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RESEARCH ARTICLE

Structure and Function of Some Receptor Organs in Apterygota (Collembola: Entomobryidae)

Deepmala Verma and Anil Paliwal
Department of Entomology, Ganjdundwara P.G. College, Ganjdundwara,
Kanshiram Nagar (U.P.)-207242

ABSTRACT
Structure and function of some external receptor organs on head region i.e. antennae and photoreceptor of a new species of Apterygota (Insecta: Collembola) of the family Entomobryidae i.e. Drepanura agronica sp. nov. has been described from under dry leaves of Keetham lake, Agra. This study is on the external receptor organs which would help in the taxonomy of the group.
***KEYWORDS**: Apterygotes, Stimuli, Ocelli*

INTRODUCTION

Receptor organs are modified according to specific stimuli because they are evaluate according to habitat and abiotic factors which influences mode of life of Apterygotes. The function of receptor is to receive stimuli from the external environment and transfer them to receptor organs and according to the nature of stimulus they activate the receptors.

Nothing is known about the receptor organs of Apterygotes, but some scientists attempts have been done by Lewis [1] and Devis [2], their work gave a preliminary knowledge of the receptor organs of Collembola, but their work completely overlooked the taxonomic value of receptor organs. Menzel and Blakers [3]described colour receptors in the bee-eye with spectral sensitivity in the bee-eye morphology. Recently Paliwal and Verma [4] described a brief note on receptor organs of Entomobrya species from Manali environment.

Apterygotes are wingless, primitive insects, minute in size with long or short antennae and six segmented abdomen. They are present in soil, under dry and fallen leaves, in decaying vegetables, surface of water etc. They inhabit moss, humus, caves, nests of termites and ants. Due to the different habitats related to different environmental conditions which are directly related to various sense organs in different species of the same family of the group, Anil [5]. The habitat of a species also play a very important role for presence or absence of sensory organs for external stimuli which are evaluated due to the effect of various ecosystem in which they survive, Chojer and Verma [6].

MATERIALS AND METHODS

The Apterygotes described in this paper were collected under dry leaves from Keetham lake and its environs at Agra in No. 2009, with the help of camel hair brush and kept in 4% formaldehyde. Holotype was mounted on slide directly by using Salmon's polyvinyl alcohol and paratypes are kept in spirit.

RESULT AND DISCUSSION

Family – Entomobryidae Schaffer, 1897

Drepanura agronica sp. nov. (Fig. 1-5)

Colour: Body colour greeyish green dorsally with black pigmentation ventrally. Two dark patches of pigments are present above and below the ocellar field. Fourth antennal segment is also pigmented. Thorax laterally with green pigments. Dark patches of pigments are present on abdominal segments. Appendages without any pigmentation.

Clothing:- Body is clothed by numerous micro and macro setae. Large number of flexed setaes are present at the top of the head and the last abdominal segment.

Thichoid sensilla:- They are generally present all over the body, but on the dorsal side of the head they are in the form of flexed setae; which form cephalic air flow receptor and those which are present on the last abdominal

segment form abdominal air flow. These receptors also regulates the jumping mechanisms in Apterygotes and are also finding out the air current. Dens provided with trichoid sensilla which are in the form of ciliated setae which form jumping air flow receptor and also help to regulate the jumping mechanism of these small insects.

Sensilla basiconica :– Absent

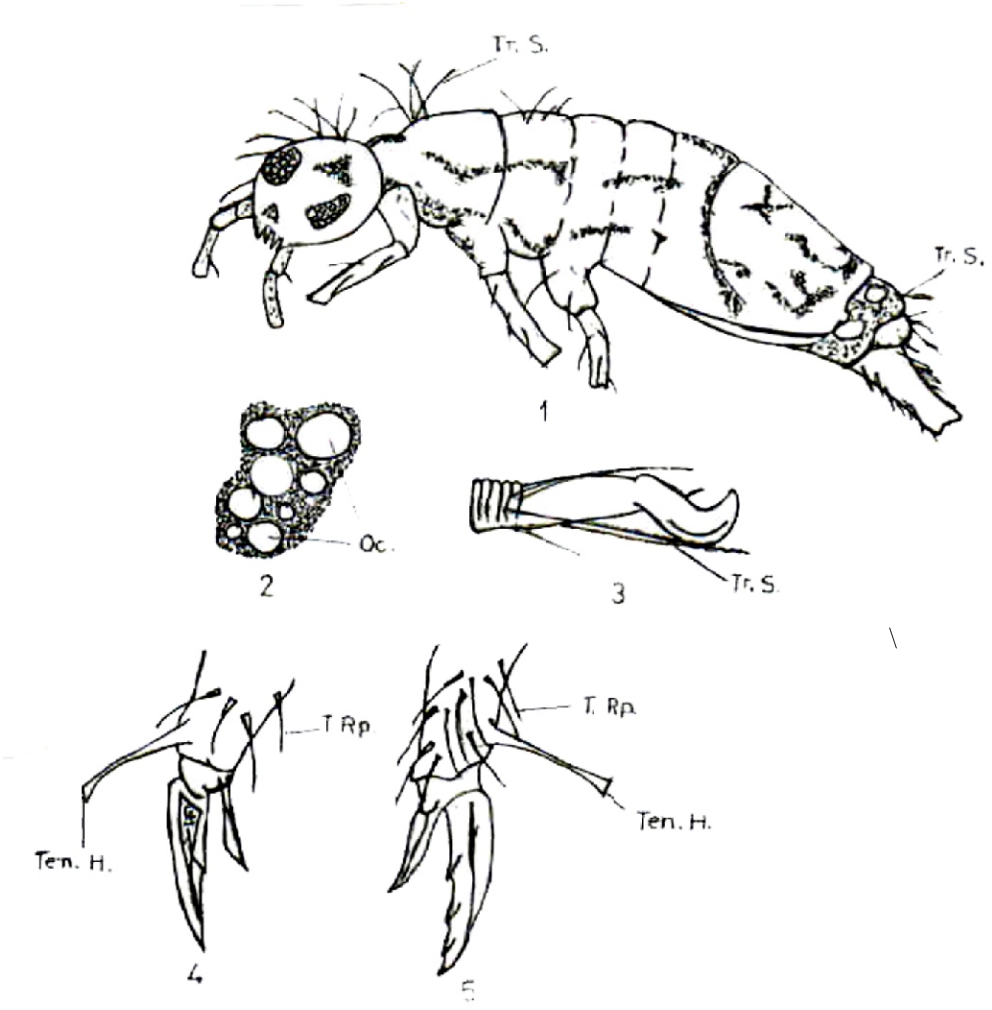
Sensilla chaetica :– Absent

Temperature receptors:- They are generally present in the form of micro setae on the antennae and legs and are very sensitive to the fluctuation of temperature.

Tenent hairs:- Clavate tenent hairs are well developed to each legs which helps in adhesion of legs on smooth surface.

Photoreceptors :– They are as following

(i) Post antennal organs – Absent



***Drepanura agronica* sp. nov. (Fig. 1-5)**

Fig. 1- Body receptors
Fig. 2- Photoreceptors
Fig. 3- Dens
Fig. 4- Fore leg
Fig. 5- Hind leg

Oc.- Ocelli
T.Rp.- Temperature receptor
Ten.H.- Tenent hair
Tr.S. - Trichoid sensilla

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