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Revalidation of the generic name Rudiloria Causey, 1955 (Polydesmida: Xystodesmidae)[1]

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It has been realized by students of North American millipeds for many years that the generic classification of Appalachian xystodesmids has been less than satisfactory. In particular a number of genera have been defined on the basis of highly simplistic and subjective conceptualizations of gonopod structure, e.g., the telopodite taking the form of a simple slender coil, or a broadened sigmoid curve, or being provided with a joint near the midlength. As the number of species has increased in recent decades, the illusory nature of such "genera" has become apparent, and the necessity for a general reorganization ever more imperative.

The remarkable degree of plasticity manifested in xystodesmid gonopods, and the high probability that some similarities are the result of random convergence in unrelated lineages, renders the formulation of precise generic definitions almost impossible. Some qualifications must be expected, and if a particular species does not agree in all respects with a diagnosis, it may be placed arbitrarily because of general similarity to others that do conform, and rather high importance must be attached to geographic factors in estimating affinities.

It may be recalled that a genus is at best defineable only in subjective ways: as understood to be simply a group of related species, the genus is outlined by the sum variability of its components, not the other way around. Observation of this principle in effect provides a solution to the nagging problems inherent in the study of any group in which the primary taxonomic characters (such as genitalia) are difficult to either verbalize or quantify. It also provides a desireable departure from the old typological principles in its independence from both a fixed verbal definition and a typical (not in the nomenclatorial sense) species.

For many years I have incubated a latent interest in the nominal genus *Apheloria* which contains several of the first xystodesmids I ever collected. From the earliest experience, it struck me that the group was probably heterogeneous but no real confrontation of the problem was made in the expectation that additional pertinent species would eventually be discovered. Now, a little more than 30 years

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after I picked up my first specimen of *A. corrugata*, it seems that the status of the genus can be examined, and a detailed revision of its species in fact is now well advanced.

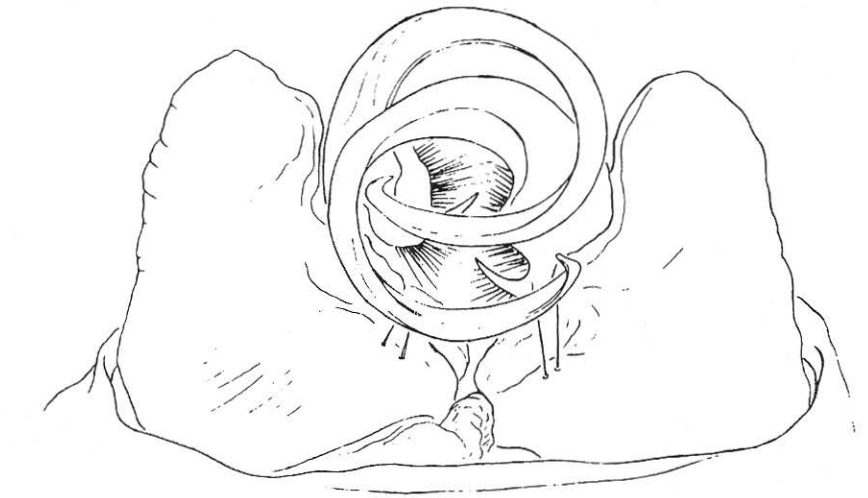
Apheloria was originally diagnosed by Chamberlin (1921: 232) as follows: "Erected for a group of species, heretofore included in *Fontaria*, in which the telopodite of the gonopod of male is a simple, coiled blade with a small spur at base." In my view, the genus was heterogeneous even at the time of its proposal, as the newly-named *A. ainsliei* is obviously not congeneric with *A. montana*, the type species. Since 1921 a considerable number of millipeds have either been named in, or referred to, *Apheloria;* no fewer than 24 such names are accounted in the "Checklist of the Millipeds of North America" (Chamberlin & Hoffman, 1958).

If the gonopods of these various species (or subspecies) are examined from a carefully standarized aspect, two major groupings become immediately evident. In one, the telopodite of the gonopod is small and curved about 340° in a tight coil, the apex directed dorsad. In the resting position the two gonopods are superimposed closely or interlocked (cf. Fig. 1). As the genitalia of *Fontaria montana* Bollman (1887: 622), the type species of *Apheloria* exemplify this pattern, the name *Apheloria* may be used to designate this group. Aside from *montana*, the following names have been based on specimens having similar if not identical gonopods:

Apheloria adela Chamberlin (1939)
Apheloria asburna Chamberlin (1949)
Apheloria aspila Chamberlin (1939)
Fontaria butleriana Bollman (1889)
Polydesmus corrugatus Wood (1864)
Leptocircus inexpectatus Attems (1931)
Apheloria iowa Chamberlin (1939)
Apheloria pinicola Chamberlin (1947)
Apheloria reducta Chamberlin (1939)
Apheloria roanea Chamberlin (1947)
Apheloria tigana Chamberlin (1939)
Apheloria unaka Chamberlin (1939)
Apheloria virginia Chamberlin (1939)
Apheloria waccamana (Chamberlin (1940)

The majority of these names are either direct synonyms or have at best the rank of subspecies, as will be shown in my forthcoming revision. Another name that has been traditionally associated with *Apheloria* for decades is *Fontaria coriacea* Koch (1847). As described in detail and illustrated in color by Koch in 1863, this species cannot be associated with any currently known aphelorine milliped, and in 1957 I proposed to revive Wood's name *corrugatus* for the common eastern milliped long known as *Apheloria coriacea.* This change was published too late to be included in the "Checklist of the Millipeds of North America" (Chamberlin & Hoffman, 1958).

In a second group, the telopodite of the gonopod describes a much wider arc, rarely if ever a tight circle, and so appears "larger" (cf. Figs. 1 and 2); curving



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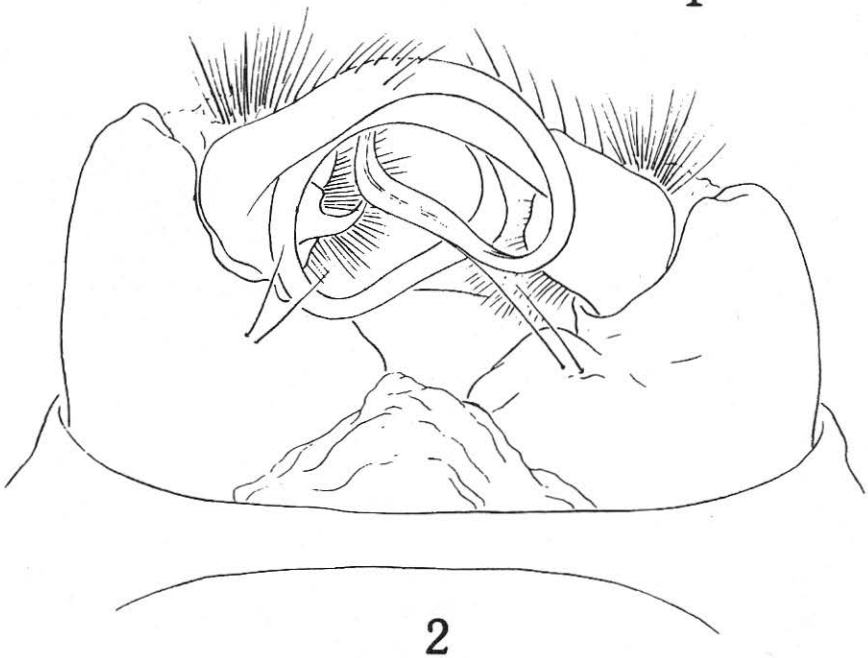

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Fig. 1. *Apheloria montana* (Bollman), gonopods of male from Rhea Co., Tennessee. Fig. 2. *Rudiloria trimaculata* (Wood), gonopods of male from Rockbridge Co., Virginia. Both drawings from anterior (oral) aspect, and from specimens of nearly equal body size to show difference in telopodite size.

mesad and apically directed ventrad instead of dorsad. The species referable to this group are likewise fairly numerous, and the following names have been proposed:

Apheloria antrostomicola Hoffman (1949)
Apheloria guyandotta Shear (1972)
Apheloria keuka Chamberlin (1939)
Apheloria kleinpeteri Hoffman (1949)
Fontaria lutzi Jacot (1938)
Rudiloria mohicana Causey (1955)
Apheloria picta Hoffman (1949)
Apheloria tortua Chamberlin (1949)
Polydesmus trimaculatus Wood (1864)
Apheloria trimaculta incarnata Hoffman (1951)

The new generic name *Rudiloria* was proposed for one of these species by N. B. Causey in 1955, defined as being similar to *Apheloria* but "Differs from that genus in the smaller body size and especially in the absence of a prefemoral spur or process on the telopodite of the male gonopods." In his recent paper on *Apheloria guyandotta*, Shear (1972: 497) expressed the view that these differences are of specific value only, and considered *Rudiloria* to be a junior subjective synonym of *Apheloria*. Certainly Dr. Shear's point is well made: the originally stipulated diagnostic characters do not justify generic status, but I now incline to the view that if *Apheloria* is to be restricted to the group as redefined here, *Rudiloria* is available to denominate most of the excluded elements. It becomes valid by accident, so to say, and not for any of the reasons originally adduced.

The two genera considered here are largely sympatric over much of the central Appalachians, although *Rudiloria* occurs over a fairly restricted range, from eastern Kentucky and southwest Virginia north to Ontario. *Apheloria* is much more widespread, and extends from New England to Georgia in the mountains, and westward as far as Oklahoma and Iowa, represented in the Central Lowlands and Atlantic coastal plain as well as in the Appalachian region. Speculation on the relative phylogenetic status of the two genera prior to revision of all the "aphelorine" taxa would be futile, yet on the basis of present knowledge, it would appear that the strongly reduced telopodites in *Apheloria* represent a derived condition.

The views expressed in the preceeding paragraphs can be summarized in the following brief generic characterizations:

Apheloria

Apheloria Chamberlin, 1921, Canad. Entom., v. 53, p. 232. Type species, *Fontaria montana* Bollman, 1887, by original designation.

Leptocircus (*nec* Swainson, 1833) Attems, 1931, Zoologica (Stuttgart), v. 30, no. 79, p. 67. Type species, *Leptocircus inexpectatus* Attems, 1931, by original designation.

Telopodite of gonopod reduced in size, set subterminally on coxa which projects distally beyond base of prefemoral region; acropodite in the form of a

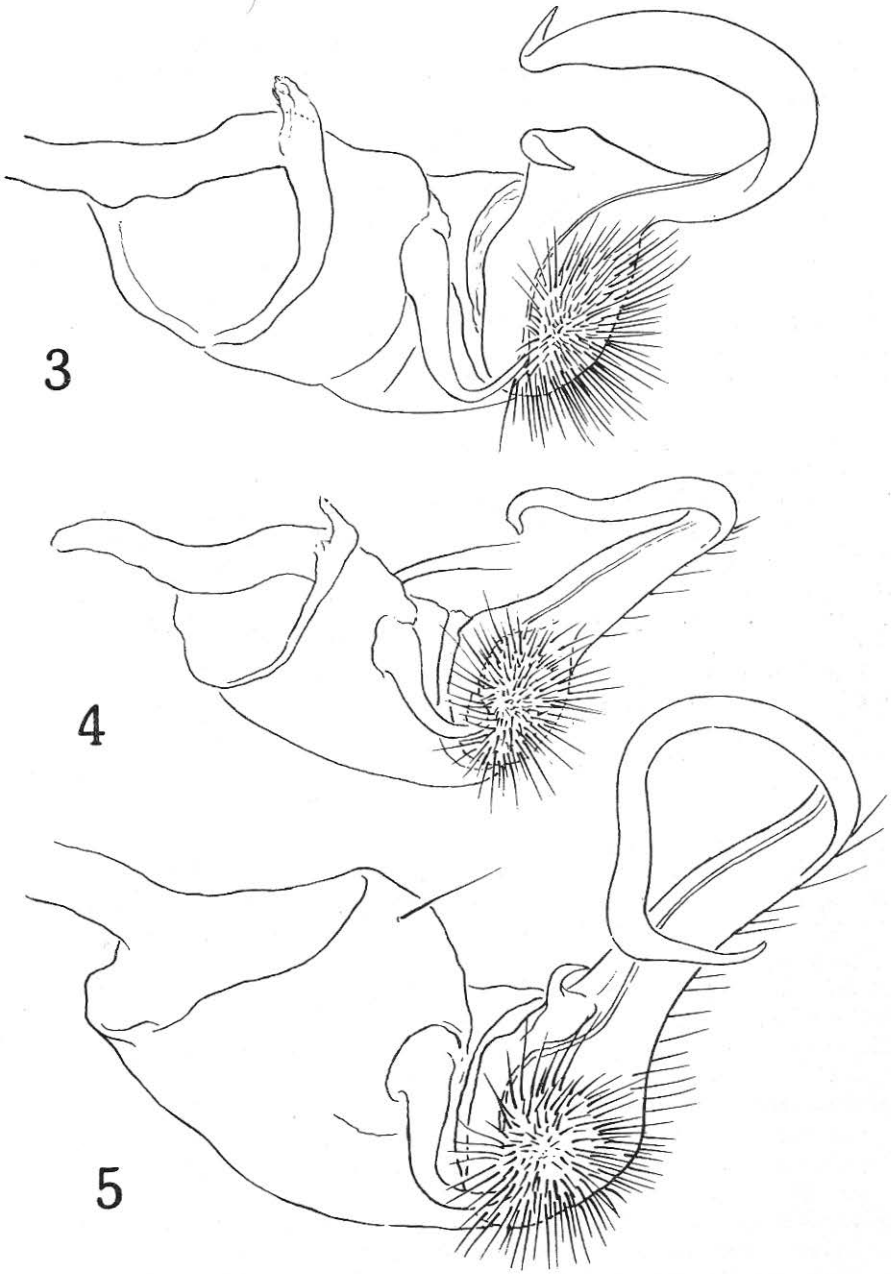

Fig. 3. Left gonopod of *Apheloria montana,* mesal aspect, specimen from Scott Co., Virginia. Fig. 4. Left gonopod of *Rudiloria mohicana* Causey, mesal aspect, from holotype, Ashland Co., Ohio. Fig. 5. Left gonopod of *Rudiloria trimaculata* (Wood), mesal aspect, specimen from Rockbridge Co., Virginia. All drawings made to same scale (X45).

simple, attenuate blade describing a tight coil of about 340°, the distal fourth curved dorsad (Fig. 1); in mesal aspect acropodite region forms nearly a right angle with main axis of prefemur (Fig. 3).

Rudiloria

Rudiloria Causey, 1955, Proc. Biol. Soc. Washington, v. 68, p. 28. Type species, *R. mohicana* Causey, 1955, by original designation.

Telopodite of gonopod of a size normal for the family, set terminally on coxa which does not project distally beyond prefemoral region (as seen in anterior or dorsal aspect, Fig. 2); acropodite in the form of a long, slender, loosely-coiled blade curving dorsomesad and ultimately ventrad; in mesal aspect (Figs. 4, 5) acropodite region essentially continuing the direction of the median prefemoral axia.

Thanks to the generous cooperation of Dr. Norman Platnick, I was able to examine the holotype of *Rudiloria mohicana* from the collection of The American Museum of Natural History. Since the gonopods had already been dissected from the body, it was not possible to prepare a drawing of them *in situ* to correspond with that representing the condition in *Apheloria*. The related species *R. trimaculata* was used for this purpose, but I give here (Fig. 4) a drawing of the left gonopod of *mohicana* made from a true medial position for comparison with similar drawings for *trimaculata* and *A. corrugata*.

Referal of the ten specific and subspecific names listed above to *Rudiloria* constitutes **new combination** for all of them except *mohicana*, but the allocation is made without any critical evaluation of their actual taxonomic status and a revision is much to be desired.

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