apine. Flagellum is composed of 4 articles.

In outer curface of both 2nd and 3nd articles there is an indentation in which is eat a group of simpie apinen. Firat three articlea are uborqual in length. Fourth article (fige 91) is shorter and tapering it enis in tuft of setae. Length of 4th article is not more than twice 2 ti greateat breadth length 0.0525 mmo breadtht 0,030 1m

Mandibiog. Left mandibles- Incisor procesa consiste of 2 eimple teeth and one sifid tooth. Iacinia mobilis ends in 3 teath. Bohind Iacinla mobilis is a lobe which beari coarae simple setae and has 2 pencils of finer setae at its base. A thind such pancil occurs further bads on mandible. Nolar portion is reprosented by a sub-cylindrical proceas which beare a large tuft of plumose setae. Right medible (fige 92):- Incisor process congints of 4 simple teeth Lacinia mobilie onds in a mushroom-haped structare bearing numeroum omali tooth-ince processes. Setose lobe behind laciaia mobilis has one penoll of getae et 1ta base and there is another pencil furthor back on mandible. Ifolar portion is eindlar to that of left mandible.

Plat maxilis. Onter lobe onde in 11 toeth of which the outer 5 and the second innezmost one are simple, the remaining 5 are bifid. There is a long; slender proceas tot among outer toeth, and a bhort spino on ventral surface noar basos of imer teeth. Groups of setae on outer ald of dormal turface of lobe moject beyona its outer marith. Outer aistal corner of inner lobe ends in a abum ipines to inner aide of this, apex of inner lobe beari 2 laxge aetome procerses.

Secondmailia. Division into 2 Lobes is indicated by a outiare line extending obliquely imands and backwards from an
indentation in outer margin of maxilia. Apex of outer lobe beare severel sotae. There in a group of long setae on ventral suxface of maxilia below buee of outar 10be. Apex and inner marginel region of inner lobe bear sereral coarme setae and a donse fringe of finer setaes fine motal are alwo prement on corsal surface of inner lobe. Kurilliped (fig. 93). Epapoait te is elongmtod, reaching almost to distal boxder of basias it ham an acute apex. Imehion is the only artiole of endopodite ahich is diatinet; thare are 2 ahort apines on ita ventral ourface and ita outer margen has a fringe of long setae. Remainder of endopodite in sub-trianguler in outiine, with divioions between ite \& articles indicated by lobes on its inner margin and by oblique suture linos between these. Fieh lobe bears a tuft of coarme setae. On ventral eurface of mores max itim man maring, and belan the coarve metat, there is a deane tutt of side metace. Thare are 2 sptnes on cuter margin of endopodite. Twe twe anturs 11 nos separating carpong propodion arad dactgion exteni meross mont of vwatral aurfiace, anch directed towarde one of thewe apines; ruture liste between meros and carpos in aborter in comparison. Endite is sub-conical with a bluntiy tapered apwx, on which is set a aub-conionl sotose proonss there is a curved spine on endito to outer side of this process. Inner surface of endite bears long setae. With setome process exoluded, endito searcely extends beyond batal lobe of endopodite.

Pexpion. Sides of lat aegment are sharply produced forwarde to flank ceptaion. Poaterior borders of lat to 4th segrent are nearly atraight with ponterior anglem aharply rounded. Mpimera of 5th segment are alightif producsd beckwaria sith thoir posterior boriors
curved cutwards and angles sharpiy rounded. Epimera of 6th and 7th segments are more markediy produced backards with their posterior angles oub-acute. Epimera of 1st to 3xd segments each have a thick xidge on ventral surface. Such ridges are absent from remaining segments. Lateral margins of segments are bordered with short spines, each of which consists of an outor sheath, split near the end into several short points, and surrounding a seta, clubled at its apex. Narrower simple spines are scattercd over the whole of dorsal surface of pereion, which also has a covering of rounded scales.

Pereionode. Firgt legi- Outer gurface of moros is convex. Portion of leg distal to meros is curved downards. Majority of apines on leg each consist of a partialiy split outer sheath and a central clubbed seta. These spines are of two types (aee fig. 94); large spines in which distal half of the outer sheath is aplit into several pleces, and swalier spines in which sheath is aplit oniy near its apex. Small simple spines are prosent on under surface of propodos. Dactylos ( (ig. 94) bears muerous long, Flattened setac and ends in a simple claw. Basal thixd of "dactylar seta" lacks socondary setae. Its diotal tro-thirds are broader than basal third and slightily flattened, and have a dense covering of shoxt setae; a long, fine seta is set on anterior side at base of broader setose portion. Apex of "dactylar seta" is sharply sounded.

In 2nd to 7th legs, outer aunface of meros is progrosoively less convex, and distal region of leg is less ourved. Sinple spines are absent from propodios of 2nd to 7th lego. Spines on these legs are aimilar to other spines on lat leg. Seventh leg is well developed but slichtly
shorter than 6th leg; length: lat leg 1.80 mmof 6th 10 g 1.93 mos 7 th $\log 1.78 \mathrm{~mm}$.

选的 oregn. Basal throemuarters of malo organ form a broad oval expansion, beyond which projects a narcower distal quarter having atraight aldes and a truncate apex. On doral aurface, centre of oval region is raised above ita sides, limits of this thioker portion being continuous with lateral margins of distal quarter: The two ducts which enter base of organ remain diatinct and opon aeparately into a hollow in its apex.
pleon (fige 95). Pleon is semicircular with its lateral borders continuous with those of pereion. Epimere of 7th segrent of pereion are sharply curved backwards to cover sides of lot and 2nd segments, and lie to outer side of 3rd segment. Pleura of 3rd to 5th segmente are sharply curved backwardis, those of 3rd segment are narrow and acute, those of 4 th and 5th segments are aub-rectangular with postero-latoral margins atraicht. Terminal segment is triangular with ita apex sharpiy rounded. Compound spinea, like those on lateral bordera of pereion, are present on apices of 3rd pleura and along postero-lateral bordors of 4 th and 5th pleura. Dorsal surface of segmenta beais acales and aimple mpines almilar to those on pereion. Pleopods. First pleopod (fig. 96):- Protopodite is a narrow bar; on its ouier alde it is procuced to form a small lobe. Exopodite is sub-oval, with an indentation in 1ts anterior margin towards outer side, and another in its posterior margin towards inner aide. It articulates at its outer angle whith outer side of protopodite. On its Corwal surface, a thickened band begins near this point of articulation
and extende across contre of exopodite. Endopodite is styliform, and sumpended from inner region of protopodite. It is grooved along its length, with groove begioning on its inner surface and twisting onto its dorsal surface. Near aper, outer edge of this groove is bordered with setae.

Second ploopod (fig. 97)t- Protopodite la a narroy bary its outer side is produced into a small lobe. Exopodite is sub-rectangular with itw posterior margin indented; its inner posterior angle forms a rounded right angle. An oblique band of thickening on dorsal surface of exopodite begins at its outer anterior angle, where it articulates with outer side of protopodite. A long seta is set on indented portion of posterior margin of exopodite. Encopodite is suapended fiom inner region of protopodite; it is styliforn, mach narrower than that of lat pleopod; there is a chitinous thiciening dom greater part of its inner eurface. Endopodite is not divided into 2 articles, but there is a sudden decrease in its width near its base which probably indicates that 2 articles are represented. Ventral surface of basal region ia raised into a curved ridge.

Thind pleopod (fig. 98):- Inner region of protopodite forms a broad lobe fringed uith groups of setae. Exopodite is subwrectangular with posterior border indented; its inner posterior angle is sub-acute and bears a long seta, and there is another such sota on indented part of posterior margin. Inner margin is fringed uith short sotae. Band of thickening on dorsal surface of exopodite is curved. Endopodite is sub-triangular. Fourth pleopod is similar to 3xd.

Pifth pleopods- Thickened band on dorsal surface of exopodite
extends to its posterior margin.
Unopod (fige 95, 99). Protopodite projects boyond terminal segment and forms part of general outiline of body. It is aub-rectangular; 1ts ponterior bonder, to outer side of exopodite, is neariy straight except for slight oremiations; and forws a distinct angle with outer margin. Its inner margin is incised. Its ponterior margin is bordered with compound apines, and a fow simple apinos are scattered on both aurfaces of protopodito. Iropodite is inserted on dorall murface of protopodite, near ita iner posterior angle; it projecte a iittle beyond protopodite. It is sub-oyilindrical and ends in a turt composed of 3 Iong setae and asveral ahorter setae. Endopodite is inserted on ventral murface of protopodite at its inner anterior comer. It in namrowiy conical, boare several compound mpines and a covering of pointed wcalea, and hat a long, terminal seta. To inner mide of insertion of exopodite, ventral surfiace of protopodite ia deoply indented longitudinalisy to form a groove to receive endopodite. Protopodito is a litile broader than it is long. Marimum length of protopodites 0.30 rime 1 breadth of protopodite: 0.92 nimes length of ramis exopodite 0.12 yree, endopodite 0.23 unco.

## Female.

Length of largeat apeciment 408 man breadths 2.4 mmo
Female differ Irom male in the following atruotureasFirst pleopods- Protopodite and excopodite are similar to thome of lat pleopod of males undopodite is not devoloped.

Second pleopod (2ig. 100)i- Protopodite is Binilar to that of 2 nd pleopod of mile. Exppodite is sub-rectangular nith posterior border indented, bearing a long seta, and inner posterior angle tub-aoute,
also bearing a seta．Erdopodite is conical with its apox oharply rounded！it is a litite longer than exopodite．

## 昭列tat．

This descripoion is based on specimans collected on 19th February，1958，from uncler pleces of maaved lying on the beach at Hawley， near Port Sorell，in the north of Mannaia； 69 males and 67 fonales were obtainod．

Speaimens were also foun on baaches in south－eastorn Tasmania． Many examples were colleoted at Dodget Ferxy（ 30 male日， 22 fenales） Roaring Beach，South Arm（7 males； 48 Iemales），and Adventure Bay； Brung Island（11 males， 44 fenales），and a few wore found at Eaglebawik Heck（ 6 males； 1 female），Seven Mile Beach（ 4 Penales），and Clifton Beach （2 femalen）．

Actarcia palifia bas not previously been recorded from Tasmania． Remarks．

Hicholle and Barnen（p．155，pl．20，PLg．2）describe and draw the tercinal articie of the flagellum of the 2nd antenia in A．pallida as being moro than twice as long as it is broad．In my spocimens，if the aptcal tuft of satas is not incladed in tho moarurmant， the Length of this artiale is guet twoe its greatest breadth．or Lang． The râto of length to breaciti of the texminal anticle in mbjeot to slight varietion．In the 20 ． t 2nd ancomae of 10 male apacimans from Hawley this ratio was found to vary from 1.75 （longth 0.0525 ma ． breadth 0.0300 mm ）to 2.00 （1encth 0.0550 mm ）breadth 0.0275 ma ）， neapurenents boing made wing a $10 \times$ nicrometer eyaplece and a 65\％objective
lens.
The nolar poresion of the conalible io desersbed (p. 155) cna
 In us specinons the dictal and of the nolar taberclo is prolonged to form an axis on wailch plumose sotae aro sot at disferant levels, buit the ponoil so fomed ia lesa compact than those rigured by Dicholls and Barnes.

Bicholls and Barnos (pl. 20, Sig. 1) show the pleura of the 3xd segrent of ploon as being aubrectanguiar, 1 tike those of the 4 th and 5th segoonto, whorcas in ay speoinens the 3xd pleura are triangular and acueo.

The endopodite of the and ploopod in ty male specinens is not clearly divided into 2 articles; however it would appear from the description (p. 157) and Iigure (text fige 2 b) of the $2 n d$ malo pleopod given by uicholla and barnee that they conalder the protoposite as ono artiele. They geats that there are no setae present on margins of exopodites of pleopode. In ny apecimens the and to 5 th exopodites exhibit setae, although those mitht be casily overlooked.

However, as in othor reapocts, particularity with regard to tho shape of the uropods, the charactore of ay apecinome iroa Haulcy are in olose agrearont with those describod for: A. pallide by Ificholls and
 to this apecios.

Micholls and Barnes compare A. pallidn with tho othor two apecies in Acigaciay A. ouchrog Dana 1653 and A. opithansis Ohilton 1901. On p. 155 they atate that A. panida is racdily distingushed from elose
two apecies by the considerable development of coxopoditas on the firat three aegmente of the pereion, but the ridges on the ventral
 are very mimilar to those exhibited by the specimens which I assign to A. suchros. On p. 158 they state that the 4th arcicle of the flageilum of the and antance in As pelita is longer and more slender than in A. euchros, but nu examples of these two species show no manted diatinction in this regard.

Hecholls and Barnes (p. 155) note that there are differences between A. pallida and both A. guchros and A. onihonisis in the mandibles, maxillipeds and pleopods, and (p. 158) that the dactylar seta of A. pellida ie distinctive in shape. But there are mose obvious distinctions in the shape of the 4th and 5th pleura of the pleon and the uropodi, between A. nallida and A. cuchron, to rhich thoy do not draw attention. Those differences are apparent from a comparimon of Bloholls and Barnen' (pl. 20, figw. 1 and 5) figurem of A. pailide with Cbilton's (pi. 15, Pigu. 3 and 3 urp.) figures of A. auchron, as woll as from a comparison of ny examples of these two species. They are aet down in the following table.

| Actaecis mallias [ficholis and Bamon. | Actaecia euchroa Dana. |
| :---: | :---: |
| Fourth and 5th pleura of pleon (fig. 95) with postero-lateral borders atraight. | Fourth and 5th ploura of pleon (fig, 85) with postero-lateral bordera rounided. |
| Protoposise of uropod (2ig. 99) <br> elightis broader than long. Postorior border of protopodite, to outer side of exopodito, atraight, forming a definste angle with outer border. | Protopozilite of unopod (IIg. 89) longer than broad. Region of protopodite to outer sice of exopodite produced posterioris into a rounded lobe, with its pontorior boxier forming a contimous curve with outar boxder. |

Beference to Chalton's (1901, p. 132, pu. 15 I1E. 4 , pl. 16
1ig. 1) account of A gothonsin show that A. palisia differs from thia apecies in the shape of the 4th and 5th pleura and termanal segment of pleon, and in the form of the endopodite of the list mile pleopod.

## Actaecin mallida Mrcholls and Barnes.

| Fig, 91. | Terminal article of flagellum of left 2nd antenna, ventral view. |
| :---: | :---: |
| Fig. 92. | Distal part of right mandible, dorsal view. |
| Fig. 93. | Distal part of left maxilliped, ventral viewo |
| F1g. 94. | Dactylos of left lat leg, anterior viewo |
| Pig. 95. | Seventh segment of pereion, pleon and uropods, dorsal view. |
| Fig. 96. | Left lat pleopod of male, dorsal viewt |
| F1E.97. | Right 2nd pleoped of male, ventral view. |
| Fig. 98. | Right 3xd pleopod of male, ventral view. |
| Fig. 99. | Laft uropod, dorsal view. |
| Fig. 100. | Left nd pleopod of femele, donsal view. |



## Fanily ontecides.

Honbiers of family oniscidae axhibit the follouing characterss:-

Frontal lise of cephaion present, even if incomplete. Eyoe turully compound. Flagellum of and anterna oomponed of 3 articles. Bndopodite of madilipad poorly developed, termad of not more than 3 articlem. hropoditan of pleopods without panadetracheac.

## Cemus plypophslosega wahrberg 1922.

 of philoscia Latroille 1804. He places in it tuo now specico, Ph. (P1.) maima and phe (P2) Euctata, both collectod in Quconsiand. Wabriong's ( $p .101$ ) proviaional cerinition of glvaophiloseia, which 1s based entirely on cheracters of the nouth parts, is as follows:-

Mramalibelne unise tandival: Penicilia $1+2$.

- Roclito thmalibels Ponicilia 1 + 1. - Sota Inferior mit kurzer Radsx und vielen haupêasten, rolust.

Erstes tazillenpaary ziähno $4+6$. Dle innoren Zähno Hind 2 - aptitaig, mit Ausnahmo doe 5., der einspitaig snd kiumor alo die übrigen ist. Incinia interiort 2 Lance Penicilla.

Zueites Maxdilonparart Der innere Lappen ton äusseren wohl abgesetest una otwas hóher, jedoch schribler. Innoror Lappen discht milt ziomilich groban Dozaten bebetzt. Inmenseite Cos äuscoren Lappens mit besonders feinen Haxiboraten, die in Gruppon atehon.

Pades madillaress Endit mit langer Spana und 2 kloinon zähnen an duscoren, oberen Rand. In dor imeren Ecke ein kiloines


 bewafinot. Der ütrige sail rit 3 vorspringenien Dorstonansarmiungen, die 3 verschroleme clieder andeuten. In der Spitzongruppe dieser
 Borsten der Anmal nach vielo. In dor untorston Gruppodagegen sinden
sich nur 2, eino kriztigere mal eine ochächoze. - Distaior deli des Basipoditen abgerundet, mit langen, foinen llarioroton, aie in Gruppen atohen. ${ }^{\text {a }}$

This defingtion separator Plymophiogola from Phtioscia Latreilic 1804, Verhoeff 1908; s.stre, in which sho exatte of the madilifped has no setae or setose condcal wrocess ("pentcinium").

Wharberg (1922) does not definttaly desicante a type sor
 he makes use of ceveral comparative. moforences to charoctere of Eh. (11, matima, thich has pace precedence, nut it thorofore socme


Verhoeff (1926) crume Elymophilogiti as a gemis. He (gp. 323-325) atatinguiabet it from other genore of oniscidao from the Australlon region wy means of a key in which he introduces other charactere bantde those of the mouth parts. The characters which Verhoofi aftributea to Elymophilotcis in this keg are as follows-

Frontal line of cephaion is abaent. rinner cooth on oiter Iobe of lat mailla are curved inwards and nostify (usiusily 5 of 6) eplit as the end so that an acditional point is Iomads there are no andale teeth on outer lobo of lat mavilas. Endeto of mexilisped is setose and bas a cone at its aper and 2 mali tceth on its outer ancle. First to 3xd tergttos have thois postorior bondeas rounded or transverwo, with poatorior anglas not arawn out into 1obas, or, is a aligit Indication of lateral excavations dooa occit; it in shaviow and it confined to posterior boxders of equmera. Postcrior boxier of 4th
tergite is bent out on each side, with posterior angles projecting as short triangles. Epimeral gland open in a row along lateral borders of eplmare. Dorcal enmiace is not tuberculate and lacks aetameales ("Borstenschuppen")s it may exhibit scale struoture ("Schuppenstiruktur") but this is absent from lateral borders of segments. If scalemetae ("Schuppenborsten") occur they do not teke the form of oval clube or bhort stalks. Pleura of 3rd to 5th segments of pleon are well developed, not or only slightig bent downaxde, and thus complotely pisible in dorsel view.

Verhoeff (1926, p. 334) places in Plyophilosots a: new apeies, R1. montang from New Caledonta.

I have collected in Tasmania examples of four apecies which belong in Philoscts Latreille according to the diagnosis given by Sars (1899. pp. 172-173). These may be further placed in plypophiloscia acconding to the definition of the mouth parts given by Wabrberg. However they do not conform in all respects to Verhoefl's (1926) characterimation of Plymphtioncis.

Verhoeff statem that the frontal inne of the cephalon is absent. In ell of ny species this line is indeed sbent in the middie region of the cephalon, but it is represented on each oide ly a ridge in front of the eye.

Verhoefi indicates that there are no middile teeth on the outer Iobe of the lst maxills, whereas in all of uy apecies this structure does exhibit 2 tooth-like spines near the base of the 4th large tooth. However, these apines are not very conspicuous and might easily be overlooked. The posterior angles of the 4 th segment of the pereion are
angular and very slightiy drawn backwards in one of the Tasmanian species (p1. notlevensil), but in the other three they form rounded right angles and the posterior border of the 4th segment is nore neawiy transverse. In sections G and $H$ of his loy, Verhoeff uses the characters of the 4th megment of the perelong and aleo those of the 3xd to 5th pleare of the pleon, as a contrast between Wahriberpal Verthoef2 1926 and Plymphilosoin on one hand and Lacrophilosof Wabrborg 1922 and Heroldin Verhoeff 1926 on the other hand. In laeyophiloscis and Hexoldin the posterlor border of the 4th segment is tiransverse with the postarior angles counded, and the 3nd to 5th pleura of the pleon are poorly developed and more or less strongly bent downards, so that they are either not visible from above or oniy their tercinal pointie are atill vinible. thus, while all of ty apectes agree uth kimpoercin and Fiymophilopef in having the 3xd to 5th pleurn of the pleon completaly viskble, three of the four apocies agree with Iaexophilosoin and Honoldis in the fozm of the ath gegnent of the pereion.

Within ection $C$ the Tasmantan spocies aro excludod from Wahrbarin and agroe with Phwophlioscin as they have a non-tuberculate doraal ariface; axhibit opimoml gland pores, and bave 2 amall teeth on the outer angle of the endite of the madilliped. Within section H they are ecceluded from Iaerophilosats and agree with Horolats as the endite of the mexiliped in setose, indented at the apex, and has a mall setose cone on the finer sides also the endopodite of the maxilliped has a poncilmike group of setae ("Nobongriffel") instead of a Pew individual setae on its innor border. Verhoeff (1928a, p. 218) Iater Ldentifien Iagrophiosoin as a synonym of Ghotophiloscia Verhoeff

1908, to which the same diatinction applies. Thus, according to Verboeff: (1926) kay, one of my apecies belongs in plymophilogoin while the other three occupy a position between Plymophilosoin and Heroldin.

But the difference in the form of the fth regrent in the one apecies (pl. notiexensia) from that in the other three apeciea in only one of degreo. Also the former species is closer to two of the others (p1. thomsoni and P1. tagmaniensis) on other charactors, such as the number of epimeral gland pores, the omamentation of the lat to 3xd legs of the male, and the ahape of the endopodite of the int pleopod of the male, than iothe remaining species in which the angles of the 4th
 species to phypophipacis, regardless of Varhoeff'e restriction on the 4 th segvent of the pereion. With this character excluded from the limita of the gams, Heroldin is still narrowiy separated from Elymophiloscia, accorting to Verboeff's (1926) kosy, on the form of the pleon. The Tasmanden apecien are also distinguished from the aix establishod specion of gezoldia on individual apecific characters, in addition to the relative difference in the 3rd to 5th pleura.

## Statuy of Plymophiloscis.

Van Name (1936, p. 112) considers that, in many cases, the treatment of aections of Ehiloscia Latreille as full genera "involves losing sight of important resomblances and relationships in the effort to emphamize arall difforencem." He therefore regarde such sectiona as sub-genera of ghilogeis s. Lat., Jackson (1941, D. 2) agrees with Van Itame. He (p. 12) returna Plymphilogola to the atatus of a sub-gonus
of Rhiloscia Tatreille and likenise classas Gbaetophiloseth, Henoldia and Wharbergha as subwgeners of Fhilofofa.

I consider that the limite of many of the mb-divisions of Philosola s. lat. are too narrow the position of the Tasmanian apocies Is an example of thin. However, as is noted by Van Hame (1936, p. 111), Pheloncin t.iat. is one of the largest genera of terrestrial Isopods, and I Peel that somp diviaion into smaller genom is demirable. I therefore do not propote to follow Jackson in regarding Eppmohtiosots as a sub-gemue of Philoseia Iatroilip.

Verhoafe (2926, p. 333) aucgeats that Plymophigsotia and Yahribyegin should perthaps be combined as aub-genera of one gemus. The position of the Tasmanian apecies indicates that Heroldis should probably
 Lacophiloget as a ynorym of Chantophiloseis and mugeats that Herolata hould pertaps be regarded as a mbgeme of ghatophiloncia. According to Herold (1931, pp. 374-375), Leptophiloset Herold 1931 bolongw between Inerophiloscis and Heroidis.

It aeems likely that the prosent nyatems of classification of apecies in the Philoscis group might be improved if some of thase, and perthap other relsted sections, were to be combined to form valldafinod genera intermediate in sime between Philosels alat. and its present abb-divisions. However I an not prepared to undertaire such a step usthout having the oppoxtunity to stuity axamies of the nections concerned. In the present paper I therefors acoept the Ifmits of Plymophilopois Imposed ly Wahrberg and Vorhoeff except as regaris those oharacterw of the cephalon, Int maxilia and 4th aegront of the pervion
which have already bean discuamed.
Ny apocies are distinct from the three establishod apecies already placed in Plymophiloscia. A check on species from the Pacific regtion which are mimply placed in philoscte solat. shows that theme ere ofther excluded from Pixpophiloncil on characterm of the nouth parts, or are too inadequately described to be asaignod to a aub-diviaion of the Philogeti group. The Rasmanian apecics are thersfore regarded as new. Thelr distinction from the aatablsahed apeoie of Plymophiloscia is demonatrated in the following treys-

1. Body nariow, ratio of its length breadth at least $3.3 \%$. .
 Body broador, ratio of itm lengthi breadith leas than

2. Outer lobe of lat maxilla with 9 teeth pereion with scalell restricted to epimera - - - . - - . - - - M1. pontana Verhoeff 192

Outer lobe of 1 st marilla with 10 toeth; peroion vith scales over ith entire doraal surface - . . . . . . . . . - . - . - 3 .
3. Endopodite and exopodite of uropod articulated at about the same level on protopodite $-\ldots-\ldots-$ Pl. maxima (Wahrberg 1922).

Endopodite of uropod articulated on protopodite diatinctily anterior to exopodite - - - - - - - 고. thonsont, BL. tascaniensis

P1. potioxensis. E2- ulverstonensie, nospp*

Koy to opociou of plypophinlogeta reproseatod in ingrania.

1. Lumber of gland poros on cach opicoron of poreion small (3-6) s ondopoatito of lot pleopod of calo styliform and evenly taporing to a straight, pointed apax - .... -


Thumber of glamd pores on cact epinoron of pareion largor ( 13 or nore) : ondopodito of lot pleopod of mie club-staped and nof ovcaly tapering, witis $2 i c s$ apleal region not

2. Postorior anglo of 4 ti seccent of pereion ionting a destinte right angley lot leg of cale with propocos sub-cylindrical, not brozdened dorso-ventrallys endopodito of lot pleopod of rale with its apical region forning an outuaraly-directod,
 Posterior ancle of 4 th segrent of poroLion Soming a rounded xight angles lst leg oi nalo uith propocos broxdenced doreom ventrally and oval in outisne; endopodito of list pleopod of malo with lits apical region not Sorricel of such a lobo - - -

3. Bropodite of lit pleopod of male with its outer borrier curved ontwardas endopodite of lat pleopod of male exhibiting on its outer side a protuberance coversd ulth elongated conieal processes; exppodite of list pleopod of female with its outer border scarcely incurved and ite apax bluntly rounded -- - - - - - -


Exopodite of lat pleopod of male with ite outer border curved ipnosidey apical region of endopodite of lat ploopod/whibiting short papiliate processes; exopodite of lat pleopod of female with itw outer borider distinctify incurved and its apax sharpiy rounded - -


## Plymophtloncti thomsont now. (Figs. 101-118).

Synonyig. Oniacua punctatur Thomson 1893, (non Thomaon 1879).

## Fals.

Length of largost apocimsas 6.5 wno g . breadthe 3.1 nimo
Colours. In live specimen, background colour of corsal surface is a medium brown except for 3 longitudinal bands of dark brown on peretion, one in mdi-line and one on each side above bases of opimora, and for a band of dark brown down each sicie of pleon. Each dark band an pareion 18 marised by a row of unpigmantad patchem. Jarge unpigmonted patchas on opimera together form anothor row of spote down each alde of poreion. Cephailon and areas between daxk bande on pereion are mottled with irregular unphgmented patches. There is a line of smill unplgmented patches down mid-line of pleon, with other mpote on each side of it.

Gephalon. Suriace of vertex is emooth. Yrontal ine is not developed acrons middle of cophalon, but at the aidea it is evidont as a ridge in front of each eye. Supra-antonnal line is present. Antomary tubercles are smail, not visible in dorsal view. Eyes are oval, compound, each composed of 20-23 ocelll.

Hratintems. Triarticulates 3rd article is conical and has a group of coarse setae on ita Inner surface and 2 long, coaree setac on Ita apac.

Second antanna. Length of pedunclat 3.20 mmo : length of 5th articie of podunclet 1.27 memol longth of articles of flageliums
lat 0.40 mmor and 0.32 nmos 3 nd 0.47 cm on postorior aruface of antenna a groove extands along length of 3xd to 5th articies of poduncle and all articles of flagellum. on distal boxder of each of 2nd to 5th articles of peduncle there is a large spine formed of a central seta and an outer sheath, which is divided tovards the end into several points. All articles of antonna bear rows of shorter spines. Thind articie of flagellum onds in a long process formed of partily fused setae.

Yandibleg. Laft mandible (fig. 101):- Incisor procena consists of a large bifid tooth and a amaller simple toothy the Latter is aituated above the former and comneoted to it by a ridge. Lacinia mobilis onde in 3 teeth. Behind lacinia mobitis is a lobe densely covered with simple setac and bearing 2 pencils of setae. Ono other pencil occurs behind lobo. Molar portion is represented by a tuft of plunose cetae set on a common basal procese. Right mandible (fige 102)i- Incisor process consiste of a large bifid tooth and 2 simple teeth situated above it. Apex of lacinis mobilis has a pointed process on each side and uneven ridges batween the two processes. There is one pencil of setae on setose lobe and anothor behind lobe. Bolar portion la like that of left mandible.

Firat maxilla, Outer lobe (fige 103) onds in 10 tecth. forming an outer group of 4 simple tecth and an innor group of 6 teeth, of which the 5th is simple and the remainder are bifid. On veneral surface there are 2 apincs ncar bace of 4th armple tooth. Gutor border of lobe is bent out in a curves apes of curve and margin distal to it bear groupa of setae. Inner lobe bears 2 thick setose processes. Apex of lobe is rounded; there is a siall spine on its outer aide.

Second maxilia (rig. 104). Apex of maxilin is divided into 2 suburectangular lobes. Base of inner lobe ls derined by a suture 1ina. Dlotal region of inner lobe has a dense covering of sotae that of outer lobe, with the esfception of a clear ara in ita finor apical angle, is covered with inner setae. Four long, coarse setac project into notich detween lobes.

Yadil1iped (fige 105). Epipodite is lonc and narrow but shorter than basis; It apex is sub-acute. Ventral surface of basis bears short acaittored apines. Outor aido of basis is produced beyond base of endopodite as a rouncied lobe which bas corb-ilke groups of tetae on its nargin. Ischion is only articie of endopodite which is aistincty there are 2 very long apines on ite ventral surface. A aiviaion of remainder of endopodite into 2 axticles is indicated by a faint suture line. There are 2 groups of actae on inner border of first of these articies; basal set consiste of one large and one analier aota, diotal set of one large seta and $5-7$ smilor sotae. Three setae occur aingly on outer boxder of endopodites one on lat
 articie. Endopodite ends in a tuft of sotae. Endite is sub-quadrangulor and has a transverse indentation in ventral sumpace near its apox. There is a spine on imer aide of enaite, beaind tisis indentation. Two small teeth occur on outor apical comer. A mall conical process, bearing a few coarse setae; is cet in an indentation in dorsal surface near fmor apical comer. Aplcal regtion of endite beara very short, scattered setas.

Persion. Plesf epimera axe rounded anteriorly and acarcely
produced forwards. Posterior borders of lat to 4 th aegmants are alnost atraight; posterior angles of lat to 3ri megnente are bluntily rounded, those of 4 th segpont are zight-angled and rourded. (Spitmara of 3nd to 5th segmante are Pigured, fig. 106). Eplmara of 5th to 7th mogmints are directad backsuds and their postarior angles ase wubacute. Soventh pereial epimera do not extand beok begond 4th segnent of pieon. Doratil anriac of pareion is emooth, except for a longitudinal groove near latoral boxier of each epicoron. humber of giand pores opening into aach groove liea betweon 20 and 29. Thame pores are more mumeroum in anterior third; foner in middle thind, end abwent from ponterior third of groove. Thare is a row of apines above inner edge of groove. (Gpimeron of 4th segment is figured, fig. 207). On dostal aurface, tergiten have a covering of mealem and also bear long; seattered mpines. One such apine (fig. 108) eonsieta of a contral aeta murrounded by a mosthy basel part of which is expanded on each elde. Scale-setae are present on lower edge of lateral boxdere of segmenta. Scale portion of one of these scalometae (fig. 109) is broad and unb-triengular with it. pidem curved out and ite apex sharply pointed. Reretorodis. Firat leg (fig, 110):- Caxpos and propodow are troadened dormo-rentrailys as a result, lover border of cerpon is cusved outrards and mopolon is oval in outlinis. Noat of apinee on leg conaiat of a moath containing a centrel meta. In all but one of the large mpines on under surface, apex of sheath la divided into 3 or 4 pointin. The apine mituated nearest distal and of carpo (fige 111) diffors in having itw heath divided into a greater number of points, at leaft 12 altogethery these are placed mymatrically on each stde of its
central sets. Spines on under surface of meros and carpos are too scattered to appear as a brush. Spatrulate scales occur on under surface of carpos, near its diatal end, and an area on anterior surface above them is covered with long setae. Short simple spines are present along proxiral part of under surface of propodos. Anterior surface of carpos; (with exception of setose area), and that of propodos exbibit a covering of large, projecting; backwardly-sloping acales. A smiller area of such scales occurs on under surface of moros. Dactylos bears several long setae, and ends in a broad termanal claw; below which is a much narrower accessory claw.

Carpos and propodos of 2 nd leg are less markediy broadened than those of lot lege In 3xd to 7th legs these articles are narrower, and their uppor and lower borders are not curved. The molti-pointed apina, spatulate scales and area of setae at distal end of carpos, and the simple apines on under suzface of propodos, are not repeated on 2na to 7th legs. Areas covered by large bachaardy-bloping scalas occur on meros, carpos and propodos of 2nd leg and on carpos of 3xd leg, but are absent From 4th to 7th legs.
 Its two ducta romain aeparate and opan under a flap on its dorsal surface.

Pleon. Length (along midmine): 1.50 mmog breadth (across 3xd eegment): 1.65 mm . ploon is abruptis narrover than percion. Pleura of 3xd to 5th segments are very amall, acute, and produced backuarde; they are vieible in doreal view (see Iige 112). Terminal eegnent (fig. 112) is triangular with its interal borders not incurved and its apex hluntily rounded. Surface of pleon ds mooth. Fergites
bear acales and pine 14180 those on poreton, but do not hsye acalemetae on their lateral borders.

Mleopeds. Firwt pleopod (ilg. 123):- Outer side of protopodite is produced to Lorm a Large oval lobe. Eropodite is sub-triangular with its apar aharply rounded and its outar border shallowiy indented; its anterior bozder expibits a fold near outer angle. Endopodite is club-shaped utit its distal third bent outwards. Its bamal half is broad and provided with conspicious obilque masoles. Dorsel aurface of endopodite extibite irregular ridees, some of which are ornamented uth scales and setac. A broad, oval, chitinous thickaning is formed on both inner and outer boxder of diatal third. Ajex of endopodite (fig. 134) is Lolded and ixregular in ohape, with its innor angle rounded and ite outer angle acoute. It corwal surface ia raimed into papdiate processes. On ventral surfaca, inner side of apar in rounded and papillate, while ita outer side form a trapazoidal lobe which, due to folding of endopoaite, liea ventral to the rounded inner part. Ventral auxface of this outer lobe axhitiots ridges but iacies papiliaes posterior border of lobe beare a you of apines.

Second pleopot (fig. 115) im Exopodite is triangular with ita apex sharply roumded and its outer border almost atraight. Comb-iske groups of estae are present down its innor border and on ringes noar border. A fow apinea occur on outer border near apor. Endopodite is blarticulate; length of articleas 1 14t 0.43 mmoj 2nd 0.93 cme First article is quadrangular in outline and has a rounded triangular lobe on ita vontral murface. Sacond article is atyliformy there is a broad chitianous thickening on inner border of its basal 3/4, bejond which
endopodite becomos very narrow and flageliliorm. Length of flagelifionm portion: 0.25 ,

Third pleopods- Inner posterior comer of protopodite is produced backnards as a long, nariou lobe. Eropodite is wub-quadrangular Whth ita apical angle aharply rounded and itw posterior boriter almont straight. Comb-ilke groups of setse occur on, and near, inner borier and there are a few spinea on postorior border.

Fourth pleopodi- Lobe on protopodite is zuch ahorter than in 3xd pleopod. Exopodite is mub-quadrangular.

Fufth pleopod:- Lobe on protopodite in very small. Exopodite is sub-triangular with 1ts apex sharply rounded. Comb-1ike groups of setae are present along both lateral borders and also oocur In a band across dorwal ourface near apex. There are a few apines on outer border.

Uropod (fig. 112). Protopodite extends beyond apex of terminal segnent for about $1 / 5$ of its own lengths there is a Iongitudinal groove down ite outer surface. Insertion of endopodite is anterior to that of exppodite; distance separating insertions of expyodite and endopodite: 0.25 nime Both rami are conicai, both bear scattered apines and have a terminal tuft of long setae. There is a longitudinal groove down outer surface of exopodite/another doun inner surface of ondopodite. Greatest length of protopodite: 0.55 mmoj length of rand: exopodite 0.98 mang endopodite 0.52 men

[^0]Porelopodias - Carpos and propodos of lst and 2nd lege are not broadened dorso-pentralif. On lat leg (Eig. 116) the miltipointed apine, spetulate scales and area of setae at distal ond of carpos, and the simple spines on under eurface of propodos, are present as in lat leg of male, but there ax no areas of large projecting mealea on meros, carpos and propodos, Suct scalos are also abment from and and 3rd logy.

First pleopod (fige 117):- Exopodite is mub-taiangular uith its outer boriar shallouly indented, although indontation is more pronouneed than in lat exopodito of mele, and its apex sharply roundeds its anterior border arhibita a fold near outer angle. Endopodite is not developed.

Sacond pleopod (9ig. 118) im Eropodite in triangular with 1te outer border straight and its apex more bluntly rounded than that of 2nd exopodite of male. There are conb-1ike groups of setae on its inner margin, and a few spines on ite outer: margin. a rounded, sub-triangular lobe, projecting back from inner posterior corner of protopodite, posaibly represents an endopodite.

Thiri and fourth pleopodat- Apices of exopodites are more bluntily rounded than in corresponising pieopods of male.

## Habitat.

Type locality:- Thais description is based on specimens found among plant debris and under loge and stones lying on the ground between aitituces of approximately $2,700-4,100$ feet on Mt. Wellingtone. Enaples vere collected on the following datens- 25th Kiny, 1956, 31 specimens; 17th Ootober, 1956, 6 apecimensy 22nd October, 1956, 8 epecimen

28th Nay, 1957, 20 apocimens. A total of 23 males and 42 forrales was present in the collection.

Other localities:- Other apeoimens vere found in debris and under logs in a forest of eucalypts and treeferns at inarraleah,

## Yaxiations.

The intansity of brom piementation varlen; wo: that in some apecimens the backeround colour of the dorsal surface is almost uniformly dark.

Some apecimens exhibit orange-broun pignentation which replace the true brow on the dorval murface completely, or everywere except for the dark brom band on pereion and pleon, or only on the opimera of pereion and ploura of pleon.

## Remarke.

Thommon (1893, pp. 54-55, pl. 1, fig. 6-19) describes apecimens collected on the slopes of Mit. Wellington and assigns them to oniscus runctatin Thomson 1879, a apeciat established on material From Dunedin, New Zealand. Chilton (1901, pp. 134-135) notes that thase Tasmanian apecimons differ from Hew Zoaland epocimons of g. punctature In having the 3xd to 5th pleura of the pleon much mallers and suggeats that the former mould perhaps be placed in Philoscia latreille 1804. Thomson (1893, p. 55, pi, 1, Ilg. 9) desoribes and Plgures the inner lobe of the ist marilin in 0 . punctatin as ending in 5 teoth. I think he wust be mistaken here as it is ucual in the oniccoicea for this atructure to bear setome procesmes instead. With this charactor excluded, Thomson's (1893) description itself might be based on examplas
of ang one of the four species belonging to Plymoshilosels which I have collected in tasmania. Hovever his opecimons can be identified by the localitys as one of these speciea is common on Mt. Wellington while none of the other three bas been found there at all.

Budde-lund (1908; p. 296) places 0. punctatue Thomson in a now gemus, Phalloniscus. $\%$ opecimens from Mt. Wellington are excluded aven from this gemus, according to the generie diagnosis given by Bowley (1935, p. 49), In having the pleon abruptly narrower than the pereion. Their distinction from Thomsonls Hew Zealand apecimens of Q. punctatur ( $=$ Bhoiloniscus punctatus (Thomson)) is therefore confimmed. As the name Onlscus prnctathe Thomson 1893 is a homonym of Oniscus minctatus Thomson 1879, the specific name punctatus can not be retained by the Tasmanian specimens. I therefore establish a new species, based on my apecimens from Nt. Wellingtons which replaces Q. punctatug Thomon 1893, and name this species Plymophilosetia thomsoni after the author of the latter.

## plypophitosgis thomsonit nosp.

Fig. 101. Diatal part of loft mandible, doraal view.
Fig. 102. Distal part of might mandible, dorsal view.
Fig. 103. Distal part of outer lobe of left lat maxilla, ventral viev.

Fig. 104. Distal part of left 2nd maxdlla, vential view.
Fig. 105. Distal part of right madilifod, ventral view.
Pig. 106. Left apimera of 3rd to 5th segnents of pereion, dorso-lateral viev.

Fig. 107. Right epimeron of 4th segment of pereion, dorsal vieu, showing gland pores.

Fig. 108. Spine on posterior border of lat segment of pereion, dorsal view.

Fig. 109. Scalo-seta on lateral border of lat segnent of pereion, doreal view.


## Plymophiloscin thomsoni nosp.

Fig. 110. Diatal part of left lst leg of male, anterior view.
Fig. 111. Distal part of apine on under surface, nearest distal end of carpos, of left lot leg of male, anterior view.

Fig. 112. Fourth, 5th and terminal segments of pleon and uropods, dorsal vieu.

Fig. 113. Right lst pleopod of male, dorsal view.
Fig. 114. Distal part of endopodite of right lat pleopod of male, ventral view. (Position of papillae on dorsal murface is Indicated by dots).

Fig. 115. Right 2nd pleopod of male, ventral view.
Fig. 116. Distal part of left lat leg of female, anterior view.
Fig. 117. Right lat pleopod of female, ventral view.
Fig. 118. Right 2nd pleopod of female, ventral view.


## Plypophiloseis tasmanientis nolp. <br> (Fig8. 119-124).

## Mole.

Length of largest apocimen: 6.3 men 3 breadths 3.0 me.
Colour. In live speciman, background colour of doxwal surface is a medium brown except for 3 bande of dark brown on pereion, oxe in madilne and one on each alde above batem of epiresty and for a band of daric brown on each uide of ploon. Buoh dark band on poreion 1s marked by a row of unpigmented patehes. Large unpignonted patchos on epimara together form another row of apota dova each side of perrion. Cephalion and axwas between dark bands on pereion are mottiod wath irregular unpigmented patches. There is a row of meall unpigmented phetches down adimine of pleon, with other apote on each side of it. Cepholog, Surface of vertex is arooth. Frontal inn is not developed acrose midde of cephalon, but at the sides it is ovident as a ridge in front of aach eys. Supxantennal line in preant. Antennery tubereles are amil, not pisible in doreal viev. Hyes are oval, compound, each composed of 19 ocelli.

EArat antonna. Triarticulates $3 x a^{3}$ articlo is conical and has several coarme wotae on its inner murface and 2 long; courwe sotac on ita apari.

Sacond antrma. Iongth of pedunclet 3.12 mmol longth of 5th article of paduncle: 1.17 mmos length of articlem of flagelluma
 antenn, a groove extende elong longth of 3xi to 5 th article of peduncle
and all articles of slagellume on distal broder of each of and to 5th articles of peduncle there is a large apine, formed of a central seta and an outor shoath which is apist near the end into several points. All articles of antenna bear rows of shorter apines. Third articlo of flagelivin onde in a long process formed of partly fused setae.

Mandibles. Left mandiblet- Incisor process consists of a large tooth with a smilier simple tooth above it and commected to it bs a ridge. Jacinta mobilis ends in 3 teeth. Behind lacinia mobilis is a lobe densely covered with simple setae and bearing 2 pencils of setae. One other pencil occurs behind lobe. Molar portion is represented by a turit of plumose setae set on a common basal procese. Right mandible:Incisor process consists of a large bifid tooth uith 2 simple teeth altuatod above 1t. Apex of laciaia mobilis has a pointed process on each elde with uneven ridgea between the two processes. There is one pencil of setae on setome lobe and one pencil bebind lobe. Molar portion is like that of loft mandible.
girat maxilis. Outer lobe ends in 10 teeth forming an outer group of 4 aimple teeth and an inner group of 6 teeth, of which the 5th is admple and the rest are bipid. On ventral surface there are 2 spines near base of 4th simple tooth. Outer borier of lobe ls bent out In a curve; apar of curve and margin aistal to it bear groups of setae. Inner lobe bears 2 thick setose processes. Aper of lobe is rounded; there is a amall spine on its outer side.

Socond maxi11a. Apex of maxilia is divided into 2 sub-rectangula
lobes. Base of inner lobe is derined by a auture line. Apex of imer lobe has a dame covering of setae; that of outer lobe, except for a
clear area in inner apicial corner, is covered uth finer setae. Three coaree setae project into notch between lober.

Maxi11iped (figo 119). Mpipodite ia long and narrow but shorter than basisi its apex is sub-acute. Scattered apinee occur on ventral murface of basie. Outer side of basis is produced beyond bace of ondopodite to form a rounded lobe bearing conb-like groups of setac on Its margin. Iechion is only articie of endopodite which is distinct; thore are 2 very long apines on its ventral surface. Division of remainder of endopodite into 2 articles is indicated by an indistinct suture line. There are 2 groupe of setae on inner border of firet of these articless basal wet consist of one large and ono amaller wota, distal set of one large seta and 6 or 7 mallor netas. Three betae oceur aingly on outer border of endopodito, one on lat article, situated near bate of a paneil which itmelf lack setae, and 2 on 2nd article. Apax of erdopodite ends in a tuft of netae. Endite is sub-quadzangular and has a transverse indentation in ventral murface noar its apex. There is a epine on inner side of endite bohind this indentation. Two arail teeth are present on outer apical corner. A manll conical procese, bearing a fow coaree setae, is set in an indentation in dornal aurface, near inner aptical cornar. Aplical region of endite bears very short, scattered setae.

Peraion. First epimera axe rounded anterioriy and scarcely produced formaris. Pouterior borders of let to fth segment are almost straight; ponterior angles of lst to 3rd segmenta are bluntiy rounded, those of 4th segment axe right-angled and rounded. Epimera of 5th to 7th segments are directed beckunde and their posterior anglea are
sub-acute. Seventh perelal epimera do not axtend baok bejond 4th segrent of pleon.

Dorsal surface of pereion to smooth except for a longtindinal groove near latoral border of each eptmeron. Humber of gland pores oponing into each groove 11 es between 13 and 23. Pores are more numerous in anterior third, fewer in middle third, and absent from posterior thind of groove. There is a row of apines above innor edge of groove. (Epimeron of 4th segment is IIgured, Pier 220). On dorsal surfaco, tergites have a covering of scales and also bear scattered spines. Ono such apine consists of a central seta surrounded by a sheath, basal part of uhich is expanded on each side. Scale-setae are present on lower edge of lateral borders of segments. Scale part of one of these seale-setae is broad and aub-triangular with its sides curved out and its apex sharply pointed.

Reretopodg. Fixitleg (fig. 121):- Carpos and propodos are broadened dorso-ventralif; as a result, lower border of carpos is curved outwards and propodos is oval in outline, lost of spines on leg are each formed of an outer sheath surrounding a central seta. In all but one of the large spines on under surface of leg, apox of sheath is divided into 3 or 4 points. The spine situated nearest diatal ond of carpos diffors in having its sheath dirided into a greator number of points, at least 12 altogether, which are arranged symmentrically on each side of its central seta. Spines on under surface of meros and carpos are too scattered to appear as a brush. Spatulate acales occur on under surface of carpos, near its distal ond; an area on antorior surface above them is covered with long setae. Single spines are
present elong proximal part of under surface of propodos. Anterior surface of carpos, (with exception of setose area), and that of propodos posisess a covering of large, projecting, backwardly-sloping scales. A mmaller aros of muth scales occurs on under surface of meros. Dactylos bears several long setae and ends in a broad terminal claw, below which is a much narrower accessozy clav.

Carpos and propodos/2nd leg are moadened, but to a lesser degree than those of let leg. In 3rd to 7th legs these articles are narrower and their upper and lower borders are not curved. The unilti-pointed apine, spatulate scales and area of betae at distal end of carpos, and the simple spines on under surface of propodos, are not repaated on 2nd to 7th legs. Large, backwardly-sloping acales are present on meros, carpos and propodos of 2nd leg and on carpos of 3xd leg but are absent from 4th to 7th lega.

Male organ: Concial in outiine with its apex sub-acute. Its two ducta remain separate and open under a flap on its dorsal aurface.
 3rd segmant) 1.65 mme Pleon is abruptiy narrovar than pereion. Pleura of 3nd to 5th segments are very maill, acute, and produced backwardss they are viaible in doreal vieve Terminal segment is triangular with its lateral boriers not incurved and its aper bluntis rounded. Dorsal surface of pleon is smooth. Tergites bear scales and spines like those on pereion, but do not base scale-setas along their lateral borders.

Ploppods. First pleopod (fig. 122):- Outer aide of protopodite is produced to form a large oval lobe. Expopodite is

Bub-quadrangular; ita outer border boing bent caiturais in a blunt curvey ita apical angle ia bluntly rounded; its anterior border exiribits a fold near outor angle. Inner anterior angle of axopodite is marizediy produced forwards to form a bluntif rounded lobe. Endopodite is club-shaped with its distal third bent outuards. Its basal half is troad and provided with conspicuous oblique muscles. Dorsal burfaco of endopodite exhibita irregular ridges, some of which are ornamented with setae. There is a broad, oval, chitinous thicisening on both imer and outer berder of distal third. Apex of endopodito (ife 123) ends in a sharp, curved point whioh is miged on its veatral urface, ancl ornamented with conical processes on its dorsal euriaces there is a yow of sionder apdnes along ita incurved innor margin. on outor ade of dorsal surface, below base of the curved aphcal point, there is an outivardiy-directed perotaberance which in denmely and completely covered with conioal processis oi vaiying longthe.

Secona pleopodt- Exopodito ie aub-triangular with its outer border atraight and its apox sharpiy rounded. Comb-ilike groups of netae are present doum its inner border and on ridges noar border. There are 2. Lev apines on outer boxier near apaci. Endopodite is biarticilates length of articleat lat 0.40 mm and 1.10 mm . First article is quadrangular in outline and has a rounded trianguiar jobe on its ventral surface. Second article is atyliforay there la a kroad ohitinous thickening on inner border of ite bacel $3 / 4$, beyond which endopodite becones very namrow and flagelliform. Length of flageliliform portiont 0.20 nm.

Third pleopods- Inmer postertor comer of protopodite is produced backarcis as a long, narrow lobe. Rropodito is mub-quadrangular
with ita apical angle sharply rounded and its posterior border atraight. Comb-1ike groupe of aetae are present on and near inner bonder. There are a fer spdnes on posterior border.

Fourth pleopodi- Lobe on protopodite is much ahorter than in 3xd pleopod. Empodite is nub-quadrangular.

Fifth pleopodi- Lobe on protopodite is very small. Expopaite is wab-triangular uth ita apex sharply rounded. Comb-1ike groupe of setae are present on both lateral borders and there is a band of such setae across dormal murface near apex. A few apines occur on outer border.

Uropad. Protopodite extonds boyond aper of terminal megment for about $1 / 5$ of its ovn leagthy there is a longitudinal groove down its outer surface. Insertion of endopodite is anterior to that of exopodites distance sepazating insertions of exopodite and andopodites 0.16 man. Both rami are conical, both bear apines and have a terminal tuft of long setae. There is a longitudinal groove down outer surface of exppodite and another down inner aurface of endopodite. Greatest length of protopodite: 0.55 mme . length of zamis exopodite 0.88 mme , ondopodite 0.51 घm.

## Temale.

Length of largest specimani 7.8 mos breadths 3.5 mero
Female differs from male in the following atructureat-Perelopodst- Caxpos and propodos of lat and 2nd lege arenot broadened dorso-ventraliy. On lat leg, milti-pointed apine, apatulate scales and area of setme at distal ond of carpos, and aimple apinee on
under surface of propodos, are present as in lat leg of male, but there are no areas of large backwardly-sloping scalea on neros, carpos and propodos. Such scales are also absent from 2nd and 3xd legs. First pleopod (1ig. 124) i- Eropodite is sub-triangular pith Ite outer boxder very slightiy incuxved and its apex rather Muntiy rounded; ita anterior border exhibits a fold near outer angle. Endopodite is not developed.

Second pileopod:- Exopodite ls subwtripngular with its outer border atraight and its apes more bluntiy rounded than that of and exopodite of male. There are comb-like groups of setae on its inner border and a few spines on its outer border. A rounded, sub-triangular lobe, projecting back from inner posterior comer of protopodite, possibly represents an endopodite.

Thind and fourth pleopodst- Apices of exopodites are nore bluntly rounded than in corresponding ploopods of male.

## Habqtat.

Type localitry- This description is based on specimens collected on 25th March, 1957, from among debria Lying on ledges of a cliff above high tide level on the shore at Tinderbox; 24 males and 24 females vere obtained.

Other localitiens-: Specimens were also found under stones on a danp hillaide densely covered with dogwood, on 12t, Dromedary.

## Yaxiations.

In some specimens From Tinderbox, the true brown plementation on the dorsal surface is replaced ty orange-brow on the epimera of
pereion, and ovor all of the pleon except for the band of dariz broun on cach side. In ofher specinons, the background colour of the ciorsal surface is craplotoly orange-brown ascept for a broad band of dariz brown doun midile of body.

In one male specimen from Tinderbox, carpos and propodos of 1at and 2nd legs are racadened as in othor male specinens, but there are no areas of large, baciarardy-aloping acales on lat to 3xd legs.

## Plymophiloscia tasmaniengis nosp.

Fig. 119. Distal part of left mardiliped, ventral view.
Fig. 120. Right epimeron of 4 th segrent of pereion, dorsal view, showing gland pores.

Fig. 121. Diatal part of left lat leg of male, anterior view,
Fig. 122. Right lat. pleopod of male, dorsal view.
Fig. 123. Distal part of endopodite of laft let pleopod of male, ventral view.

Fig. 124. Right lst pleopod of femsle, ventral view.


## Plynophiloscia notierensis n.sp. (Figs. 125-131).

Male.
Lengith of largeot speciment $7.1 \mathrm{mm}$. Breadth 3.5 mm
Colour. In live specimen, background colour of cephaion and pereion is a medium brown with 3 longitudinal bands of daris frown on pereion, one in nidilino and one on onch oide above bases of epineras bactground colour of pleon is dark lurow. Each darls band on pereion Ls marked by a row of large, unplgmonted patches, and othor patches on epinora fogether form anotior rou of apots down each side of peroion. Cephalon and areas between daris bands on pereion are motiled uith irregular unpigmented parches. There is a row of small unpipmantod patchos down midmine of pleon, with a few othor apote on each side of 2t.

Cephalon. Surface of vertex is smooth. Frontal lino is not developed across midile of cephaion, but it is evident at tho sides as a aidge in iront of each eye. Suppamantemal 1 ins is prescnt. Antonnary tubercies are mail, not visible in dorsal viewe Eyes are oval, compound, ach composed of 19-21 ocel14.

Firat antonns: nriarticulatos 3xd axtlole is confcal and has several coarse setae on its inner surface and 2 long, coarse sotac on its aper.

Second antonna. Length of peduncles $3.07 \mathrm{~mm} . \mathrm{S}_{\text {I }}$ Iength of 5th article of pectunclet 1.17 wins length of articles of Plagellum
 antonns a groove extende along length of 3xd to 5th articles of peduncio
and all articles of flagellume on distal border of each of hai to 5th article of peduncle there la a large spine formed of a central seta and an outer mheath, epilit at the end into several points. All articies of antenna bear rowe of shorter mpans. Third article of flagellum endia in a long procoss formed of partiy fused wetae.

Kendibleas. Left mandibles- Incisor process consiets of a large bifid tooth with a smoller aimple tooth situated above it. Lacinia mobilis has a dense covering of simple wetae and also bears 2 pencils of setaes one other pencil occurs bohind 10be. Molar portion is repreaented by aituft of plumose metae set on a common basal processe. Rlght mandiblet- Incisor process conaiste of a large bifid tooth with 2 smaller aimple teath situated above it. Apex of lacinia mobilie has a pointed process on each side, and uneven ridges between the two proceases. Setore lobe bears one pencil of setae and there is one other pencil behind lobe. Eslar porition an like that of left mapashle.

Pirst maxilia. Outer lobe ende in 10 teeth forming an outer group of 4 large bifid teeth and an inner group of 6 teeth, of which the 5th in aimple and rest are bifid. On ventral surface there are 2 apines near base of 4th simple tooth. Outer margin of lobe is bent out in a curve; curved portion, together with margin distal to 1t, is fringed with groupe of setae. Inner Lobe beari 2 thick setose processes; there is a spiac on outer apical comar of lobe.

## Second maxills. Apex of maxilla is divided into 2 anb-

 rectangular lobes. Base of inner lobe is defined hy a suture line. Distal region of inner lobe has a dense covering of setaes that of outer lobe, with exception of a clear area in imer apical angle, has a apariercovoring of shorter setac. Thwee coarse setas project into notoh between loles.

Ifoniliped (2ig. 125). Epipodito 20 lone and narrow but ohorter than basiag its aper is sub-acute. Scatierce apinom occur on ventral suriace of basis. Outor side of basis is mroduced boyond base of endopadito to sorn a roundod lobe ulitich bears comb-lifice groupa of setae on its rarein. Ischion is onisy artizalo or endopocisto rhich is aistincts there are 2 very long spanes on its ventral surface. Diviaion of remalnder of ondopodite into 2 articios is indicatod by a faint suture 2ine. Thaze are 2 groups of sotae on innor border of first of those articles basal sot conoists of one largo and one scaller soća, diatal sot of one large sota and 6057 onalier cotac. Three actae occur singly on outer borlor os cndopodite, one on let article, placed noar base of a pencil which ifself lacks sotac, and 2 on 2 nd article. Apex of endopodite onde in a tuft of setac. Enciato is sub-yuadrangular and has a transporse indentation across its ventral surface near apex. There is a spine on insor side of endito behind this indontacion. Two small teoth occur on outor apical corner. A small conical process, bearing a few coarse sotae, is set in as indontation in dorsal suriace near inaer apical comor. Agical rection of onaito bears very short, gattersd setae.

Eexetion. First epinera aro rounded antoriorisy and only



 segrontsare Eigared, Elg. 126). Epimora of 5th to 7th sogronts ase
more markediy directed beckwards with thair postorior angles sub-acute. Seventh peroial epimera do not extend back beyond 4 th segrent of ploon.

Doreal surface of poreion is anooth except for a longtudinal groove near lateral boxder of each epimeron. Number of gland porea opening into each groove lies batween 23 and 32. Pores are nore mumorous in anterior half, fevar in third quarter, and absent from posterior quarter of groove. There is a row of apines above imer odge of groove. (Epimeron of fth segnant of pereion is figured, fig. 127). On dortal surface, tergites have a covering of scalem and also bear ucattered apinal. One of these spines conista of a central scta surrounded by a maeth, basel part of which is expanded on esch side. Scalo-setae are present on lower edge of lateral borderw of segnents. Scale part of one of these mealemetae is broad and mub-triangular; with sides curved out and aper marply pointed.

Perefopode. First leg (figo 128) i- Carpou la broadoned dormo-ventrally wo that ita lower border in curved outmarile. Propodios In not broadoned; 1 ta upper and lower bordere are almoat ntraight. Nont of spines on log each consist of an outer sheath and a central seta. In all but one of the large apinea along under surface of log, apex of sheath is divided into 4 points. Spine nearest distal end of aarpos differs in having its sheath divided into a ereator number of pointa, at least 14 altogether, which are arringed aymotricilly on each side of its contral seta. Spines on under surface of meros and carpos are too scattered to appoar as a brumh. Spatulate scales occur on under aurface of carpon, near ite distal end, and an area on anterior aurface above then is covered uith long sotae. Simple spinea occur on proximal
part of under wurface of propodos. Anterior murface of carpos, (with exception of setose area), and that of propodos, exhibit a covering of large, profocting, beckardly-aloping wenles. A mailler area of auch scales accurs on unior surface of meros. Dectolow baers actoral long setac, and onds in a beoad terminal claw with a much nerrower aceossoxy clav below it.

Caxpos of and log in only ulightiy beoedened dorsomentraliy. In 3rd to 7th legs, earpos is not treadened, henoe its upper and lower boriory are not curvod. The miltimpointed apine, apotuilate sealen and aiee of setae at distal end of carpos, and the almple aptnes on under surface of propodios, are not ropeated on 2nd to 7th lege. Areas of large, backnardiy-aloping seales occur on merow, carpos and propados of 2nd leg and on carpon of 3nd leg, but are abeent from 4th to 7th legr.

Kale organ. Concial in outiine with its apex wherente. Ite two duets remein dietinct and opon under a Elap on its doriwal surfince.

Pleon. Length (along mdd-1ine): 1.70 mens treadth (across 3xd segnent): 1.80 mons. Pleon is abruptiy parrover than pereion. Pleura of 3rd to 5th segments are very amil, acute, and produced beohnariay they are viaible in dormal view. Fersinal segnont is triangular with its intoxal borders not incurved and itm apace bluntly zounded. Dormi purfece of pleon is amooth. Tergiten bear woalen and apina: lilice thome on pereion, but accilo-metae axe not present along thalr Iateral borders.

Pleopods. Finat pleopod (ilge 129) i- Outer alde of protopodite is produced to form a large oval lobe. Hropodite in
mub-tifangular with its outer berder whallowiy inourved and its aper bluntis rounded; its anterior bosder exhibita a fold nasir outer angie. One or 2 apinew occur on euter border near aper. Fndopodite is club-shaped, with its distal bessier third tapering and bent outwardy. Basal hale is provided with conspicuoum oblique macles. Dormal surface of ondopodite is raised into ridgsing wome of which are omamanted with scales or metae. There is a long, spindle-mhaped, ohitinous thicceening on both inner and outer border of dietel third. Apex of ondopodite (fig. 230) endik in a sharply-pointed; triangular lobe which is bent outwarde at an angle to reat of diatal third. Inner border of this lobe is curved out and beers a rou of apines. Veatral ourface of lobe is raised inte ridges, wile its dorwal surface is omamented with papiliato processen; no papiliae are visible in ventral view of endopodite.

Second pleopodi- Exopodite is aub-triangular with its outer border slightiy incurved and its apar rather elongatad posterioriy and wharply sounded. Conb-14ke groups of setae are present down inner boxder and on midges near bozdor. There are e few apinen on outer borier near apex. Fndopfitite is biarticulates longth of artiolent lst 0.34 man's 2nd 0.98 mas. Firwt article is quadrangular in outiline and has a rounded triangular jobe on its ventral surface. Second article is atyliform there is a chitinous thickening on innor border of its basal $3 / 4$, beyond which endopodite becomen very mirou and glagelifform. Length of fingelliform portiont 0.23 .

Third ploopod:- Inner posterior comer of protopodite is produced to forit a longs, narrow lobe. Exopodite is mb-quadrangular

Wth its posterior boider allghtly incurved and its apicill angle sharpily rounded. Comb-11ke groups of setae occur on and near inner border, and there are a fow spines on posterior border.

Fourth pleopodi- Lobe on protopodite is much shorter than in 3xi pleopod. Bropodite is sub-quadrangular.

Fifth pleopodi- lobe on protopodite is very mall. Exopodito is sub-triangular uith its apex sharply rounded. Comionlike groups of eetee occur on both lateral borders and also form a band of setae across dorwal surfice near apace "There are a fow spines on outer border.

Unopod. Protopodite extends beyond apex of terminal segnent for about $1 / 5$ of its own leagth; there is longituainal groove down it outer surface. Insertion of empopodite is anterior to that of exopodite; distance separating insertions of exopodite and endopodites 0.15 mm . Both rami are conical, both bear scattered mpines and end in a turt of long aetme. There is a longitudinal groove dom outer surface of exopodite and another down inner surface of endopodite. Greatest length of protopodite: 0.55 mone 5 length of rand exopodite 1.02 mmon endopodite 0.54 mis.

## Female.

Length of largest apeciment 10.0 mmos breadth: 4.8 mm . Pemale differs from male in the following atructuresi-

Perelopode:- Carpos of lat and 2nd legs is not broadened dormo-ventrally. On lat leg, milit-pointed apine, apatulate scales and area of setae at distal end of carpos, and simple spines on propodos, are present as in lat leg of male, but thore are no areas of large
backwardiy-sloping scales on meros, carpos and propodon. Such ecsies are also absent from 2nd and 3xd legs.

Pirst pleopod (fig. 131)i- Eropodito is gub-triangular with its outer border shaliowiy incurved, although the invari ourvature is more pronounced than in lat excopodite of male, and its apex sharply rounded. It anterior border arhibita a fold near outer angle. one or 2 mines occur on outer border near apex. Endopodite is not developed.

Second pleopodi- Exopodite is sub-triangular with its outer border almont atraight and its apar more bluntiy rounded than that of 2nd exopodite of male. Comb-like groups of sêtae occur along its Inner boxder and thare are a fow apines on outer border near apex. A aub-triangular lobe, projecting back from inner posterior comer of protopodito, possibin represents an endopodite.

Thind and fourth pleopodes- Postorior borders of ecopodites are almost atraicht and thair aplical angles are more binntly rornded than those of corremponding exopodites of male.

## Habstat.

2xpe Loon2tyt - This deccription is based on apecimens found under stones and among fallen leaves, montly of eucalypt and dogrood, on a damp hillaide at Notley Corge, went of the Jamar Piver. Specimens vere collected on the following datest- 26th Ky, 1956, 4 males, 3 females; 26th December, 1956, 3 femaleas 16th June, 1957, 1 mio, 5 Cemaless 9th August, 1957, 42 males, 57 Yemales.

Other localitiess- Other apecimans were found anong damp
Pallen leaver axound the base of a eucalypt at Prompect, near Launceston.

## Fariations.

The intenaity of pigmentation varies so that in some apecimens the background colour of the dormal surface in almost uniformy dark. In some specimene the true brown coloration on the dermal surface is replaced by orango-broten on the opimera of the pereion and the ploum and termanal segment of the ploon. In other. the background colour of the doreal anrface is entirely orangembrow.

## Plymophiogcia notioxensis nosp.

Fig. 125. Distal part of right maxilliped, ventral vien.Fig. 126. Laft epimers of 3xd to 5th segments of pereion,dorsomateral view.Fig. 127. Left epimeron of 4th segment of pereion, dorsalview, showing gland pores.
Fig. 128. Distal part of left lat leg of male, anterior view.
Fig. 129. Bight lst pleopod of male, dorsal view.
Fig. 130. Distal part of endopodite of right list pleopod ofmale, ventral view (Position of papillas on dorsalsurface is indicated by dote).
Fig. 131. Alght lst pleopod of female, ventral view.


## pryophilosof ulveratonensis B.sp.

(Figs. 132-139).

## yele.

Length of largest apecimant 6.6 mm ; breadthi 3.1 ma .
Colour. Background colour of dormal surface in live animal 1a light brown except for 3 longitudinal bands of dark brown on pereiong one in mdi-line and one on each side above baser of opimert, and for a bend of dark brown os each slde of pleon. Dark band down mid-line of poreion is mariced by mall unplgmented patchem. Thore is a line of largor unpigmonted patchen dom sach of the two lateral dark banda, and othor larger patebes on epsearm together form another row of apote down cach aide of pereion. Cephaion, arean between earik bands on porvion, and middie region of pleon, are mottied with irregular, unplgmented patehon.

Caphnion. Surfice of vertace is amooth. Frontal line ie not developed acroses aiddle of cophaion, but at the siden it is evidont as a ridge in front of each ege. Supremantennal lise is present. Antemary tubercles are small, not visible in dormal view. Hyes are oval, compound, each compomed of 19-22 ocelli.

Firat antarga. Triarticulatof 3xd axticle is conical and hat aeveral comree setae on its inner murface and 2 long, coarse setae on Its aper.

Second antenna. Length of pedunciet 3.85 man; length of 5th article of poduncle: 1.50 ming length of articlea of flagellums
 antenne, a longitudinal groove extends along longth of 3rd to 5th articles of peduncle and all articles of flageliun, on distal border of each
of and to 5th articies of peduncie there is a large apine formed of a contral seta and an outer sheath, spilt at the end into acyeral points. All articles of antema bear rows of ahorter apines. Third articie of flagelium onds in a long proceas formod of partify fused setae. Mandibles. Left mandiblet- Incisor process consists of a Inrgo bifia tooth with 2 simple teeth placed above it. Lacinit mobilia ond in 3 teeth. Iobe behind Iacinia mobilis has a dense coreming of simple setae and also bears 2 pencils of etec. One otber pencil occury bekind lobe. Solar portion is represented uy a tuft ef piunose setac set on a common bacal process. R1ght randiblet- Incisor process conslats of a large bifid ucoth with 2 aimple teetk sitrated above it. Apax of lacinia mobilis exhibite a pointed process on each cicie with unever zidges between the two procesacil. There is one pencil of setae on sctone loke and one poncil behind lobe. Nolar portion is 15ke that of left manablo.

First maxilla. Outer lobe ands in 10 ifeth forming an outer group of 4 simple teeth and inner group of 6 toeth, of which the 5th 18 aimple and the rost are bifld. On ventral surfacs there are 2 spines below base of 4th simple tooth. Outer border of lobe is curved outwardes curved portion and margin aistal to it are firinged with group of eetao Inner lobe bsars 2 thick actose processens thare is a short apine on its outer apical angle.

Second mandilax Apex of maxilla is divided into 2 subrectangular Lobes. Base of inner lobe is dofired if a suture 1100. Aptcel region of inner lobe bas a dense covering of setaes that of outer lobe, except for a clenr area in inaer apical angie, han a sparser
covering of finer aetae. Three long, coarse setae project into notch between lobet.

Maxdilipad (fig. 132). Epipodite is long and narrow but shorter than baiss its aperx is sub-acute. Short apinas occur on ventral aurface of basis. Outar side of basis ill produced boyond bame of endopodite to form a rounded lobe which bears comb-1ike groupe of aetae on ite margin. Ischson is only article of endopodite which is distincts there are 2 long spines on its ventral surface. Division of remainder of endopodite into 2 articles is indicated by a faint suture line. There are 2 groups of setae on inner border of firat of these articlet, basal set consiating of one large and one amaller seta, distal set of one large aete and 8-10 maller metae. Three long satae occur aingly on outer border of endopodite, one on 1at article, altumted moar bace of pencil which itmole Iacia setae, and 2 on $2 n d$ asticle. Apeax of endopodite ends in a tuft of setae. Endite is sub-quairangular. There is a transverme indentation across ita ventral nurface near apos. There is a spine on innor aide of exilite behind this indentation. Two emall teeth are present on outer apical comer. A mall conical process, bearing a fer coarse setae, is eet in an inner indentation in dorsal murface near/apical cornar. Apical region of ondite boars moderataly long, scattered sotae:

Perotion. Pirst opimora are rounded anterioriy and only sllghtiy produced fomands. Posterior borders of lat to 4th tergites are almost atraight; posterior anglea of lat to 3xd segmenta are bluntily rounded, those of 4th megnoat are xight-angled and rounded. Epimora of 5th to 7th segnents are alrected backwarde and thoir
posterior angles are bluntly pointed. Seventh epimera do not extend back boyond 4th segnont of ploon.

Dorsal surface of pereion is anooth except for a longitudimal groove nasar lateral border of each epmmeron. Number of gland pores oponing sato ach groove 1lem batween 3 and 6. Pores occupfy anterior thind of groove and are abaent from its posterior twombirds, There is a yow of apinee above inner edge of groove. (Epinorun of 4th tergite is 2igured, Iig. 133). Doreal suriace of tergites has a donse covering of scales and also beare scattered spinete. Ono such apine consists of a central seta and an outer shoath, basal part of which is expanded on gach side. Scale-setae oocur on lower edge of latoral borders of segments. Scale part of one such seta (fige 134) is aub-triangular, not espacially broad, and has its sides curved out and its apex sharply pointed.

Perecopody. Firut leg (fige 135):- Carpos and propodos are not broadened dorsomentraily, bence their upper and lower bordera are acarcely curved. Majority of spines on leg each consist of a central sota surrounded by an outer sheath. In all but one of large opines on under aurface of leg, apar of sheath is divided into 4 points. Spine neepest distal end of carpos differs in having its shoath divided Into a creater mumber of points, at least 8 altogethor, which are arranged symotricalif on each aide of lis central seta. Spincs on under surfice of neros and carpos are too scattered to appear as a bruako Iarge apatulate acales occur on under surface of cerpos, near its diatal ond, and there is an area covered by long actae on antorior surface above thems simple apines occur on under surface of proximal part of
propodos. Arcas of amaller, projecting, hyaline acales are present on under curface of meros, under and anterior auxfaces of carpos, and anterior surface of propodos; these apines slope allghtily formanda toverde distal and of article. Dactylos bears several long eotae, and onde in a broid terminal claw with a men narrower accessory claw below it.

Carpos and propodos of and and 3xd lege are not broedened dormo-ventrailly. voliti-pointed apine, upatulate scales and area of setae at aistal ond of carpos, and mimple apinos on under aurface of propodos, are not repented on 2nd to 7th legm. Areas covered by projecting hauline ecales occur on maros, carpos and propodom of 2 ni 10g, on meron and carpos of 3rd leg, and on meros of 4th leg, but are aboent from 5th to 7th legw.

Kheorrm. Condeal with ite apex mbeacute. Its two ducter reman distinct and open under a Rap on its doreal auriage.

Pleon. Langth (along mid-11ne): 1.60 mmof breadth (across 3rd segrent): 1.65 mas. Pleon ill abruptiy narrower then pwrelon. Pleura of 3xd to 5th megnente are very mall, acute and produced backuardy they are visible in dortal viev. Terminal segrant is triangular with it lateral borders not inourred and its aper forming an obtume angle. Dorsal surface of pleon bears moalen and aplnem like those on poreion, but scale-motae are not present on lateral, boxders of segmente.

Rleopode. Firet pleopod (fig. 136) i- Outer alde of peotopodite is produced to form a large oval lobe. Eropodite ia sub-triangular uth ita outer border deopif incurved and ite aper mub-acutes ite anterior border axhibitis a fold noar outer angle.

Findopodite is atyliform and curved outrards, and tapers evenly to a sharp apical point. Ita basel third is provided with conspicuous oblique maclel. Doraal surface of endopodite is ralsed into ridgess one ridge down centre in ornamented uith moalem. With exception of a small, inwardilydirected, chitinous point at its extreme tip, apical region (fige 137) is not bent at an angle to rest of distal third. There is an indentation in inner aurface, a little above apical point; a row or aphoas is aituated along this indented portion. Ventral marface of apical region is ridged; on dorsal surface there is a rou of papilinte procespes noar outer border. Ho papillae are fisible in ventral viow of endopodite.

Second pleopod (fige 138):- Eropodite is nub-triangular with its outer border mhallowis but diatinotiy incurred, and its apex markedly elongated posterioriy and sub-acute. Comb-like groups of setae are present on inner border and on ridceas noar border. There are a few apines on outer border near aper. Bndopodite is biarticulates Length of articleas Ist 0.36 mmog 2nd $1.32 \mathrm{~mm}_{\text {, First article }}$ is quadrangular in outilines there is a rounded triangular lobe on its ventral aurface. Second articie is atyiliforms there is a chitinous thickening down outer edge of its basal $2 / 3$, beyond watch article becomes very narrow and flagelliform. Length of flagolifiozm portions 0.43 mm

Third pleopod:- Inner posterior comer of protopodite is produced backuarde to Iorm a long, narrow lobe. Exopodite is sub-quadrangular cith its posterior border shallowiy but distinctily incurved and ita apical angle elongated posteriorly and aharply rounded.

Comb-like groups of setae are present on and near inner border, and spines occur along posterior border.

Pourth pleopod:- Lobe at inner posterior corner of protopodite is very short. Exopodite is eub-quadrangular.

Fifth pleopod:- Inner posterior corner of protopodite is ecarcely drawn out to form a lobe. Exopodite is sub-triangular with 1ts apex sub-acute. Comb-1ike groups of setas occur on both Lateral borders of exopodite and are also present on an area of ita dorsal surface near apex. There are a few apines on outer border.

Eropog. Frotopodite projects beyond apex of terminal segment for about $1 / 5$ of its oun length; there is a longitudinal groove donn ita outer surface. Insertion of endopodite is anterior to that of exopodite; distance separating insertions of exopodite and endopoditer 0.1 mm . Both raml are conical, both bear splnes and have a terminal turt of long setae. Thare is a longituainal groove down outer surface of exppodite and another down inner surface of endopodito. Greatest length of protopodstof 0.56 mmos length of ramit exopodite 1.00 mm 。 ondopodite 0.53 mm

## Female.

Length of largest specimen: 7.6 manos breadth: 3.6 mino
Female differs from male in the follouling structurent-
Pereiopodat- on lat leg, multi-pointed apine, large apatulate scales and area of setae at distal end of carpos, and alimple apines on under surface of propoios, are present as in lat leg of male, but there are no areas of smailer projecting, haline scales on meros, carpoa and propodos. Such scales are also absent from 2nd to 4th lega.

First pleopod (fig. 139):- Exopodite is mub-triangular with its outer border deeply incurved and its apecr sharply rounded; its anterior boxder exchibite a fold near outer angle. There are a feu apines in outer border near apeac. Endopodite is not developed.

Second pleopodi- Eropodite is sub-triangular uith its outer border slightily incuxved and its apex sharply rounded but mot maricediy elongated. Comb-1ike groupe of setae occur on ite Inner border and there are a fow mpines on its outer border. A rounded, sub-triangular lobe, projecting backwarde from inner posterior corner of protopodite, possibly represents an endopodito.

Third and fourth pleopodat- Bxopoditel have their posterior bosders only allghtiy incurved, and their apical anglea are leas elongated posterioriy and less sharply rounded than those of corremponding axopocisten of male.

## Habitat.

Eype locality:- This description is based on apecimens found under atones and among plant dobris on the ground irmodiately iniand Irom a beach at West Ulyerstone. Specimens were collected on the following datess- 30th May, 1956, 37 melow, 59 Leralans 26th Jamaxy, 1958, 25 mien, 53 femalen.

Other localltient- Other specimens wore found under trailing plants growing on a bank above the ehore at Roaring Beach, South Arw, in south-oastern Tasmania.

Vamiations. Background colour of domal surface in some specimens is a noderately darik brom, but the three bands on the poreion zemin distinotily darker. In some apocimens many of the
unpigmented patohe on the ilghter brown regions are confluent so that the unplgmented areas are very extensive: In some specimens the true brow pignentation of the dorsal surface is replaced by orangembroum on the eptimera of the pereion and on the pleura and apical part of the terminal segment of the pleon.

## Plymonhilosois ulverstonensis n.Ep.

Fig. 132. Distal part of left maxilliped, ventrel view.
Pig. 133. Rsetht opineroa of 4th segrent of pereion, dorsal view, showing glamd pores.

Fig. 134. Scalemata on Lateral border of lst segaent of pereion, dorsal view.

Fig. 135. Distal part of left lat leg of male, anterior view.
Fig. 136. Left lat pleopod of male, dorsal vieve
Fig. 137. Distal part of endopodite of left lst pleopod of mole, ventral viewo (Position of papillae on dorsal surface is indicated by dota).

Fig. 138. Left 2nd pleopod of male, venimal view.
Fig. 139. Left list pleopod of female, ventral view.


## Famis Rorcelliondiag.

The characters of the fanily are defined is Eaney (1953, p. 76) as followis-
"Iarge animals with compound eyes and psevdotrachoae. Epdimera very well developed and often expanded laterally and posterioriy. Flagellum always with two distinct wegments, head often with welldeveloped lateral and frontal lobes. Rami of the uropods usualiy visible from above, though the ondopodites may bo neariy totally concealed by the teleon, which is often strongly produced.- -i-. - -; the exopodites very different in shape from the endopodites. Anfmals adapted to live in drier conditions than the Onlscidae or Trichoniscidae."

## Gemus Porcellio Iatroille 1804.

The characters of the genus are defined hy Sars (1899, p. 176) as follows:-
"Body oval; more or less depressed, with the lateral parta lamellaris expanded. Cephaion partly ilanked by the sidompates of the lat segnent of mesosome, lateral lobos well devaloped, frontal lobe more or less projecting, and diatinctly defined from the epistome. Netasome not abruptiy contracted, epimeral plates of 3xd to 5th aegnents prominent and recurved; last segment conically produced. Eyes, as a rule, well developed, subdorsal. Antennas moderately slender, with the flagellum composed af 2 artioulations only. Oral parts normal: Lege gradually increasing in length posteriorly, last pair in inale sometime differing from that in female. Opercular plates of the 2 anterior pairs of pleopocia, and sometimas also of the 3 succeeding pairs, provided with distinct air-cavities. Copulative organs of male of a similar structure to that in oniscue. Uropoda distinctiy projecting, outer ramu lanceolate, inner much smaller, linear, and originating far in front of the former."

It is noted that Verhoeff (1917, p. 213) reatriets genus Porcelifio to species having pseudotracheae present only in the lat and 2nd pleopods. Verhoeff's subdivisions of porcelito Latreille are retained as distinct genera by Vandel (1945); but are ranked as sub-genera by Edney (1953). As genus Rorcellio is not native to Tasmania, I do not propose to try to assess those differences of opinion, but prefer in the present papar to recogniag the genus in its uider sense, as it is defined by Sars.

Porcellito scaber Latroille 1804.

$$
\text { (Figw. } 140-1 / 1 \text { ). }
$$

Syponyuy- Porcellis praniger Milers 1876.
Further aynoxyuy is given by Budde-Iund (1885, pp. 129-130) and Richardson (1905, pp. 621-622).

Porcellis gcaber ia a commpolitan apeciae which has presumably been introduced into Tasmania. Tusmanian specimans are therefore not desoribed in detail in the prement paper. Descriptions of P. Eaber are given in previous literature; e.g. Bucde-Lund (1855, pp. 129-131), Sars (1899, pp. 176-177, pl. 77), Richardmon (1905, pp. 621-624).

The following account of characters which may be examined without dissecting the animal, is given here to enable R. egaber to be distinguished from other species of Oniscoidea represented in Tasmania.

Length of largest male apeciment 1.3 mmos breadth: 6 mmo
Length of largeat female speciment 12.5 mm .5 breadthit 6 mime
Doraal surface of live animal is dark grey except for IIghter grey opinera of pereion and pleura of ploon. Animla ia not able to enroll.

Frontal lino of cophalon (fig. 140) is produced into median and latoral lobes. Median loba is tub-triangular uith ita apex bluntiy rounded; lateral lobos are sub-quadrangular with comer. rounded. Vertax is covered uth large impegular tubercles. Eyen are compound. Second article of peduncle of 2nil antoana (al g. 140) in markediy dilated on inner adde. Nagellum in biarticulate;
longet of arciclesz list 0.63 mmo , and 0.67 mm
Epimara of percion are large and lamellar. Posterior borders of each of lst to 3rd epinera oxhibit a deep, curved indentation; those of 4th to 7th opinera are not deeply indented but slope backands in a shallow curve. Posterior angles of all segnents are sub-acute. Dorsal surface of pereion bears mumerous large, irregular tubercles.

Pleon is not abruptily narrover than poreion. pleura of 37 to 5 th segments of pleon are large, lanellar, and directed backwandss those of 3 rd segrent are sub-crescentizic in shape, those of 4th and 5th segmenta are sub-rectangular. Torainal aegment (fig. 141) is sub-triangular with its lateral borders deeply incnrved and apax sub-acute. Its cormal nurface has a shallow, longitudinal indentation. All segrents of pleon bear tubercles which are smaller than those on cepbalon and perelon.

Pseudotracheas are presont in exppodites of list and 2nd pleopods. Exopodite of uropod (fig. 1il) is lanceolate, terminal in Its position on protopodite. Endopodite io submeylindisical and is inserted on Inner aide of protopodite near its bace. In fenale, rams of uropod are shorter in relation to protopodite than in male. Lengths in a male apeciment protopodite (along inner border), 0.75 mmog exopodite 1.57 rm, , endopodite 0.75 mm . Lengths in a female specimens protopodite (along inner border), 0.71 rinh, exopodito 1.00 mene, endopodite 0.68 mm .

## Habstat.

These obaervations are based on specimens collected on 22 nd March, 1956, from under pleces of crumbling sandstone on the face of a
cliff above the shore, and from clumps of rushes on the top of the cliff, at Dodge's Ferry. Thirty-three males and 22 females were obtained.

Numerous examples of $g$ scober were collected in and near populated areas, where they occur in such aituations as among decaying vegetation and below objects lying on the ground. Specimons were found under these conditions in the following localities, which represent wdely separated parts of Tusmania:- Cooee, Hatone, Unvergtone, Sheffield, (north-west); Sandy Beach (West Tamar), Iaunceston, Iongfond, Cressy, (north-sast); Hobart, Collinsvale, Huonville, Dunalley, (southeast); and Txial Haxbour, (west).

Specimons were also collectod from among debris Iying a 14 thle above high tide level neas the sea shore in the follouing localitieasEaglehats Eeek, South Axm; Tinderbox and Bames Bey, Bruxy Island.

## Vamations.

The following variations in the colour of live adult animals were noteds- Dorsal surface grey except for orange opimern and pleura; completely orange; or mottled in dark and light brown, dark and light grey, or dark grey and orange.

## Remarys.

Haswell (1882, pe 280) includes Tasmania in the distribrution of Porcillio grantige Miera 1876. Budde-Iund (1885, p. 149) suggests that Io ERaniger probsily does not dffier from go Laevis Latreille 1804. Chilton (1901, p. 140) disagrees whth Budde-Lamd's suggestion, and recegnizes P. graniger to be aynonymous with g. gcaber latrel110 1804. He therefore states that g. scaber has been recorded from Tasmania.

## Rorcellis scaber Latreille.

 dorsal view.

Fig. 141. Fifth and tominal negonts of pleon anil uropode of talo, dorsal view.


## Fandy Anmadil11disdag,

The charactors of tho facsuy are dofined by Baney (1953, p. 88) as follous:-

Mody strongly convex, integamont usunily snooth; capaile of rolling into a ball. Frontal lobo or seubollun of head very strongly developad. Frontal and postacmiollar caninao presone eithor singly or togother. Antemanc shart, the glagoilun of two sogronts. Ancorior margin of the omapodite of tho naxdilipod non-ciliatca, with a number of stout, dentiform processes. Epinorn well-doveloped but not expanded latcralls at all, thoso of the lot segnonit stroncly produced anteriorly as far as the antorior nargin of tho hoad. Outlino of tho pleon contsmous with that of the percton. Uropods short, not projecting beyond the toluon, their ondopodites greatly expandod laterally so that thoy and the tolson form a convex covering round the pootorior end of tho animal, continuous laterally with the opimera; the ondopoditos slightly expanded, usually conpletoly bicien from abovo by tho tolaon- - - . Legs racher stiort, lat two pairs of pleopods with paoudotrackeac. Falo genftalla not vory different from those of the oniscidae, though the endopodites of the lat pair are often otrongly divergent postoriorly, or the taps are bent outrarde-- - ..."

Presunably tho statocont "their ondopoditos creatis expandod latorally" etc., applics indtead to tho cexpoditor of tho uropodo.

The two goneza offandy Arraciulidisian ropreconted in facranta nay bo distinguished as followas-

Eyes compound; posterior angle of lot segnant of peroion onisire, not alaft - . . . . . . . - - Asmadilisidium Brandit. Eyes aimple; posterior ancle of lay begrent of pereion clert - - - . . . . . . . . . . . . - Bluma Budio-Iaurd.

Gomus Armadin11atum Brandt 1833.
The characters of the gemu are dofined by fars (1899, p. 188) as followe:-
nody owlong or olliptical in form, vary convox, and capablo of being rolled up into a perfect bail. Cophaion with the front distinctiy marginate, latoral lobes rounded, and oharply defined at the base. Epistome vertical, Forming above a triangular shicld, advancing nore or leso beyond tho frontal odge. Sidempates of lst segrent of mesosomo large, securiform, not incised behind. Locasome sendicirealar, with the cages contimous throughout; last segment lasellar, quadranguiar or trianguiar in com, not extending beyond the Linits of the epimeral plates of the pemitimate acement. Eyes distinct, latoral. Antennulae with the terninal joint but little produced. Antennae, as a rule, not attaining baif the length of tho body, penultimate paduncular joint acarcely longer than the 2nd; flagellum biarticulato. Opercular plates of only the fixst 2 pairs of pleopoda with air-cavitios. Uropoda very ahort, with the basal part broad, lanellar, outer rams spatulate, inner narrow, cylindric."

It is noted that Edney (1953, pi 88); in deftring gemus Ampacis174diun, states "Eyes comyound."

Armadilisdium yulgae (Latroilie 1804) :Ifine-Eduards 1840. (Fign. 142-143).

## 

 Axmadividium gubientatum Raswell 1882.Further eynonyuy is given by Bude-Iund (1885, pp. 67-68). Axpadilijidium yulrgae is a commopolitan species which has presumably been inctroduced into Tasmania. Tasmanian apacimens are therefore not described in detail in the present paper; Deacriptions of A. grigare are given in provious literature, e.E. Budie-Iund (1885, pp. 66-68), Saze (1899, pp. 189-190, pl. 82), Richardison (1905, pp. 666-668).

The following account of characters which agy be exaninod without dissecting the animal, is given here to enable A. guleare to be distinguishod from athor species of Onisooidea repremented in Tasmania:-

Length of largest mele specimans 13 wnos breadths 6 mm
Length of largest fomale speciment 15 minol breadth: 7 ma.
There is a sexual difference in colour of mature animals. Dorsal surface of live male apecimen is black, that of ilve female specimen is mottied in dark and light brown.

Body is strongly convex dorsally, and animal is able to enroll. Dorsal aurface of cephaion and body is not setome.

Vertex of cephalon (fig. 142) is broad and Mlattenod. Frontal IIno is produced Into amail, rightmangled, lateral lobes. Antennary lobe on each aide is raifead into a zidge which is visible in
dorsal view of cephalon. There is a ralsed triangular abield on frons; uppor border of its antexfor surface forms a ridge which projects beyond frontal Line and curves back oror it. Eyes are compound. Flagelium of 2nd antenna (fige 142) is Warticulates 1ength of articlos: 18t 0.56 mm . 2nd 0.76 mi.

Epimora of lat segmont of percion (fig. 142) aro produced backaris; their postorior angles are sub-acute and entire, not cleft. Epimerm of 2nd to 5th megnonts are trapemoidal with postorior angles bluntly rounded, those of 6th and 7th eqgrents are sub-rectangular: wh posterior angles xightmangled. Posterior border of 2nd and 3nd epimern are markediy directed backvands, those of 4th to 7th epinoss are more nearly transwerte.

Pleon is sem-elreular with its lateral borders contimonn with those of perelon. Pleuxi of 3nd to 5th egments are mberectangular and curved backrards. Terminal eogment (fig. 143) is quadrangulary narrowing posteriorly, with latoral and posterior borders straight.

Pseudotracheae are prepent in exopodites of 1at and 2nd pleopodie. Eropodite of uropod ( $\mathrm{IL} \mathrm{G}, ~ 143$ ) occupies the space botueen terninal segment and plewzon of 5th segment of pleon. It 18 flattened and mub-quadranguiar, with postorior margin straight, and 18 tominal In its position on protopodite. Endopodite is sub-cylindidical, alightiy constricted at basal end; it is. inserted on innor gide of protopodito near base of the latter.

## Britat.

These observations are based on specimens colleeted on 9th Apri1, 1956, Irom a heap of decaying vegetation in a garden in Hobart;

10 malos and 5 females were obtained.
Other apecizens were found in gardens in Launceston, under mones on Queen's Domain and in the Dniversity Park, Hobart, and in debris on ledges of a cliff above the shore at Tinderbox.

Remarigis
Haswoll (1882, p. 279) includes Tasmania in the distribution of his new species, Axmailldikm gipoientgtumo His description of this apecies is buief and is not accompenied by figures. However, as the only species of Axpadilildium which I have found in Tasmonia is A. gulgare, and the characters of this apeofes agree with the information on A. gubdentatum given by Hawwil, I consider it very probable that Ac subdentatum Haswell is a synozyw of A. Fulpare (Latreinie).

Armadiludium pulgare (Latreille).

Fig. 142. Cephaion, 2nd antennae and lst segrent of pereion, dorsal view.

Fig. 143. Fifth and terminal segments of pleon and uropods, dorsal view.


Gemus Eluma BuddemInad 1885.

Synomys. Eluma Buddeminad 1879, nom.mad.
The characters of the genus are defined by Collinge (1922, pp. 103-104) as followss-

Body ohlong-ovate, strongly convex, setose, and closely and mimitely practured. Cephalon atrongly marginate, with median and Interal lobes; eplstome with elopting dorsel portion and iseeled. Eyes aimpie, very small. Antemmise amall, 3-jointed, terminal joint conical. Antemae somowhat short, elagellum biniticulato. Pleural platen of mesosomatic segmente $2 m$ alightly excavate enterioriy, ventral margin indentate on aegmenta 2-4, trucate on 6-7. Coxppodite of flist degment separated from the pleuron and forming a notch on the posterior margin. Telson triangular, width greater than the length, not extending beyond the uropoda. Jropoda shozt, extending slightiy beyond the telson; babipodito mobust, thickened, antero-dorsal eurface expanded, articulating ventro-anterioriy; exopodite 1 lattened, expanded, laminates endopodite styliform, elongeted."

Eluma caelatum (ifiers 1877) Collinge 1917.

$$
\text { (Figs . } 144-1 / 6 \text { ) }
$$

Symoryenc. Aypadi11idivm caclatum 11iers 1877. Elumg purpurasceng Budde-Iand 1879, nonomad. Elumg purpurascons BuddemLund 1865.

Acconding to Collinge (1922, pp. 105-106), the distribution of Eluma caelatum Includes French Guiana, some Western European countries, Algoria, cortain Atlantic islanda and the Mcobar Ialande. I have seen no rocord of the species from tho Australian rogion. As ay Tasmanian apecimens of E. caolatum wore found in or noar populated aceas, it acens 2ikely that the species has boen introduced into Tasmania. Tasmanian specimens are thearafore not described in detail In the present paper. Descriptions of E. caelatum are given in previous 11torature, e.g. Budde-Iand (1885, pp. 48-49), Col1inge (1922, pp. 104-106, p1. 8), Eancy, (1953, pp. 94-95, 11gs. 161-164).

The rollowing account of characters which may be examined without dissecting the animal, is given here to enable E. caelatum to be distinguished from other apecies of oniscoidea repreaented in Tasmania.

Longth of largest malo specimons 9 mmos breadths 4 man Longth of largest female apecimens 10.5 mm ; breadth: 4.5 mm

Dorani guxface of live antmal is daric pindeb-bxorm except for lighter pink epariera of peraion and pleura of pleon. Body is atronely conver dorsaliy and antmal is able to onroll. Dorsal surface of cephailon and body has a dense covering of setae.
 Frontal ino is produced into small, rightmangled lateral 10bes. Antonnary lobe on exch olde is mised inio a riago uhich is viaible in corsal vica of cephaion. There is a raised triangalar shield on frons; uppor borider of its antorior surface foras a ridge which meots frontal line. Hyes are simple, each consisting of one large ocellus. Flagellum of 2nd antonna (fig. $1_{4}$ ) is biarticulato; longth of arsiclest lat 0.27 mmos and 0.60 mmo

Fpimera of lat segnent as percion are proxuced bacimarda; there is a lou ride down dorsal suriace of lat epineron, near its lateral bordor, and posterior anele of epinoron ta deopit cleft (fig. 145). Epimora of and to 5th segrents are frapezoidal with posterior angles bluntily rounded, those of 6th and 7th sognents are aub-roctangular with posterior ancles zight-angled. Postcrior borders of 2 nd and 3 rd eplmora aro maricodly dircetcal bacikards, those of 4th to 7th epimera are nore noariy transverse.

Ploon is semi-circular with ito latoral borders contimuous with those of poreion. Ploura of 3rd to 5th sogronts are subm rectangular and corved backurds. Terminal secrost (inge M6) is eub-triangular whth its latoral borders alightly curved outwarde and apex sharply rourded.

Pscudotrachene are prescnt in aropoditos of lat and 2nd pleopods. Exopodite of uropod (fige 1,6 ) occupios the apace botwoen the terrinal segnont and pleuron of 5th segrant of pleon. If is slattencd and

position on protopodite. Endopodite is sub-cylindrical, slightiy constricted at its basal end, and is inserted on inner side of protopodite near base of the latter.

## Habitats

These observations are based on specimens found under stonew on Queen!s Domain, Hobart. Examples were collected on 4th June, 1956, and 19th July, 1956 a total of 12 males and 12 ferales being obtained.

Other specimens were found among decaying vegetation in gaxdens in Iaunceston and Hobart, under stones in the University Park, Hobart, and at Collinsvale, and in debris on ledges of a cliff above the ahore at Tinderboce.

Eluma caelatur has not previously been recorded from Tasmania.

## Bemaricg.

Budde-Innd (2885; p. 49) suggests that his species, Elumg purpurascens; is perbaps not different from Armadilitainm caolatum Miers 1877, but be is not prepared to consider the eynorynuy of these two speces as definite. This synonymy is confirmed by collinge (1917g, p. 115), (1922).

Eluma ceselatum (Miera).

Fig. 144. Cephaion, 2nd anteme and ist segnent of pereion, dorsal view.

Fig. 145. Left epimeron of lat segment of pereion, doriomateral view.

Fig. 146. Fifth and terninal segments of pleon and uropods, dorsal view.


## Family Armadillidae.

Nemberw of family Armadilisdae exhitit the following charactersi-

Body capable of being enrolled. Cephalon very ahort and broad. Flagellum of 2ad antonn blarticulate. Pseudotracheac present in exopodites of finat four pairs of all five paire of pleopoda. Terminal segrent aub-quadranguiar with its lateral bordera 1ncurved. Interval between terwinel aegment and 5th pleuron of pleon on each ulde occupied by a lobe of protopodite of uropod. Bropodite of uropod reduced in size and situated on, or towarde inner side of, 2obe of protopodite.

The two genera of Iamily Armadilisdae represented in Tasmania may be distinguished as followst-

Posterior angle of ist epimeron of pereion entire, not cleft lobe on under suxface of list opimeron completely separated from epimeral border - - - - - Cubaria Brandt, s.gtr. after Verhoeff.

Poaterior angle of lat epimeron of pereion clefts inner lobe, formed by cleft, continuous with lateral bonder of epimeron $-\cdots-\infty-m-\cdots-\cdots-m-\infty-$ Sphaekilio Verhoeff.

Genus Cubaris Branat 1333, s.str. after Verhoeff 1926.
Synorvis. Hesodillo Verboeff 1926.
Axmadillo, section VI, Budie-Imad 19040
? Spherilio, section VIII, Budide-Iund 1904 (in part).
Buddo-Iund (1904) groups apecies of Armadilidas in two genora, Spherf110 Dana 1852 and Arpadil1o Brandt 1833 ; at the aame tims he alterw the limits of both. He divides Sphocililo into thirteen sectionsand Axmadilila into seven sectione. He refors to each one of seotions II, VI and VII of Axmadilla as Cubsite Brandt (in part).
 as the type species of section VI of Axpadilin.

Verbooff (1926, pp. 251, 259) conslders that Spherilio and Armadille can not be cleariy separated on the characters which Budde-Iund (1904) uses to distinguieh thame In keys to geners of Amadilisidse from Ne: Caledonia (pp, 252-258) be restricts Argadillo, Sphernllo (whech be (p. 250) prefers to spoll as Sphaerinio) and yorulang Budde-Iund 1913, and establishes nine new genera. He states ( p .259 ) that all of these genera except Eydodilio Verboeff 1926 belong in the group which
 that three of his now gonera, Hetodilio, Havaiodilio and Merulanolis, whould poseibly be grouped as sub-genera of berylang in the wider sense.

Vorboeff (pp. 275-276) compares his new geme Hesoditio with Budde-Lund's (1904) acctions of Spheriliog and refors it to scotion VIII. Of the nine species comprising this section he places four in othor new genera! Sph. bifrons (Budde-Iund 1885) in Aystrailocid10 Verboeff 1926 (p. 274), and Sphe ghayph, Sph-Derisingt (Dolufum 1900);
and Sphe Erontalis Dudde-Lum 1904 in Havasoditio Vertooff 1926 (p. 256). Ho statco that the remainder, 1.e. Sph apeciosme (Dana 1853); Sphomplimpe, Sph yitionsis, Dana 1853; Spho auckiandicas (Budde-Innd 1885) and Sphatarancengis Budde-Innd 1904, probably, but do not darinitely, balong in Hesodinlo. Verioerf considexs that of the nine apecios of Spherfilo established by Habrberg (1922), only two, Sph. Carrornture and Sph- jufoniger, can potizibly be Inciuded in Hesodillo. Verbooff assignis to Hemodille nine species which ho designates as new.

Herold (1931. p. 319) atates that Gubaris murina Brandt nust be inoluded in Hesodivio Verhoeff, and to nanes it as Hesoditio murypus (Brdt.).

Jackon (1933a, p. 90), (19336, pp. 157-159) 1dentifies
Ilesodilla medtut Verhooft 1926 with Cubarig murina Brandt and (p. 159) states that the gemus hesodilio rust therofore be abandoned in \&avour of Cubaris Brandt. Thio is necossary as G. nurina is tho oype specics of the only one of Budde-Iund's soctions of Axmadillo which is otill ausoclatod uth Gubaris.

Verboeff (2938 p. 12) at first accepts Jackson's aynozy亡ष; although be incorrectily retains the generic name Hesodilio, and refore
 paper, be ( pp, 23-14) rojecta the rynoryny of the fuo apecies and retains II. modius as dictinct fron H. Finimes.

Jcckson (1942, p. 3) otates that as Hesodil20, by Vorhoeff's (1930) admission, contains C. 咀xina, then Hesodinio and Cubarie are mynonym, and adds that gamus Gubaria is tha cleariy dufinod by both

Brandt and Verboaff and cust be used only in this restrioted sense. ilaferring to Verhoofi's claim that Ge musina and G. meding are dintinct, Jackson (pp. 16-17) states that an exandnation of rumerous speoimens of the formor in the Britash Muserm suggesta that Verhoeffín points of difference are not sufficientily constant to justify separation of the apocies. He therefore retains his eariler mynongid.

Vandel (1945: p. 254) refers to genus Gubaris an "Cubaris

 gemis. I propose to follow Jackion (1941) in olassing Marulans and Kervianeling, and also Harmiodilig Verhoeff, as genera distinct from Gubaritat actur.

Verhoeff (1926) dopines Nesodillo by means of two key to genorm of Axmadilitaes. In oxder to aet down the generic charactere in a more compact form I propose the followine diagnosis of gubarife Wustr. ( $=$ Hespdilio) which is based on information on Mesodilio given by Verhooff in the key a (pp. 252-256), key b (pp. 256-258), key to uib-Samsite of Armadilildae (pp. 263-264) and remariat on the genus (pp. 275-277).

## Genartc Diapnasin.

Frontal line of cephaion forms only a lou ridge which is etraight or curved, but is noither dram out into protuberances (c尺. Havalodanlg Vorboeff 1926) nor longhtudinally fumoved in the mid-IIne (cf. Yernlana Budde-Iund 1913, Verhooif 1926 mostr.). Second antemae are alenderly built with their greater part projecting out from cephaion. Dorsal aurface of animal is amooth, rugose or tuberculato,

But lacks apanco. Pontorior borders of lo仓 to 6 th docrenis of

 angle of lâ aptionon is ontiro, not clait. If a grall loise or tooth is prosont oil undor suaspace of lat ophaton it is not viciblo from the ortor side, and it does not roxn a conefronation of aptnoral boxder,
 prosent on undor surface of 2nd epincron it does not projoct boyond

 or not constrictod. Doxal surfoce of torninal segani is not hooled. (ci. Merylanelia Vorhooix 1926). Postorior bonder os cominal socront is iluntiy rounded or afraight or shallowity incurved in tho centro, but Is not docply incised in tho nid-lino (ef. Schiandillo Vorhoesf 1926 and Augtralicalilo befrons (Budde-Iund 1es5) Voritoosi 1926). Plcopods accupy considerably nore than $1 / 3$ of ireadth of pleon. Inopoditos of all ploopods possest pooudotracheze. Rmpodston aro not divicied Linto layere (of. Bugholungia Michalsem 1912). Brocdth of antorior boider of protopodito of uropod, if ceater fthan hength of outcr border of protopodito, is not noro than 5/4 flres tho lattor. (af. Ochotoditio
 5020 than $1 / 3$ langth of ontire protopodito. Ineer bordor of pinotopodite




of lobe of protopodite), then the free lobs of protopodite, manured on ita inner border up as far a lateral indentation of terminal sogront; is longer than it in browd accross the niddle (of. Arasedilo Brandt 1833, Verboeff 1926 e.atro). Eropodite is inserted on dorsal eurface of protopodite and is diatinctily removed from inner border of latter: Suriace of protopodite le not elevated posterior to exopodite. (ct: Aeanthodtile Verhoeft 1926).

Gonotype: Gubazis muripa Branit 1833.
When Verboefy statem that the terminal segnent is not koelod, I interpret a koiel as being a aharpiy defined riage, such aa he (1926, Pig. 74) Pigures for Meruleno11s yhurbergif Verhoeff 1926, and not a broad, blunt elevation, extenaing down only a part of the length of the megment, much as occurs in the Tammantan apeole which I aseign to Gubarin s.atr.

All apoctes ansigrod to Kesodilio vy Verhoof (1926, 1928. 1936, 1938, 1942b, 1946), Jackson (1930, 1931) and Harold (1931) are automatically included in Cubarin s.atr. It is noted that Verboeff (1946) designates as now H. burmang, N. tepasserima and H. schoilenbergit sub. fp. malaises. However those are already eatabilimhed in 1946, as a koy which distinguishes I. burwany and N. tenasoeming from other epecies assignod to Hesodilio, and a comparison of Ho schellenbexg mub. ap. malaisei with E. schellenberg Verhoofi 192sg, are pibilahod in an earlier paper (Vertoery 1942b).

The mpecien of Sphemille which Verhoone (1926) muggestem my belong in Nesodilio muit almo be considered here. Chiliton (1910b, p. 290) 11stis Sphe gucklandicus (Budie-Lund) as a gynoryra of Sphe monolfmis Dana.

Information given in the original descriptions of Sphe monilimys, Sph upociong (Dana) and Spho tarangengis Buddeinm is not muffecient to juatify the transference of these species to Cubaris. Spha yitiensis Dana (1853, p. 721, pi. 47, Pig. 4d) is described and Pigured as having a rectangular notch in the inner border of the protopodite of the uropod, and is therefore cxclucded from Guberis nostr. I agree with Verhoeffis *uggestion that Syh. maymoratus Wahrberg and Sphe rufonimer Wahrberg may possibly be inciuded in Kesodilla, and consequently in Gubaris s.atm. Benidos species oxiginaliy piaced in Nesoditio, Jackson (1941, pp. 16-17) includes in Gubaritis s.str. the Pollowing apeeies:-

 (Verhoeff 1926), doubtifulis suggested by Verhoesf (1926; p. 357), appears unilkely, and Jaclenon keepm these two species distinet. Jacken also groups with spocies of Cubaris e.stre O. Iund Stebbing 1900h, G. autery Chilton 1915e and g. minest Chsiton 1917s, but atates in a footnote that these three speciea do not belong in Cubaris mistr. but are related to Sphaerinio Verhoeff 1926. Reference to original descriptions show that in each of these species the posterior angle of the lat opimeron is clert.

I have collected examplea of four Taemantan apeciea which I assign to Gubaris nustar. These can not be 2dentifiod with species included in the restricted gemis by previous authorw, lut before they can be regarded as new it is necessary also to compare them with the other established spocies assignad to gubame inct. which may remain in Cubayie sistre. The mumber of spocion in Gubaria rolat. is
considerable; empecially eince, ax is pointed out ly Jackson (1933b, p. 149), wow authort use this name to repiace Argadinig. I bave enen no reference to any comprebansive attenpt to deternine vich of
 attript covers only mpacies found in Oceanta. Verbooff (1938, 1942i,


I have traced apeolea of Gubamit w congulting Budde-Innd's (1904) mivinion and the Zoological Hecorde for the years 1901-1954. I bave then obtainga information on the mpacien from revialom by Budgo-innd (1885, 2904), Barnan (1932) and Van Name (1936, 1942), and from the original demaription of mpecies not inciuded in these worid.
 VII of Axpaifile as Gubarin Brantt (in part). In a later papor (Budelomi, 1909, p. 54) he classes thene geations as ab-genern of

 which hag C. auring Branit as its type, only the specien in his (1904)
 bs oxiginily places in section VIL.

Barnaxa (1932) classes Dinlosmemis Bethalay and Gubarim as
 and A. dopreany. Dollus 1896, which ax piaced in gection FII by Budde-Iuna (1904).

Van Rame (1936) extonde Cubgris to completoly repiace Ampadile a.lat. He dividen the apectes which be inciuder in geme Cubaris into IIve groupi. He assign his groups I and II to mbogomily

Venesil1o Verhoofi 1928b, which has as its tope g. (I.) claysus (Budar-Land 1885), a epeoiee which is included in Budde-inndto section II of Axradilio. Denestilo is classed as a germs by Vorhooff (1933, p. 101). Van rame regards the apecies in his group III as doubtiul nembert of Yenerilio. As the apeciea in this last group all bear apines or apine-like tubercios on the dorsal surface and, according to rigures, have the lobes on the liot and 2nd epfeere projecting beyond the opingral border, they aro in any case exciluded from Gubarie suatr. of five species of Gubaris dealt with by Van (lane (1942) in a supplenent to his earlies woxi, two balong in his group I and three in hif group II; therofore thes may also to aasigned to Yenosillo.

Other apecies whifoh have beon reabved from Gubaris to other genert arot-

| Spectes. | Germa. | According to :- |
| :---: | :---: | :---: |
| c. dolliusi stobbing 1900] | $\frac{\text { Henlanolia }}{1926} \text { Verhooie }$ | $\begin{aligned} & \text { Verhoeff 1926, } \\ & \text { p. } 357 \text {. } \end{aligned}$ |
| G. Pobricolor Stobbaing 1900] | $\begin{aligned} & \text { Sphacri1119 Voriouif } \\ & 1926 \text { (non Spheri } 1110 \\ & \text { Dana } 1852 \text { ) } \end{aligned}$ | $\begin{aligned} & \text { Verhooff 1926, } \\ & \text { p. } 296 \text {. } \end{aligned}$ |
| C. wernont Collinge 1917b | $\frac{\text { Bethralus }}{1909} \text { Puddemanic }$ | $\begin{aligned} & \text { Barnard 1932, } \\ & \text { p. } 315 \text {. } \end{aligned}$ |
| C. barnardi Collinge 1920 | Bethatue Budde-Inand | $\begin{aligned} & \text { Barnaird 1932, } \\ & \text { p. } 317 \text {. } \end{aligned}$ |
| E. Secutor Jackson 1924 | $\frac{\text { Becthalug Budab-Iund }}{1909}$ | $\begin{aligned} & \text { Barmard 1932, } \\ & \text { p. } 316 \text {. } \end{aligned}$ |
| C. Ofampoensis Barmad 1924 | Dinloomochae Branat | $\begin{aligned} & \text { Barnayd 1932, } \\ & \text { go } 328 . \end{aligned}$ |

Chiliton (19101, pp. 239-290) used the name Gulowis for the Heu Zealand spectes thioh Budde-Lunt (1904) includes in Spheri110. Thöse belonging in gection VIII, Sph. greciosus, Sphe monolimas and Sph. tarangensis, have already been discussed. The remainder belong in other sections of Spherilig from which Verhooff (1926, pp. 275-276) aissocistes Mesodillo.

Species of Cubaris suppressed due to synoyyty aro:-

| Species. | Symonym of:- | According to:- |
| :---: | :---: | :---: |
| c. Dnunnea Brandt 1833 | C. 無品m Brandt 1833 | $\begin{aligned} & \text { Richardson 1905s } \\ & \text { p. } 645 . \end{aligned}$ |
| O. gubensie de Saussure 1857 | C. maxing Brandt 1833 | Budde-Iund 1885. p. 28. |
| (Dana 1854) | C. murina Brandt 1833 | Budde-Iund 1885, p. 28. |
| G. Iavanensis (Dollifus 1859) | C. Mmpina Brandt 1833 | Budde-Iand 1894, $\text { p. } 603 .$ |
| G. borollit (Dollfus 1894) | C. muring Brandt 1833 | $\begin{aligned} & \text { Van Hame 1936, } \\ & \text { p. 387. } \end{aligned}$ |
| G. mediug (Verthoers 1926) | C. mirina Brandt 1833 | Jackson 1933a, 19338. 1941. |
| G. akermani collinge 1920 | $\frac{\text { c. }}{1917 \underline{g}}$ | $\begin{aligned} & \text { Baranard 1932, } \\ & \text { p. 377. } \end{aligned}$ |
| Q. erieeus Collinge 1920 | $\frac{\text { c. }}{1917 \mathrm{~b}} \mathrm{bung} \text { colinge }$ | $\begin{aligned} & \text { Barnard 1932, } \\ & \text { p. } 377 . \end{aligned}$ |
| C. kashmixi Jackson 1935 | C. Aenota Arcangels 1934 | $\begin{aligned} & \text { Vandel 1945, } \\ & \text { p. 252. } \end{aligned}$ |
| C. ofricinalis stobbing 1900b, non (Dacmareat 1825) | Axpad4110 puxprurascens (Budde-Inai 1912b) | Jackson 1943, p. 15 |
| C. retfculatug Collinge | $\frac{\text { Bothaius }}{\text { (Buddersinue }}$ | $\left\lvert\, \begin{aligned} & \text { Barnard 1932, } \\ & \text { pot 308. } \end{aligned}\right.$ |
| G. lonedcauda Collinge 1917 b | $\frac{\text { Bathazua }}{(\text { nudgenima }}$ | $\begin{aligned} & \text { Barnard 1932, } \\ & \text { p. } 308 \text {, } \end{aligned}$ |
| $\begin{aligned} & \text { C. } \frac{\text { trilobata Collinge }}{1917} \end{aligned}$ | $\frac{\text { Diploexrochus }}{(\text { Brandt } 1833)}$ | $\begin{aligned} & \text { Barnand 1932, } \\ & \text { p. } 343 . \end{aligned}$ |

In addicion Budde-Innd (1904; p. 120) includec in a 1sist species which are close to G. gurging, and which may be identical tath it, anothor three species, C. gineres Brandt 1833, G. galbineng (Eschscholts 1823), and G. Elavobrumeng (Dollfus 1896b).

Eudde-Iund (1885, D. 28) 1ista Axmadillo conclobator Budde-Iund 1879 as a synorim of g. minefing However, in 1904 ho does not 11st A. conglobator as boing close to g. rupring, aleo he (p. 125) describes the former apecics as having a carins on the under surface of the lat opimoron, a character which distincuishes it from C. murina which has no guch carina.

Descriptions of the remaining species in Gubaris malat. have bean oromined and compared with the generic characters of Gubasis s.stre. Hone of the species in Buddo-Iund's (1904) section VI of Armadi110, nor A. emunttus Budde-Iund, can be excluded on any charactor from Gubaris sostre. The other two species in section VII thich do not belong in Bothalus A. temipunctainy and A. demeessug, Dollfus, 12kewice can not be exciudided.

Among the apecics of Gubanis from India and 1slands in the Indian Ocaan established by Collinge ( $1914 \mathrm{~B}, 1914 \mathrm{~b}, 1914 \mathrm{c}, 1915,1916 \mathrm{~g}$, 1916b), two, G: mamoratus Collinge 1916g and G. albolateralis Collinge 1916b, are probably excluded from Gubarif a.stry, as in the Ilgures of the list pereial epimera of these species (collinge, 1916a, pi. 50, fics. 4, 5), (1916b, pl. 18, IIg. 8) the lobe on the undor side of the lat epimeron appears to be comected uith the epinoral border. The othor apecies can not be rejected Irom Cubaryis sastr. I an doubtutul as to whothor g. pacrun Collinge 1915 should belons here as the Porm of the
uropods in this species (see Collinge 1915, pl. 11, ilg. 10) is raihor different from that exhibited hy other menbers of the gemus, but Verhoeff 's limits do not exalude it on this character.

Baxmard (1932, p. 377) describes G. burmunt Collinge 1917b as having the margin of the lat epheroh grooved. However hils figures (fige 76a) ahow that the ridge Porming the ventral edge of the groove is a contimuation of the lobe on the under suxface of the opimeron and It does not neet the lateral epimeral margin. Barnard (pp. 378-379) notes that G. burnupi resembles G. miser (Budde-Iand 1904) and other apecies in section VI of Asmadillo as regarde the condition of the lat epimeron. Thus G. burmung ahould evidently be included in Gubaris s.atr. Presumably the same applies to G. poncolae Barnard 1937, apecinens of which are previously regarded by Barnard (1932, p. 378) as a variant of g. burnupi.

OS the species which Van thame (1936) places in his group IV of Cubaria, only one, G. cinchonae Van Hame 1936, is not included in Budde-Iind's section VI of Axpedillo: this species is not excluded from Cubaris s.str. Van Name's group V of Gubaria comprises C. teminpunctatus and C. depreasyn, (Dollifus), which have already been discussed. Van Hame lists Pour speoies, C. Exanamia (Micolet 1849), G. affinis (Dana 1854), G. cacohuamilipenata (BLilimal 1867) and C. californica (Budde-Ind 1885), which are insufficientily describod to be placed in one of his groups. The identity of these species is uncertain.

The remaining species in Gubaris s.lat. are excluded from Gubaria a.atr. on the following characteras-

Frontal IIne of cephaion incised in the centrat-
C. cinctutus (Kinahan 1859) Stebbing 1900, G. holmalanus chilton 1916, G. apenceri 日arnel 19340

Lateral margin of lst epimeron thicky postorior margins of anterior segments alnost transverser- C. anorala Gerstaecker 1873.

First opinerion with it postorior angle clefti-
C. comionsalis, G. minuta, Baker 1913; G. olaytononsis Cbilton 1917, G. natalensis Collinge 1917b, G. truncatua Collinge 1920, G. insulacis Searle 1922, C. guxianowt Collinge 1942.

Pronotum narrow, occupying $1 / 9-1 / 10$ or length of segnentsC. harsadienais, Ge oxyromil, Barmard 1940.

Terninal segment cleft posterioriy:- G. apencert Barmes 1934.
Body provided with spinesy basal surieiace of protopociste of uropod occupying considerably more than $1 / 3$ of length of protopodite; free lobe of procopodite broader than longi- G. Helsmorei Nicholls and Barnea 1927.

I have not yet seen a description of G. Lmota Arcangeli 1934.
Baynard (1932, p. 312) sugeests that g. Mismoret should probahly be transferred to genus Akermanis Collinge 2910. A comparison of Barnes' (1934) description of G. apencori_with Eudde-lund's (1885, p. 38), (1904, pl. 8, 11g. 1-8) description and inguros of the type apocisi,
 probabiy belongs in gexus Australiodilio Verhoeif. 1926. other apecies of Gubarie which do not belong in Gubaris soatr. rmat rorain in Gubame -.lat. until they can be re-examined and placed elscwhere.

Thus, as far as I can dotermino from the exarinnation of ilterature, Gubaris s.atr. may contain the following established apecieat-

Spacies placed in Cubaris s.str. or Resodilio ty previous authorst - C. mumina Brandt 1833 (type apecies); G. gaibinens (Eschscholts 1823); G. Lifuensig Stebbing 1900by G. garcieins,
 C. pronyensis, G. plasticus, (Verhoefi 1926) : G. Bekellenberen,
 (Jackson 1930); G. yerhoeffi (Herold 1931); G. Sonesil_(Verhoeff 1936);

 C.? mponiger (Eichrborg 1922).

Other apeciess- G. cineren Erandt 1833; G. colliman, G. plomarulug, (Budde-Iund 1894): G. temuhucteting G. depressyg, (Dollifu 1896a); G. Mayobrunery (Doilfus 1896b); G. albipes, C. arcuatus, (DoLliwa 1698); G. Infuscatus, G. pallidug, (Budde-Lund
 G. Intermirtus, C. Mifrcomarinatus, C. ominterg (Bude-Iand 1504); G. cacruleut, G. mbuste, Collinge i914as E. framilis Colilinge 1914b; G. amandale Collinge 1914ay G. solidulus, E. nacrum, G. Esampatus,
 E. mrannepcaudatus, G. chtitong, E. eavernosus, E. jobsiun, Coilinge 1916bs G. burmad Collinge 1917bs G. cinchonat Van Hane 1936; G. ponpolae Barnard 1937.

I can not be eertain that all of thoce species definitaly belong here as the deseriptions of sone do not give informetion on all of the charactors mentioned in the generic diagnosis, but I have found no reason to exclude any of them. It is algo possible that some species may prove to be synonymous, particularly as the authors of
those originally placed in Hesodille do not compare them with the older apecies in Cubayde.

Three apaciea in the 11st, E. cinorea, G. galhineus and G. glayobrument, are close to, and possibly oynorymous with, G. murina. The original descriptions of two species, C. infuscatus and C. rallidus, (Bude-Iund 1902), are too brief to charactorize them satiafactorily. Budde-Iund (1904, p.125) states that detailed descriptions of these two apecles will be givan in the Proceodinge of the Zoological Society of London, but I have not been able to trace these descriptions.

None of 收 Sour Tasmanian spacies of Gubaris s.Btr. can be indentified uhth any of the other apecies in the list and are therefore considered to be new. Although most authora use similar combinations of characters to distinguiah their species of Cubaria, gape in the information on some prevent the differentiation of these new Tamanian oxmples by means of a single key. For convenience, they are therefore distinguished from other apeciea in Gubants s.atr. by noans of three boeys. Key I deals with specien which are assigned to Cubaris s.atr. or to Nesodilio by previous authors, kes 2 deals with species established by Budde-Lund, Doylfus and Van Name, and key 3 deals with specios established by Collinge and Bamard.

## Sex Is

1. Posterior border of terchnal aegront ineurved in the ridalo - .-. - - - - . . . incisug, G. pronyensis, $\mathbf{G}$. plasticus, G. burwamug, (Vertoorf).

Posterior bonder of torcimal sognent straight or curved

2. Terainal cepront mot conoirictod, its breadth boing constant or decreasing postorior to its central incurviture - - - - 3 . Termanal segrient conotricted so that its broadth inercases postorior to its central incurvature - - - - - - - - - - - 5 .
3. Peroion lackine tuberalios - . . . - - - g. 1ifuonsia Stobbing
 Percion tuberculaie . . . . . . . . . . . . . . . . . . . . - - - - 4 .
4. Exopodite of uropod reaching posterior border of protopodite


Exopodit of uropod not reaching posterior border of protopodito - - - - - - - - - g. hickmani n.ap.
5. Sogronts of perotion each with a transvorse row of tuborcles or swollings on cach side of the mid-line - . - - - - - - - -
 (Vorbeorf).

Segrents of porcion without such an arrangerent of tuborales or

(I as uncertain of the position of Q. jonestis (Vorhocff) here, as Verhoors (1936, p. 102) statos that only indications of the awellinga exhibited to G. schellenberpi are apparent in this species. I assign it to the second altoraative in order to demonsirate its diatinction from the jamanian speciles on other characters).
6. Ventral suriace of lat epimeron exhibiting a ridge in front


Ventral surface of lat epineron hith no ridge in front of

7. Length of $2 n d$ article of flagelium of and antenne leas than
 (Verhoeff), c.i parmoratug (Wabrberg) (non Collinge).
length of $2 n d$ article of eFagellum of 2nd antoma throe times length of lat article .-. . - . - . - . . . tamarensifi nosp.
8. Segments of pereion aach with a bransverse row of amall holes in front of posterior border $\ldots \ldots-\ldots-$. . lacustria (Verhoeff) Segments of pereion without amall holes - - - - - - - - - - - -9.
9. Exopodite of uropod reaching posterior boxder of protopodite -


Exopodite of uropod not reaching posterior border of

10. Second epimeron vith no lobe on its ventzal auxface . . . . -
 Second epimeron with a lobe on Its ventral surface - - . . - - 11 .
11. Lobe on ventral surface of 2nd epimeron connected uth epimoral


Lote on ventral aurface of and epimeron not comected nith

12. Frontal line of cephalon not raised on a ridge - .......... ....................................... gerhoeffi (Herold).

Frontal line raised on a ridge, at least at sldes of

13. Erontal line dopressed in tho dddle $\ldots \ldots \ldots \ldots \ldots \ldots$

14. Segmento of poreion smooth - - - - - - - - - C. areancelif (Verhooff), Ge enoonsts (Jackson)

Soponts of pereion each with a low tuborelo on eaciz alde

15. Budopodeto of uropod narrowific diafally with its apcx


Endopodite of uropod broadconing diataily with isn apox


## Ker 2.

1. Second opimeron uth no lobs on its ventral surface $-\cdots-$ - - - G. egens (Buddo-Lund; C. teminamotatug G. depressun, (Dollfus).

2. Ventral suriace of lat epimeron oxbibiting a midge in front


Ventral surface of lat epimeron with no ridge in front of


Lobe on lst epimeron with its apex acute $-\cdots-\infty-\infty-m$


Lobe on lat epimeron with its apex hiunt $-\ldots-\ldots-m^{-}$
4. Latersl processes of clypeus oval: eye composedof 22 or more


Interal processes of olypous sub-triangulary eye composed of

5. Exopodite of uropod reaching, or almost reaching, posterior borier of protopodite - m-m-m-- - - - G. collimig, E. Itronarefingtus, (Buddeminni).

Exopodite of uropod terminating distinctily in front of posterior border of protopodite m-n-m-m-m-m-m.
6. Pereion with a series of prominent tuberclee extending across
 Persion sithout much a mexies of pominent tubercles - - - - 8 .
7. Second to 7th segments of pereion with two tubercles on each eptmoron - - - - - - - - - - - - - - - C. ginchonge Van Hame. Second to 7th segments of pereion with one tuberele on each opimeron - - - - - - - - - - - - - - - C. hickrgnif nosp.
Q. Second opirseron deeply cleft alnost into tito parts $-\cdots$ - - - - - - C. slomerulus (Eudde-Iund), C. albipes (Dolifus). Second epimerom not so deopily cleft, only with a scall 10 bo on Its ventral curface $\ldots-\ldots-\ldots-\ldots-\ldots-\ldots-\ldots-\infty$.
9. Lengith of 2na axticle of flagellum of 2ni antoma twice longth
 langth of 2nd artiale of flagellum of 2nd antoana $5 / 2$ tinon or nore than 5/2 times length of list articio $-\ldots-\ldots-\ldots-10$.
10. Segrents of percion each with a low tuberclo on each aide above bade of epimeron - - - . - - - K. tagnanfengig n.sp.
 of cephalon
11. Frontal 1ino Represced in the madie - - - - Ge axciatus (Dollifue

Frontal 1ine not depressed in the middle $-\cdots-\cdots \cdots$ - - - - - - - - - - - - - - - - G. gulcifrong nosp.

## Ror 3:

1. Pootertor bordor of terminal negnont (aceording to collince, 1914g, pi. 35, Pig. 10) incurved in the madlo - - - - - -


Ponterlor border of texninal segront straight or curved

2. Exopodite of uropod renching posterior boxder of protopodito. -. - - - C. coemleus, G. dilectun, C. cavemogus, Collinge. Eropodito of uropod not reaching posterior bordor of protopodite - - - - - - - - - - - - - - - - - - - - - - - - 3 .
3. Length of 2nd arisclo of glagelium of and anteman sudee or less than terice length of lat axitclo . . . . . . - C. solidulug. C. meruri, C. Exavelit, C. exnansus, C. gusilius, Collinge. Length of zan article of slagellum of zad antemns 5/2 tines or noro than $5 / 2$ tines length of lat article $-\ldots-m-4$
4. Torainal cegront not constriced, its breadith being conokant posterior to its central incusvarure - - - - G. hiclomani no ap. Tomanal segnent consiricted so that its breadth increabes pogterior to its central incurvaturo m-m-m-m-m-m.
5. Segrents of pereion each uith aovoral turercles on cach alde of the mid-18n0 - - - . . . mobusta, G. Exapilis, Col19nge. Segnonts of peroion without such an axmancoment of tubercles - -- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - $6_{0}$
6. Voneral surrace of Ist opineron exhinienge a ridge in Pront of


Ventral eirrece of list ortmoron with no widge in front of

7. Dorsal eurface of body gramiate - - - - - - C. gramiatug, G. burmun, Collingeg fanoplae Bannard.

Dormal surface of body not gramiate - - - - C. tamerenais nospo
8. Endopodite of uropod narroring distally with its apess shaspify
 Q. Jobatus, collinge.

Endopodite of uropod broadening distally with its apex biuntiy sounded - - - - - E. tamondensis. S. sulctiront, nompp.

## Koy to species of Gubaris sestr. represented in Tasmania.

1. Ventral auriace of lat epimeron exhibiting a ridge in front
 Ventral surface of lat epimeron with no ridge in firont of 10be - - - - - - - - - - - - - - - - - - - - - - - - 2.
2. Peraion with a $工$ ow of prominent tubercles across aach torgite; breadth of terminal segnont conntant postorior to its central incurvature - - - - - m - - - - - Q. jelonand nosp. Perelion with tergites mooth axcept Lor a low tubercle and/or elight zugosity on each side above epimera; breadth of torminal segnent incrsasing again postorior to its central inciavature - - - - m - - - - - - - - - - - - - - - - - 3 .
3. Frons of cephaion with a deep, transverse groove below and parallel to frontal lines lateral procesaes of clypers (in acult) produced uprards to form acute, triangalar lobes - -


Frons of cephalon with no doep transverse grooves lateral processes of clypeus almost right-angled and scarcely produced


# Gubarte bickmeni nosp. <br> (Figs. 147-161) 

Kh19 (fig. 147).
Length of largest speciment 6.0 men. breath: 2.9 min
Colour. Dorsal surface of live animal is mottled with darts brown, orange-brown and yellow.

Cephgion ( 8 ig. 148). Surface of vertex is uneven. In the centre it is croses by two transverse ridgeas there is a curved ridge to inner side of each eye, and behind this ridge, on each side of vertex, there is an oval tubercle. Vertex bears scales and acalo-setae 1ike thoae which are deacribed from porelon. Frontal line forman an uninterrupted zidge which is curved bacikarde towards vertex and which enda in a blunt angle on each side of cephalon. Surface of frone is ahallowly depressed on each side to receive and antennee; thers is no deep groove anterior to these depressions. Lateral processes of clypeus appear might-angled in anterior view and are scarcely produced uprards. Ejas are rounded and compound, each composed of 11-13 ocelli.

Firat ontonmse Triarticulate; 3 xid article has a group of coarre aetae near its apex.

Second antenng. length of pedunclet 1.95 maos length of
 of each of 2 nd to 5 th articlos of petuncle there is a large seta which has its aper split into several fine points. 111 articles of antenna bear mumerozs sharply pointed aetae. Second article of flagellum ends in a long, narrow process which appears to be formed of parthy fused setae.

Yandihieg. Left mandible (fig, 149):- Incisor process ends in 3 teeth, central tooth being woakly bifid and lateral teeth aimple. Lacinia mobilis ends in 2 testh. Bohind lacinia mobilis there Is a rounded lobe covered uith Pine setas. This lobe alwo bears 2 pencils of setae, and a thind penoll occurs behind lobe. Molar portion is represented by a turt of plumosestate set on a cormon basal procoss. Right mandible (fige 150)i- Incisor procens consiats of one bifid tooth and one aimple tooth. Iacinia mobilis in irregular in ahape. Setome Lobe at base of lacinia mobilis beare one pencil of satae, and there is one other pencil behind lobe. Kolar portion is 1ike that of left manalble.
plrst maxilig. Outer lobe (fig. 151) bears 10 mimple teoth, made up of an outer group of 4 large teeth and 1 mer group of 6 more slander teath. On ventral suxface there is a mbort apine at base of 4th large tooth. Outer margin of lobe is bent outwarde in a blunt curve, which, together with the part of margin diatal to it, is fringed with comb-jike groups of setae. Imer lobe (fig. 152) bears 2 ahort, thick, blunt eetose processes. Apex of lobe to outer side of these procesmes is rounded.

Sacond marill. Distal region of maxilia in divided into 2 sub-rectangular lobes, with outer lobe approximately twice as udde as Inner lobe. These lobes are distinctiy eeparated at aper of mazilla, and further back the diviaion between them is indicatod hy a suture line. Distal region of inner lobe is densely covered ufth setae; that of outer lobe has a mparwer covering of shorter, finor aetae. Two coarse setae, set on dormal surface of outer lobe, project into the notch between 10bes.

Maxilliped (Eig. 153). Epapodite is narrow, shortor than basis, and has an acute apex. Basis has spiny setas scattered on its ventral aurface and fine cetae present along its inner margin. It is broad compared with encopoilte, which occupies onif the inmer half of distal border of basis. Ischion is the onity article of endopodite which is distinots thare are 2 large apines on its ventral surface. Rerainder of endopodite ls eub-conical in outiline; a division into 2 ventral axticles is indicated to an oblique suture inns across/surface, beyond which encopodite becones abruptiy narrower. There are 2 sets af setas on Inner borier of first of these articles; basal set consioting of one large and one amaller seta, distal set consisting of one large seta and 3 maller setac. Three sotas occur singly on outer border of endopodite, one on lat article, situated in the angle of a pencil which is itself free from setse, and 2 on 2nd article. Aper of endopodite onds in a tuft of. motas, Endite is sub-quadrangular in outilines its apex is ohallowily indented. Two large spinas are placed to ventral nide of this indentation, and there la a maill apine on each side of apical region. A few apimiles occur down outer border of endite.

## Perefion. Flrst epimera are sharply rounded anteriorig and

 produced forwarde past so that cephalon is sumk into adopression in lat segment. Outer side of lat epimeron is revolute, so that dorasel axfiace of opdmeron in concaves its lateral margin is simple, lacidng a marginal fixrow. Posterior angle of lat eplmerion is sharply rounded and not cleft. On ventral muriace of epimaron, in front of posterior angle, there is a mall, rounded lobe which has no connection with latoral margin (see IIg. 154). Surface anterior to lobe is not prooved or rildged. Poaterior angle of and epimeron is rounded and notcleft. On vencral surface of 2nd epdmoron there is a small. rounded Iobe, blunter than that on lat eppreson, sitwated wall in front of posterior angle and not comected nth epimeral margin (seo 2ig. 154). Ventral murface of 3xd epimeron is slightly thickened near its antorior border. Eplmera of 3xd and fth negnonts are trapesoldal and rounded posteriorly, those of 5 th to 7th segments are quadrangular with thoir posterior anglos sub-acuto. Epimora of all segrents are directed backiaxds at an ancle to postazior boxder of midale region af theis middle respective tergites. This/port of postoxior border is almost straight in 1st to 4th sogrents, in 5th and 6th eegnonts it is produced into a modian point, in 7th aegment it has a large modian point with a smaller point on each alde of it.

Rasko of length of pronotrum to length of entice tergite (measured in the ald-1ine) is is 404 in 2nd segment, and appoximately 18 4.0 in 3nd to 7th segmants: Iengths in 2nd eegneat: pronotrom 0.20 man entire tergite 0.88 kmeg langths in 3 rd segment: pronotumi 0.24 mm , entire tergite 0.94 un.

Dossal eurface is tuberculate. Four pairs of large tubercles on each segment togethor form 8 longituditnal zows down pereion. On Lat aegrent there is a median entinence in front of the contral pair of tubercles. On each aide of pereion a amall rounded tuberele is present to inner alde of 2ud large tribercio on all segrents, and 2 namow tubercles occur betweon 2nd and 3xd laree tuborales on 104 to $6 t h$ segrente, with one such trbercio in this position on 7th segnent. Tuborcles Comming tho outormost patr are not very pronounced on 4 th segment; on 6th and 7th sognents they project boyond posterior border
of tergite.
Dorasal surface of tergitea has a covering of rounded scales and also beare numerous scale-setae! Scile-seta (IIge 155) has a broad, $\nabla$-shaped scale postion, apoz of which is produced to form a nimyon fold into which a mort seta projectim.

Perefoppal. Firat legi- Each of the Large opines on under surface of leg orde in a amall mumber of pointe which divide off from apine at difforent levelu. Spines on under aurface of meros and earpos are too aparse to appear as a berush. Leg aleo bears numerous almple, aharply pointed setae. An area on anterior arface at distal end of carpos has a donse covering of fin setae. Short, almple apinoa occur along under murface of bamil half of propoles. Dactylom has a broad, blunt terminal claw, bolou which there is a slender, pointod accebsory claw. 4 long, uingle mata 28 set in angle between bases of clawe.

The area of setae on carpoif and the simple apines on propodos are not ropeated on 2nd to 7th legs.

Mele ororn. Conical in outiline. Its two ducts remain distinct and open eoparatoly under a glap on doraal surface of organ.
phepn. Outisine of pleon is semicircular, continuous with that of pereion. Pleura of 3xi to 5th segments are large, expanded laterally, and strongly curred backards. They are sub-sectangular in shape, rath 4th and 5th pairs succesestively narrower and more rounded than the preceding pair. Posterior border of each of lat to 4th tergitan forma a blumt modian angle waich is prograsalvoly more obtue In each mucceeding eegment; midale of posterior border of 5th tergite is nearly atraight. No tubercles are present on lat to 5th segmente.

There are no lobes on ventral aurface of 3rd to 5th pleura.
Terminal segnent (ife. 156) curves imwards on both sides at about the middle of its length. Postorlor half of segment is subquadrangular with its posterior border straight and corners bluntiy rounded; its breadth is constant at 0.49 mmog not increasing postcriorly. There is a pair of oval tubercies on dorsal surface in centre of broader basal half of sognent; surface behind tubercles is raised into a wide; convex, median, longitudinal ridge, with, however, does not extend to posterior borier of segment.

Dorsal surface of tergites bears acales and scale-setae aimilar to those on poreion.

Pleopods. Pirat pleopod (fig. 257)s- Protopodite is produced on its outer side to form a large oval lobe. Exzopodite is poar-ahaped. It is divided into an inner laminar part and a someubat smaller, outer tracheal part. A feu aplnes occur on ventrai surface near posterior border of laminar part. Endopodito is atyliform, uith It dietal hall cuxved outrards. Its basal hale is provided with oblique musclew. There is a narrow chitinous thickening down outer edge of its distal half. On dorsal surface, a mige, ormamented with emall scales, extends down centre of distal part of endopodite; this ridge is directed inwards and surfoce to 1 mer side ofir it is indented, thrs forming a groove. A row of spimules is situated between ridge and innor border of endopodite.

Second pleopod (fig. 158):- Exopodite is sub-triangular, very nartow and elongated posteriorly, with its apex sharply rounded; its outer margin is indented. Tracheal part occupies outer anterior
region of exopodite and is linated posterioriy by this indentation. Inner maxgin of apopodite is boxdered nith hort setae. There are a Lew epines on ventril murface of laminar paxt, near ite outer margin. An area covered with 2 ine setat begion at aper and cxtends forwaxds IOF mom distance on ventral muxface of exopodite. indopodite in biaxticulates length of artlcies: 1st 0.22 gmog 2 nd 0.95 mme Firwt article is quadrangular in outlines thare is a eurod ridge on itw ventrul miface. second articie is marrow and elongated. It cachiblts - ohitinows thickening down imer edge of its basel $5 / 8$, beyond which axticle becoma very namow and Ingeliffome Length of ilagelisform portion: 0.37. 3 .

Thind pieopodi- scopodito is abbintangular uith its outer margin indented; ita distal region is elongated but to a lemser degree than that of 2nd eropoitto. Truchsal part oecupies a position gingiar to that of and pleopod. on ventan murface of esopocisto there are a for apines near outer margin of latnar part, and comblike groupt of metec occur on and noex imer margine on doral frafaces a short, sealowovered midge extends buckands from innor anterior angle. Foruth pleopod 15 aimilas to 3xu.

Fifth pieopolit - Bropodite differs in hape from that of 3nd pleopod, being a more zegular tifangie uith its outer margin scarcely Indented. Both of ita lateral margins bear comb-11ks groupa of setae. Irachoal part occupios an area in its outor angle.

Vropod (fige. 156, 159). Basal munface of protopodite 1s broad and oblique, viesble in dorsel view of uxopod, in wich view it occuplem approxirately $1 / 3$ of length of entire protopodites Its
breadth is less than length of protopoaite. Length of basal uuxface; 0.22 日ros mreadth of masal surfaces 0.47 mmos length of entire protopoditas 0.62 the Beyond basal surface, imer border of protopodite is doepry and ovenily incurved so that free lobe of protopodite becomes mudienif parrower postorioriy. Posterior margin of lobe is obliqualy rounded. Greatent length of lobes 0.50 man. length of posterior margin: 0.14 mm . Area of protopodite visible to outer mide of terminal segment, when uropod is attached, is longer on its inner side than it is broad; length (along innor edge as far as indentation of terminal segment): 0.30 maog brsedth (in a line across insertion of expopalte)s 0.22 mi. Exopodite is inserted on dorsal surface of lobe, a littie removed from ita imer margin. It does not reach to posterior borior of lobe. above base of exopodite, protopodite 1m raiwed into 2 eub-triangular prominance, the sharply rounded inner angle of which overlapm kunor margin of lobe. Inxopodite is sub-cylindrical, bears a few apiny matae, and ends in a tuft of Jong setae. Endopodito is insortad on vantral surface, near imer border, at bat of protopadite. It is sub-ayininicical, conver on cuter slde and narroudng dietelly with itm apex sharply rounded! it bsara numororis sharply pointed setae and ands in 3 long setae. Endopodita does reach to posterior border of teruinal segnent. langth of ramis exopodite 0.12 mog endopodite 0.32 mo.

## Temale.

Iength of largent apecimens 6.0 timos breadth: 3.0 mm . Yemale differs from mele in the following atructurest-

Firot pleopod (ilg. 160):- Expopodite is sub-oval, very whort and hroed. It is difided obliquely into an imer laminar part and an outer trecheal part, the two boing mub-equal in area. Endopodite is not developed.

Second pleopod (2ig. 16i):- Exopodite is sub-triangular, very short and broad, uith its outer margin indented and its apex aharply rounded but not markedly elongated. Tracheal part occupies an area In its outer angle. There are a feu apines on ventral surface of apical region of empodite, and comb-114se groupe of setae occur down its Inner margin. Endopodite is not developed.

Thisd pleopods- Exopodite ia aimilar in shape to that of and ploopod of fewale, and thus has the apical region loss elongated than in 3rd exopodite of mala; there is no scaly ridge on itm dorsal surface. Fourth pleopod agrees uith 3nd.

Fifth pleopods - Exopodite is similar in shape to that of 5th pleopod of male, but there is no mealy ride on its dorsel aurface.

## Habitat.

Sype localifyt- This description is based on specimens found on 7th October, 1957; under Loge and among debrie lying on the ground in a forest of eucalypts and treeforns at Tamraleah; 51 males and 29 Pemales were obtained.

Specimens were previously collected from thls locality by Profeasor V.V.Hicionan in Jamiary 1954 and January 1957.

Othar Jocalitiless- Two Pemale specimens were Iound under a sucalypt log at Weyatinah.

## Remaris.

rhat apceics is maned aftor Frafessor V.V.lliolman, who presented no with tho exmples 4 rom hia collection and thereby drev [8 attention to the specics.

## Cubaris hicknant nospo

F1g. 147. Male specimen, dorsal view. (Cephaion and pleon are foreshortened due to curvature of animal).

Fig. 148. Cephalion, anterior view. (Antennee and mouth parts have been renoved).

Fig. 149. Diatal part of left mandible, dorsal viev.
Fig. 150. Distal part of right mandible, dorsal view.
Fig. 151. Diatal part of outer lobe of right lat maxdila, ventral view.

Fig. 152. Distal part of inner lobe of inght lot maxilla, ventral $\begin{aligned} & \text { iew. }\end{aligned}$

Fig. 153. Distal part of left maxilliped, ventral view.
Fig. 154. Right epinera of 1st and 2nd segments of pereion, ventro-lateral view.

Fig. 155. Scalometa on dorsal surface of lst segment of pereion, dorsal view.

Fig. 156. Terminal segnent and uropods, dorsal view.
Fig. 157. Left lat pleopod of male, dorsal view.
Fig. 158. . left and pleopod of male, ventral view.
Fig. 159. Right uropod, dorsal viev.
Fig. 160. Left lst pleopod of female, ventral vieu.
Fig. 161. Right 2nd pleopod of female, ventral view.


## Gubers tasmaniengis nosp.

(Igg. 162-171).
Yale. (51g. 162).
Longth of largest apocimons 6.3 ma ; mreadthe 3.1 ras
Calour. Background colour of dorwal surface in 1ive andmal 1s purplimb-brown. Cephaton and pereion exhibit unpignented patohen which represent muscular insertionis. Protopoditos of uropode are orange.

Gephilon (fige 163). Surface of verter ia minoth except for a pais of very low tuberelen aituatod immodiately behind frontal ridge. Frontal line Lorms a ridge whlch ia curved backnarde towarde vertox and is almo shailowiy dopreseed in the mid-lines ridge ands In a bluat angie on each alde of cephalon. Frons does not exhibit a transverse groove bolow frontal ridges it is indented iv two shallow depresmions for 2nd antemae. Lateral procenses of elypeus appear IIght-angiodin anterior fiew and are carcely produced upwards. tyes are sounded, compound, anch composed of 12-14 ocell.

Eixat antama. Triarticulate, sith articies rather short and broad. Third axticle beare a group of coarse setae near apece. Seconi antomn. Longth of poduncles 2.15 neno 3 longth of articles of flagellums lat 0.15 zmo, and 0.45 me. an distall border of emoh of 2 nd to 5 th articles of peduncle there in a large seta, divided towardim the end into soverni points. 411 articles of antenna bear apiry eatao. second articie of flagellum ands in a process Pormed by partiy fumed setae.

Mandibles. Left mandiblet- Incisor process is 3-pointed, being formed by one simple tooth and one strongly bifid tooth. Lacints mobilis ends in 2 wdely separated teeth. Iobe behind lacinia mobllis has a dense covering of netae and also bearis 2 pencile of aetae; one other pencil occurs behind 20be. Wolar portion is represented by a tuft of plumese setae set on a coumon basal process. Right randiblesm Inoisor procesi consists of one simpie tooth and one more veakiy bifid tooth. Lacinta mobilis is imegular in shape. There is one pencil of setue on metose lobe, and one other pencli behind lobe. Nolax portion is 1ike that or laft mandibie.
grat maxile. Outer lobe ends in 10 gimple teeth, made up of an outer group of 4 Iarge teeth and an inner group of 6 wore mlender teeth. There 18 a small apimule on ventral surface below base of 4th lazge tooth. Outer margin of lobe is bent out in a blumt curve which, together with wargin distal to it, ls fyinged with groups of setas. Imer lobe (1ig. 164) bears 2 moderatoly long, blunt setone procencep. Apex of lobe to outer side of processer is rounded and bears a few ahort setae.

Second maxili. Distal region of maxilia is divided into 2 sub-rectangular lobes, Mth outer lobe approximataly turee as wide an Inner 10be. Lobes are neparated by a notch it aper of maxilla, and further back the division between them is indicated by a outure line. Distal region of imer lobe has a dense covering of setass that of outerimbe bas a sparser covering of shorter, siner setae.
kaxi111pod (fig. 165). Epipodite is narrow, mhortore than basie, and has a wharply rounded apere. Basis is moh broader than
endopodite; it has spixy setae on its ventral maxtace and fine setae down its inner margine Isohion is only articie of endopodite which 1s distincts there are 2 large pines on its ventral surface. A division of remainder of endopodite into 2 articies is indicated by an oblique gutare $14 n e$ on its ventral surface and by a arden decrease In ita widh above this 1ine. There are 2 groupe of setae on imer border of firet of these articles; a basal set of one large and one maller seta, and a distal aot of one large nata and 4 amiler setae。 Three setae occur singity on outer border of endopodite, one on ist axticle, eitusted near base of a pencil which iteele lecks setae, and 2 on 2nd article. Apex of endoprodite onis in a turt of aetae. Endite $1 s$ aub-qusdxangular. Its apdeal region 18 uneven and bears 3 apines wheh decrease in aize from innemmat one outwards. at inner apical cormay thare is a maill dapression in thich is set a boort, miunt spine.

Penetion. First epimera are sub-acuto anterioriy and produced forvarde past eyes to that cephaion is sunk in a depression in ist segmont. Outer side of lat epimeron is revolute, so that domal surface of opimeron is concave. Its lateral margin is aimple, laciding marginal furrows 1 ta ponterior angle $1 s$ sharyiy rounded and not cleft. on ventral eurface of lst epineron, inifont of goaterior angle, ther is a broad, bluntly rounded lobo which is not connected with lateral margin (sao 11g. 166). Surface antertor to lobe is not grooved or ridged. Poaterior angle of and epineron is rounied and not cleft. On ventral aupface of 2 nd ephmon thex is an elongated, blunt lobe, situated mell in front of posterior angle and not connected ath epimeral margin (3ee Pig. 166). Ventral aurface of $3 x i$ epimeron is
clightiy thiclrened near its anterior margin. Beimern of 3rd and 4th segrents are treperoidal and rouniled posterioriys those of 5th to 7th sogronts are quandrangular with posterior ongles alnoot rightmangled. Epinera of all segments axe directod bachourds at an angle to nddale region of segments. Across middlo of body, posterior borders all. torgites run atraight.

Ratio of longth of pronotuin to lengti of ontive tergte (measured in the mid-1ino) is it 504 in 2nd segnent and amproxinately Is 4.5 in 3 xd to 7th segnants.' Iongths in and segnents pronotum
 0.25 ming entare torgite 1.13 nme

There is a shallow, Bent-circular groove in midde rogion of anterfor half of lat tergite. On all segments there is a very low oval fuborcle on each stdo above bases of epimera; these tuborcles together form a line down each side of pereion. Thore is a slightig rugoto area situated to the inner side of each tusborales othorrise remainder of dorsal oumface is amooth. Torgites have a coveming of rounded scalea and also bcar acattered scalomsetac. Scalo-seta (fig. 167) has a short, broad scale portion folleh is produced posterioriy in tho centre to form a club-shaped fold into which a ahort seta projects.

Peresopods. Birst legs- Each of the large egines on log has Its apes difided into several points. Flumorous auch spines aro set olose togother to form a brush on unier surface of both meros and carpos. Simple, spiry setac occur on all axticies. An area at distal end of anterior surface of carpos is covered with long, fine setae. There is a lino of short, asmile spincs on under sursace of
propodos. Dactylos has a brosd torminal clatr, below which is a narrower, sharper accossory claw. A long geta is wet in angle between clave.

The area of fine setae on carpos and line of almple apines on propodos are not repested on 2nd to 7th legs. Large apines on under surface of meros become progreasively less ramerous.

Male orpan. Corioal in outiline. Its two cucta remin distinct and open aeparately undor a flap on ite dorsal muxface.

Pieons Outling of pieon in eemciroular, contimous uth that of pereion. Pleurs of 3xd to 5th eegnents aze large, expended Iaterally, and strongly curved backards; they are sub-rectangular in shape with 4 th and 5 th paire each rarrower than preceding pair. Firut to 5th segmant: are gacoth dorwalif: betweon pleure their poaterior borders are evenis curved. There are no lobes on ventral suxface of $3 x d$ to 5th pleura.

Torainal segment (fig. 168) curves imends on both sides at abont uddie of Its lengths beyond this narroung ita breadth increases again considerably. Mrasdithacross central constrictions 0.52 mine maximum breadth of postigior parts 0.68 me Postorior borider of segment is almost aimaight with its corners biuntiy rounded. Doraal surface of terminal segrant is raised into a broad, blunt, median, longitudinal ridge, which, however, does not entend to postertor border of segment.

Tergites of ploon bear scales and mealo-setae mimilar to thome on paraion.
pleopodg. First ploopod (fig. 169):- Protopodite is produced
on its outer side to form a large oval lobe. Eropodite is sub-iriangular with its apex buntiy roundeds apines occur on its ventral surface near apax. Trachoal part occupies approximately the outer half of axopodite. Endopodite is styliform whth its distal half curved outzards; apical tip of latter is still further curved outwards at a silght angle to the rest. Basal half of endopocilte is provided uith oblique muscles. There is a nawrow chitinous thickening on outer edge of distal hall. A zhdge, which is directed inuands and orrimented uth small scales, extends dom centre of dormal surface of distal half. Surface to innor side of this ridge is indonted, the groove so formed being 1 imited on its imer aide by another, less prominent ridge. There la a row of spimies on dossal aurface of distal half of exdopodite, near its imer border.

Second pleopod:- Exopodite is sub-triangular with its outer margin incurved and ita apical region greatily elongated. Tracheal part occupies the outer lobe of exopodite which is limited by outer arm of thle incurvature. an ventral suxiace, spines are mesent near outor margin of laminar part, and an area covered uith fine zotae extends forwards for some diatance from apex. Inmer margin of exopodito bears ahort setae. Excopodite is harticulate; length of articless Ist $0.28 \mathrm{mmo}, 2 \mathrm{nd} 1.23 \mathrm{mmo}$ Firat article is quadrangular in outline: there is a curved ridge on its ventral surface. Second article is narrow and elongated; there is a clititnous thickening down outer edge of its basal $5 / \varepsilon$, beyond which endopodite becomes very narrow and flagelliforme lenget of flagelifeorn portiont 0.46 mmp

Third pleopodi- Exopodite is sub-triangular ufith its outer
border indented. Its apical part is elongated but to a lesser extent than that of 2nd exopodite. Tracheal part occupies most of the cuter Lobe limited by outer arm of the incurvature. On ventral suxface spines occur near outer margin of laminar part and comb-1ike groupa of setae are present across apex and on innor margin. on dorsal gurface a short. scaly ridge extends backurds from innor ancerior angle. Fouxth pleopod is similar to 3xd.

Fifth pleopod:- Bxopodite is more regulariy twiangular than that of 3xd pleopod, as its outer nargin is acarcely indented; both of 1ts lateral maxgins bear comb-1113z groups of setae.

Uropod (figs. 168, 170). Basel suxface of protopodite is broad and obligue, visibie in dorsal view of uropod, in which viow it occupies approximately $1 / 3$ of length of entire grotopodite. Its breadth is less than length of protopodite. Lencth of hassi surfaces 0.22 mant breadth of basal surface: 0.52 mmog length of entire protopodite: 0.67 nime Beyond basal surface, Lmer border of protopodite Is shallowis and obliquely incurved so that Iree lobe of protopodite gradually bocome considerahly narrowor postemioriy. Its postorior margin is obliquely rounded. Greatest length of lobes 0.55 mm . length of poetemior margins 0.09 mo Area of lobe visible to outer side of temuinal segment, when uropod is attached. is longer on its Imor alde than it is broad; Iength (along inner edge as far as Indentation of terminal segment): 0.35 mes breadth (in a $12 n 0$ acrosa Insertion of empodite): 0.22 m. Eropodite is sub-cylindrical and has an "apical tuit of setaes it temanater considerably in front of posterior border of protopodite. Exopodite is inserted on
doral murface of protopodite, avey from inner border of latter. Anterior to base of exopodite, euxface of protopodite is raised into a aub-triangular prominence. When uropod is attached, the oharp imer angle of this prominance overlaps lateral border of ternanal segment. Endopodite is inserted on ventral surface, near inner border; at base of protopodite. It is sub-ayilindrical, broadening distally, with its aper bluntily rounded; it bears numerous opiny setae and one apical spine. Endopodite terminates far in front of posterior bozier of terminal segnent. Length of ramit exopodite 0.12 mine, endopodite 0.24 mim.

## Pemale.

Length of largest apeciment 6.8 mano breadths 3.4 mis
Ferale differs from male in the following atructuress-
Perelopodst- Large apines on under surface of meros and carpos are less mamerous than on correaponding legs of male.

First pleopod (fig. 171):- Exsopodite 1s Eub-rectangular, very short and broad. Its inner laminar part is almost as large as its outer tracheal part. Splnes are present on ventral surface of laminar part, near its postarior margin. Mndopodite is not developed.

Second pleopodi- Exopodite is sub-triangular, very short and broad, with its outer margin Incurved, and its apex sharply rounded but not greatis elongated. Tracheal part occupies outer angle of exopodite. Spines occur on ventral surface near posterior margin of laminar part, and there are short setae on inner margin. A conical process, which projecta back from imer inde of protopodite, probably represents an
endopodite.
Thira pleopodi- Eropodite is similar in shape to that of 2nd pleopod of fersile and is therefore less elongated posteriorly than 3nd exopodite of male. There is no scaly ridge on its dorsel surface. Fourth exppodite is similar to 3xd.

Pifth pleopods- Eropodite is similar in shape to that of 5th pleopod of male. There is no acaly ridge on its dorsal surface.

## Habitat.

Type localitys:- This description is based on specimens found among debris on ledgas of a cliff above the abore at Tinderbox. Collections were made on the following datess- 25th March, 27th May, 4th Auguet, 19th Hovember, 1957. A total of 11 malas and 25 femalen wis obtalmod.

Other 1ocalftions- Othor apecimans were found under stones at East Rimdon.

## Variation:

In some specimans, pereion and pleon are mottied with addational unpigranted patches which do not represent muacular insertions. Protopodites of uropods of some specimens are coloured purplishmbroun like the rest of the dorssl surface.

Cubaxis tasmaniensis nosp.

Pig. 162. Male specimen, doreal view. (Cephaion and pleon are forestortened due to curvature of animal).

Fig. 163. Cephalon, anterior viev. (Antennae and mouth part have been removed).

Fig. 164. Distal part of inner lobe of right lst maxilla, ventral view.

Fig. 165. Distal part of right maxilliped, ventral view.
Fig. 266. Right epimera of list and 2nd segments of pereion, ventro-lateral view.

Fig. 167. Scalemseta on dorsal surface of 1st segment of pereion, dorsal view.

FIg. 168.

Fig. 170. Right uropod, dormal view.
Fig. 171.

Fig. 169. Left lst pleopod of male, dorsal viev,
Terminal segment and uropods, dorsal view.

Left lat pleopod of female, ventral view.


## Gubayte sulcifrons nosp.

(Figs. 172-180).

Male.

Golour. Dorsal surface of live apecimen is greyiah-brown mottied with unpignented patches, of which only some represent muscular insertions. Protopodites of uropods are orange.

Cephaion. (fig. 172). Surface of vertex is smooth except for a pair of vory lov tubercles situated immediately behird frontal ridge. Frontal line form an uninterrupted ridge wich is only slightis curved backwards and which terminates in a blunt angle on each side of cophalon. Frons is indented by a deep groove sunning parallel to frontal ridge. Region of frons lying between this groove and depressions for 2nd antennae forms a sub-triangular prominence. Lateral processes of clypeus are produced upwards to form large, acute, triangular lobes. Eyes are rounded and compound, each composed of 22-14 ocells.

Rirat antenna. Triarticulate; 3rd article has a group of coarse aetae near its aper.

Second ontenna. Length of peduncle: 2.92 mmos length of axticles of flagellums 1st 0.21 kmo, 2nd 0.53 ume on distal border of each of 2nd to 5th articles of peduncle there is a large aeta, split at the end into several fine points. All articles of antenna bear mumerous sharply pointed setae. Second article of slagellum terminates in a process formod of partiy fused aetae.

Mondibles. Left mandibles- Incisor process concista of

3 aimple teeth, the central tooth being larger than the othors. Lacinia mobilis ends in 2 widely separated teeth. A lobe behind lacinda mobilis has a dense covering of long, simple setae and also bears 2 pencils of setae. One other pancil occurs further back on manalile. Molar portion is represented by a tuft of plumose setae set on a comion basal proceas. Fight mandible:- Incisor process consiats of a large bifid tooth and a amaller aimple tooth. Lacinia mobilis is irregular in shape. There is one pencil of setae on setose 30 be and one other pencil behind lobe. solar portion is like that of left mandible.

Firgt maxills. Outer lobe ende in 10 simple teeth, made up of an outer group of 4 large teeth and an inner group of 6 more slender teeth. On: ventral surface there is a srail spine below base of 4th large tooth.' Outer margin of lobe is bent outuards in a blunt curve, which, together with margin distal to it, is Eringed uth groups of setae. Inner lobe (fig. 273) bears 2 moderately longs charply pointed setose processes. Apex of lobe to outer aide of these processes is rounded and bears groups of short setae.

Second maxdila. Apical part of maxilla is divided into 2 aub-rectangular lobes, with outer lobe approximatoly tuice as wide as inner lobe. On dorsal turface of mardila, base of imer lobe echibits a V-shaped band of chitin. Distal region of imner lobe is densely covered with setae, that of outer lobe bears shorter, finer sotae. Two coarse setae are set on dorsal surface of outer lobe near the angle of notch between lobes.
faxilisped (ifig. 174). Epipodite is marrou, shorter than basis, and har a sharply rounded apex. Basis is ruch broader than endopodite on ifs ventral surface it bears sharply pointed setae. Ischion is the only arificle of entopodite which is distinct; there are 2 large spines on its ventral suriace. A division of romainder of oxdopodito into 2 arcicles iv indicated by a Laint, oblique suture line across its ventral surface, and by a sudden decrease in its width above this line. On inner border of first of these articles thore are 2 groups of setae, basal set consisting of one large seta and one srailer selka, and dictal set of one large sota and 4 smaller setae. Thrse setae occur singly on outer border of endopodite, one on lat article, situated noar base of a poncil which itself lacks sotae, and 2 on 2na arcicle. Apox of endopodite onds in a tuft of setae. Endite is sub-quadrangular with its outer aistal comer rounded off. There are 3 apines on its ventral surface ncar apex, the innor most: one boing larger than the others. Innor corner of aper exhibits a mall indentation in witich is set a short, blunt spine.

Pereion. First epinera are sharply rourded anterioriy and produced forwarde past eyes so that cephalon is sunk in a depression in lat segnent. Onter side of lat opineron is revolute, making dorsal suriace of epineron concavas its latoral margin is simple, lacking a marginal fuxrow. Postorior angle of lst epimeron is aharply rounded and not cleft. On ventral surface of epimeron, in front of posterior angle, thore is a snall, rounded lobe which has no connection with Lateral margin (see fig. 175). Surpace anterior to lobe io not erooved or ridged. Posterior angle of and epiceron is roumed and not oleft. On ventral surface of and epimeron there is a small,
rounded lobe, blunter than that on 1at epineron, iituated well in front of posterior angle, and not comected with epimeral margin (see 1ig. 175). Ventral surface of 3xi epimeron is silgatiy thickenod near its anterior margin. Mpimara of 3rd and 4th segments are trapezoidal and rounded posterioriys those of 5th to 7th aegnents are quadrangular, with posterior angles almost right-angled on 5 th and 6th and sub-acute on 7th. Ipinsra of all segments are direoted backwards at an angle to middle region of segmenta. Between opimera, posterior borders at all tergitow run straight.

Ratio of length of pronotum to length of entice tergite (neasured in the mid-line) is 18 4. 2 in 2nd segment and approxdmately 1: 3.6 in 3rd to 7th regments. Lengtis in and aegmonts pronotum 0.33 ontire tergite 1.40 mmes lengthe in 3rd segrents pronotum 0.42 me, ontice tergite 1.50 .

There is a shellow semicircular groove in middle region of anterior haif of int tergite, otherwiee doral surface of perion is almost amooth, tergites being only slightiy zugose on each wide above bases of epimern. Tergites have a covering of rounded acales and also bear seattered scalo-setac. Scale-seta (fig. 176) has a short, broad scale portion which is produced posteriorly in the centre to form a club-shaped fold into which a short seta projects.

Pereiopode. Firat. legi- Each of the large apinas on lag has its apex divided into several pointu. Invorous such apines are net close together to form a bruah on under surface of both meros and carpos. Slmple, spiny aetae occur on all articlee. An area at diatal and of anterior aurface of carpos is covered uith long, fine setace. There is a line of abort, simple apizes on under aurface of propodos.

Dactylos hat a moad terntial claw, belou wisioh is a nayrover, sharper accescory claw. A long sota is sot in anglo betwcon claws. The aren of sino sotae on carpos and $15 n e$ of singlo apines on propotos are noi repeated on 2nd to 7th logs. Iarge apines on onder surface of nevos becona progressively less muprous.

Male orpon. Condal in outhino. Its two ancts recain distinct and open soparately undor a slap on les clorsal suriace. Plcons Onflino of picon so scmelrculas, continuous with that of pereson. Pleurx of 3xd to 5th segmorto are large, expanded Lateraily, and ofroneky curved hachardss they axe abmrectangular in shape with 4th and 5th pairs ach successively namower than preceding pair. Pirst to 5th segments aro emoth dorsallys betweon plenri theis posteriox borders aro evenly curved. There are no lobes on vontral surface of 3rd to 5th plenra.

Terminal segnent (19g. 177) curves invards on both sides at about midde of ies length. Beyond this conimal namoving; breadth of sognent increases again slightig. Breadth across central constrictions 0.70 mos maximm breacth of posterior part: 0.78 mm . Postemior border of sequont is straight, wiel its cormers Buanty romaded. Dorsal aurace of teminal segment is raised into a broad, Glunt, median, longitudinal ridge, wich, however, docs not extend to posterior boricr of segrent.

Torestes of gioon bear ncaleo and ccalometro similar to thoce on perolon.

Pleopods. First pleopod (I2g. 176)i- Protopodite is produced on ity onter ofde to Rom a lare, oval lobe. Exogodite is
mb-triangular with its aper bluntily roundeds there are a fow apines on ita ventrul muxiace noar aper. racheal part occupies outer half of empodite. Eriopodite is stylifome Its basal hali is provided with oblique ruscles. Bistal half is curved outwardy and has a narrow chithous thickening dous its outer border. 4 ridge, which is oxnamented near its basal end with apinas and more diataliy uhth scales, extonds down addele of: dorsal sumface of distal haif of endopedite. This mige is directed inwards, and auriace to inner side of it is indented, thus forring a groove. Near apex there is a chorter ridge on each side of central ridge. There is a row of mpimies on doxal burface noar inmer border of endopodite.

Second pleopodi- Exopodite 18 mub-triangulargwith its apical region groatiy elongated, and its outer margin incurved. Trachoul part oscupies area of exopodite situated anterior to outer arr of this Incurvature. Spines occur on ventral unface near outer odge of elongated laninar part. Also on ventral susface, an area covered with fine setae begins at apox and extends forwardis for some ilstance. Enciopodito is biarticulatos length of articlem 1st 0.33 mate, 2nd 2.32 rime First articie is quadrangular in outlines there is a curred ridge on 1te ventral axiace. Second article is narrow and elongateds there is a chithoum thickening dom inner edge of its basel 5/8, beyond which endopodite becomen very naxrev and M1agelliform. Iength of flagel11form portion 0.46 man

Thind pleopodi- Enopodite is sub-triangular with ite outer border indenteds it in elongeted posteriorly but to a lesear extent than 2nd expopodite. Tracheal part occuples/area in outer angle of
exppodite. On ventral surface, spincs occur near outer edge of laminar part, and coirb-like groups of setac are present across apex and on inner margin. On dorsel aufiace, a whort, scaly ridge extends backuande from imer anterior anglo. Fourth pleopod is similar to 3xd. Mfth pleopodi- Exopodite is more regularly triangular than that of 3xd pleopod, as its outer margin is scarcely indented. Both of 1 te lateral margins bear comb-1ike groupe of setae.

> Uropod (figs. 177, 179). Basal aurface of protopodite is broad and oblique, visible in dorsal view of uropod, in which view it occupies approximately $1 / 3$ of length of entire protopodite. Its breadth is leas than length of protopodite. Iength of basal aurfaces 0.31 mins breadth of basal surfface: 0.65 manos. length of entire protopodite: 0.90 mme Beyond basal surface, imer border of protopodite is very. shallowly incurved so that free lobe of protopodite graduaily becomes namiover posteriorly. Its posterior margin is obliquely truncate with its corners bluntiy rounded. Greatest length of lobe: 0.70 meme 3 length of postexior margins 0.25 mo. Area of protopodite viaible to outer aide of terminal segnent, when uropod is attached, is longer on Its inner side than it is broads length (along imor edge as far as indentation of terninal segmont): 0.53 ame 3 breacith (in a line across Insertion of exopodite): 0.38 mm . Fropodite is sub-conical and very short, and ends in a tuft of setae. "It is inserted on doraal sumpace of protopodite, avay from inner bonder of latter.: Anterior to insertion of exopodite, eurface of protopodite is raised into a sub-triangular prominence which coverw base of exopodite. "When uropod is attached, the sharp imer angle of this prominence overlaps lateral
border of terminal segnent. Eridopodite is inserted on ventral aumface, near inner border, at base of protopodite. It is aub-yilindrical, bromening distaliy, with ite aper very bluntiv roundeds it beare muorous abaspiy pointed setae and one apical apine. Endopodite tominates far in fromt of posterior border of terminal segment. Iength of rami exopodite 0.09 mmog ondopodite 0.35 mm .

## Female.

 Female affers from male in the following atructurest-

Perelopoder- Large spines on under aurface of meros and carpol anc less muerous than on corresponiting lege of nilo.

First pleopod (Eig. 180)s- Exopodite is aub-rectangular, Very showt and broad. It is divided into an inner landnar part and an outer tracheal part, the two boligg subequal in area. There are a Pew apines on ventral murface of laminar part, near its posterior mangin. Findopodite is not devaloped.

Second pleopodi- Eropodito is sub-triangular, very short and broad, with its outer maxgin shaliowly incurved, and its apers aharpiy zounded but not maricedis elongated. Tracheal part occuptes an area In outer angle of exopodite. On ventral auriace of laminar garty apines are present noar outer boxier and on aper. A narrow, conical process, which projects backwaxde from inner wide of protopodite, probably represents an endopodite.

Thind pleopodi- Exopodite is aimilar in shape to that of 2nd pleopod of female and thas has its aploal region less elongated
than 3rdexopodite of male; there is no scaly ridge on its dorsal surface. Fourth exopodite is similar to 3rd.

Firth pleopodi- Exopodite is similar in ahape to that of 5th pleopod of male; there is no mealy midge on ite dorsal murface.

## gobetat.

Trpe Localltry- This description is based on specimens found on 8th Mach, 1957, empolled and buried in damp, mandy soil at the bace of a cliff above high tide Leval on the shore at Roaring Beach, South Arms 74 miea and 63 females were obtainod.

Other Iocalitieg:- Specimans were found in debris dn ledges of a eliff above the shore at Tinderbox.

## Pariatione

In anil speoimens, the lateral procenses of the clypaus are relatively mborter and blunter than those of mature apecinens, however the cephaion of the former is atill distinct due to the furansverse groove the on the frons. The glight rugoaity on/aidea of the pereial tergites is a 11ttle more pronounced on smiller apecimenso

## Cubaris gulcifnons nosp.

| F1E. 172. | Cophaion, anterior view. (Antennae and mouth parte have been removed). |
| :---: | :---: |
| Pige 173. | Distal part of innor lobe of left lot maxilin, |
|  | ventral view |
| F1E! 174 | Distal part of might caxdilipod, vantral view. |
| FiE. 175 | Rdght epimeza of 1st and 2ad megrents of pereion, |
|  | ventro-lateral view. |
| Pig. 176 | Scalemseta on dorsal surface of lst segment of |
|  | pereion, dorsal view. |
| Fig. 177. | Terminal segrent and uropods, dorsal view. |
| Fig. 178. | Right lat pleopod of male, dorsal view. |
| Fig: 179. | Right uropod, domel viow. |
| Fig. 180. | Left lat pleopod of Penale, ventral view. |



## Gubexa tamemensis nonp. <br> (F1gis. 181m192).

Mele.
Length of largest specimens 10.0 mano breadth: 4.5 min
Colous. Background colour of doxsal surface in live animal 1: darik groy. Cepdalion and pervion exhiblt unplepented patches which represent insertion of musclea. Protopoiltes of uropods are orange-broun at the base, shading to dark groy at the posterior end.

Gephaion (fig. 181). Surface of vertex la slightiy uneven but not tuberculate; it beara acales and acale-setae like those deacribed from pereion. Frontal line porns an uninterrupted, curred ridge which is bent back towards vertex and which ends in a blunt angle on each aide of cephalon. Surface of frons has a shallow depression on each side to receive 2nd antennae. Above these depressions frons is pressed backwards. There is no deep groove across auriace of frons. Lateral lobes of clypens appear right-angled in anterior view and are scarcely procunced upwards. Eyes are rounded and compound, each composed of 15 ceell1.

Eixat antonng. Triaiticulate; 3xd axticle has a group of coarae setae noar ita apax.

Second antenna. Iength of peduncle: 3.00 mana length of articles of flageliuna lat 0.17 mime, 2nd 0.55 man. On distal boxder of each of $2 n d$ to 5 th articles of peduncle there is a large apine, divided towards its apex into several pointes. 4.1 articles of antema bear mumaroum opiny setae, Second articie of flagellum onds in a procens formed of partly fused setas.

Mandibleg. Left mandible (Ifig. 182)i- Incisor process is 3-pointed, being formed of a large, strongly bifid tooth with a amaller simple tooth aituated above it. Both apical angles of laeinis mobjlis are produced to form a blunt tooth. Lobe bohind lecinia mobilis has a dense covering of aimple aetas and also bears 2 pencils of setae. Another 2 pencils of setae occur behind base of lobe. Molar portion set is represented by a tuift of plumome metao/on a oommon beal proasss. plaght mandile (148. 183) i- Inolmor procelis in 3-pointed, being formed of a large, more walcly bifid tooth ulth a smaller almple tooth Ituated above it. Lacinta mobilis is imregular in ohape. Setose lobe behind lacinia mobilis bears one pencil of setae and there are 3 other pencils of setae bebind 10be. Kolar portion is Liks that of left mandible.

Bixst maxilis. Outer lobe onds in 10 simple teoth, forming an outer group of 4 lerge teeth and an imer group of 6 more alender tecth. On ventral arface there are 2 whort apines placed apart from each other below base of 4th large tooth. Outer margin of lobe is curved cutwandes apar of curve and margin distal to it are fringed with groups of setae. Inner lobe (ilg. 184) bears 2 fairly short, thick, blunt aetose processes. Apex of lobe to outer side of these processes is rounded.

Second maxilla. Distal region of madila is divided into 2 sub-rectangular lobes, with outer lobe approxdmately twice with of inner lobe. These lobes are distinctiy separated at apex of maxilla, and further back the diviaion between them is indicated loy a muture lina. On dorsal eurface thore is a $V$-apaped band of chitin at bame
of imer Lobe. Distal region of Inner lobe bas a dense covering of setaes that of outor lobe has a spareer covering of finer setae. kyin11ped (11g. 185). Epipodite 1s long and narrow but shorter than baciss its apare is sharpify rounded. Basla 18 unch broader than eniopodite. On its ventral muxface besif exhibite mattered mpiny setae. Ischion is only article of endopodite which is aistinety there are 2 long apines on its ventral unface. Remainder of ondopodite is sub-conical in outilings a diviaion into 2 articion is indicated by - fasint, oblique auture 14ne. There are 2 groups of setae on inner border of firut of these articles, basal set consisting of one large and one maller aets and distal set of one large meta and 4 mallor setae. Three setae occur singly on outer borier of endopodite; ons on 1st article, sitarated near base of a pencil which itiself lack aetae, and 2 on 2nd axticle. Aper of endopodite onds in a tuft of setac. Indite in aub-quadrangular with ite outer apical angle rounded off. On its ventral nuface noar apor there wre 3 large spines which decreate In length from innormost. one outwards. A short, blunt ipine is apt In a dopreasion at Inner apical angle.

Pereton. Firat eplmera each form an acute anterior angle and are strongly produced forwardi past eyes so that cephalon is ank in depremsion in ist segment. Outer side of lat epimeron is revolute wo that dorsal surfece of epimeron is concave. sctual lateral boxder of epimeron is poderately sharp. Posterior angle of ist epimeron in roundeds its borderw are ontire, not intoriupted ty a cleft. On ventral aurface of epimeron (Ifg. 186) there is a promanent, abaply zounded Lobe which termintes a iltule in front of ponterior border of
segment and rebults in the formation of a moderately deep fiscure on unier alde of epimeron. The aharp outer edge of thile lobe in continuous with a low shige haich extonds forwarde on under surface of eplmeron and which gradually becomes obliterateain anterior third of segment. Bidge is not connocted with outer border of epimeron. Second epimeron is traperoidaly its posterior engle is rounded. On ventral aurface of $2 n d$ epimeron (fig. 186), well in front of posterior angle, there is an ohlique, aharpiy roumied lobe waich results in the formation of a moderately derp flesure on undor side of opimeron. Antorior edge of this lobe is comectod with anterior border of epimeron by a pidge. Lowe doen not project boyoni borders of epimeron. Under tuxface of $3 x d$ epimeron is allghtly thickened near ita anterior border. Third and 4th eptinere are trapezoidal and rounded posteriorizy. XIfth to 7th epinera axe quadrangular with their porterior angle: Sorming zounded might angles. Eptwara of all segrints are directed beoknaris at an angle to midale regtion of their sespective degrents. Aoroas middle of body, posterior borders of all tercites run atraight.

Ratioi of length of pronotum to length of entire tergite (measured in the medilini) is it hol in 2na aegnent and approximately If 3.7 in 3xil to 7th segmante. Ieagthis in 2nd segrenti pronotum 0.38 mmo , ontire targite 2.58 mmo longthe in 3 ma segnents pronotum 0.44 mmo , entire torgite 1.65 घme

Thore is a very shallow, manfoixcular groove in middla of anterior half of lat tergito, and on all teretes there is a slightiy zugone area on each side above bases of ephneray remainder of dorsel manface of pereion as grooth. Tergites have a covering of rounded
scales and also bear momous scattered sorlemetage Scaleaseta." (fige 187) has a broad bagal scale part which is curved backwaris on each side and is joinod in the midale to a Iong sheath, pointed at its apers seta projecte into base of shath.

Pereiopods. First legi- Each of the large spinea on leg is cifided near its apar into severil point which segarate off at different levela. humerous guch spinas aze bet close together to Soxm a bragh on under surface of both meros and emmpos. Simple, phiv setac are preaent on all axticles. An area on antorior muxace at distal end of carpos is covered with long, Ine setae. Short, simple mpines oceur along under suxface of basal gart of propodos. Dactylos has a broad terminal alaw, below wioh is a much marrower accessory claw a long tots is get in angle between claws.

The area of setae at distal end of carpos and line of atmpie ppines on under muface of propocios are not repeated on 2nd to 7th lega. Large spines on under surface of meros and caspos becone progremeively sparaex.

Male orfan. Conical in outiline; ita two ducts remain alatinet and open separately under a flap on $2 t a$ dorsal inuface.

Ploon. Outilno of pleon is semicircuiar, contimous weth that of porelone Pleura of 3xi to 5th sopments are laxge, erpanied Iateralif and curved backwardis they are sub-reotangular in phape with 4th and 5th pairs each narrower than meceding pairy Postorior boxders of lat and 2nd segrents are eveniy curved; between pleura, those of 3rd to 5th aegments mun atraighte Dorsal auxface of let to 5th megents is anooth. There are ng lobes on ventral surface of 3nd to 5th pleura.

Terninal segnont (fig. 188)curve imards on both sides at about madde of its longthy beyond this narrowing its breadth increasea again considerably. Breadth across central constrictions 0.90 man raydrum breadth of posterior parts 1.12 mon. Posterior border 20 otraight with ita cornors bluntly rounded. Dorsal surface of basal part of toratinal segmont is alightiy railod into a moad median eminance.

Tercites of pleon bear scales and scalometae like those on perejon.

Pleopods. First pleopod (eig 189):- Outer alde of protopodite is produceat to form a large ovel lobe. Hzopodite is sub-tatiangular with its aper hurtily sounded and sta cuter bozder incurved. It is divided into an inner laminar part and a dowewhat omalier, outer tracheal part, Spines occue on ventrel surface of apical angle. Endopodite is atylifom with its diatal haif curved outwarde. Its basal hale is prorided with ohlique maciest There is a narrou chitinous thickening down cuter eige of aistal half. On dorsal aurface aldge, which is ornamented with scales, extends down centre of aistal part of endopodite. Thle ridge is directed invaride and surface to imer side of it is imented, thus forming a groove. There Is a shorter, less prominent ridge to outer alde of central ridge.参 yow of apanulea is present on dorsal surfiace nose imner bozder of endopodite.

Second pleopodi- Bxopodite is sub-triangular, very namiow and elongated postemioriy, with its apex sharpily rounded its cuter
boxder is deeniy incurved. Tracheal part occugdes the outer loke of exopodito which is bordered by outer arm of this incurvature. An area covered with flue setae extends from aper forvarals for nome distance on ventral eumfece of expopisto. Spines occur on ventral surface near outer border of Laminar part. Endopodite is Biarticulate; Iongth of articleas 1st 0.52 mmo ind 1.52 nm. Flust articie is quadrangular in outlines there is a curred mage on its ventral nuxface. Second articio is marrow and elongted. Shere is a chitinous thiclsening dow outer aide of ita basail $5 / 5$, beyond which article becomen very janyov ard mlagelifoxm, length of ilageliform portions 0.54 mim

Third pleopodi- Eropodito is bub-triangilar and elongated posteriorly brit to a leaser degree than 2nd asopodites its apex is sharpiy rounded and its outer berder is deepiy incurved. Trachoal part occupies tha outer lobe gitwated in front of cutar arm of this incurvature. On ventral surface, comb-1ing groupe af setse occur on and noar inner margin, and pines aro present mean outor margin of ininuas part. On dorsal aurface a ibhort, scalo-covered ridge extends hackwardi from neas inner antortor angle.

Fourth pleopodis- Bropodito is less elongated posterloriy than 3xd eropodites otherwae 4th mleopod is singlar to 3xd.

Fifth pleopeit- Esopodite difíors in shape from that af 3na pleopad in batng more regulariy tufingular with ths outer border onyy alightily indented. Comblife group of betae aze present on both Iateral brriers of exopodite.

Uropod (12ga. 188, 199). Paral aunface of protopodite is
broad and oblique, visible in donsel view of uropod, in which view it occupies epproximately $1 / 3$ longth of entire protopodite. Its breadth $2 s$ leas than length of protopodite. Length of basal suxfce: $0.31 \mathrm{~mm} \cdot 1$ breadth of basel surfaces 0.65 min $:$ length of entire protopodites 0.85 mm . Beyond basal surface, inner border is shallowiy incurved so that iree lobe of protopodito gradually becomes narrower posterioriy. Itw posteriop margin is etraight, alightiy oblique, and has its cormery bluntily rounded. Greatest length of lober 0.62 mmos Iength of posterior margins 0.21 ume Area of protopodite visible to outer mide of terminal eegment, when uropod is attached, is longer on its inner side than it in broms length (along inner edge as far as indentation of posterior eegment): $0.57 \mathrm{~mm} \cdot 3$ breadth (In a Ine acrose insertion of excopodite): 0.40 min. Exopodite 10 very short, sub-conical, and onds in a tuft of setae. It is inserted on dorsal surface of protopodite away from inner border of latter. Anterior to insertion of exopodito, surface of protopodite is raised into a sub-triangular prominence which coivers base of exopodite. When uropod is attached, the sharpiy rounded inner angle of this prominence overlape lateral boxder of terminal aegment. Endopodite is inserted on ventral mufiace, near imer borier, at base of protopodite. It is sub-cylindical, broadoning at fixst, then slightly narrowing again posterioriy, with 1ts aper moderately shampiy rombied. Endopodite beare epiny setae and one apical spine. It terrinates distinctily in front of posterior boyder of texninal segment. Length of ranit exopedite 0.11 men endopodite 0.38 Im.

## Femala.

Peanle diffors iron male in the following structureat-
Perelopoda:- Spines on. under surface of meros and carpos are Leas mamerous than on corrosponding loge of nale.

Pirat pleopod (fig. 191):- Roppodite is sub-rectangular, very short and broad. Its innor, laminar part is alnosi as large as its outer, tricheal part. Spines occur on vontral aurface of landmar part, near its postorior margin. Endopodito is not doveloped.

Second pleopod (fig. 192)sa Exopodito ls sub-sriangalar, very short and broad, fith its outor border inourved and its apax rather bluntily rounded; it is not markediy elongared posturioriy. Trachal part occupion an area in outer angle of exopodito. on ventral aurface, spines occur near outor bonder of laminar part and on apical angle, A condical process, projecting techaxde from inner alde of protopodite, probabiy represents an endopodite.

Third pleopodi- Exopoaste is alnilar in shape to that of 2nd pleopod of female, and its apical region is therefore ruch less elongated posteriorly than that of 3rd exopodite of males thero is no scaly ridge on its corsal surface.

Fourth pleopods- Aper of exopodite is nore sharpiy roumded than in 3xd expopaite of semale otherwise 4th pleopod is piralar to 3xd.

Fiftic pleopocil- Exopodite is eimelar in shapo to that of 5th ploopod of males thore is no scaly zidge on its dorsai suxface.

## Habitat.

Type locality:- Thas description in macd on spocinons collected on 27th Decerber, 1957, Iron among downt unier grass tusabohz
growing innedistely Inland from the shore of the Tamar River at Swan Point, West Tomary 7 males and 21 females vere obtained.

Other Zocalitiags- Other specimans were sound under stones and piant debris on the ground imediately iniand from a beach at Weat Ulverstono.

## Veriationg.

In aome specimons, cephalon, perelon and pleon are mottled with adiational unpignonted patches, distinct from those representing insertions of macles.

In one epeciman the outer. Iobe of the left lat maxilla axhibite only 5 inner teeth. whing that of the right lat maxila has 7 Imer tseth.

## Gubacis tamarensis nosp.

| PLE. 181. | Cephalon, anterior view, (Antomae and couth paris have been removed). |
| :---: | :---: |
| Fig. 182. | Distal part of left mandible, dorsal viow |
| Fig. 183. | Distal pare of right mandible, dorsal view. |
| Fig. 184. | Distal part of innor lobe of right lot maxilla, ventral view. |
| Fig. 185. | Distal part of left maxilliped, ventral viow. |
| Fig. 186. | Right opimera of lst and 2nd segments of pereion, ventro-lateral view. |
| Flg. 187. | Scalemseta on dorsal surface of lst segment of pereion, dorsal view. |
| Fig. 188. | Terminal segrent and uropods, dorsal view. |
| Fig. 189. | Left lit pleopod of male, dorsal viewo |
| Fig. 190. | Right uropod, dorsal view. |
| F1g. 191. | Right lat pleopod of female, ventral view. |
| Fig. 192. | Rigint and pleopod of Perale, ventral view. |



## Gemzs Sphaeri 310 VerboefP 1926.

(non Spberyilo Dama 1852).
Symonyy: Dryciullo Herold 1931.
Chelomadilio Hexold 1931.
FRydillo Verhoer 1937.
Spherinio, Eection XIII, Budde-Iund 1904 (in part).
Dans (1852, pi 201; 1853, ppi 715, 719) gaves very briaf definition of his gemus Sphexilio. In 1853 he describes four new
 and Sph gninosy, but does not designate any one of them as the type. In a Iater paper (Dana 1854), be eatablishes anothor speciea, Sphe gefinisa

Cudde-Iund (1904) extends the 14mits of Spherilio to include sixty-five apacies. He groups these into thirteen sections within the genus and nominates a type for each rection. He tranafers Sphe affinis Dans to his section II of Armadilig, but rotains all four of Dana's original speciea in Sphexilio.

Vorhoeff (1926, D. 250) consider that Spherilion as it is treated by Budemand, lis an unnatural gems.- He prefers to spell the narpe of the gerus as Sphaerdilo. In heys to genera of Armadiliddae, Verhoeff (pp. 252-258) restrict Spherfilos he (p. 295) names the resiricted germs as "Sphaerinio (Dana) s.str." But none of Dana's oxiginal species of Sphemilio belong in Sphaerilio as it is IInited by Verhoeff.

Jaclaon (1941, p. 2) considars that Verhoeffis Sphnerilio contains the species placed by Budde-Iund in his aection XIII of Spherillo; this seotion does not inciude any of Danals apecies. He
notes that, according to article 35 of the Intornational Rules of
 Dame. Hovever be (p, 3) is of the oparion that woricers on Spherilio have so conaistentily negleoted to apply the International Rules of Honenclature that it is now too late to do more than protest fomally, and, in the interest of clarity, to accept the atatus quo. He suggeats that, on these grounds, Sphaerilio Verhoeff ahould be retained as the generic name for the forms inoluded under Budio-luni's section IIII, and that Sphemilio should be allowed to die out as its species are abmorbed into now or exiating ganare. In hilo check-list Jackson (pp. 19-23) Groupe all species of Sphesfile in the wide aense under the heading of Spherilio Dana, but diatinguishas the apecies which be
 using for each the appropriate apolling of the genorio name. In addition to Verboeffis apecies and those in section XIII, Jackson thus places in Sphasming tho Pollouing apeciati- Sphaemilio (Xeatodinlo) marquesarum (Jackson 1933a) and Spherilio gocictatis (Haccagno 1932). Vandal (1945; p. 254) recognimes "Sphaerfilo Verhooff (noo Spherille Dana)."

One of the spscies in Budde-Iund's aection IIII, Sphomilla miselius (Buddo-Inad 1885) Budde-Irand 1904, is recorted fron Tastants by its author. If Jackson's proposal is followed, this apeoies should be placed in Sphapmillo Vorhooff. Hoveror it is noted that Veriooff alters his concopt of sphaerilig in asperont papors, costify unithout explaining his rcasons for dosef so. I thorefore foel obliged to
examine the patter more closely before I accept Jackson's asalgment
 this gandue. The following account of Vertoertis work on Sphaertile explain the alturtion

Verhoerf (1926; ppo 254-255) in his key a, mections L and $M$, Leoyr Sohaerilito and othor genere opposito Armadil10, Drandt 1833, Veriooif 1926 s.ettr. He clatms that in Amadillo sustre tho groove which ie a contination of the cleft in the poeterior axgle of the let epimeron, is prolonged forwerde to the antorior angle of the -phorion, thoreas in Sphaeri110 and others, if aroh a groove ocours, it doos not resoh the anterior angle of the eptineron. In aection I be etate that the inner lobe of the lat epimeron in Schaerilig form a contimation of the epimeral borier and is viaible from the outer alde of the eptmeron. In this paper Verboeff places no reatriction on the baokuard extent of the inner lobe of the let epinaron in relation to that of the outor ponterior angle, the oomection or othorwate of the 2obe on the 2nd eplmoron with the epdmeral border, or the presence or absente of lobes on the under maface of the 7th opimora of the porelon and the plema of the pleon in Sphaerilino. Vorhoeff divide genus Sphaezilin Into two new mubegenara, Sphaezilio

 and asalgne to Yertodillo; Snh. (X.). sebricolor (Stebbing 1900b) and two now apacies, Sph. (X) 14foranail and Sph. (X.) polstur. It is
noted that Verbooff (pp. 258, 296, 301m303) makes aeveral raferoncen to a mpecien the name of "ythtatur", but no species is described under this name. On pe 302 be stateis- Die Uropoden besitzon
 sig. 65 is labeilod as a drawing of the uropot of Sph stbyicolor (Stebbang) on po 357 he atmen "Cubaris mbricolox Stobb. $=$
 Whould be appiled to Sche sebricolor. Vorhoefy (p. 303) statee that in Sph. (X.) poistus the groove from the cleft in the lst oplmoron extende forwards to the anterior angle of the eplmeron. This contredict the livelt for Spherillo mot in his key a to genera.

Verboeff (1928, p. 209) establishes another neu apeoien of


Herold (1931, po 321) tranifers Spho hebridgrum Verhoaff 1926 to his new genus Lobodille, noting that he has found that this apeciea poimeasees lobes on the urior gide of the pleura of the pleons the presence of auch lobes is a charactor of the gemus. In the mame papar Herold orecte another two genern, Dryadilo and ghelomedilio, in both of which 1obes are absent from the under whe of the 7th opimera of the pereion and the pleure of the pleon. Herold (ppe 316, 335) Wtates that in pryain11a the imor lobe of the lat epimeron is ohort and does not reach the ponterior border of the outer 10 be , but remeine conitiderably removed irom it, whoreat in Cholomedilio (eee ppe $316-349$ ) the inner lobe of the lat epineron is long, reaching about to the pontariox borier of the outer iobe. In bie ginerie alagnosis of Ghelomadivio be (p. 349y) wate that the aleft in the

Int opimaron in contimous with a groove which reacher to the anterior angle of the epimeron.

Verhooff (1937) establichea a now gemis, Rundi12, for on new apecies, R. takakuwai. In his ramarion on the genw he (p. 419) cleavit that the posterior angie of the lat opdmoron is almply roumied and that the inner lobe thorifore doem not form a continumition of the opinaril bortor. However, in his description of $E_{\text {. }}$ tatabonati, be ( $\mathrm{p}, 420$ ) states that the inner lobe of the 1 st opinemin pasees over in a curve into the lateral border, and in has Plgure (fige 14) of thil stiructure the inner lobe in shown ac being contimous with the latorel border. The inner lobe of the lat opimeron in Be falabust terninateal considerably in front of the poitorior bordor of the epimeron.

Verhoeff (1938; p. 3) eonfly the presence of ventrial lobes on the pleura of Lobodillo hebrignan (Voxhooff 1926), but considons that thia apecie in wrongiy piaced in Loboditio and transform it to
 b) kny Spheanilio and other genorm oppoalto Iobodillo and yelanaviliae. mapainting that lobee ("Phylecomerwn") are abent from the under nide of the 7th epdione of the pervion and the 3xi to 5th pience of the pleon in inphearille and the othexw. In aection a of this key be Surthar 1inite spharille wo stating that the innor lobe of the let opdmeron reachell, or projecte beyom, the posterior border of the epimaron, and that the 1 mer 30 be on the 2nd opderion is comected with the epimoral boxdor. He refers to tho genis as Ephoretile Verke. ( $n$ Chalomadilie Horola)." on p. 6 be nitas that Chelomadilio agreet with ghacrillg in heving the frmor lobe of the lat opimeron long,
reaching to the posterior border of the outor 1000 and adde that in
 alvay boconcs realior antoriority and unich, ouE. as in Sph. rebricolor, roaches about to tho ntidile of the latoral border of the exineron. But Herold (1931, D. 349) states that this croove in Ghelonalinio extends to the antorior angle of the epinerone In this (1938) kexy to
 from Sblaemillo.

Verioese (1942, pe 96) placos in Sphemento a apcoice whith
 ansumed from this that Verhoofite spoaica is not the ame as sphosilio
 XIII of Sphemillo, and uhsoh is nomed by Jackson (1241, p. 21) as

 A conparision of tho charactore of Vorhooif's apcoles whth those of
 that those two species are distinet.

Verhoeff ( 1942 it , Do 165) atakes that he now intorprets
 a log to the stab-genora he rafore to Sphatrillo as "sub-coms Spacritilo
 subugorms afatinct fron sub-gerne Sphaxilio. Verhoofe ciatins that the innor lobe of the ist epimeron reraing far in front of the porterior
 whilet in corstrast it almat or axnctily reaches, or even exteads beyond,
the posterior bordor in cholonadilio and Xegrodil1g. In conorasting Rundillo to tub-cran Sphaeminin he notos that the outor bordor of the let epinoron in Rivodilo is thickened and aimilar to that of Yeatodillo, whereas in Sphoriliz thels boxdor is narrow and aharp-edgea. According to Verhoeff (1942b, p. 168), aub-genus Sphagrillo now includes, in addition to Herold's (1931) nine apecioe of pryadilio. the following peolent- Sphe prement, Sah. esteriz, Sph. opacys, Sphe pontizrapuas Verhooff, and a new apeoios, Sph. Ansularum. But according to his origimal descriptions of the spcaios, the innor lobo
 beoknarde as far an the outer posterior angle of the epimoron, (at Jeast when it is view from the outer aide of the opimoron). Thase
 which Verhooff seta down on $p_{0} 165$ of this same papor. Sphe montivagan Verhoorf and Sphe thenlarum both conflict with Vorhooff's (1938) limat on the lobe of the 20d epinoron in baving this lobe complotoly separatod from thio epineral border.

It is agparont from this account of gemus Sphaovilio Forhoorg 1926 that Verhoefr causos a groat deal of confusion regaxding the limite and rynonyuy of the gemis. He (2926) minintorprete the rolathonahip of his Spherillo with Suhanile Dana. Ho gives no true alagnosis of Sphoentilo but alvays dofinos itis 1inits ir means of keys. In 1926 he restricts the exient of the proove continumis with the oleft in the lat eptmoron for the gorms as a wholat than, In the same papor, be includes in the gemas a apocies whicin bolonga outside this reatriction. He (1938) later mponymes with

Spheri110 a geme which 11kendec falle outiside this reatriction. Hie Lindt on the baknaxd extent of the inner lobe of the lat opimeron in relation to tbat of the outer ponterior angile, as aet dovn for gom Sphayfily in 1988, in in atreat opponition to that
 applise to the ynonymy or diatinction of Chelomitillo and Dexiralilo which is dependant on this chareoter. In 1942p be rotaine in
 be derinnt them in thet paper. Having reatrieted the oharacter of the lobe on the 20a opimaron in 1988 be mubeqquentily places in Spheratile two apeoies whiloh do not comply with this remeriction. Probably thia compilicated altumtion parilig seaulte from the fact that a satimfactory trpe apecies hat not been denignted for gem Spharati10s

## sye apeotion.

Verhoete (1926) naturailis does not nominate one of his spoeiew at the type of Sphaemilo as he doas not regard the gema be be mput

Jackon (1941, pp. 2-3) considers that if a type ia mought for seation IIII of Sphayin1o, it appeare that Sphort110 ganat Holinr 1868 mut be nominated; be $(p, 19)$ inter names Sphayil1e dapas at the type specien of Spheryilio Verhooft. This procedure is contrary to serveral wection of Axticle 30 of the Bules of Zcologleal Honenalature (as reproduced in Sohenk and yalastex ( 2936 ; pp. 34-35), Budio-Inmi (1904, p. 53) designates Sph. montiryay (Bualio-Iund 1885)
as the type of his section XIII, and wueh designation ahould not be -ubject to ohage, (see sedition I, a, p. 34). In any case, Sphe dange ahoula be excluded from consideration as the bype of section XIII, as it in doubtfulify placed in this eeetion by Budie-Iund

 under the genoric mame the tim of ite original pubilontion, and is thorefore exoluded srom consideration as the typo of this gerus, (soe estion II, © . 4, p. 34). Tharefore Jaclesontig dealgnation of Spht danae as the type of Sphaezilio mould not be mustainod. Spha mentigragu (Budde-Iund) can not be regarded at the trpe of Sphgerilia for the same reaton. Thus the gemis to date hail no atiaradtony type apociob. of the ar apecion placed in germil Sphaentile by Verhoeff (1926) thisee belong in sub-gomas Xestodi210. One of the tharee originaily inciuded in aub-genus Sphorfillo, Spho bebydarum, is now
 uropodis of a kind charaoteriatic of Arpadilionestre. rather than of

 the obvious choice for a typo. I therefore denignate Sphacritio grapacus Verhooft 1926 as the type spocies of gemas Sphaseilio Verbeert 1926.

Le previounly noted, Verhoeff (1926, po 296), in hia oxiganal deseription of Side. gremacula, states that the inner lobe of the Int ephenon in this apecies projecti backuards as far as the outer positerior-
angle of the epimeron. That this character in the type apecies compliea with Verhooff's (1938) reatriction on the inner lobe of the Iet epimion for genve Spherijio and contradict hil (1942b) later obaracterimation of mb-gerna Sphaerille. Fiven if Terboeffls (1938) xestriotion for the genve as a whole is rejected, if uib-genera are to be distinguished en this feature of the lat oplmeron, the typical rubugemus Spherilio mut be charactarisod by the condition achibitad by the type apecies, and ahould therefore inolude oniy thowe apeoien in which the inner lobe of the Int opimaron projecta brokuarim approximitely at fur ale, or further than, the outer posterior
 Spheorille can not be uphold. A1so Verhooff's (1942, ifg. 19),
 Verhooff and Sph. Aprulariw both show the inner lobe texminatiag far In front of the posterior angle. Theme apeoles can no longer be included in mub-gorme sphererilo.

The queation now arimes as to whethor it is preferable to eccopt Verbocte' (1938) mestrietion on the inner lobe of the lat opimeron and to roinutate gracillio and Bughilo to thair original rank of genere diatinct ifon Spherefilo; or to formally remove thin mestriction so that the apecie having the imer lobe terminating conalderabiy in front of the ponterior angle, which are inoluded in Sphaerille by Verhoerf (1942b), noed not be xemoved from the gemus beane of this charmetor. Veribeff (19289, p. 209), in listing
 inner lobe of the int epimaron in these apocies does indeed project
backwards as far as the outer porterior ancle unen the epineron is viewed from the cuicr alde, but adis that when it is acen from the innor aide she imer lobe terminatos a litile in front of the outor angic. He illustrate the amer viev in his iligure (íice 8) of Snto gracus. Ceriainly the dimtane to thich the annor lobe saile chort of the poaterior angle, as thoun in thin sigure, is not conslcerable unilite the conaltion shoun in Herolite (1931, fige 85)
 notes as baing chametoriatic of gemas bxrisile, and Verhooff's
 Ftus the dastinotion between aub-germ Sphaerilio and Dryndille remalne. Howerer, in viou of this lator qualification of Verboorf! origetnul description of Sphe ryoment, I prefer yot to mocept the (1938) rativiation of the gemu on this charadter of the lat epimeron uthout having an oppoctunity to examine apeoimens of the type species.

With regra to the other charactore in doubt, the ariginal description of Spho nymaine for of ang assietance, as thois condition in thie ipecies is not poted. However Vertoeff (1928),
 but in a comparison of the two apecies he does not mention the extent of the grocve continatous with the clart in the lot epineron, or the eprientilan ore otberudee of the lobe on the 2nd epineron with the optacial bontar. It thorefore man reamonable to masum thet
 to Verhoeft: (1928. 12g. 8, 9) Araminge of Sphe oraculy, this groove in the lat epimeron torminates a conaiderable distance behind the
antordor angle of tio epinoron, and the lobe on tho 200 opimeren is connected thet the epicoral borcor. This supporiss Verhoeasts (1926) restriction on the former character and his (1920) restraction on the latter.

However I am not convinced that it is aâvisablo to confine Sphaerin10 Bo these narrower limits, With the discrepancy rogaritne the typical atate of the inner lose or the lob epinomon aetelod, the chiof causo of confusion is romorcd, and it trould result in sowor conplionetions recaraing tho position of individual apecies to exploy tho wider 15mits on those two charactors as well.

I thorefore recognife the linits of genus Sphaeri110 as givon by Verhoeff (1926, pp. 252-258), (1938, p. 7) with the excoptions that the groove contiming formards fron tho cloft in the let opameron may extond to the anterior angle of the epinoroz, the innor lobe of tho 18t epimeron nay Cemsinte consldarably in front of the orator posterior angle of the epireron, and the lobe on the 2nd epinoron may be separated fron the eptmoral border. This allows apecics originally placed in


In his (193s) les to genera, Verhoofs uses his reatriction on the lote of the and epimeron in Sphareilio to diotinguiah this cems from ficrodillo Verhoord 1933, in wich thss 10be io coparated Erom the epimaral border. However, in an carisor congarisom of tho two genera, he (1933, p. 98) notoo that Herodillo also alifers irom Sphaerillo in that the inner lobe of eho ley opinoron in the former Is not visible from tho outor aicio of tho opirnroz, and tho form of the uropods differs. Nhus, with tho rovericelion on tho and opirorom in

Smherilio remod, this goms is atill atatinct from Hiczodillo.
As Vertocifts deffaiesions are ontirely diven as portions of legys, I propose the foliowing alagnosis of gems Sphacritio Verinoeff 1926, basea on the information on the gemus given by Vertoef: (1926, pp. 252-258, 263-20.4, 295), (1930, p. 7), but anended on the polnts alscussed.

## Conexte diamosit.

Dorsal surface of aniral is smooth, rucose or tuberculate, tout lacha apines. Sccond antonnac are alendeniy buillt with thoir Ercater part projeceing out from cephalon. Firse torgte of pereion does not exhititt a wellmareloped central eninence. (af. Orodillo Verhoesf 1926). Poatorior borders of 2nd to 4th perelal tergiter are elither not incurved or only allghtig inourved on aach side. Iatoral bozdor of lat opimaron is oithor narzow and sharp-adged or thickened unierneaih. Posterior angle of lat epimeron exifibits a deep cleft reaniting in the formation of an inner lobe which is conelmous with lateral epimeral borier and is visible from outor aide of epimeron. Inner lobe may project backwards approximately as far as, or furthor than, outer posterior angle of epimeron, or lit may terminaic coneidorably in front of postorior angle. If a. groove contimues formands fron clost in ponterior angle, it may eriond to anterior ancle os epimeron or may torcinate before reaching thits anglo. Lobe on and ogimeron ray be connected with, or separated frou, opimoral border. Ho lobes ("Paylacomeren" of Verhoers 1930) are present on undor aurface of 7th epinora of peroion or 3xd to 5th pleura of pleon. Dorsal surface of tominsl secront is not keelod (af. Horulaneila Vorhoere 1926).

Posterior borler of texrinal sogront is not deeply incised in tibe
 (Budde-Lund 1885) Verboeff 1926). Pleopods occupy considerably more than $1 / 3$ breadth of pleon. Eropodites of all ploopode possess paeudotrachsas. Fixopodites are not divided into layere (of. Evidelundis Michuelsen 1912). Breadih of anterior border of protopodite of uropod, if greater than length of cuter border of protopodite, is not more than 5/4 timo the Intter: (ef. Ochetodilio Verioerf 1926). Basal marface of protopodite attains not more than $1 / 3$ length of entire protopodite. Inner border of protopodits in incurved, but not angularify Indented near insertion of exopodite (cr. Meruiana Budite-Iumd 1913, Verhoeff 1926 E.str.). Outer side of protopodite in not produced outiarie to form a triangular lobe (of. Brydodille Verhoeff 1926). Gropodite of uropod variee in length, but if it is very whort ( $1 / 4$ or laws than $1 / 4$ breadth of lobe of protopodito), then the free lobe of protopodite, measured on its inner border up as far as iateral indantation of terninal segment, is longer than it is broad acrowa the niadle, (ef. Armadilis Brandt 1833, Verhooff 1926 a.stro). In the uxceptional case, Boge Spho Sisgug Verhoarf 1926, where $\because$ ucopodite is very ehort and free lobe of protopodite is not broader than long, Iateral border of lat epfrioron is narrow and sharp-edged undernoath, thus distinguishing the apecien from Axydinio asitis. Surface of protopodite ie not elevated posterior to exopodite (of. Acenthodilio Verhoeff 1926).

Genotrras. Sphaeritio rropaepi Vorhooff 1926.
Diue to previous differencen in the limits of the gemus it
neen advieable to compare the characters of all species assigned to It whith this diagnosis to deternine whether any of then mus now be renoved. The original descriptions of these species have been exanined accordingly.

Verhoaft (1942, p. 97) states that the last pleuron of the pleon in Sphe nontixacus Verhoeff has a lobe on its under suruface. This excludes the apocies from Sphaeryilo according to the linite wish I recogalpe. However, as Verhooifis deacription is briaf, an attompt to place the species elsowhere on this alone appears inadvisable. The poaition of Sphe pontivesur Verhooff therefore remaina in doubt.

Four of the spocies included by Budde-Iund (1904) in his section XIII of Spheri110; Spheri110 parys (Budde-Iund 1885); Sphe
 on the under aurface of the 3rd to 5th pleura of the pleon, (according to Budde-Iund (1908, pi 271) in the case of Sphe ratyug). These species are therefore excluded from Sphseatilo; they may possibly belong in Lobodij10 or Helanasizig.

The torminal segment of Spho hrezis Budde-Iund 1904 is slightily keeled on its dormal surface. The exopodite of the uropod in Sph. coecun (Dolifus 1898) is completely atrophica. The protopodite of the uropod in Sinh hroricaula (Dollfun ioge) is very short and broad. Thus those apocies mas be uronciv placed in Sphaerillo. The orictinal description of Spho pictyn Holier 1868 is very inadequate and makes no mention of charactors of list epimeron. Uahribere (1922, p. 233) states that two of his new apecies,

Spherinio tuberosur and Spha telsogrossua, bolong in Budde-Iundis section XIII of Spherilio. Sph tuberosus is excluded from Sphasifilo on the form of the uropods. Verhoeff (1926, p. 270) recognizes that the characters of this species agree with those of his new genus Acanthodillo. According to Wahrberg ( $\mathrm{p}, 249$ ) an imer duplicature 1a represented as a thickening on the 5th to 7th epimera of the pereion in Sph. telangrossun. As lobes are absent from the under side of the 7th epimera in Sphaernilo, the position of Sphe teleosrobsus in this genue is doubtarul.

As far as can be ascertained from the information given in the original descriptions, the characters of the remaining speciea assigned to Sphaerilio, Including those of Spho misellus (Budiomiund), do not conflict wath the diagnosis of the gerus proposed in the present paper.

As far as aub-genera are concernod, I am not certain of the relationship of Chelomadilio with sub-gemus Sphgerillo. With the latter restricted to species having the inner lobe of the lst epimeron projecting backwards as far ab, or further than, the outer posterior angle, as I suggeat, Herold!s apecies of Ghelomadillo agree with it In this regard. However Herold (1931) does not note the condition of the latoral border of the lat opimeron in these species; i.e. whether it is narrov and sharp-edged as in aub-genus Sohaeri110, or thickened as in Xestodilin. I therefore recognise the species oxiginalis placed in Chelomadilio as belonging in gemus Sphoerilio, but do not classify them further into a sub-gems.

Gemus Sphaemilo Verhoeff 1926 therefore appoars to contain
the following apociesi-
Species not included in Buddeminnd's acetion XIII os Sphemilo:Sphaeri110 (Sphaeril10) pypraeus Verhoesi 1926 (bype apecics): 3ph. (Sphe)

 (X.) polttus, Verioeff 1926; Sph. (X.) mangesaryn (Jechson 1933a); Sph. (Dryadilo) Scueniorni, Sph. (Dro) bedoliensie, Sph. (Dra) baliensis, Sph. (Dra) arcancelits, Spho (Dra) schellonioretis, Sphe (Dr) montanua, Sph. (Dri) haberert, Sph. (Dra) mapaiftous, Sph. (Dro) aexinneatus,
 Sphe tuberifrons, Sph pratulosus, Soh nitens, (Herold 1931); Sphe societatis (lyccapno 1932); Sph insulanm VerthoefY 1942b.

Species inoludod in Budde-Iand's scetion XIII of Sphoxi11g:-
 (Budde-Iund 1885); Sph. melanurus (Do1lfus 1886); Sph. glozestanng,
 (Brade-Iund 1904).

The following additional apecies of section XIII of Sphemilo may bolong in Sphemillo, but their descriptions give riso to some
 Sph.? brovicavis, (Dolifus 1898); Sph.? brovis (Buaddo-Iund 1904); Sphat telsognossus (Wabrborg 1922).

Sphe montivarus Verhoerf 1942a does noi correctly bolong in Sphacmilo, But an altornailive position for thas apecios can not be sugerotod.

Thus the opecien contont of gemus Sphacrilio Vertoosi is not
greatiy aitered by uy inveatigations. However it is boped that these may assiet in mabilising the position of the gemes as a whole.

Sphaoritio misoliug (Buddeminn 1835) Jackaon 1941.

Sphowillo misallus (Budde-Iund 1885) Bude-Innd 19040
The position of Sphe miseline in genus Sphgerilio Vertoofs La considered in the proceding disoupaion on the gomes.
 (1855, pe 285) description given thy Thomion (1893, pp. 72-73) contains some errory; Thomson tranelates "truncus utrinque manifesto tuberculatus" as"body everywhere distinctily tubercied," Bride-rund is "truncua" obviousiy refers to the pereion as diatinot from bis "caudae" which refera to the pleon. This phrase ahould readi- pereion distinotily tuborcied on each afde. Thoman tranalates "Elagelium scapd articulo quinto irevius; flageili articulus prior altoro triplo vel magis ixeviox" as "Elagelium 5-articulate, Bhorter than the peduncles first articulation of the Slagellum rather shortor than the next timee." Thils should readt- plagellum yhortor than 5th artiole of peduncles first articio of elagailua three times or distinctivy aborter than the other:

Butao-Iand (1885, p. 285), (1904, p. 93) recorda Sphaerinio
 carlier name, Van Diemen's land). Unfortunately ho doce not record the locality or conditions in which bese apecimen vas fownd.

I have not so far collectad apecimous which can be assignod to Syhgeridig micelius (Buade-fund).

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[^0]:    Female.
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