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CHELODESMID STUDIES II

THE STATUS OF THE MILLIPED *TELONYCHOPUS MEYERI*  
VERHOEFF, AND OF THE FAMILY NAME TELONYCHOPIDAE<sup>1</sup>

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*Telonychopus meyeri* was described (Verhoeff, 1951) as "eine neue, aberrante Form der Rhachidesmidae" on the basis of a single male specimen taken near Cuiabá, Mato Grosso. Despite the general similarity of the animal to the larger species of the dominantly Brazilian family Chelodesmidae (even Verhoeff remarked "Ausserlich besteht in vieler Hinsicht Ubereinstimmung oder Ahnlichkeit mit *Leptodesmus...*"), Verhoeff considered his new form to be a rhacodesmoid solely on the presumptive absence of the gonocoxal solenite (*hüfthornchen*" of German authors). Upon comparing *Telonychopus* with the true Central American rhacodesmoids, Verhoeff found so many important differences that he erected a new family Telonychopidae.

For a long time, I have felt that some fundamental error surrounded the case of this peculiar genus. First of all, it seemed unlikely that a true rhacodesmoid would occur so far outside the known range of the group; second, everything about Verhoeff's original description and drawings suggested a perfectly ordinary chelodesmid except for the missing solenite. At my request, Dr. Egon Popp kindly loaned the gonopod-preparation of *T. meyeri* from the Zoologisches Staatssammlung, München, for a personal examination. It then became evident that the gonopod structure is quite typical of a large chelodesmoid, and furthermore, that Verhoeff's drawings are incorrect in showing that the seminal groove passes through a nearly complete loop at the base of the so-called "solenomerite".

Since the body of the type specimen apparently is no longer in the collection at München (Verhoeff undoubtedly sold it, *sans* gonopods, to some unsuspecting museum in Europe), no further

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investigation could be made. However, a recent collection of Brazilian millipeds sent to me for identification by Dr. G. R. Kloss, contains two samples of a millipede which is certainly congeneric, if not conspecific, with *T. meyeri*, and moreover, these specimens are likewise from the vicinity of Cuiabá!

It is now possible, thanks to this fortunate sequence of events, to establish the correct systematic position of *Telonychopus*, and of the family name based upon it. It will be shown that the solenite is present in perfectly normal configuration, and that the genus is referable in every respect to the Chelodesmidae. Verhoeff simply damaged the gonopods in making his preparation, and was then, because of his ignorance of chelodesmoid morphology, unable to realize that the solenite had once been present. Thus, the genus *Telonychopus* and family Telonychopidae were based upon a gross and palpable error. By coincidence, *meyeri* belongs to a group of millipeds which had previously not received a generic name, and so *Telonychopus* remains valid, but not because of any of the originally stipulated criteria!

#### Genus *Telonychopus* Verhoeff

*Telonychopus* Verhoeff, 1951: 86. Type species: *Telonychopus meyeri* Verhoeff, by monotypy.

Diagnosis: A genus of telonychopodine (see following discussion of classification) chelodesmids, with the following characteristics: body robust, large, broadest at anterior end, paranota narrowing gradually posteriorly; limbus broad, its free edge and outer submarginal surface set with numerous long, acicular spines; gonopod aperture enormously large, extending laterally beyond coxal bases of 8th legs, and caudally between the coxae. Gonopods massive, the coxae projecting prominently from the aperture, connected by a large and heavily sclerotized sternum; prefemora massive, dorsally concave toward the coxae, with only rudimentary prefemoral processes. Acropodite simple, straight, with a distal element (tibiotarsus?) abruptly set off by its much smaller size, no distinct suture or constriction evident. No separate solenomerite present; the seminal groove runs directly from base of telopodite to apex of the distal element.

Distribution: Southwestern Brasil (Mato-Grosso) in the basin of the Rio Cuiabá.

Species: Two are definitely known. Some chelodesmoids inadequately described from Mato-Grosso by F. Silvestri in 1895 and 1902 are perhaps referable to this genus, and perhaps will be proven senior synonyms for either or both of the names used at the present.

#### *Telonychopus meyeri* Verhoeff

Fig. 1

*Telonychopus meyeri* Verhoeff, 1951: 87, figs. 1-5.

Type locality: "23.4.99 wurde das einzige erbeute ♂ in Matto Grosso am Lager am Akurisal, in einem Quellsumpf des Rio Cujaba gefunden, und zwar von Dr. Hermann Meyer, dem diese Form gewidmet ist, 14° 19' s.Br. 55° 14' w.L." On the maps available to me, the place name is spelled Acorizal, a village on the Rio Cuiabá about 45 km northwest of Cuiabá, the correct coordinates are 15.14 S, 56.21 W.

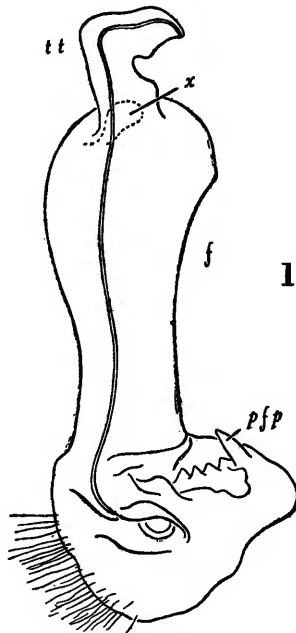


Fig. 1. *Telonychopus meyeri* Verhoeff. Telopodite of right gonopod of holotype, mesial aspect. Abbreviations; f, femur; pfp, prefemoral process; tt, tibiotarsus; x, internal chamber projecting into base of tibiotarsal region.

Type specimen: The microscope preparation of the gonopods is preserved in the Verhoeff Collection at the Zoologische Staatssammlung, München. In 1960 the body of the holotype could not be found, and presumably it was either lost or destroyed during the war, or sold by Verhoeff to some European museum. The gonopods are badly damaged, most of the coxae are missing and only the telopodites are adequately mounted.

Diagnosis: *T. meyeri* is distinguished from the following new species by the greater size of the body and more simply formed apical elements of the gonopods (compare figures 1 and 4).

Description: Verhoeff's type was 70 mm in length. In all of the characters mentioned in either the generic or specific description, *meyeri* seems to agree closely with the detailed description given for the following species; except of course for several obvious omissions and mistaken interpretations.

Remarks: Verhoeff's description of the gonopods must be corrected in several instances, as shown by the study of both his original preparation and the closely related fresh specimens. To begin with, the assumption that the solenite was naturally missing is completely erroneous. The structure in question obviously must have been destroyed and lost when Verhoeff broke up the large gonopods for his balsam-preparation. In his figure 2, the letters "fo 2" clearly indicate the normal basal cavity into which the apex of the solenite inserts. As shown in the present drawings (figs. 4, 5) for *T. klossae*, n. sp., the solenite is actually present in the typical chelodesmid position: originating in a marginal notch at the distal end of the coxal segment, on the mesial side.

Further, Verhoeff described and figured a most singular course for the seminal groove, as running straight up the telopodite to the end of the femur, where in some inexplicable way it formed a complete loop and crossed over itself (still on the surface!) before continuing onto the tibiotarsal division (called the solenomerite by Verhoeff). Restudy of the preparation shows that in actuality the seminal groove is nearly straight across the end of the femur, and the appearance of a loop is created by an internal, nearly spherical cavity. Verhoeff clearly did not look very closely at his preparation.

The two most unusual characteristics of the genus, as originally conceived by its author, are hereby dismissed as imaginary. Nonetheless, the gonopod structure is still sufficiently distinctive to fully warrant recognition of *Telonychopus* as a valid genus. It is simply fortuitous that this genus has heretofore not been recognized and named!

#### ***Telonychopus klossae*, new species**

Figures 2-7.

Type specimens: Male holotype and female paratype (DZ 1367, 1368), from Santo Antonio Leverger, Mato-Grosso, Brasil, collected on Nov. 26, 1963, by Alvarenga, Oliveira, and Bokermann; male and female paratype (Hoffman Collection) from Chapada dos Guimarães, Mato-Grosso, collected on Nov. 11-14, 1963, by the same field party, originally DZ 1358, 1359.

Diagnosis: Apparently similar to *T. meyeri* in external characters, but differing at least in the smaller size and in the more complicated formation of the gonopod tibiotarsus (compare figures 1 and 4).

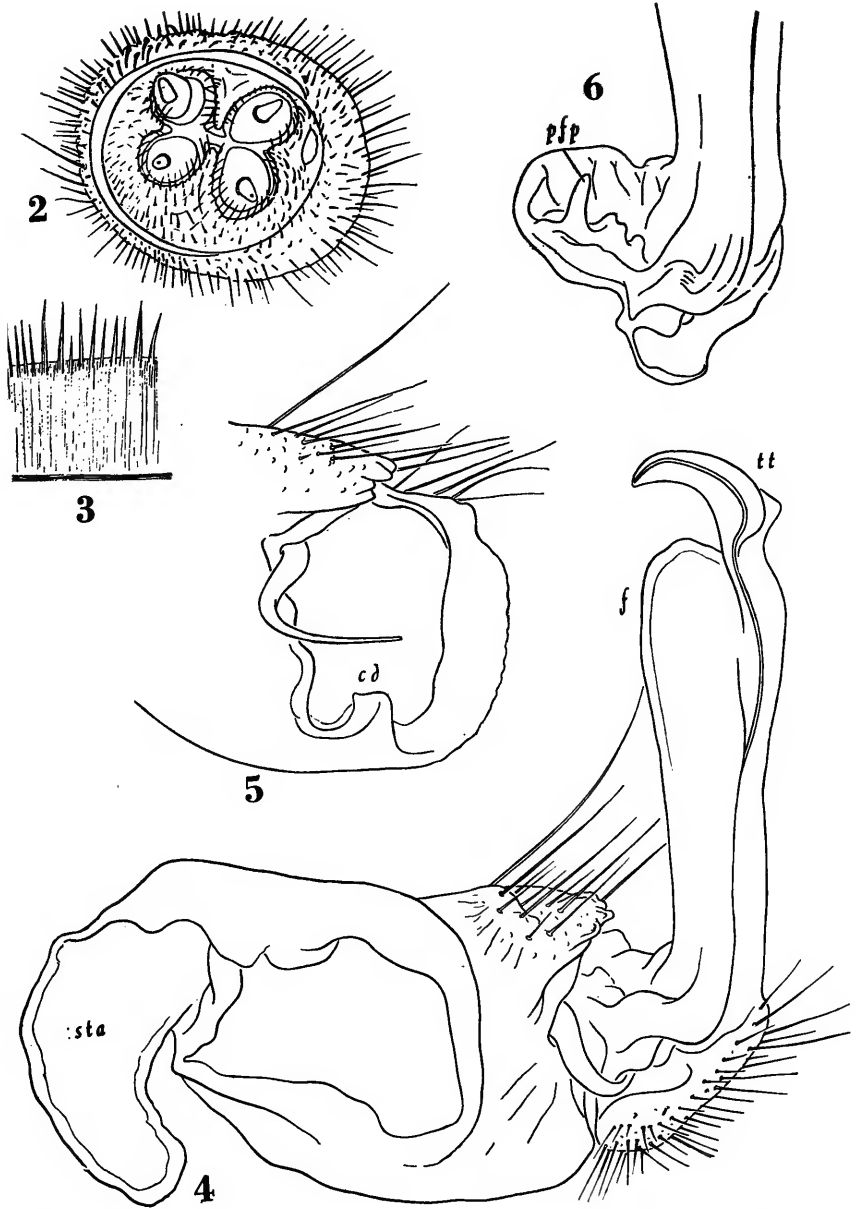


Fig. 2-6. *Telonychopus klossae*, n. sp., holotype male. Fig. 2, distal end of antenna, showing 7th article, sensory cones, and lateral sensory area. Fig. 3. Section of limb from midbody segment. Fig. 4. Left gonopod, mesial aspect. Fig. 5. Distomesial aspect of gonopod coxa, the telopodite removed. Fig. 6. Prefemur of gonopod telopodite, mesial aspect. Abbreviations: cd, dorsal coxal condyle of gonopod; f, femur; pfp, prefemoral process; s, solenite; sta, sternal apodeme; tt, tibiotalarsus.

Description of holotype: Adult male, 64 mm in length; the widths of selected segments (across paranota) as follows:

Segment 1	10.3 mm	Segment 10	11.0 mm
2	11.2 mm	12	10.8 mm
4	11.9 mm	14	10.4 mm
6	12.1 mm	16	9.8 mm
8	11.5 mm	18	7.3 mm

Width/length ratio (at segment 6): 19.0%. Depth of segment 12, 7.6 mm, depth/width ratio at this segment: 70.4%.

Coloration, after three months of preservation: prozonites uniformly very dark brown, almost black; metazonites dark reddish-brown dorsally, with lateral half of paranota, tip of epiproct, and a broad, lunate transverse stripe on the caudal half of each metatergite, bright yellow. Face, antennae, undersides, and legs light brown.

Dorsally, the metazonites generally smooth and polished, those of segmentes 14-18 with fine middorsal corrugation and tuberculation near posterior edge. Paranota nearly half as wide as body cylinder, laterally depressed and continuing slope of middorsum. Paranota of anterior and posterior segments overlapping, those of segments 6-12 distinctly separated. Stricture distinct dorsally, its anterior edge well-defined, medially with a distinct transverse suture. Surface of prozonites dulled by a dense, fine texture composed of minute, transverse striations.

Head smooth and polished, width across genae 5.5 mm.; genae convex, not margined laterally but with prominent median depression which merges with the clypeal area and creates the impression of a subantennal swelling subtended by a marginal convexity. Labrum depressed but not otherwise differentiated from facial surface. Facial setae as follows: epicranial not detected and presumably absent; supra-antennal 1-1; interantennal 1-1; subantennal 1-1, genal 2-2 (a pair on each upper genal convexity); the lower setal series irregular in pattern, but approximately 12-12 frontals; 16-16 clypeals forming a double row toward center of face; and 18-18 labrals. Epicranial suture prominent, deep, with a single row of small punctations; surface of head heavily wrinkled behind antennal sockets.

Antennae moderately long (10.6 mm) and slender, extending back to caudal edge of 3rd segment. Antennomeres 2-6 similar in shape and general appearance, each distinctly clavate distally, sparsely and uniformly setose. Lengths as follows: 1st, 0.6 mm, 2nd, 2.0 mm, 3rd, 1.7 mm, 4th, 1.7 mm, 5th, 1.7 mm, 6th, 1.5 mm, 7th, 0.4 mm. 7th antennomere semi-globose with a prominent rounded sensory organ on the dorsal side; the distal edge incurved and projecting toward the center, separating the sensory cones into two unequal diads (fig. 2).

Collum distinctly wider than head, lateral ends strongly depressed into a nearly vertical position, the surface smooth and polished; anterior and posterior edges set off by a fine marginal

rim laterally. Segments 2-5 rather strongly elevated middorsally, the paranota bent forward forming oblique lobes, with the lateral edges converging posteriorly. Midbody segments less strongly arched, paranota transverse with the posterior and anterior corners about equally rounded. Paranota of segments 12-19 becoming more angular posteriorly, those of segment 19 abruptly reduced to small spiniform projections. Scapulae strongly developed and completely marginal on all segments; peritremata abruptly broadened, elongate-oval in form, located in the posterior half of the paranota, and merging continuously into the prominent, caudal paranotal rim.

Limbus (fig. 3) broad and distinct (about 0.3 mm wide), provided ventrally and halfway up the sides of the metazonites with prominent acicular projections originating submarginally and diverging away from the limbar surface. On segments 17-19, these processes continue completely across the dorsum as well.

Epiproct short, subtriangular, with the usual two transverse whorls of setae and four terminal setae. Paraprocts nearly flat, smooth, and unmodified, the margins compressed and elevated but not dorsally enlarged; discal seta set on a distinct elevation in the lower third of the height; marginal seta arising from a small tubercle at the upper two-thirds. Hypoproct broad, subtriangular, unmodified, with a prominent, blunt median projection and two smaller paramedian tubercles located immediately at its base.

Sides of body unmodified except for a low swelling above the insertion of the anterior legs. Both coxal condyles produced laterally into thin, auriculate, projecting lobes. Stigmata similar in size and shape, elongate-oval, their edges distinctly elevated above adjoining segmental surface; posterior stigma located exactly halfway between the two coxal cavities; anterior stigma set slightly higher on side and closer to anterior coxal condyle. Stricture sharply defined down sides and across ventrum, prozonite forming a slightly overhanging edge.

Legs attached to prominently elevated, densely setose, bicruciate impressed podosterna, those of segments 8 and 9 produced into four prominent, basally approximate subcoxal projections; podosterna becoming broader, lower, and less setose posteriorly on body, with occasional development of low, blunt, subcoxal spines. Sternum of 2nd pair of legs loosely attached to pleurotergum of 3rd segment, the coxae of these legs with low, rounded, seminal processes; coxae of 3rd pair of legs nearly in contact medially, separated by a pair of thin sternum projections. Sternum of segment 4 with two high, setiferous knobs between the 4th pair of legs, and smaller, similar knobs between the 5th pair. Sternum of segment 6 broad and depressed to accommodate gonopodal apices, the coxae inserted upon strongly elevated subcoxal lobes.

Gonopod aperture enormous (ca. 6.0 mm in width, and 4.0 mm long), reducing the prozonite to a thin, transverse strip; and extending back between the 8th pair of legs; lateral ends of aperture produced into strongly elevated, concave rims. Sternum of segment 7 with two setiferous subcoxal processes.

Legs moderately long and slender, the podomeres densely setose dorsally and ventrally, somewhat less so laterally. Prefemora of all legs with a prominent rounded knob on the dorsal side, other podomeres essentially cylindrical, the relative lengths 3>6

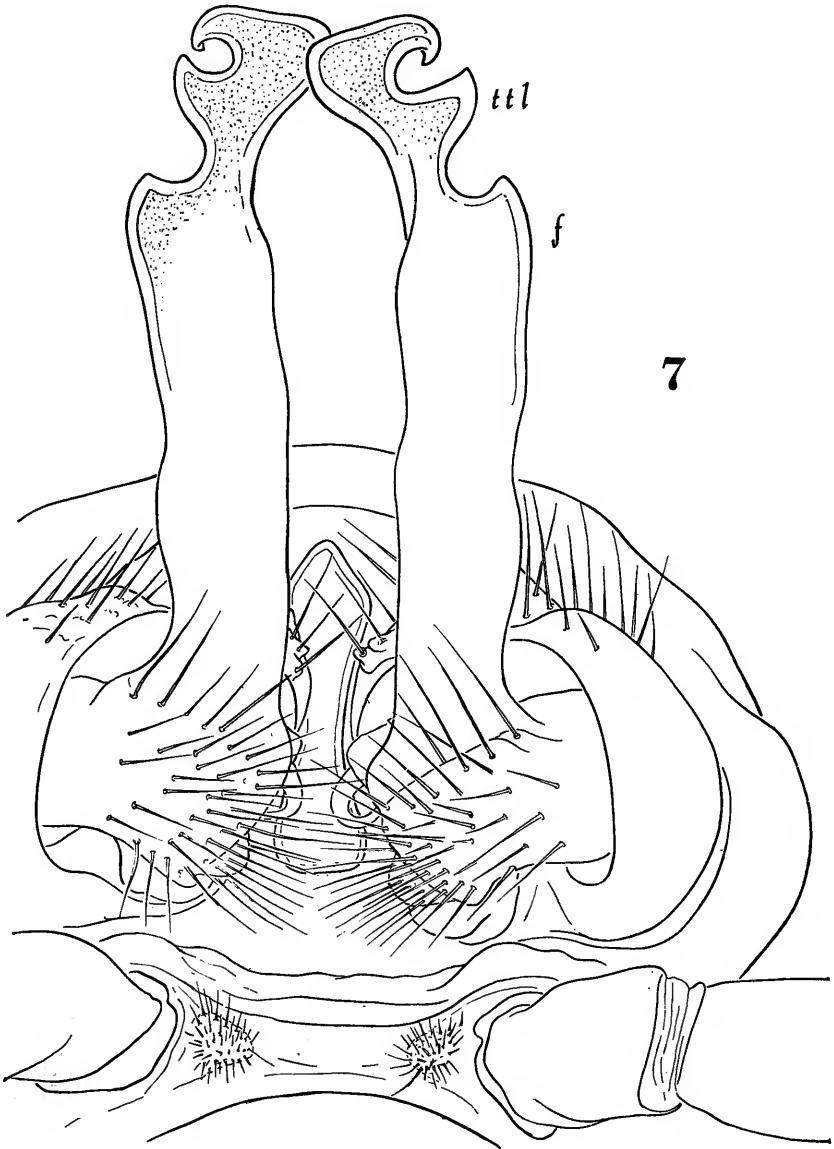


Fig. 7. *Telonychopus klossae*, n. sp. Ventral aspect of gonopods and gonopod aperture, male holotype, to show sternum, outline of aperture, and gonopod details. Abbreviations: f, femur; ttl, lateral lobe of tibio-tarsus, not present in *T. meyeri*.

=5=2>4>1. Tarsal claws nearly straight, those of the peregonopodal legs with well-defined dorsal carinae. Anterior legs without glands, processes, tibial pads, or other modifications.

Gonopods relatively large and robust, the coxae projecting from the aperture, joined by a prominent, heavily sclerotized sternum which is flexibly but firmly continuous with the sternal apodemes, these considerably enlarged, spatulate, and strongly recurved dorsad (fig. 4, sta) in a characteristic way. Coxae with numerous macrosetae on the dorsal side, none medially, no coxal apophysis ("huftstab") present. Telopodite similar to that of *T. meyeri*, set on the coxa at a right angle (fig. 4); prefemur relatively small but considerably prolonged dorsally, this area largely concealed under edge of coxa, but when removed by dissection is seen to be prominently concave, the depression preceded on the mesial side by a short, digitiform prefemoral process (fig. 6, pfp). Caudalventral surface of prefemur set with scattered setae; origin of seminal groove concealed by a basal overhanging lobe, the groove runs nearly straight up the telopodite and thence out to apex of gonopod; telopodite beyond prefemur almost straight, a little flattened and expanded at end of femur (fig. 4, f); gonopod terminating in a laminate, curved tibiotarsus with a prominent, triangular, ventrolateral lobe not developed in *meyeri* (fig. 7, ttl).

Paratype: Female, collected with holotype: 55 mm in length; widths of selected segments (across paranota) as follows:

Segment 1	8.4 mm	Segment 10	9.6 mm
2	9.2	12	9.6
4	9.5	14	9.3
6	9.7	16	9.1
8	9.8	18	7.8

Width/length ratio (at segment 8): 17.9%. Depth of segment 8, 7.0 mm, depth/width ratio at this segment: 71.4%.

Similar in color pattern and structural details to the male, except as follows: podosterna relatively wider and more prominently grooved transversely, with no indication of subcoxal knobs; antennae shorter, not extending beyond middle of 3rd segment; metatergites with vaguely-defined transverse sulcus, and the paranota more depressed laterally. Ventral edge of 3rd segment prominently elevated laterad to the cyphopods, the latter large, elongate-conic in shape, and distinctly protruding from the aperture.

#### SYSTEMATIC POSITION

The closest relatives of *Telonychopus* are clearly species of the three genera *Catharodesmus*, *Euthydesmus*, and *Manfrediodesmus*. In the first two genera named, the gonopod aperture has a similar size and shape, the gonopod sternum is present, the sternal apodemes abruptly decurved and laminate, and there is general structural agreement in most other details of body form. The

nature of the gonopod sternum and sternal apodemes is yet not known for *Manfrediodesmus*, but in other respects, especially the general appearance of the gonopods, there can be no doubt that *M. passarellii* is closely related to *Telonychopus*.

*Euthydesmus*, originally proposed without illustrations of the gonopods, has recently been redescribed and figured (Hoffman, 1954), but even this account omitted some details which I now consider important, and the type species *E. acicarina* should be again restudied.

*Catharodesmus* includes about a dozen rather large chelodesmoids of the southern Andes and adjoining parts of Brasil and Argentina; I have studied the types of several Attemsiian species but a good revision of the genus cannot be undertaken until various species described by Silvestri (without gonopod illustrations) are accounted.

On the basis of existing knowledge about the attributes of the three genera here mentioned, it seems entirely desirable to formalize their obvious relationship, as well as their mutual sharp separation from the bulk of chelodesmid genera, by the proposal of tribal status. The existing name Telonychopidae can be modified to denominate this group:

#### TELONYCHOPODINI Verhoeff, new status

Components: *Telonychopus* Verhoeff, 1951; *Catharodesmus* Silvestri, 1897; *Euthydesmus* Silvestri, 1902; *Manfrediodesmus* Schubart, 1948.

Diagnosis: Moderate to large sized chelodesmids with the following characteristics: gonopod aperture unusually large, broader than long, reducing the prozonite medially to a thin transverse strip; gonopods attached by a prominent, sclerotized sternum; sternal apodemes large, laminate, and distally recurved; coxae large and robust, setose on the dorsal and lateral sides, without coxal apophysis; telopodite basically simple in form, prefemur small, its process either quite rudimentary or else as long as acropodite, latter nearly straight in most species, occasionally recurved distally, no indications of segmentation evident, usually no separate solenomerite branch developed.

Anterior legs of males unmodified except for distinct dorsal carinae on the tarsal claws, no prefemoral knobs or tibial pads present. Sterna of segments just behind the gonopods usually with prominent setose subcoxal knobs. Paranota well developed, the metatergites widest near the anterior end of the body (6th-8th segment). Pore formula normal in distribution. Limbus with prominent spiniform projections ventrally and laterally at front part of body, extending completely around the segments at least posteriorly in some species.

Distribution: Species belonging to this tribe occur in southern Peru, Bolivia, Argentina, and the southwestern states of Brasil, where the group appears to reach its greatest diversity. One

genus, *Catharodesmus*, seems to be heterogeneous as currently understood, and will probably be fragmented as the result of more careful studies. Perhaps additional Brazilian species presently masquerading under the name *Leptodesmus* will be found referable to the Telonychopodini.

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