

ABSTRACT

The series of two fossil species belonging to the order Palaeodictyoptera from the Late Carboniferous of Kuznetsk Basin in Russia were re-examined. The two species as *Tchirkovaea guttata* and *Paimbia fenestrata* were investigated with emphasis on the wing growth and development in comparison with the structure of developing wings in recent mayflies. This fossil material of *T. guttata* and *P. fenestrata* was long considered by previous authors as undisputed evidence for a unique type of wing development in the Palaeozoic insects. The idea was that the larvae of these insects possessed the wings, which became articulated and fully movable already earlier during the postembryonic development and that these gradually growing wings changed their position from longitudinal to perpendicular to the body axis. Moreover, the development was supposed to include two or more subimaginal instars, implying that the fully winged instars moulted several times during postembryonic development. After detailed study of the available fossils and subsequent comparison of the fossil evidence with the development of wings in the recent mayfly *Cloeon dipterum* it was discovered, that the alleged series of immature, subimaginal and imaginal wings of *T. guttata* and *P. fenestrata* do not provide clear evidence that would support the original idea of wing development in the Palaeozoic insects as interpreted by the previous authors. On the contrary, the results of this thesis suggest, that the fossil specimens of the supposed wings in fact represent the wing pads, a developing wing inside the sheath well known in the recent hemimetabolous insects.

Keywords:

Insecta; Pterygota; Palaeoptera; Palaeodictyoptera; postembryonic development; wing; larva; metamorphosis