Abstract

Palaeodictyopterida is remarkable insect superorder, which formed a significant part of the diversity of upper Palaeozoic insects, but disappeared by the end of the Permian. The main synapomorphy of the superorder is the piercing-sucking mouthparts in the form of a rostrum consisting of five styles. This rostrum was probably used to pierce on plant tissue and for the juice sucking. The same type of mouthparts shared by adults was present also in larvae of Palaeodictyopterida. The external copulatory organs of the superorder members was also showed some morphological interests. The male genitalia consist of a pair of gonostyli and two penial lobes, similarly to the genitalia of recent Ephemeroptera. The female genitalia of Palaeodictyopterida are developed in a form of the ovipositor that can be compared with the endophytic ovipositor of some recent Odonata. This morphological features support placement of Palaeodictyopterida as sister group of Odonatoptera + Panephemeroptera.

The main aim of the work was to describe new representatives of the order Megasecoptera, the second largest group of Palaeodictyopterida. Wing venation of Megasecoptera exhibits a reduction of the longitudinal and transverse veins in comparison with the order Palaeodictyoptera. Other body structures were examined mainly in the families Brodiopteridae and Protohymenidae, where differences in the length of the mouthparts and genital morphology were found. This gives us the idea of specializing in a variety of food sources within a single order. The secondary task was to study the larvae of the order Palaeodictyoptera, whose morphology of the articulation of the wing sheats given support for the dual theory wing origin hypothesis.