BioOne COMPLETE

Taxonomic Studies on the Genus Caryopemon (Coleoptera: Chrysomelidae: Bruchinae) of China and Myanmar with Some New Host Plants

Authors: Li, You, Omar, Youssef Mohamed, and Zhang, Runzhi

Source: Florida Entomologist, 99(2) : 257-263

Published By: Florida Entomological Society

URL: https://doi.org/10.1653/024.099.0215

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

Taxonomic studies on the genus *Caryopemon* (Coleoptera: Chrysomelidae: Bruchinae) of China and Myanmar with some new host plants

You Li[1,2], *Youssef Mohamed Omar*[1,3], *and Runzhi Zhang*[1,*]

Abstract

The genus *Caryopemon* Jekel (Coleoptera: Chrysomelidae) contains 9 species distributed only in Oriental and Afrotropical regions with 3 of these species from China and Myanmar. *Caryopemon luteonotatus* Pic and *Caryopemon hieroglyphicus* Jekel are recorded for the first time in China. *Caryopemon giganteus* Pic is recorded newly in Myanmar. Re-descriptions, illustrations, and a key for these 3 species are included. *Mucuna interrupta* Gagnepain and *Mucuna macrocarpa* Wallich (Fabales: Fabaceae) are reported as host plants of seed beetles for the first time.

Key Words: seed beetle; Caryopemini; taxonomy; new country record; *Mucuna*

Resumen

El género *Caryopemon* Jekel (Coleoptera: Chrysomelidae) contiene nueve especies distribuidas únicamente en las regiones orientales y afrotropicales con tres de éstas especies de China y Myanmar. *Caryopemon luteonotatus* Pic y *Caryopemon hieroglyphicus* Jekel están reportadas por primera vez en China. *Caryopemon giganteus* Pic es recientemente reportado en Myanmar. Redescripciones, ilustraciones y una clave para éstas 3 especies está incluida. *Mucuna interrupta* Gagnepain y *Mucuna macrocarpa* Wallich (Fabales: Fabaceae) son reportadas por primera vez como plantas hospederas de semilleros de escarabajos.

Palabras Clave: escarabajo de semillas; Caryopemini; taxonomía; nuevos registros del pais; *Mucuna*

The Old World bruchid genus *Caryopemon* Jekel, 1855 (Coleoptera: Chrysomelidae) was erected as monotypic based on the type species *Caryopemon hieroglyphicus* Jekel, 1855 with Ostindien [East Indies] as the locality (Jekel 1855). Anton (2010) in his Catalogue of Palaearctic Coleoptera considered *C. quadriguttatus* Chevrolat, 1877 and *C. centronotatus* Pic, 1924 as synonyms of the type species (Chevrolat 1877; Pic 1924).

During the years 1898, 1901, and 1909, Pic described *C. luteonotatus* from India, *C. signaticollis* from Madagascar, and *C. giganteus* from Yunnan Province, China, respectively (Pic 1898, 1909). In 1987, Borowiec erected the genus *Procaryopemon* based on the type species *Procaryopemon archetypus* from British Bootang [North India]. Later, *Procaryopemon* and *P. archetypus* were synonymized with *Caryopemon and C. giganteus* Pic, 1909, respectively (Nilsson & Johnson 1991; Anton 2010).

Caryopemon cruciger (Stephens, 1839) and *C. humerosus* (Fairmaire, 1898) were described first in the genera *Caryoborus* and *Bruchus* (*Pachymerus*), respectively, and in 1913 Pic transferred them to the genus *Caryopemon*, and, in 1924, he described the species *C. lhostei* from Sri Lanka.

After more than 55 years, Decelle (1981) added the 8th species, *C. abyssinicus*, based on specimens from Abyssinie [Eritrea and the northern half of Ethiopia] and Somalia. Anton (1999) described the 9th species, *C. transversovittatus*, from specimens collected from Laos, Thailand, and Vietnam. The main objectives of this work are to report new distributions for 3 species: *C. luteonotatus* and *C. hieroglyphicus*, first records in China; and *C. giganteus*, first record in Myanmar.

Materials and Methods

The specimens were collected from Yunnan Province, southern China, and form Lashio, Myanmar. The specimens were deposited in the Institute of Zoology (IOZ), Chinese Academy of Sciences (CAS), in Beijing, China, and each was given a database number corresponding to the NZMC collection code entry. The morphological studies were conducted using a Cannon 5D digital camera and the images processed in Adobe Photoshop CS5.

Results

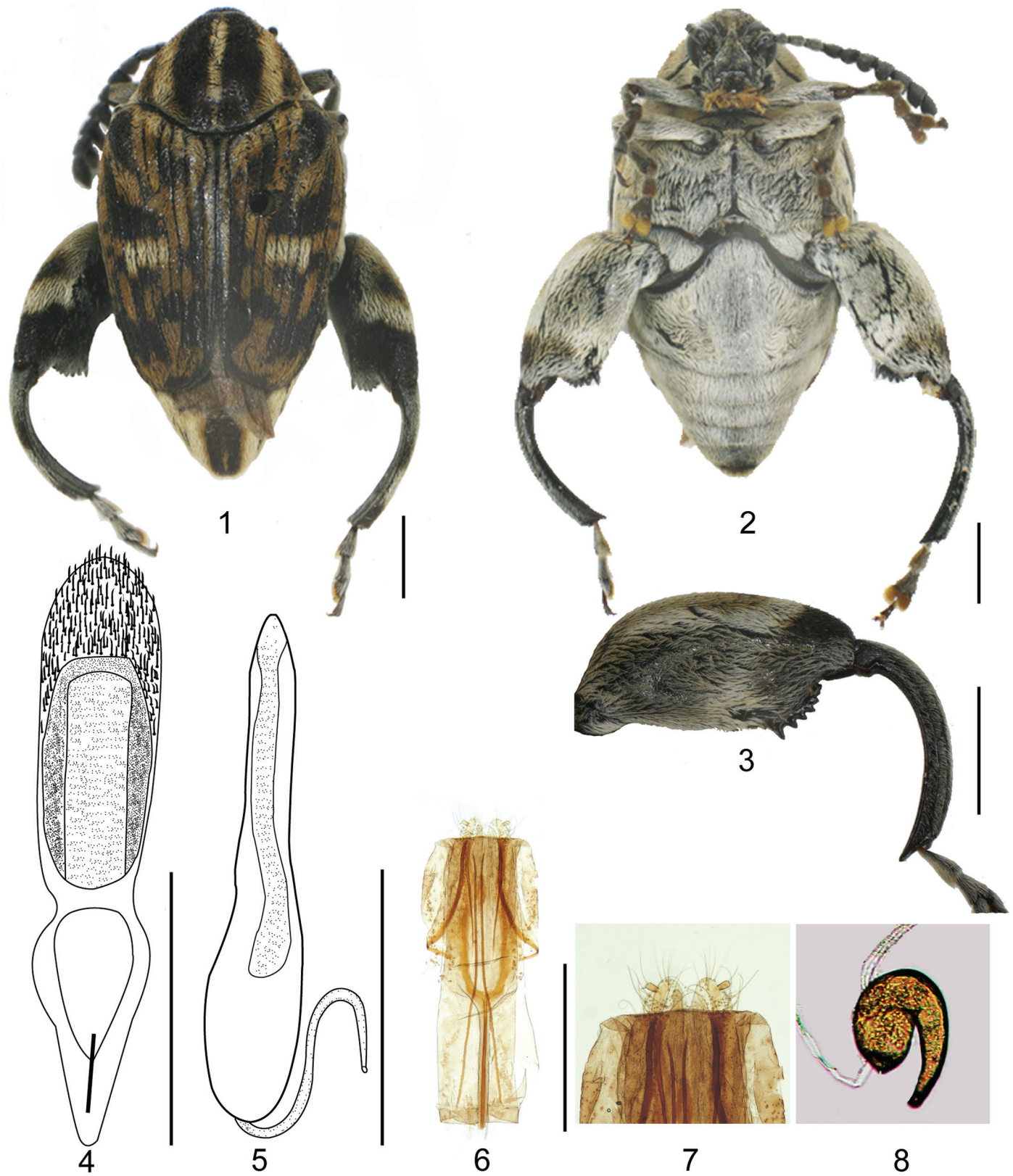
Caryopemon hieroglyphicus Jekel, 1855 (Figs. 1–8)

Caryopemon hieroglyphicus Jekel, 1855:27.—Type locality: Ostindien.

Caryopemon quadriguttatus Chevrolat, 1877:90.—Type locality: Kampuchea.

[1]Key Laboratory of Zoological Systematics and Evolution, Institute of Zoology, Chinese Academy of Sciences, No. 1 Beichen West Road, Chaoyang District, Beijing 100101, China
[2]School of Forest Resources and Conservation, University of Florida, Gainesville, Florida 32611, USA
[3]Plant Protection Department, Faculty of Agriculture, Assiut University, Assiut 71515, Egypt
*Corresponding author. E-mail: zhangrz@ioz.ac.cn

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use



Figs. 1–8. *Caryopemon hieroglyphicus*; 1, dorsal view; 2, ventral view; 3, hind femur; 4, lateral lobes, ventral view; 5, median lobe; 6, ovipositor; 7, apex of ovipositor; 8, spermatheca. Scale bars = 1 mm. (4 and 5 from Singal, 1987)

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

Caryopemon centronotatus var. *lajoyei* Pic, 1924:40.—Type locality: South Vietnam.

MATERIAL EXAMINED

1 female, Cheli Village, Yunnan Province, China. 23.09°N, 102.17°E, alt. 620 m, 16-IV-1957, Zang Lingchao [IOZ(E)1045478].

DIAGNOSIS

Dimension. Body length (pronotum–elytra) 15.9–15.0 mm; width 3.1–5.5 mm.

Color. Integument black; vestiture gray and brown, dense, conspicuous; ventral segments gray and dorsal segments brown (Figs. 1 and 2). Pronotum medially and laterally with 3 brown stripes. Elytra covered with gray, brown, and white hairs in hieroglyphic form. Female pygidium with 2 vertical glabrous lines. Hind femur with terminal part glabrous.

Head elongate; frontal carina present. Eyes flat, emarginate to 2/5 length of eye. Antennal articles 1–4 subcircular, 5 isosceles right triangle, 6–11 pectinate. Pronotum subtrapezoidal (Fig. 1), with greatest width at base (W/L = 1.20), slightly rounded in middle of sides. Metasternal process strongly convex in lateral view. Elytra longer than wide, about 1.15 times longer than combined width; humeral callus distinct. Pygidium longer than wide. Hind femur strongly incrassate, dorsal side granulate, pecten with 1 large, sharp spine with 6 gradually smaller, blunt denticles following; 3 small spines before pecten (Fig. 3).

Male genitalia. Median lobe elongate and sclerotized (Fig. 5); lateral lobes fused into gutter-like structure (Fig. 4); apex of lateral lobes densely pubescent.

Female genitalia. Ovipositor 2.5 times longer than wide, weakly sclerotized (Fig. 6). Stylus with 2 short setae (Fig. 7). First pair of baculum elongate, almost 2 times longer than 2nd pair (Fig. 6). Apodeme of spiculum gastrale extending to apex of genitalia. Plate of spiculum gastrale longer than apodeme. Apex of ovipositor with 2 protuberances (Fig. 7). Spermatheca C-shaped (Fig. 8).

DISTRIBUTION

China (Yunnan) (Fig. 25), India, Cambodia, and South Vietnam.

Caryopemon luteonotatus Pic, 1898 (Figs. 9–14)

Caryopemon luteonotatus Pic, 1898:173.—Type locality: India.

MATERIAL EXAMINED

1 male, Xiaomengyang Village, Yunnan Province, China. 22.08°N, 100.90°E, alt. 850 m, 1-VIII-1957, Wang Shuyong [IOZ(E)1045488].

DIAGNOSIS

Dimension. Body length (pronotum–elytra) 5.2–7.0 mm; width 2.6–3.0 mm.

Color. Integument black, antennal margin reddish; vestiture pale yellow, conspicuous on elytra, dorsal of hind femur, pygidium, and segmental venter (Figs. 9 and 10), especially dense on segmental venter. Six pairs of spots on elytra as follows: 3 square close to anterior margin and suture; 3 round at center and on posterior margin. First sternite with brown hairs forming large spots in middle (Fig. 10).

Head elongate; frontal carina present, hairless. Eyes rather flat, emarginate to 1/2 length of eye. Antennal articles: 1–3 subcircular, 4 and 5 isosceles right triangle, 6–11 pectinate. Pronotum subtrapezoidal, with many shallow pits, greatest width at base (W/L = 1.15), sides almost straight (Fig. 9). Metasternal process strongly convex in lateral view. Elytra about 1.15 times longer than wide. Pygidium longer than wide. Hind femur strongly incrassate, pecten with 1 sharp spine with 2 gradually smaller, blunt denticles following, 3 spines before pecten; 1st spine small in middle of hind femur; other spines large and sharp between pecten and small spine (Fig. 11).

Male genitalia. Median lobe elongate, apex ogival, bent ventrad (Fig. 13); internal sac with dense large spines in middle (Fig. 12); lateral lobes fusing into gutter-like structure without pubescence (Fig. 14).

DISTRIBUTION

China (Yunnan) (Fig. 25), India, and Nepal.

Caryopemon giganteus Pic, 1909 (Figs. 15–24)

Caryopemon giganteus Pic, 1909:34.—Type locality: China.

Protocaryopemon archetypus Borowiec, 1987:54.—Type locality: North India.

MATERIAL EXAMINED

7 female, 3 male, Kunming, Yunnan Province, China. 24.90°N, 102.83°E, alt. 1,900 m, 8-VI-1955, Kryzhanovsky leg [IOZ(E)1045387-1045396, 1045412]; 5 female, 2 male, Yuanjiang County, Yunnan Province, China. 23.48°N, 102.94°E, alt. 500 m, 12-V-1957 Liang Qiuzhen [IOZ(E)1045404-1045410]; 1 male, Yuanjiang County, Yunnan Province, China. 23.38°N, 103.35°E, alt. 540 m, 16-V-1957, Liu Dahua [IOZ(E)1045403]; 2 female, Puer City, Yunnan Province, China. 22.49°N, 100.97°E, alt. 850 m, 2-V-1957, Zang Lingchao [IOZ(E)1045398-1045399]; 1 male, Nujiang River, Yunnan Province, China. 25.85°N, 98.85°E, alt. 800 m, 11-V-1955, Xue Zifeng [IOZ(E)1045397]; 1 female, Dali City, Yunnan Province, China. 25.69°N, 100.14°E, 30-V-1955, Yang Xinchi [IOZ(E)1045413]; 1 male, Cheli Village, Yunnan Province, China. 23.09°N, 102.17°E, alt. 580 m, 30-VI-1955, Ou Bingrong [IOZ(E)1045411]; 1 female, Menga Village, Yunnan Province, China. 22.18°N, 100.33°E, alt. 800 m, 30-X-1958, Wang Shuyong [IOZ(E)1045414]; 1 male, Lashio, Myanmer. 22.94°N, 97.74°E, alt.860 m, 8-VI-2013, Jiang Kaiwen.

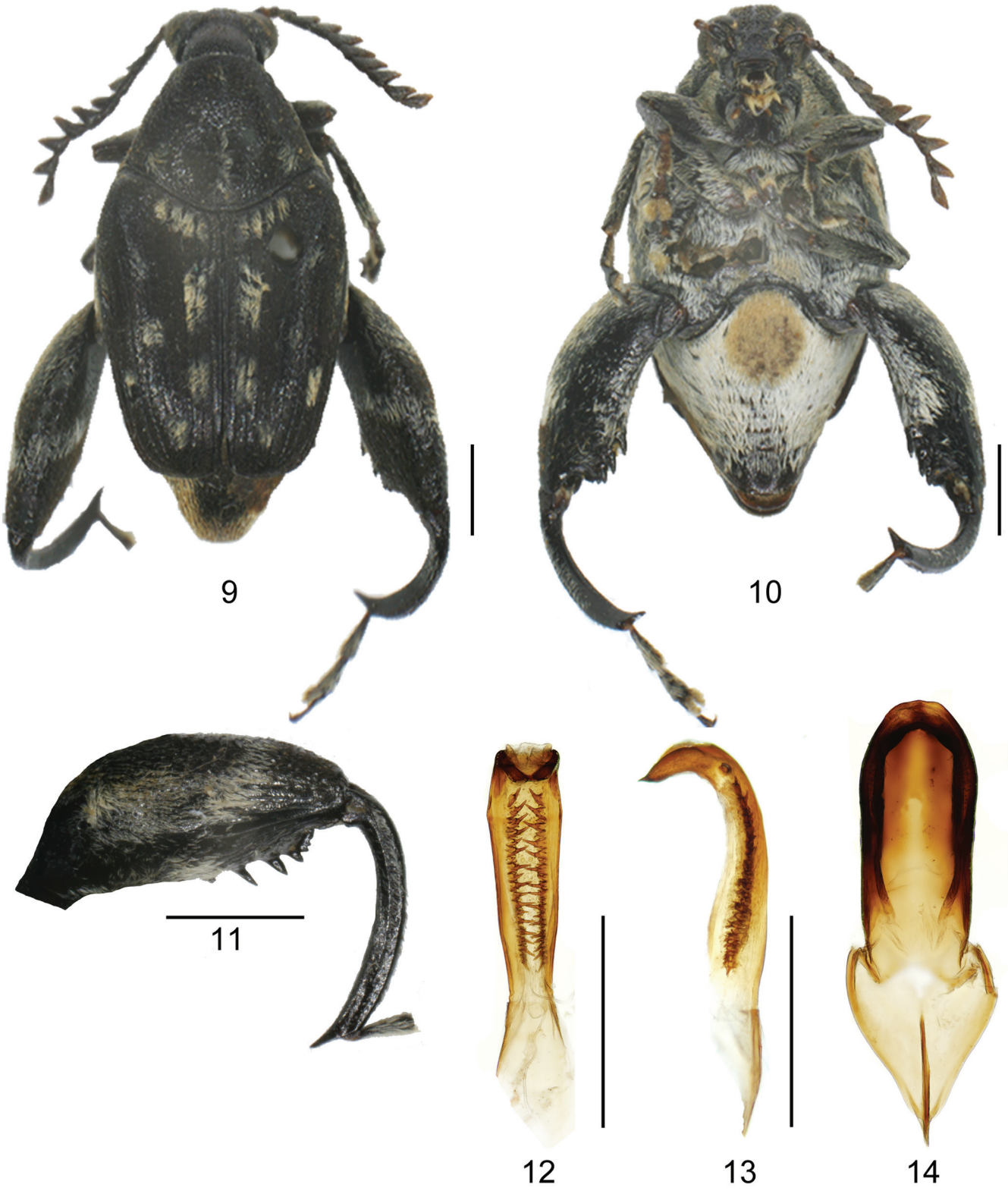
DIAGNOSIS

Dimension. Body length (pronotum–elytra): 8.1–12.0 mm; width 4.7–6.0 mm (body size depends on size of host seed).

Color. Integument black, sometimes reddish at apex of antennae, vestiture gray and brown, dense, conspicuous, especially on ventral segments (Figs. 15 and 16). Pronotum with 3 gray stripes medially and laterally. Elytra with gray vertical striae, sometimes widened at middle. Hind femur with 2 glabrous spots on dorsum.

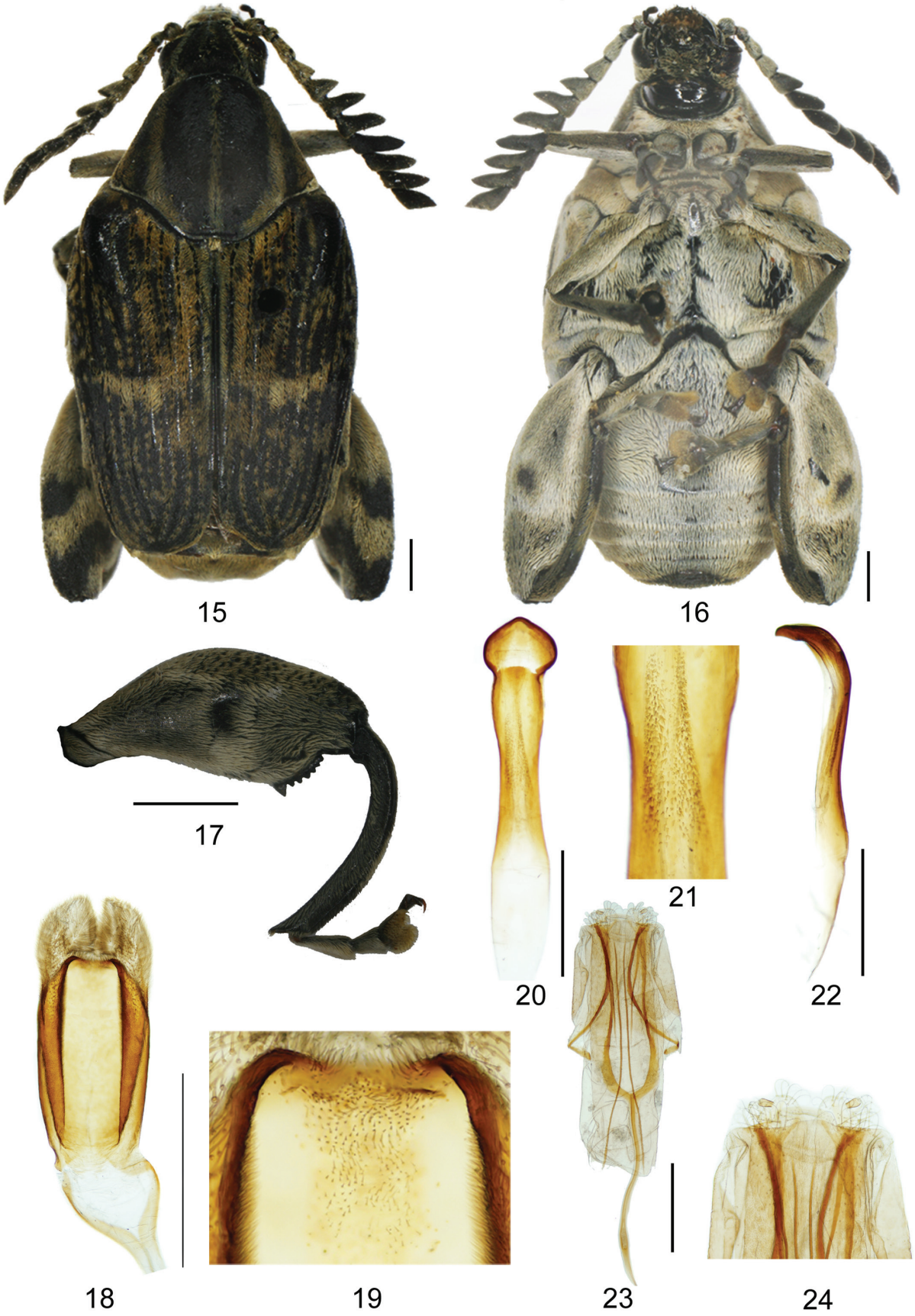
Head elongate; frontal carina present. Eyes rather flat, emarginate to 2/5 length of eye. Antennal articles: 5–11 pectinate. Pronotum subtrapezoidal, greatest width at base (W/L = 1.27), sides almost straight (Fig. 15). Metasternal process strongly convex in lateral view. Elytra about 1.23 times longer than wide. Last 2 tergites (including pygidium) exposed behind elytra. Last sternite emarginate up to base in male, not emarginate in female. Hind femur strongly incrassate; dorsal side of hind femur granulate and with

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use



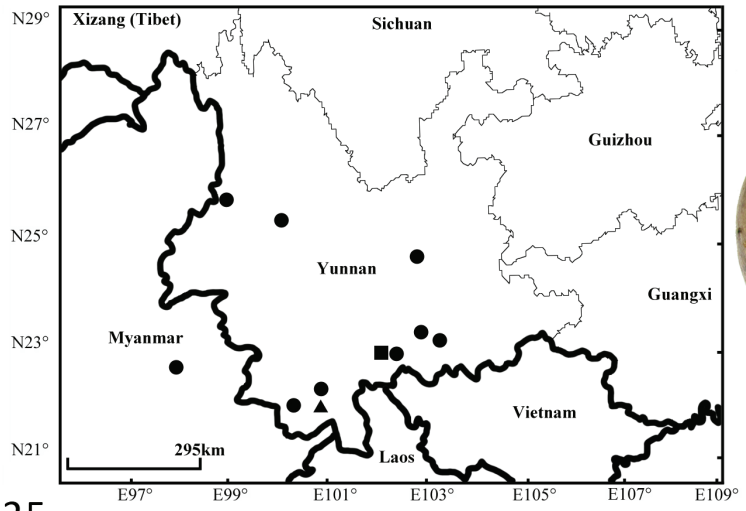
Figs. 9–14. *Caryopemon luteonotatus*; 9, dorsal view; 10, ventral view; 11, hind femur; 12, median lobe, ventral view; 13, median lobe, lateral view; 14, lateral lobes, ventral view. Scale bars = 1 mm.

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use



Figs. 15–24. *Caryopemon giganteus*; 15, dorsal view; 16, ventral view; 17, hind femur; 18, lateral lobes, ventral view; 19, setae on the lateral lobe; 20, median lobe, dorsal view; 21, minute denticles in the middle of internal sac, 22; median lobe, lateral view; 23, ovipositor; 24, apex of ovipositor. Scale bars = 1 mm.

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use



25



26

Figs. 25 and 26. Localities and host plant for the herein described *Caryopemon* species. **Fig. 25.** Map of southwestern China, illustrating localities for *Caryopemon* species in China and Myanmar. *Caryopemon hieroglyphicus* = square, *Caryopemon luteonotatus* = triangle, *Caryopemon giganteus* = circles. **Fig. 26.** Seeds of *Mucuna* sp. (Fabaceae) from Myanmar (Lashio): the middle and right were infested by *Caryopemon giganteus*. Scale bar = 10 mm.

1 large, sharp spine with 5–7 gradually smaller, blunt denticles following (Fig. 17).

Male genitalia. Median lobe elongate (Fig. 20), apex ogival (Fig. 22), bent ventrad; middle of internal sac lined with minute denticles (Fig. 21); lateral lobes fused into gutter-like structure; apex of lateral lobes distinctly concave in middle (Fig. 18); apex of gutter-like structure covered with many setae (Fig. 19).

Female genitalia. Ovipositor 2 times longer than wide, weakly sclerotized (Fig. 23). Stylus with 2 short setae (Fig. 24). First pair of baculum elongate almost 2 times longer than 2nd pair (Fig. 23). Apodeme of spiculum gastrale extending to apex of genitalia. Plate of spiculum gastrale as long as apodeme. Apex of ovipositor with 2 protuberances (Fig. 24). Spermatheca C-shaped (Fig. 8).

DISTRIBUTION

China (Yunnan), Myanmar (Fig. 25), and Nepal.

HOST

Mucuna interrupta Gagnepain, *Mucuna macrocarpa* Wallich, *Mucuna* sp. (Fig. 26).

Key to Species of *Caryopemon* in China and Myanmar

1.— Hind femur with 1 large, sharp spine with 5–7 gradually smaller, blunt denticles following; 3 very small spines or no spines before pecten; apex of lateral lobes densely pubescent 2

1′.— Hind femur with 1 sharp spine with 2 gradually smaller, blunt denticles following; 1 small spine and 2 large spines before pecten; apex of lateral lobes not pubescent . . . . . *C. luteonotatus*

2.— Elytra with gray, brown, and white hairs in hieroglyphic form; apex of lateral lobes distinctly convex in middle . . . . . *C. hieroglyphicus*

2′.— Elytra with only gray vertical striae, sometimes widened in middle; apex of lateral lobes distinctly concave in middle . . . . . *C. giganteus*

Discussion

The species of *Caryopemon* can be identified by the combination of characters that are given by Singal (1987) and Borowiec (1987). The genus includes 9 species as follows: *C. hieroglyphicus* (= *C. quadriguttatus* = *C. centronotatus*), *C. luteonotatus*, *C. signaticollis*, *C. giganteus* (= *P. archetypus*), *C. cruciger*, *C. humerosus*, *C. lhostei*, *C. abyssinicus*, and *C. transversovittatus*, which are distributed in Cambodia, China, Eritrea, northern Ethiopia, India, Laos, Madagascar, Myanmar, Nepal, Somalia, South Africa, South Vietnam, Sri Lanka, Thailand, Vietnam, Zaire, and Zimbabwe (Decelle 1981; Singal 1987; Udayagiri & Wadhi 1989; Nilsson & Johnson 1991; Anton 1999, 2010). Unfortunately, the host plants are known for only 2 species and a 3rd is unknown in this study. *Abrus precatorius* L. (Fabales: Fabaceae) was recorded as a host plant for *C. cruciger* and *C. lhostei*, whereas in this study, *Mucuna interrupta* Gagnepain and *M. macrocarpa* Wallich (Fabales: Fabaceae) are reported for the first time as host plants for Bruchinae. The seeds of *Mucuna* are usually rather large, usually with a diameter greater than 20 mm.

The species of both plant genera, *Abrus* and *Mucuna*, are found worldwide in the tropical and subtropical areas only. Probably, that explains why the possibilities of range extension of *Caryopemon* species are limited because the distribution of individual species may depend on the range of their host plant.

Three of the 9 species were discovered in Yunnan Province, southwestern China, and Lashio, northeastern Myanmar. *Caryopemon hieroglyphicus* and *C. luteonotatus* were recorded from the same locality in China at 620 m and 850 m elevation, respectively. The species *C. hieroglyphicus* was described based on a single male specimen, which was collected at 2,300 feet (about 700 m) elevation on bushes, whereas *C.*

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

transversovittatus was collected at 330 m elevation. The differences in altitude perhaps are due to the host range of each species. The available distribution data of species of this genus and their host plant distributions supports our assumption that the genus still has many species to be recorded from many countries in which the host plants are found. With more collecting in the tropical and subtropical countries, it is probable that new species of these seed beetles will be discovered.

Acknowledgments

We are grateful to Liu Ning, Ren Li, Wang Zhiliang, and Yao Jian (Institute of Zoology, Chinese Academy of Science) for their kind help. We sincerely thank Alex Delobel (Museum national d'histoire naturelle, Paris) for providing constructive comments and Charles O'Brien for doing the linguistic review before submission. The first author thanks Jiang Kaiwen for presenting specimens. Thanks to Ramon Saucedo for translating the abstract. This research work was supported by the National Natural Science Foundation of China (31210103909-31172130/J1210002), and it is part of the first author's Master's thesis.

References Cited

Anton KW. 1999. *Caryopemon transversovittatus* n. sp. from Oriental Region (Coleoptera: Bruchidae: Pachymerinae). Genus (Wroclaw) 10: 395–398.

Anton KW. 2010. Bruchinae, pp. 339–353 *In* Löbl I, Smetana A [eds.], Catalogue of Palaearctic Coleoptera. Vol. 6: Chrysomeloidea. Apollo Books, Stenstrup, Denmark.

Borowiec L. 1987. The genera of seed-beetles (Coleoptera: Bruchidae). Polskie Pismo Entomologiczn 57: 3–207.

Chevrolat A. 1877. Les diagnoses de nouvelles especes des bruchides. Annales de la Société entomologique de France 5: 116.

Decelle J. 1981. Une nouvelle espece africaine de *Caryopemon* Jekel, 1855 (Coleoptera: Bruchidae: Pachymerinae). Revue de zoologie et botanique africaines 95: 727–731.

Jekel H. 1855. Insecta Saundersiana: Coleoptera, Curculionides. Van Voorst, London, United Kingdom.

Nilsson JA, Johnson CD. 1991. *Protocaryopemon* Borowiec 1987, a synonym of *Caryopemon* Jekel 1855, and *P. archetypus* Borowiec 1987, a synonym of *C. giganteus* Pic 1909 (Coleoptera: Bruchidae: Pachymerinae). Coleopterists Bulletin 45: 349.

Pic M. 1898. Description d'un genre nouveaux et de sept coleopteres exotiques. Bulletin de la Société zoologique de France 23: 173–174.

Pic M. 1909. Divers Coleopteres exotiques nouveaux. Naturaliste Paris 31: 19–34.

Pic M. 1924. Notes diverses, descriptions et diagnoses. l'Echange Moulins 39: 29–30.

Singal SK. 1987. Taxonomic studies on the genus *Caryopemon* Jekel (Coleoptera: Bruchidae: Pachymerinae: Caryopemini). Association for Advancement of Entomology 12: 215–218.

Udayagiri S, Wadhi SR. 1989. Catalog of Bruchidae. Memoirs of the American Entomological Institute 45: 301 p.

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use