

Description of pre-imaginal stages of *Apterygida media* (Dermaptera: Forficulidae), with a key to nymphs of Central European Dermaptera species

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KOČÁREK, P. 2001. Description of pre-imaginal stages of *Apterygida media* (Dermaptera: Forficulidae), with a key to nymphs of Central European Dermaptera species. *Entomol. Probl.* 32(1): 93 – 97. – The eggs and four nymphal instars of Short-winged Earwig *Apterygida media* (HAGENBACH, 1822) are described. Individual instars are defined and keyed by the number of antennal and tarsal segments, and the measurement of body characters. An identification key to the nymphs of species *Labidura riparia*, *Apterygida media*, *Forficula auricularia* and *Chelidurella* spp is provided.

Key words: larval description, pre-imaginal stages, morphology, key, *Apterygida media*, Dermaptera, Forficulidae, Palearctic Region.

Introduction

The genus *Apterygida* WESTWOOD, 1840 is represented by three species distributed in Palearctic region and Taiwan (STEINMANN 1989). The adults are similar to species of *Forficula* LINNAEUS, 1758, but male forceps are not dilated basally; remote and slender. Elytrae are comparatively short, the wings generally abbreviated, concealed or absent (STEINMANN 1993).

The species *Apterygida media* (HAGENBACH, 1822) is distributed in Europe from south Sweden to Greece and Portugal to Ukraine (ALBOUY & CAUSSANEL 1990, STEINMANN 1993). In Central Europe, the species occupies very moist habitats, especially near water, such as river banks (KOČÁREK & ŠEVČÍK 1997), where it prefers herbal layers, with greatest abundance in the shrub layer (KOČÁREK 1998). The life cycles were studied by SYMS (1940) and KOČÁREK (1998). Eggs were presented in dissected females from May to the beginning of June, nymphs appeared from June until the beginning of October and adults during the entire season from May to October (KOČÁREK 1998).

No detail knowledge exists about the morphology of immature stages of *A. media*, and a key to nymph of 3rd and 4th instars only was published by OSCHMANN (1969). The fauna of central European earwigs consists of 7 species (KOČÁREK et al. 1999), but only in three of them are nymph descriptions available (ALBOUY & CAUSSANEL 1990). Keys to the individual nymphal instars of *A. media* and to the nymphs of four central European earwig species are provided in this paper.

Material and Methods

Studied material of *Apterygida media* was taken from

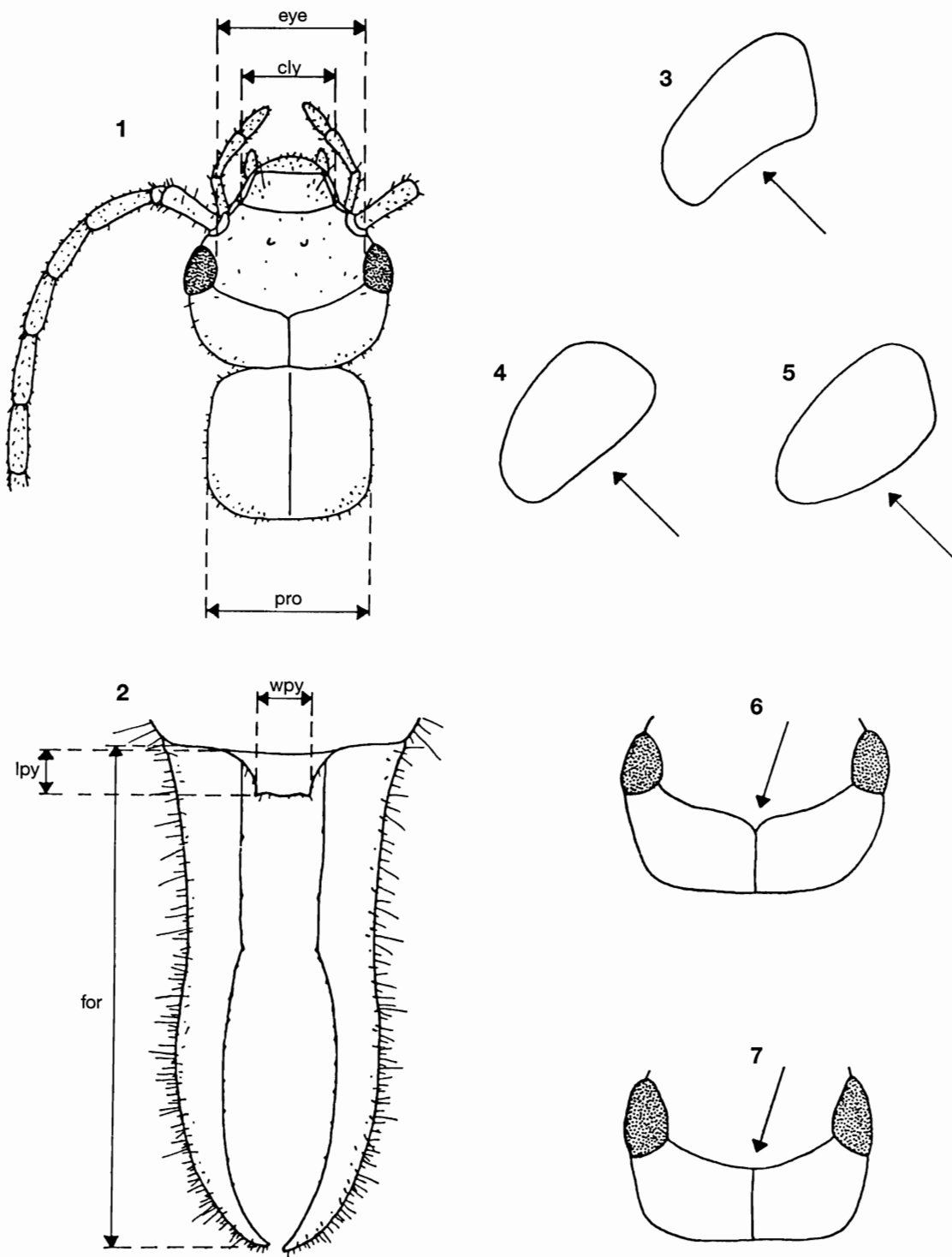
the floodplain forest group type *Ulmeto-Fraxinetum carpinetum*. The site is about 2 km to the north of the town of Lednice na Moravě (48°48' N, 16°46' E) at 161 m a. s. l., on territory periodically flooded in the valley of the Dyje river. The characteristics of this area were fully published in KRÍSTEK (1985).

The material was collected in 1971/1972 in the following way: the herb layer by sweeping, the shrub layer by sweeping and cutting of branches and the tree layer by cutting of branches from the crowns. Eggs were obtained by dissection of females. The material was preserved in 75% ethyl alcohol and is deposited in the author's collection.

The material of *Forficula auricularia* LINNAEUS, 1758 (approximately 400 nymphs) and *Chelidurella acanthopygia* (GENÉ, 1832) (approximately 300 nymphs) used for comparisons was collected by pitfall trapping in the Litovelské Pomoraví Protected Landscape Area (KOČÁREK 1998); the material of *Labidura riparia* (PALLAS, 1773) (43 nymphs) was collected individually in the rocky bank of the Dunaj river near the village of Chřába in south Slovakia (18.VIII.1998).

The material of *A. media* used for measurement consisted of: eggs – 120 specimens dissected from 8 females; 1st nymphal instar – 34 specimens; 2nd nymphal instar – 42 specimens; 3rd nymphal instar – 22 specimens; 4th nymphal instar – 23 specimens.

Measurements of specimens were made using a dissecting microscope (MBS 10) with a graticule. Width between eyes, basal width of clypeus, maximum width of pronotum, width of apical part and total length of pygidium, and total length of forceps were measured (see Figs. 1, 2). Body length was not measured, since the abdomens distended with storage in alcohol. The measurements are presented in the form: mean ± stand-



Figs 1 – 7. Morphometric characters of *Apterygida media* – head with pronotum (1) and end of abdomen with the forceps (2) of 4th nymphal instar; eye – width between the eyes, cly – basal width of the clypeus, pro – maximum width of the pronotum, wpy – apical width of the pygidium, lpy – total length of the pygidium, for - total length of the forceps. Side view of the left eye of *Forficula auricularia* (3), *Apterygida media* (4) and *Chelidurella acanthopygia* (5). 6 – 7: dorsal view of the head sutures of *Apterygida media* (6) and *Chelidurella acanthopygia* (7).

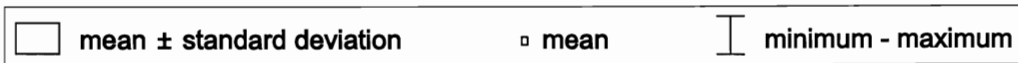
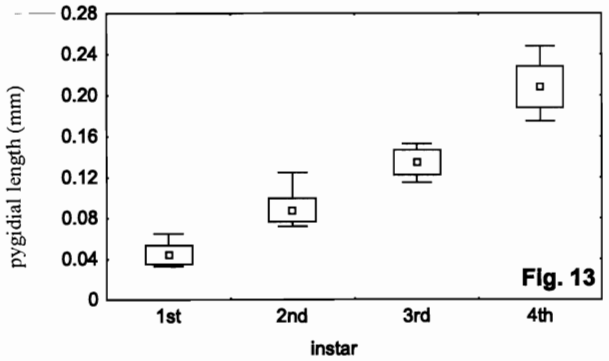
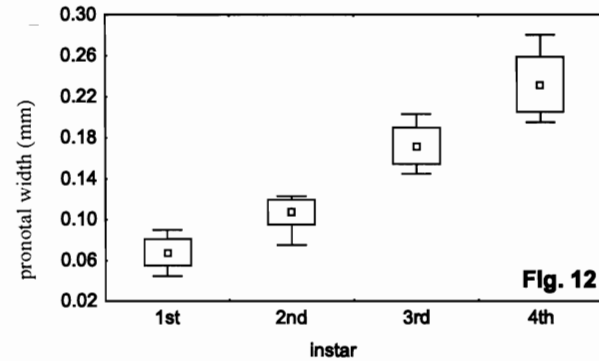
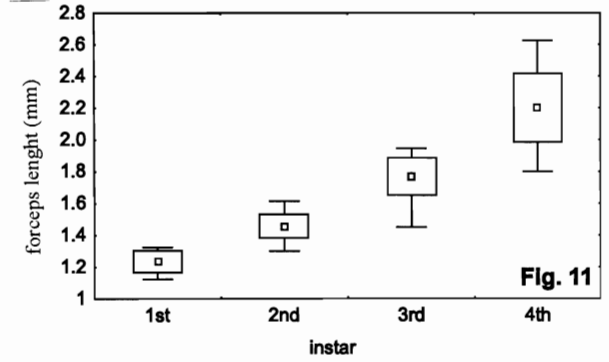
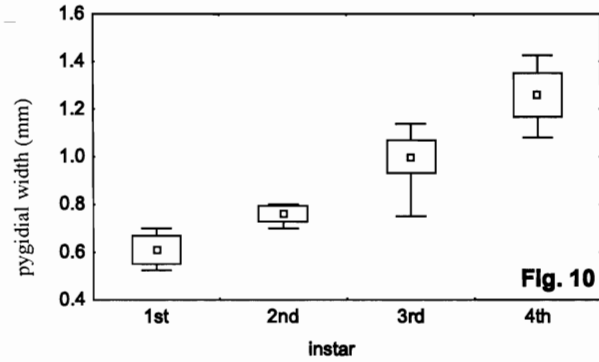
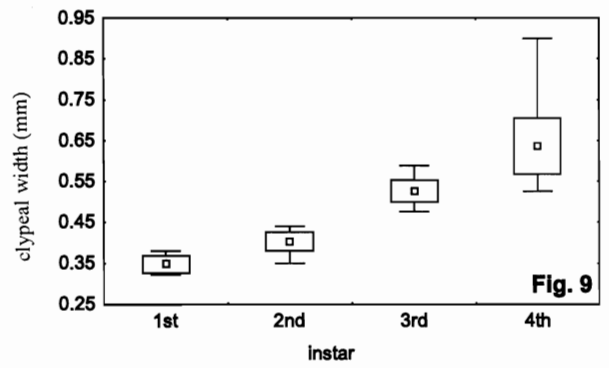
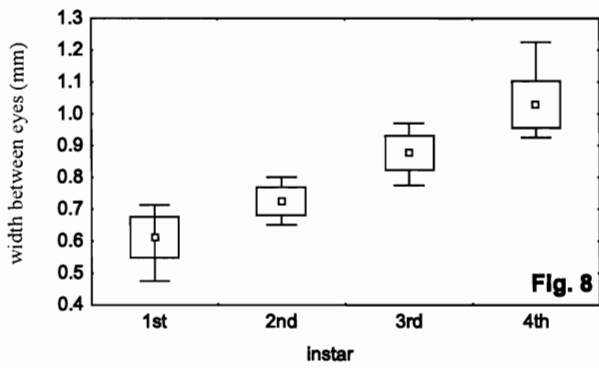
ard error. In descriptions of the 2nd – 4th nymphal instars are described only character states different from the 1st instar.

The morphological terminology is taken from the paper of STEINMANN (1986).

Descriptions

Egg

Ovoid, creamy white, without obvious sculpturing.



Figs 8 – 13. Morphometric characters of the individual nymphal instars of *Apterygida media*.

Length 1.15 ± 0.01 mm, width 0.73 ± 0.01 mm. Number of eggs in the female ovarioles 21.3 ± 0.02 .

First instar

Head. Width between the eyes 0.61 ± 0.02 mm. Vertex pale brown, with fine setae, without puncturation; coronal suture white. Frons pale brown, with fine setae and without puncturation; anterior angles dark brown; postfrontal suture white, nearly straight with sharp V-shape angle in contact with coronal suture. Eyes black, prominent, with straight ventral margin. Antennae sockets prominent; antennae moniliform, 8-segmented (occasionally 9-segmented); finely but thickly pubescent; scape clavate; pedicel very short; third segment longest and cylindrical, sometimes with two narrow areas corresponding to the future segments of the next instar; remaining segments cylindrical. Clypeus pale brown, with small setae; anterior

angles with dark brown spots. Basal length of the clypeus 0.35 ± 0.02 mm. Mandibles pale brown, with two teeth apically and one small tooth in the centre of inner margin. Maxillary palps yellowish brown, subequal, five segmented; two basal segments very short, segments 3 – 5 similar to each other, all segments setose. Labium with 4-segmented palps clothed in small setae; proximal 2 palpal segments very short, 2 distal longer; mentum yellowish brown.

Thorax. Segments yellowish brown, with fine setae; each segment overlapping the anterior margin of the successive segment; white longitudinal suture on the each segment. Pronotum wider than longer, with nearly parallel margins, 0.61 ± 0.02 mm wide. Mesonotum wider than pronotum, side margins rounded. Metanotum trapezoid, posterior margin wider than the anterior and very slightly roundly arched. Legs yellowish brown; coxae prominent; femora and tibiae slightly flattened laterally; tarsi

2-segmented, segments subequal, claw bifid, sharp. All leg segments setose.

Abdomen. 10-segmented, all segments visible dorsally, distinctly setose, yellowish brown, each segment overlapping anterior margin of the successive segment; basal segment covered anteriorly by the metanotum. Forceps yellowish brown, 1.24 ± 0.02 mm long, thickly setose; inferior margin with two sharp keels, interior margin with one smooth keel; apices slightly curving inwards. Between the branches of the forceps and edge of the apical abdominal segment is trapezoid pygidium with distal wide 0.07 ± 0.01 mm and total length 0.04 ± 0.01 mm; distal margin straight.

Second instar

Head. Width between the eyes 0.74 ± 0.01 mm. Postfrontal suture with more distinct sharp angle in contact with coronal suture. Basal width of the clypeus 0.40 ± 0.01 mm. Antennae 10-segmented.

Thorax. Pronotum 0.76 ± 0.01 mm wide. Posterior margin of the mesonotum roundly arched. Metanotum covering more of the first abdominal segment than in the 1st instar, and more tapered in the posterior corners (posterior margin more distinctly roundly arched). Tarsi 3-segmented.

Abdomen. Forceps 1.45 ± 0.01 mm long; the apices slightly curving inwards; keel of the interior margin slightly toothed. Pygidium 0.11 ± 0.01 mm wide in the distal margin and long 0.09 ± 0.01 ; the distal margin straight.

Third instar

Head. Width between the eyes 0.88 ± 0.01 mm; head darker than in the foregoing two instars. Basal width of clypeus 0.52 ± 0.01 mm. Antennae 10-segmented; third segment longer, with narrow area corresponding to the future segments of the 4th instar.

Thorax. Segments darker and more setose than in the foregoing instars. Pronotum 1.00 ± 0.01 wide. Lobes of mesonotum extending more laterally than in the 2nd instar. Metanotum more tapered than in the foregoing instar and covering relatively more of the first abdominal segment.

Abdomen. Segments darker than in the foregoing instars. Forceps 1.77 ± 0.02 mm long, darker. Keel of interior margin distinctly toothed. Pygidium 0.13 ± 0.01 long and 0.17 ± 0.01 mm wide in the distal margin; distal margin with sharp, tooth-like corners.

Fourth instar

Head. Width between the eyes 1.03 ± 0.02 mm; head darker than in the foregoing instars. Basal width of clypeus 0.64 ± 0.01 mm. Antennae 11-segmented; third segment with narrow area corresponding to the border between the incoming two segments of the imago.

Thorax. Segments darker than in the foregoing instars. Pronotum 1.26 ± 0.02 wide. Lobes of mesonotum

and metanotum extending more laterally than in the 3rd instar; posterior margins more distinctly roundly arched.

Abdomen. Segments darker than in the foregoing instars. Forceps 2.23 ± 0.04 mm long, darker. Keel of the interior margin distinctly toothed, with the slightly arched distal part of the incoming males. Pygidium 0.21 ± 0.01 long and 0.23 ± 0.01 mm wide in the distal margin; distal margin with tooth like corners, sharper in the incoming males.

Identification keys

Key to nymphal instars of *Apterygida media*:

- 1 (2) Tarsi 2-segmented. Antennae < 10-segmented 1st instar
- 2 (1) Tarsi 3-segmented. Antennae 10- or 11-segmented.
- 3 (4) Antennae 10-segmented 2nd instar
- 4 (3) Antennae 11-segmented.
- 5 (6) Posterior margin of mesonotum \pm straight. Pronotum about 1.0 mm wide 3rd instar
- 6 (5) Posterior margin of mesonotum distinctly arched. Pronotum about 1.2 mm wide 4th instar

Key to the nymphs of some Central European species:

- 1 (2) Antennae > 15-segmented; if 8-segmented (the 1st nymphal instar), the forceps are longer than 2 mm *Labidura riparia* (PALLAS, 1773)
- 2 (1) Antennae < 12-segmented; if 8-segmented, the forceps are shorter than 2 mm.
- 3 (4) Ventral margin of eye slightly arched (Fig. 3) *Forficula auricularia* LINNAEUS, 1758
- 4 (3) Ventral margin of eye straight or rounded (Fig. 4, 5)
- 5 (6) Postfrontal suture with sharp V-shape angle in contact with coronal suture (Fig. 6) *Apterygida media* (HAGENBACH, 1822)
- 4 (3) Postfrontal suture roundly arched, without sharp V-shape angle in contact with coronal suture (Fig. 7) *Chelidurella* spp.

Remarks. GALVAGNI (1994) described a new central European species - *Chelidurella guentheri*, closely related to *C. acanthopygia*, only the male of which can be distinguished by the morphology of the pygidium. In the territory of the Czech Republic, both species were found to occur (KOČÁREK et al. 1999, KOČÁREK & GALVAGNI in press). The population in the Litovelské Pomoraví Protected Landscape Area (KOČÁREK 1998), studied in this paper, belongs to the species *C. acanthopygia* but because the nymphs of both species could not be indistinguished, I used the key only to the genus level.

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