

***Helenococcus*, A New Genus of Diaspididae with Description of a New Species, *Helenococcus hokeae* (Homoptera: Coccoidea) from Australia¹**

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ABSTRACT *Helenococcus*, a new genus of Diaspididae, is described and designated, including detailed illustrations and descriptions of the adult female, second instar, and first instar of the type species, *Helenococcus hokeae*. The new species was collected on *Hokea pampiniana* from New South Wales, Australia.

Key Words Insecta, description, systematics, taxonomy, scale insects.

During our course of study of immature stages of *Gymnaspis* Newstead (1898), an examination of dry material labeled *G. perpusilla* (Maskell 1896) from the United States National Museum (Natural History) revealed a species not referable to any species of *Gymnaspis* or to any existing genus in the Family Diaspididae. The above-mentioned material was labeled "cotype" but with a question mark and a note in the box saying that the specimen was not *G. perpusilla*.

The following descriptions and the illustrations are of one half the dorsum (left half) and venter (right half), and should be doubled for a complete view of the surface. Measurements (in microns) and numbers are taken from 10 specimens, if available, and are given as a range.

Helenococcus, n. gen.

Type species: *Helenococcus hokeae*, n. sp.

Diagnostic characters: Body pyriform, with free abdominal segments slightly lobed laterally, pygidium somewhat triangular, pygidial margin pointed at apex, median lobes well developed. Ducts slender, arranged as submarginal rows along the posterior intersegmental line of each of abdominal segments I-VII of dorsal surface, with a cluster of these ducts between median lobes; a number of such ducts may be irregularly scattered on marginal and submarginal areas of thorax and abdominal segments I-VII of both surfaces.

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H. hokeae, n. sp.

Type Material and Deposition: Adult female holotype (1 specimen on slide) with right label “Native Dog Bore Darling River, New South Wales, Australia, July 28, 1910, on *Hokeae pampliniana*, Coll. W. W. Froggatt, #12”; left label “*Helenococcus hokeae* Liu and Howell Holotype”, deposited in the United States National Museum of Natural History (USNM); 5 adult female paratypes on 5 slides (3 deposited at USNM, 2 at the University of Georgia Entomology Collection, Georgia Experiment Stations, Georgia Station, Griffin, GA or UGA-Griffin), and 10 second instars on 10 slides and 3 first-instar exuviae on 3 slides (Deposited at UGA-Griffin).

Etymology: The new genus is named *Helenococcus* in honor of Ms. Helen Brookes, for her outstanding contributions to the study of Australian scale insects. The species name is based on that of its host, *Hokea pampliniana*.

Adult Female (Fig. 1)

Body (Fig. 1A) of slide-mounted adult female pyriform, 466-734 long and 395-544 wide, widest at metathorax or abdominal segment I. Derm membranous except for a slightly sclerotized pygidial margin. Pygidium (Fig. 1B) triangular and pointed at apex. Median lobes parallel, non-zygotic at base, equal or wider than long, apex truncate usually with a small invagination, both mesal and outer margins smooth, mesal margin straight or with a slightly invaginated curve. Second lobes small, inner lobule distinct and pointed, and outer lobule reduced. Third lobes small, inner lobule pointed, and outer lobule unrecognizable. Minute spicules form groups in rough horizontal rows at base of labium.

Dorsal surface. Ducts (Fig. 1D): Elongate, 26.8-49.2 long and 2.0-2.8 wide at orifice. Marginal-submarginal: a marginal cluster of 5-12 ducts between median lobes and their orifices are usually not visible from body surface; a cluster or short row of ducts (6-14, only 5-8 visible from surface) on VII, and a row of 8-16 ducts along the posterior intersegmental lines of I-VI. Submedian, 0-4 (usually 2-3) on VI, 2-4 on IV, 3-4 on III, and 1-3 on II. Few such ducts irregularly scattered on marginal regions of abdominal segments I-V, anterior region of head, and three thoracic segments as illustrated.

Setae: Hairlike. Marginal, 2 on head (1 at anterior margin, 1 at lateral margin), 1 on prothorax, 2 on each of meso- and metathorax, and 1 on each of abdominal segments I-VIII. The marginal setae on abdominal segments larger posteriorly, and the ones on V-VII are extremely large and stout (the largest one on VII). Submarginal, 2 on head, 1 on each of meso- and metathorax. Submedian, 3 on head, 1 on each of thoracic segments, and 1 on abdominal segment II.

Variation: A number of ducts (occasionally numerous) may be present on marginal-submarginal areas of thoracic segments, especially on metathorax.

Ventral Surface. Ducts (Fig. 1G): Similar to those on dorsal surface in shape and size. Few scattered on cephalothoracic region, and a number of such ducts on marginal-submarginal area of each of meso- and metathorax, and abdominal segments I-VII.

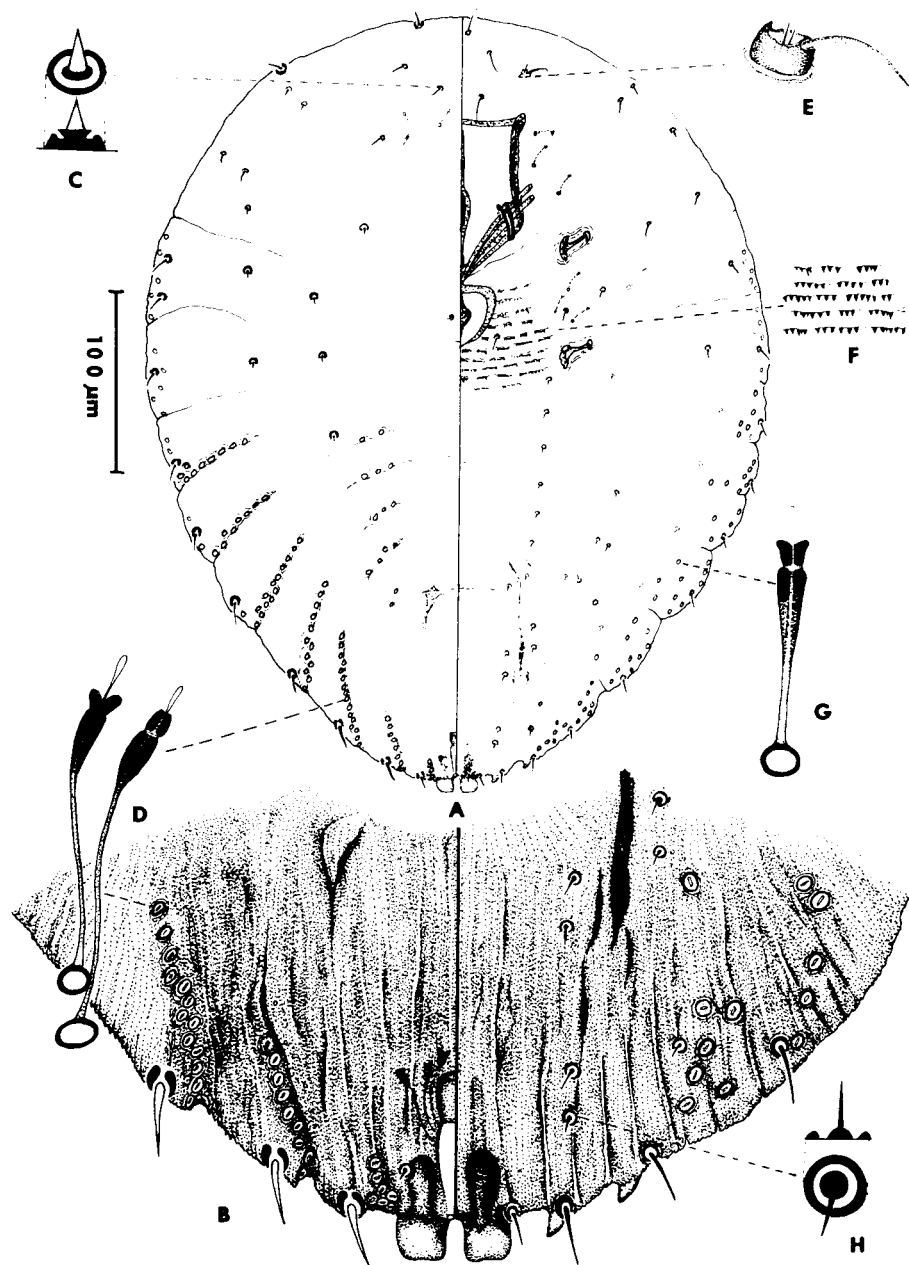


Fig. 1. Adult female of *Helenococcus hokeae*, n. sp.: A. Body; B. Pygidial margin; C. Seta on head; D. Dorsal elongate ducts; E. Antenna; F. Micro spines on derm of thorax; G. Ventral duct; H. Seta on pygidium.

Setae: Hairlike, 1 at anterior margin, 1 mesolaterad of antenna, 1 anterior of clypeolabral shield, 3 near lateral margin. 1-2 anterolaterad or laterad of anterior spiracle, 1 marginal seta on each of thoracic segments, and 1 on margin of each abdominal segment becoming larger posteriorly (the largest one on VII), and 1 small seta mesad of median lobe (1 pair between median lobes) representing abdominal segment IX. Submarginal: 1 on each of abdominal segments I-V, and 2 on VI and VII (Fig. H). Submedian: 1 on head (anterior of clypeolabral shield), 1 lateral of labrum (on mesothorax), one on metathorax, and one on each of abdominal segments 1-7.

Antennae (Fig. F): Small tubercle with 1 lateral elongate fleshy seta and 1 tiny seta from a terminal invagination.

Spiracles: Located on pro- and metathorax without associated disc pores.

Vulvar Area: Vulva distinct, perivulvar pores absent, and paravulvar sclerosis present.

Second Instar Male (Fig. 2)

Body (Fig. 2A) on slide oval or pyriform, 280-488 long and 219-329 wide, widest at metathorax or abdominal segment I. Derm membranous with a slightly sclerotized pygidial margin. Pygidium (Fig. 2B) pointed at apex. Median lobes well developed, similar to those of adult female's in shape. Other lobes unrecognized.

Dorsal Surface. Ducts (Fig. 2C): Elongate, 20.1-28.8 long and 1.9-2.6 wide at orifice. Marginal-submarginal: a marginal cluster of 3-5 ducts between median lobes (their orifices are usually not visible from body surface); a cluster or short row of ducts (4-7) on VII, and a row of 6-9 (usually 6-7) ducts along the posterior intersegmental line of each segment of abdominal segments I-VI. Submedian, 0-2 on VI, 1-3 on II-V. Few such ducts irregularly scattered on dorsal surface.

Setae: Marginal setae: 3 along margin of head, 1 on each of thoracic segments, and 1 on each of abdominal segments, and those on abdominal segments V-VIII very large. Submarginal, 3 on head, and 1 on each of thoracic segments, 1 on abdominal segment II. Submedian setae: 1 or 2 on head, 1 on prothorax near median, often 1 on each of meso- and metathorax, and 1 on abdominal segment II.

Ventral Surface. Ducts (Fig. 2F): Similar to those on dorsal surface in shape and size, 3-5, occasionally as many as 10, on marginal-submarginal area of each of meso- and metathorax, and abdominal segments I-V, 1-3 on VI-VII.

Setae (Fig. 2G): Hairlike. Marginal, 3 on head; 1 on each of thoracic segments, and 1 on each of abdominal segments, and those on abdominal segments IV-VIII stouter posteriorly. Submedian, 2 on head (anterior of clypeolabral shield), 1 on prothorax near labral shield, 2 on mesothorax, and 1 on metathorax and each of abdominal segments I-VI, and 2 on pygidium. Submarginal, 3 on head, 1 on each of thoracic segments and on each of abdominal segments I-VII.

Antennae (Fig. 2D): Reduced to small tubercle, 1 fleshy lateral seta and 2 tiny setae in an invagination.

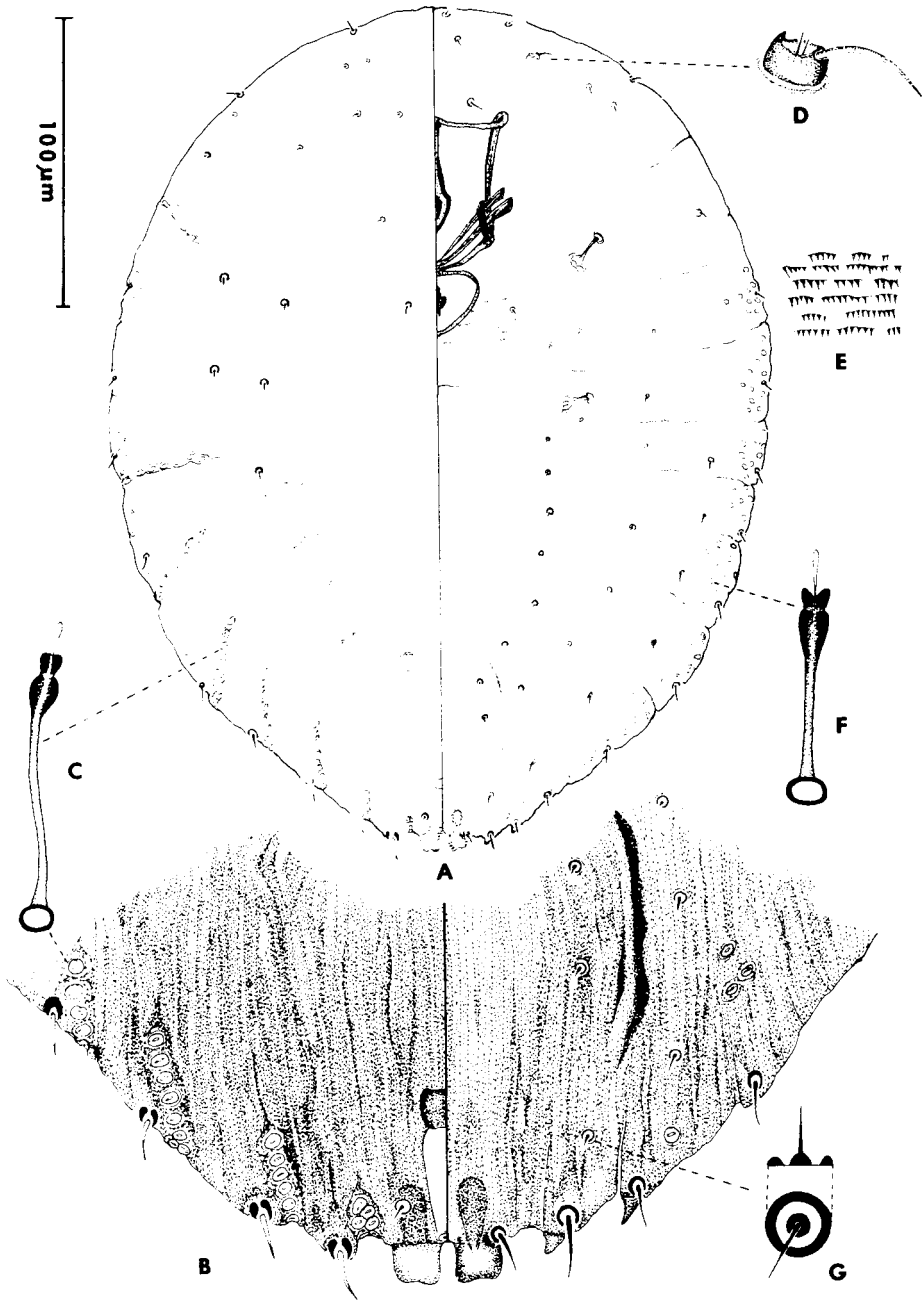


Fig. 2. Second instar male of *Helenococcus hokeae*. A. Body; B. Pygidil margin; C. Dorsal duct; D. Antenna; E. Micro spines on derm of thorax; F. Ventral duct; G. Seta on pygidium.

Spiracles: Situated on pro- and metathorax, without associated disc pores.

Variation: A number of ducts (occasionally numerous) may be present on submarginal areas of thoracic segments. One more seta may be present on submedian area of mesothorax, or prothorax, or abdominal segment I, or an additional small submedian seta on II. Minute spicules form horizontal rows at base of labium.

Second Instar Female

Very similar to second instar male in general appearance, but differing from the male in the following: (1) Having significantly fewer ducts on marginal-submarginal area of dorsal surface: 3-5 between median lobes, 3-6 (usually 4-5) on each of abdominal segments II-VII, and 0-4 (usually 1-2) on I; (2) Having fewer ducts on ventral surface: few (1-5) on marginal and submarginal area of each abdominal segment I-VII, and usually lacking or very few (1-3) on thoracic segments and head; (3) Pygidial margin smaller and more pointed, second lobes reduced, and other lobes unrecognizable.

First Instar (Fig. 3)

Due to the lack of usable specimens, only the antenna, marginal ducts, pygidial margin and legs are described and illustrated.

Antennae (Fig. 3A): Five-segmented, and terminal segment (V) annulate; 1 slender seta on segment I, and II; 0 and III, 1 fleshy seta on IV, 2 fleshy setae in middle and 1 elongate seta near terminal and 1 elongate on apex.

Pygidial Margin (Fig. 3C:) Pointed and slightly sclerotized. Median lobes small and relatively distinct; second lobes large and sclerotized; other lobes unrecognizable. Caudal setae about $\frac{1}{4}$ to $\frac{1}{5}$ of body length.

Ducts: Elongate. Dorsal marginal, 1 on each of abdominal segment I-VIII (Ducts may also distribute on other areas).

Legs (Fig. 3B): Normal, characters as illustrated.

Discussion

The new genus is characteristic in having the elongate ducts which are arranged in a marginal-submarginal row on posterior intersegmental line of each of abdominal segments I-VII, and a cluster on VIII and between median lobes. To our knowledge, there are no other genera in the Family Diaspididae having this distinct character.

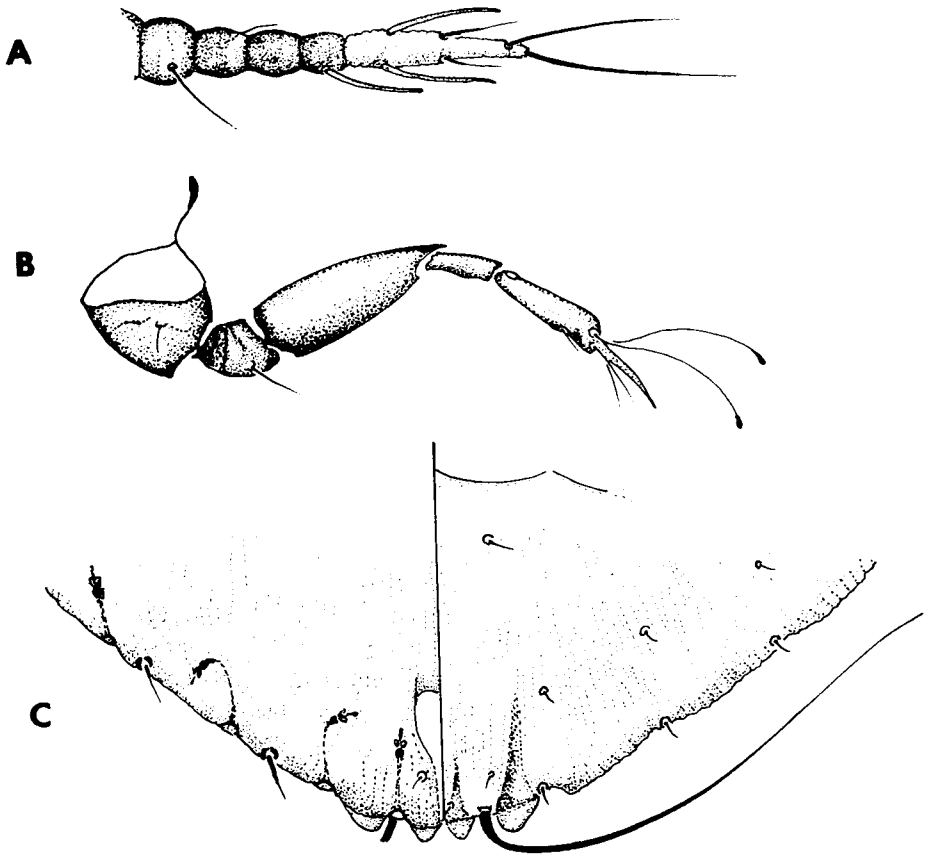


Fig. 3. Characters of the first instar (sex undetermined) of *Helenococcus hokeae*:
A. Antenna; B. Middle leg; C. Pygidial Margin.

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