

A new species in the genus *Antecerooccus* Green (Hemiptera: Coccoomorpha: Cerococcidae) from China

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Abstract: A new ornate pit scale (Hemiptera: Coccoomorpha: Cerococcidae): *Antecerooccus ficicola* **sp. nov.**, is described and illustrated. It was found on *Ficus* sp. in Yunnan, China. This new species is closest to *Antecerooccus roseus* (Green, 1909) but differs from the latter in: 1) cribriform plates in a group of 8–14 on each side of abdominal segment III; and 2) having small convex closed pores. An identification key to the adult females of *Antecerooccus* species known in China is also provided.

Key words: ornate pit scale; taxonomy; key

中国绵壶蚧属一新种记述（半翅目：蚧亚目：壶蚧科）

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摘要：记述来自中国云南榕树上的绵壶蚧属 1 新种：榕树绵壶蚧 *Antecerooccus ficicola* **sp. nov.**，并提供了相关特征图。新种与蔷薇绵壶蚧 *Antecerooccus roseus* (Green, 1909) 相似，后气门路孔带两分叉，背面中区具大 8 字腺，及多格腺在前部腹节腹面呈小群分布，但与后者区别在于新种筛板在腹部第 III 节每侧 8–14 个，且在气门路上存在凸闭孔。文中还提供了中国绵壶蚧属已知种类雌成虫分种检索表。

关键词：壶蚧；分类；检索表

Introduction

The scale insect genus *Antecerooccus* (Hemiptera: Coccoomorpha: Cerococcidae) was established by Green (1901) for a single species, *Antecerooccus punctiferus* Green, 1901. It was then considered as synonym of *Cerooccus* by Green (1908). Hodgson & Williams (2016) wrote a revision of the family Cerococcidae worldwide and revived the generic status of *Antecerooccus* Green and listed *Phenacobryum* Cockerell, 1902; *Amelococcus* Marchal, 1904; *Cercococcus* Scott, 1907 and *Coricoccus* Mahdihassan, 1933 as its synonyms. There are now 56 described species of *Antecerooccus* in the world, of which 24 species are from the Afrotropical, 17 species from the Palaearctic, 9 species from the Australasian, 7 species from the Oriental, 4 species from the Neotropical and 1 species from the Nearctic Regions (García Morales *et al.* 2016). The genus *Antecerooccus* is distinguished from other genera in the family Cerococcidae by the following characteristics: adult females have an anteroventral

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sclerotization on each anal lobe; the largest “8”-shaped pores almost having a line or band on each side of posterior abdominal segments (Hodgson & Williams 2016).

To date, six *Antecercococcus* species have been reported from China: *A. bryoides* (Maskell, 1894); *A. indicus* (Maskell, 1897); *A. citri* (Lambdin, 1986); *A. echinatus* (Wang & Qiu, 1986); *A. roseus* (Green, 1909) and *A. ornatus* (Green, 1909) (Yang 1982; Tang & Hao 1995; Wang 2001). In this paper, the new species *Antecercococcus ficicola* **sp. nov.** is described and illustrated from Yunnan, China. An identification key to the adult females of *Antecercococcus* species known in China is provided.

Material and methods

The scale insect samples were collected from Baoshan City, Yunnan Province, China, by Drs. Yaoguang QIN & Xubo WANG. Individuals were preserved in 75% alcohol for storage. Slide-mounted specimens were prepared using the method of Borchsenius (1950), stained in acid fuchsin and mounted in Canada balsam. The morphological terms used in our descriptions mainly follow Hodgson & Williams (2016). Measurements and counts were taken from all the type specimens. Measurements are given in micrometers (μm) except for the length and width of the body, which are given in millimeters (mm).

All the slide-mounted type specimens, and part of the remaining material preserved in 75% alcohol, are deposited in the Insect Collection at the Department of Forestry Protection, Beijing Forestry University, Beijing, China (NFUC).

Taxonomy

Antecercococcus ficicola **sp. nov.** (Figs 1, 2)

Waxy test of adult female (Fig. 1): stellate, with 9 stout, pointed processes of different sizes on the outer edge, 4 prominent transverse waxy ridges on dorsum; white to pinkish white, sometimes some dorsal waxy ridges coral-red or dark brown.



Figure 1. *Antecercococcus ficicola* **sp. nov.**, waxy test of adult female. A, B. Dorsal views; C. Ventral view.

Slide-mounted female (Fig. 2). Body roundly pear-shaped and membranous, 2.28–2.78 mm long and 2.10–2.33 mm wide.

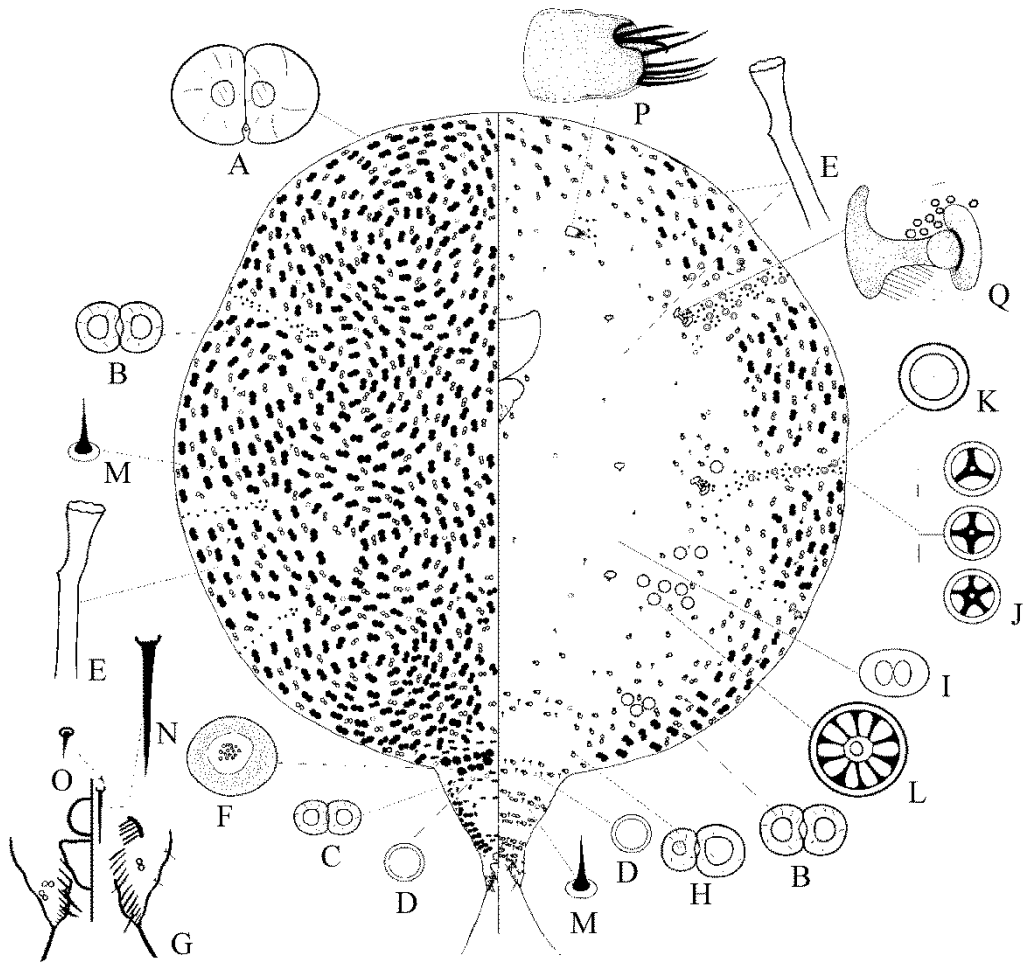


Figure 2. *Antecerooccus ficicola* **sp. nov.**, adult female. A. Large “8”-shaped pore; B. Medium-sized “8”-shaped pore; C. Small “8”-shaped pore; D. Simple pore; E. Tubular duct; F. Cribriform plate; G. Anal lobe; H. Asymmetrical pore; I. Small bilocular pore; J. Quinquelocular disc-pore; K. Small convex closed pore; L. Multilocular disc-pore; M. seta; N. Pre-anal setae; O. Companion setae; P. Antenna; Q. Anterior spiracle.

Dorsum. “8”-shaped pores of 3 sizes: (1) the large pores (Fig. 2A), each $23\text{--}25 \times 15\text{--}18 \mu\text{m}$, abundant arranged in swirls throughout dorsum anterior to cribriform plates; also with a line of 8–10 pores on each side of abdominal segments IV–VII; (2) the mediate-sized pores (Fig. 2B), each $13\text{--}15 \times 8\text{--}9 \mu\text{m}$, abundantly arranged in swirls throughout dorsum anterior to cribriform plates; and (3) the small pores (Fig. 2C), each $8\text{--}10 \times 5\text{--}6 \mu\text{m}$, present in transverse rows across posterior abdominal segments. Simple pores (each about $3 \mu\text{m}$ in diameter) (Fig. 2D), tubular ducts (each $20 \mu\text{m}$ long and $3 \mu\text{m}$ wide) (Fig. 2E), and dorsal setae (each $6\text{--}10 \mu\text{m}$ long) (Fig. 2M), all scattered throughout whole dorsal surface. Cribriform plate (Fig. 2F) circular, with sclerotized margin, each $10\text{--}23 \mu\text{m}$ in diameter, present in a group of 8–14 on

each side of abdominal segment III. Anal lobe (Fig. 2G) with sclerotized inner margins; each inner margin with two fleshy setae, the anterior fleshy seta longer and straighter, 28–31 μm long; the posterior fleshy seta bent, 15–21 μm long; each lobe with 2 “8”-shaped pores. Anal plate lies immediately posterior to the anal ring, approximately triangular, 58–60 μm long and 55–73 μm wide. Anal ring with 4 pairs of setae, each 75–80 μm long.

Venter. “8”-shaped pores of 3 sizes: (1) the large pores (Fig. 2A), same size as on dorsum, forming a fairly broad longitudinal band marginally; (2) the mediate-sized pores (Fig. 2B), same size as on dorsum, forming a fairly broad longitudinal band marginally and present in transverse rows across abdominal segments; and (3) the asymmetrical pores (Fig. 2H), each 13–14 \times 8–9 μm , present in marginal area of body and transverse rows across abdominal segments. Simple pores small, same size as on dorsum, present on venter occasionally. Small bilocular pores (Fig. 2I) oval, each 5 \times 3 μm wide, numerous on head and thorax near marginal “8”-shaped pores band but less frequent medially. Quinquelocular disc-pores (Fig. 2J), each 3 μm in diameter, present laterad to each antenna and in the stigmatic pore bands. Small convex closed pores (Fig. 2K), each 5 μm in diameter, present near thoracic spiracles and in stigmatic pore bands (appear to have a faint reticulation pattern). Multilocular disc-pores (Fig. 2L), each 18–21 μm in diameter, mostly with 10 loculi, distributed as follows: 0–1 near each posterior thoracic spiracle; 5–9 laterad to each metathoracic leg stub and 1–3 on each side of abdominal segment II, 1 also found in area near one side of antennae on 1 individual. Tubular ducts (Fig. 2E), same size as on dorsum, scattered throughout whole ventral surface. Ventral setae (Fig. 2M) hair-like, scattered on venter, each 6–10 μm long; pre-anal setae (Fig. 2N), each 58–68 μm long; companion setae (Fig. 2O) short, each 6–13 μm long; apical setae, each 145–175 μm long. Leg stub sclerotized and triangular, 25–30 μm wide at base. The metathoracic stubs are the largest and the anterior stubs the smallest. Antenna (Fig. 2P) stub-like, each 40–43 μm long and 31–33 μm wide, apex with 8 setae, each 23–25 μm long, part in a setal cavity. Anal lobe each with an anteroventral sclerotization, the inner margins sclerotized; a small seta on the anterior inner margin, about 9 μm long, and a posterior ventral seta on the posterior inner margin, about 24–28 μm long; two small setae on the outer margin, each about 8 μm long; each lobe with 1 “8”-shaped pore. Clypeolabral shield and labium, the labium 107–120 μm long and 75–83 μm wide, the apical segment with 4 pairs of setae; the clypeolabral shield 200–205 μm long and 138–140 μm wide. Spiracle (Fig. 2Q), two pairs of thoracic spiracles present, each 65–73 μm long, spiracular peritremes each 43–45 μm wide. Stigmatic disc-pores mainly 5 loculi, each about 5 μm in diameter, forming bands extending from the venter onto the dorsum, the anterior stigmatic pore band 1–4 pores wide; the posterior stigmatic pore bands bifurcated, each 1–3 pores wide. Vulva located between abdominal segments VI and VII, entirely membranous, horizontal and about 53 μm wide.

Holotype. ♀, **China**, Yunnan, Baoshan City, on branches of *Ficus* sp., 20-X-2016, Yaoguang QIN & Xubo WANG leg. **Paratypes.** 5♀, same data as for holotype.

Etymology. This species epithet is derived from the host plant (*Ficus* sp.) on which it was collected, combined with the Latin *-cola*, meaning ‘living on’ or ‘inhabiting’.

Remarks. Species of *Antecerooccus* are divided into 4 groups by Hodgson & Williams (2016), and the new species *A. ficicola* **sp. nov.** is placed in Group C because it has bifurcated posterior stigmatic pore bands, large “8”-shaped pores present on median area on dorsum, and

multilocular pores not forming transverse rows on anterior abdominal segments. It is closest to *A. roseus* (Green, 1909), but differs from the latter in having (character-states for *A. roseus* in brackets) (1) cribriform plates in a group of 8–14 on each side of abdominal segment III (cribriform plates in submedial groups on both abdominal segments III and IV, with three or four plates on each side of IV and one or two on each side of III); (2) multilocular disc-pores, each 18–21 μm in diameter (each 7–8 μm in diameter); (3) small convex closed pores present near thoracic spiracles and in stigmatic pore bands (absent); and (4) stigmatic pore bands without the smallest “8”-shaped pore (each band with 2–4 pores towards apex).

Key to adult females of *Antecerooccus* from China

(based on Hodgson & Williams 2016)

1. Posterior stigmatic pore bands bifurcated 2
- Posterior stigmatic pore bands not bifurcated *A. ornatus* (Green)
2. Leg stubs absent *A. bryoides* (Maskell)
- Leg stubs present 3
3. Quinquelocular disc-pores present at base of each antenna 4
- Quinquelocular disc-pores absent at base of each antenna *A. echinatus* (Wang & Qiu)
4. More than eight cribriform plates on each side of abdominal segment III *A. ficicola* sp. nov.
- Less than eight cribriform plates on each side of abdominal segment III 5
5. Multilocular disc-pores very few, restricted to sub-margins of most abdominal segments and also sometimes metathorax 6
- Multilocular disc-pores present in bands across all abdominal segments and laterad to each metathoracic leg-stub *A. citri* (Lambdin)
6. Each closed pore of intermediate-sized 8-shaped pores being almost round *A. roseus* (Green)
- Each closed pore of intermediate-sized 8-shaped pores being slightly narrow and pointed *A. indicus* (Maskell)

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References

- Borchsenius NS. 1950. Mealybugs and scale insects of USSR (Coccoidea). *Akademii Nauk SSSR, Zoological Institute, Moscow*, 32: 1–250.
- 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 available from: <http://scalenet.info> (accessed 6 October 2022)
- Green EE. 1901. On some new species of Coccidae from Australia, collected by W.W. Froggatt, F.L.S. *Proceedings of the Linnean Society of New South Wales*, 25: 559–562.
- Green EE. 1908. Note on the genus *Antecerooccus* Green. *Entomologist's Monthly Magazine*, 44: 41–42.
- Green EE. 1909. *The Coccidae of Ceylon. Part IV*. Dulau & Co., London, pp. 250–344.
- Hodgson CJ & Williams DJ. 2016. A revision of the family Cerococcidae Balachowsky (Hemiptera: Sternorrhyncha, Coccoomorpha) with particular reference to species from the Afrotropical, western

- Palaeartic and western Oriental Regions, with the revival of *Antecerooccus* Green and description of a new genus and fifteen new species, and with ten new synonymies. *Zootaxa*, 4091(1): 1–175.
- Lambdin PL. 1986. *Cerococcus citri* (Homoptera: Coccoidea: Cerococcidae), a new species of scale insect from China. *Annals of the Entomological Society of America*, 79: 369–371.
- Maskell WM. 1894. Further coccid notes with descriptions of several new species and discussion of various points of interest. *Transactions and Proceedings of the New Zealand Institute*, 26: 65–105.
- Maskell WM. 1897. Further coccid notes: with descriptions of new species and discussions of points of interest. *Transactions and Proceedings of the New Zealand Institute*, 29: 293–331.
- Tang FD & Hao JJ. 1995. *The Margarodidae and others of China (Homoptera: Coccoidea of Insecta)*. Chinese Agricultural Science Technology Press, Beijing, 738 pp.
- Wang T & Qiu Y. 1986. Two new coccids of horticulture from China (Homoptera: Coccoidea). *Acta Entomologica Sinica*, 29(3): 302–305.
- Wang TC. 2001. *Fauna Sinica (Insecta Vol. 22: Coccoidea: Pseudococcidae, Eriococcidae, Coccidae, Asterolecaniidae, Lecanodiaspididae, Cerococcidae, Aclerdidae)*. Science Press, Beijing, 610 pp.
- Yang PL. 1982. *General Classification of Scale Insects in China*. Shanghai Science & Technology, Shanghai, 425 pp.