

ON THE PRESENCE OF TWO COXAL SENSE ORGANS IN  
PTERYGOTA INSECTS

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Received 17 October 1973

The sensilla of Insects, beside being spread all over the tegument, are thickly grouped on some parts of the body and especially on the appendages in small, well defined areas constituting actual sense organs. While investigating on the morphology of Insects, I have noted the constant presence, in species belonging to different orders, of two sense organs of this type at the base of the three pairs of legs. These organs have been previously reported only in Blattodea (*Periplaneta americana* L., PRINGLE, 1938 a, 1938 b) and in Hymenoptera (Apoidea, Vespidae, Formicidae; LINDAUER & NEDEL, 1959 and MARKL, 1962, 1963, 1965). One of these organs, called by PRINGLE the « inner coxal hair plate », is placed between the trochantin and the coxa, another, referred to as the « outer coxal hair plate », lies on the episternal face of the coxal process.

Both organs have been found in all the species that I have examined: *Cloeon* sp. (Ephemeroptera), *Calopteryx haemorrhoidalis* V. di Lind (Odonata), *Blabera craniifer* Burm. (Blattoidea), *Mantis religiosa* L. (Mantodea), *Brachyptera calabrica* Aub. (Plecoptera), *Bacillus rossius* F. (Phasmodea), *Embia* sp. (Embioptera), *Forficula auricularia* L. (Dermaptera); *Eyprepocnemis plorans* Charp., *Tetrix subulata* L., *Uromenus riggioi* La Gr. (Orthoptera); *Cicada orni* L., *Cimex lectularius* L. (Hemiptera); *Oxythyrea* sp., *Oedemera* sp. (Coleoptera); *Calliphora* sp., *Tipula* sp. (Diptera); *Crisopa* sp. (Neuroptera); *Apis mellifica* and *Camponotus* sp. (Hymenoptera).

It is remarkable that in the vermiform larva (i.e. new born larva) of *Eyprepocnemis plorans* (Orthoptera), although the numerous sensilla scattered on the body of the different larval stages and of the adult have not yet appeared, both of the sense organs in issue are already present and perfectly formed.

In *Eyprepocnemis plorans*, *Uromenus riggioi*, *Mantis religiosa*, *Forficula auricularia*, *Cicada orni*, in which no true points of articulation occur between the trochantin and the coxa, the « inner coxal hair plate » is located on the narrow strong membrane which links the trochantin to

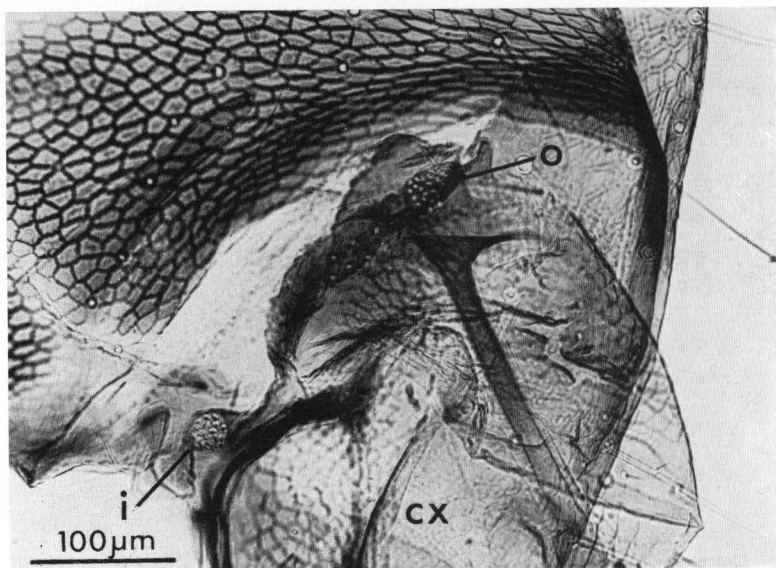


Fig. 1. — Position of outer coxal hair plate (o) and inner coxal hair plate (i) in the vermiform larva of *Eyprepocnemis plorans* Charp. (Orthoptera); cx: coxa.

coxa, and has the form of a small but distinct dome-like protuberance. In *Embia* sp., *Bacillus rossius*, *Tetrix subulata*, *Brachyptera calabrica* and *Blabera cranifer*, in which the trochantin has a moncondylic articulation with the coxa, the « inner coxal hair plate » is located on the anterior edge of the coxa, dorsal to the trochantinal articulation of coxa. The « outer coxal hair plate », however, is always located on the episternal face of the coxal process.

The number of the sensilla which constitute these sense organs varies according to the species from 10 to 60 for the inner organ and from 2 to 50 for the outer organ.

In both organs and in all the species studied I have always observed sensilla chaetica, which show differences as to length, the diameter of cuticular thickening surrounding its basal pit and the thickness of its walls.

The constant presence of these two sense organs and their precise

location in all orders of Pterygota is particularly interesting as a further indication that these Insecta have a common origin.

In accordance with the suggestion of PRINGLE, since confirmed by MARKL, it is very likely that these organs, because of their location, are

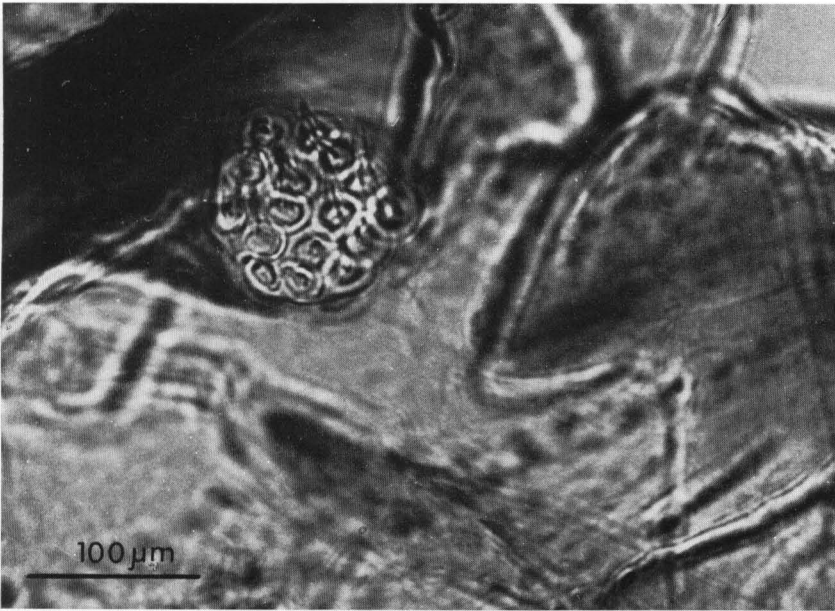


Fig. 2. — Detail of the external structure of inner coxal hair plate.

proprioceptors functioning as receptors of position, compression and tension and analogous to the so called hair plate known for various appendages and their articulations in the Insects.

#### SUMMARY

The presence of two proprioceptor organs at the base of each of the three pairs of legs is reported for species from all of the orders of Insecta Pterygota. These organs were previously known only in the Blattodea and Hymenoptera.

#### RIASSUNTO

L'Autore ha rilevato la costante presenza di due organi propiocettori, situati alla base delle tre paia di zampe, in tutti gli ordini di Insetti Pterigoti. Tali organi erano conosciuti solo nei Blattoidei ed Imenotteri.

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