

*Short Communication*

## A STUDY OF PHOTORECEPTORS ORGANS OF TWO NEW SPECIES OF FAMILY HYPOGASTRURIDAE

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**ABSTRACT**

The visual organs of Collembola are very simple and they are meant for perceiving the light. In present work, we studied the structure and function of photoreceptors organs in Collembola species (*Hypogastrura kubertpurensis* and *Hypogastrura communis principalis* Yosii), which belongs to the family Hypogastruridae.

**KEYWORDS:** *H. kubertpurensis* and *H. communis principalis* Yosii, photoreceptors organs.

**INTRODUCTION**

The member of this family belongs to order Collembola was the first time studied by Parona (1983) from Indian faunal limits. 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 (1972) described an ultrastructural study of photoreceptors in Collembola. Post antennal organs (PAO) are of variable shape, made up of transparent cuticle behind the base of antennae, Beeker (1970) described the postantennal organs of Collembola, Lewis (1970) reported on the structure and function in some external receptor organs in Collembola while Bajjal (1971) reported a new species of Lepidocyrtinus from India, while Dallai (1971) 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 (1949) 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. These are made up of elevated transparent cuticle. In some collembola the body is heavily pigmented and is meant for perceiving the light. Some collembola the post antennal organs, ocelli and the pseudo-ocelli are totally absent.

**MATERIAL & METHODS**

The material for the present study was largely obtained various rice field of Kuberpur, District Agra (U.P) and wheat field of Ethadmadpur, District Agra (U.P). The specimens were mostly procured from under heaps of cry fallen leaves, among mosses, edges of stream and rivers.

Large number of specimens was collected from different localities and wheat and rice crop fields during monsoon near Agra 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 Celesteron digital microscope with 5MP camera.

**RESULT & DISCUSSION**

*Hypogastrura kubertpurensis* sp.

Order- Collembola

Sub Order -ArthropleonaBorncr,1901 1.

Family -Hypogastruridae Borner, 1913

Species -*Hypogastrura kubertpurensis*

The habitats from which this species has been recovered include, under bark, hardwood litter, pond margins, and on snow. The body Color deep blue dorsally, with black pigmentation and gray ventrally. Ocellar field black. Antennal with blue pigmentation, leg and furca without pigmentation. In the present study, we investigated photoreceptors organ in *Hypogastrura kubertpurensis* during this work [Photo Plate 1.].

**Post antennal organs (Post-Ant.Org.)** - Post antennal organs are well developed with four peripheral lobes and the central sensory cell. The peripheral cells of post antennal organs arc for receiving light and smell.

**Ocelli (Oc.)** - Ocellar fields has five ocelli, two of these ocelli are of equal in size. The Ocelli has prominent transparent elevated cuticle which help in finding out the intensity of light.

**2. *Hypogastrura communis principalis* Yosii**

Order-Collembola

Sub Order -ArthropleonaBorncr, 1901.

Family- Hypogastruridae Börner, 1913

Species- *Hypogastrura communis principalis* Yosii

Collembola collected from the wheat field of Ethadmadpur, from Agra regions. Body dorsally purple with blackish blue pigmentation and grey ventrally. Ocellar field black, legs and furca present. Body clothed by simple setae, which a longer and somewhat numerous around the last abdominal. Postantennal Organs (PAO) and Ocelli show in Photo plate 2.

**Postantennal Organs (PAO)** - They are well developed with four peripheral lobes and sensory setae. They are

receiving light and smell. PAO with an associated "nebenhocker-like" structure.

**Ocelli (Oc.)** - Ocelli in 8 numbers. These are present on the lateral margin of the body surface. They are with distinct chitinous border. Most probably these are hygro-receptors in function.

Between the ocelli and bases of the antennae are located structures known as the post-antennal organs (PAO). They are depressions in the integument which may contain tubercles sensitive to heat, light and barometric pressure.

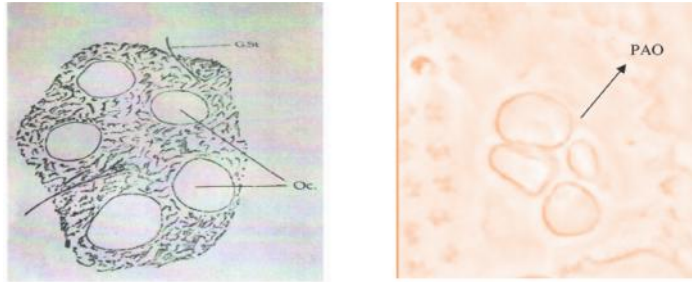
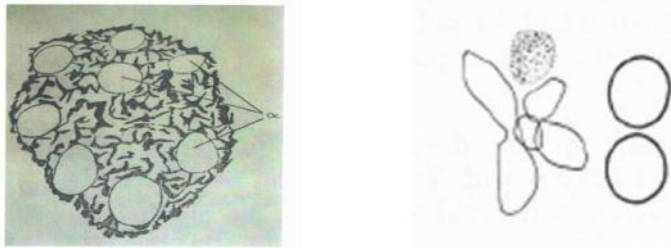


Photo Plate: I. A. Ocelli and B. Structure of Post Antennal Organ in *Hypogastrura kubertpurensis* sp.



**PHOTO PLATE 1:** A. Ocelli and B. PAO with associated "nebenhocker" and anterior ocelli *H. communis principalis* Yoshi

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