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CHELODESMID STUDIES. XXII. SYNOPSIS OF *TESSARITHYS*, A NEW GENUS OF BRASILIAN MILLIPEDS (DIPLOPODA: CHELODESMIDAE)

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ABSTRACT

The new genus Tessarithys is proposed for T. neoecobius, sp. n., from Bahia (Senhor do Bonfim). The genus will also include T. machaerophorus (Schubart, 1956) and T. soledadinus (Attems), both described in the genus Leptodesmus. Characters of body form and male genitalia suggest some degree of relationship with the genus Iguazus.

For many decades the old generic name *Leptodesmus* was in terms of its content roughly equivalent to the modern family Chelodesmidae, and even as lately as the 1960s it remained a bastion of chelodesmid heterogeneity. During the past 30 years, however, substantial progress has been made toward the development of a rational (and highly exclusive) generic concept for this name, from which *Leptodesmus* has emerged as an apparently monophyletic group of about a dozen species confined to southeastern Brasil. One regrettable side effect of this process has been the relegation to Limbo of many species which were excluded from *Leptodesmus* but for which no established generic position was available. Gradually, as original material could be restudied and genera defined with precision, many of these nomenclatorial orphans have been rescued by assignment to modern genera, but plenty remains to be done along this line of remedial action.

This paper represents a small step along the convoluted pathway that will eventually lead to a clarification of the nomenclature and classification of all Brazilian chelodesmoids. Originally intended to be merely the vehicle for description of a new species from Bahia, it subsequently expanded with the discovery that two hitherto unassociated species named in *Leptodesmus* were assignable to the same genus as the novelty.

Access to material in the Museu de Zoologia, Unversidade de São Paulo, was granted and facilitated by Dr. P.E. Vanzolini and Dr. J.L.M. Leme. The type material of *Leptodesmus soledadinus* in the Naturhistorisches Museum, Wien, was examined through the cooperation of Dr. Jürgen Gruber of that museum. My best thanks are extended to these helpful colleagues.

Family Chelodesmidae Cook

***Tessarithys*, gen. n.**

Type species: *T. neoecobius*, sp. n.

Diagnosis: Moderate-sized species (length to 45 mm) of rather compact and robust facies (W/L ratio 19%), paranota relatively large but strongly depressed, imparting a notably convex dorsal

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profile; body nearly parallel-sided over segments 5 through 15, tapering abruptly cephalad, even more so caudad, segments 18,19, and 20 telescoped into those preceding each. Metaterga microvermiculose, without transverse sulcus or any traces of seriate tubercles. Stricture obscure across dorsum, becoming sharply defined in front of coxae and across venter. Ozopores in the usual sequence, peritremata continuous with scapulae, and with margined posterior edge of paranota. Paraprocts and hypoproct without notable modifications. Segments of anterior third of body with small but evident pleurosternal carinae.

Legs relatively, short and robust, prefemora without glomus, tibiae of all legs of males with apical subtarsal pads (obscure on the last legs in one species); anterior legs unmodified. Coxae of 2nd pair of legs not produced into gonapophyses, the gonopore flush on posterodistal surface. Sternum of segment 4 narrow, with two small acute paramedian projections; sternum of segment 5 with four long, slender, digitiform closely-appressed processes. Sterna posterior to gonopods broad, flat to depressed, with small spine adjacent to each coxal condyle.

Gonopod aperture large, oval, its edge not flared or elevated. Gonopods long, extending well over sternum of segment 6, the telopodites largely parallel to each other. Coxae relatively short, especially so in the dimension between base of cannula and rim of internal opening, sternal apodeme short beyond proximal end of coxa. Lateral side slightly produced distad as a rounded lobe partly concealing prefemoral region; one dorsal macroseta and one distomedian at curvature of the cannula. Telopodite set against coxa at a right angle, lateral condyle hidden behind (inside of) coxal lobe; prefemur short, forming a broadly obtuse angle with acropodite, the two set off on lateral side by a conspicuous cingulum, proximad to which surface of prefemur is glabrous and flattened. Prefemoral process long and slender, parallel to acropodite and surpassing its apex, forming a distinct sheath on lateral side, with a triangular lobe on median side about at the midlength. Acropodite long and slender, with slender, acuminate, subterminal solenomerite. Prostatic groove mostly visible in mesal aspect except at base of acropodite where diverted to ventral side.

Sternum of second pair of legs of female modified on posterior side: a prominent flattened convexity of the surface just ventrad to position of cyphopods; coxae of these legs with long acuminate ventral projection.

Name: From the Greek *tessares*, four + *ithys*, straight, upright, in reference to the sternal processes of the fourth segment.

Distribution: Northeastern Brasil (Bahia).

Remarks: The compact, strongly convex, parallel-sided body with telescoped posterior segments sets this genus off from others so far known from Bahia and adjacent states. Almost certainly it can serve as the type genus of a tribe, following a better knowledge of the chelodesmid fauna of eastern Brasil. Similarity of gonopod structure with that of *Leptodesmus therezopolis* Chamberlin, from Rio de Janeiro, invites comparison with that species, but the peripheral structures of *therezopolis* (a paratype examined) do not concur closely with those of *Tessarithys*.

Closer affinity is suggested by *Iguazus ornithopus* (Brolemann), of São Paulo and nearby states, particularly in details of body form. The secondary sexual characters of the male differ slightly (particularly sternal processes and form of the gonopod coxae), but not enough to preclude a common tribal position. This point is better deferred for future examination. The modifications of the 2nd legs and sternum in the female sex may offer useful indications of relationships when these structures have been studied in other chelodesmid genera.

Key to the species of *Tessarithys*

1. Prefemoral process of gonopod with large retrorse blade-like process on dorsal side, and smaller subterminal process with which the recurved apex forms an opening through which the solenomerite and parasolenomerite are inserted (fig. 8); width across metaterga 8.5-9.5 mm *T. machaerophorus* (Schubart)
- Prefemoral process simple in form, at most with an angular lobe or projection at midlength; smaller species, 6.5-8 mm in metatergal width 2

2. Processes of posterior pair of segment 5 separated from each other; sternum of segment 6 without subcoxal processes; tibial pads missing from last several pairs of legs; prefemoral process of gonopod somewhat incrassate just beyond its base (fig. 9); median projection larger, with small denticles on the edge beyond it; antennae unicolorous
 *T. soledadinus* (Attems).
- Processes of posterior pair of segment 5 adnate (fig. 4), sternum of segment 6 with small paramedian lobes between coxae of anterior legs; tibial pads present on all posterior legs; prefemoral process not thickened beyond its base, median projection smaller, without accessory denticles; basal half antennae reddish-brown, distal half yellow ... *T. neocobius*, sp. n.

***Tessarithys neocobius*, sp. n.**

(Fig. 1-7)

Material: Male Holotype and three female paratypes (MZUSP 413) from Villa Nova [now Senhor do Bonfim], 10.27 S, 40.11 W, state of Bahia, Brasil; E. Garbe leg. 1908.

Diagnosis: Externally similar to *T. soledadinus*, with differences in gonopod structure as noted in the foregoing key (figs. 7 and 9).

Holotype: Adult male, length ca. 42 mm, body nearly parallel-sided over segments 5 through 15, maximum width 8 mm. Dorsal color reddish-brown, maroon to chestnut, legs and basal three antennomeres lighter reddish-brown (perhaps orange in life), peritrematic region of paranota and distal three antennomeres clear bright yellow.

Body notably convex and compact, paranota large but strongly depressed and continuing slope of middorsum; pro- and metazona of nearly equal diameter, stricture very shallow and indistinctly costulate, no evident anterior edge across dorsum and down sides. Surface of metazona finely vermiculose.

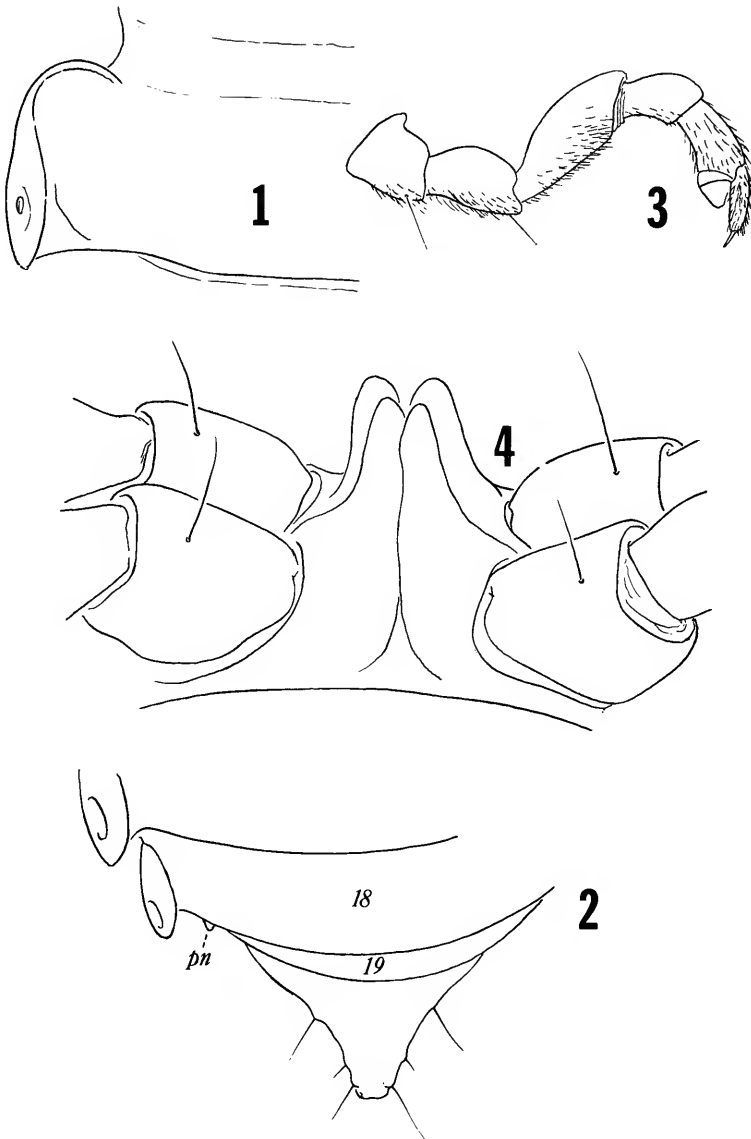
Head smooth and glabrous, no cranial setae except labral series evident. Antennae widely separated (isthmus about equal to length of 2nd antennomere), long and slender, reaching back to paranota of 3rd segment, articles 2-6 subequal in size and shape, scarcely clavate distally; four apical sensory cones, separated into two equal diads.

Collum convexly arched, smooth and polished, ends broadly rounded and much surpassed by paranota of segment 2. Anterior corners of all paranota rounded or oblique, posterior corners forming acute angle from segment 3. Midbody paranota as in fig. 1. Posterior segments abruptly diminished and telescoped, segment 19 almost entirely withdrawn into 18, its paranota just large enough to accommodate the ozopore, and partly hidden by those of segment 18. Epiproct subconical, projecting well beyond paraprocts, latter unmodified; hypoproct broadly subtriangular, of typical chelodesmoid shape.

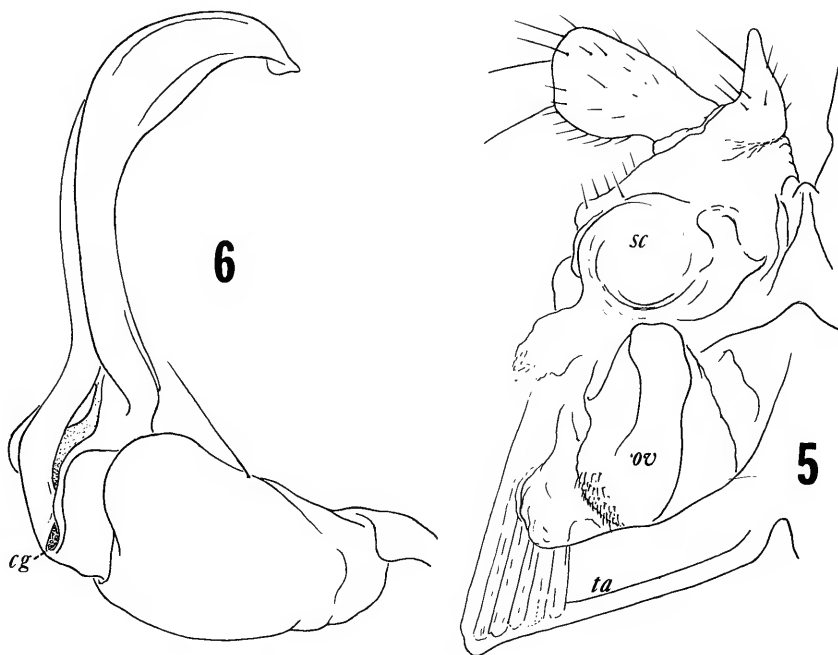
Sterna relatively broad, medially somewhat depressed, with an acute small spine at base of each coxa, these largest on segments 8-10, sterna mostly glabrous. Legs moderately long and robust (fig. 3), nearly glabrous on dorsal surface of podomeres, ventral surfaces densely invested with small, short acute setules. All legs with prominent tibial pads subtending base of tarsi, basal half of each pad in the form of a clear sclerotized ring.

Anterior legs without modifications; gonopore flush on distal surface of coxae of 2nd legs. Sternum of segment 4 narrow, with two small acute contiguous projections; sternum of segment 5 broader, with four large digitiform processes, the anterior two somewhat longer and broader but those of both pairs set equally close (mostly in contact) (fig. 4).

Sternum of segment 6 with small paramedian lobes between anterior leg pair, otherwise somewhat depressed medially. Gonopod aperture large, oval, reducing sternum anteriorly to a narrow transverse strip, edges not flared or elevated. Gonopods large, extending between legs of 6th segment, of the form described in the generic diagnosis and differing from those of the other two species chiefly in structure of the prefemoral process (fig. 7-9).



Tessarithys neoecobius, sp.n.: 1, left paranotum of segment 10, oblique dorsolateral aspect; 2, posterior end of body, showing extreme telescoping of segments, only the tips of paranota 19 visible (PN); 3, leg from midbody segment; 4, sternal processes of 5th segment, posterior aspect.



Tessarithys neoecobius, sp. n.: 5, left side of sternal region and base of second pair of legs of female, posterior aspect, showing enlarged convex area of sternum (SC), left cyphopod, and long process of coxa (OV, outer valve of cyphopod, TA, left tracheal apodeme with retractor muscle indicated); 6, left gonopod, lateral aspect showing basal cingulum of acropodite (CG).

Paratype: Adult female, length ca. 41 mm, width 8.0 mm. Similar to male in coloration and external features, aside from broader sterna and more slender legs and antennae as usual in the family. Sternum of 2nd pair of legs with prominent convexity each side on aboral surface; coxae each with long acuminate ventral process (fig. 5).

Name: Greek *neos*, new + *oecobios*, house, in reference to the original name of the type locality.

Distribution: The species is so far known only from the original locality.

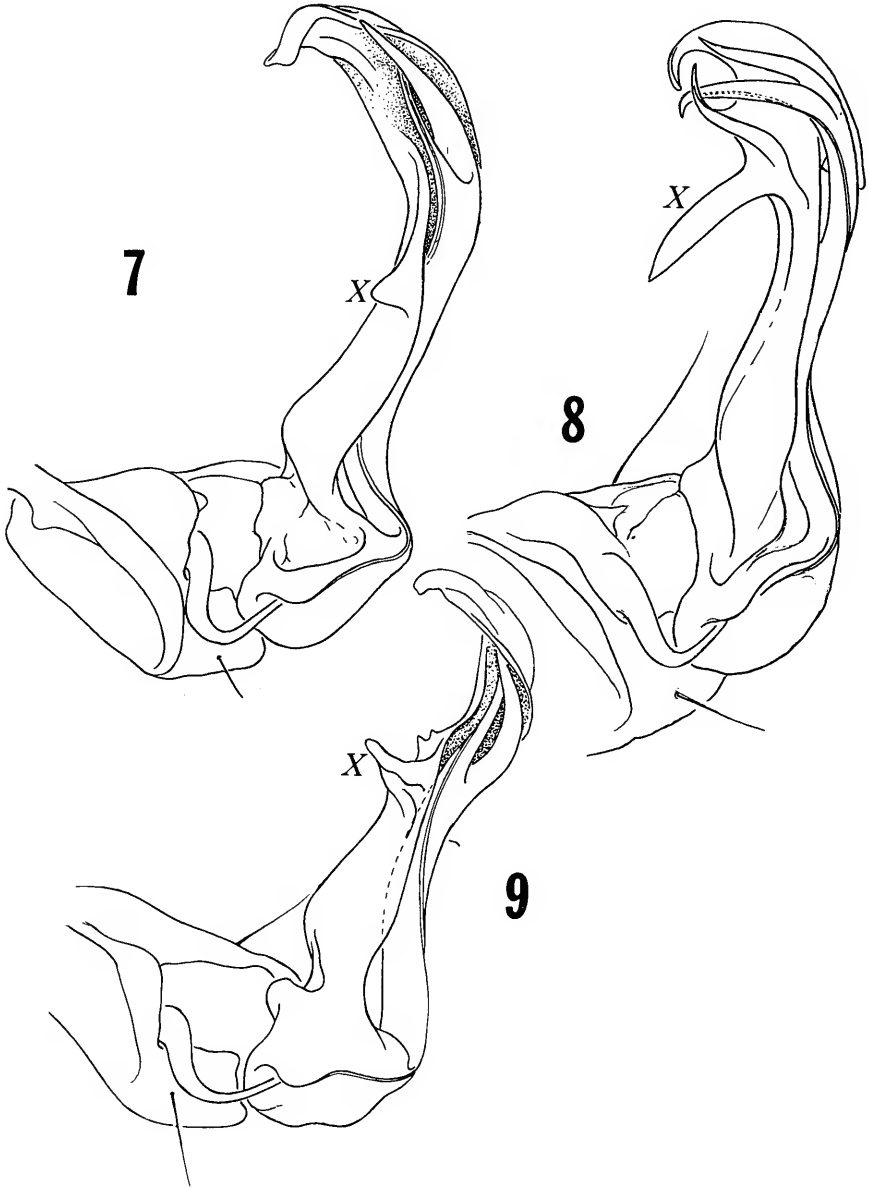
***Tessarithys soledadinus* (Attems), comb. n.**

(Fig. 9)

Pseudoleptodesmus soledadinus Attems, 1931, Zoologica Stuttgart, nr. 79, p. 30, figs. 43-45.

Leptodesmus (*Pseudoleptodesmus*) *soledadinus*: Attems, 1938, Das Tierreich, lief. 69, p. 43.

Leptodesmus soledadinus: Schubart, 1946, An. Acad. Brasil. Cienc., v. 18, p. 196.



Tessarithys neocobius, sp. n.: 7, left gonopod, mesal aspect. *Tessarithys machaerophorus* (Schubart), left gonopod of paratype, mesal aspect. 8, *Tessarithys soledadinus* (Attems), left gonopod of holotype from microscope preparation, coxa and telopodite slightly separated. All drawings made to same scale. X, subterminal dorsal process of prefemoral process.

Material: Male holotype (Naturh. Mus., Wien), labeled only "Soledad, Brasilien."

Description (modified from Attems): Color very dark reddish-brown, edges of paranota reddish-yellow; antennae and legs lighter reddish-brown than the dorsum.

Width of metazona 6.7 mm, of prozona 4.6 mm.

Head smooth, glabrous, some setae perhaps abraded off. Epicranial suture indicated only as a dark line. Collum somewhat narrower than the 2nd segment, laterally symmetrical, semi-elliptic.

Paranota well-developed, set near middle of segmental height, their upper side continuing the strong convexity of the dorsum; anterior corners rounded, posterior corners making a minute projection from the 5th posterior, exceeding posterior edge of metazona only posterior to segment 14; lateral margin of poriferous segments thickened, the peritremata were present merging at both ends the narrow marginal rim. Pore opening facing dorsally. Upper side of metazona without sculpture. 18th segment with paranota extremely reduced, 19th small, short, and lacking paranota. Pleurosternal carinae distinct back to 12th segment. Hypoproct triangular, with two rather large paramedian tubercles.

Sternum of segment 4 with two very small indistinct, tubercles, that of segment 5 with four long slender glabrous projections, the anterior two of which are close together, the posterior pair somewhat separated, the two on each side however tightly pressed together. Sternum of segment 6 smooth, glabrous, without processes. Posterior sterna glabrous, with a small acute spine near each coxa. Legs sparsely setose, except the tarsus, tibia, and part of the postfemur which are dorsally almost spinose. Prefemora without glomus. Legs, except for the last few pairs, with thick whitish subtarsal tibial pad.

Gonopod aperture transversely oval, posteriorly extending beyond middle of coxae of 8th legs, anterior edge separated from median area of segment by the stricture. Gonopod as shown in fig. 9, similar to that of *T. neoecobius* but with dorsal lobe of prefemoral process much larger and projecting, and edge beyond its base with several small denticles.

Remarks: This species is generally similar to *T. neoecobius*, from which it differs in substantially smaller size and in the genitalic characters cited in the key to species and shown in figs. 7 and 9. Unfortunately there is no way at the present to identify the type locality. "Soledad" might be the name of a private home or fazenda; the label carries no collector's name to aid in research. Unquestionably, however, as attested by the close relationship with *neoecobius*, the species is an inhabitant of northern Bahia, and its exact habitat will eventually be established by field or bibliographic search.

***Tessarithys machaerophorus* (Schubart), comb. n.**

(Fig. 8)

Leptodesmus machaerophorus Schubart, 1956, Rev. brasil. Biol., v. 16, p. 424, figs. 5, 6.

Material: Male holotype, two male and six female paratypes (MZUSP 407) from Joazeiro, Mun. Joazeiro, state of Bahia; E. Garbe leg. September 1913.

Diagnosis: A large member of the genus, metatergal width 8.6-9.4 mm; antennae monochromatic; prefemoral process of gonopod with long, falcate basally-directed projection from the nodal region; coxal process of 2nd legs of female nearly as long as prefemur, more robust than in *neoecobius*.

Description: The original description by Schubart is adequately detailed, and being readily available is not quoted or paraphrased here. I wish only to give a new drawing of the left gonopod for comparison with those of the other two species. Schubart's drawing was made from a microscope preparation and does not show an exact median aspect. Figures 7, 8, and 9 in this

paper will show the essential similarity of the gonopod in all three species, aside from the shape of the prefemoral process. Details of peripheral form agree very closely with the account given for *T. neocobius*.

Remarks: Under the heading "Justificação" Schubart stated only that "Nos gonopódios existe uma certa semelhança na forma do telopodito com *L. rubricus* a algumas espécies do grupo *a*, mas o processo pre-femoral com seus 3 ramos distais é bem peculiar..." He did not detect the obvious affinity with Attems' *L. soledadinus*, nor did I until only recently, and then with the advantage of knowing *T. neocobius* at first hand. Any similarity with *rubricus* or the other taxa comprehended in Schubart's "Grupo *a*" (1946) is purely superficial, and that group itself is quite heterogeneous.

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