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## East African odontopygid millipedes 4: A restricted redefinition of the genus *Rhamphidarpoidea* Kraus, 1960, a related new genus, five new species, and notes on solenomere function (Diplopoda; Spirostreptida; Odontopygidae)

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### Abstract

Based mainly on morphology of the solenomere, a restricted redefinition of the millipede genus *Rhamphidarpoidea* Kraus, 1960, is given. *R. aberdare* (Brolemann, 1920), *R. aloysiisabaudiae* (Silvestri, 1907), *R. alticolus* (Brolemann, 1920), *R. austrosudanicus* n.sp., (South Sudan), *R. collinus* n.sp., (Kenya), *R. cyclopyge* (Attems, 1935), *R. filigerus* (Attems, 1938), *R. kenyanus* (Brolemann, 1920), *R. kilimanjaronus* (Attems, 1909) n. comb. ex *Odontopyge*, *R. lobiferus* (Attems, 1938), *R. milobonte* Pierrard, 1970, *R. pectinatus* n.sp., (Kenya), *R. regina* (Carl, 1909), and *R. ruandensis* Kraus, 1960, are referred to *Rhamphidarpoidea* in the restricted sense. *Raduliverpa* n.gen. is described to accommodate *R. serpentispina* n.sp. (TYPE SPECIES; Tanzania, Kenya), *R. mitis* n.sp. (Tanzania). *R. serrata* (Kraus, 1960), n. comb. ex *Rhamphidarpoidea*, and *R. sicaria* (Attems, 1935) n. comb. ex *Prionopetalum*. *Rhamphidarpe aculeata* Attems, 1938, *Rhamphidarpe armata* Attems, 1938, *Rhamphidarpoidea bidens* Kraus, 1960, *Rhamphidarpoidea bidenticulatus* Pierrard, 1970, and *Odontopyge winspearei* Silvestri, 1907, are excluded from *Rhamphidarpoidea* and placed *incertae sedis*.

**Key words:** Odontopygidae, taxonomy, *Rhamphidarpoidea*, new genus, new species

### Introduction

Genus concepts in Odontopygidae are generally less than ideal, and as a result the family is currently composed of a mixture of large genera often containing quite dissimilar species, and many very small genera (Frederiksen 2013b). A very good example of this is provided by the genus *Rhamphidarpoidea* Kraus, 1960. The history of *Rhamphidarpoidea* indirectly goes back to the description of the genus *Rhamphidarpe* Attems, 1914. Between the year it was described and 1960, 17 species were referred to *Rhamphidarpe*. Kraus (1960) restricted *Rhamphidarpe* to two species, referred three former *Rhamphidarpe* species to a new genus, *Rhamphidarpina*, and a further 12 to another new genus, *Rhamphidarpoidea*. In addition he had described *Rhamphidarpella* two years earlier (Kraus 1958). Kraus (1960) included 15 species in *Rhamphidarpoidea*, including three species he described as new. Pierrard (1970) added two more species, but apart from that no work has been done on the genus since 1960.

Whereas *Rhamphidarpe sensu* Kraus (1960), *Rhamphidarpina* and *Rhamphidarpella* are quite well-defined (as odontopygid genera go), Kraus' descriptions underline the “waste-paper basket” nature of *Rhamphidarpoidea* which was already implied by Kraus (1960) himself. “Out of the Attemsian “*Rhamphidarpe*” complex we have assembled a number of species in natural, smaller groups as far as the state of our knowledge has provided a basis (*Rhamphidarpe* s.str., *Rhamphidarpina*, *Rhamphidarpella* etc.) ..... We preliminarily place the remaining species of the *Rhamphidarpe* complex in *Rhamphidarpoidea* because a further subdivision at present appears premature (translated from German).” In the present contribution we initiate such a subdivision, based on studies of five new species, syntypes of several previously described species, new material of a previously described species which we transfer to *Rhamphidarpoidea*, and original descriptions and drawings. We restrict *Rhamphidarpoidea* to 14 species, including 3 new species, define a new genus for a further 4 species, including 2 new species, and place the remaining 5 species referred to *Rhamphidarpoidea* by previous authors *incertae sedis* aff. *Rhamphidarpoidea*.

Adding to the confusion is the fact that the identity of the type species of the type genus of Odontopygidae,

*Rhampidarpe winspearei*: Attems (1914)  
*Rhamphidarpoidea winspearei*: Kraus (1960)

No drawings could be found, but according to the key in Kraus (1960) the solenomere has two barbs.

**Distribution.** Uganda

### Possible function of the solenomere

The part of the odontopygid gonopod referred to as the solenomere is characterized by containing a canal which is mostly (always?) formed by longitudinal rolling-up of the solenomere (see, e.g., Frederiksen 2013b: fig. 16). The solenomere has been supposed to function as a “sperm canal (e.g., Barnett & Telford 1996)” but it has also been hypothesized that various structures seen on odontopygid gonopods may function in sperm competition by removing sperm from the female receptacula or by “stratifying” sperm inside the receptacula (Barnett & Telford 1996).

On the solenomere of *Raduliverpa serpentispina* (Fig. 7), between the transverse ridges, we observed some structures which are consistent with odontopygid spermatozoa as described by Manier et al. (1974) and Jamieson (1987) (Fig. 7B). The size (ca. 6 µm) and overall shape agree, with reservation for the granular cover seen on Fig. 7B. We regard it as likely that these are spermatozoa which were removed from a female’s vulva by a scraping action of the solenomere. The basad orientation of the ridges on the solenomere of *Raduliverpa serpentispina*, and of the denticles on the solenomere of several *Rhamphidarpoidea* species, suggest that the structures are used for pulling/scraping out sperm rather than for pushing it in. We also regard it as likely that the rows of spines seen on the solenomere of many *Rhamphidarpoidea* species have a similar function. The solenomere of *Rhamphidarpoidea* and *Raduliverpa* (and certainly several further odontopygid genera) would thus be functional analogues of the more or less lamp-brushlike flagella on the gonopods of several genera of Julidae (e.g., Enghoff 1995) and Nemasomatidae (Enghoff 1985), and of the elongated posterior gonopods of the julid *Dolichoiulus parcestriatus* (Brölemann, 1901) (Enghoff 1992) which are also supposed to assist in removing sperm from previous copulations.

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