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The "endemic" paradoxosomatids (Diplopoda, Polydesmida) of the Fiji Islands

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ABSTRACT

The Paradoxosomatidae of the Fiji Islands are discussed. As a result of the re-examination of the type material the taxonomic position of *Orthomorpha lampra* Chamberlin and *Prionopeltis dasys* Chamberlin is cleared. *O. lampra* is a senior synonym of *Gyrodrepanum bimontanum* (Carl), *P. dasys* a junior synonym of *Anoplodesmus saussurii* (Humbert). All the known paradoxosomatid species of the Fiji Islands are introduced from elsewhere, mostly from India.

Five species of the family Paradoxosomatidae have been described or recorded from the Fiji Islands by Chamberlin in 1920. They were listed in his paper under the following names:

Orthomorpha lampra Chamberlin, 1920
Orthomorpha coarctata (De Saussure, 1860)
Orthomorpha gracilis (C. L. Koch, 1847)
Prionopeltis dasys Chamberlin, 1920
Prionopeltis clarus Chamberlin, 1920.

Of these, *O. coarctata* and *O. gracilis* have a world-wide distribution and were already well-known synanthrope species at the time. *P. clarus* was described by Chamberlin after material from the Fijis and Samoa. The present writer (Jeekel, 1963) synonymized it with *Chondromorpha xanthotricha* (Attems, 1898), a species now known from the tropical parts of all regions and likewise belonging to the small group of paradoxomatid species which have attained a wide distribution outside their original area through human agency.

The identity of the two remaining species, *O. lampra* and *P. dasys*, remained in doubt, because the male characters were either insufficiently

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described or totally unknown. Still the true relationship of the two was intriguing from a systematic and from a zoogeographic point of view. The diplopod fauna of the Fijis may not be very diversified as to the larger groups, it is certainly very rich in species of the family Rhinocricidae, and apparently also has a number of endemic Cambalidea, Polydesmidea and Polyzoniida. The presence of an endemic element belonging to the family Paradoxosomatidae could be possible, and would be quite interesting.

During a visit to the Museum of Comparative Zoology at Cambridge, Massachusetts, in November 1971 the author had the opportunity of restudying the pertinent Chamberlin types and could solve the mystery of the enigmatic species.

Gyrodrepanum lamprum (Chamberlin, 1920)

Orthomorpha lampra Chamberlin, 1920 : 112. (1).
Orthomorpha (Gyrodrepanum) bimontana Carl, 1932 : 431, figs. 14—15. (2). New synonymy.
Sundanina bimontana; Attems, 1937 : 170, fig. 213.
Gyrodrepanum bimontanum; Jeekel, 1968 : 86.

Distribution. — Fiji Is.: Ovalau, Levuka (1); India: Anamalai Hills, Valparai (2); Nilgiri Hills, Kartery valley, below Coonoor (2).

Description. — The description by Chamberlin is quite insufficient for the recognition of the species, that by Carl gives most of the important characters. The following notes were made after the holotype male and only specimen of *O. lampra* in the Museum of Comparative Zoology at Cambridge, Mass., U.S.A., and are to supplement and rectify the descriptions by Carl and Chamberlin.

Head and antennae. — Labrum weakly emarginate, tridentate. Clypeus moderately convex, well impressed near the labrum, its lateral sides weakly emarginate. Pubescence moderate up to the frontal region. Antennal sockets separated by one and a half times the diameter of a socket or by five sixths of the length of the 2nd antennomere. Postantennal groove wide and moderately deep, the ridge in front rather weakly inflated. Vertex rather weakly convex, with a single pair of setae. The vertigial sulcus weakly impressed, running downward to the upper level of the sockets. Antennae rather short, moderately stout, clavate. Pubescence moderate proximally to rather dense distally. Length of antennomeres: 2nd = 3rd > 4th = 5th > 6th; the 6th eight ninths of the length of the 2nd.

Collum. — A little narrower than the head. Subreniform in dorsal outline, with the anterior border faintly convex in the middle, a little more convex laterally. The lateral border widely and almost evenly rounded, with a narrow marginal rim. Posterior border widely and weakly concave in the middle, becoming a little convex towards the lateral sides. Surface shiny, with a few scattered hairs, transversely weakly convex in the middle, with a rather faint median groove, much more convex laterally.

Body somites. — Moderately constricted by rather narrow waist which is distinctly longitudinally ribbed. Prosomites dulled by fine cellular structure.

Metatergites polished. Transverse furrow deeply impressed and distinctly ribbed, running to near the base of the keels and sometimes dividing into two branches there. Furrow present up to the 18th somite, almost obsolete in the 19th. Median furrow of metatergites also well impressed, present up to the 19th somite in front of and behind the transverse furrow. Sides with fine granulation. Pleural keels not absent as stated by Carl, but distinct on 2nd somite, weakly developed near caudal margin of 3rd somite, and present to about the middle of the body as almost obsolete elevations near the hind margin of the sides.

Lateral keels. — Second somite scarcely wider than collum. Keels below the level of those of the third somite, their margin laterally very widely rounded, anteriorly with a slight indentation; the anterior edge a little thrust forward and narrowly rounded. Posterior edge slightly produced caudally. Marginal rim narrow. Third somite wider than the 2nd, the keels anteriorly and posteriorly slightly shouldered at base, caudally slightly produced but not projecting behind the margin. Remaining keels (fig. 1) anteriorly and posteriorly almost equally rounded, not at all produced. The premarginal furrow continues in medial direction along the caudal margin of the metatergite to near the middle.

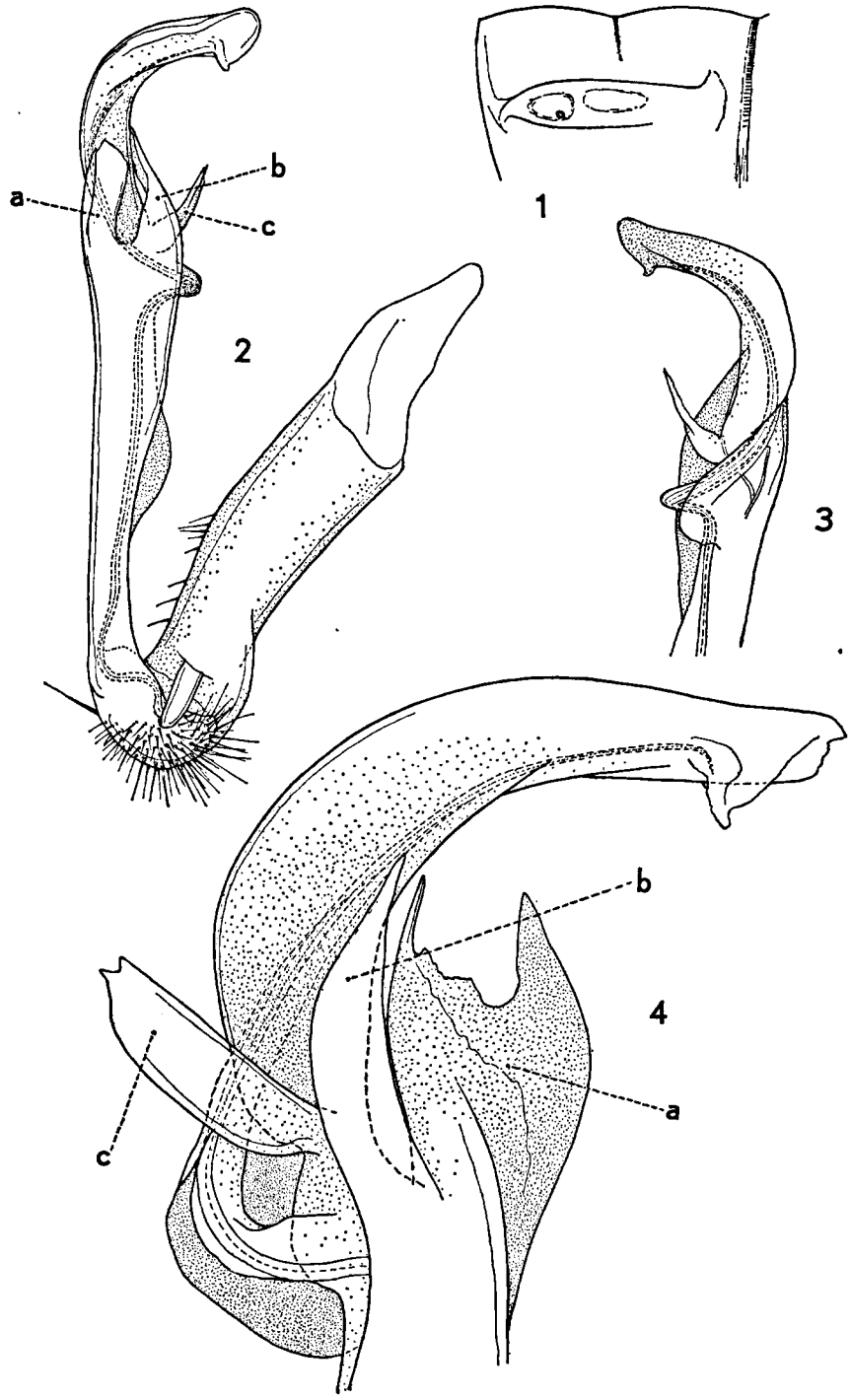
Sternites and legs. — Sternites of middle somites slightly longer than broad, sparsely setiferous, the cross impressions consisting of a weak transverse furrow and a wide median impression. No cones, but the 5th sternite on each side with a thick tubercular protuberance between the anterior legs. According to Carl the 5th sternite has a single truncate or rounded process. Legs rather thick, of moderate length, rather sparsely setiferous but the tarsi and tibiae scopulate, the brushes thinning out in the posterior legs. Podomeres: 3rd > 6th > 2nd > 4th = 5th. The length of the 6th podomere seven of ninths of that of the 3rd.

Anal somite. — Epiproct rather short and broad, rather conspicuously tapering, with concave sides and a pair of lateral preterminal tubercles. Epiproct dorsoventrally thick, terminally rather broadly truncate and weakly emarginate. Paraprocts finely rugulose, the setae on low tubercles. The rim narrow and of moderate height. Hypoproct triangular, with a pair of small setiferous tubercles.

Gonopods. — Chamberlin's description of the gonopods is, even accompanied with the present drawings, almost completely unintelligible. Carl, on the other hand, has given a few drawings, but these are not altogether correct. Therefore, new drawings (figs. 2—4) are given to elucidate the exact structure.

The spermal channel runs along the latero-anterior side of the gonopod femur, and not on the medial side as one might infer from Carl's drawing. Near the base of the tibiotarsus there are three processes, not four. One of these is arising more distad (c) and seems to arise from the tibiotarsus. The other two (a and b) apparently arise from the postfemoral region.

Remarks. — As *Gyrodrepanum montanum* (Carl) was thus far known


a
b
c
1
2
3
4

only from the type series, the discovery of the same species in the Fiji Islands hidden under the name of *Orthomorpha lampra* was quite a surprise.

Although the possibility of a mislabelled specimen can never be excluded, the available evidence seems to be in favour of a correct labelling. Since the species has close relatives in the Indian fauna it is clear that it must have been introduced into the Fijis probably with plant material. As to what extent the species has established itself permanently on the islands is unknown as more recent collections are not available.

Anoplodesmus saussurii (Humbert, 1865)

Polydesmus Saussurii Humbert, 1865 : 26, pl. 2, fig. 8. (1).
Prionopeltis dasys Chamberlin, 1920 : 131. (2). New synonymy.
Anoplodesmus saussurei; Attems, 1937 : 102, figs. 131—133.
Anoplodesmus saussurei ssp. *mauritianus* Verhoeff, 1939 : 66, pl. 4, fig. 39. (3). New synonymy.
Anoplodesmus saussurii; Jeekel, 1965 : 108. (4). Review of literature.

Distribution. — Ceylon: various records (1, 4). Mauritius (3). Fiji Is.: Viria, Ruva River (2).

Remarks. — The holotype and only specimen of *P. dasys* is unfortunately a female. However, by some remarkable coincidence the Museum of Comparative Zoology has in its collection a male specimen of *A. saussurii* identified by Attems, and through a close comparison of the two specimens the specific identity of the two could be established beyond doubt.

It becomes evident now that *A. saussurii* also belongs to the small group of paradoxosomatid species which may establish themselves outside their natural range when transported with plant material, etc. Earlier the necessity of the subspecific name *mauritianus* created by Verhoeff for the Mauritius material was already contested (Jeekel, 1965). With the present evidence at hand it seems fully justified to withdraw this name in the synonymy of *saussurii*.

Summarizing the preceding discussions the five paradoxomatids known from the Fiji Islands are:

Gyrodrepanum lamprum (Chamberlin, 1920) (Polydrepanini)
Oxidus gracilis (C. L. Koch, 1847) (s. *Orthomorpha g.*) (Sulciferini)
Anoplodesmus saussurii (Humbert, 1865) (Sulciferini)
Chondromorpha xanthotricha (Attems, 1898) (Sulciferini)
Orthomorpha coarctata (De Saussure, 1860) (Orthomorphini)

Of these, the world-wide distribution of *gracilis* and *coarctata* was already established for many years, and it is impossible to say from where the Fiji populations were derived. The original area of *O. gracilis* must be located sowewhere between Japan and Indochina, that of *O. coarctata* between Indochina and Java.

FIGS. 1—4. *Gyrodrepanum lamprum* (Chamb.), holotype ♂. 1: right lateral keel of 9th somite, lateral aspect. 2: right gonopod, medial aspect. 3: distal part of same, lateral aspect. 4: left gonopod telopodite, anterior aspect. a, b, and c: branches of telopodite.

Chondromorpha xanthotricha, now known from localities in tropical countries all over the world, probably attained its cosmopolitan distribution much later than *Oxidus gracilis* and *Orthomorpha coarctata.* Its original area probably includes Ceylon, or India, or both, and it seems likely that it was introduced into the Fijis directly from there.

The same is even more probably for *A. saussurii* and *G. lamprum,* which are known to originate from Ceylon and from southern India respectively, and of which only *saussurii* was recorded from Mauritius.

None of these species have any relationship with the Paradoxosomatidae of the Australian region, and thus we may conclude, with the present information at hand, that the Fiji Islands have no endemic paradoxosomatid fauna. Perhaps the poverty of the endemic diplopod fauna, at least with respect to the presence of the order Polydesmida, may account for the relatively high diversity of introduced paradoxosomatids. Apparently the endemic diplopod fauna does not occupy all the available ecological niches.

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