

Description of a new species in the genus *Takahashia* Cockerell (Hemiptera: Cocomorpha: Coccidae) from southern China

Yu'ang LI, San'an WU^①

The Key Laboratory for Silviculture and Conservation of Ministry of Education, Beijing Forestry University, Beijing 100083, China

Abstract: A new species *Takahashia nanlingensis* **sp. nov.** is described and illustrated from adult females collected from Nanling National Forest Park, Guangdong, China on twigs of *Castanopsis uraiana* (Fagaceae). This new species differs from *T. japonica* by antennae 6-segmented and anal ring having 10 setae.

Key words: scale insects; *Castanopsis uraiana*; taxonomy

华南纽棉蚧属一新种记述（半翅目：蚧次目：蚧科）

李宇昂，武三安^①

北京林业大学森林培育与保护省部共建重点实验室，北京 100083

摘要：记述蚧科纽棉蚧属 1 新种：南岭纽棉蚧 *Takahashia nanlingensis* **sp. nov.**，模式标本采自广东南岭国家森林公园淋漓锥（壳斗科）枝条上。新种与该属惟一种日本纽棉蚧 *T. japonica* Cockerell 的区别是触角 6 节，肛环毛 10 根。

关键词：蚧虫；淋漓锥；分类

Introduction

The genus *Takahashia* was established by Cockerell (1896) as a subgenus of *Pulvinaria* Targioni Tozzetti, 1866, with *P. (Takahashia) japonica* as type species. Later, Cockerell (1899) raised it to genus level. Based mainly on the oviposition mode, Tang (1991) placed this genus in the tribe Pulvinariini, subfamily Coccinae in the family Coccidae. Hodgson (1994) transferred it to subfamily Filippiinae in his classification system. On a molecular phylogenetic tree of the family Coccidae, *T. japonica* is sister to subfamily Eulecaniinae *sensu* Hodgson (Choi & Lee 2019).

Tseng (1947) described a new species *T. wuchangensis* from Wuhan City in Hubei, China on *Parthenocissus tricuspidata* (Vitaceae). Tang (1991) considered it to be a synonym of *T. japonica*. So only one species was recognized now in this genus. *T. japonica* originated in the eastern Asia and has recently invaded Europe (Italy; Britain; Croatia) (Limonta & Pellizzari 2018; Tuffen *et al.* 2019; Landeka *et al.* 2021).

Accepted 23 March 2023. Published online 25 May 2023. Published 25 June 2023.

① Corresponding author, E-mail: sananwu@bjfu.edu.cn

In this paper, a new species *Takahashia nanlingensis* **sp. nov.** is described and illustrated from southern China.

Material and methods

The samples were collected on twigs of *Castanopsis uraiana* (Fagaceae) from Nanling National Forest Park, Ruyuan Yao Autonomous County, Shaoguan City, Guangdong, China. They were all immersed in 75% ethanol. Then slide-mounted specimens were prepared using the method of Borchsenius (1950), stained in acid fuchsin and mounted in Canada balsam. The terminology used in the descriptions is mainly that of Hodgson (1994). Characters were examined under a Leica DM 1000 microscope. A COIC ZSA0850 stereoscopic microscope was used for drawing. The illustration shows views of the adult female, with the dorsum depicted on left side and the venter on the right side, and with enlargements of important characters shown around the main illustration. Measurements and counts were taken from all type specimens. Measurements are given in micrometers (μm) except for the length and width of the body and length of the body, which are given in millimeters (mm). All 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 (BFUC)

Taxonomy

Genus *Takahashia* Cockerell, 1896

Type species: *Pulvinaria (Takahashia) japonica* Cockerell, 1896.

Generic diagnosis. Body of adult female broadly oval to nearly circular. Antenna 6 or 7 segmented. Leg short, otherwise normal, without a tibio-tarsal articulatory sclerosis. Claws without denticle. Anal plates together quadrate. Anal ring with 6 or 10 setae. Marginal setae strongly spiniform to conical, finely pointed, lanceolate, straight or slightly curved. Stigmatic clefts absent, with 0–3 spines. Dorsal tubular ducts small, numerous. Dorsal setae small, stoutly spiniform, curved, and distributed without any pattern. Dorsal pores disc-like, strongly sclerotized, apparently enclosing two to five loculi, or dorsal pores absent. Ventral multilocular pores very numerous on the median and median lateral areas of the abdomen and metathorax; quinquelocular pores few and set in an irregular loose group near each stigmatic cleft; pregenital disc-pores mainly with 9–10 loculi. Ventral tubular ducts very numerous (Hodgson 1994).

Takahashia nanlingensis **sp. nov.** (Figs 1, 2)

Adult female.

Unmounted material. Dorsum convex, venter concave, nearly spherical; green yellowish to dark brown in color. The ovisac 3-prismatic in shape, about 14–16 cm long, nearly 20 times longer than the body.

Mounted material. Body broadly oval to elongate, 6.05–11.5 mm long, 4.88–6.2 mm wide.

Dorsum. Derm membranous, with cell-like clear areas. Microducts, each 7–12 μm long and 3–4 μm wide, present in cell-like areas. Dorsal setae cone-shaped, with well-developed

basal sockets, 14.5–17.75 μm long, scattered on dorsum. Dorsal pores and tubular ducts absent. Anal plates each broadly triangular, 179–202 μm long and 56–87 μm wide; posterior margin slightly longer than anterior margin, anterior margin 117.5–122.0 μm long, posterior margin 131.5–133.0 μm long, outer angle nearly a obtuse-angle; each plate with about 3 apical or subapical setae and 1 mid-dorsal setae, 66.0–74.5 μm long; ano-genital fold with 2 pairs of long setae, and 2 pairs of long setae laterally, each 63.0–94.5 μm long. Anal ring subcircular, with about 2 rows of pores and 10 setae, each 145–158 μm long.

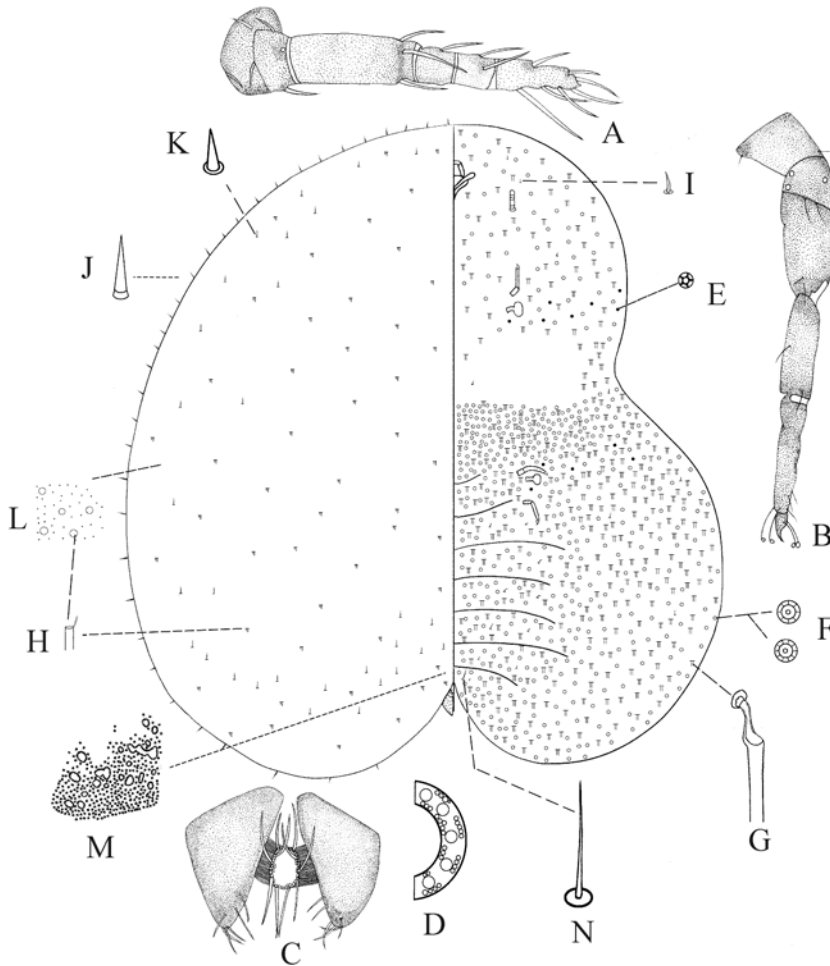


Figure 1. *Takahashia nanlingensis* **sp. nov.**, adult female. A. Antenna; B. Leg; C. Anal plate; D. Anal ring; E. Spiracular disc-pore; F. Multilocular disc pores; G. Ventral tubular duct; H. Dorsal microduct; I. Ventral setae; J. Marginal setae; K. Dorsal setae; L. Cell-like area on the dorsum; M. Transparent area in front of anal plate; N. Pregenital setae.

Margin. Marginal setae sharply spinose, straight, each 19.0–29.5 μm long, all with well-developed basal sockets; about 14 setae between anterior clefts, about 9 setae between each anterior cleft and posterior cleft, and about 10 setae between each posterior cleft and anal cleft. Stigmatic spines absent. Eyespots not found.



Figure 2. The ovisacs of *T. nanlingensis* sp. nov. (A) and *T. japonica* (B).

Venter. Derm entirely membranous. Antennae and legs relatively very small compared to body. Antennae 6-segmented, each 218–225 μm long; third segment longest, scape widest (50.5–60.0 μm), the flagellar segments tend to be parallel-sided and narrower at terminal; scape with 3 hair-like setae; pedicel with 2 hair-like setae and 1 sensory pore; segment III with 3 flagellate setae near end; segments IV and V with 2 flagellate setae; segment VI with 6 flagellate setae and 1 long hair-like seta. Lengths (μm): I 25.5–28.5; II 22.0–22.5; III 77.5–81.5; IV 24.5–27.5; V 22.5–23.0 and VI 49.5–52.5. Setae measurements (μm): hair-like setae 15.5–22.0; fleshy setae 17.0–39.5; long hair-like setae 78.0–87.0. Three legs of similar length. Length (μm): fore leg (I) 305–310; middle leg (II) 314–319; hind leg (III) 306–312; coxa: I 39.5–40.5, II 39.5–52.5, III 43.0–46.5; trochanter + femur: I 92.5–97.5, II 96.0–102.5, III 85.5–105.0; tibia: I 64.5–70.0, II 75.0–79.5, III 74.5–77.5; tarsi: I 77.0–80.0, II 80.0–89.5, III 79.5–81.5; claws all about 19.5. Trochanter each with 3 round campaniform sensilla on each surface, each about 4.5 μm in diameter; the tarsus slightly longer than tibia, with a weak articulation between tibia and tarsus, but with no articulatory scleriosis, with 2 tarsal digitules, knobbed and longer, 30.25–35 μm ; claws without a denticle, a pair of digitules with knobbed apices, slightly longer than claw. Mouthpart developed, clypeolabral shield 220–245 μm long

and 212–247 μm wide; labium 94.5–114.5 μm long and 150.5–189.0 μm wide, with 4 each 24.5–28.0 μm long setae on each side. Thoracic spiracles well-developed, anterior spiracular peritremes each 107.0–118.5 μm wide, posterior peritremes each 127.5–131.5 μm wide. Spiracles each with about 6 disc-pores, with 5 loculi and about 5.0 μm in diameter, present dispersed from around spiracle to body margin. Multilocular disc-pores each about 7–9 μm in diameter and mainly with 10 loculi, a few with 8 or 9 loculi, distributed on whole ventral surface but denser on abdomen and metathorax. Tubular ducts of one type, each with a slender terminal filament, 32.5–35 μm long and 5–6 μm wide, with same distribution as multilocular pores. With 2 pairs of long pregenital setae in segments VII, each 67.5–88.5 μm long; other ventral setae 7.5–10.0 μm long, quite sparsely distributed.

Holotype. ♀, **China**, Guangdong, Shaoguan City, Ruyuan Yao Autonomous County, Nanling National Forest Park, 24°50' N, 113°15' E, on twig of *Castanopsis uraiana* (Fagaceae), 21-IV-2021, coll. San'an WU. **Paratypes.** 6♀, same data as holotype.

Etymology. This new species is named after the Nanling Mountains, where it was collected.

Remarks. The new species and *T. japonica* share a very long ovisac secreted from abdominal venter, but differ by antenna 6-segmented, anal ring with 10 setae and ovisac prismatic in the former, whereas antenna is 7-segmented, anal ring has 6 setae and the ovisac is cylindrical in shape in the latter.

Acknowledgement

This project was supported by the GDAS Special Project of Science and Technology Development (2020GDASYL-20200102021).

References

- Borchsenius NS. 1950. *Mealybugs and Scale Insects of USSR (Coccidea)*. Akademii Nauk SSSR, Zoological Institute, Moscow, 250 pp.
- Choi J & Lee S. 2019. Molecular phylogeny of the family Coccidae (Hemiptera, Coccoomorpha), with a discussion of their waxy ovisacs. *Systematic Entomology*, 45(2): 396–414.
- Cockerell TDA. 1896. Preliminary diagnoses of new Coccidae. *Psyche*, 7(supplement): 18–21.
- Cockerell TDA. 1899. Tables for the determination of the genera of Coccidae. *The Canadian Entomologist*, 31: 330–333.
- Hodgson CJ. 1994. *The scale insect family Coccidae: an identification manual to genera*. CAB International, Wallingford, U.K., 639 pp.
- Landeka N, Uzelac M, Poljuha D & Sladonja B. 2021. The first record of the Asiatic string cottony scale *Takahashia japonica* in Croatia. *Journal of Forestry*, 145(5-6): 263–267.
- Limonta L & Pellizzari G. 2018. First record of the string cottony scale *Takahashia japonica* in Europe and its establishment in Northern Italy. *Bulletin of Insectology*, 71(1): 159–160.
- Tang FD. 1991. *The Coccidae of China*. Shanxi United Universities Press, Taiyuan, 377 pp.
- Tseng S. 1947. A new scale insect parasitic on the ivy. *Science*, 30(1): 21.
- Tuffen M, Salisbury A & Malumphy CP. 2019. Cotton stringy scale insect, *Takahashia japonica* (Hemiptera: Coccidae), new to Britain. *British Journal of Entomology and Natural History*, 32: 1–4.