Zootaxa 3755 (5): 485–490
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3755.5.8
http://zoobank.org/urn:lsid:zoobank.org:pub:A2EF9D93-487E-4246-B78C-3A08475E38ED

Sexual morphs and biology of *Aphis verbasci* Schrank (Hemiptera: Aphididae)

MARIUSZ KANTURSKI, KARINA WIECZOREK[1], ŁUKASZ JUNKIERT
University of Silesia, Faculty of Biology and Environmental Protection, Department of Zoology, Bankowa 9, 40-007 Katowice, Poland
[1]Corresponding author. E-mail: karina.wieczorek@us.edu.pl

Abstract

The oviparous female and wingless male of *Aphis verbasci* from Poland and the United Kingdom are described and illustrated in detail for the first time, with notes on biology, distribution and host plants.

Key words: Aphididae, *Aphis,* sexuales, *Verbascum* sp.

Introduction

Aphis verbasci Schrank is a monoecious and holocyclic aphid species widely distributed in Europe (except Scandinavia), Middle East, North Africa, India and Pakistan (Blackman & Eastop 2013). This species is trophically associated with plants from the genus *Verbascum*, but it can also feed on *Eryobotria japonica*, *Lantana camara*, *Buddleja* spp. and *Scrophularia* spp. (Holman 2009). Despite the well-known viviparous generation of *A. verbasci*, the sexual morphs have remained undescribed, although Schouteden (1900) provided some information about the colour of live viviparous and oviparous specimens. Blackman & Eastop (2013) gave data about the occurence of oviparous females and males in the United Kingdom, and in October 2013 the authors collected sexuales of this species from *V. phlomoides* L. in southern Poland. The aim of this paper is to describe the oviparous female and apterous male of *A. verbasci*.

Material and methods

The aphids were collected in Prusice (51º22'17'' N; 16º57'07'' E) in the area of Trzebnickie Hills and in Branice (50º03'06'' N; 17º47'09'' E) in the area of Eastern Sudetes Mountains. Material was prepared after Kanturski & Wieczorek (2012). Photographs were taken by the Sony SLT a37 camera with extension rings.

The specimens were examined using the light microscope Nikon Ni-U. Drawings were made with a camera Lucida. For each of the drawings a magnified view is provided. Measurements are given in mm (Table 1). The material studied is deposited in Natural History Museum, London, UK (BMNH) and entomology collection of the Zoology Department, University of Silesia, Katowice, Poland.

Material examined: Poland: Prusice, 5.x.2013, 1 oviparous female, 1 male, (M. Kanturski) 10/13/2a; Branice, 19.x.2013, 2 oviparous female, 1 male, (M. Kanturski) 10/13/2b. **United Kingdom**: London, 27.x.1985, 1 oviparous female, (V.F.E.) 17840(a), 1 oviparous female, 3 males 17840(b), 7.x.1985, 1 oviparous female, (V. F. E) 17838; Pangbourne, 10.x.1985, 1 oviparous female, 3 males, (J. Keenlyside) 172/85.

***Aphis verbasci* Schrank, 1801.**
(Figs 1, 2, 3)

Accepted by L. Mound: 9 Dec. 2013; published: 24 Jan. 2014

secondary rhinaria of variable size with sclerotic ring (Fig. 2c). Ant. segm. IV at least 2 times shorter than ant segm. III and V with 1 rounded and ciliated primary rhinarium and 3–5 secondary rhinaria, similar to those on ant. segm. III. Ant. segm. V with 1 rounded and ciliated primary rhinarium and 3–6 ciliated, accessory rhinaria (Fig. 2d). Vb 2.40–2.77 times Va; other antennal ratios: V:III 0.97–1.00, IV:III 0.32–0.41. Antennal chaetotaxy: segm. I with 5–6 setae, segm. II with 4–6 setae, segm. III with 8–12 setae, segm. IV with 3–6 setae, segm. V with 3 basal, 2–3 apical and 2–3 subapical setae. Antennal setae pointed, 0.01–0.02 mm long; the longest antennal seta III about 1.0 times basal articular diameter of this segment. Rostrum long, reaching abdominal segment V, ARS long and pointed, with 4 primary and 4 accessory setae (Fig. 2e). ARS 0.47–0.55 times ant. segm. III and 1.80–2.11 times HT II. First segment of hind tarsus with 3 setae (Fig. 2f). Abdomen with reticulation in form of pentagons and hexagons (Fig. 2g). Dorsal side of abdomen covered with variable sized sclerites in pleural and marginal position. On abd. segm. I–IV from these sclerites arising pleural and marginal setae. On abd. segm. V and VI there is also spinal sclerotization with 2 pairs of spinal setae. Dorsal setae pale, slightly capitate, 0.02–0.04 mm long. Abd. segm. VII and VIII completely sclerotized (cross bars). Siphunculi imbricated, widest at base and gradually narrowing toward apex without reticulation and flange (Fig. 2h). Cauda tongue shaped with 8 long and pointed setae and short and pointed spinules (Fig. 2i). Genitalia well developed, strongly sclerotized with lobate parameres with numerous setae. Basal part of phallus shortened, hooked-shaped with numerous setae (Fig. 2j).

Bionomic remarks. Numerous colonies of *A. verbasci* live always on the whole underside surface of the basal leaves of *Verbascum* spp., lying directly on the ground. During summer apterous viviparous females produce much honeydew and the colonies are visited by ants, especially *Lasius niger*. The bisexual generation begins to appear in October, with numerous oviparous females and less numerous males and for some time those two generations exist together (Fig. 3a). Ant attendance of sexuales in autumn was not observed. After copulation orange eggs are visible in the female's body (Fig. 3c) and the oviparae each lay 2–3 big, orange eggs on the lower surface of the leaf (Fig. 3d). Eggs are protected from the effects of winter under the dead leaves until spring.

Oviparous females of *A. verbasci* differ morphologically in comparison to parthenogenetic apterous viviparous females. They are characterized by longer and wider genital plate—a phenomenon which occurs also in other subfamilies of aphids e.g. in Lachninae (Depa *et al.* 2013) or Chaitophorinae (Wieczorek & Junkiert 2011), and also are slightly sclerotized on abdominal segments IV and V. Wingless males have 5-segmented antennae and well developed dorsal sclerotization, visible in life as well as in mounted specimens. In both sexual morphs siphunculi are straight, not curved like in apterous viviparous females. There are also considerable seasonal differences in coloration. The large, summer colonies of parthenogenetic females of *A. verbasci* are golden-yellow in colour, but in autumn they have much paler coloration from pale yellow to pale green (Fig. 3a,b). The bisexual generation on the other hand is slightly pulverulent and of a dark green-olive colour (Fig. 3c,e,f).

Acknowledgements

We would like to express our thanks to Roger Blackman, Diana Percy and Paul Brown, the Natural History Museum, London, UK, for the loan of slides and for all their help during the visit in the collection of the BMNH. We are very grateful the Reviewers and the Editor for all valuable suggestions and comments that improved the manuscript.

References

Blackman, R. & Eastop, V. F. (2013) *Aphids on the World's Plants. An Identification and Information Guide*. Available from: http://www.aphidsonworldsplants.info/ (accessed 03 January 2014)

Depa, Ł., Mróz, E., Brożek, J. (2013) Description of the oviparous female and new information on the biology of the rare aphid *Stomaphis radicicola* Hille Ris Lambers 1947 (Hemiptera, Aphidoidea). *Zoologica Fennica*, 24, 100–406.

Holman, J. (2009) *Host Plant Catalog of Aphids – Palaearctic Region*. Springer Verlag, New York, 1216 pp.

Kanturski, M. & Wieczorek, K. (2012) The methods of collection and preparation of aphids (Hemiptera: Aphidoidea) in faunistic, taxonomic and molecular research. *Young scientists for Polish Science*, 8, 137–143.

Schouteden, H. (1900) Catalogue Raisonne des Pucerons de Belgique. *Annales de la Société Entomologique de Belgique*, 44, 113–139.

Wieczorek, K. & Junkiert, Ł. (2011) Description of sexuales of *Periphyllus singeri* (Börner) (Hemiptera, Aphidoidea: Chaitophorinae). *Zootaxa*, 2872, 63–68.