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

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

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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*

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 Canon 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.

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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)
**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 scipulum gastrale extending to apex of genitalia. Plate of scipulum gastrale longer than apodeme. Apex of ovipositor with 2 protuberances (Fig. 7). Spermatheca C-shaped (Fig. 8).

**DISTRIBUTION**

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

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

**Caryopemon luteonotatus** Pic, 1898:173.—Type locality: China.

**Material Examined**

7 female, 3 male, Kunming, Yunnan Province, China. 24.90°N, 102.83°E, alt. 1,900 m, 8-VI-1955, Kryzhansky 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, Gu Xiaotao [IOZ(E)1045397]; 1 female, Dali City, Yunnan Province, China. 25.69°N, 100.14°E, 30-V-1955, Yang Xincheng [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)104544]; 1 male, Lashio, Myanmar. 22.94°N, 97.74°E, alt. 860 m, 8-VI-2013, Jiang Kaiwen.

**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 spines 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. 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)

**Protocaryopemon archetypus** Borowiec, 1987:54.—Type locality: North India.
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.
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.
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. ihostei*, *C. abyssinicicus*, 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; Nilsen & 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. ihostei*, 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...
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.

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