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A New Milliped of the genus *Parvulodesmus* Shelley from North Carolina, with Rediagnoses of the Genus and *P. prolixogonus* Shelley (Polydesmida: Xystodesmidae)

by Rowland M. Shelley

ABSTRACT

Parvulodesmus Shelley, 1983, is characterized by a long, slender gonopodal telopodite with an apical loop, extending *in situ* 2-3 segments anterior to the 7th; it comprises two species – *P. prolixogonus* Shelley, in Abbeville County, South Carolina, and *P. stephani*, n. sp., in Onslow County, North Carolina. The species are distinguished primarily by the lengths of the prefemoral processes and by the presence or absence of a subterminal acropodal projection. The genus extends some 300 mi (480 km) from the western Piedmont Plateau of South Carolina, near the Savannah River, to the outer Coastal Plain of North Carolina. Additional species are anticipated between these sites and in the Coastal Plain of South Carolina.

In May 1952, Leslie Hubricht, an amateur malacologist, collected two males and one female of a strange, small-bodied xystodesmid milliped in Abbeville, Abbeville County, South Carolina, near the Savannah River in the Piedmont Plateau. My colleague, R. L. Hoffman, to whom he donated the specimens, recognized them as a new genus and mentioned them to me in the 1970's when I was sampling in South Carolina. At that time the material was not available, having been loaned in 1962 to the late William T. Keeton (Cornell University) who was then working with xystodesmids. After Keeton's death in 1980, his milliped collection was recovered

by Dr. Hoffman, and the specimens in question, loaned to me for description, became the types of my (Shelley 1983*a*) new genus and species *Parvulodesmus prolixogonus*, named in reference to their small size and extremely long gonopods. Subsequent field trips to Abbeville and adjacent counties in piedmont South Carolina in both cool and warm weather – in spring, summer, and fall – have not provided more material, so the genus is still known from only this one sample.

Now, 49 years later, *Parvulodesmus* has serendipitously reappeared, this time as a new species, not from a neighboring county in South Carolina where it would be expected, but 300 mi (480 km) to the east northeast, in another state and physiographic province – at Jacksonville, Onslow County, in the Outer Coastal Plain of North Carolina. A resident collected three specimens (again two males and one female) on his front lawn and gave them to the county agriculture agent, who sent them to the Plant Disease and Insect Clinic at North Carolina State University. The entomologist there, D. L. Stephan, recognized them as unique to North Carolina and sent them to me for identification and study. They add another genus and species to the diplopod fauna of the state and allow meaningful diagnoses of the genus and *P. prolixogonus*. I therefore present a brief review of *Parvulodesmus* along with a description of *P. stephani*, n. sp.

Fig. 1. Distribution of *Parvulodesmus*. Dot, *P. prolixogonus*; square, *P. stephani*.

Genus *Parvulodesmus* Shelley

Parvulodesmus Shelley, 1983*a*:121-122. Hoffman, 1999:357. Shelley *et al.*, 2000: 120.

Type-species. Parvulodesmus prolixogonus Shelley, 1983*a*, by original designation.

Diagnosis. A genus of small-bodied Xystodesminae characterized by an acicular prefemoral process of variable length and by a long, slender, blade-like acropodite, extending *in situ* two to three segments anterior to the 7th, with an apical loop of variable diameter.

Species. Two are known; others probably await discovery between the two known sites.

Distribution. Known only from the type localities of the two known species, in Abbeville County, South Carolina, and Onslow County, North Carolina (Fig. 1). This distribution suggests that *Parvulodesmus* may be primarily a coastal genus, with Abbeville being near its western limit.

Remarks. The discovery of *P. stephani* in January confirms my belief (Shelley 1983*a*) that *Parvulodesmus* is active in cool weather rather than the warm temperatures of spring, summer, and autumn, when most collecting takes place. It is one of four cool-weather xystodesmid genera in lowland provinces of the southeast, the others being *Caralinda* Hoffman, *Gonoessa* Shelley, and *Lourdesia* Shelley, in the Coastal Plains of Georgia, Florida, and Alabama (Shelley 1983*b*, 1984, 1991).

Parvulodesmus stephani supports the provisional phylogenetic placement of the genus in the Rhysodesmini (Shelley 1983*a*, Hoffman 1999), on the basis of small body size, hirsute sterna, and acicular prefemoral processes. I neglected to examine the sternum before dissecting the gonopods of the holotype of *P. prolixogonus*, but a lightly sclerotized remnant is evident between the gonocoxae of *P. stephani*, and the genus exhibits this additional feature of the tribe.

Parvulodesmus prolixogonus Shelley

Parvulodesmus prolixogonus Shelley, 1983*a*:122-125, figs. 1-4. Hoffman, 1999: 357.

Type specimens. Male holotype and one male and one female paratypes (VMNH) collected by L. Hubricht, 1 May 1952, in Abbeville, Abbeville County, South Carolina. The gonopods of the male paratype are lost.

Diagnosis. Prefemoral process short and inconspicuous, extending only to level of distal extremity of prefemur; acropodal loop relatively broad, directed dorsad;

acropodite apically divided, with short solenomere and subterminal digitiform process.

Ecology. Nothing definite is known about the habitat in which the the specimens were encountered; in response to my letter in 1982, Mr. Hubricht could only remember that they were found near the railroad.

Distribution. Known only from the type locality.

Remarks. Shelley (1983*a*) noted that *P. prolixogonus* was the smallest xystodesmid then known, and indeed it is smaller than *P. stephani.* However, *Lourdesia minuscula* Shelley, with adults as short as 12.2 mm (Shelley 1991), now holds the title of "world's smallest xystodesmid."

Parvulodesmus stephani, new species
Figs. 2-3

Type specimens. Male holotype and one male and one female paratypes (North Carolina State Museum of Natural Sciences collection [NCSM]) collected by R. Downs, 25 January 2001, at 1008 Schall Drive, Jacksonville, Onslow County, North Carolina.

Diagnosis. Prefemoral process long and slender, extending to level of base of acropodal loop; latter relatively narrow, directed mediad; acropodite apically simple, narrowing to acuminate tip.

Color in life. Unknown; pigments faded. However, the dorsum is mottled brown with light paranotal spots and a light stripe along the anterior margin of the collum.

Holotype. Length 19.1 mm, maximum width 4.1 mm, W/L ratio 21.5%.

Head capsule smooth, polished; epicranial suture indistinct. Antennae relatively short and slender, reaching back to 3rd tergite, becoming progressively more hirsute distad, with four apical sensory cones, no other sensory structures apparent; 1st antennomere subglobose, 2-6 clavate, 7th short and truncate, relative lengths of antennomeres 2>3>4>5=6>1>7. Genae not margined laterally, without medial impressions, ends broadly rounded and projecting slightly beyond adjacent cranial margins. Facial setae as follows: epicranial 1-1; interantennal, frontal, and genal absent; clypeal about 7-7; labral about 8-8, continuing along genal borders with about four setae per side.

Terga smooth, polished. Collum broad, ends not produced beyond those of 2nd tergite. Paranota moderately declined, angling ventrad and continuing slope of dorsum, anterior corners rounded, caudolateral corners rounded on segments 1-5, blunt on 6-13, becoming progressively prolonged caudad; caudal edges of paranota discontinuous with caudal tergal margins.

Sides of metazonites finely granular, without noticeable grooves or impressions. Strictures faint, indistinct. Sternum of segment 4 with two minute lobes; sterna of segments 5-6 flat, glabrous, and unmodified. Postgonopodal sterna with sublinear caudal margins and two hairs on each side of midline, with shallow transverse grooves between leg pairs and faint midventral depressions. Pregonopodal legs moderately hirsute; postgonopodal legs becoming progressively less hirsute caudad. Coxae without projections; prefemora apically rounded through segment 6, slightly acute on 9th legs (caudal legs of segment 7) and becoming progressively more spiniform caudad. Hypoproct slightly produced in midline; paraprocts with margins slightly thickened.

Gonopodal aperture elliptical, ca. 1.8 mm wide and 0.6 mm long at midpoint, without anteriolateral indentations, lateral margins slightly elevated above segmental surface, caudal margin slightly thickened. Gonopods *in situ* (Fig. 2) with telopodites

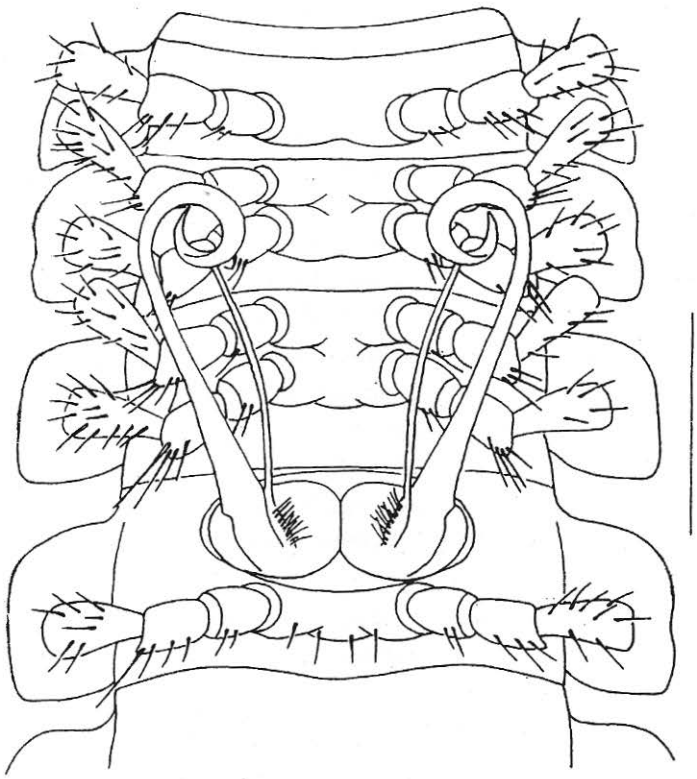

Fig. 2 *Parvulodesmus stephani*, ventral view of segments 4-7 of holotype, showing gonopods *in situ*. Scale line = 1.00 mm.

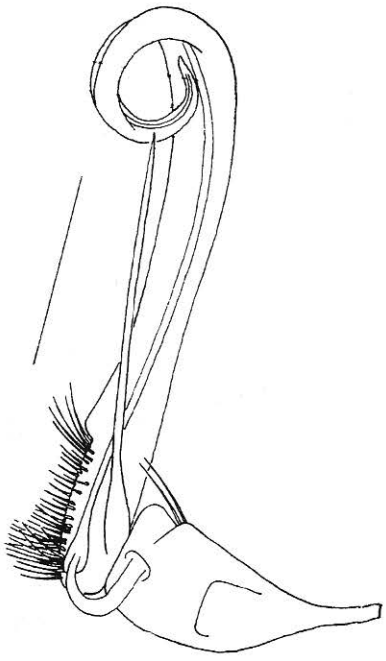

Fig. 3. *Parvulodesmus stephani*, right gonopod of holotype, medial view. Scale line = 1.0 mm.

extending anteriad from aperture and diverging, overhanging legs of 5th and 6th segments. Gonopod structure as follows (Fig. 3): coxa small, closely appressed to opposite member and connected by lightly sclerotized sternal remnant. Prefemur small; prefemoral process long and slender, arising mediad and extending anteriad just beyond level of base of acropodal loop. Acropodite demarcated from prefemur by slight cingulum, stem expanded slightly basally then narrowing and expanding again; apical loop relatively narrow, directed mediad, tip simple and acuminate, without subterminal projection. Prostatic groove arising in pit in base of prefemur, running along medial surface of acropodal stem and inner surface of loop to terminal opening.

Male paratype. Length 17.4 mm, maximum width 4.4 mm, W/L ratio 25.3%. Agreeing closely with holotype in all details except epicranial setae absent.

Female paratype. Length 17.3 mm, maximum width 4.3 mm, W/L ratio 24.9%. Agreeing closely with males in somatic features except paranota shorter and more strongly declined, creating appearance of more highly arched body; facial setae as in holotype with addition of one pair of subantennal setae; distinct prefemoral spines arising on legs of segment 7 and continuing to legs of segment 17. Cyphopodal aperture broad, encircling 2nd legs and extending well laterad, margins strongly elevated and slightly flared. Cyphopods clearly visible, valves protruding through aperture; receptacle and operculum not detected, valves moderately large and subequal, glabrous.

Ecology. The specimens were discovered in a dead section of a zoysia lawn on organic soil; there is no evidence that the turf was imported, and the species is considered native to Onslow County.

Distribution. Known only from the type locality.

Remarks. I am pleased to name this species for David L. Stephan, who has sent me many interesting North Carolina millipeds over the years, particularly from the Coastal Plain, and who first recognized the uniqueness of these specimens. Beyond this, he has been a long-time supporter of the NCSM and has materially aided its overall research program.

The discovery of this genus and species in North Carolina increases the known diplopod fauna of the state to 10 orders, 24 families, 50 genera, and 118 species and subspecies (Shelley 2000), since *Aniulus carolinensis* Shelley is a synonym of *Oriulus venustus* (Wood), which is already known from the state (Shelley 2001).

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