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Sellnickiella (Sellnickiella) biunguiculata sp. nov.: a noteworthy species of Labidostomatidae from Australia (Acari: Actinedida: Labidostomatina)

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Abstract – *Sellnickiella (S.) biunguiculata* sp. nov. is described from Australia. This species shows an exceptional apomorphic character among Labidostomatidae: the lack of median unguis on legs II–IV. Otherwise, this species is a typical member of *Sellnickiella (Sellnickiella)*, a gondwanan group which representatives recorded from South America, South Africa, Australia and New Zealand.

INTRODUCTION

The Australian labidostomid fauna was summarized by Atyeo and Crossley (1961a) who described two species of *Labidostoma*[1] Kramer which are now placed in *Sellnickiella (Sellnickiella)* Feider and Vasiliu, 1969 (Bertrand 1990a): *Sellnickiella (S.) womersleyi* (Atyeo and Crossley) and *S. (S.) adelaideae* (Womersley)[2]. These authors (Atyeo and Crossley 1961b) also described some new species from New Zealand belonging to both *Sellnickiella* and *Labidostoma (Atyeonella)* (Feider and Vasiliu 1969; Bertrand 1990a). Others known species of *Sellnickiella* are restricted to southern hemisphere (Feider and Vasiliu 1970; Feider, Vasiliu and Calugar 1974; Bertrand 1990b; Bertrand and Theron 1992).

Although labidostomids are worldwide in distribution, they show biogeographic patterns at the generic or infrageneric level which allow us to consider them as good indicators of past relationships between continents. The homogeneity of the characters as their originality justify the fact that they constitute the suborder Labidostomatina (= Labidostomina) amongst the heterogeneous order Actinedida with a small number of valid genera (only four). Collections from the southern continents are still scarce, and increased knowledge is leading to a constant improvement of traditional classification patterns, mostly based on morphological characters of palearctic species. Grandjean (1942) stated that the division of the genus *Labidostoma* was untimely. However, 50 years after, new data have shown four main groups, each assigned generic status: *Eunicolina, Akrostoma, Sellnickiella* and *Labidostoma* (Bertrand 1990a). *Labidostoma* is worldwide in distribution, and *Sellnickiella* is restricted in southern hemisphere. Description of a new Australian species is a contribution towards our knowledge of the labidostomid fauna of the southern continents.

The specimens discussed below are all lodged in the Western Australian Museum, Perth (WAM) and are stored in alcohol. Three were dissected and cleared in lactic acid. The following abbreviations are used:

ap.m.: antiaxial cheliceral appendice
apo1, apo2, apo3, apo4, apo sej.: ventral apodemes 1 to 4 and sejugal apodeme
bo.a, bo.p: trichobothria, anterior and posterior
cha, chb: cheliceral setae
da, db, dc, dd, de: paired opisthosomatic setae of dorsal files
E: eye
FE: frontal eye
ga, ge, gr, gm: fundamental paired aspidosomal setae (except trichobothria)
la, lb, lc, ld, le: paired opisthosomatic setae of lateral files
ly: lateral lyrifissure of dorsal shield
LE: lateral eye
LL: adoral lateral lips
ma, mb: usual paired infracapitular setae
p: pores of the cuticle
P1, P2, P3: paraproctal setae
SL: superior lip (labrum)
tα, tπ, ti: antiaxial, paraxial, and inferior terminal teeth of fixed digit of chelicera
tr: tracheal trunk

[1] This generic name is either spelt *Labidostoma* or *Labidostomma* by various authors. Etymologically, the Greek root 'stoma' (for mouth) is correct. This term was used by Oudemans (1904) who named the family Labidostomidae correcting the error of Kramer (1879). According to the International Code of Zoological Nomenclature, the valid family group name is Labidostomatidae, although the first genus described was *Nicoletia* Canestrini and Fanzago, 1877, and the term Nicoletiellidae (Canestrini, 1891) has been used by several authors (see Steyskal, 1970).

[2] Feider and Vasiliu (1969) wrongly attributed *S. 'wommersleyi'* to Womersley (1935).

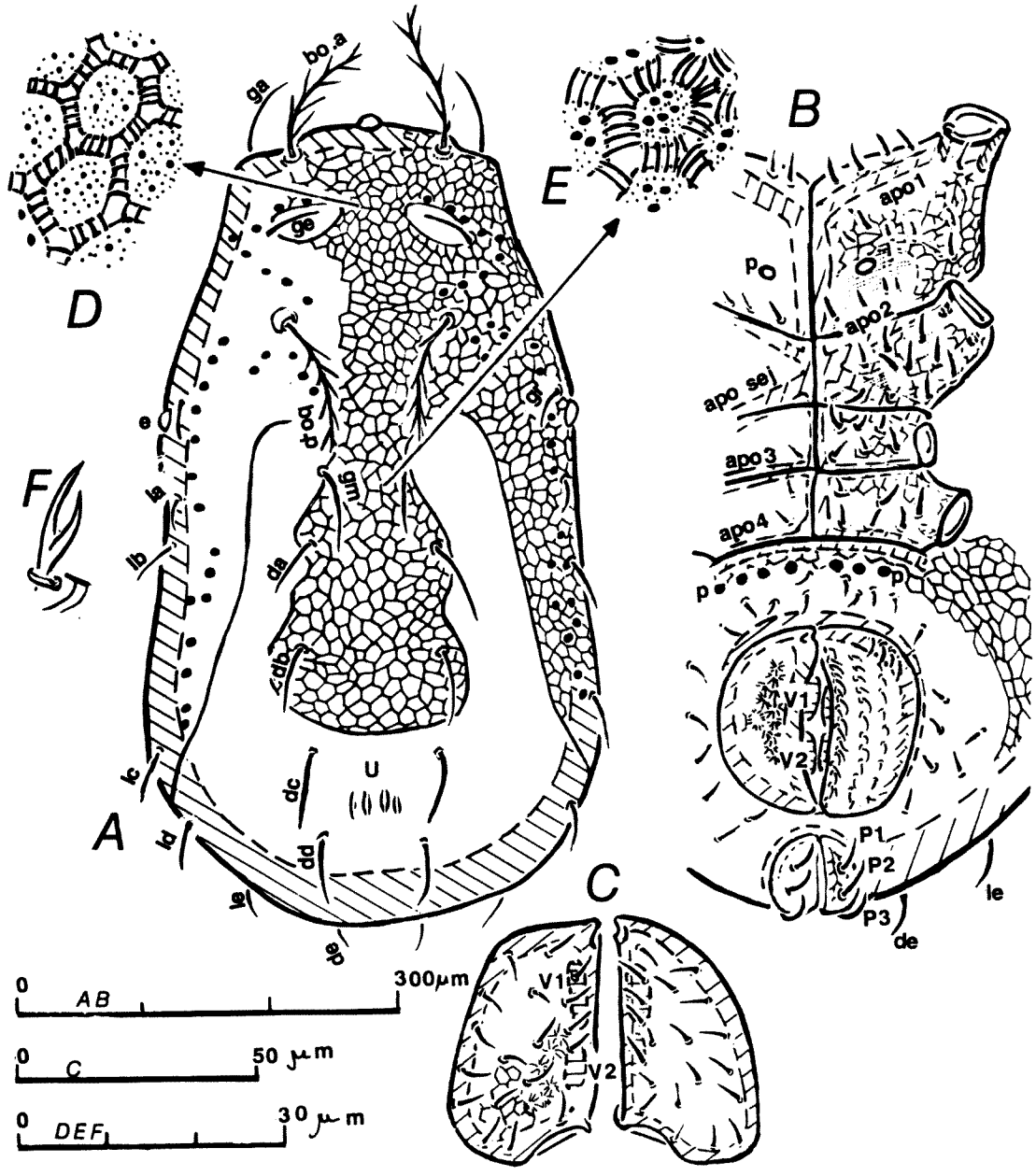

Figure 1 *Sellnickiella (Sellnickiella) biunguiculata* sp. nov.: A, dorsal shield female; B, ventral shield, male; C, progenital valves of female (nota: both valves are slightly separated in order to show their articulations at anterior and posterior extremities); D, E, cuticular reticular patterns of dorsal shield; F, famulus of tarsus I (dorsal).

Tζ: terminal eupathidial seta of palp tarsus
U: U-shaped zone of dorsal shield
ω, ω1, ω2: solenidia of tarsus (palp or leg)

SYSTEMATICS

Genus *Sellnickiella* Feider and Vasiliu

Sellnickiella Feider and Vasiliu, 1969: 206.

Type species

Labidostoma brasiliense Sellnick, 1922, by original designation.

Remarks

This genus includes two subgenera: *Dicastriella*, which is only known from South America, and *Sellnickiella* which has been found on all the southern continents (Bertrand 1990a; Bertrand and Theron 1992); and *Sellnickiella*, which is noteworthy because unlike others members of the family it does not show uniformity of sclerification in adult stases and lacks a pair of "gland like organs" (which are subject to neotaxy in *Eunicolina*, and in some species of *Labidostoma*). The differentiated sclerification of the dorsal shield in *Sellnickiella* was well illustrated by Feider and Vasiliu (1970) and

may be related to immature sclerification (neoteny in the common sense of maintenance of pre-adult characters in adult stases). These characters are found in both subgenera, *Sellnickiella* and *Dicastriella*. The subgenus *Sellnickiella* also exhibits the peculiar morphology of the famulus (dorsal regressive seta of tarsus I), with two unequal branches which is unique among species of Labidostomidae. This morphology results from a regressive evolution with the complex primitive famulus being present in *Labidostoma* (Grandjean 1941).

Sellnickiella (Sellnickiella) biunguiculata sp. nov.

Material Examined

Holotype

♀, Dwellingup, Western Australia, Australia, 32°43'S, 116°04'E, 8 June 1978, pitfall traps, S.J. Curry (WAM 93/96).

Paratypes

Australia: Western Australia: 1 ♀, 1 ♂, Dwellingup, 32°43'S, 116°04'E, 8 June 1978, pitfall traps, S.J. Curry (WAM93/37–38); 4 ♂, 3 ♀, Mt Cooke, 32°25'S, 116°18'E, 27 April 1992, leaf litter, M.S. Harvey, J.M. Waldock (WAM 93/39–45).

Diagnosis

Sellnickiella (S.) biunguiculata is very similar to *S. (S.) womersleyi* (Atyeo and Crossley) from South Australia, but can be distinguished by the bidactylous tarsi II–IV, the absence of lateral projections on the anterior edge of dorsal shield, the ornamental pattern of dorsal shield, and characters of the fixed digit of the chelicera, which is serrate and bears a strong blade.

Description

General Morphology (Figure 1)

Small elongated, long legged species, yellow to brown in alcohol. Leg I length similar to body length: dorsal shield ca. 600 to 650 µm, somewhat oval; chelicerae strong, ca. 150 µm in length; their strong digits come into view in dorsal examination before frontal extremity of dorsal shield beneath a small median eye (20 µm diameter). Dorsal shield (Figure 1A) bears usual pairs of setae with pairs *ga, gr, ge gm* and trichobothria *boa* and *bop* belonging to the aspidosoma, 1 ♂ lacks one pair, *ge*, as in *S. womersleyi* [see Atyeo and Crossley (1961)], dorsal and lateral files (*la*) to (*le*) and (*da*) to (*de*) on the opisthosoma.

Trichobothria long (more than 100 µm) with thin ciliation longer on anterior pair, which is inserted very close to anterior edge of dorsal shield. Distance between bases of anterior pair is 140 to 150 µm while in the posterior pair this distance is 160 to 180 µm. Anterior pair (*ga*) inserted ventrally. Cuticle regularly alveolated except in dorsal part behind level of lateral eyes where ornamentation is dissolved into a tiny punctated U-shaped area whose internal margins are limited by setae (*gm*)

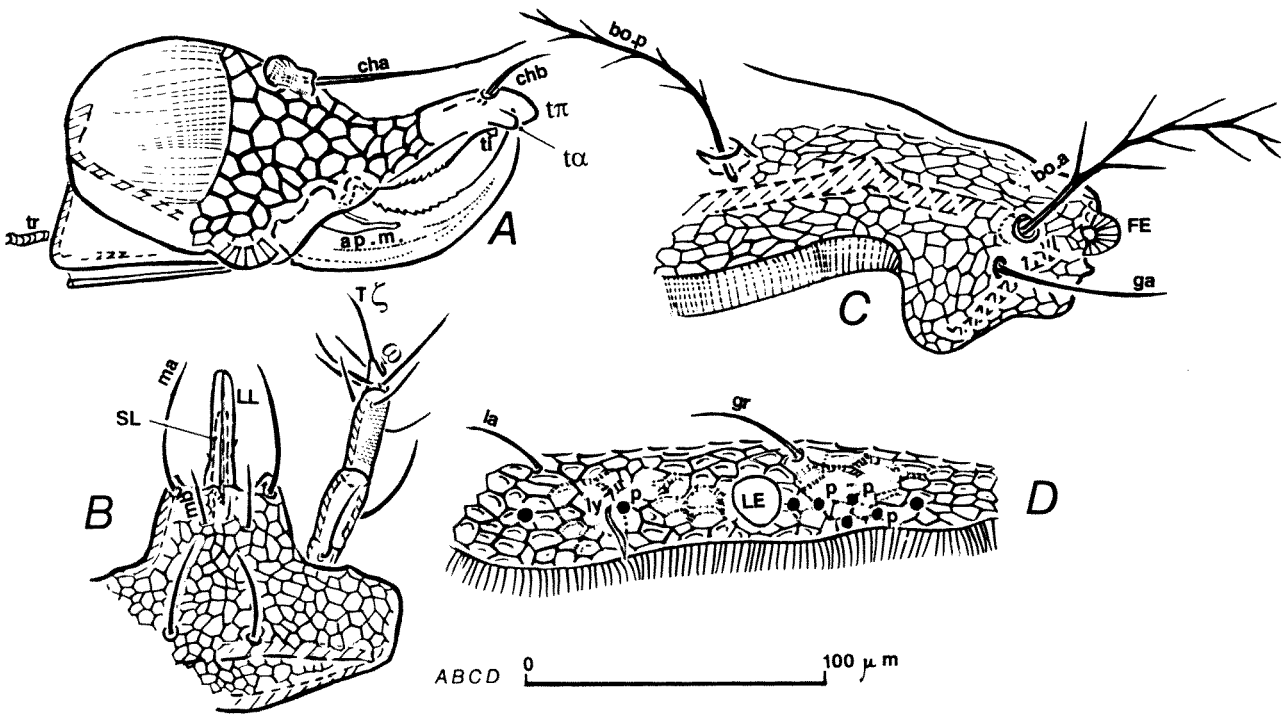

Figure 2 *Sellnickiella (Sellnickiella) biunguiculata* sp. nov: A, chelicera, antiaxial view; B, infracapitulum and palp, ventral view; C, anterior part of dorsal shield, lateral view; D, ocular zone of dorsal shield, lateral view.

and dorsal setae (*da*) and (*db*). Cuticle exhibits numerous pores mainly in two regions: interbothridic area and above lateral margin of dorsal shield in alveolated area.

Chelicera (Figure 2A)

Chelicerae are typical of the genus, and very similar to that of *S. womersleyi*, with a strong fixed digit bearing tiny inferior teeth. Fixed and mobile digits serrate, indentations attenuated from basis to distal part; proximal part of movable digit with a strong basal tooth which is co-adapted with a shaft on the fixed digit [see Bertrand (1990b) or Feider and Vasilu (1970) for descriptions in others *Sellnickiella* species]. Fixed digit provided with a strong blade. Antiaxial cheliceral appendice present.

Infracapitulum and Palp (Figure 2B)

Infracapitulum proximally wide, narrowed distally, slight lips, basal width of lips narrower than infracapitulum edge. Two pairs of ventral infracapitular setae (*ma* and *mb*); a third pair (*ge*) added behind, but absent in the ♂ lacking (*ge*).

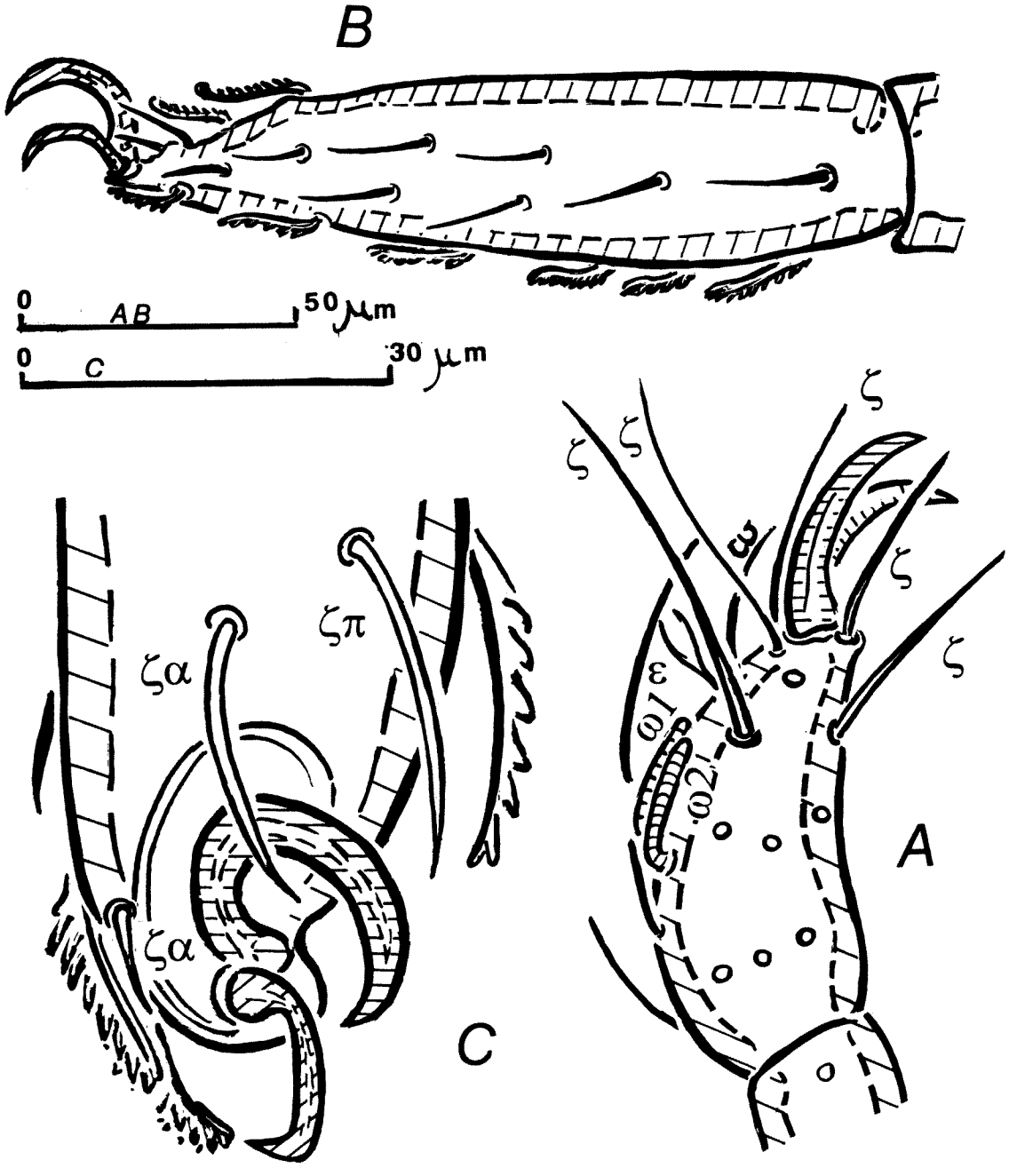

Figure 3 *Sellnickiella (Sellnickiella) biunguiculata* sp. nov: A, tarsus I, antiaxial view; B, tarsus II, antiaxial view; C, distal part of tarsus III and claws, dorsal lateral view.

Morphology of the palp as for family, with four articles and usual chaetotaxy: 1;1;3;4+ ω; solenidion ω tiny and dorsal.

Podosoma and Ventral Shield (Figure 1B)

Epimeral plates alveolated, except in the posterior zone where ornamentation is produced by slightly striated alveolae; strong apodemes. Epimeral plate III strongly reduced, epimera I and II developed. Epimeral plate I with the usual pore. Epimeral chaetotaxy: 15–18; 10; 6–7; 6. Ventral shield with 7–9 cuticular pores arranged in a transverse row situated behind epimera IV.

Male genital valves strongly setose, setae disposed in 4 irregular longitudinal rows. Female genital valves with only about 20 setae. When genital valves of both males and females are closed, the sagittal edges are closely appressed. Females with a narrow furrow into which anterior edge of paraprocts fit ensuring solidarity of movements of paraprocts and genital valves. Progenital chamber with two pairs of genital papillae in both sexes. Anal shields each with 3 setae. Fundamental ornamentation pattern of anal and genital valves is alveolated but pentagonal or hexagonal walls tending to disapear leaving only costules visible and giving a stellate secondary pattern.

Legs and Claws

Legs divided into trochanter, basifemur, mesofemur, telofemur, genu, tibia, tarsus and apotele. Claws of legs I–IV with only two, large ungues (10 µm), middle unguis absent. Tarsi I–III with eupathidia. Tarsal extremities present dorsally (Figure 3C), tarsal recess visible where claws can be partially retracted (very similar to that of *Sphaerolichus barbarus* Grandjean, 1939).

Remarks

As noted above, this species is very similar to *S. (S.) womersleyi* from South Australia, but can be distinguished by features of the tarsi, dorsal shield, and fixed cheliceral digit. The principal diagnostic feature of this species is the bidactylous tarsi II–IV: it is an important character state which can be considered as autapomorphic.

Despite the unique occurence of bidactylous legs, this species seems to form a natural group with *S. (S.) womersleyi*, *S. (S.) adelaideae* from Australia and *S. (S.) circinus* from New Zealand. This suggests that they might share a common ancestor, and that apomorphic character states of *S. (S.) biunguiculata* can be only interpretated as elements of species-level differentiation.

The claws of labidostomids, as in the Sphaerolichidae, show distinct heteronychy on legs II, III and IV, with the median unguis being the weakest and lost from leg I (Grandjean 1941). *Sellnickiella biunguiculata* is unique amongst known labidostomids and shows only two claws on all legs. Of particular interest would be the nature of the tarsal claws in the immature instars: protonymphs of labidostomids present a symetrical, tridactylous claw on leg IV. It is on this argument that Grandjean proposed that the tridactylous condition reperesented the primitive state, with bidactylous and monodactylous claws representing advanced states.

Also of interest is the presence of tarsal eupathidia on legs I–III: it is an usual character amongst Labidostomidae and is rare among Actinedida which usually have the eupathidia restricted to tarsi I–II. This character is also shared with Sphaerolichidae. Grandjean (1941) underlined the possible relationships between Labidostomidae and Sphaerolichidae on the basis of common primitive morphological characters. Unfortunately, the genus *Sphaerolichus* is only known from a few rare northern hemisphere species. Since Grandjean's publications (1941, 1942), new data on the lack of gland-like organs in labidostomids (notably *Sellnickiella*) clearly demonstrate that affinities between these families are strong enough to consider those Endeostigmata which lack rutella (Sphaerolichidae and Lordalycidae) are closer to the primitive Actinedida (Eupodina, Labidostomina) than to other families of this heterogeneous group.

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