

Two New Records of Ennominae Species (Lepidoptera: Geometridae) from Korea

Sei-Woong Choi^{1,*}, Jeong-Seop An¹, Sung-Soo Kim²

¹Department of Environmental Education, Mokpo National University,
Muan 534-729, Korea

²Research Institute for East Asian Environment and Biology,
Seoul 134-852, Korea

ABSTRACT

Two ennomine species, *Amblychia angeronaria* Guenée and *Peratostega deletaria* (Moore), are reported for the first time from Korea. *Amblychia angeronaria* was collected from Isl. Gageo-do, in the south west of Korea. The species is distinguished by the large wingspan, the ochreous forewing with a row of large white dots on the postmedian and a grayish apical dot, and the grayish or dark ochreous hindwing with undulating post-medial line and dark grayish subterminal line. *Peratostega deleraia* was collected from Isl. Jeju-do, and can be distinguished by the dark brown forewing with a blackish dentate postmedian and a light brown apical dot, and the dark brown hindwing with the light brown subterminal and angulate termen. Diagnosis and description of the species are given along with figures of the male and female genitalia.

Keywords: Lepidoptera, Geometridae, Ennominae, *Peratostega deletaria*, *Amblychia angeronaria*, taxonomy, Korea

INTRODUCTION

Genus *Amblychia* Guenée was established, based on *Amblychia angeronaria* Guenée as the type species, and comprises about 20 species mostly from the Indo-Australian region (Holloway, 1993; Scoble, 1999). The species of *Amblychia* show gray-brown wing ground color with a mixture of straight and crenulate fasciae, strongly angular and excavated margin to the hindwing (Holloway, 1993). The male genitalia of *Amblychia* have a bifid uncus, strong and apically rugose gnathos, rhomboidal valva with short and long hairsetae on the costa and the aedeagus with a small lateral thorn subapically. The female genitalia of *Amblychia* have the strongly sclerotized, curved ovipositor lobe, densely scaled membranous pair of lobes on the lamella postvaginalis, the short and sclerotized ductus bursae and the large corpus bursae with a dentate signum (Holloway, 1993).

Genus *Peratostega* Warren was designated, based on *Peratostega coctata* Warren as the type species, and comprises four species from northern India, Borneo and Japan (Scoble,

1999). *Peratostega* species show filiform male antennae and dull reddish brown wings (Holloway, 1993). The male genitalia of *Peratostega* have a single coremata on valva, the short and triangular valva with double spurs from sclerotized ventral angle, the short saccus, the small aedeagus with a broad scobinate band on the vesica. The female genitalia have the crescent-shaped lamella antevaginalis, the narrow ductus bursae, the pyriform corpus bursae with a straight bifid or bilobed flange (Holloway, 1993).

In the present study, two ennomine species, *Amblychia angeronaria* Guenée and *Peratostega deletaria* are reported for the first time in Korea. More than 10 specimens of *Amblychia angeronaria* were collected at the most southwestern island of Korea, Gageo-do, and two specimens of *Peratostega deletaria* were collected at the southern slope of Mt. Halla-san, Jeju-do. Morphological terminology, including the male and female genitalia refers to Scoble (1992). Abbreviations are as follows: TL, type locality; MNU, Mokpo National University; JN, Jeonnam, Province Jeollanam-do; JJ, Province Jeju-do.

© This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

***To whom correspondence should be addressed**
Tel: 82-61-450-2783, Fax: 82-61-450-2789
E-mail: choisw@mokpo.ac.kr



Fig. 1. Adult of *Amblychia angeronaria* and *Peratostega deletaria* in Korea. A, *Amblychia angeronaria* (male); B, *Amblychia angeronaria* (female); C, *Peratostega deletaria*.

SYSTEMATIC ACCOUNTS

Order Lepidoptera Linnaeus, 1758
 Family Geometridae Stephens, 1829
 Subfamily Ennominae Duponchel, 1845
 Genus *Amblychia* Guenée, [1858]

Type species: *Amblychia angeronaria* Guenée.

¹**Amblychia angeronaria* Guenée, [1858] (Figs. 1, 2)

Amblychia angeronaria Guenée, [1858]: 215. TL: India (central).

Amblychia sinibia Wehrli, 1938: 88. TL: China, Sichuan, Tachien-lu (Kangding).

Amblychia torrida Moore, 1877: 621. TL: Andaman Island, South Andaman (Port Blair).

Material examined. Korea: JN: 1♂6♀, Isl. Gageo-do, N34°03'50", E125°07'18", 348 m, 5 Jun 2012; 1♀, Isl. Gageo-do, N34°04'24", E125°06'00", 185 m, 5 Jun 2012; 1♂5♀, Isl. Gageo-do, N34°04'16", E125°06'26", 228 m, 5 Jun 2012; 1♀, Isl. Gageo-do, N34°04'24", E125°06'00", 185 m, 10 Sep 2012.

Diagnosis. This species is characterized by the long pectinations of the male antennae, the larger wingspan, a row of white triangular dots on the postmedian fascia of forewing, a dark brown medial line and blackish discal dot on fore and hindwings and undulating postmedial line of hindwing. The male genitalia can be distinguished by the strongly tapered and apically bifid uncus, the large spatulate gnathos, the large and rounded juxta, and the membranous and apically projected valva, with large setae-like hairs on the costa and cucullus. The female genitalia can be distinguished by the long and medially curved ovipositor, the long and sclerotized apophyses, the broad antrum, the short ductus bursae, and

the long membranous corpus bursae with a rounded signum with dentate margin.

Description. Wingspan 67–75 mm. **Head:** Antennae in male bipectinate with long pectinations (Fig. 1A), in female filiform (Fig. 1B); frons broad, ventrally projected, covered with dark ochreous scales; labial palpi long, almost twice to eye diameter, well projected beyond frons covered with dark ochreous hairs. **Thorax:** Body and legs covered with yellowish white hairs. **Forewing:** Ground color ochreous; basal line dark ochreous, suffused with white dots; medial line dark ochreous, slightly rounded; one dark brown discal dot; postmedial line with a row of large whitish triangular dots; termen with dark brown or blackish, undulating subterminal line; apex with one large, light ochreous dot. **Hindwing:** Ground color brownish in male and dark ochreous in female; medial line dark ochreous; discal dot blackish; postmedial line blackish, undulating; termen with dark ochreous rounded subterminal line; margin medially sharply pointed outward.

Male genitalia (Fig. 2A, B). Uncus long, strongly tapered, apex weakly bifid; gnathos spatulate; tegumen triangular, almost equal to length of vinculum; transtilla ring-shaped; juxta large, heart-shaped; saccus short, broad. Valva long, strongly tapered, apex projected; costa slender, sclerotized, distally with long setae-like hairs; sacculus long, sclerotized; cucullus basally with setae-like hairs. Aedeagus long, rod-shaped; vesica tubular with small patch of cornuti.

Female genitalia (Fig. 2E). Ovipositor lobe long, medially curved, distally sharply pointed; apophyses posteriores strongly sclerotized, long, almost equal to length of apophyses anteriores; antrum broad; ductus bursae short, tapered, sclerotized; corpus bursae long, pear-shaped, signum rounded sclerotized plate-shaped with dentate margin.

Host plant. Lauraceae (Sugi, 1987).

Distribution. Korea, Japan, Taiwan, Borneo, Sumatra, North

Korean name: ¹*큰노랑남방가지나방 (신칭)

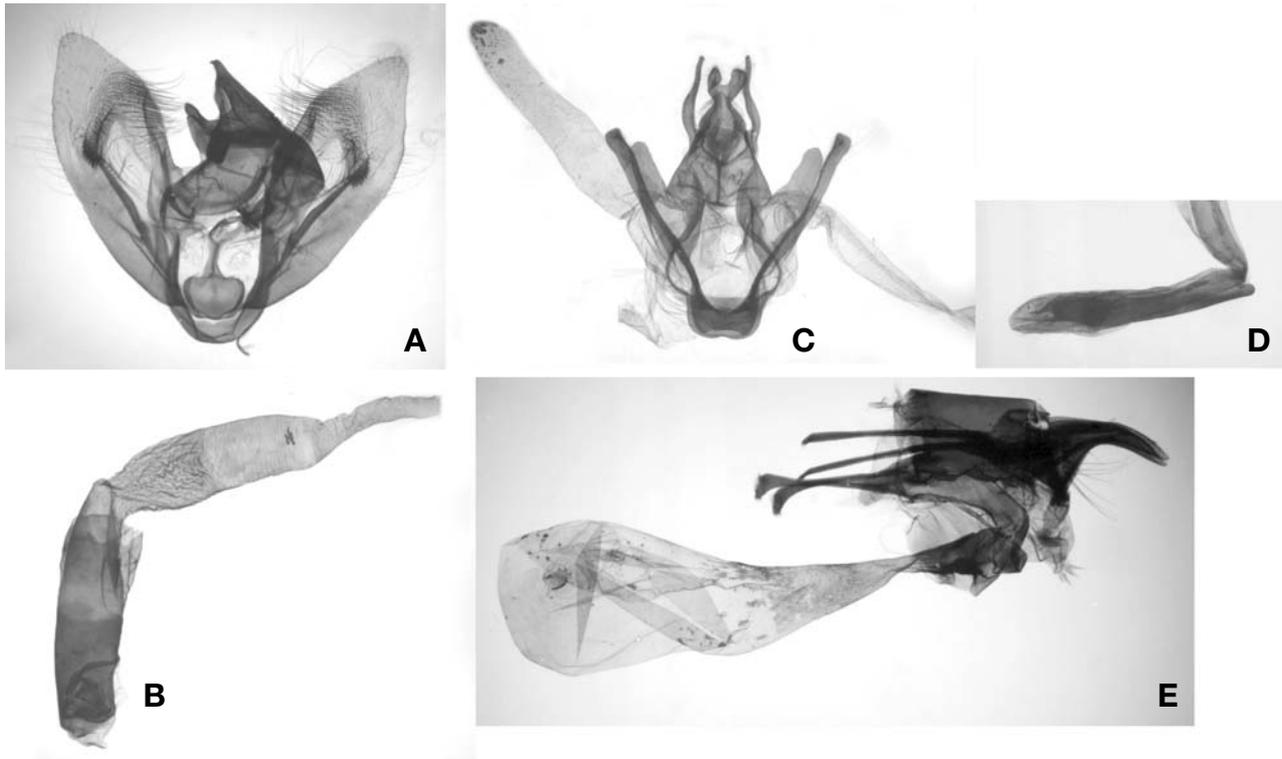


Fig. 2. Male and female genitalia of *Amblychia angeronaria* and *Peratostega deletaria* from Korea. A, B, E, *Amblychia angeronaria*; C, D, *Peratostega deletaria*; A, C, Male genital capsule; B, D, Aedeagus; E, Female genitalia.

East Himalaya.

Remarks. The species is bivoltine in Korea, flying June and September.

Genus *Peratostega* Warren, 1897

Peratostega Warren, 1897: 80.

Type species: *Peratostega coctata* Warren, 1897.

¹**Peratostega deletaria* (Moore), 1888 (Figs. 1, 2)

Macaria deletaria Moore, 1888: 261, Pl. 8, fig. 14. TL: India, Darjeeling.

Lomographa (Ingena) deletaria hypotaenia Prout, 1930: 315. TL: Japan, Takao-san.

Material examined. Korea: JJ: 1♂ Seonheul, Jocheon, N33° 16'5.6", E126° 27'22.8", 16 Jul 2010, Kim SS; 1♂ Hareri, Seogwipo-si, N33° 19'56.7", E126° 36'25.7", 499 m, 2 Oct 2010, Choi SW.

Diagnosis. This species can be distinguished by the brownish wings, dark ochreous dentate postmedial line of fore and hindwings and light yellowish apical dot of the forewing. The male genitalia can be distinguished by the bifid uncus,

long digitate gnathos, membranous costa and long and sclerotized saccullus of valva, and a pair of long coremata pouch on valva.

Description. Wingspan 26 mm. **Head:** Antennae in male fili-form (Fig. 1C); frons narrow, covered with ochreous and dark ochreous scales; labial palpi strongly upturned, projected beyond frons covered with ochreous hairs. **Thorax:** Body and legs covered with yellowish white hairs. **Forewing:** Ground color light brownish; postmedial line dark brown, thick, rounded; apex with large light yellowish dot. **Hindwing:** Ground color brownish; basally dark brownish; postmedial line dark brownish, dentate; termen medially projected.

Male genitalia (Fig. 2C, D). Uncus expanded, bifid; gnathos long digitate; tegumen triangular, almost equal to length of vinculum; saccus short, broad. Valva long, slender; costa slender, membranous; sacculus long, strongly sclerotized; a pair of coremata pouch present. Aedeagus long, rod-shaped; vesica tubular with linear patch of cornuti.

Female genitalia. Not examined.

Host plant. *Quercus* spp. (Sugi, 1987).

Distribution. Korea, Japan, Taiwan, North India.

Korean name: ¹*남방검회색가지나방 (신칭)

ACKNOWLEDGMENTS

We would like to thank two anonymous reviewers for helpful comments. This study was supported by the project on the survey and excavation of Korean indigenous species of the National Institute of Biological Resources (NIBR) under the Ministry of Environment, Korea and the Nature survey of Gageo-do, Shinan county, Jeollanamdo.

REFERENCES

- Guenée A, [1858]. Uranides et Phalenites 1. Histoire Naturelle des Insectes (Lepidoptera), Species Général des Lépidoptères. Tom Uranides et Phalenites, Paris, IX, pp. 1-514, X, pp. 1-584.
- Holloway JD, 1993. The moths of Borneo: family Geometridae, subfamily Ennominae. *Malayan Nature Journal*, 47:1-309.
- Moore F, 1877. On the Lepidoptera of the Andaman and Nicobar islands. *Proceedings of the Zoological Society of London*, 1877:580-632.
- Moore F, 1888. Descriptions of new Indian lepidopterous insects from the collection of the late Mr. W.S. Atkinson. *Asiatic Society of Bengal, Calcutta*, p. 261.
- Prout LB, 1930. On the Japanese Geometridae of the Aigner Collection. *Novitates Zoologicae*, 35:289-337.
- Scoble MJ, 1992. *The Lepidoptera: form, function, and diversity*. Oxford University Press, Oxford, pp. 1-404.
- Scoble MJ, 1999. *Geometrid moths of the world: a catalogue (Lepidoptera, Geometridae)*. Vols. 1, 2. Apollo Books, Stenstrup, pp. 1-1016.
- Sugi S, 1987. *Larvae of larger moths in Japan*. Kodansha, Tokyo, pp. 1-453.
- Warren W, 1897. New genera and species of moths from the old-world regions in the Tring Museum. *Novitates Zoologicae*, 4:12-130.
- Wehrli E, 1938. Neue untergattungen, arten und unterarten von ostasiatischen Geometriden (Lepid.). *Mitteilungen der Münchner Entomologischen Gesellschaft*, 28:81-89.

Received September 11, 2012
 Revised October 25, 2012
 Accepted October 28, 2012