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A preliminary study of receptor organ of Tomoceridae (Order: Collembolan) in Agra region

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Abstract

The member of this family (Hypogastruridae Börner, 1913). are small, broad, heavily pigmented which are with or without jumping organs. Under this family the receptor organs of three genera and five species have been studied. In the present study, we examined the structure and function of antennae receptors organs in Collembola species (*Hypogastrura kubertpurensis* and *Hypogastrura communis principalis* Yosii, *Xenylla obscura*, *Xenylla funicta* sp. nov. and *Protanura granulata* sp. nov), which belongs to the family Hypogastruridae.

Keywords: Hypogastruridae, antennal receptor organs

Introduction

Member of these family (Tomoceridae) Collembola are generally found near the water or among mosses. Insects of this family are small, broad, heavily pigmented which are with or without jumping organs. The size and shape of receptor organs are highly variable in different insects, but within of some Indian apterygotes a certain degree of uniformity becomes apparent. The visual organs of Collembola are very simple and they are meant for perceiving the light. Barra ^[1] described an ultrastructure study of photoreceptors in Collembola. Post antennal organs (PAO) are of variable shape, made up of transparent cuticle behind the base of antennae, Beeker ^[2] described the postantennal organs of Collembola, Lewis ^[3] reported on the structure and function in some external receptor organs in Collembola while Baijal ^[4] reported a new species of *Lepidocyrtinus* from India, while Dallai ^[5] observed first data on the ultra structure of the postantennal organs of Collembola. Ocelli are simple with elevated cuticle and are dome shaped. They are situated in the form of group of each side of the head. The number of ocelli in collembola being variable but never more than eight. Bagnall ^[6] again used the ocelli and postantennal organs on the morphological modification for separation of certain genera of Collembola. Pseudo-ocelli are found all over the body of some collembolan, which are generally of different shape and sized.

Material and Methods

The material for the present study was largely obtained various rice field of Aligarh, District (U.P) and wheat field of Khair, District Aligarh (U.P). The specimens were mostly procured from under heaps of cry fallen leaves, among mosses, edges of stream and rivers. Specimens was collected from different localities and wheat and rice crop fields during monsoon near Aligarh region. The specimens were collected with the help of camel hair brush mounted with 90% alcohol. The microscopically study of the structure of the receptor organs, specimens were first put into dil. KOH and then mounted on slide under a binocular microscope and mounted in salmon's polyvinyl alcohol-lactophenol medium and photo plate prepared with the help of holotype and used Celestion digital microscope with 5MP camera.

Result and Discussion

Family - Tomoceridae, Börner, 1913

These Collembola are found near the edges of moisture, reams and rivers. These Collembola are one of the large size Collembola. Body covered by distinctly coarsely ribbed or fluted scales. Abdomen IV usually shorter than abdomen III. Dens usually equal to or longer than manubrium, sometimes shorter and with or without crenulation. Dens either subdivided or not arc with or without spines. Ocelli generally six well developed. post antennal organs absent. Under this family only arc genera and one species are studied.

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***Tomocerus neuceratus* sp. nov.**

Body deep brown black dorsally and yellowish brown ventrally. Ocellar field black. Antennal brown with black pigmentation. Leg and furca are yellowish brown. Body heavily clothed by setae and scales at the top of the head and thorax. The last abdominal segment heavily covered by micro and macro setae. Appendages are clothed by setae.

Trichoid Sensilla (Tr. S.) - Dorsal side of the head region, thorax, antenna and the last abdominal segment is covered by trichoid sensilla. Appendages are also covered by trichoid sensilla. Dens provided with trichoid sensilla. These are nachano receptor to find out the air current and orient the body of Collembola against the air current.

Sensilla Basiconica (Sn. B.) – Absent

Sensilla Chaetica (Sn. Ch.): These are found on large rr.uco and represented with six dental spines. These sensilla chaetica are important in jumping reflex, specially for opening the furca in the thick mud content.

Sensilla Squamiformia (Sn. Sq.): Sensilla squamiformia form air flow on the dorsal side of the head and thorax and covered the entire body. The primary function of sensilla squamiformia is to form cephalic air flow and also thoracic air flow to find out the air current and adjust the body of Collembola accordingly to air current. The formed insulating layer all over the body to protect the body from dehydration. They are represented by distinctly cored ribbed or fluted scales.

Temperature Receptors (T. Rp.): These are found in the form of setae on the antennal and thoracic appendages. They are meant for finding out the temperature variation.

Tenant Hairs (Ten. H.): Clavate tenant hairs are present to each foot, which helps in locomotion of Collembola on the smooth surface by molecular forces.

Photoreceptors

Post Antennal Organs (Post. Ant. Org.) - Absent

Ocelli (Oc.): Ocellular field has six ocelli, four anterior ocelli large, two posterior are small but equal in size. These ocelli are meant for finding out the intensity of light.

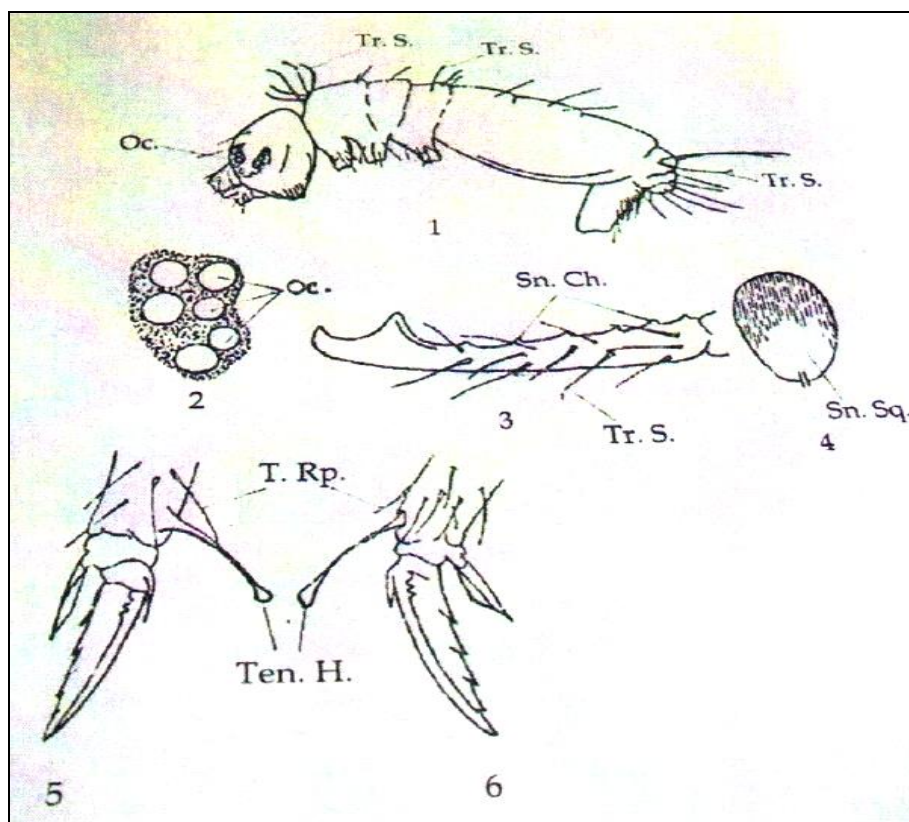


Plate 1: *Tomocerus neuceratus* sp. nov. 1: Body receptors; 2: Photoreceptors; 3: Dens; 4: Scales; 5: Fore leg; 6: Hind leg, Sn. Ch.- Sensilla chaetica, Sn. Sq.- Sensilla squamiformia, T.Rp.- Temperature receptor, Ten.H.- Tenant hair, Tr.S.- Trichoid sensilla

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