

# Discovery of Two Unrecorded Species of the Family Crambidae (Lepidoptera) from Korea

Sung-Soo Kim, Yang-Seop Bae<sup>1</sup> and Bong-Kyu Byun<sup>2\*</sup>

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

<sup>1</sup>Division of Life Sciences, University of Incheon, 12-1 Songdo-dong, Yeonsu-gu, Incheon, 406-772, Korea

<sup>2</sup>Department of Biological Science & Biotechnology, Hannam University, Yuseong-Gu, Daejeon 305-811, Korea

## 한국산産 포충나방科的 2미기록종 보고 (나비목)

김성수 · 배양섭<sup>1</sup> · 변봉규<sup>2\*</sup>

동아시아 환경생물연구소, <sup>1</sup>인천대학교 생명과학부, <sup>2</sup>한남대학교 생명시스템과학과

**ABSTRACT:** Two species, *Daulia afralis* Walker and *Herpetogramma cynaralis* Walker, belonging to the family Crambidae, Lepidoptera, are reported for the first time from Korea, based on the materials collected from Jeju Islands located in the southern part of the Korean peninsula. Both male and female genitalia were dissected and examined. Also, the photos of the external morphology, including the wing patterns, and genitalic characteristics of the two species are taken and redescribed briefly, including distributional ranges and available information. Taxonomic information and synonymies for the species were given and discussed.

**Key words:** *Daulia afralis*, *Herpetogramma cynaralis*, Crambidae, Korea, New record

**초록:** 제주지역을 중심으로 실시한 나방류 조사결과 포충나방과의 2종(*Daulia afralis* Walker, *Herpetogramma cynaralis* Walker)이 우리나라에서 처음으로 발견되었기에 보고한다. 본 연구에서는 이들 종의 외부형태 및 암수생식기의 특징을 검경하여 도해하고 간략히 재기재하였다. 또한 각 종별로 분류학적 정보 및 국내의 분포범위에 대하여 정리하여 보고한다.

**검색어:** *Daulia afralis*, *Herpetogramma cynaralis*, 포충나방과, 한국, 미기록종

Recently, Bae et al.(2008) reviewed a total of 349 species of Pyraloidea of Korea, to revise all the known species in Korea. Also, they enumerated the Korean species under the superfamily Pyraloidea, which was recently proposed taxonomic status (Minet, 1991). However, the two species, *Daulia afralis* Walker and *Herpetogramma cynaralis* Walker were not included in them(Bae et al., 2008), which are reported in this study.

In this study, we report the two newly recorded species of Crambidae, including two females of *Daulia afralis* Walker and one female of *Herpetogramma* from Jeju islands located in the

southern Korea. Also the genus *Daulia* is recorded for the first time from Korea.

## Materials and Methods

Materials examined in this study were collected from Jeju Island, southern part of the Korean peninsula and are deposited at the entomological collection of Hannam University (HUNHM). Among them, three specimens of *Daulia afralis* Walker were loaned to compare with Korean specimens from University of Osaka Prefecture, Osaka, Japan(UOP). All available genitalia were mounted on slide glass with Euparal mountant. The illustrations for each species were taken by digital camera,

\*Corresponding author: [bkbyun@hnu.ac.kr](mailto:bkbyun@hnu.ac.kr)

Received September 11 2012; Revised October 26 2012

Accepted November 9 2012

Nikon attached on the microscope, Carl Zeiss Axio Imager A1. The color standard for the description of adults was based on "Methuen Handbook of Colour" (Kornerup and Wanscher, 1978). Abbreviations used in this study are as follows: gen. sl. no.: genitalia slide number; TS: type species.

## Systematic accounts

### Order Lepidoptera Linnaeus, 1758

Order Lepidoptera Linnaeus, 1758

Family Crambidae Latreille, 1810

**Genus *Daulia* Walker, 1859.** TS: *Daulia afralis* Walker, 1859  
*Girtexa* Swinhoe, 1890. TS: *Girtexa argentuosalis* Hampson, 1897

Genus *Daulia* was established by Walker (1859), based on *Daulia afralis* Walker (= *Girtexa argentuosalis* Hampson). In adult, its head and vertex is covered with light brownish yellow scales. The costa of forewing is straight with slightly arched area near costa. It is rather characteristic in having a group of metallic spots near the dorsum of forewing. It is distributed in the Oriental region, including Southeast.

***Daulia afralis* Walker** 금흰줄포충나방 (신칭) (Figs. 1, 3, 4)  
*Daulia afralis* Walker, 1859, List Specimens lepid. Insects Colln Br. Mus. 19 : 975. Type locality: Borneo, Sarawak.  
*Girtexa argentuosalis* Swinhoe, 1890, Trans. Ent. Soc. Lond. 1890: 286.

*Adult* (Fig. 1). Wingspan 17mm in male, 19mm in female. Head and vertex covered with light brownish yellow scales. Thorax with light brownish yellow scales. Forewing with straight costa then slightly arched near costa; apex not acute; termen oblique; ground color yellowish brown; basal patch with light reddish brown reaching to basal 1/5; a dark reddish brown lines from 1.3 of costa to 1/3 of dorsum, a short line on middle then another short line below the cell towards dorsum; a long fascia from 3/4 of costa slightly curved the end of cell then arched outwardly reaching to 3/4 of width of forewing; a white wide line developed along termen; cilia light grayish brown. Hindwing with light yellow, rather white on the upper area; a short light reddish brown line on 1/3 of forewing, 1/2 and from near subapex to tornus, somewhat broad white fascia developed along the area near termen; an apparent metallic blackish pattern on the middle of dorsum. Cilia grayish brown.

*Male genitalia* (Fig. 3). Uncus wide, rounded terminally, with numerous small bristles from middle to the top. Valva broad, expanded, with well sclerotized costa towards apex; a well sclerotized thorn shaped process on basal 1/3 at middle; sacculus weakly sclerotized with numerous short hairs ventrally.

*Female genitalia* (Fig. 4). Papillae analis narrow with many moderate hairs. Apophyses anteriores thick as long as apophyses posteriores. Ostium bursae wide, well sclerotized. Ductus bursae short as long as 1/3 of corpus bursae, very strongly sclerotized from ostium bursae to beyond middle. Coprus bursae sack-shape, with numerous tiny spines from entrance to



Figs. 1-2. Adults: 1 *Daulia afralis* Walker; 2 *Herpetogramma cynaralis* Walker.

the middle around it, with no signum.

*Material examined.* [JJ] 1 ♀, Tamra Univ., Seoguipo, JJ, Korea, N33°16'55".6, E126°27'22".8, 16.VII.2010 (S.S.Kim)-gen. sl. no. 123; 1 ♀, Tamra Univ., Seoguipo, JJ, Korea, N33°18'19".99, E126°34'09".28, 17.VII.2010 (S.S.Kim)-gen. sl. no. 122-coll. HUNHM; 1 ♂, Yona, Okinawa Pref., Japan, 14.V.1998 (L.T.), R. Sato, leg.-gen. sl. no.-L003; 1 ♀, ditto, 15.V.1998(L.T.), R. Sato, leg.-gen. sl. no.-L001; 1 ♂, [Ryukyus] Yona, Kunigami, Okinawa-hontou, Japan, 15-18.V.1998, T. Ohno-gen. sl. no.-L002-coll. UOP.

*Distribution.* Korea (new record), Japan, China, Taiwan, India, Myanmar, Malaysia.

*Remarks.* Nye & Fletcher (1991) stated “*Daulia* established in the Pyralidae; it was used for a new species *Daulia treicleiota* Bethune-Baker, 1911, Ann. Mag. Nat. Hist. (8)8: 544, placed in the Tineidae but currently placed in the Cossidae. *Daulia* and *D. indecora* were transferred to the Tineidae by Becker & Robinson, 1981, Syst. Ent. 6: 144”. (Nye and Fletcher, 1991). However, the genus was later placed under the subfamily Pyraustinae of family Pyralidae (Inoue, 1982). Recently the subfamily Pyraustinae was treated as member of the family Crambidae (Munroe and Solis, 1999).

**Genus *Herpetogramma* Lederer, 1863.** TS: *Herpetogramma servalis* Lederer, 1863

*Pachyzancla* Meyrick, 1884. TS: *Botys mutualis* Zeller, 1852

*Acharana* Moore, 1885. TS: *Botys otreusalis* Walker, 1859

*Stenomeles* Warren, 1892. TS: *Botys agavealis* Walker, 1859

*Ptiloptila* Swinhoe, 1894. TS: *Ptiloptila bigricornalis* Swinhoe, 1894.

*Pantoeocome* Warren, 1896. TS: *Pantoeocome deformis* Warren, 1896

*Ptiloptila* Hampson, 1899, misspel.

*Macrobotys* Munroe, 1950. TS: *Botys aeglealis* Walker, 1859

*Coremataria* Amsel, 1956. TS: *Botys infuscalis* Guenée, 1854.

*Culcitaria* Amsel, 1970. TS: *Culcita djiroftella* Amsel, 1959

***Herpetogramma cynaralis* Walker** 앞점노랑포충나방 (신칭) (Figs. 2, 5)

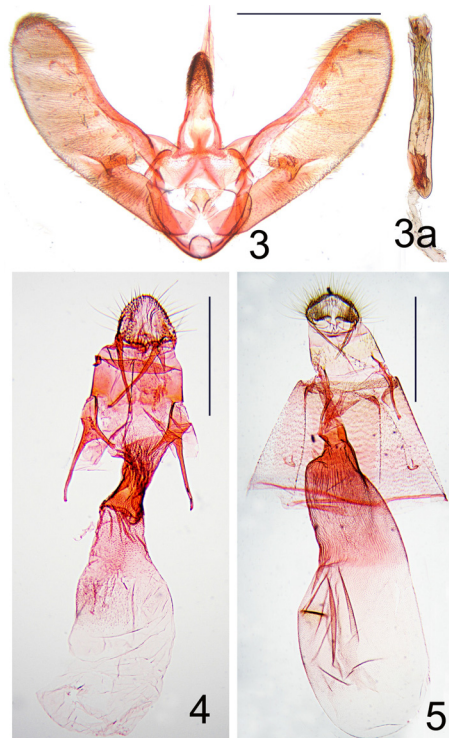
*Botys cynaralis* Walker, 1859, List Specimens lepid. Insects

Colln Br. Mus. 18: 672.

*Adult* (Fig. 2). Wingspan 20mm in female. Head and vertex with light brownish yellow; antenna long reaching to 3/4 of costa of forewing. Thorax pale brownish yellow. Forewing with straight costa, then slightly arched towards apex; ground color pale yellow, rather dark along the costa, a small black spots on 1/4 of costa, 1/3 of subcosta; an apparent blackish spot on middle near costa; four tiny spots dotted from 2/3 of costa to middle vertically, then dotted from the middle to 2/3 of width of forewing; a broad grayish black fascia from apex then running towards dorsum. Cilia light grayish brown. Hindwing similar with forewing in pattern, with several small spots along termen.

*Male genitalia.* Unknown.

*Female genitalia* (Fig. 5). Papillae anales short, narrow, covering with numerous short hairs. Apophyses anteriores short as long as half of apophyses posteriores. Ostium bursae wide, rounded. Ductus bursae very short, slightly twisted at entrance. Corpus



**Figs. 3-5.** Male and female genitalia: 3 Male genitalia of *Daulia afralis* Walker; 3a ditto, aedeagus; 4 female genitalia of *Daulia afralis* Walker; 5 female genitalia of *Herpetogramma cynaralis* Walker. <scale bars: 1 mm>

bursae long sack-shaped, as long as 9 times of dusctus bursae, slightly sclerotized around entrance, coverng with minute spines to basal 1/3.

*Material examined.* [JJ] 1 ♀, Tamra Univ., 1,100 Road, 13.IX.2008, Seoguipo, JJ, Korea, (S.S.Kim)-gen. sl. no. 121 (S.S. Kim)-coll. HUNHM.

*Distribution.* Korea (new record), Japan, China, Taiwan, India, Malaysia, Australia.

## Discussion

In this study, two species of Crambidae, *Daulia afralis* Walker and *Herpetogramma cynaralis* Walker, are reported for the first time from Korea. Among them, *Daulia afralis* Walker has been known from Southeast Asia, including southern area of Japan and China. And *Herpetogramma cynaralis* Walker is distributed from southern area of Japan to Australia. In this study, the two species were collected from Jeju, southern area of the Korean peninsula. It can be expected that the species will be used as indicator species for monitoring the climate change for the time being.

## Acknowledgements

The corresponding author would like to express his deep thanks to Prof. T. Hirowatari, University of Osaka Prefecture, Japan for his loan of the material for this study. This study was carried out with the support of Forest Science & Technology Projects (Project No. S121212L110110) provided by Korea Forest Service.

## Literature Cited

- Bae, Y.S., Byun, B.K., Paek, M.K., 2008. Pyralid moths of Korea (Lepidoptera: Pyraloidea). Korea National Arboretum, Samsungad.com, Seoul.
- Inoue, H., 1982. Pyralidae, in: Inoue, H. et al. (Eds.), Moth of Japan. Kodansha, Japan, pp. I: 301-403, II: 223-253, Pls. 336-348.
- Kornerup, A., Wanscher, J.H., 1978. Methuen handbook of colour, 3rd ed. Methuen, London.
- Minet, J., 1991. Tentative reconstruction of the ditrydian phylogeny (Lepidoptera: Glossata). *Entomologica Scandinavica* 22, 69-95.
- Munroe, E., Solis, M.A., 1999. The Pyraloidea, Lepidoptera, Moths of Butterflies Vol. 1: Evolution, systematics and biogeography. in: Kristensen, N.P. et al. (Eds.), *Handbook of Zoology 4: Arthropoda: Insecta (part 35)*. Walter De Gruyter, Berlin and New York, pp. 233-256.
- Nye, I.W.B., Fletcher, D.S., 1991. *The Generic Names of Moths of the World*. British Museum (Natural History), London.