

**DESCRIPTION OF THE PUPARIA OF *AFROSYRPHUS VARIPES*
AND *DIDEOPSIS AEGROTUS* (DIPTERA, SYRPHIDAE)**

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Abstract

Description of the unknown puparia *Afrosyrphus varipes* (Curran, 1927) and *Dideopsis aegrotus* (Fabricius, 1805) is given. The species *A. varipes* from Africa is probably related to genus *Epistrophella* (Dušek & Láska, 1967) according to the puparium. That of *D. aegrotus* does not show similarity to other known puparia.

Introduction

The authors continue in descriptions of unknown immature stages of syrphids (e.g. Dušek & Láska, 1959, 1964, 1988). During a long period we were successful in obtaining material of *Afrosyrphus varipes* (Curran, 1927) and *Dideopsis aegrotus* (Fabricius, 1805). We describe empty puparia only from material originated from the tropics. Descriptions of puparia are useful not only for future ecological studies but also for solving the problems of relationship of genera.

As to terminology we follow the terms in English according to the paper Dušek & Láska (1964). We use the term orificium (Wimmer, 1925) instead of spiracles or slits. Periorificial ornamentation is used instead of interspiracular ornamentation in analogy of Bhatia's (1939) openings of perispiracular glands.

Description of puparia

Afrosyrphus varipes (Curran, 1927)

Puparium oval from dorsal view, droplike in lateral view. Estimated length of whole puparium about 6–7 mm, width 2.8–2.9 mm and height 3.3–3.5 mm. Colour of empty puparium light brown, in medial line there are very slightly darker elongate spots present on each segment. Segmental spines on lateral margin about 0.1 mm (apical part 0.06 mm, basal part 0.04) placed on fleshy projections. Dried rests of fleshy projection 0.1 mm long. Integument covered in very fine nodules of about 0.01×0.01 mm.

Posterior respiratory process in about horizontal position and extremely long. Length 1.4–1.5 mm, apical width 0.46 mm, basal width 0.44–0.48 mm, width in middle of process 0.4 mm. Colour brown, surface covered with spherical nodules except on apical portion. Orificia I and III are not opposite (as in *Epistrophe* sensu str.) forming distinct angle. Orificia are not lined in dark colour and are placed on small carinae. Periorificial nodules large, inflated about as or more than carinae forming general shape of spiracular plate rounded.

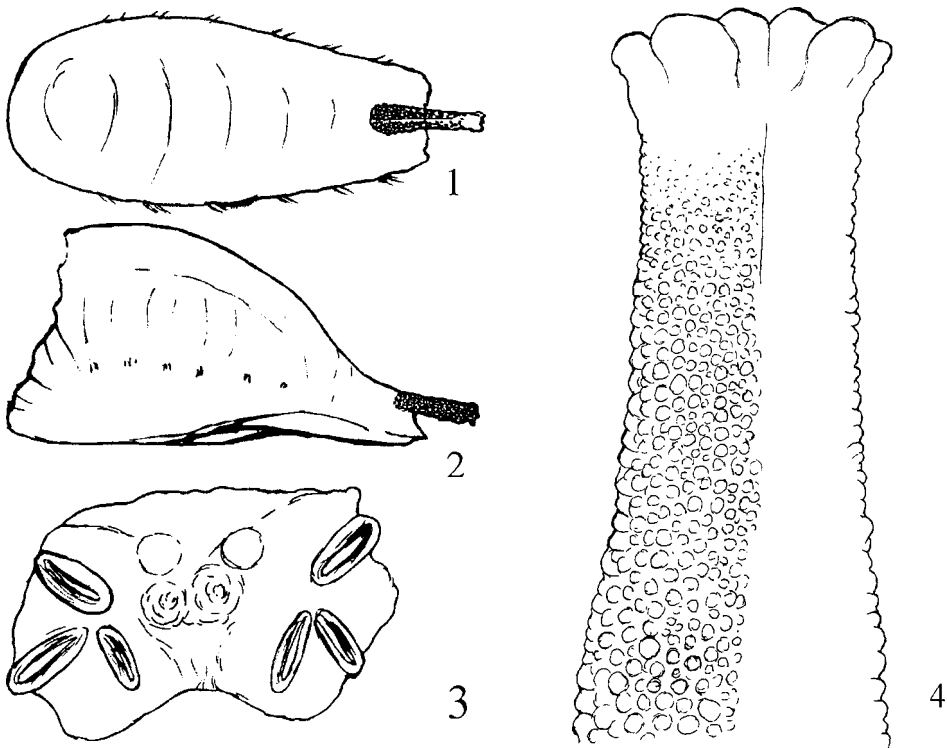


Fig. 1–4: *Afrosyrphus varipes*: 1 – puparium dorsal view, 2 – puparium lateral view, 3 – spiracular plate, 4 – posterior respiratory process from above. Scale bar: 1, 2 = 5 mm; 3, 4 = 0.5 mm.

We expect that larva will be oval, slightly flat and rounded with conical fleshing projections on margins as it is in genus *Epistrophella* Dušek et Láska, 1967.

Differential diagnosis

The puparium is easily differentiable by its very long (1.4–1.5 mm) posterior respiratory process very similar to *E. euchroma* (Kowarz, 1885). But in *E. euchroma* the process is shorter (0.78–0.97 mm).

Material

Immature stages were collected 30. 10. 1970 in the colonies of aphid *Brachycaudus aegyptica* in Nairobi by Prof. Dr. Schmutterer, who dealt with the bionomy of African Syrphinae (Schmutterer, 1972a, 1972b, 1974).

Phylogenetic note

The adult of *A. varipes* differs from *E. euchroma* in general appearance but it might be caused by high mimicry to bees (including long antenna). Vockeroth (1969) admits the similarity to *Epistrophe* (in that genus includes also genus *Epistrophella*). According to us *Afrosyrphus* Curran, 1927 is closer to *Epistrophella* than *Epistrophe* s. str.

Dideopsis aegrotus (Fabricius, 1805)

Puparium droplike in both views. Length 7.5–9.5 mm, width 3.4–4.6 mm and height 3–4 mm. Colour of empty puparium light brown, except for dark brown posterior respiratory process. Segmental spines 0.05–0.06 mm, basal portion of spines rather broad. Integumental vestiture is absent.

Anterior length of posterior respiratory process about 0.3 mm, but spiracular plates posteriorly sessile, posterior respiratory process thus being of conical shape. Posterior respiratory process 0.8 mm broad at base, and 0.5 mm in the level of orificia. Orificia on less distinct carinae, orificium III about in horizontal position, angle between orificia I and III less than 90°. Medial end of orificium III curved up.

Differential diagnosis

From the other genera the puparium is easily differentiable by the slope spiracular plate and by the curved orificium III.

Material

Immature stages were collected by Dr. Starý on *Eupatorium odoratum* on the colonies of aphids *Aphis gossypii* and *Aphis spiraecola* in Nha-Ho, 15 km W Phan-Rang, Vietnam 23. 10. 1979.

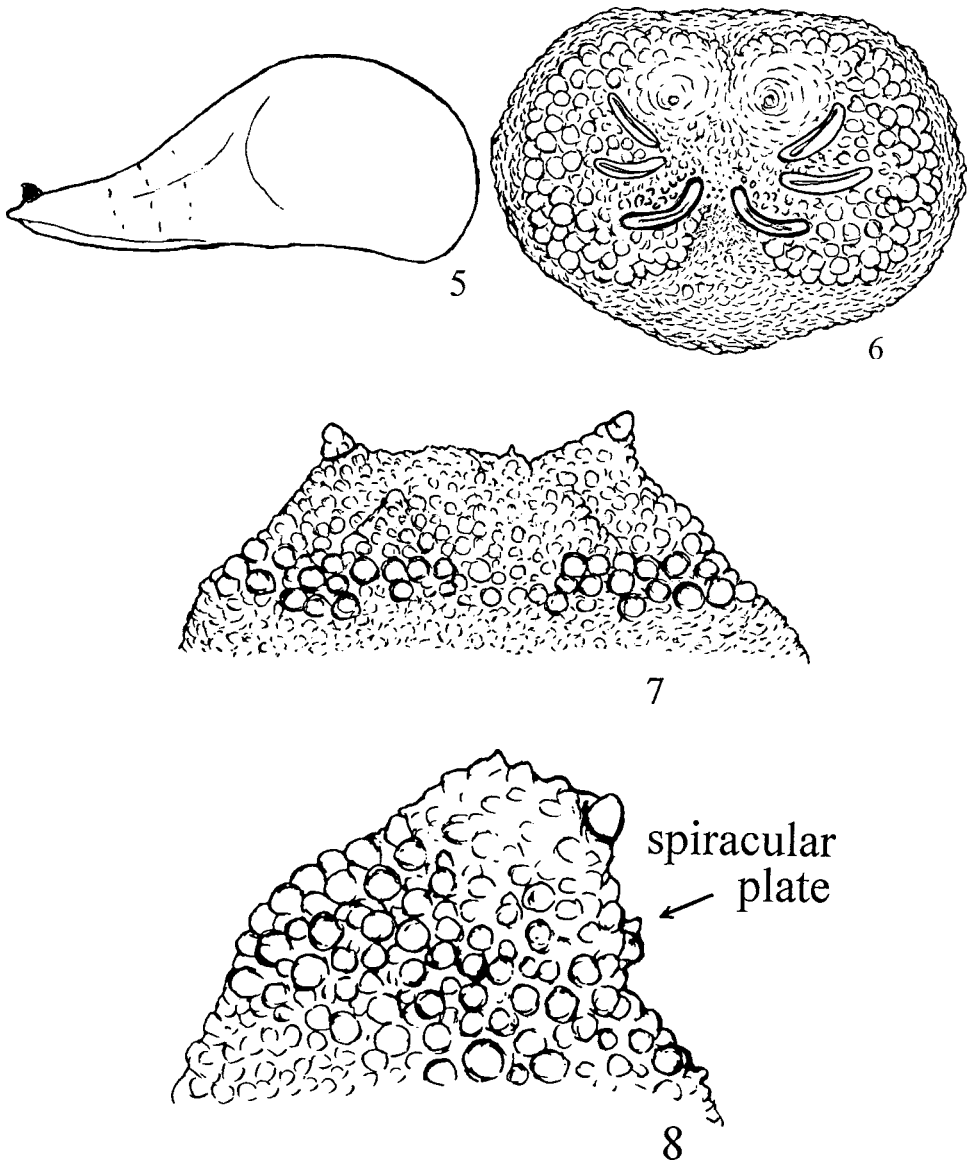


Fig. 5–8: *Dideopsis aegrotus*: 5 – puparium lateral view, 6 – spiracular plate, 7–8 posterior respiratory process: 7 – from above, 8 – lateral view. Scale bar: 5 = 5 mm; 6–8 = 0.5 mm.

Phylogenetic note

According to Vockeroth (1969) genus *Dideopsis* Brunetti, 1908 is similar to genus *Asarkina* Macquart, 1942, so that also puparia of genus *Asarkina* may show some affinity. Musa (1974) described the immature stages of *Asarkina ericetorum* (Fabricius, 1781) from northern Nigeria. However, the larva of this species is adapted to spittle masses of the genus *Poophilus* and is adapted to this unusual mode of life. Spiracular plate of *A. ericetorum* differs from all Syrphinae and has developed only two pairs of orificia.

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References

- BHATIA, M. L. 1939: Biology, morphology and anatomy of aphidophagous Syrphid larvae. *Parasitology* 31: 78–129.
- DUŠEK, J. & LÁSKA, P. 1959: Beitrag zur kenntnis einiger unbekannter aphidophager Syrphiden Larven (Diptera, Syrphidae). *Acta. Soc. Ent. Českoslov.* 56: 279–292.
- DUŠEK, J. & LÁSKA, P. 1964: A contribution to distinguishing the European species of the subgenus *Syrphus* Fabricius (Diptera, Syrphidae) according to male genitalia and larvae. *Acta. Soc. Ent. Českoslov.* 61: 58–70.
- DUŠEK, J. & LÁSKA, P. 1988: Saprofage Larven von *Ferdinandea cuprea* und *Brachypalpus valgus* (Diptera, Syrphidae). *Acta. Entomol. Bohemoslov.* 85: 307–312.
- MUSA, J. L. 1974: The immature stages of *Asarkina ericetorum* (F.) (Dipt., Syrphidae) in Northern Nigeria. *Entomol. Month. Mag.* 110: 109–110.
- SCHMUTTERER, H. 1972a: Zur Beutespezifität polyphager, räuberischer Syrphiden Ostafrikas. *Zeitsch. angew. Entomol.* 71: 278–286.
- SCHMUTTERER, H. 1972b: Untersuchungen über das Verhalten von zwei ostafrikanischen Ameisenarten gegenüber räuberischen Syrphiden. *Entomophaga*, 17: 443–453.
- SCHMUTTERER, H. 1974: Ökologische Untersuchungen an entomophagen Syrphiden und ihren Parasiten im Hochland von Kenia (Ostafrika). *Zeitsch. angew. Entomol.* 75: 42–67.
- VOCKEROTH, J. R. 1969: A revision of the genera of the Syrphini (Diptera: Syrphidae). *Mem. Ent. Soc. Can.* 62: 1–176.
- WIMMER, A. 1925: Larvy a kukly dvojkřídleho hmyzu středoevropského se zvláštním zřetelem na škůdce rostlin kulturních. [The larvae and puparia of Central European Diptera with special aspect on pest of cultivated plants]. Praha, 379 pp. (in Czech).



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Biol. 38, 79–83