

Species of *Heleanna* Clarke, 1976 (Lepidoptera: Tortricidae: Olethreutinae) from China

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Abstract: Two species of *Heleanna* Clarke are recorded in this paper. The genus *Heleanna* is first reported in Chinese mainland. *H. turpinivora* Nasu & Byun, already known from Korea and Japan, is now reported in China. Variation in the female genitalia is described. A key to Chinese species of *Heleanna* is given. Photographs of the adults and genitalia of *H. turpinivora* are provided.

Key words: Tortricoidea; Eucosmini; key; taxonomy

中国泽小卷蛾属 *Heleanna* 记述 (鳞翅目: 卷蛾科: 新小卷蛾亚科)

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摘要: 首次报道泽小卷蛾属 *Heleanna* 在中国大陆的分布, 记述泽小卷蛾属 *Heleanna* 2 种, 其中包括 1 新纪录种: 山香圆泽小卷蛾 *H. turpinivora* Nasu & Byun, 提供了该种的成虫和雌雄性外生殖器图, 指出了雌性生殖器特征的变异。文中还提供了中国泽小卷蛾属的分种检索表。

关键词: 卷蛾总科; 花小卷蛾族; 检索表; 分类

Introduction

Clarke (1976) proposed the genus *Heleanna* with *Rhopobota physalodes* Meyrick from Sri Lanka as the type. To date the genus *Heleanna* includes six species: *H. chloreis* (Turner), *H. fukugi* Nasu, *H. melanomochla* (Meyrick), *H. physalodes* (Meyrick), *H. tokyoensis* Nasu & Byun and *H. turpinivora* Nasu & Byun distributed in the Palearctic, Oriental and Australian Regions (Nasu 1999; Brown 2005; Horak 2006; Gilligan *et al.* 2014).

In China, *H. melanomochla* (Meyrick) was recorded as a pest feeding on mango from Taiwan (Meyrick 1936; Clarke 1976; Nasu 1995). During examination of specimens from China (Zhejiang Province), the genus *Heleanna* is discovered for the first time on the Chinese mainland. In this paper *H. turpinivora* Nasu & Byun is reported in China for the first time. Photographs of adults and genitalia of *H. turpinivora* are provided. A key to Chinese species of *Heleanna* is given.

Material and methods

This study is based on examination of specimens collected by light traps from forests and mountains in Zhejiang Province, China. Genitalia dissection and mounting methods follow Li (2002). Images of the adults were taken with a Nikon D300 digital camera with a macro lens, and images of the genitalia were captured with an Olympus C-7070 digital camera attached to an Olympus BX51 microscope.

Morphological terminology follows Brown & Powell (1991) as refined by Baixeras (2002). All specimens examined are deposited in the Insect Collection, College of Life Sciences, Nankai University, Tianjin, China.

Abbreviations. TL—type locality; TD—type depository; BMNH—Natural History Museum, London, United Kingdom; NSMT—National Science Museum, Tokyo, Japan.

Taxonomy

Heleanna Clarke, 1976

Heleanna Clarke, 1976, *Insects of Micronesia*, 9: 11.

Type species: *Rhopobota physalodes* Meyrick, 1910.

General characters. Forewing with chorda and M-stem reduced or absent; R_3 close to or stalked with long stalk of R_4 and R_5 ; R_5 to termen; M_1 , M_2 and M_3 about equidistant; M_3 very close to CuA_1 at base but the two veins distally strongly diverging with M_3 bent to apex and CuA_1 terminated near tornus; CuA_2 from beyond middle of cell; CuP present at margin; in the male costal fold small or absent and an ovate deep depression at the base of cell always present filled with whitish modified scales and covered by a dome of large scales. Hindwing with $Sc+R_1$ and R_s connected at base, R_s and M_1 closely approximated and parallel at base, M_2 bent close to stalk of M_3 and CuA_1 ; CuA_2 from 3/4 of cell or beyond; CuP produced into a weak trace at wing margin, $1A+2A$ well developed; $3A$ invisible.

Male genitalia. Tegumen with a deep notch on top medially. Uncus absent. Socius well developed, strongly sclerotized, drooping, naked at basal half and distally usually bristled and often with many stout setae apically. Gnathos nearly membranous. Valva usually slender, medially with distinct neck; cucullus triangular or oblong; a setose process usually behind posterior edge of basal opening. Aedeagus short and simple, cornuti composed of a bunch of slender spines. While in *H. fukugi* Nasu, uncus mound-like, concave on top, valva oblong, unconstructed, sacculus with 6–7 long thick setae before cucullus, which are absent in other species.

Female genitalia. Sterigma ring-shaped or cup-shaped at posterior margin of sternite VII or in an excavation of its hindmargin, a twisted and longitudinally grooved or folded ductus bursae strongly sclerotized except at both ends. Corpus bursae inverse pear-shaped, usually with narrowed anterior termination; two horn-shaped or blade-shaped signa present.

Distribution. Palaearctic; Oriental; Australian Regions.

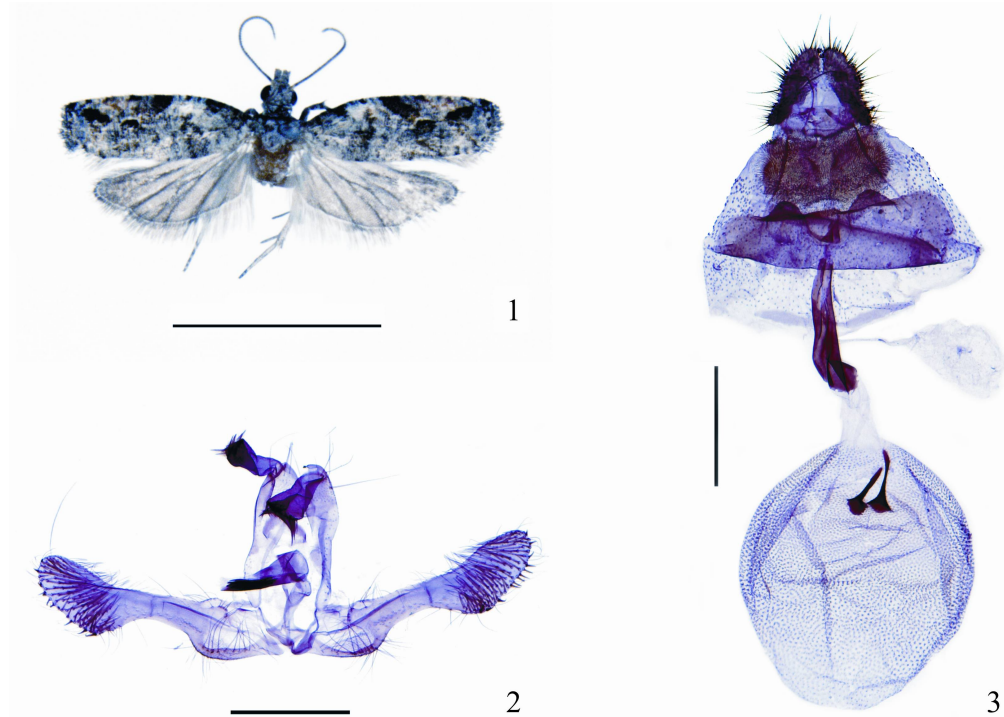
Key to Chinese species of *Heleanna* Clarke based on genitalia characters

1. In the male socius elongate oval, with five or six stout setae apically; cucullus oval; aedeagus with 11–12 deciduous cornuti; in the female sternite VII with a pair of leaf-shaped processes on the outer side of ostium

- and two signa equal in size *H. melanomochla* (Meyrick)
- . In the male socius triangular, with more than ten stout setae apically; cucullus triangular; aedeagus with 8–9 deciduous cornuti; in the female sternite VII with a pair of triangular processes located on the outer side of ostium and two signa different in size *H. turpinivora* Nasu & Byun

1. *Heleanna turpinivora* Nasu & Byun, 2007 (Figs. 1–3), new record to China

Heleanna turpinivora Nasu & Byun, 2007, *Transactions of the Lepidopterological Society of Japan*, 58(4): 380. TL: Japan, Honshu, Tokyo, Garden of the Imperial Palace; TD: NSMT.



Figures 1–3. *Heleanna turpinivora* Nasu & Byun. 1. Adult; 2. Male genitalia, slide no. ZAH15011; 3. Female genitalia, slide no. ZAH15051. Scale bars: 1 = 5.0 mm; 2, 3 = 0.5 mm.

Adult. Male (Fig. 1). Vertex with light brown scales; frons flat, with light brown scales over it. Antenna light brown except for gray scape. Labial palpus grayish brown, inner side white; second segment triangular, third segment small and porrect. Thorax and tegula grayish brown, with apical half gray. Forewing length 5.5 mm; elongate oblong; costa concave at basal 1/5; apex and tornus round; ground color dark gray; three or four scale-tufts on basal 1/3 (in some specimens scale-tufts can't be observed because scales are worn-out); costa dark brown at basal 1/5, with a dark brown semicircular patch scattered with brown on the middle; two irregular dark brown patches located at the apical end of discal cell and before apex respectively; two or three small gray patches along termen; costa with seven pairs of blurry white strigulae from base to apex: strigulae 1–4 between base and the point where Sc meets costa; strigulae 5 and 6 on the semicircular patch; distal pair distributed between pairs of veins R_3 – R_4 ; cilia gray, with brown basal line. Hindwing with well developed cubital pectin and distal half of costa with many scales; hindwing and cilia gray. Foreleg brown; midleg grayish

brown, tarsus brown; hindleg gray, tarsus brown. Abdomen grayish brown, concolorous with thorax.

Male scent organ. Costal fold absent. An ovate depression is located on the base of discal cell on the upper side of forewing, filled with whitish yellow long scales and covered with large domed scales.

Male genitalia (Fig. 2). Tegumen with a wide concavity on top. Uncus absent. Socius large, nearly triangular, sclerotized, with many stout setae apically. Gnathos weakly sclerotized. Valva slender, deeply constricted in the middle ventrally; neck slender; sacculus with many long setae below basal opening; a setose papillary process at posterior edge of basal opening; cucullus roundly triangular, hairy, with marginal spines. Aedeagus cone-shaped, gradually narrowed to termination, armed with nine deciduous cornuti.

Female. Head and thorax similar to male, forewing length 5.5 mm; forewing color and pattern as in male, but costal base not concave.

Female genitalia (Fig. 3). Papillae anales large, flat, setose. Apophyses posteriores nearly as long as apophyses anteriores. Sternite VIII membranous, spinulose. Ostium cup-shaped, located in an incision on posterior edge of sternite VII, with a pair of triangular strongly sclerotized processes located on the outer side of ostium. Ductus bursae sclerotized except anterior 1/6, twisted and curved at anterior 1/3. Ductus seminalis originating from about anterior 1/3 of sclerotized part of ductus bursae. Corpus bursae inverse pear-shaped, inner surface spinulose; two blade-like signa different in size, located near entrance of corpus bursae.

Specimens examined. 2♂3♀, **China**, Jiufucun, Longtangshan, Zhejiang Province, 520 m, 27–31-VIII-2014, Aihui YIN, Qingyun WANG & Suran LI; 2♂1♀, Laoan, Mt. Tianmushan, Zhejiang Province, 555 m, 17–19-VIII-2014, Aihui YIN, Qingyun WANG & Suran LI; 1♂, Longxushan Village, Longxushan, Zhejiang Province, 778 m, 21-VIII-2014, Aihui YIN, Qingyun WANG & Suran LI (genitalia slide nos. ZAH15011♂, ZAH15014♂, ZAH15051♀).

Host plant. *Turpinia ternata* Nakai (Staphyleaceae) (Nasu & Byun, 2007).

Distribution. China (Zhejiang); Korea; Japan.

Remarks. The characters of the adult and male genitalia are identical between the specimens from Japan and Korea (the type locality) and China but in the female, the corpus bursae is slightly different. The corpus bursae is inverse pear-shaped and strongly constricted at anterior 1/3 in the paratype (Nasu & Byun 2007) while in the specimens from China the constriction of the corpus bursae at the anterior part is indistinct.

This species is similar to *H. melanomochla* (Meyrick), but can be distinguished by socius triangular, with more than ten stout setae apically; cucullus triangular; aedeagus with 8–9 deciduous cornuti in the male and a pair of triangular processes located on the outer side of ostium and two signa different in size in the female. While in the latter species, socius is elongate oval, with five or six stout setae apically, cucullus is oval and aedeagus is armed with 11–12 deciduous cornuti in the male; and a pair of leaf-shaped processes are on the outer side of ostium and two signa are equal in size in the female.

2. *Heleanna melanomochla* (Meyrick, 1936)

Acroclita melanomochla Meyrick, 1936, *Exotic Microlepidoptera*, 5: 24; Clarke, 1958, *Catalogue of the type specimens of Microlepidoptera in the British Museum (Natural History)* described by Edward Meyrick, 3:

276; Nasu, 1995, *Transactions of the Lepidopterological Society of Japan*, 46(3): 159; Brown, 2005, *World of Catalogue of Insects*, 5: 377. TL: Taiwan, Formosa (Heito) [Taiwan]; TD: BMNH.

Heleanna melanomochla: Clarke, 1976, *Insects of Micronesia*, 9(1): 12.

Host plant. *Mangifera indica* Linnaeus (Anacardiaceae) (Meyrick 1936; Nasu 1995).

Distribution. China (Taiwan).

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