

Notes on the nomenclature and taxonomy of European Paradoxosomatidae (Diplopoda, Polydesmida)

by

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I. THE STATUS OF THE NAMES *STRONGYLOSOMA* BRANDT, 1833, *STOSATEA* GRAY, 1843, AND *TROPISOMA* C. L. KOCH, 1844

The genus *Strongylosoma* was proposed by BRANDT, 1833 (Bull. Soc. imp. Nat. Moscou 6 : 205), for the reception of a single species, *Strongylosoma inuloides* Brandt, 1833. As the paper cited may be difficult of access to other students the relevant passage is quoted herewith.

"1. Genus. *STRONGYLOSOMA*. Nov. gen.

"Corpus elongatum teres. Oculi nulli.

"1. *Strongylosoma, inuloides*. Nob.

"*Julus stigmatosus* Eichwald Zool. Spec. P.

"II. p. 114.

"Habitat in Lithuania et Volhynia.

The above citation admits of no doubt that BRANDT introduced the new specific name *inuloides* merely to replace *stigmatosus* Eichwald. This may seem strange as there is no demonstrable justification for the action. However, at the time some authors apparently held themselves entitled to alter a specific name whenever it was necessary to change the generic position of a species. Anyhow, it is clear that the substitution was unjustified and that *inuloides* Brandt is a junior objective synonym of *stigmatosus* Eichwald.

EICHWALD described *Julus stigmatosus* in 1830 (Zoologia specialis, Pars altera: 124) as follows:

"2. *J. stigmatosus*, m., 16 pedum paribus, corpus rufescens, u-

"trinque laete maculatum, segmentis teretioribus laevis-

"simis, stigmata in eminentiis parvulis postice infixis of-

"ferentibus, uno alteroque sulco transverso notatis. Hab.

"Lithuaniam, prope Vilnam frequentissime, etiam Vol-

"hyniam.

On the whole this description seems fairly accurate, although it is curious that the author credited his species with 16 instead of 30 or 31 pairs of legs. Surely this must be seen as an inadvertent error, for the number of 16 pairs was used by EICHWALD as a generic character for the genus *Glomeris* on the previous page of his book. At any rate, there can be no doubt that *Julus stigmatosus* is the East-European paradoxosomatid currently known under the name of *Strongylosoma pallipes* (Olivier). The millipede fauna of the Wilno region was treated by JAWLOWSKI, 1926 (*Spraw. Kom. fizjogr. Polsk. Akad. Umiej* 51 : 147—166), according to whom *Strongylosoma pallipes* is a fairly common species around that town.

Julus pallipes was described by OLIVIER, 1792 (Encyclopédie méthodique. Histoire naturelle. Insectes 7 : 416), in the following words:

"12. IULE pallipède.

"*Julus pallipes*.

"Pedibus utrique 31. pallidis, corpore ferrugi-

"neo.

"Il est un peu plus petit que l'Iule terrestre, le

"corps est ferrugineux, cylindrique. Les anneaux sont

"distincts, munis de chaque côté d'un petit rebord.

"Les pattes sont pâles & au nombre de trente & une

"paires.

"Il se trouve aux environs de Paris.

The species was rediscovered in the neighbourhood of Paris by GERVAIS, 1835 (Mag. Zool. 1835 : cl. VIII, n. 133, p. 11), who referred it to the genus *Polydesmus* Latreille. Later, GERVAIS, 1839 (Revue zool. Soc. Cuvier. 2 : 280), synonymized *stigmatus* Eichwald with *pallipes* Olivier, an understandable conception considering the then prevailing superficiality in diplopod taxonomy. His view was subsequently shared by BRANDT, 1840 (Bull. scient. Acad. imp. Sci. St Pétersb. 7 : 321).

The first author who recognized that the species occurring in Eastern Europe is not the same as the one found in the surroundings of Paris was LATZEL, 1886 (in: GADEAU DE KERVILLE, Bull. Soc. Amis Sci. nat. Rouen 1885 : 175). Unfortunately, LATZEL retained the name *pallipes* for the East-European form and gave the name var. *gallicum* to material from the very type locality of *pallipes*, viz. "environs de Paris"! Of course, this *Strongylosoma pallipes* var. *gallicum* Latzel is nothing else than the true *pallipes* of OLIVIER.

A careful redescription of this form, now correctly raised to species rank, was given by BRÖLEMANN, 1894 (Mém. Soc. zool. Fr. 7 : 450), under the name of *Strongylosomum gallicum*, and based upon material from the surroundings of Paris and elsewhere. In a subsequent paper BRÖLEMANN, 1895 (Boll. Soc. ent. ital. 27 : 103), brought *gallicum* into the synonymy of *Strongylosoma italicum* Latzel, 1886 (Boll. Soc. ent. ital. 18 : 309).

In the course of taxonomic development later on, the western species was considered to be also generically distinct from *Strongylosoma* and *italicum* Latzel was eventually destined to become the type-species of *Entothalassinum* Attems, 1914, and of *Stosatea* Gray, 1843.

The name *Stosatea* Gray, 1843 (in: TODD (ed.), The Cyclopaedia of Anatomy and Physiology 3 : 546), was originally proposed without included nominal species. In fact, the name appears to have never been associated with a specific name prior to 1916, when BRÖLEMANN (Annls Soc. ent. Fr. 84 : 591) took it up for a group of species with *Strongylosoma italicum* Latzel as type.

Doubtless owing to war conditions at the time, BRÖLEMANN was unaware of the fact that ATTEMS, 1914 (Arch. Naturgesch. 80A (4) : 228) had already made *italicum* the type of his genus *Entothalassinum* Attems.

Of the two generic names, *Entothalassinum* has been used by most authors. It

is clear, however, that *Stosatea* is the valid name for the genus, and that *Entothalassinum* Attems, 1914, is a junior objective synonym of *Stosatea* Gray, 1843, the fact that *Stosatea* was given a proper taxonomic meaning as late as 1916 not having any bearing on the actual priority of the name.

For the time being it seems best to retain the name *italica* (Latzel) for the type-species of *Stosatea*. By now we know from experience that a change of the taxonomic concept of a given name easily leads to a disastrous confusion in literature. In the present case, therefore, to replace *italica* by *pallipes* in the original sense of OLIVIER, seems, after so many years of wrong usage, highly undesirable. Actually, it would be best to refer the case of *pallipes* to the International Commission on Zoological Nomenclature with the object of having the name placed on the Official Index.

But even if *pallipes* would be rejected, the validity of *italica* is threatened by at least two names. A first question to be solved in this connection is, which of the two names proposed by LATZEL in 1886, *Strongylosoma italicum* or *Strongylosoma pallipes* var. *gallicum* was published first. Although BRÖLEMANN in 1895 gave the priority to *italicum*, it is not certain whether he was correct on this point, and *gallicum* may well be a senior synonym of *italicum*.

As a further potential senior synonym of *italica* must be considered the species described as *Polydesmus genei* by O. G. COSTA, 1839 (Il Gran Sasso d'Italia 1 (5—7)). Finally, the availability of *Strongylosoma monilis* Bonelli, mentioned by NEWPORT, 1844 (Ann. Mag. nat. Hist. 13 : 266), remains to be tested.

In the context of the present discussion on *Strongylosoma* and *Stosatea*, we cannot bypass a consideration of the nomenclatorial status of *Tropisoma* C. L. Koch, 1844 (Deutschlands Crustaceen, Myriapoden und Arachniden, Heft 40, pl. 13).

Tropisoma was based monotypically on *Julus pallipes* Olivier. The species actually described under this name by KOCH, however, was not *pallipes* of OLIVIER but *pallipes* in the sense of later authors, i.e. *Strongylosoma stigmatosum* (Eichwald). *Tropisoma*, therefore, was based on a misidentified type-species, and the case is clearly one to be referred to the I.C.Z.N.

If the type of *Tropisoma* is chosen in accordance with KOCH's usage of *pallipes*, *Tropisoma* will become a junior objective synonym of *Strongylosoma*. If, on the other hand, *pallipes* here is interpreted objectively and taken in the sense of OLIVIER, *Tropisoma* will become a junior objective synonym of *Stosatea* Gray. Obviously, the best solution will be to place *Tropisoma* on the Official Index, in accordance with a similar decision regarding the name *pallipes*.

The above discussion may be summarized as follows:

1. The East-European paradoxosomatid up to now known under the name of *Strongylosoma pallipes* (Olivier) henceforward should bear the name *Strongylosoma stigmatosum* (Eichwald, 1830).

2. *Julus pallipes* Olivier, 1792, is not identical with *Strongylosoma pallipes* auctores, but with *Strongylosoma italicum* Latzel, 1886, and *Strongylosoma pallipes* var. *gallicum* Latzel, 1886. In order to avoid confusion as regards the identity of *pallipes*, it is recommended here to place this name on the Official Index. Pending the re-evaluation of some older specific names, a continuation of the use of *italicum* Latzel is proposed, for the time being.

3. *Stosatea* Gray, 1843, is a senior objective synonym of *Entothalassinum* Attems, 1914, and accordingly should replace the latter name.

4. It is recommended here to place the name *Tropisoma* C. L. Koch, 1844, based on a misidentified type-species, on the Official Index.

II. THE OCCURRENCE OF THE TRIBE EVIULISOMATINI BRÖLEMANN, 1916, IN EUROPE

In his last paper on Spanish myriapods, ATTEMS, 1952 (Eos 28 : 351, 353), described two new monotypical genera of Polydesmida which he assigned to the family Sphaerotrichopidae Attems (= Dalodesmidae Cook). Of course, the record from Spain of two new genera of this family, typically distributed in the temperate zone of the southern continents, was, to use ATTEMS's own words "sehr bemerkenswert".

However, on closer examination of the descriptions and drawings of ATTEMS it becomes clear that the two genera are not at all such exotic elements in the west-palearctic fauna as their reference to the Dalodesmidae might suggest. Indeed the two genera were entirely misplaced as to family. *Miradoria* Attems, 1952, is evidently based on a species of the genus *Archipolydesmus* Attems, 1898, which belongs to the Polydesmidae, and which is known to occur from Morocco, throughout Spain, to the south of France.

Liliputia Attems, 1952, on the other hand, belongs to the family Paradoxosomatidae, and is obviously a synonym of *Boreviulisoma* Brölemann, 1928 (Bull. Soc. Sci. nat. Maroc 8 : 56).

Of *Boreviulisoma* only one species, *B. liouvillei* Brölemann, 1928, was known. It has been recorded from a few localities in Morocco by BRÖLEMANN and by SCHUBART, 1960 (Bull. Soc. Sci. nat. Maroc 40 : 171).

As to the identity of *Liliputia badia* Attems, after a comparison of the pertinent descriptions and drawings by ATTEMS, 1952, BRÖLEMANN, 1928, and SCHUBART, 1960, it becomes clear that *badia* and *liouvillei* refer to the same species. The only really important point of difference in the descriptions is that ATTEMS noticed the presence of a ventro-femoral tubercle on the legs of the male of *badia*. Obviously, these tiny knobs were overlooked by BRÖLEMANN.

As *Boreviulisoma* belongs to the predominantly aethiopian tribe Eviulisomatini Brölemann, 1916, the herewith established synonymy definitively extends the range of this group of Paradoxosomatidae to the European continent.

Is, however, *Boreviulisoma* the only European representative of this tribe?

The characters on which the group is based are derived mainly from the gonopods. In these, the femoral part is generally strongly reduced, down to almost complete disappearance. In the latter case the acropodite seems to consist only of the tibiotarsus and the solenomerite. The reduction of the femur is combined with an aberrant course of the spermal channel. As usual, this starts on the medial side of the prefemur, but then runs more or less transversely across the anterior side of the remainder of the femur towards the lateral side and the basis of the solenomerite. The peculiar course of the spermal channel is obviously the result of a torsion of the distal part of the telopodite against the prefemur of about

180°. A further consequence of this torsion is that the tibiotarsus arises more or less mesad of the base of the solenomerite. Generally the tibiotarsus in the Eviulisomatini is comparatively strongly developed and of a rather complicated structure. Mostly it sheathes or supports in some way the flagellate solenomerite.

It is a very unfortunate condition that in practically all European Paradoxosomatidae the course of the spermal channel of the gonopods has been insufficiently described. Although the available drawings may be sufficiently adequate for identification purposes, they are in most cases useless for a morphological interpretation. The spermal channel is usually indicated by one or a pair of dotted or interrupted lines which leave us completely ignorant of the exact location of the structure.

In spite of this, a minor group of European paradoxosomatid genera can be distinguished which, according to the available evidence, appears to belong to the Eviulisomatini. Although their reference to this tribe necessarily is still somewhat dubious, it seems justified to consider the taxonomic position of these genera from this point of view, in order to signalize the deficiencies in the available data.

The genera in question are *Metonomastus* Attems, 1937, *Eroonsoma* Manfredi, 1943, and *Microdesminus* Strasser, 1960. They consist of a number of small species, measuring from 5 to 10 mm, with 19 somites, which occur in Italy and Jugoslavia.

Metonomastus was proposed by ATTEMS, 1937 (Tierreich 68 : 46), to replace *Microdesmus* Verhoeff, 1901 (Arch. Naturgesch. 67 (1): 223), which is pre-occupied. The name *Nannodesmus* Chamberlin, 1943 (Proc. biol. Soc. Wash. 56 : 35), also proposed to replace *Microdesmus*, is a junior objective synonym of *Metonomastus*. In 1937, ATTEMS referred four species to this genus, but it is clear that *arcadicus* (Verhoeff, 1900) belongs to *Paradoxosoma* Daday.

The gonopods of *M. albus* (Verhoeff, 1901), the type-species of the genus, have been illustrated by VERHOEFF, 1901, and by ATTEMS, 1937. If, however, both drawings were correct, the material of the two authors would have belonged to two distinct genera! The drawing by VERHOEFF suggests that the solenomerite arises laterad of the tibiotarsus, and that it is also applied to the lateral side of the tibiotarsus (called "Schutzklappen" by VERHOEFF). Furthermore, one gets the impression that the course of the spermal channel is in agreement with the Eviulisomatini. The drawing by ATTEMS corresponds with the gonopod depicted by VERHOEFF only in outline. Like VERHOEFF, ATTEMS gave the medial aspect of the gonopod, at least judging from the presence of the coxal horn. Nevertheless, the solenomerite in his drawing arises and is situated mesad of the tibiotarsus. It is clear that either VERHOEFF or ATTEMS, probably the latter, has given a completely erroneous picture of the gonopod of *M. albus*.

We can pass without comment *Metonomastus bosniensis* (Verhoeff, 1901), like *albus* described from Jugoslavia, as only the female is known.

Metonomastus birtellus (Silvestri, 1903) (in: BERLESE, Acari, Myriapoda et Scorpiones hucusque in Italia reperta, Fasc. 100, Nr. 4), from Umbria, *Metonomastus caprae* (Verhoeff, 1942 (Zool. Anz. 139 : 227), from Capri, *Metonomastus patrizii* Manfredi, 1950 (Atti Soc. ital. Sci. nat. 89 : 37), from Lazio, *Metonomastus romanus* (Verhoeff, 1951) (Zool. Jb. [Syst.] 80 : 212), from

Lazio, and *Metonomastus mariae* (Strasser, 1965) (Boll. Soc. adriat. Sci. Trieste 53 : 173), from Abruzzi, form a group of closely related species which seem somewhat disjunct from the type of the genus in particular by the more elongate prefemur.

Unfortunately, most of the available drawings of the gonopods of these species are too perfunctory to serve as a base for determining the exact course of the spermal channel. If, however, the evidence of these drawings is put together, we can only conclude that the spermal channel here follows a course similar to that found in the Eviulisomatini. In particular STRASSER's drawings of the gonopods of *M. mariae* can hardly be understood if we do not assume that the spermal channel runs across the anterior side of the prefemur towards the lateral side of the acropodite.

If the present interpretation is correct, it is clear that the gonopod process indicated as parsolenomerite by VERHOEFF and STRASSER actually represents the tibiotarsus, which as compared to the tropical Eviulisomatini is strongly reduced. It may be remarked in passing that the term parsolenomerite as used by VERHOEFF is quite meaningless inasmuch as it denotes morphologically unrelated structures in various polydesmoid groups.

Eroonsoma Manfredi, based on *E. pominii* Manfredi, 1943 (Atti Soc. ital. Sci. nat. 82 : 180), from the Mte Gargano, Italy, obviously is related to *Metonomastus*, at least to the Italian species of that genus, but the morphology of the gonopods is insufficiently known. As in the Italian species of *Metonomastus* the gonopod prefemur is elongate, but the acropodite apparently differs greatly from the condition in *Metonomastus*. Probably its morphology was not sufficiently clear to MANFREDI because according to her the spermal channel in *Eroonsoma* runs through the tibiotarsus, which is, of course, a morphological impossibility. It seems not unlikely that the presence of a separate solenomerite was overlooked: not at all surprising considering the scantiness of the material and the minute size of the gonopod. In any case the exact course of the spermal channel and the position of the solenomerite cannot be properly determined from the available drawing.

MANFREDI considered the peculiarities of *Eroonsoma* so important that she referred it to a new family Eroonsomidae (recte: -somatidae). There appears to be no reason, however, to confer such an exclusive taxonomic status on the genus which fits very well among the Paradoxosomatidae.

Microdesminus Strasser was based on *M. saetosus* Strasser, 1960 (Fragm. ent. 3 : 97), from the Dalmatian island of Cres and the surroundings of Trieste. This interesting form is related to *Metonomastus*, from which it differs in the gonopods by a strong proportional reduction of the tibiotarsus (marked as parsolenomerite by STRASSER) as against the solenomerite. Again, the course of the spermal channel needs further study, but as in *Metonomastus mariae*, the gonopod drawings can be understood only if we assume that it is of the eviulisomatine type.

For the present these remarks may suffice to indicate that the tribe Eviulisomatini is probably well represented among the European paradoxosomatids, but that a much more detailed study of the gonopods is needed to settle the point conclusively.

It may be added here, that it looks as if the group of genera including *Stosatea* Gray, *Paradoxosoma* Daday, 1889, and *Trachydesmus* Daday, 1889, (three genera which, by the way, will be probably better united) also may belong to the Eviulisomatini. As morphologically interpretable gonopod drawings are not available a discussion on this question, however, would be premature and too speculative.

A review of the above discussion is given in the following points:

1. The genus *Miradoria* Attems, 1952 (Sphaerotrichopidae) is a junior subjective synonym of *Archipolydesmus* Attems, 1898 (Polydesmidae).

2. The genus *Liliputia* Attems, 1952 (Sphaerotrichopidae) is a junior subjective synonym of *Boreviulisoma* Brölemann, 1928 (Paradoxosomatidae, tribe Eviulisomatini). Its type-species *L. badia* Attems, 1952, is identical with *B. liouvillei* Brölemann, 1928.

3. It seems quite probable that the genera *Metonomastus* Attems, 1937, *Eroonsoma* Manfredi, 1943, and *Microdesminus* Strasser, 1960, also are referable to the Eviulisomatini. The family Eroonsomidae Manfredi, 1943, is discarded as a synonym of Paradoxosomatidae Daday, 1889.

4. It is hinted that the genus *Stosatea* Gray, 1843, and allied generic groups also may prove to belong to the Eviulisomatini.

Krombein, Karl V., *Trap-nesting wasps and bees*. Smithsonian Press, Washington, DC. 20560, 1967. Prijz \$ 12,50.

Vanaf 1953 gedurende een periode van 12 jaar bestudeerde de auteur in verschillende delen van de V.S. de solitaire bijen en wespen, die normaal in allerlei holten nestelen, maar waarvoor KROMBEIN ruim 3400 „vallen” vervaardigde, die hij de dieren als nestplaats offereerde en waarvan een druk gebruik werd gemaakt. Ze bestonden uit blokjes uitgewerkt grenenhout, waarin een holte geboord was variërend van 3,2 tot 12,7 mm doorsnee. In de regel werden bundels van zes blokjes van verschillende diameter horizontaal bevestigd op plaatsen, waar de betreffende insekten verwacht konden worden, onder dode takken, tegen dode boomstammen enz. Was een val in gebruik genomen en afgesloten door een prop, dan werd hij meegenomen en vervangen door een andere. Thuis werd het blokje gespleten en de inhoud zorgvuldig genoteerd. Daarna werden beide helften weer op elkaar gebonden en kon de kweek normaal verder gaan.

Op deze wijze bestudeerde KROMBEIN de biologie van 75 soorten wespen, 43 bijen en 83 mijten, vliegen, kevers en andere insekten, die als parasiet of als predator met de oorspronkelijke bewoner verbonden waren. De aanpak van de studie wordt uitvoerig beschreven en toegelicht op de platen, terwijl het grootste deel van het boek (p. 39—344) wordt ingenomen door het verslag van de biologie der waargenomen soorten. Dat hierbij tal van nieuwe gegevens verkregen werden, spreekt vanzelf. Maar ook de predatoren en parasieten krijgen een uitvoerige behandeling (p. 349—486). Vooral bij de mijten waren tal van nieuwe soorten.

Verbazingwekkend is het grote aantal dieren, dat het slachtoffer van de wespen wordt. Van één soort bestudeerde KROMBEIN ruim 100 nesten met 6—9 cellen per nest, elke cel gemiddeld met 23 spinnen. Van een wesp uit Florida had hij bijna 250 nesten, elk met gemiddeld 8 cellen, elke cel met 10 rupsen van een mottesoort. Maar ook de wespen zelf verschaffen op een of andere manier voedsel aan ongekende aantallen andere dieren!

Hoewel het boek uitsluitend Amerikaanse soorten behandelt, is het een werk, waarvan elke hymenopteroloog kennis zou moeten nemen. Mogelijk kan het hem inspireren tot navolging. Wat zou het bv. niet makkelijk zijn voor Broeder VIRGILIUS, als hij zulke bundels blokjes op geschikte plekken bevestigde. Hij kon dan op zijn gemak de „vallen” inspecteren in plaats van zich in het zweet te werken met zaag en beitel! — LPK.