

External features of cephalic formation of the springtail, *Tomocerus ishibashii*  
(Collembola: Tomoceridae)

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The collembolan is a member of the entognathous hexapods as well as the dipluran and proturan. The cephalic formation of the collembolan, *T. ishibashii* was observed externally with light microscopy.

At first, the clypeolabrum and the antennal, intercalary and three gnathal segments differentiate. Shortly after, three pairs of bulges (B1-3) are formed in the procephalon. B1 is the optic plate on which the ocelli later differentiate. At the same time, a pair of rudimental appendages are formed in the antennal to the labial segments. The rudimental intercalary appendages, however, are ephemeral, and disappear by the end of blastokinesis. The rudimental clypeolabrum is formed as a single lobe, and does not show a paired structure at any developmental stages. The developing appendages of the maxilla and labium are divided into two parts in the same manner as in the thoracic appendages, and their proximal parts correspond to the coxopodite, and their distal ones to the telopodite. The lacinia and galea of the maxilla, and the glossa and paraglossa of the labium originate from the inner part of their proximal part or coxopodite. The maxillary and labial telopodites develop into the palpi. The lacinia, galea and maxillary palp are homologous with the glossa, paraglossa and labial palp, and both palpi remain undeveloped. The labial coxopodite is subdivided into two parts, i. e., the postmentum and prementum, and they are homologous with the subcoxa and coxa of thoracic appendages. In *T. ishibashii* no sternal element participates in the postmentums formation.

The posterior part of cranium is formed with the terga of three gnathal segments which extend dorsally, and they also extend ventrally, so that each lateral side of the rudimental mandible and maxilla is covered with them. The parts derived from the terga are so-called the mouth folds. In *Anurida maritima* (Folsom, 1900; Garaudy, 1967) and *Isotoma cinerea* (Philipschenko, 1912), the entognathy is formed by the folds which appear at the both sides of the rudiments of mandible, but the origin of the folds was not referred to. Bruckmoser (1965) observed that the mouth folds of *Orchesella villosa* are derived from the terga of the mandibular and maxillary segments. In *T. ishibashii*, however, the labial terga take part in the formation of the mouth folds as well as the mandible and maxillary ones.

#### References

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