

<https://doi.org/10.25221/fee.496.3>

<https://elibrary.ru/sehxmm>

<https://zoobank.org/References/955984FA-9C17-42C6-BC43-35F7457D77BA>

**A NEW SPECIES OF THE GENUS *PHYLLONORYCTER* HÜBNER, 1822
(LEPIDOPTERA: GRACILLARIDAE) FROM KOREA**

J.-C. Sohn

Department of Science Education, Gongju National University of Education, Woongjinro 27, Gongju-si, Chungnam 32553, Republic of Korea. E-mail: jsohn74@gjue.ac.kr

Summary. A new species of Gracillariidae, *Phyllonorycter wolaksana* sp. n., is described on the basis of six specimens from Republic of Korea. External and genital features of the new species are illustrated. Holotype of the species is deposited in the Gongju National University of Education, Gongju, Korea.

Key words: moths, Gracillarioidea, taxonomy, new species, description, Mt. Wolaksan, Republic of Korea.

Д.-Ч. Сон. Новый вид рода *Phyllonorycter* Hübner, 1822 (Lepidoptera: Gracillariidae) из Кореи // Дальневосточный энтомолог. 2024. N 496. С. 12-15.

Резюме. Из Республики Корея по шести экземплярам описан новый вид минирующих молей *Phyllonorycter wolaksana* sp. n. (Gracillariidae). Приведены фотографии внешнего облика имаго и гениталий нового вида. Голотип хранится в Национальном педагогическом университете Конджу, Республика Корея.

INTRODUCTION

Phyllonorycter is one of the species-rich genera within the gracillariid subfamily Lithocolletinae, currently including 425 species worldwide (De Prins & De Prins, 2023). The monophyly of Lithocolletinae has been well supported (Kawahara *et al.*, 2017), while *Phyllonorycter* still includes a few heterogeneous members (De Prins *et al.*, 2013). Kumata (1993) argued that the genus is a relatively derived group within Lithocolletinae, given its characteristics in larval chaetotaxy.

The adult moths of *Phyllonorycter* are very small, with wingspans of 6–9 mm, and they have the brassy or orange-brown forewings contrasting with white streaks (Emmet *et al.*, 1985). The larvae are sap-feeders in early instars but later they turn into tissue-feeders, leaving tentiform leaf-mines (Davis & Deschka, 2001; De Prins & Kawahara, 2012). The members of *Phyllonorycter* whose larval hosts are known utilize 112 plant species in 31 families and exhibit phyletic conservatism in the numerous subgroups (Lopez-Vaamonde *et al.*, 2003).

The species diversity of *Phyllonorycter* in Korea seems underestimated, currently including 30 species (Kim & Byun, 2017; Kim *et al.*, 2024). This figure is far less than the ones in the

neighboring countries: 112 and 65 species in Russia (Baryshnikova, 2019) and Japan (Kumata *et al.*, 2013), respectively. The Korean species of *Phyllonorycter* include a few pests of economic concern, for example, *Ph. ringoniella* (Matsumura, 1931) often causing severe damage on apple farms (Kumata *et al.*, 1983). In the present study, a new species of *Phyllonorycter* is described from Korea.

MATERIAL AND METHODS

Type specimens are deposited in two institutional collections: the Gongju National University of Education, Gongju, Korea (GJUE) and the National Institute of Biological Resources, Incheon, Korea (NIBR). Abdomens of selected specimens were dissected and prepared as slide specimens, following Clarke (1941) except that chlorazol black and Euparal resin were used for staining and permanent mounting, respectively. Terms of wing patterns and genitalia follow Kumata (1963). Verbatim label data are given only for primary type. In the label data, the “GSN” in brackets and a pipe mark indicate the “genitalia slide number” and a line break, respectively.

DESCRIPTION OF NEW SPECIES

Phyllonorycter wolaksana sp. n.

<https://zoobank.org/NomenclaturalActs/680792DD-3718-418E-839B-FD8A8615F06F>

Figs 1–4

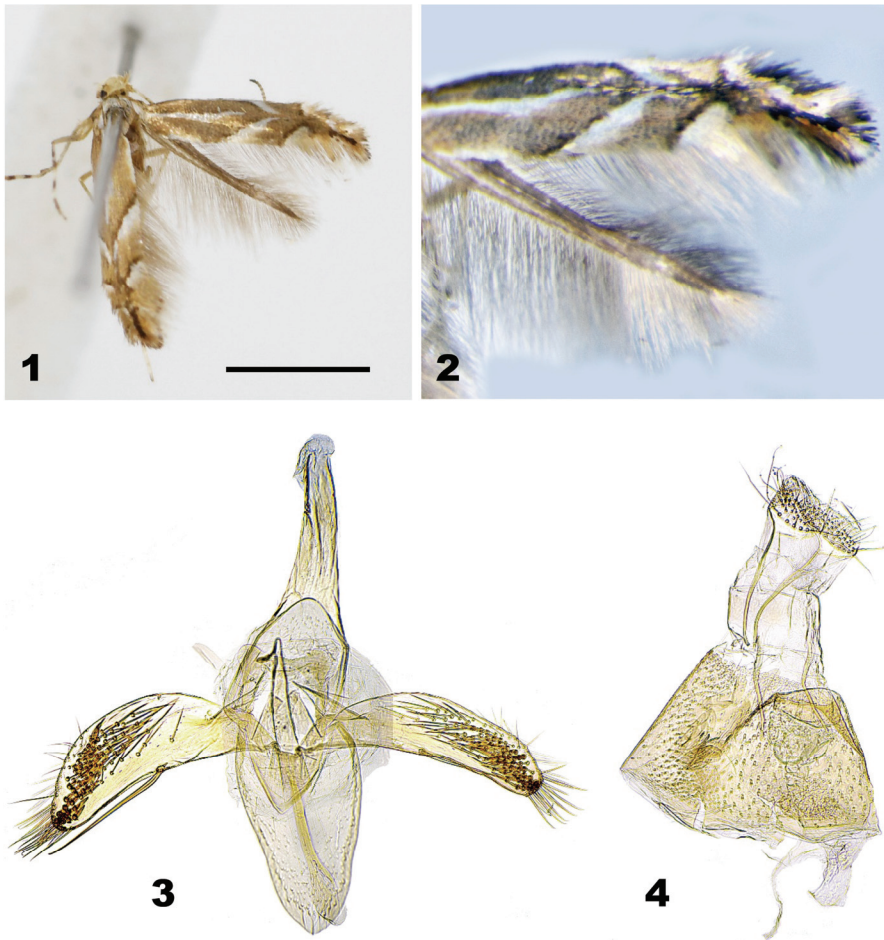
TYPES. Holotype: male, **Korea**: “KOREA Chungbuk Prov. | Jecheon, Mt. Wolak-san | N36°51'56.0" E128°05'20.0"E Alt. 222m | 15-18 June 2007 coll. J.C. Sohn”, dissected genitalia in capsule, GJUE. Paratypes: 4♂, 1♀, **Korea**: Chungbuk Prov., Jecheon, Mt. Wolaksan (36°51'56.0"N 128°05'20.0"E, alt. 222 m), 15-18 June 2007 (JC Sohn), [GSN] SJC-1351(♂), 1352(♀), 1484 (♂), [COI] JCS-23-014”, GJUE & NIBR.

DIAGNOSIS. This species is similar to a European congener, *P. coryli* (Nicelli, 1851) in the male genitalia but differs from the latter in having the asymmetrical valvae and the linguiform eighth sternite.

DESCRIPTION. HABITUS (Figs 1, 2). *Head*: Vertex lustrous, pale gray; frons lustrous, white. Antenna 2/3 as long as forewing, filiform in both sexes; scape white, tinged with gray dorsally; flagellomere pale gray, tinged with pale grayish-brown distally. Labial palpus lustrous, white; 2nd segment 1.5x longer than 1st; 3rd segment 2.5x longer than 2nd, acuminate apically.

Thorax: Patagium white; tegula pale brown, tinged with white distally; mesonotum pale grayish-brown, with white streak laterally and medially. Forewing (Fig. 2) length 3.1–3.5 mm, pale grayish-brown; costal streak white, curved on median area; medio-basal streak narrow, white; hind-basal streak white, inclined on median area; three white costal strigulae on apical area and one tornal patch crescentiform, white, juxtaposed with dark grayish-brown streak marginally; apical area with black streak medially; cilia fuscous above apex and on tornus, white below apex. Hindwing narrow, grayish-brown; cilia fuscous. Foreleg with coxa grayish-brown; femur and tibia grayish-brown dorsally, white ventrally; tarsus grayish-brown, with white ring basally. Midleg with coxa white; femur white, tinged with pale grayish-brown distally; tibia white, with grayish-brown band on distal 1/3 of dorsum; tarsus white, with dark grayish-brown patch dorsodistally. Hindleg with coxa, femur and tibia lustrous, pale gray; tarsus white, with grayish-brown patch dorsodistally.

Abdomen: dorsal side pale grayish-brown; ventral side white, tinged with pale orange ventrobasally.



Figs 1–4. *Phyllonorycter wolaksana* sp. n. 1 – adult, holotype, male (scale bar = 2 mm); 2 – magnified wings of holotype; 3 – male genitalia, paratype (SJC-1484); 4 – female genitalia, paratype (SJC-1352).

MALE GENITALIA (Fig. 3). Tegumen symmetrical, subtriangular apically; anellus as long as tegumen, narrowed distally. Left valva broadly round costally, nearly straight on saccular margin, round apically, with spiniform setae subcostally on distal 2/3 and a long spiniform seta at middle of saccular margin; right valva similar to left valva, but narrower and with shorter saccular seta. Vinculum subtriangular. Flap-like eighth sternite tongue-shaped, scobinate and setose along submargins. Aedeagus slightly curved, narrowed to apex, with elongate rim basally and a hook-like projection subapically.

FEMALE GENITALIA (Fig. 4). Papillae anales band-like, setose. Apophyses posteriores as long as apophyses anteriores. Ostium bursae broad, with pouch-like emargination at the connection with ductus bursae. Most of ductus bursae and entire corpus bursae lost in the specimen.

DISTRIBUTION. Korea (endemic).

ETYMOLOGY. The species epithet is derived from the type locality, Mt. Wolaksan.

ACKNOWLEDGEMENTS

This work was supported by a grant from the National Institute of Biological Resources, funded by the Ministry of Environment (MOE) of the Republic of Korea (NIBR202304203).

REFERENCES

- Baryshnikova, S.V. 2019. Gracillariidae. P. 36–43. In: Sinev, S. Yu. (Ed.). *Catalogue of the Lepidoptera of Russia*, Edition 2. Zoological Institute RAS, St. Petersburg. [In Russian]
- Clarke, J. F. G. 1941. The preparation of slide of the genitalia of Lepidoptera. *Bulletin of the Brooklyn Entomological Society*, 36: 149–161.
- Emmet, A.M., Watkinson, I.A. & Wilson, M.R. 1985. Gracillariidae. P. 244–368. In: Heath, J. & Emmet, A.M. (Eds.). *The Moths and Butterflies of Great Britain and Ireland, Volume 2 Cossidae–Heliodinidae*. Harley Books, Essex.
- Davis, D.R. & Deschka, G. 2001. Biology and systematics of the North American *Phyllonorycter* leafminers on Salicaceae, with a synoptic catalog of the Palearctic species (Lepidoptera: Gracillariidae). *Smithsonian Contributions to Zoology*, 614: 1–89.
- De Prins, J. & De Prins, W. 2006–2023. *Global Taxonomic Database of Gracillariidae (Lepidoptera)*. World Wide Web electronic publication. Available from: <http://www.gracillariidae.net> (accessed on 10 January 2024).
- De Prins, J., Davis, D.R., de Coninck, E., Sohn, J.-C. & Triberti, P. 2013. Systematics, phylogeny and biology of a new genus of Lithocolletinae (Lepidoptera: Gracillariidae) associated with Cistaceae. *Zootaxa*, 3741: 201–227.
- De Prins, J. & Kawahara, A.Y. 2012. Systematics, revisionary taxonomy, and biodiversity of Afrotropical Lithocolletinae (Lepidoptera: Gracillariidae). *Zootaxa*, 3594: 1–283.
- Kawahara, A.Y., Plotkin, D., Ohshima, I., Lopez-Vaamonde, C., Houlihan, P.R., Breinholt, J.W., Kawakita, A., Xiao, L., Regier, J.C., Davis, D.R., Kumata, T., Sohn, J.-C., De Prins, J. & Mitter, C. 2017. A molecular phylogeny and revised higher-level classification for the leaf-mining moth family Gracillariidae and its implications for larval host-use evolution. *Systematic Entomology*, 42: 60–81.
- Kim, D.-S. & Byun, B.-K. 2017. Taxonomic review of the genus *Phyllonorycter* Hübner (Lepidoptera: Gracillariidae) in Korea. *Journal of Asia-Pacific Entomology*, 20: 1377–1386.
- Kim, D.-S., Oh, J.-I. & Byun, B.-K. 2024. The checklist of leaf-mining moths *Phyllonorycter* Hübner (Lepidoptera: Gracillariidae) of Korea with description of two new species and nine newly recorded species. *Zootaxa*, 5397: 397–417. DOI: 10.11646/zootaxa.5397.3.5
- Kumata, T. 1963. Taxonomic studies on the Lithocolletinae of Japan (Lepidoptera: Gracillariidae) part 3. *Insecta Matsumurana*, 26: 69–88.
- Kumata, T. 1993. A contribution to the knowledge of the Malaysian Lithocolletinae (Gracillariidae, Lepidoptera), with a revision of Indian *Cameraria* associated with Leguminosae. *Insecta Matsumurana*, 48: 1–85.
- Kumata, T., Kobayashi, S. & Hirowatari, T. 2013. Gracillariidae. P. 91–155. In: Nasu, Y., Hirowatari, T. & Kishida, Y. (Eds.). *The Standard of Moths in Japan IV*. Gakken Education Publishing, Tokyo.
- Kumata, T., Kuroko, H. & Park, K.-T. 1983. Some Korean species of the subfamily Lithocolletinae (Gracillariidae, Lepidoptera). *Korean Journal of Plant Protection*, 22: 213–227.
- Lopez-Vaamonde, C., Godfray, C.J. & Cook, J.M. 2003. Evolutionary dynamics of host-plant use in a genus of leaf-mining moths. *Evolution*, 57: 1804–1821.