One newly recorded genus and species of *Cameronaspis* (Hemiptera: Diaspididae) from China

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Abstract: The genus *Cameronaspis* Takagi, Pong and Ghee, 1988 is reported for the first time in China. The newly recorded species *Cameronaspis adinandrae* Takagi, Pong and Ghee, 1988 is illustrated and redescribed. A checklist of the genus *Cameronaspis* worldwide is provided.

Key words: Diaspidinae; Diaspidini; checklist; taxonomy

中国盾蚧科一新记录属（半翅目：盾蚧科）

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摘要：记述中国 1 新记录属：卡梅盾蚧属 *Cameronaspis* Takagi, Pong and Ghee, 1988 及 1 新记录种：杨桐卡梅盾蚧 *Cameronaspis adinandrae* Takagi, Pong & Ghee, 1988，对该新记录种进行了详细描述与拍照，提供了卡梅盾蚧属世界已知种名录及其分布。

关键词：盾蚧亚科；盾蚧族；名录；分类

Introduction

Armored scale insects are the most species-riched family of scale insects, which include over 2600 species in 421 genera (García Morales *et al.* 2016). There are four subfamilies currently studied: Ancepaspidinae, Aspidiotinae, Diaspidinae, and Furcaspidinae (Normark *et al.* 2019). Diaspidini is a large tribe belonging to the subfamily Diaspidinae, which includes three subtribes in the current classification of Diaspididae (Normark *et al.* 2019). The genus *Cameronaspis* was established by Takagi, Pong and Ghee in 1988 with *Cameronaspis linderae* as its type-species, and fell into the subtribe Chionaspidina of the tribe Dispidini. This genus is a small genus in the Diaspididae, with only 6 species currently reported worldwide (García Morales *et al.* 2016). All species in the genus *Cameronaspis* are distributed in the Oriental Region, five of them being found in Malaysia (García Morales *et al*. 2016). However, none of the species in this genus had been reported from China.

In our current study, the species *C. adinandrae* Takagi, Pong & Ghee, 1988 is the first record of the genus *Cameronaspis from China,* collected from Guizhou Province.

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Material and methods

Permanent slide mounts of adult females were prepared from samples using the method described by Henderson (2011). The illustrations of the adult females were taken using a Nikon SMZ1500 stereomicroscope with a camera lucida.

Illustrations of adult females of the newly recorded species were drawn from slide-mounted specimens, each showing an overview of the dorsum on the left side and the venter on the right; enlarged details of the significant features are given around the body, but not in direct proportion to each other. The morphological terminology follows Miller & Davidson (2005).

Slide-mounted specimens of the newly recorded species have been deposited in the Entomological Museum, Northwest A&F University, Yangling, Shaanxi, China (NWAFU).

A checklist of the known species in the genus *Cameronaspis* in the world

Cameronaspis adinandrae Takagi, Pong & Ghee, 1988 — Malaysia (Malaya); Nepal
Cameronaspis dilleniae Takagi, 2005 — Malaysia (Sabah)
Cameronaspis ilicis Takagi, 2005 — Malaysia (Sabah)
Cameronaspis linderae Takagi, Pong & Ghee, 1988 — Malaysia (Malaya)
Cameronaspis orchidarum (Ferris, 1955) — Philippines; Singapore
Cameronaspis pustilfera Takagi, Pong & Ghee, 1988 — Malaysia (Malaya)

Taxonomy

***Cameronaspis* Takagi, Pong and Ghee, 1988**, new record to China.

Cameronaspis Takagi, Pong and Ghee, 1988. *Insecta Matsumurana* (*New Series*), 39: 5.

Type-species: *Cameronaspis linderae* Takagi, Pong & Ghee, 1988.

Diagnosis. Adult female. Body elongate, fusiform; mesothorax and metathorax and abdominal segments 1–4 moderately lobed laterally; pygidium rather narrow. Derm membranous except for pygidium. Antennae with 1 seta. Along the posterior margin of the abdominal segment V with a linear transverse sclerosis mesally to submedian macroducts on each side on pygidium dorsally (except in *C. adinandrae*) and a similar one between submedian macroducts and submarginal macroducts. Pygidium ventrally with a winglike sclerotized area extending anteriorly beyond the level of posterior ends of posterolateral groups of perivulvar pores. A submarginal dorsal boss presents on prosoma and abdominal segment I and III. Median lobes well-developed, appressed together, several notches in the slanting lateral margin, united basally by an elongate sclerosis, which extends anteriorly beyond bases of median lobes. Second lobe quite close to median lobe. The internal lobule of second lobe represented by a pointed sclerotized process, with an elongate sclerosis arising from its inner base dorsally; the outer lobule of second lobe small or obsolete. Third lobe represented by a smaller process or serrations. The fourth lobe suggested by serrations. Dorsal macroducts present on abdomen and arranged in well-defined single rows, forming submedian and submarginal rows. Lateral macroducts occurring anteriorly as far as abdominal segment I or metathorax. Marginal macroducts numbering 6 on each side of pygidium: each side with 1 on abdominal segment VII, 2 on each of segments V and VI, and 1 on abdominal segment IV.

Marginal gland spines present on the abdomen, occurring anteriorly as far as abdominal segment I or II or metathorax, each with 1 or more microducts on abdominal segment V or VI. Anus situated towards base of pygidium. Perivulvar pores with 5 groups.

***Cameronaspis adinandrae* Takagi, Pong & Ghee, 1988** (Figs.1–7), new record to China

Cameronaspis adinandrae Takagi, Pong and Ghee, 1988. *Insecta Matsumurana* (*New Series*), 39: 9.

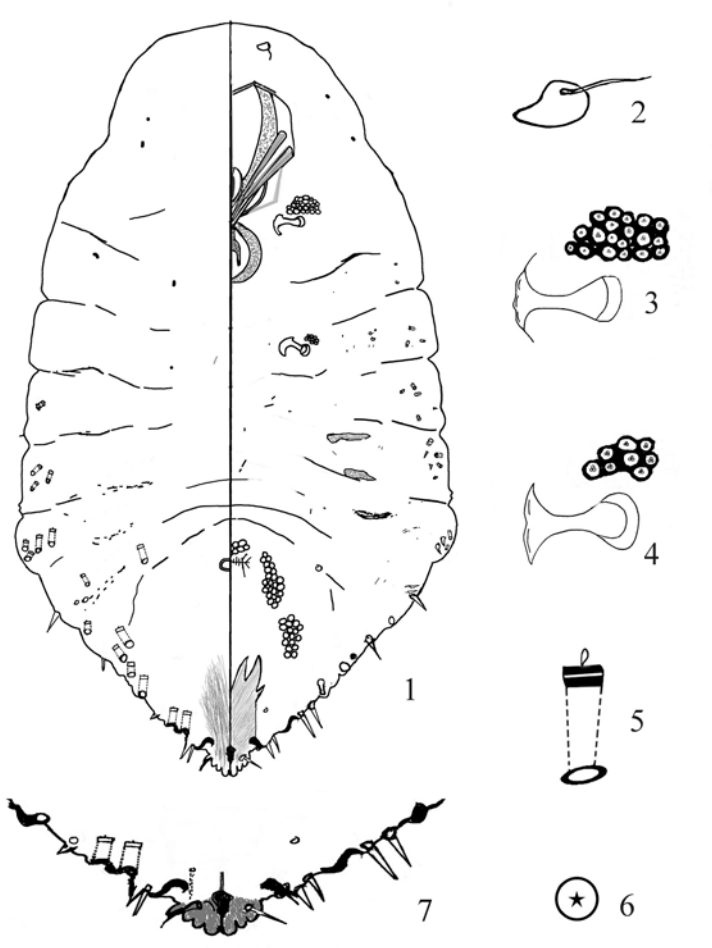

Figure 1–7. *Cameronaspis adinandrae* Takagi, Pong and Ghee, 1988. 1. Whole body; 2. Antenna; 3. Anterior spiracle; 4. Posterior spiracle; 5. Detail of dorsal macroduct; 6. Perivulvar pore; 7. Margin of pygidium.

Adult female. Body elongate, fusiform; pygidium slightly roundish on margin. Antennae with 1 seta. Anterior spiracle with 50–70 trilocular pores in a cluster; posterior spiracle with 2–10. Pygidium without linear scleroses between mesal and submedian macroducts of the abdominal segment V. Median lobes appressed together except for a short apical length, several notches in the slanting lateral margin. Second lobe present, though small and membranous. The internal lobule of second lobe reduced to a small pointed process, with a clavate sclerosis on the dorsum; the outer lobule of second lobe obsolete or suggested by a

slight prominence. With a total of 6 marginal dorsal macroducts on each side of pygidium: 1 on abdominal segment VII, 2 on segments V and VI, respectively, and 1 on abdominal segment IV. Dorsal macroducts arranged segmentally in submedian and submarginal rows; submarginal dorsal macroducts present on abdominal segment III to V: 1–5 on segment III, 1–3 on segment IV and V; submedian dorsal macroducts present on segment III to V: absent or 1 on segment III, 1 or 2 on segment IV and V. Submedian dorsal microducts usually absent on prepygidial abdomen. Lateral macroducts: rarely 1 or 2 on mesothorax; 2–8 on metathorax, 6–10 on segment I, 3–9 on segment II, 3–6 on segment III; rarely 1 on segment IV. Ventral ducts absent. Lateral gland spines: absent on segment I, 0–2 on segment II, 1–4 on segment III, 2–4 on segment IV, and 1 each on segment V–VIII. Anal opening near the base of pygidium. Perivulvar pores with 5 groups, 13–26 in the median group, 19–38 in each of the anterolateral groups, 16–30 in each of the posterolateral groups.

Specimens examined. 15♀, **China,** Guizhou Province, Tongren City, Fanjing Mountain, on the leaves of Caprifoliaceae and *Camellia*, 17-VIII-1996, coll. Tao ZENG.

Distribution. China (Guizhou); Malaysia (Malaya); Nepal.

Remarks. The species *Cameronaspis adinandrae* was first described by Takagi, Pong and Ghee (1988) and the types were collected in the Forest Research Institute of Malaysia. The morphological characters of the Chinese specimens are exactly the same as the original description, particularly pygidium ventrally with a winglike sclerotized area and median lobes well-developed, appressed together, and several notches in the slanting lateral margin. In *Cameronaspis adinandrae*, pygidium without linear scleroses between mesally and submedian macroducts of the abdominal segment V, is the main distinguishing character. The Chinese specimens are consistent with this.

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References

Ferris GF. 1955. Some miscellaneous Coccoidea (Insecta: Homoptera). (Contribution No. 91). *Microentomology*, 20: 22–29.

García Morales M, Denno BD, Miller DR, Miller GL, Ben-Dov Y & Hardy NB. 2016. ScaleNet: A literature-based model of scale insect biology and systematics. Database. doi: 10.1093/database/bav118. http://scalenet.info.

Henderson RC. 2011. Diaspididae (Insecta: Hemiptera: Coccoidea). *Fauna of New Zealand*, 66: 275.

Miller DR & Davidson JA. 2005. *Armored Scale Insect Pests of Trees and Shrubs*. Cornell University Press, Ithaca and London, 442 pp.

Normark BB, Okusu A, Morse GE, Peterson DA, Itioka T & Schneider SA. 2019. Phylogeny and classification of armored scale insects (Hemiptera: Coccomorpha: Diaspididae). *Zootaxa*, 4616: 1–98.

Takagi S. 2005. Further material of *Cameronaspis*, with other forms (Homoptera: Coccoidea: Diaspididae). *Insecta Matsumurana* (*New Series*), 62: 153–174.

Takagi S, Pong TY & Khoo SG. 1988. Does *Africaspis* (Homoptera: Coccoidea: Diaspididae) occur in Asia? *Insecta Matsumurana* (*New Series*), 39: 1–34.