

The genus *Pancalia* Stephens (Lepidoptera: Cosmopterigidae) of China, with description of a new species

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The Chinese species of the genus *Pancalia* Stephens are reviewed, with five species and one subspecies treated. *Pancalia wuyiensis* sp. n. is described as new, *P. isshikii amurella* Gaedike is newly recorded for the Chinese fauna, and *P. aureatus* Yang is redescribed with the male genitalia given for the first time. Images of adults and genitalia of the examined species are provided, along with a key to the Chinese species and subspecies.

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1. Introduction

Pancalia Stephens is a small genus of twelve described species and three subspecies, distributed so far only in the Palaearctic and Oriental regions (Sinev 2002). It can be easily distinguished by the body with metal luster and rather asymmetrical male genitalia. In China five species were previously recorded (Gaedike 1967, Yang 1977, Liu 1981, 1992, 1997, Sinev 2007). In our study of the Chinese Cosmopterigidae, we recognized five species and one subspecies belonging to this genus, which are reported herein.

2. Material and methods

Adults were collected by light traps in mountainous areas. Terminology follows Koster and Sinev (2003) except the term “uncus” following Kaila (2004). Genitalia slides were made by mounting the material in the Canada balsam following the methods outlined by Li and Zheng (1996). Images of adults were taken with a Nikon D300 digi-

tal camera and genitalia were taken with an Olympus C-7070 digital camera. All the examined specimens are deposited in the Insect Collection, College of Life Sciences, Nankai University, Tianjin, China.

3. Taxonomy

3.1. *Pancalia* Stephens, 1829

Pancalia Stephens, 1829: 49.

Type species: *Phalaena Tinea leuvenhoekella* Linnaeus, 1761, by subsequent designation.

General characters. Adults with metal luster; labial palpi laterally flattened; antennae with pecten on scape; ocelli present; intersegmental membrane with microspines dorsally. Male genitalia with brachia of uncus symmetrical; valvae and valvellae asymmetrical; phallus without cornutus. Female genitalia with apophyses posteriores longer than apophyses anteriores; signa paired or absent.

Remarks. The opinions on the taxonomic sta-

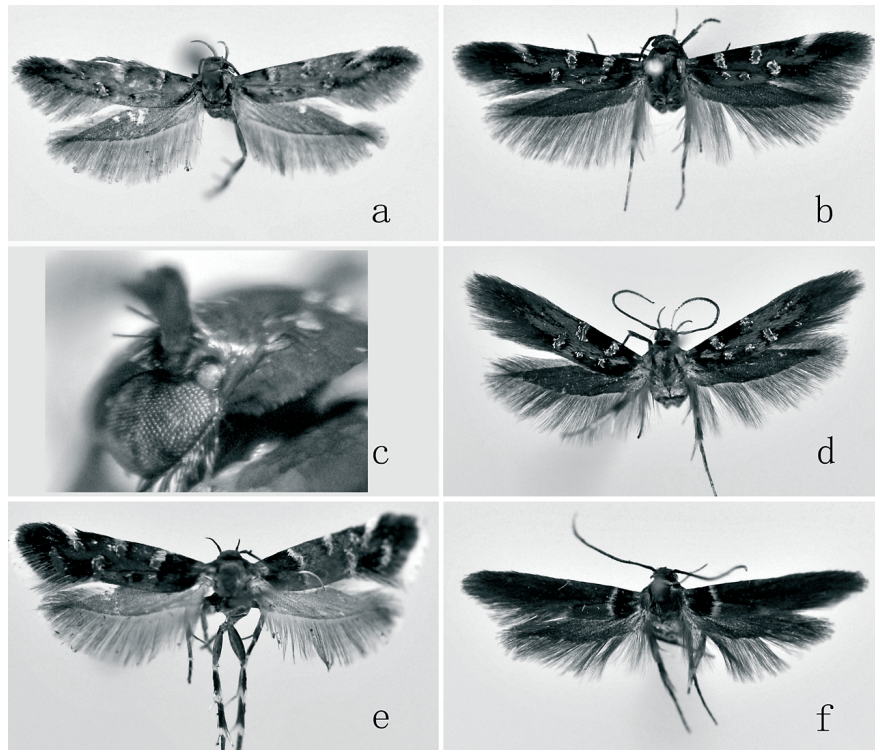


Fig. 1. Adults of *Pancalia* spp. – a. *P. aureatus* Yang. – b–c. *P. isschikii amurella* Gaedike (c. enlarged head showing ocellus). – d. *P. hexachrysa* (Meyrick). – e. *P. gaedikei* Sinev. – f. *P. wuyiensis* sp. n.

tus of the genus *Pancalia* Stephens vary among authors. *Pancalia* was placed in Gelechiidae (Heinemann & Wocke 1877), Elachistidae (Staudinger & Rebel 1901), Momphidae (Spuler 1910), Heliodinidae (Meyrick 1928, Gaedike 1967, Yang 1977, Liu 1981), and Schreckensteiniidae (Pierce & Metcalfe 1935, Kloet & Hincks 1945, Lhomme 1946, Gaedike 1967). It was firstly placed in Antequerinae of Cosmopterigidae by Kuroko (1982) and was substantiated by Sinev (1985). In this study we follow Sinev's treatment of its systematic position.

3.2. *Pancalia aureatus* Yang, 1977 (Figs 1a, 2a)

Pancaria (sic) *aureatus* Yang, 1977: 150.

Type material. Holotype ♂, China: Beijing Agricultural University [Malianwa] (39.55°N, 116.24°E), Beijing, 10.VII.1958, leg. Chikun Yang, genitalia slide No. ZZW08873. [examined]

Paratypes: 1 ♂, same locality as holotype, 18.VIII.1959, leg. Fasheng Li; 1 ♂, Luodao-

zhuang, Beijing, 5.VI.1951, leg. Chikun Yang. [Untraceable]

Additional material: 1 ♂, Mt. Xiaowutai, Yu County (39.57°N, 115.02°E), Hebei Province, 1,200 m a.s.l., 23.VII.2000, leg. Yanli Du & Zhendong Li; 1 ♂, Yangling (34.17°N, 108.04°E), Shaanxi Province, 450 m a.s.l., 22.VIII.1986, leg. Houhun Li; 2 ♂♂, Chengcheng County (35.11°N, 109.56°E), Shaanxi Province, 1,000 m a.s.l., 7.VII.1987, leg. Houhun Li.

Redescription. Adult (Fig. 1a). Wingspan 13.0–15.0 mm. Head shining dark leaden coloured. Antennae blackish brown. Labial palpi grayish yellow, leaden coloured ventrally. Thorax and tegulae dark leaden coloured. Forewings dark yellow with shining golden luster, black at base and apex, with three costal and four dorsal tubercular silvery spots, each spot edged with black scales on inside and outside; first costal spot at 1/6, straight down to fold, second one near middle extending to midwing, third one at 3/4, oblique to end of cell, becoming white into cilia; first dorsal spot and smaller second one beneath fold at 2/5 and 3/5 respectively, third one before tornus, obliquely outward and perpendicular to

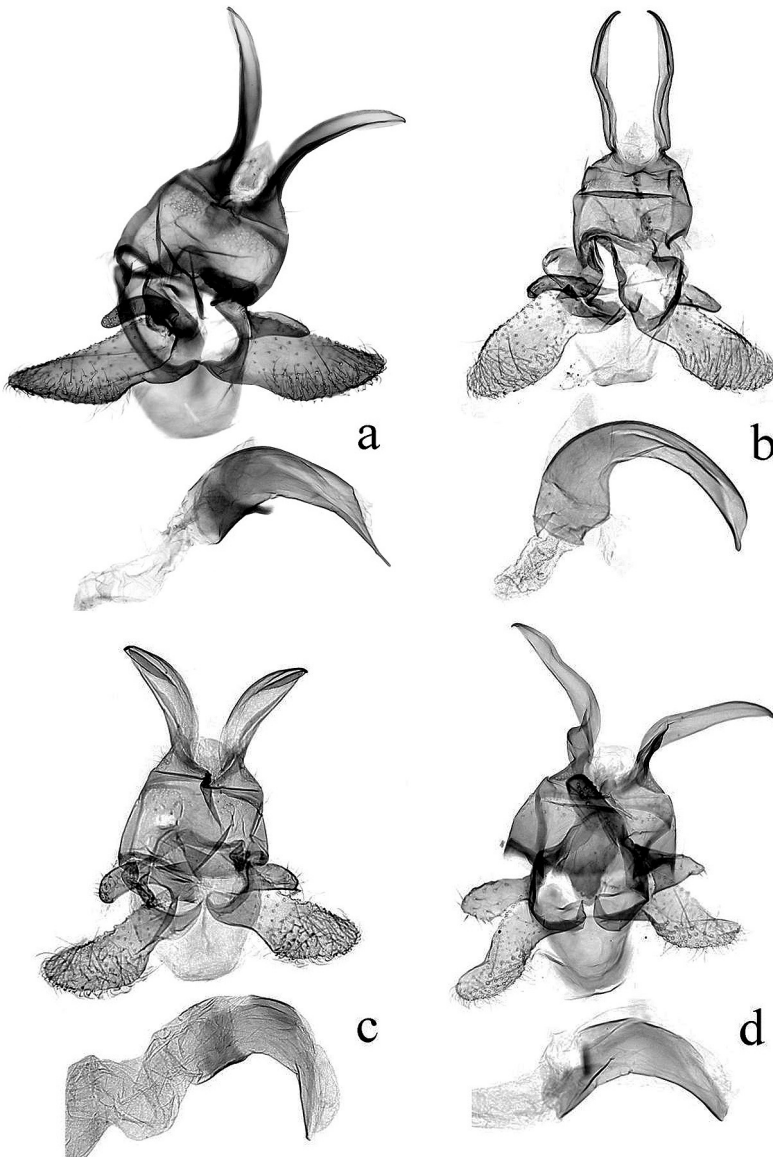


Fig. 2. Male genitalia of *Pancalia* spp. – a. *P. aureatus* Yang. – b. *P. isshikii amurella* Gaedike. – c. *P. hexachrysa* (Meyrick). – d. *P. wuyiensis* sp. n.

fold, fourth one on termen; cilia grayish yellow, dark gray at apex. Hindwings and cilia grayish yellow. Fore legs dark brown or dark leaden coloured, mid and hind legs concolourous to fore legs, but with grayish white or white annulations at middle and end of tibiae as well as at end of each tarsomere.

Male genitalia (Fig. 2a). Pleural lobes of eighth segment nearly trapezoidal. Brachia of uncus curved, longer than tegumen, slightly hooked apically. Valvae with distal half nearly triangular, dorsal margin straight, ventral margin

slightly concave at basal third. Left valvella slightly narrowed distally, curved downwards in middle, blunt at apex; right valvella digitate, about 4/5 length of left one, gradually narrowed to narrowly rounded apex. Anellus a sclerotized ring. Phallus broad basally, slightly narrowed distally, with an elongate, sharply pointed apex.

Diagnosis. This species resembles *P. hexachrysa* (Meyrick) in the male genitalia, but can be distinguished by the forewings dark yellow with shining golden luster, the brachia of uncus narrower, longer than the tegumen, the left valvella

slightly narrowed distally and the phallus gently bent subapically. In *P. hexachrysa* (Meyrick), the forewings are ochreous brown except costal margin black from base to second costal spot; the brachia of uncus are wider, about same length as the tegumen, the left valvella is somewhat expanded distally, and the phallus is strongly bent subapically.

Distribution. China (Beijing, Hebei, Shaanxi).

3.3. *Pancalia isshikii amurella* Gaedike, 1967 (Figs 1b–c, 2b, 3a)

Pancalia amurella Gaedike, 1967: 372.

Pancalia isshikii amurella Gaedike; Sinev, 1985: 821; Sinev, 1999: 264.

Material examined. China: 3 ♂♂, Sangang, Mt. Wuyi (27.45°N, 117.40°E), Fujian Province, 740 m a.s.l., 17–19.V.2004, leg. Haili Yu; 1 ♂, Mt. Baishi, Laiyuan County (39.12°N, 114.41°E), Hebei Province, 1,300 m a.s.l., 20.VII.2000, leg. Haili Yu; 1 ♂ 1 ♀, Mt. Xiaowutai, Yu County (39.57°N, 115.02°E), Hebei Province, 1,200 m a.s.l., 22–23.VII.2000, leg. Yanli Du & Zhendong Li; 5 ♂♂, Baligou, Huixian City (35.27°N, 113.47°E), Henan Province, 780 m a.s.l., 12–14.VII.2002, leg. Xinpu Wang; 3 ♂♂, Louguantai (34.06°N, 108.19°E), Shaanxi Province, 1,300 m a.s.l., 13.V.1995, leg. Aisihaer Maimaiti; 1 ♂, Chengcheng County (35.11°N, 109.56°E), Shaanxi Province, 1,000 m a.s.l., 7.VII.1987, leg. Houhun Li; 1 ♂, Jiulong, Ji County (40.02°N, 117.24°E), Tianjin, 200 m a.s.l., 28.VI.2004, leg. Houhun Li *et al.*; 1 ♂, Limutai, Ji County (40.02°N, 117.24°E), Tianjin, 300 m a.s.l., 1.VII.2007, leg. Houhun Li *et al.*

Adult (Figs. 1b–c). Wingspan 10.5–12.0 mm.

Diagnosis. This species is similar to *P. hexachrysa* (Meyrick) externally, but can be distinguished by the third costal spot on the forewing becoming white into cilia, the phallus bulbous at base in the male genitalia (Fig. 2b), and the signa paired in the female genitalia (Fig. 3a). In *P. hexachrysa* (Meyrick), the third costal spot on the forewing is not produced into cilia, the phallus is not bulbous in the male genitalia, and the signa are absent in the female genitalia. It also resembles *P. sinense* Gaedike, but can be separated by

the male left valvella conspicuously curved at base. This subspecies is reported for the first time in China.

Distribution. China (Fujian, Hebei, Henan, Shaanxi, Tianjin), Russia (Far East).

3.4. *Pancalia hexachrysa* (Meyrick, 1935) (Figs 1d, 2c, 3b)

Chrysoclista hexachrysa Meyrick, 1935: 607.

Pancalia leuwenhoekella japonica Riedl, 1973: 29.

Pancalia hexachrysa (Meyrick), Kuroko, 1982: 267; Sinev, 1985: 817; Liu, 1992: 676; Liu, 1997: 37; Sinev, 1999: 261.

Material examined. China: 2 ♂♂, Sangang, Mt. Wuyi (27.45°N, 117.40°E), Fujian Province, 740 m a.s.l., 17–19.V.2004, leg. Haili Yu; 5 ♂♂, Guadun, Mt. Wuyi (29.49°N, 110.26°E), Fujian Province, 1,100 m a.s.l., 22.V.2004, leg. Haili Yu; 1 ♀, Guadun, Mt. Wuyi (29.49°N, 110.26°E), Fujian Province, 1,100 m a.s.l., 23.V.2004, leg. Haili Yu; 2 ♂♂, Xianfengling, Mt. Wuyi (29.49°N, 110.26°E), Fujian Province, 1,000 m a.s.l., 26.V.2004, leg. Haili Yu; 2 ♂♂, Dashah, Daozhen County (28.53°N, 107.36°E), Guizhou Province, 1,420 m a.s.l., 22.V.2004, leg. Shulian Hao; 4 ♂♂, Dashah, Daozhen County (28.53°N, 107.36°E), Guizhou Province, 1,450 m a.s.l., 23–24.V.2004, leg. Shulian Hao; 4 ♂♂, Dashah, Daozhen County (28.53°N, 107.36°E), Guizhou Province, 1,350 m a.s.l., 25.V.2004, leg. Shulian Hao; 1 ♀, Baihe County (32.49°N, 110.07°E), Shaanxi Province, 200 m a.s.l., 16.V.1994, leg. Jin Zhou.

Adult (Fig. 1d). Wingspan 10.0–13.0 mm.

Diagnosis. This species resembles *P. gaedikei* Sinev, but can be distinguished by the dark brown cilia of forewings, the distally expanded left valvella in the male genitalia (Fig. 2c), and the absence of signa in the female genitalia (Fig. 3b). In *P. gaedikei* Sinev, the cilia of the forewings is white in distal half before apex of costal margin and along termen, the left valvella is slightly narrowed distally in the male genitalia, and the corpus bursae has paired signa in the female genitalia. This species is also similar to *P. aureatus* Yang, and the differences between them are stated under *P. aureatus* Yang.

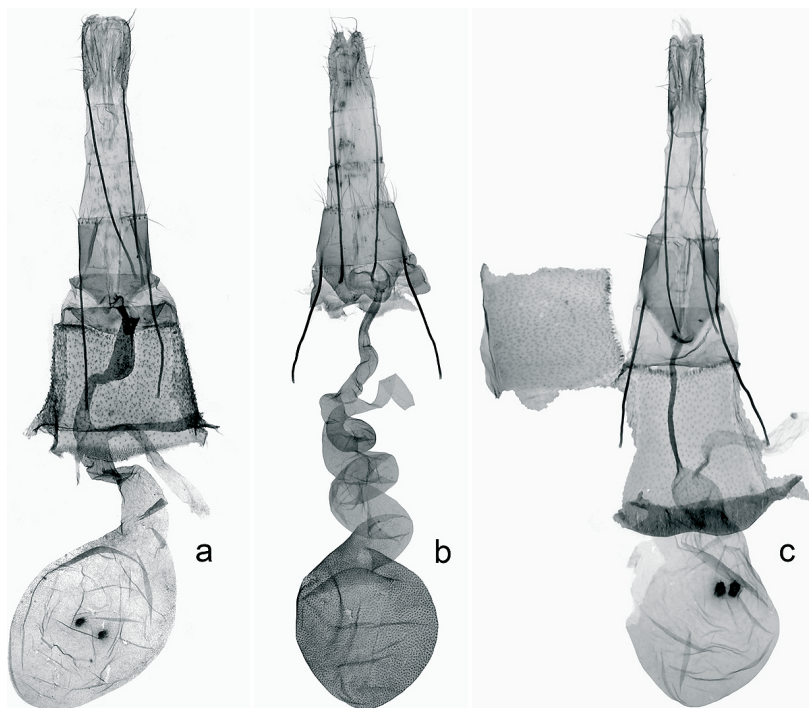


Fig. 3. Female genitalia of *Pancalia* spp. – a. *P. isshikii amurella* Gaedike. – b. *P. hexachrysa* (Meyrick). – c. *P. gaedikei* Sinev.

Distribution. China (Anhui, Fujian, Guizhou, Hunan, Shaanxi), Japan (Honshu, Kyushu), Russia (Far East).

3.5. *Pancalia gaedikei* Sinev, 1985 (Figs 1e, 3c)

Pancalia gaedikei Sinev, 1985: 818; Sinev, 2007: 39.

Pancaria (sic) *latreillella* Curtis; Yang, 1977: 150, misidentification.

Material examined. China: 1 ♀, Beijing Agricultural University [Malianwa] (39.55°N, 116.24°E), Beijing, 25.VII.1958, leg. Chikun Yang.

Adult (Fig. 1e). Wingspan 12.5 mm.

Diagnosis. This species is characterized by the cilia along termen of forewings white in distal half; the male valvae boot-shaped and the valvellae slightly narrowed apically in the male genitalia (Sinev 1985); the female sterigma being a sclerotized band along ventral margin of ostium bursae, and the paired signa being rounded, spinescent invaginations (Fig. 3c). This species was misidentified as *Pancaria* (sic) *latreillella* Curtis by Yang (1977).

Distribution. China (Beijing), Russia (Far East).

3.6. *Pancalia sinense* Gaedike, 1967

Pancalia sinense Gaedike, 1967: 372.

Pancalia sinensis (sic) Gaedike; Sinev, 1999: 264.

Diagnosis. This species resembles *P. isshikii amurella* Gaedike, but can be distinguished by the antennae dirty-white near apex, the forewings with a large brown spot at middle of basal black area, and the left valvella slightly bent near apex in the male genitalia. In *P. isshikii amurella* Gaedike, the antennae in male are uniformly brown, the forewings sometimes have sporadic brown scales at middle of basal black area, and the left valvella is distinctly curved at base in the male genitalia.

Distribution. China (Beijing).

Remarks. Gaedike (1967) described and illustrated *P. sinense* based on one male specimen collected from Beijing, China. Sinev (1999) also provided the illustration of its male genitalia. Unfortunately, we did not collect it in this study.

3.7. *Pancalia wuyiensis* Zhang & Li, sp. n. (Figs 1f, 2d)

Type material. Holotype ♂, China: Mt. Wuyi (26.54°N, 116.42°E), Fujian Province, 740 m a.s.l., 20.V.2004, leg. Haili Yu; genitalia slide No. ZZW07226. Paratypes: 3 ♂♂, same data as for holotype except dated 16, 21.V.2004.

Diagnosis. This species resembles *P. pyrophracta* (Meyrick, 1924), but can be distinguished from it by the forewings having a narrower orange yellow fascia, with small pale yellow spots at costal and dorsal 1/2 respectively; in the male genitalia, the left valvella longer than the right one, conspicuously broadened before apex, the right valvella triangular, pointed at apex. In *P. pyrophracta* (Meyrick), the forewings have wider orange yellow fascia and lack the spots at costal and dorsal 1/2; in the male genitalia, the left valvella is evenly broad and of same length as the right one, the right valvella is broad at base, gradually narrowed to 3/5, and sticklike in distal 2/5. The new species is distinguishable from other known species of the genus by the forewings lacking the tubercular scales.

Description. Adult (Fig. 1f): Wingspan 11.5 mm. Head shining dark leaden. Antennae blackish brown except flagellum with dorsal surface white distally. Labial palpi grayish yellow, second segment black apically, third segment black ventrally. Thorax and tegulae blackish brown. Forewings with basal 1/6 having shining purplish luster, remaining part blackish brown; with a narrow orange yellow fascia from costal 1/6 to dorsum, outwardly geniculate at fold; small yellow spots at costal and dorsal 1/2 respectively; cilia blackish brown. Hindwings and cilia dark brown. Legs black; spurs of mid tibiae deep gray dorsally, black ventrally; tarsi deep gray on ventral surface except first tarsomere with deep gray annulation medially; hind tibiae with grayish white annulations at middle and end, spurs gray.

Male genitalia (Fig. 2d): Pleural lobes of eighth segment nearly semicircular. Brachia of uncus curved, hooked apically. Valvae bluntly rounded at apex; left valva curved more or less in S shape, distal half of dorsal margin and basal half of ventral margin concave; right valva slightly shorter than left one, dorsal 2/3 concave, ventral

margin arched. Left valvella slightly narrowed at base, broadened before apex, apex blunt; right valvella triangular, pointed at apex, about 3/4 length of left one. Anellus heavily sclerotized, distal 2/5 nearly parallel sided, apex blunt. Phallus broad basally, narrowed slightly to blunt apex, arched medially.

Female. Unknown.

Distribution. China (Fujian).

Etymology. The specific name is derived from the type locality, Mt. Wuyi, Fujian Province.

4. Key to the Chinese species of *Pancalia* Stephens based on external and male genitalia characters

1. Forewings without spots of tubercular scales; male anellus elongate *P. wuyiensis* sp. n.
- Forewings with conspicuous spots of tubercular scales; male anellus not elongate 2
2. Basal spots of forewings produced to a silvery band; male phallus dilated bulbously at base 3
- Basal spots of forewings separated conspicuously; male phallus not dilated at base 4
3. Antennae in male uniformly brown, forewings sometimes with sporadic brown scales at middle of basal black area; male left valvella distinctly curved at base
- Antennae in male dirty-white near apex, forewings with a large brown spot at middle of basal black area; male left valvella slightly bent near apex *P. sinense* Gaedike
4. Forewings with third costal spot becoming white into cilia; male left valvella slightly narrowed distally, phallus with apex elongate and pointed 5
- Forewings with third costal spot not produced into cilia; male left valvella roundly expanded distally, phallus with apex not elongate
- Forewings ochreous brown, cilia with distal half white along termen; male valvae boot-shaped *P. gaedikei* Sinev
- Forewings dark yellow with shining golden luster, cilia uniformly dark yellow; male valvae triangular in distal half

P. aureatus Yang

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