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**SEXUAL DIMORPHISM IN THE FIRST- AND SECOND-NYMPHAL
INSTARS OF *QUADRASPIDIOTUS ZONATUS* (FRAUENFELD)
(HEMIPTERA: COCCINEA: DIASPIDIDAE).**

ABSTRACT

SEXUAL DIMORPHISM IN THE FIRST- AND SECOND-NYMPHAL INSTARS OF *QUADRASPIDIOTUS ZONATUS*
(FRAUENFELD) (HEMIPTERA: COCCINEA: DIASPIDIDAE).

Morphological characters separating male and female 1st- and 2nd-instar nymphs of *Quadraspidiotus zonatus* are discussed. In the 1st instar, male nymphs possess a campaniform sensillum on each tarsus and dorsal submedian setae on the 1st abdominal segment; these characters are absent on the female. There is also a slight difference in the body shape.

In the 2nd-instar nymphs, the differences are greater. In the male nymph, the number of glandular ducts is much greater than in the female and there is a pair of setae present on the 1st abdominal segment and three pairs of ventral submedian setae on the head (absent on the female). There is also a greater difference in body shape than in the 1st-instar nymphs.

Key words: macroducts, setal distribution, Aspidotini, scale cover.

RESULTS

Quadraspidiotus zonatus (Frauenfeld) belongs to the tribe Aspidotini. The 1st-instar nymphs differ from the other known 1st-instar nymphs of the Aspidotini in lacking the ventral submedian series of setae on the abdomen. However, as in all species of Diaspididae, they do have only a single pair of short submedian setae on the venter of abdominal segment VII.

The 1st- and 2nd-instar nymphs of *Q. zonatus* are sexually dimorphic and are described in detail in Podsiadlo (1997) and Podsiadlo (2000).

First instar nymphs: sexual dimorphism is shown by the presence in the male of: (a) a campaniform sensillum on the dorsal side of each tarsus and (b) a pair of dorsal submedian setae in the 1st abdominal segment; these two characters are absent in the female. There is also a slight difference in the shape of the thorax which, in newly hatched males, tends to be widest in the mesothorax but is widest in the metathorax in the female. Fully-grown specimens are rather variable in shape, although males tend to be somewhat longer and narrower than females, and their abdomen tends to be triangular rather than rounded as in the female. However, many individuals are intermediate in the shape, some even showing the characteristics of the

opposite sex, and so determination of the sex based on body shape is unreliable.

Second instar nymphs: sexual dimorphism is more obvious than in the 1st instar, with differences in (a) the colour and structure of scale cover, (b) the shape of the body, (c) the glandular system and (d) the distribution of the setae.

a. Scale cover: 2nd-instar male nymphs of *Q. zonatus* settle on the underside of oak leaves and, because the scale cover is white, they are conspicuous against the green leaf. However, the females, which settle almost entirely on the trunks and branches of the oaks, have a thinner, semitransparent scale cover which is usually darker and brownish and, as a result, are rather difficult to see.

b. Body shape: this changes with age. Newly-moulted males are broadly oval, usually with a triangular-shaped abdomen although this later becomes more elongate. Newly-moulted females are nearly circular, usually with a rounded abdomen and, as they age, they barely change shape, the body just becoming slightly more pyriform.

c. Glandular system: males have 8-12 short macroducts on each side of the body, arranged in a marginal series extending from the mesothorax to 1st abdominal segment; these are absent in females. The males also have 11-13 long macroducts on each side of the pygidium, beginning on the Vth abdominal segment, while the females only have 4-6 long macroducts on the pygidium. In addition, the males have a marginal, dorsal and ventral series of microducts on thorax and abdomen, whereas only the marginal series are present in the female. No macroducts are present on the IVth abdominal segment on either sex.

d. Setal distribution: the males possess a pair of short dorsal submedian setae on the 1st abdominal segment and three pairs of ventral submedian setae on the head. These setae are absent on the female.

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