



<https://doi.org/10.11646/zootaxa.4563.2.12>

<http://zoobank.org/urn:lsid:zoobank.org:pub:3B00482D-ECCD-48E3-8192-CB1B4A01F74D>

Neotype designation for *Rodolia iceryae* Janson in Ormerod, 1887 (Coleoptera: Coccinellidae)

KWEVITOUKOUI HOUNKPATI^{1,3}, JUANITA A. FORRESTER² & JOSEPH V. MCHUGH¹

¹Department of Entomology, University of Georgia, 120 Cedar St, Athens GA 30602

²Chattahoochee Technical College, 1645 Bluffs Parkway Canton, GA 30114

³Corresponding author. E-mail: bhounkpati@graindeseltogo.org

Abstract

The primary type of *Rodolia iceryae* Janson in Ormerod, 1887, a species commonly found in the Afrotropical region, is lost. In an effort to stabilize the specific epithet and to fix the taxonomic status and type locality of this economically important species, a neotype is here designated. A species diagnosis, illustrations of the male terminalia, and photographs of the neotype specimen and labels are provided.

Key words: Coccinelloidea, Noviini, taxonomy, holotype, Africa, Afrotropical region

Introduction

The Noviini Mulsant, 1846 is a tribe of Coccinellidae Latreille, 1807 that includes many species utilized as biocontrol agents in pest management programs. Noviine coccinellids have an oval or elongate oval body, with a pubescent dorsal surface and broad head, directed ventrally, and with antennae composed of 7 to 9 antennomeres (Gordon 1972; Gordon 1985; Ślipiński 2007). *Rodolia* Mulsant, 1850 is one of the best-known genera of Coccinellidae due in part to the remarkably successful pioneering efforts at management of cottony cushion scale, *Icerya purchasi* Maskell, 1878 on citrus crops in California in the late 1880s using the vedalia beetle, *Rodolia cardinalis* (Mulsant, 1850).

In the late 1880s, *I. purchasi* also appeared in South Africa and New Zealand (Douglas 1889). In South Africa, however, a local coccinellid species was a very effective predator of the new pest (Ormerod 1887). Eleanor A. Ormerod borrowed specimens of this species from the Albany Museum (AMGS) in Grahamstown (Cape Province) (Douglas 1889) and showed them to O.E. Janson, who formally described the species as *Rodolia iceryae* Janson in Ormerod, 1887. This African species was later introduced into New Zealand in an attempt to control cottony cushion scale there (Ormerod & Janson 1889).

Unfortunately, the location of the type specimen of *R. iceryae* is unknown. Ideally, a type specimen of a species that is newly described from loaned material would have been deposited back at the museum that provided the loan; however, there was no mention of a type repository in the original description and the specimen is not currently stored at the AMGS. It is possible that Janson retained the type specimen of *R. iceryae* in his personal collection. In that case, the specimen might have been deposited at another institution later.

While conducting a study of West African Coccinellidae (WAC), KH noted the missing status of the type specimen of *R. iceryae*. This observation was confirmed by JAF, who reached the same conclusion after studying specimens of most of the taxonomically relevant species of the tribe from museums around the world while conducting a revisionary study of Noviini.

Since the holotype of *R. iceryae* is apparently lost, in order to stabilize the specific epithet and to fix the taxonomic status and type locality of this economically important species, a neotype is here designated according to the Article 75.3 of the International Code of Zoological Nomenclature (ICZN 2000).

Material and methods

Many museums kindly assisted this study by hosting visits, providing data, or initiating loans of specimens for this and related studies. These collections and institutions include the following:

- AMGS** Albany Museum, Grahamstown, South Africa (Terence A. Bellingan)
ANIC Australian National Insect Collection; Canberra, Australia (S. Adam Ślipiński)
DABCS Department of Animal Biology and Conservation Science, Accra, Ghana (Millicent A. Cobblah)
EMEC Essig Museum of Entomology; Berkeley, United States (Cheryl B. Barr)
ICIPE International Centre of Insect Physiology and Ecology, Nairobi, Kenya (Robert S. Copeland)
IFAN Institut Fondamental de l'Afrique Noire, Dakar, Sénégal (Abdoul A. Niang)
IITA International Institute of Tropical Agriculture, Cotonou, Benin (Georg Goergen)
MLAC Natural History Museum of Los Angeles County; Los Angeles, United States (Brian V. Brown)
MRAC Musée Royal de l'Afrique Centrale, Tervuren, Belgium (Marc De Meyer)
NHRM Naturhistoriska Riksmuseet; Stockholm, Sweden (Bert Viklund)
NHMUK Natural History Museum; London, United Kingdom (Roger Booth)
SAMA South Australian Museum; Adelaide, Australia (Eric G. Matthews)
UCRC University of California at Riverside Entomology Museum; Riverside, United States (Douglas Yanega)
UMZC University Museum of Zoology Cambridge, United Kingdom (William A. Foster)
USNM United States National Museum of Natural History; Smithsonian Institution; Washington, D. C., United States (Natalia J. Vandenberg)
ZIRS Zoological Institute of the Russian Academy of Sciences (formerly Museum of the Zoological Institute of the USSR in Leningrad); St. Petersburg, Russia (Boris M. Kataev)
ZMHB Museum für Naturkunde; Berlin, Germany (Bernd Jaeger)
ZMHU Zoological Museum at Helsinki University; Helsinki, Finland (Hans Silfverberg)

Terminology used for genitalia follows Ślipiński (2007). Corresponding terminology from Vandenberg *et al.* (2018) is given in parentheses.

Specimen examination was made using a Leica MZ8 stereomicroscope. Point-mounted specimens were removed from their mounts and softened in warm distilled water. The abdomen was removed from the relaxed specimen and placed in 10% KOH solution to remove excess tissue. Genitalia were removed from the abdomen, treated briefly in 10% KOH, rinsed in distilled water, and placed in glycerol on a depression slide for further examination.

Habitus images were captured using a Microoptics™ Lab XLT Workstation (Microoptics, Inc., Ashland, VA, USA) equipped with a Canon EOS-1 digital camera and a Canon Macro Photo MP-E 65mm lens. Lighting was provided by the imaging system strobe light and two Yongnuo Digital Speedlite YN560 III speed flashes pointed indirectly at a white “Chinese lantern” diffuser. Image stacks of the habitus were combined to create a deep focus composite image using Helicon Focus 6.4.2 Pro (Helicon Soft Limited, Kharkov, Ukraine). Photographs were edited with Adobe Photoshop CS6 (Adobe Systems, Inc., 2003, San Jose, California).

Figures 6–9 were made using AutoMontage Pro, V. 5.01 (Synoptics, Ltd. Frederick, MD, USA) to generate a single composite image from optical slices taken using a Sony DKC-5000 camera attached to a Leica Leitz DMRB compound microscope (Leica Microsystems, Inc., Bannockburn, Illinois). Illustrations were digitally prepared using a WACOM Intuos Pro M digitizer board and digital pen (PTH-660 Wacom Co., Ltd, China), and rendered in Adobe Illustrator CS6 (Adobe Systems, Inc., 2003, San Jose, California).

Collection label data are described verbatim with the following marks added for clarification: “/” indicates line breaks, “//” indicates separate labels.

Taxonomy

Rodolia iceryae Janson, 1887

(Figs. 1–9)

Rodolia iceryae Janson in Ormerod, 1887: 30; original description;

Rodolia obscura Weise, 1898: 524; synonymized by Raimundo & Alves, 1978: 35.

Type material: NEOTYPE (♂, MRAC) here designated to avoid ambiguity about the identity of this species whose type material is lost. The neotype (Figs. 1–9) has been point mounted on a pin with a genitalia vial and four labels with the following data: “Pietermaritzburg / Natal 3-4-1957 / Hunt // COLL. MUS. CONGO / ex. coll. Dr. Breuning // *Rodolia iceryae* Jans. / det. H. Fürsch 1973 // NEOTYPE ♂ / *Rodolia iceryae* Janson”. The neotype label is on red paper.

Type locality: South Africa

This specimen was selected as the neotype for several reasons. It was determined by Dr. Helmut Fürsch, a taxonomic authority of Afrotropical Coccinellidae. The specimen closely matches the original description of the species. It was collected from the same region as the originally described type specimen.

Diagnosis. *Rodolia iceryae* can be separated from other species of *Novinii* by the following combination of characters: length 3-5 mm; body hemispherical, widest just posterior to middle (Fig. 1); shiny; dorsal surfaces pubescent; base of the elytra with a large semicircular blood-red spot, enclosing the scutellum; head concealed from above; humeral angles somewhat produced anteriorly, rounded, and slightly elevated.



FIGURES 1–5. Neotype, *Rodolia iceryae* Janson in Ormerod, male: 1. Dorsal habitus, 2. Ventral habitus, 3. Specimen labels, 4. Lateral habitus, 5. Tegmen, lateral view.

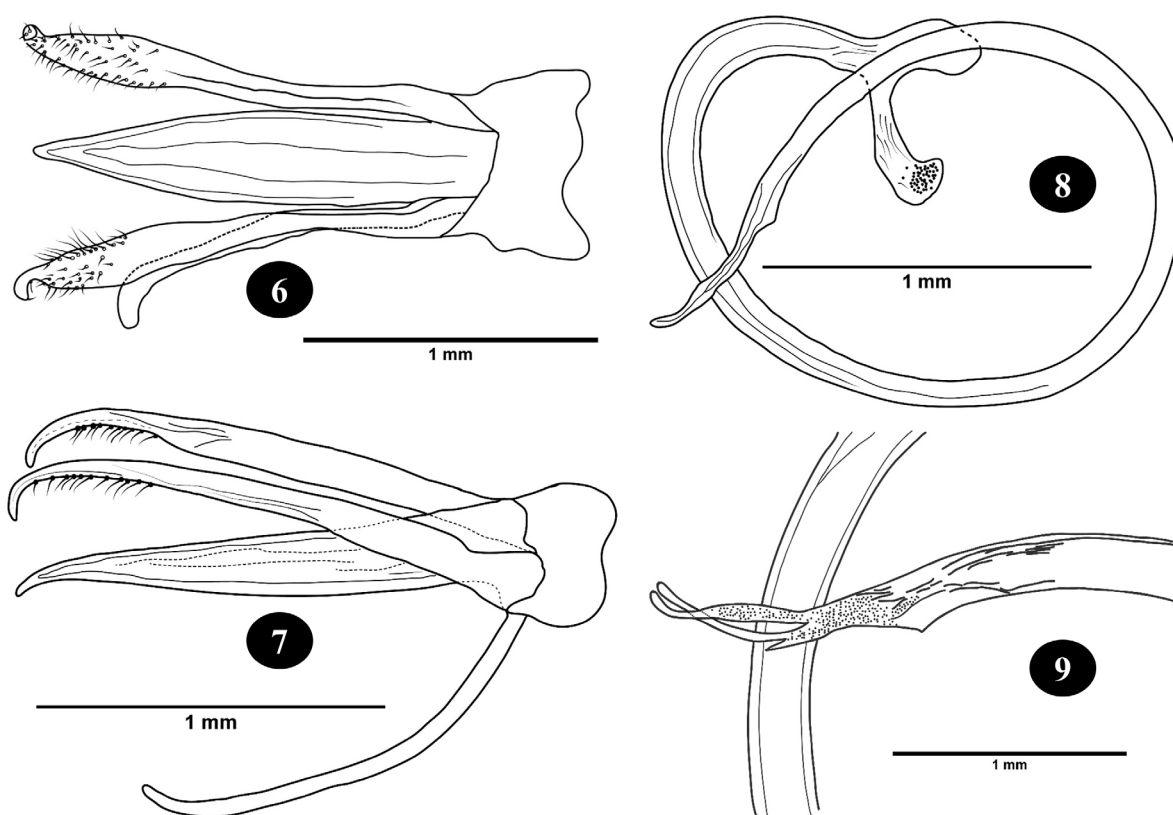
Rodolia iceryae may be diagnosed by the structure of the male genitalia. The lateral lobes (= parameres) of this species are similar to those of *Rodolia insularis* Weise, 1895 in that they are medially constricted. However, the setae on the distal 25% of the parameres are notably shorter in *R. iceryae* than in *R. insularis*. *Rodolia iceryae* has a very short, narrow penis (= siphon) with a bifurcation just proximal to the apex. The only other species of *Rodolia* that have a similar penis are *R. argodi* Sicard, 1909, and *R. occidentalis* Weise, 1898. However, *R. iceryae* is readily distinguished from both of them in that the apex of the penis of *R. iceryae* is strongly curved, so much so that it almost forms a complete circle.

Discussion

Fürsch's spelling of the specific epithet on the determination label of the neotype specimen ("*Rodolia iceriae* Jans") and in his publication (Fürsch 1995) is an incorrect subsequent spelling.

A broad search for the original type specimen at museums with extensive or taxonomically significant holdings of Coccinellidae was unsuccessful. A query was made to the AMGS from which the original type was borrowed; however, only six specimens of *R. iceryae* were present in their holdings and all had different collection data than the original type. Those other specimens were collected from the Eastern Cape, Republic of South Africa, and had the following label data: "Sundays / River Valley / C.N. Smithers / March 1953". At ICIPE, there were only two specimens, both identified by Fürsch in 1999, with the following collection data: "CWWF 7.4 / on aphids / Mwanza / 27 May 1995 / Coll. H. Thindesa / Malawi // *Rodolia iceriae* Jans. / det. H. Fürsch 1999 // GTZ-31 // F4".

The South African province where the neotype and original holotype were collected is currently considered to be KwaZulu-Natal.



FIGURES 6–9. Neotype, *Rodolia iceryae* Janson in Ormerod, male genitalia: **6.** Tegmen, ventral view, **7.** Tegmen, lateral view, **8.** Penis (= siphon), lateral view, **9.** Apex of penis.

Acknowledgements

The work was made possible through the assistance of numerous volunteers and staff at various institutions. We are grateful to Dr. Terence A. Bellingan (AMGS), Dr. Robert S. Copeland and Mawuko Sokame (ICIPE), for providing valuable collection data. We thank Dr. Abdoul Aziz Niang and Mouhamadou M. Ndiaye (IFAN) for granting access to their collections. We also thank the reviewers for their helpful comments on a previous draft of this manuscript.

This project was supported by the following grants: NSF PEET grant #DEB-0329115 (to JVM, M.F. Whiting

and K.B. Miller), Borlaug LEAP grant #016258-97 (to KH), H.H. Ross Fund grant (to KH), Global Programs Graduate International Travel Award from the University of Georgia (to KH), WARC Travel Grant (to KH), and the Department of Entomology at the University of Georgia.

References

- Douglas, J.W. (1889) Notes on some British and Exotic Coccidae (N^o. 13). *In*: Barrett, C.G., McLachlan, R., Douglas, J.W., Saunders, E., Fowler, W.W. & Stainton, H.T. (Eds.), *The Entomologist's Monthly Magazine*. Entomologist's Monthly Magazine Limited, London, pp. 232–239.
- Fürsch, H. (1995) Die Marienkäfer der entomologischen Namibia-Expedition des Museums für Naturkunde Berlin 1992 mit Bemerkungen zu anderen afrikanischen Arten. (Coleoptera, Coccinellidae). *Mitteilungen aus dem Museum für Naturkunde in Berlin. Zoologisches Museum und Institut für Spezielle Zoologie (Berlin)*, 71, 327–340.
<https://doi.org/10.1002/mmnz.19950710212>
- Gordon, R.D. (1972) The Tribe Noviiini in the New World (Coleoptera: Coccinellidae). *Journal of the Washington Academy of Sciences*, 62, 23–31.
- Gordon, R.D. (1985) The Coccinellidae (Coleoptera) of America North of Mexico. *Journal of the New York Entomological Society*, 93, 1–912.
- ICZN (2000) *International Code of Zoological Nomenclature*. International Trust for Zoological Nomenclature, London, United Kingdom, 306 pp.
- Latreille, P.A. (1807) *Genera Crustaceorum et insectorum: secundum ordinem naturalem in familias disposita, iconibus exemplisque plurimis explicata*. Amand Koenig, bibliopolam, Paris, 258 pp.
- Maskell, W.M. (1879) On some Coccidae in New Zealand. *Transactions and Proceedings of the New Zealand Institute*, 11, 187–230.
- Mulsant, M.E. (1846) *Histoire Naturelle des Coléoptères de France. Sulcicolles—sécuripalpes*. Maison Libraire, Paris, 280 pp.
- Mulsant, M.E. (1850) Species des Coléoptères trimères sécuripalpes. *Annales des Sciences Physiques et Naturelles, d'Agriculture et d'Industrie, Lyon*, Series 2, 2, 1–1104.
<https://doi.org/10.5962/bhl.title.8953>
- Ormerod, E.A. (1887) *Notes on the Australian bug (Icerya purchasi) in South Africa. With additional illustrations from S. Australia, and notes of history and treatment from government reports of the United States of America*. Simpkin, Marshall & Co., London, 36 pp.
- Ormerod, E.A. & Janson, O.E. (1889) *Notes and descriptions of a few injurious farm & fruit insects of South Africa*. Simpkin, Marshall & Co., London, England, 126 pp.
- Raimundo, A.A.C. & Alves, M.L.G. (1978) Contribuição para o conhecimento dos coccídeos de Angola -I. *Garcia de Orta: Série de Zoologia*, 7, 23–40.
- Sicard, A. (1909) Description d'une nouvelle espèce de Coccinellide d'Afrique (Col.). *Bulletin de la Société Entomologique de France*, 8, 142–143.
- Ślipiński, S.A. (2007) *Australian Ladybird Beetles (Coleoptera: Coccinellidae). Their Biology and Classification*. Australian Biological Resources Study, Canberra, ACT, 228 pp.
- Vandenberg, N.J., Iverson, A. & Liere, H. (2018) A new species of myrmecophilous lady beetle in the genus *Diomus* (Coleoptera: Coccinellidae: Diomini) from Chiapas, Mexico that feeds on green coffee scale, *Coccus viridis* (Green) (Hemiptera: Coccidae). *Zootaxa*, 4420 (1), 113–122.
<https://doi.org/10.11646/zootaxa.4420.1.6>
- Weise, J. (1895) Über die mit *Novius* Mulsant. *Annales de la Société Entomologique de Belgique*, 39, 147–151.
- Weise, J. (1898) Coccinelliden aus Usambara. *Annales de la Société Entomologique de Belgique*, 98, 191–201.