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NOTES ON THE MOUTHPARTS OF EUKOENENIA MIRABILIS (GRASSI) (ARACHNIDEA: PALPIGRADIDA)

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With 1 text-figure

In the course of the last years, I have been investigating the morphology of various groups of mites. During this comparative study, special attention has been paid to the gnathosoma, which organ represents the specialized structure of the mouthparts in this subclass. Recently, while summarizing my results on the phylogeny of the gnathosoma (Van der Hammen, 1969), it appeared necessary to start from a more primitive Arachnid condition in which the chelicerae are still in front of the palps; at the same time, just as in the mites, the coxisternal region of the palp should be present, and the mouth should be in front of the chelicerae. This condition is indeed still found in one primitive order of Arachnidea, viz., the Palpigradida.

Representatives of this group are, as a rule, only rarely met with. In 1962 and 1964, however, my colleague Dr. J. Travé (Laboratoire Arago, Banyuls-sur-Mer) kindly presented me with a series of twelve specimens of *Eukoenenia mirabilis* (Grassi, 1885) collected by him and Mr. Y. Coineau at various localities near Banyuls-sur-Mer, a classical locality of the species. I am extremely grateful to Dr. Travé and Mr. Coineau for supplying me with this very important material.

The species was originally described as *Koenenia mirabilis* (cf. also Grassi, 1886), and as such it is still mentioned in literature. Petrunkevitch (1955: P118), however, discovered that the name *Koenenia* Grassi (1885) is preoccupied by *Koenenia* Beushausen (1884). For this reason he replaced it by *Eukoenenia*, a name originally introduced by Börner (1901: 551) for the typical subgenus of *Koenenia*. The type-species of *Eukoenenia* Börner, (1901), consequently, is the type-species of *Koenenia*, viz., *Koenenia mirabilis* Grassi.

In the present paper, only the mouthparts of *Eukoenenia mirabilis* are studied, i.e. the mouth, the lips, the chelicerae, the palps (although they have an ambulatory function here), and the epimere (the coxisternal region) of the palp. A complete redescription of the species, according to the same principles of observing, describing, and drawing as used in my papers on mites, will be very interesting. Part of the terminology still used for the segments of the appendages appears to be incorrect. I hope to return to the morphology of the species in another study.

In the specimen described here, and of which the anterior part of the prosoma is represented in fig. 1, the prodorsum has an elevated rostral part. According to Millot (1942: 35) this would be an artificial condition caused by the preservative. However, it appears that an important number of muscles are attached to the anterior part of the prodorsum (fig. 1C); these run in ventral direction (fig. 1A). They certainly are contractor muscles of the rostral part of the prosoma. This means that the condition figured here is a relaxed condition, not an artificial one. The elevated rostrum has the advantage that it facilitates the study of the cheliceral bases.

The mouth (fig. 1B) is enclosed by the labrum (*LS*) and the underlip (*LI*); it has two commissures, *J* and *J'*. The shape of the mouth is more or less elliptic. The terminal part of the labrum is curved downwards. When the entrance to the mouth is closed, this part rests more or less against the underlip; in that position some five small, curved cilia surpass at each side the anterior border of the underlip (fig. 1B). The position of the mouth between labrum and underlip, and in front of chelicerae and palps is considered here the primitive Arachnid condition.

The chelicerae are strongly developed. They consist of three segments: trochanter, principal cheliceral segment, and apotele. The homology of the segments is based on the condition of the articulations (cf. Van der Hammen, 1966: 54-57). The articulation between segments 1 and 2 is an articulation trochanter / femur; that between segments 2 and 3 (the movable jaw) is an articulation tarsus / apotele. Segment 2, the principal cheliceral segment, consequently represents a fusion of femur, genu, tibia, and tarsus. The trochanter articulates with a distinctly differentiated coxal region (fig. 1A: *CX*), which is more or less membraneous. The two specialized setae with fused bases, which occur just above, and more or less between the bases of the chelicerae, are considered here supracoxal setae (fig. 1A, C: *eC*). Supra- or laterocoxal setae are known from the coxae or the coxal regions of mites; in this group they are associated with palp, leg I, and (rarely) leg II (cf. Van der Hammen, 1966: 57-58). They are recorded here for the first time from a different group of Arachnidea; the record is also the first one

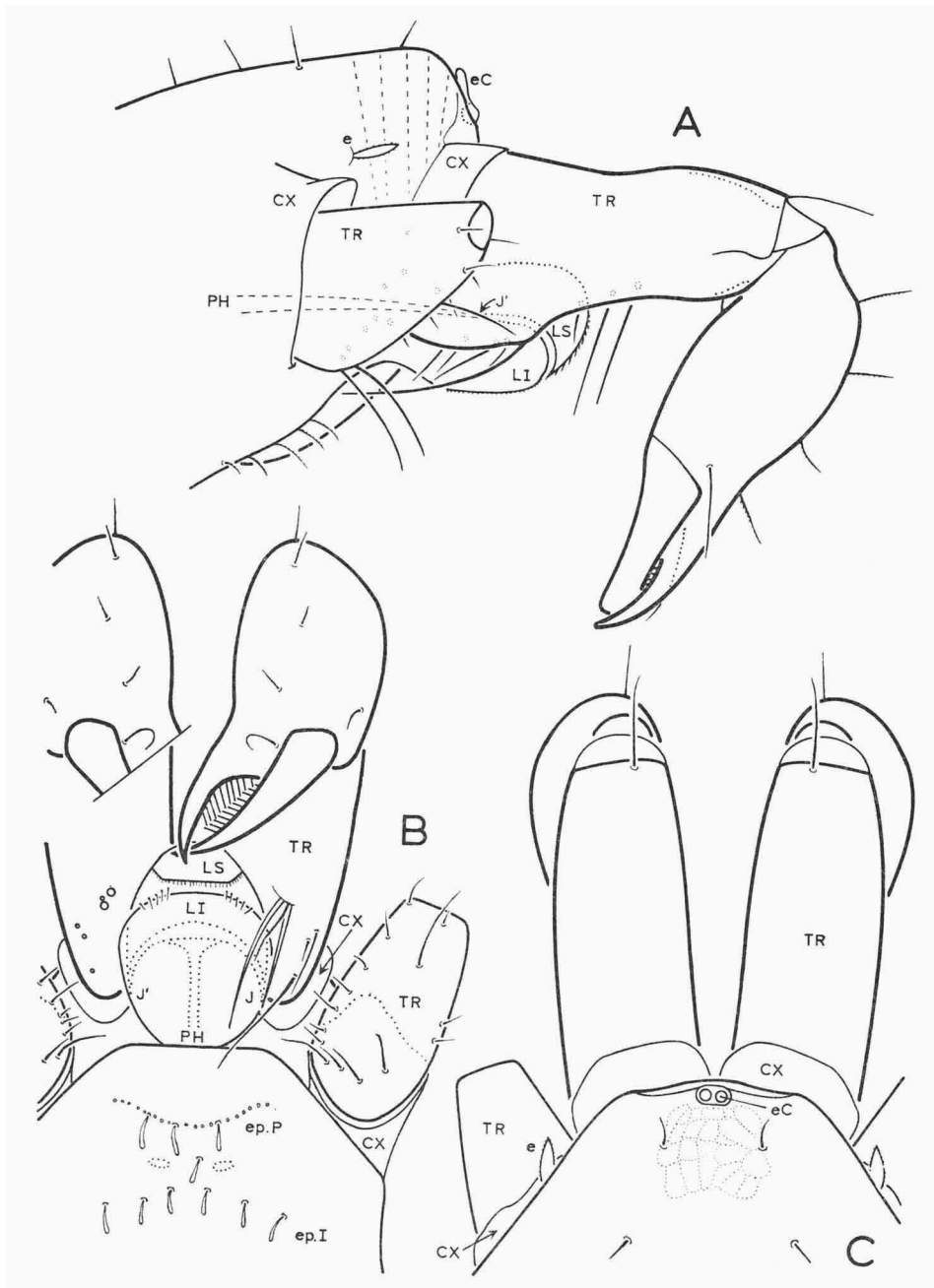


Fig. 1. *Eukoenenia mirabilis* (Grassi), anterior region of prosoma with mouthparts; A, lateral view; B, ventral view; C, dorsal view; A-C, $\times 370$.

for the chelicerae. Their fused condition is a proof that in the ancestors of the Arachnidea, the chelicerae were more widely separated. In the present species, supracoxal setae are also present in the region of the palp, but not in those of the legs. Judging from the descriptions of other species of Palpigradida (cf. Rémy, 1950), the supracoxal setae of the palp can be multiplied; multiplied supra- or laterocoxal setae are also known from some mites. The chelicerae have a considerable number of setae. The trochanter presents one dorsal seta (it occupies nearly the same position as in *Ophiocarus*) and a rather great number of ventral setae. The last-mentioned setae are partly very long; they are probably associated with the lips. The principal cheliceral segment (segment 2) has dorsal and lateral setae. The fixed and the movable jaw present long, oblique teeth.

As mentioned above, the palp has a coxal region (*CX*), dorsally of which there is one supracoxal seta (fig. 1A, C: *e*); the dorsal part of the coxal region is more distinctly differentiated. The first free segment, consequently, is no coxa as is still mentioned in literature (cf. Millot, 1949: 524), but a trochanter. Ventrally there is a distinctly developed epimere or coxisternal region of the palp; it is fused with the epimere of leg I. The epimere of the palp (fig. 1B: *ep. P*) presents four setae; it can be distinguished from the epimere of leg I (*ep. I*) by a pair of muscle attachments between the two segments.

In comparing the gnathosoma of mites with this primitive Arachnid condition (cf. Van der Hammen, 1970), it appears that especially the palp and its coxisternal region have moved in anterior direction, resulting in a pre-cheliceral position. It will be interesting to compare the mouthparts of other Arachnidea with those of the Palpigradida.

SUMMARY

The mouthparts of *Eukoenia mirabilis* are described in detail. Special attention has been paid to the commissures of the mouth, the lips, the chelicerae, and the palps. It appears that the bases of chelicerae and palps articulate with a coxal region; their first segment consequently is a trochanter. The specialized setae above the coxal regions of chelicerae and palps are homologized with supracoxal setae. It is the first record of these setae outside the mites. They are for the first time observed in association with the coxal region of the chelicerae.

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