

## A NEW GENUS OF ISOPODA (FAMILY SPHAEROMIDAE)

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Among the Isopoda collected at the Chatham Islands by Mr. G. E. Archey in January, 1924, were five small specimens from "The Horns, Waipurua Creek," some of which were completely rolled up into a ball. At first these looked as if they belonged to *Cubaris* or an allied genus of Terrestrial Isopoda, for no legs or uropoda were visible, and, on unrolling the specimens, a still further resemblance was displayed, for the lower margins of the anterior segments of the peraeon were notched behind for the reception of the next posterior segment, as in many species of *Cubaris* and other genera. Further examination, however, showed that these resemblances were external and adaptive only, for the mouth parts, the antennae and the pleopoda proved to be quite different from those of any of the Oniscoidea, and to come nearest to those of the family Sphaeromidae. But it seemed difficult to fit the new form into any existing division of this family, for the pleon showed distinctly five segments all separate, or at least well marked off from one another, and there was no trace of the uropoda. Dissections and microslide preparations were made of one of the specimens, drawings prepared, and a preliminary description drawn up, when the work had to be put aside for other duties. In the interval my attention happened accidentally to be drawn to the genera *Caecosphaeroma* and *Vireia*, established by Dollfus about twenty-five years ago for blind subterranean species found in different places in Europe, and the resemblance of these forms, with highly convex bodies and vaulted pleons with uropoda vestigial or absent, to the Chatham Island specimens, was at once apparent. Re-examination confirmed the first impression of the relationship of the forms mentioned, and showed that the Chatham Island specimens must be placed near to *Caecosphaeroma* and *Vireia*, though they are found at a place so remote, differ in being of a dark colour and in the possession of well-developed eyes, and, much more important, have the pleon composed of five distinct segments instead of only two. I am therefore establishing a new genus *Paravireia* for the Chatham Island specimens, and suggest for it the following diagnosis. The relationship of the new genus to other Sphaeromidae and other general points connected therewith will be best discussed after the detailed description of the species has been given.

### Genus *Paravireia* (novum).

Body very convex, capable of rolling into a ball. Peraeon of seven free segments, the seven peraeopoda short, sub-equal. Pleon of five separate segments, the first four short, the last (pleotelson)

large and broad. Uropoda absent. In other respects similar to *Vireia*.

**Paravireia typicus** sp. nov. (Plates 45-47, figs. 1-19).

With the characters of the genus.

*Colour*.—Whole dorsal surface dark coloured, almost black.

*Length*.—When unrolled, about 4 mm.

*Locality*.—In fresh water, The Horns, Waipurua Creek, Chatham Islands. Collected by G. E. Archey, January 25, 1924.

The species is probably a brackish or freshwater form. On being asked for particulars as to the locality, Mr. Archey replied that though he could not remember collecting this particular form, he was almost certain it was gathered, probably from under stones, in the water of the creek; "although the spot was only a few hundred yards from the mouth the water was quite fresh, for the stream enters the sea over a waterfall about thirty feet high, but it is possible that rough weather would drive big waves into the stream itself, and thus the creatures could have got from the sea to the river at some time or other." Considering the affinities of the species, it is, however, probable that it is a permanent brackish or freshwater one, and it is highly desirable that it should be looked for in other fresh water streams of the Chatham Islands.

As there is only the one species it is not possible to distinguish specific characters from the generic. The following detailed description of a male specimen will, however, enable these to be drawn up should other species be discovered.

Body slightly narrowing posteriorly, very convex, with side portions of the segments almost vertical. Head much narrower than the peraeon, its front margin almost straight. Eyes well developed, round, situated posteriorly near the lateral margins. First peraeon segment longer than the others, which are sub-equal. First pleon segment short and without epimera, the next three sub-equal, short, epimera or side portions long, reaching to the same level as those of the peraeon; last segment (pleotelson) large, broad, its anterior portion raised into a dome-like projection forming below a rounded concavity in which the pelopoda rest, hind margin nearly straight.

The whole dorsal surface bears small scattered setae, each forked at the end, and with a fine cilium arising from the fork (see figs. 1, 2, 3, 4, 5).

In the whole animal it is difficult to see the connection of the peraeon epimera to their segments, but in a dissected male specimen mounted as microslides a straight line or suture is quite distinct in segments five, six and seven, though it cannot be made out in the anterior segments. The epimeral portion of segment one is

broadened below, and forked behind to receive the next segment when the animal is rolled into a ball, those of segments two and three are similarly forked and somewhat broadened, the remaining segments have the lateral portions narrow below and without fork (fig. 4).

The front margin of the head is nearly straight, with a slight concavity in the middle between the bases of the first antennae. The epistome is rectangular, about twice as broad as long, its distal margin straight. The upper lip forms a semi-circle, the margin fringed with the characteristic short forked setae (fig. 7).

The first antenna (fig. 8) is slightly shorter than the second, its first peduncular segment lies close against the anterior margin of the head, the second joint is rather more than half the length of the first, the third about three-fourths that of the second, flagellum formed of one large joint (perhaps representing two), followed by two small joints, all three with a few setae.

In the second antenna (fig. 9) the last two joints of the peduncle are sub-equal and longer than the preceding, the flagellum rather shorter than the peduncle, and formed of seven joints, the first being much longer than the others, all with tufts of long setae.

The mouth parts are, on the whole, of normal structure, but are all rather elongated and slender.

The mandible (fig. 10) has a strong cutting end, molar process, and lacinia mobilis well developed, short palp three-jointed, not reaching to the end of the mandible.

Lower lip (fig. 11), with narrow inner lobes, extremity covered with fine setae.

First maxilla (fig. 12) with about ten stout setae at extremity of the outer lobe, inner lobe slender, with two plumose setae at the extremity, and a row of fine hairs on its outer margin.

Second maxilla (fig. 13) broad at base, inner lobe rather narrower than the outer, both rounded at the end, and covered with fine hairs, and, in addition, four stout setae on the inner and two on the outer.

Maxillipeds (fig. 14) with the second joint broad, the lobe arising from it long oblong, reaching nearly to the end of the palp, its extremity with seven plumose setae and some fine hairs. The palp shows five distinct joints progressively decreasing in size, their inner margins furnished with stout setae, but not produced into lobes.

The pereopoda are short, slender, and sub-equal in length. In the first (fig. 15) the carpus is, as usual, quite short and almost triangular, in the others it is progressively longer (fig. 16). All the joints bear setae of varying size and character, the distribution of which will be best learnt from the figures.

In the first pleopod (fig. 17) the inner margin of the basal joint is armed with four pectinate setae, the endopod is a little more than

half as long as the exopod, much smaller, tapering distally, and bears three plumose setae at its extremity; the exopod is broadly oval, and fringed with long plumose setae.

In the second pleopod (fig. 18) the basal joint and the exopod are similar to those of the first, but the endopod is branchial, and has its margins without setae. The male appendage reaches well beyond the exopod, and forms a slightly curved rod enlarged at the rounded end.

The third pleopod (fig. 19) is similar to the second without the male appendage, but the plumose setae on the margin of the exopod are much fewer in number. The fourth pleopod has the same structure as the third, but the exopod bears only three plumose setae.

The fifth pleopod was not made out with absolute certainty, but appears to consist of two oval branchial plates without transverse folds or thickened protuberances, and with the margins entirely free from setae.

There is no trace of the uropods.

#### Affinities of *Paravireia*.

Hansen (1905) has divided the Sphaeromidae into three sub-families:—

1. *Limnoriinae*, in which the abdomen or pleon consists of six movable segments.
2. *Plakarthriinae*, in which the abdomen has all the segments fused together, the dorsal surface with two interrupted furrows as rudiments of division.
3. *Sphaerominae*, with the five anterior abdominal segments fused with one another, but generally showing transverse furrows, at most three and the posterior two broadly interrupted in the middle, as traces of division into segments.

The *Sphaerominae* contains the great majority of the Sphaeromidae, and is divided by Hansen into three groups, Hemibranchiatae, Eubranchiatae and Platybranchiae, mainly on the characters of the fourth and fifth pleopoda.

The genus *Vireia* and the allied *Caecosphaeroma* are placed by Hansen in the section Monolistrini of the Platybranchiatae. In this section the endopod of pleopod 1 is very narrow, both rami of pleopod 3, and of the following pairs are without marginal setae, the exopod of pleopod 3 unjointed, and the endopods of all three pairs opaque, respiratory, while the exopod is vitreous, and at least not so well adapted for respiration.

From the description which has been given of *Paravireia*, and particularly of its pleopoda, it must, I think, be concluded that this species should be placed under the Monolistrini, and near to *Vireia*,

which it so closely resembles in the complete absence of the uropoda. There are, however, differences even in the pleopoda, for the endopod of pleopod 1 is not "more than three times longer than broad," as in the others of the section, the exopod of pleopod 3 bears numerous marginal setae, and there are a few even in pleopod 4. A much more important point is, however, that *Paravireia* differs not only from the other Monolistrini, but also from all the members of the sub-family Sphaerominae by having the abdomen consisting of five separate segments. In discussing the structure of the abdomen in the Sphaeromidae Hansen points out that in the Sphaerominae it consists of two movable parts, the anterior one showing by its sutures that it represents four segments, and corresponds to the five free anterior segments in *Limnoria*, probably corresponding to the posterior four of these, the first having completely disappeared. The abdomen in *Paravireia* seems to confirm Hansen's conclusions, but instead of having the four segments fused they are all separate and apparently movable. The question therefore arises whether *Paravireia* should not be placed in a separate sub-family distinct from the Sphaerominae, or at least in a special section of that sub-family, the resemblance to the Monolistrini being due to convergence. It is true that the reduction of the uropoda may be merely an adaptation arising independently in different groups, but, on the other hand, it is only in the Monolistrini that the uropoda have been so nearly completely lost, and the general resemblance of the pleopoda of *Paravireia* to those of other Monolistrini is, I think, too great to be neglected. Moreover, the coalescence or otherwise of the segments of the pleon is perhaps not so important a character as it at first appears, and differences may occur among species closely allied. Thus in *Vireia burgunda* (Dollfus), and in *Caccosphaeroma virei* (Dollfus) the two parts of the abdomen are immovably fused with each other, while in *Vireia berica* (Fabiani) the two parts are movable, as in all the other Sphaerominae\*.

I conclude, therefore, that *Paravireia* should be placed in the Monolistrini near to *Vireia*, and I look upon the section as composed of Isopoda that very early acquired the habit of rolling into a ball, and, as a result, have almost or completely lost the uropoda, while along with extreme specialisation in this point *Paravireia* retains the ancestral character of separate segments in the abdomen. The group is probably an ancient one that has survived owing to the

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\*This paragraph was written before I was able to consult Mons. E. G. Racovitza's very complete "Revision des Monolistrini" Archiv. Zool. Exper. et Gen. XLIX., p. 625, Biospeologica XIII., 1910. In it he states that *Vireia burgunda* and *V. berica* are not congeneric, the resemblances in the almost complete absence of the uropoda being due to convergence, and he places the first in the subgenus *Vireia* of *Caccosphaeroma*, and the second in the subgenus *Typhlosphaeroma* of *Monolistra*. Minute vestiges of the uropoda are, he says, present in both species. The Revision contains a very full account of the section *Monolistrini*, and of the origin of the forms included in it.

adoption of a fresh-water, and, in most cases, an underground mode of life. Certainly the existence of two genera so nearly allied as *Vireia* and *Paravireia* in localities so remote from each other as underground waters in Europe, and a fresh-water stream in the Chatham Islands, New Zealand, is a fact that commands special attention.

#### EXPLANATION OF PLATES.

*Paravireia typicus* Chilton, n. gen. et. sp.

All the figures are from a single male specimen.

#### PLATE XLV.

- Fig. 1—Side view of whole animal.  
 Fig. 2—Peraeon segments 1 and 2 with peraeopod 1; seen from in front with head removed.  
 Fig. 3—Peraeon segment 4; separated and seen from in front.  
 Fig. 4—Epimeral portions of first four peraeon segments; seen from below.  
 Fig. 5—Pleon segments 1 and 2; one half shewn, flattened out.  
 Fig. 6—Pleon segments 2, 3, 4, with pleotelson.

#### PLATE XLVI.

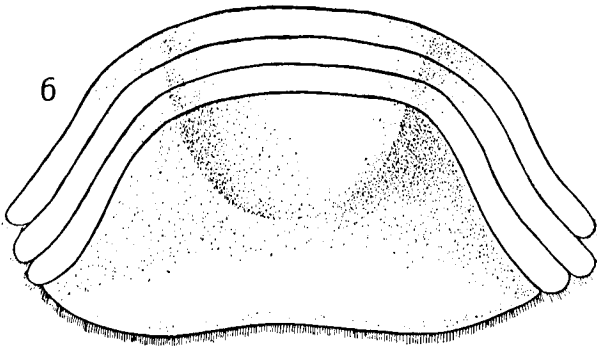
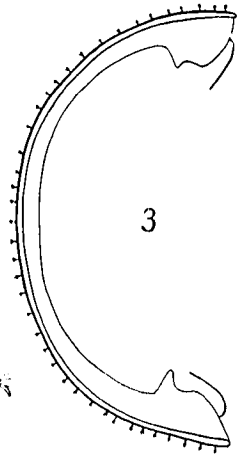
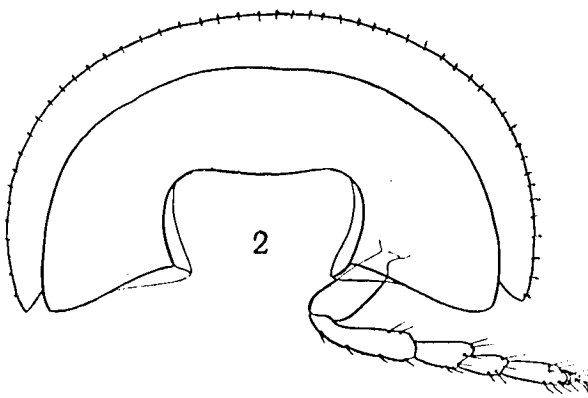
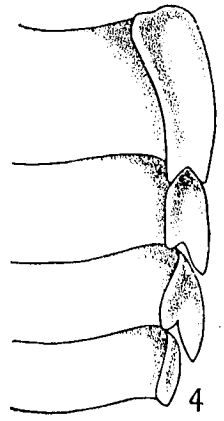
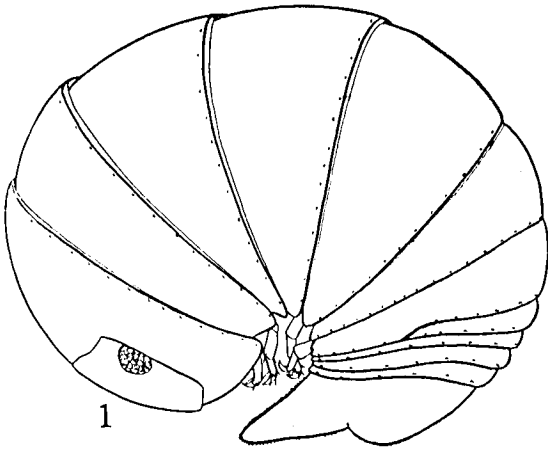
- Fig. 7—Epistome and upper lip.  
 Fig. 8—Antenna 1.  
 Fig. 9—Antenna 2.  
 Fig. 10—Mandible.  
 Fig. 11—Lower lip.  
 Fig. 12—First maxilla.  
 Fig. 13—Second maxilla.  
 Fig. 14—Maxilliped.

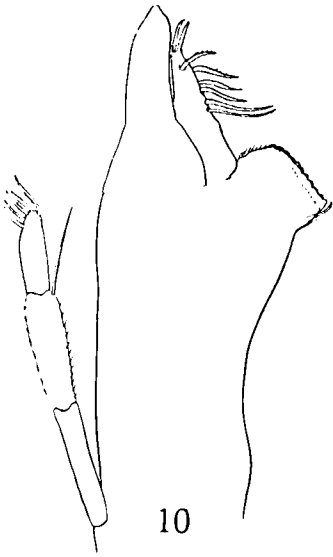
#### PLATE XLVII.

- Fig. 15—First peraeopod.  
 Fig. 16—Seventh peraeopod.  
 Fig. 17—First pleopod.  
 Fig. 18—Second pleopod.  
 Fig. 19—Third pleopod.

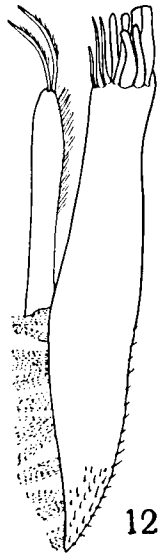
#### REFERENCES.

- Dollfus, A., and Viré, A.  
 1904.—Sur quelques formes d'isopodes appartenant à la faune souterraine d'Europe; Partie systématique, par. A. Dollfus.  
 Annales des Sciences Naturelles, Zoologie, ser. 8, tome 20, p. 367.  
 Hansen, H. J.  
 1905.—On the Propagation, Structure and Classification of the family Sphaeromidae.  
 Quar. Jour. Microscopical Science, vol. 49, p. 69.

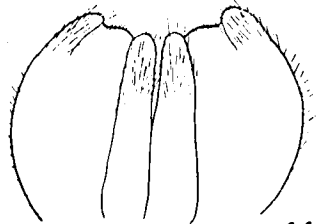




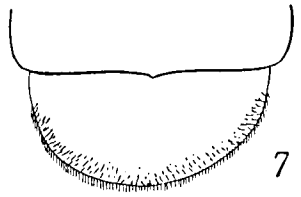
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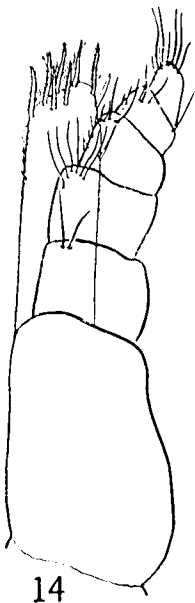
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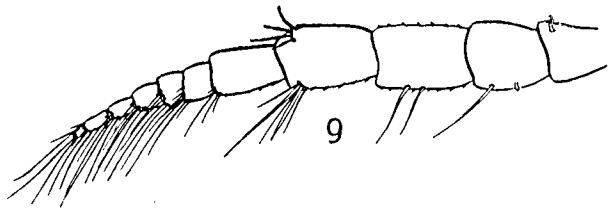
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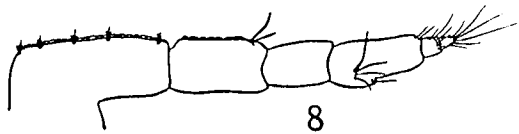
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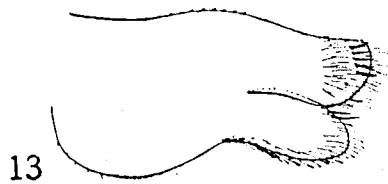
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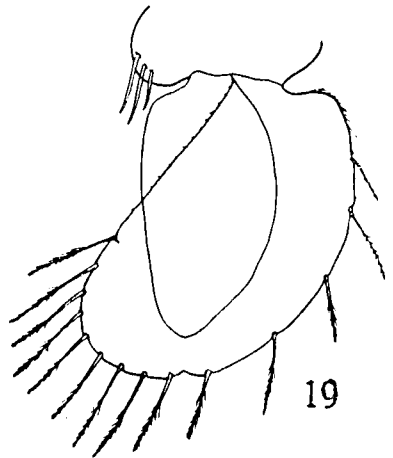
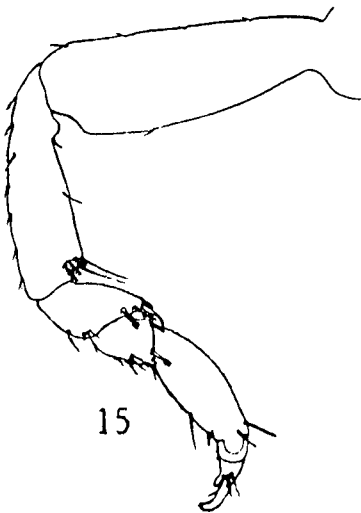
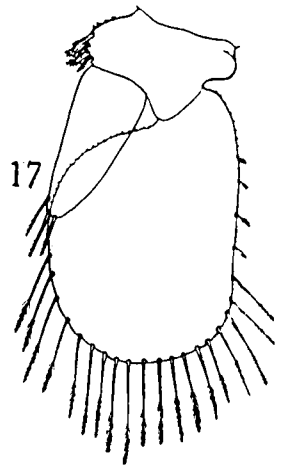
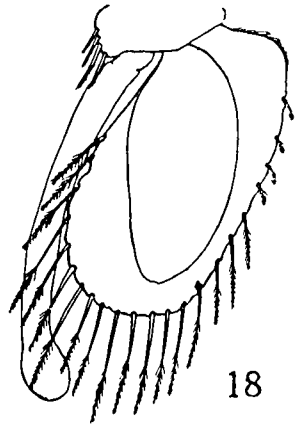
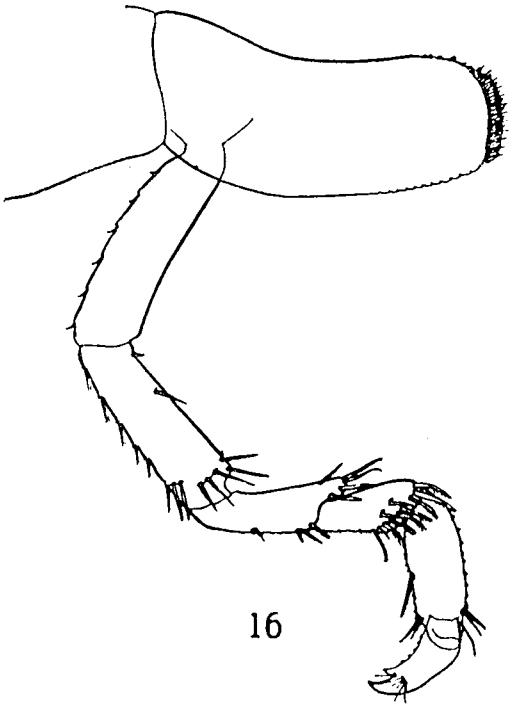
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