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Наука СПбГУ 2021

Сборник материалов
Всероссийской конференции
по естественным и гуманитарным
наукам с международным
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Сборник содержит материалы докладов Всероссийской конференции по естественным и гуманитарным наукам с международным участием «**Наука — 2021**», проходившей 28 декабря 2021 г. в Санкт-Петербургском государственном университете в цифровом формате. В сборнике представлены результаты теоретических и прикладных исследований по самому широкому кругу актуальных проблем в областях естественных и точных наук (биология, математика, механика, информатика, медицина, науки о Земле, физика и астрономия, химия), а также социальных и гуманитарных наук (искусство, история, международные отношения и политология, науки о языках и литература, психология, педагогика, когнитивные науки, социология, журналистика и массовые коммуникации, философия, конфликтоведение, этика, культурология, религиоведение, экономика и менеджмент, юридические науки).

Междисциплинарный характер материалов сборника позволяет адресовать его ученым всех областей знания, а также использовать в научной, учебной и учебно-методической работе преподавателей высших учебных заведений.

Материалы докладов в сборнике представлены в авторской редакции.

SENSORY STRUCTURES ON THE ANTENNA OF HYDROPSYCHIDAE (INSECTA: TRICHOPTERA)

Insect sensilla are the receptors of various modes, from tactile to gustatory and olfactory, derived from the integument epithelium. Continuing studies show an unexpectedly wide variety of the Trichoptera antennal sensilla. In comparison to other insects, caddisflies have more than 20 different types and subtypes of cuticular structures [1, 2].

Structure and distribution of the antennal flagellum sensilla were recently investigated in males of 19 species of the caddisfly family Hydropsychidae [2]. Data obtained by scanning electron microscopy (SEM) reveal 11 types of sensilla: long trichoid, chaetoid, thick chaetoid, curved trichoid, coronary, basiconic, styloconic, and four types of pseudoplacoid sensilla (mushroom-like, auricillic, ribbed, and T-shaped). Among them, the thick chaetoid, ribbed pseudoplacoid, and T-shaped pseudoplacoid sensilla were found only in the subfamily Macronematinae. These three rare sensilla types seem to be advanced and might be considered as apomorph characters useful for taxonomy of this subfamily. Various types of pseudoplacoid sensilla is shown to be originated from a mushroom-like type by structural transformation of the apical part (the sensilla cap). Basal segments of antenna in the majority of studied species are provided with ventrally positioned sensory fields consisting of curved trichoid sensilla. In contrast to the subfamilies Arctopsychinae and Hydropsychinae, the increased numbers of these sensilla occur in Diplectroninae and Smicrideinae. Most Macronematinae show a reduction of sensory fields and a strongly decreased average number of curved trichoid sensilla on distal segments.

Distribution patterns of sensilla includes the non-specific distribution found in long trichoid sensilla, in mushroom-like pseudoplacoid sensilla (subfamily Arctopsychinae, a few species of Hydropsychinae), auricillic pseudoplacoid sensilla in a single species of Macronematinae (*Macrostemum fenestratum*), and coronary sensilla in a few species. Specific distribution is typical for the most of sensilla types. Patterns of specific distribution are very diverse, especially in the pseudoplacoid sensilla. Curved trichoid sensilla are grouped in sensory fields in most studied species except for *Aethaloptera evanescens*, where they are located mainly on the first segment around two large groups of auricillic pseudoplacoid sensilla. Sensory fields are usually observed on basal segments of flagella, where they are always located on ventral or ventrolateral surface. There are five different structural types of these fields in Hydropsychidae. The number of curved trichoid sensilla in sensory fields always decreases towards the antennal apex. Sensory fields in Arctopsychinae seem to have the most archaic distributional pattern comparing to all other Hydropsychidae; species of the advanced subfamily Macronematinae show reduction of sensory fields. Fixed distribution pattern is shown for chaetoid sensilla in Arctopsychinae, Diplectroninae, some Hydropsychinae, and a few Macronematinae species.

Presence of the peculiar ribbed pseudoplacoid sensilla seems to be an apomorphic character of Macronematinae. Other sensilla types like long trichoid, chaetoid, coronary, and

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styloconic sensilla also show structural modifications. Coronary sensilla in Arctopsychinae and some Diplectroninae have unevenly developed surrounding microtrichia like in a few other Trichoptera families (Rhyacophilidae, Glossosomatidae, Ecnomidae, Apataniidae). In contrast to majority of previously studied caddisfly families, Hydropsychidae display high diversity of sensilla distribution patterns. The great differences found in this family probably indicate a rapid function-related evolution of the antennal sensory surface structures.

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