

Three Species of the Genus *Cydia* Hübner (Lepidoptera: Tortricidae) New to Korea

韓國産 *Cydia* 屬 (나비목: 잎말이나방科)의 3未記錄種

Bong-Kyu Byun* and Shan-Chun Yan¹

邊鳳奎* · 嚴善春¹

Abstract – Three species of the genus *Cydia* Hübner, *C. curvivalva* Liu et Yan, *C. trasiias* (Meyrick), and *C. nigricana* Fabricius, are reported for the first time in Korea. Morphological characteristics of them are briefly redescribed with illustrations of adults and genitalia. Also the known biological information for the species are mentioned.

Key Words – Systematics, Tortricidae, Olethreutinae, Grapholitini, *Cydia*, New record, Korea

초 록 – 본 연구를 통해 잎말이나방科에 속하는 *Cydia*屬의 3種 (<*C. curvivalva* Liu et Yan, *C. trasiias* (Meyrick), *C. nigricana* Fabricius>을 우리나라에서 처음으로 報告하며, 이들의 分類學的 特徵을 간략히 再記載 하고, 採集된 成蟲 및 암·수 生殖器를 圖示하였다.

검색어 – 분류, 나비목, 잎말이나방科, *Cydia*屬, 分類, 韓國

Genus *Cydia* Hübner is one of the complex group and is well known as pests attacking the corns and seeds in their larval stage. *C. pomonella* Linnaeus is a well known pest of pear and walnut. Razowski (1989) divided the genus *Cydia* into three subgenus, *Cydia* Hübner, *Collicularia* Obraztsov and *Kenneliola* Paclt. The genus comprises more than 100 species in the Palearctic, and less than 50 species in the Nearctic, and also many species from the Oriental region.

In the Microlepidoptera of Korea (Park, 1983), three species of the genus *Cydia* Hübner, *C. prismatica* Meyrick, *C. kurokoi* (Amsel), *C. japonensis* Kawabe, were cited. Among them, *C. japonensis* Kawabe was corrected as *C. glandicolana* (Danilevsky) recently by Byun *et al.* (1998). And *C. prismatica* Meyrick was con-

firmed as to be synonym of *C. iridescence* (Walsingham) (type locality: Weonsan), but it has not been found in South Korea to date since its first report by Walsingham (1900). In 1987, Park and Ahn reported *Cydia amurensis* (Danilevsky) with its host plant. Jaros *et al.* (1992) added a species, *C. milleniana* (Adamczwski), to the Korean fauna, based on the North Korean material (Mt. Paektu-san). Consequently five species have been known from the Korean peninsula.

Recently the authors have further examined undetermined materials through the joint study on the genus with the second author, and among them three species have been reported for the first time in Korea. In the present study, external characteristics of the male and female including their genitalia, if available, were ex-

*Corresponding author. E-mail: bkbyun@foa.go.kr

산림청 국립수목원 곤충분류연구실 (Systematic Entomology Lab., Forest Museum, Korea National Arboretum, Prov. Gyeonggi 487-821, Republic of Korea)
¹중국 동북임업대학교 산림자원과 환경대학 (College of Forest Resources and Environment, Northeast Forestry University, Harbin 150040, Heilongjiang, China)

amined and briefly redescribed with illustrations, and available biology for the species was given. Materials examined are preserved in the collections of the Forest Museum, Korea National Arboretum (KNA).

Systematic Account

Cydia Hübner, 1825 Type species: *Phalaena pomonella* Linnaeus, 1758

- = *Laspeyresia* Hübner, [1825]
- = *Carpocapsa* Treitschke, 1829
- = *Coccyx* Treitschke, 1829
- = *Semasia* Stephens, 1829
- = *Cerata* Stephens, 1829
- = *Carpocampa* Harris, 1841
- = *Trycheris* Guenee, 1845
- = *Orchemia* Guenee, 1845
- = *Melissopus* Riley, 1881
- = *Melliopus* Packard, 1890
- = *Mellisopus* Fernald, 1891
- = *Adenoneura* Walsingham, 1907
- = *Melissopus* Fernald, 1908
- = *Crobylophora* Kennel, 1910
- = *Hedulia* Heinrich, 1926
- = *Laspeyresia* Wu, 1938
- = *Kenneliola* Paclt, 1951
- = *Pseudotomoides* Obraztsov, 1959
- = *Erminia* Obraztsov, 1959
- = *Phanetoprepa* Obraztsov, 1968
- = *Dicraniana* Diakonoff, 1984

Cydia curvivalva Liu & Yan

담흑애기잎말이나방(신칭) (Figs. 1, 4)

Cydia curvivalva Liu & Yan, 1998, Entomotaxonomia, 20(4): 279.

Wing span, 11 mm (Fig. 1). Head, thorax and forewing dark grayish brown. Vertex with tufts hairs. Labial palpus pale grayish brown, ascending, close together with compound eyes. Forewing costa with a series of whitish pairs strigulae mixed with brown and lead and with two dark brown lines from 3/5 and 4/5 of costa obliquely toward termen; submarginal line with a series of black spots between veins; ocelloid patch indistinct. Hindwing brown. Forewing veins separated; R₁ from middle of discal cell; R₂ from 5/6, nearer to R₃ than to

R₁; R₄ from upper angle of discal cell; R₅ to termen, parallel with M₁, M₂; CuA from discal cell.

Male genitalia (Fig. 4). Tegumen slightly protruded; vinculum developed; uncus, socius and gnathos reduced; valva boots-shaped, sacculus without invagination, curved upward from the middle, numerous short hairs developed along the ventral margin of valva from the half to apex.

Material examined: 1 ♂, Temple Gwanumsa, Island Jeju, 24. VIII. 1992 (B.K. Byun)-coll. KNA.

Distribution: Korea (new record), China.

Remarks: The adults emerged in July and August across the Yangze River. The species differs from the allied species by the curved valva of the male genitalia.

Cydia trasiat (Meyrick)

회화나무애기잎말이나방(신칭) (Figs. 2, 5)

Laspeyresia trasiat Meyrick, 1928, Exotic Microlepid., 3: 448.

Kenneliola trisia Danilevsky & Kuznetsov, 1968, Fauna SSSR, 5 (1): 573.

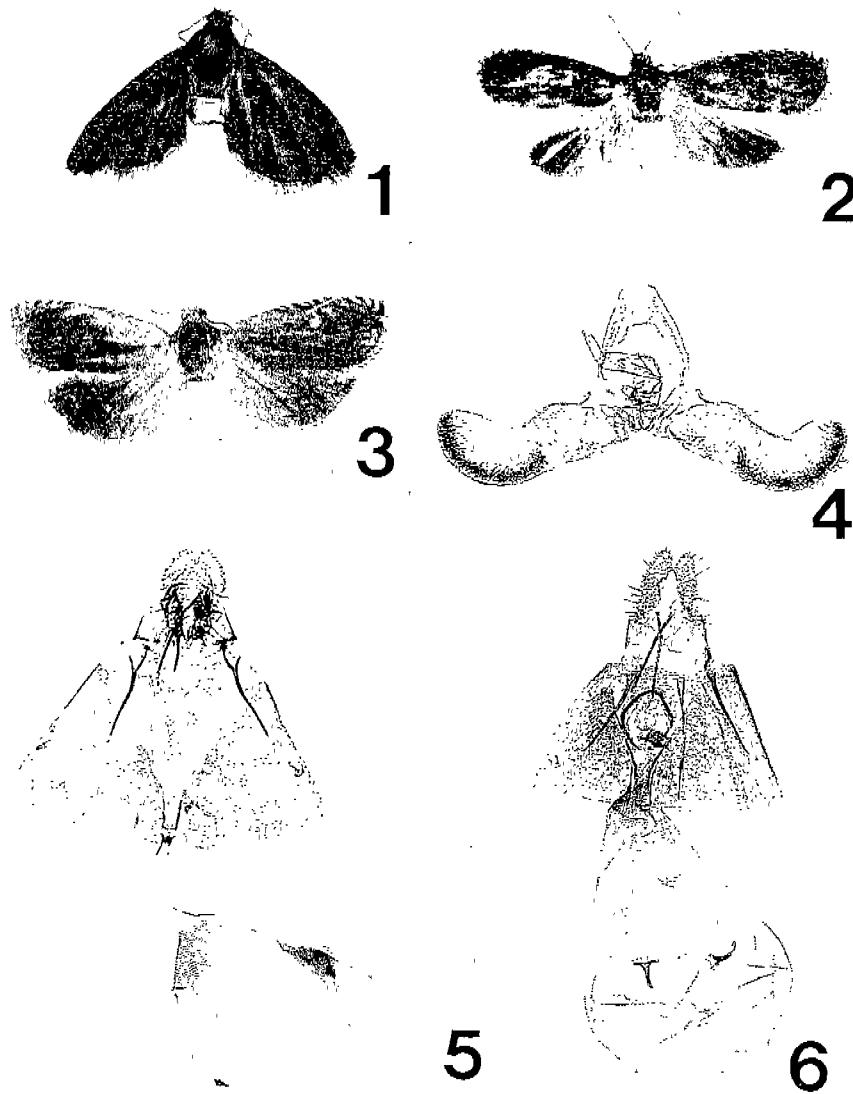
Laspeyresia sp. 1980, Chang *et al.*, 1: 66-71; 1983, 4: 57-61; Academica Sinica, 1983, Forest Insects of China: 591.

Wing span, 11 mm (Fig. 2). Head, thorax and forewing dark grayish brown. Vertex brown with blue purple scales. Thorax and forewing with blue greenish metallic luster. Forewing costa gently curved to apex, with five pairs of yellow brown strigulae beyond middle of costa; two lead gray lines from 3rd and 5th strigulae obliquely toward termen; three black spots in ocelloid patch. Hindwing dark brown, rather light on base. Cilia pale.

Female genitalia (Fig. 5). Papillae anales rather large, broad posteriorly. Sterigma weakly sclerotized, with entrance valley shaped; ostium bursae small, slightly sclerotized around its neck. Ductus seminalis originating from middle of ductus bursae. ductus bursae fairly short, nearly half of corpus bursae; corpus bursae large, with numerous tiny spinules around entrance and with two signa, smaller one horn-shaped, the other bigger in broad and flat shaped.

Material examined: 1 ♀, Daegwangryeong, Prov. Kangwon, 27. VII. 1995 (B.K. Byun)-coll. KNA.

Distribution: Korea (new record), Japan, China, Russian Far East (Siberia).



Figs. 1-6. 1-3. Adults: 1. *Cydia curvivalva* Liu et Yan ; 2. *Cydia trasiat* (Meyrick) ; 3. *Cydia nigricana* Fabricius. 4-6. Genitalia: 4. *Cydia curvivalva* Liu et Yan, ♂; 5. *Cydia trasiat* (Meyrick), ♀; 6. *Cydia nigricana* Fabricius, ♀.

Host plant: *Sophora japonica* L., *S. Japonica* var. *pendula* L. in China (Yan, 1997).

Remarks: Two generations a year in China, overwintering as matured larvae under the bark of trees. In the coming early April, new moths begin to emerge, and reach to peak period from middle or late April to early May (Yan, 1997).

***Cydia nigricana* Fabricius**

완두애기잎말이나방(신칭) (Figs. 3, 6)

Pyralis nigricana Fabricius, 1794, Ent. Syst. 3 (2): 276.

Tortrix proximana Haworth, 1811, Lepidoptera Britannica: 458

Ebdopisa pisana Guenée, 1845, Ann. Soc. Ent. France 2 (3): 182.

Endopisa nebritana Barrett, 1906, The lepidoptera of the British Islands, 2: 193.

Enarmonia rativera Meyrick, 1912a, Ent. Month. Mag., 48 (23): 34.

Laspeyresia novimundi Heinrich, 1920, Canada Ent. 52: 257.

Laspeyresia nigricana Kennel, 1921, Zoologica, 21 (54): 651; Liu et al., 1977, Economic Insects in China, 11: 39; Kawabe, 1982, Moths of Japan 1: 149, 2: 181, pl. 30: 26, 27.

Endopisa nigricana Pierce & Metcalfe, 1922, Genitalia

of the British Tortricidae: 87.

Laspeyresia (Endopisa) nigricana Danilevsky & Kuznetsov, 1968, Fauna SSSR, 5 (1): 482.

Cydia nigricana Bradley, 1979, British Tortricoid Moths, Olethreutinae: 264; Razowski, 1991, Monogr. Fauny Polski, 19: 40.

Wing span, 11 mm (Fig. 3). Head, thorax and forewing dark grayish brown. Vertex with tufts hairs. Forewing costa gently curved to apex, with seven pairs of yellow whitish strigulae, four blackish spots in ocelloid oatch. Hindwing dark brown, with paler cilia.

Female genitalia (Fig. 6). Sterigma well sclerotized, with complete or incomplete ring, and with proximal process. Ostium bursae well sclerotized; ductus bursae very short, as 1/5 as long as corpus bursae, with a sclerotized ring at posterior end; corpus bursae with numerous tiny spinules around the entrance, two small hook-like signa in middle.

Material examined: 1 ♀, Chuncheon, Prov. Kangwon, 2. IX. 1988 (K.T. Park); 1 ♀, Chuncheon, Prov. Kangwon, 25. VIII. 1989 (B.K. Byun); 1 ♀, Chuncheon, Prov. Kangwon, GW, 12. VIII. 1989 (B.K. Byun)-coll. KNA.

Distribution: Korea (new record), China, Japan, Russia (Siberia), N. America.

Host plant: *Pisum* sp., *Lathyrus* sp., and *Vicia* sp. are known from China (Yan, 1997).

Remarks: One generation a year in China. The matured larvae overwinter in soil and begin to pupae in next late May. Moths emerged in late June and oviposit in late July in China (Yan, 1997).

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