

A NEW SPECIES OF THE GENUS *RHIZOCOCCUS* (HEMIPTERA, COCCOIDEA, ERIOCOCCIDAE) FROM CHINA

NAN Nan, WU San-An*

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

Abstract A new felt scale species *Rhizococcus isodoni* sp. nov., is described and illustrated from Lishan Mountain, Shanxi Province, China, on root of *Isodon glaucocalyx* (Labiatae). The type specimens are deposited in the Insect Collection of Beijing Forestry University.

Key words Hemiptera, Eriococcidae, *Rhizococcus*, new species, China.

1 Introduction

The genus *Rhizococcus* was established by Signoret in 1875, with *Rhizococcus gruidii* Signoret, 1875 (= *Coccus thymi* Schrank, 1801) as type species. But the status of this genus is still controversial. Borchsenius (1949), Kosztarab and Kozár (1988), Tang and Hao (1995), Kozár and Konczné Benedicty (2008), Ouvrard and Kozár (2009) and Pellizzari and Kozár (2011) treated *Rhizococcus* as a separated genus, whereas Ferris (1955), Williams (1985), Miller and Gimpel (2000), Hodgson and Miller (2010), Pellizzari and Germain (2010) and Seljak (2010) treated *Rhizococcus* as a junior synonym of *Eriococcus* Targioni Tozzetti, 1868 *sensu lato* or *Acanthococcus* Signoret, 1875 *sensu stricto*. Here we consider *Rhizococcus* as a separated one from *Eriococcus*. The adult females of *Rhizococcus* can be distinguished from that of *Eriococcus* in having dorsal enlarged conical setae only on margins and minute ones (usually less than 10 μm), if present, in transverse rows or bands on dorsum (Kosztarab & Kozár, 1988; Tang & Hao, 1995; Wang, 2001). At present, there is about 59 species worldwide (Wang, 2001) and distributed in all six zoogeographical regions (Kosztarab & Kozár, 1988; Wang, 2001; Kozár, 2009). Twelve species were recorded from China (Wang, 2001; Nan *et al.*, 2011), they are: *Rh. agropyri* Borchsenius, 1949, *Rh. cingulatus* (Kiritchenko, 1940), *Rh. deformis* (Wang, 1974), *Rh. herbaceus* Danzig, 1962, *Rh. minimus* (Tang, 1988), *Rh. multispinatus* Tang, 1995, *Rh. oblongus* Borchsenius, 1949, *Rh. orientalis* (Danzig, 1975), *Rh. wangi* Miller, 1996, *Rh. terrestris* Matesova, 1957, *Rh. trispinatus* (Wang, 1974) and *Rh. zygophylli* (Archangelskaja, 1931). One new species is described and illustrated in this paper.

2 Material and Methods

The scale insect specimens were collected individually and stored in 75 % alcohol. Slide-mounted specimens were prepared using the method of Borchsenius (1950), stained in acid fuchsin and mounted in Canada balsam. Morphological terms generally follow Williams (1985) and Kozár *et al.* (2009). Measurements are in micrometers (μm) except that length and width of body are in millimeters (mm). The drawings are as usual for illustrating Coccoidea, with the central drawing showing the outline of body and distribution of characters and the enlarged drawings (not to scale) showing the structure of important characters.

All specimens (mounted and materials in 75 % alcohol) are deposited in the Insect Collection, the Department of Forestry Protection, Beijing Forestry University, Beijing, China (BFUC).

3 Description

Rhizococcus isodoni sp. nov. (Figs 1–3)

Unmounted material. Body of adult female yellow-brown in color in life, covered by white ovisac with smooth surface.

Mounted material. Body of adult female oval, 1.23–2.98 mm long and 0.70–2.03 mm wide. Antennae 6- or 7-segmented, with segment III and IV always combined together. If 7-segmented, length of each segment: I 35–48 μm , II 35–43 μm , III 53–60 μm , IV 40–43 μm , V 23–28 μm , VI 25–30 μm , VII 38–48 μm ; segment II with a circular sensory pore, and segment V, VI, VII with 1, 1, 3 fleshy setae separately. Anal ring circular, 65–78 μm in diameter, with 1 outer row of pores and 10 long setae, each about 115–135 μm long. Anal lobe conical, each about 83–93 μm long and 60–83 μm wide, without

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

This research was supported by National Natural Science Foundation of China (31071949).

Received 9 Nov. 2012, accepted 3 Dec. 2012.

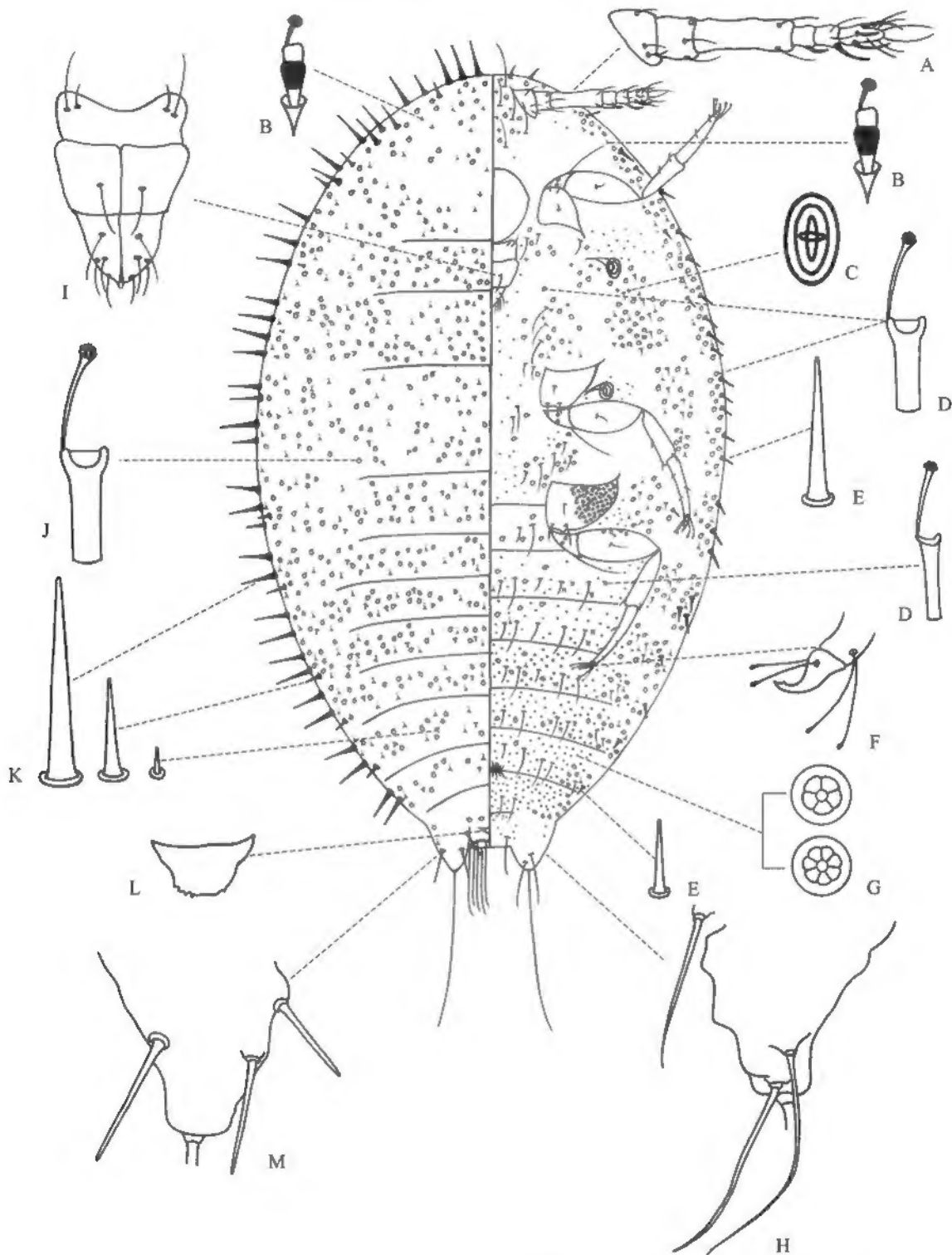


Fig. 1. Adult female of *Rhinococcus isodomi* sp. nov. A. Antenna. B. Microtubular duct. C. Cruciform pore. D. Ventral macrotubular duct. E. Ventral enlarged seta. F. Hind claw. G. Multilocular disc pores. H. Ventral view of anal lobe. I. Labium. J. Dorsal macrotubular duct. K. Dorsal enlarged setae. L. Cauda. M. Dorsal view of anal lobe.

teeth on inner margin; each dorsally with 3 enlarged setae; outer margin seta about 58 – 78 μm long and 6 – 8 μm wide, anterior inner margin seta about 38 – 45 μm long and 4 – 5 μm wide, posterior inner margin seta about 53 – 65 μm long and 3 – 5 μm wide; each

ventrally with 4 flagellate setae; a long apical seta about 225 – 300 μm long, a subapical seta about 100 – 123 μm long, a medium seta about 100 – 108 μm long, a suranal seta about 70 – 85 μm long.

Venter. Labium 3-segmented, about 113 –



Figs 2–3. Adult females of *Rhizococcus isodoni* sp. nov. on roots with (as shown by arrows) or without white ovisac.

163 μm long, with 2 pairs of flagellate setae on basal segment, 1 pair on median areas and 5 pairs on apical labial segment. Legs developed, each leg with 1 pair of tarsal digitules (each about 48–55 μm long) and 1 pair of claw digitules (each about 35–40 μm long), all with enlarged apices and exceeding the apex of claw; each face of trochanter with 2 sensory pores and a long hair-like seta; each claw with 1 denticle near apex; hind coxae with a lot of translucent pores. Length: front leg: coxa 68–95 μm , trochanter + femur 165–223 μm , tibia 88–125 μm , tarsus 115–133 μm , claw 25–28 μm ; middle leg: coxa 73–100 μm , trochanter + femur 170–218 μm , tibia 110–125 μm , tarsus 120–140 μm , claw 28–33 μm ; hind leg: coxa 85–125 μm , trochanter + femur 178–235 μm , tibia 108–138 μm , tarsus 133–145 μm , claw 30–35 μm . Thoracic spiracles small, each atrium about 35–43 μm wide. Multilocular disc pores with 5 or 7 loculi, each about 5 μm in diameter, mainly distributed on median area of thorax, abdominal segments and the surface around spiracles. Cruciform pores, oblong, each about 4 μm long and 3 μm wide, present on head, submedian and submarginal area of pro- and meso- thorax. Macrotubular ducts of 2 sizes: 1) large ducts, each about 23 μm long and 9 μm wide, with an inner ductule about 20 μm long, present on the whole venter, denser on margins and submargins; 2) small ducts, each about 20 μm long and 6 μm wide, with an inner ductule about 18 μm long, scarce across abdominal segments. Microtubular ducts, each with an outer ductule about 4 μm long and a dermal orifice about 2 μm wide, mainly present on margins and thoracic submargins. Enlarged setae conical, the largest about 45 μm long and 8 μm wide, the smallest about 23 μm long and 5 μm wide, forming a longitudinal row on margins, occasionally present on submarginal areas. Flagellate setae 10–95 μm long,

present on submedian area and forming transverse row on abdominal segments.

Dorsum. Macrotubular ducts of 1 size, same as the large ones on venter, distributed on all surface of dorsum. Microtubular ducts, same as the ventral ones, having a similar distribution as macrotubular ducts. Enlarged setae conical, of 3 sizes: 1) large setae, each about 65–75 μm long and 10–15 μm wide; 2) small setae, each about 25–48 μm long and 5–9 μm wide; 3) minute setae, each about 6–9 μm long. Large and small setae in a longitudinal marginal row, each segment with 2 large ones and 0–2 small ones on each side of abdominal segments I–VII; minute setae scattered on the whole dorsum; setae on abdominal segment VIII absent. Cauda crescent-shaped, about 18–38 μm long and 50–65 μm wide, slightly sclerotised, with a few nodulations.

Holotype ♀, Fuyuhe, Mt. Li (35.43° N, 112.01° E; alt. 1 523 m), Qinshui County of Shanxi Province, China, on root of *Isodon glaucocalyx* (Labiatae) by NAN Nan, 26 July 2012. Paratypes: 6 ♀♀, same data as holotype; 5 ♀♀, Xixiagou, Mt. Li (35.43° N, 112.01° E; alt. 1 548 m), Qinshui County of Shanxi Province, China, on root of *I. glaucocalyx* by NAN Nan, 23 July 2012.

Diagnosis. This species can be distinguished from others of the genus by: 1) a large number of translucent pores on hind coxa; 2) the anal ring with 10 setae; 3) the long and slim outer margin enlarged setae on dorsum of anal lobes.

Etymology. The specific name is derived from the generic name of its host plant.

Acknowledgements We are grateful to Prof. LU Duan-Zheng, College of Biological Sciences and Technology, Beijing Forestry University, for helping in host plant identification.

REFERENCES

- Borchsenius, N. S. 1949. Insects Homoptera. Suborders Mealybugs and Scales (Coccoidea). Family Mealybugs (Pseudococcidae). Vol. VII. Fauna SSSR. Zoologicheskii Institut Akademii Nauk SSSR, N. S. 38. Izdatel'stvo Akademii Nauk, Moskva-Leningrad. 382 pp.
- Borchsenius, N. S. 1950. Mealybugs and Scale Insects of USSR (Coccoidea). Akademii Nauk SSSR, Zoological Institute, Moscow. 32. 250 pp.
- Ferris, G. F. 1955. Atlas of the Scale Insects of North America, v. 7, the Families Acleridae, Asterolecaniidae, Conchaspidae, Dactylopiidae and Lacciferidae. iii. Stanford University Press, Palo Alto, California. 233 pp.
- Hodgson, C. J. and Miller, D. R. 2010. A review of the Eriococcid genera (Hemiptera: Sternorrhyncha: Coccoidea) of South America. *Zootaxa*, 2459: 1-101.
- Kosztarab, M. and Kozár, F. 1988. Scale Insects of Central Europe. Akademiai Kiado, Budapest. 456 pp.
- Kozár, F. 2009. Zoogeographical analysis and status of knowledge of the Eriococcidae (Hemiptera), with a world list of species. *Boll. Zool. Agr. Bachic. Ser. II*, 41 (2): 87-121.
- Kozár, F. and Konczné Benedicty, Z. 2008. Description of a new genus *Hispaniococcus* from Spain, and a new *Pseudohermes* species from Canary Islands (Hemiptera Coccoidea Eriococcidae Cryptococcidae). *Boll. Zool. Agr. Bachic. Ser. II*, 40 (3): 247-260.
- Kozár, F., Williams, D. J. and Konczné Benedicty, Z. 2009. A new genus and four new species of the scale insect family Eriococcidae (Hemiptera: Coccoidea) from the Austro-Oriental Region. *Zootaxa*, 1979: 1-15.
- Miller, D. R. and Gimpel, M. E. 2000. A Systematic Catalogue of the Eriococcidae (Felt Scales) (Hemiptera: Coccoidea) of the World. Intercept Ltd., Andover, U. K. 589 pp.
- Nan, N and Wu, S-A 2011. A new species and two new records of Eriococcidae (Homoptera, Coccoidea) from China. *Acta Zootaxonomica Sinica*, 36: 757-764. [动物分类学报]
- Ouvrard, D. and Kozár, F. 2009. Links between host-plant type and site of feeding as revealed by the evolution of Palaearctic Eriococcidae (Sternorrhyncha: Coccoidea). *Ann. Soc. Entomol. Fr. (n. s.)*, 45 (1): 101-118.
- Pellizzari, G. and Germain, J. F. 2010. A new species of *Acanthococcus* (Hemiptera, Coccoidea, Eriococcidae) on *Leptospermum scoparium* (Myrtaceae) from Italy and France. *Zootaxa*, 2543: 51-63.
- Pellizzari, G. and Kozár, F. 2011. A new species of *Greenisca* and two new species of *Ovalicoccus* from Italy (Hemiptera Coccoidea Eriococcidae), with a key to European genera of Eriococcidae. *Zootaxa*, 3090: 57-68.
- Seljak, G. 2010. A checklist of scale insects of Slovenia. *Entomologia Hellenica*, 19: 99-113.
- Tang, F-D and Hao, J-J 1995. The Margarodidae and others of China (Homoptera: Coccoidea of Insecta). Chinese Agricultural Science Technology Press, Beijing. 738 pp.
- Wang, Z-Q 2001. Fauna Sinica, Insecta, Vol. 22, Coccoidea: Pseudococcidae, Eriococcidae, Coccidae, Asterolecaniidae, Lecanodiaspididae, Cerococcidae, Acleridae. Science Press, Beijing. 610 pp.
- Williams, D. J. 1985. The British and some other European Eriococcidae (Homoptera: Coccoidea). *Bull. Br. Mus. Nat. Hist. (Ent.)*, 51 (4): 347-393.

中国根毡蚧属一新种 (半翅目, 毡蚧总科, 毡蚧科)

南楠 武三安*

北京林业大学省部共建森林培育与保护教育部重点实验室 北京 100083

摘要 记述采自我国山西历山蓝萼香茶菜 *Isodon glaucocalyx* 根部的根毡蚧属 1 新种, 香茶菜根毡蚧 *Rhizococcus isodoni* sp. nov. 模式标本保存在北京林业大学昆虫标本室。

香茶菜根毡蚧, 新种 *Rhizococcus isodoni* sp. nov. (图 1-3)

雌成虫活体黄褐色, 体被白色平滑卵囊。玻片上, 雌成虫卵圆形, 体长 1.23~2.98 mm, 宽 0.70~2.03 mm。触角 6 或 7 节。肛环毛 10 根。尾瓣内缘光滑无齿, 每侧背刺 3 根, 外侧 1 根长 58~78 μm, 宽 6~8 μm; 内侧 2 根, 靠基部的长 38~45 μm, 宽 4~5 μm; 靠端部的长 53~65 μm, 宽 3~5 μm。尾片存在。喙 3 节, 基、中、端节各有 2、1、5 对刚毛。足发达, 胫节短于跗节, 后足基节有大量透明孔。盘腺为五格腺或七格腺, 主要分布于体腹面的中区、气门附近和腹部各节。十字孔腺分布于头和前中胸腹面的亚中区和亚缘区。腹杯状管有大小 2 种, 其中小杯状只分布在腹部。背杯状管与

腹面大杯状管同大, 散布于全背, 并在胸、腹部呈横带。微管腺散布于全背和腹面体缘及胸部亚缘区。腹刺圆锥状, 在体缘成 1 纵列。背刺圆锥状, 按大小分为 3 种: 大刺长 65~75 μm, 宽 10~15 μm; 小刺长 25~48 μm, 宽 5~9 μm; 微刺长 6~9 μm。其中大、小刺只分布在体缘, 成 1 纵列, 腹部 I~VII 节每节每侧大刺 2 个, 小刺 0~2 个; 微刺散布于全背; 腹部第 VII 节无肛前刺。

新种区别于根毡蚧属其它种类的特征为: 1) 后足基节有大量透明孔; 2) 肛环毛 10 根; 3) 尾瓣外缘背刺细长。

正模 ♀, 山西沁水历山富裕河, 海拔 1523 m, 2012-07-26, 南楠采于蓝萼香茶菜根部。副模: 6 ♀♀, 同正模; 5 ♀♀, 山西沁水历山西峡沟, 海拔 1548 m, 2012-07-23, 南楠采于蓝萼香茶菜根部。

词源: 新种种名源自寄主植物 *Isodon glaucocalyx* 的属名。

关键词 半翅目, 毡蚧科, 根毡蚧属, 新种, 中国。

中图分类号 Q969.35

* 通讯作者, E-mail: sananwu@bjfu.edu.cn