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A Checklist of the Lepidoptera in Yeoseo Island with One Newly Recorded Species, *Ethmia lapidella* (Ethmiidae)

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여서도 나비목 종목록과 미기록 1종 보고

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ABSTRACT: Despite covering only a small fraction of the Earth's land area, islands play a vital role in biodiversity. This study reports on the biological and conservation value of Yeoseo Island, where limited research has been conducted. A checklist of Lepidoptera is provided, identifying a total of 154 species belonging to 27 families. Additionally, this study presents information on the adult morphology, genitalia structures, and ecology of *Ethmia lapidella* (Walsingham, 1880), which is newly reported from this island.

Key words: Checklist, Ethmiidae, Lepidoptera, New record, Yeoseo Island

초 록: 본 연구는 국내 완도군 최남단에 위치한 여서도에 대한 나비목 생물상 조사를 통하여, 여서도의 생물학적 그리고 보존적 가치에 대해 알리고자 한다. 본 연구로부터 나비목 총 154종 27과에 대한 체크리스트가 구축되었고, 먹점뿔나방과에 속하는 미기록 1종을 새롭게 기록하였다. 북두칠성먹점뿔나방(신칭)의 성충 형태, 생식기 구조 및 생태에 대한 정보를 함께 제공하였다.

검색어: 섬, 여서도, 미기록종, 먹점뿔나방과, 나비목, 분류

Islands, covering only 5.3% of Earth's land area, are repositories of biodiversity with numerous endemic species that have evolved independently of large-scale terrestrial migrations (Tershy et al., 2015). However, island ecosystems are degraded by invasive species, human development activities, and climate change (Vitousek, 1988; Lal et al., 2002; Chi et al., 2020). Therefore, continuous and comprehensive monitoring of island ecosystems is essential to identify rates of ecological change and formulate effective conservation strategies (Borges et al., 2018; Lee et al., 2024). Based on the characteristics of the island, this study investigated the insect fauna on Yeoseo Island, which serves as a suitable site for examining the impacts of climate change on species dynamics (Lee et al., 2012).

Yeoseo Island, located in Cheongsan-myeon, Wando-gun, Jeollanam-do, is a 2.51 km^2 area with a 10 km coastline, in the southernmost Korean archipelago (Kim et al., 2014). This island is directly influenced by the high-temperature Tsushima Current, with the 352 m Yeho mountain rising at its center and its surroundings predominantly composed of the cliffed coastline (Lee et al., 2012). Although a previous study on the spider fauna of this island was conducted, no further research has been carried out over the past decade (Kim et al., 2012). However, as unrecorded insect species continue to be reported, further investigation of the island is essential (Lee et al., 2015;

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Shim et al., 2021; Han and Kim, 2023). This study aims to document the insect species diversity of Yeoseo Island, by investigating Lepidoptera (butterflies and moths), which are widely utilized as ecological indicators due to their diverse ecologies and habitats (Kanarsky, 2017).

Materials and Methods

Collection sites

The collections were conducted over two periods, from August 7 to 11 and August 21 to 23, 2023, targeting three sites closely associated with forested areas. The collection sites were marked on the map with red, green, and blue markers, and the corresponding coordinates and altitudes for each marker are as follows (Fig. 1): Red, 33°59'03"N, 126°55'14"E, 42m; green, 33°59'04"N, 126°55'22"E, 32m; blue, 33°59'14"N, 126° 55'13"E, 9m.

Specimen collection and preparation

During the daytime, specimens were collected using a sweep net through sweeping and netting methods. At night, samples were collected using a light trap (mercury vapor lamp, 220 V/400 W) and bucket trap (black light, 12 V/20 W). Attracted specimens were captured using tubes containing cotton soaked in 30% ammonia solution and stored in a freezer. The specimens were then pinned with wings spread, followed by drying in a 50°C oven for over three weeks.

Identification

To identify unrecorded species, abdomen dissection was conducted following the method proposed by Kim et al. (2017), using the EZ4 stereomicroscope (Leica, Germany). The specimens, along with the dissected abdomen and genitalia, were photographed using a Leica S8APO stereomicroscope

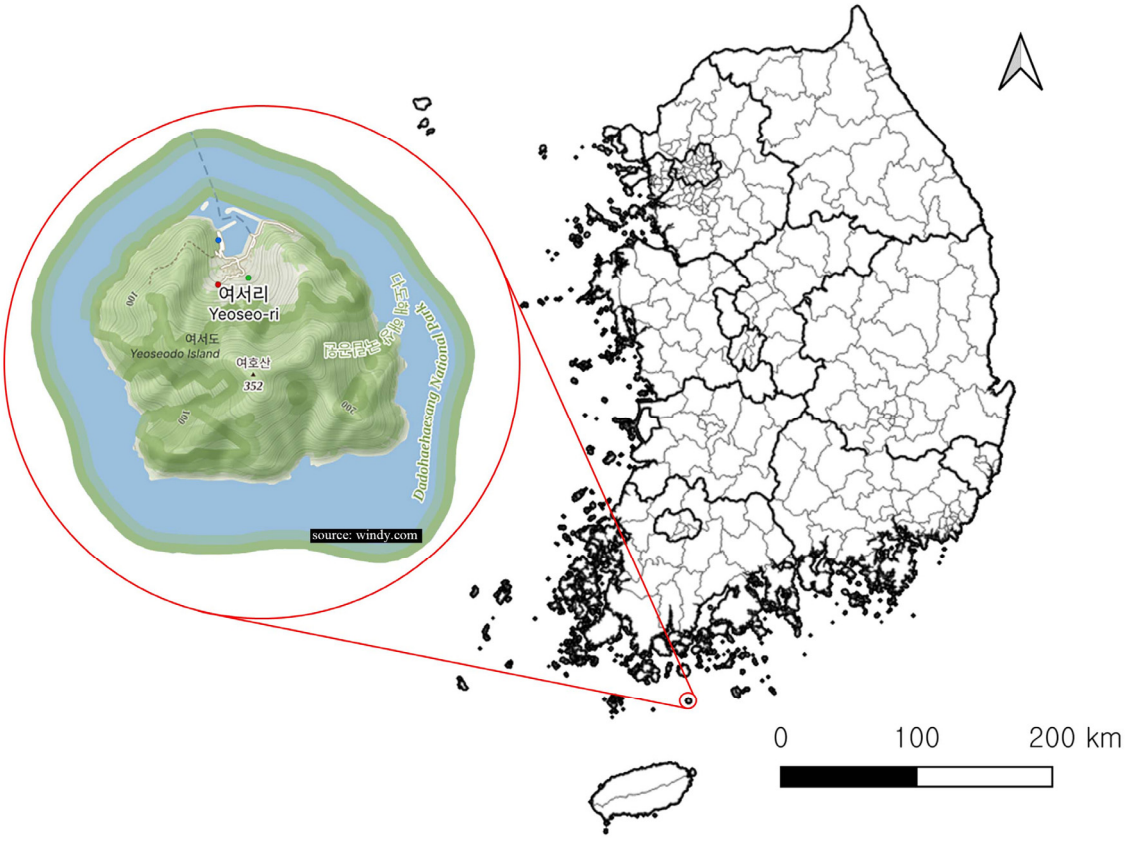

Fig. 1. A map of the collection sites was generated using QGIS 3.30.0, based on the EPSG:5186-Korea 2000/ Central Belt 2010 coordinate system, and Windy.

equipped with a Tucsen Dhyana 400DC digital camera and a Leica LED 5000 HDI dome illuminator. Mosaic software (version 2.4, Tucsen, China) and Helicon Focus software (version 8.2.2 Pro, Helicon Soft, Ukraine) were used to create composite images from multi-focus photographs. Adobe Photoshop 2024 (version 25.7.0, Adobe, USA) was used to adjust the background and brightness of the pictures.

Results

This study presents 154 species, 135 genera, 57 subfamilies, and 27 families of Lepidoptera inhabiting Yeoseo Island in Table 1. The family Erebidae exhibited the highest richness with 31 species and 11 subfamilies. Including this, Fig. 2 provides a sunburst chart showing the abundance of families and subfamilies, with the number of species represented by relative area. Among the reported species, four management species designated by the Ministry of Environment are as follows (Fig. 3A-D): *Dinumma deponens*, *Goniorhynchus exemplaris*, *Hedya auricristana*, and *Samia cynthia*. These species, classified as biological resources requiring export approval, hold significant conservation value for biodiversity and require authorization from the Minister of Environment for international export (Ministry of Environment of Korea, 2019). Additionally, this study reports *Ethmia lapidella* (Walsingham) for the first time from Korea as an unrecorded species belonging to the genus *Ethmia* Hübner, which previously had limited information available in Korea, with only two species reported,

Table 1. A checklist of the Lepidoptera in Yeoseo Island

Family	Subfamily	Scientific Name	Korean Name
Autostichidae		*Autosticha pachysticta* Meyrick, 1936	바둑점원뿔나방
Cosmopterigidae	Cosmopteriginae	*Anatrachyntis japonica* Kuroko et al., 1982	세모창날개뿔나방
		Cosmopterix lienigiella Zeller, 1846	갈대창날개뿔나방
		Cosmopterix zieglerella Hübner, 1810	섬모시창날개뿔나방
		Labdia semicoccinea (Stainton, 1859)	세미창날개뿔나방
Crambidae	Crambinae	*Metaeuchromius flavofascialis* Park, 1990	칠점박이벼명나방
		Pseudargyria interruptella Walker, 1866	줄은빛포충나방
	Pyraustinae	*Ostrinia orientalis* Mutuura et Munroe, 1970	오리엔트조명나방
		Paliga auratalis Warren, 1895	금빛세줄들명나방
		Pyrausta panopealis (Walker, 1859)	들깨잎말이명나방
		Sinibotys butleri (South, 1901)	
		Sitochroa palealis (Denis et Schiffermüller, 1775)	흰배들명나방
	Spilomelinae	*Daulia afralis* Walker, 1859	금흰줄들명나방
		Diaphania indica (Saunder, 1851)	목화바둑명나방
		Diasemia accalis (Walker, 1859)	점애기들명나방
		Eurrhyparodes accessalis Walker, 1859	애기무늬들명나방
		Glyphodes pyloalis Walker, 1859	뽕나무명나방
		Goniorhynchus exemplaris Hampson, 1898	노랑무늬들명나방
		Haritalodes derogata (Fabricius, 1775)	목화명나방
		Hemopsis dissipatalis (Lederer, 1863)	앞흰무늬들명나방
		Herpetogramma luctuosalis (Guenée, 1854)	포도들명나방
		Patania chlorophanta (Butler, 1878)	몸노랑들명나방
		Spoladea recurvalis Fabricius, 1775	흰띠명나방
		Tyspanodes hypsalis Warren, 1891	줄검은들명나방
Depressariidae	Depressariinae	*Tyrolimnas anthraconesa* Meyrick, 1934	애기원뿔나방

Table 1. Continued

Family	Subfamily	Scientific Name	Korean Name
Erebidae	Aganainae	*Mecodina nubiferalis* (Leech, 1889)	남방구리잎나방
	Arctiinae	*Asuridia carnipicta* (Butler, 1877)	눈무늬점불나방
		Barsine aberrans (Butler, 1877)	교차무늬주홍테불나방
		Barsine striata (Bremer and Grey, 1852)	홍줄불나방
		Katha deplana (Esper, 1787)	노랑배불나방
		Macrobrochis staudingeri (Alphéraky, 1897)	목도리불나방
		Spilarctia seriatopunctata (Motschulsky, 1860)	줄점불나방
		Spilarctia subcarnea (Walker, 1855)	배붉은흰불나방
		Stictane rectilinea (Snellen, 1879)	넓은띠회색불나방
	Boletobiinae	*Oruza brunnea* (Leech, 1900)	줄무늬꼬마짤름나방
	Calpinae	*Calyptra gruesa* (Draudt, 1950)	왕갈고리큰나방
		Calyptra hokkaida (Wileman, 1922)	북방갈고리큰나방
		Eudocima phalonia (Linnaeus, 1763)	애으름밤나방
		*Oraesia emarginat*a (Fabricius, 1794)	작은갈고리큰나방
		Oraesia excavata (Butler, 1878)	붉은갈고리큰나방
	Erebinae	*Ercheia niveostrigata* Warren, 1913	청백무늬나방
		Erygia apicalis Guenée, 1852	구름잎태극나방
		Hypersypnoides submarginata Walker, 1865	검스레흰별썩은잎나방
		Spirama helicina (Hübner, 1831)	톱니태극나방
	Herminiinae	*Adrapsa simplex* (Butler, 1879)	별박이수염나방
		Cidariplura gladiata Butler, 1879	흰점멧수염나방
		Simplicia niphona (Butler, 1878)	곧은띠수염나방
	Hypeninae	*Hypena claripennis* (Butler, 1878)	각시뒷노랑수염나방
		Hypena trigonalis (Guenée, 1854)	대만수염나방
	Hypocalinae	*Hypocala subsatura* Guenée, 1852	대만수염잎큰나방
	Lymantriinae	*Somena pulverea* (Leech, 1889)	꼬마독나방
		Sphrageidus similis (Fuessly, 1775)	흰독나방
	Pangraptinae	*Pangrapta costinotata* (Butler, 1881)	은무늬짤름나방
		Pangrapta perturbans (Walker, 1858)	산그물무늬짤름나방
	Scoliopteryginae	*Dinumma deponens* Walker, 1858	검은띠큰나방
		Gonitis mesogona (Walker, 1858)	무궁화잎큰나방
Ethmiidae		*Ethmia lapidella* (Walsingham, 1880)	북두칠성먹점뿔나방(신칭)
Gelechiidae	Dichomeridinae	*Anarsia bipinnata* (Meyrick, 1932)	괴불잎말이뿔나방
		Dichomeris rasilella (Herrich-Schäffer, 1854)	쑥잎말이뿔나방
Geometridae	Ennominae	*Amraica superans* (Butler, 1878)	노박덩굴가지나방
		Ascotis imparata (Walker, 1860)	남방네눈쑥가지나방
		Chiasmia defixaria (Walker, 1861)	두줄점가지나방
		Fascellina chromataria Walker, 1860	갈고리가지나방
		Krananda semihyalina Moore, 1868	유리창가지나방
	Geometrinae	*Agathia carissima* Butler, 1878	검띠푸른자나방
		Agathia visenda Butler, 1880	검띠발푸른자나방
		Chlorissa anadema (Prout, 1930)	흰줄무늬애기푸른자나방

Table 1. Continued

Family	Subfamily	Scientific Name	Korean Name
Geometridae	Geometrinae	*Comibaena procumbaria* (Pryer, 1877)	무늬박이푸른자나방
		Eucyclodes difficta (Walker, 1861)	왕무늬푸른자나방
		Eucyclodes infracta (Wileman, 1911)	흰애기푸른자나방
	Larentiinae	*Asthena anseraria corculina* (Butler, 1878)	노랑줄흰물결자나방
		Ecliptopera umbrosaria (Motschulsky, 1861)	큰톱날물결자나방
		Gandaritis fixseni (Bremer, 1864)	큰노랑물결자나방
	Sterrhinae	*Scopula ignobilis* (Warren, 1901)	넉점물결애기자나방
		Scopula indicataria (Walker, 1861)	구름무늬흰애기자나방
Gracillariidae	Gracillariinae	*Caloptilia theivora* (Walsingham, 1891)	동백가는나방
	Lithocolletinae	*Chrysaster hagicola* Kumata, 1961	참싸리가는나방
Hesperiidae	Hesperiinae	*Parnara guttata* (Bremer et Grey, 1852)	줄점팔랑나비
Lyonetiidae	Lyonetiinae	*Lyonetia clerkella* (Linné, 1758)	복숭아굴나방
Noctuidae	Acronictinae	*Acronicta leucouspis* Herz, 1904	뿔무늬저녁나방
		Acronicta pulverosa (Hampson, 1909)	흰배저녁나방
		Gerbathodes paupera (Staüdinger, 1892)	흰무늬애저녁나방
	Aediinae	*Aedia leucomelas* (Linnaeus, 1758)	뒤흰날개밤나방
	Agaristinae	*Sarbanissa subflava* (Moore, 1877)	뒷노랑얼룩나방
	Amphipyrinae	*Amphipyra monolitha* Guenée, 1852	흰눈까마귀밤나방
	Bagisarinae	*Brevipecten consanguis* Leech, 1900	남방쌍무늬밤나방
		Sphragifera biplaga (Walker, 1858)	꼬마봉인밤나방
	Condicinae	*Niphonyx segregata* (Butler, 1878)	엉겅퀴밤나방
	Eriopinae	*Callopistria albolineola* (Graeser, 1889)	흰줄어린밤나방
		Callopistria repleta Walker, 1858	얼룩어린밤나방
	Eustrotiinae	*Maliattha signifera* (Walker, 1858)	넓은띠흰꼬마밤나방
		Naranga aenescens Moore, 1881	벼애나방
	Heliothinae	*Helicoverpa assulta* (Guenée, 1852)	담배나방
	Noctuinae	*Chasminodes albonitens* (Bremer, 1861)	은빛밤나방
		Spodoptera depravata (Butler, 1879)	잔디밤나방
		Spodoptera litura (Fabricius, 1775)	담배거세미나방
		Tiracola aureata Holloway, 1989	바위무늬밤나방
	Plusiinae	*Abrostola triplasia* (Linnaeus, 1758)	쐐기풀알락밤나방
		Antoculeora locuples (Oberthür, 1880)	왕은무늬밤나방
		Erythroplusia rutilifrons (Walker, 1858)	꼬마은무늬밤나방
		Macdunnoughia purissima (Butler, 1878)	은무늬밤나방
Nolidae	Chloephorinae	*Pseudoips prasinanus* (Linnaeus, 1758)	쌍줄푸른나방
		Sinna extrema (Walker, 1854)	그물애나방
	Nolinae	*Meganola albula* (Denis and Schiffermüller, 1775)	혹나방
		Nola minutalis Leech, 1888	각시혹나방
Notodontidae	Dicranurinae	*Fentonia ocypete* (Bremer, 1861)	밤나무재주나방
		Syntypistis subgeneris (Strand, 1915)	연갈색재주나방
		Wilemanus bidentatus (Wileman, 1911)	먹무늬은재주나방
	Notodontinae	*Mesophalera sigmata* (Butler, 1877)	동백나무재주나방
	Phalerinae	*Phalera flavescens* (Bremer and Grey, 1852)	먹무늬재주나방

Table 1. Continued

Family	Subfamily	Scientific Name	Korean Name
Nymphalidae	Libytheinae	*Libythea lepita* Moore, [1858]	뿔나비
	Nymphalinae	*Polygonia c-aureum* (Linnaeus, 1758)	네발나비
		Vanessa indica (Herbst, 1794)	큰멋쟁이나비
Oecophoridae	Oecophorinae	*Promalactis suzukiella* Matsumura, 1931	구슬무늬원뿔나방
Papilionidae	Papilioninae	*Graphium sarpedon* (Linnaeus, 1758)	청띠제비나비
		Papilio protenor Cramer, [1775]	남방제비나비
		Papilio xuthus Linnaeus, 1767	호랑나비
Pieridae	Pierinae	*Pieris rapae* (Linnaeus, 1758)	배추흰나비
Plutellidae		*Plutella xylostella* (Linné, 1758)	배추좀나방
Pterophoridae	Pterophorinae	*Fuscoptilia emarginata* Snellen, 1884	칠성털날개나방
		Hellinsia ishiyamanus Matsumura, 1931	물쑥털날개나방
		Nippoptilia vitis Sasaki, 1913	포도애털날개나방
Pyralidae	Epipaschiinae	*Orthaga olivacea* Warren, 1891	제주집명나방
	Phycitinae	*Oncocera semirubella* (Scopoli, 1763)	앞붉은명나방
	Pyralinae	*Endotricha olivacealis* Bremer, 1864	검은점뾰족명나방
		Hypsopygia mauritialis (Boisduval, 1833)	노랑띠붉은비단명나방
		Hypsopygia nannodes (Butler, 1879)	갈색띠비단명나방
Saturniidae	Saturniinae	*Samia cynthia* (Drury, 1773)	가중나무고치나방
Sphingidae	Macroglossinae	*Ampelophaga rubiginosa* Bremer and Grey, [1852]	머루박각시
		Cephonodes hylas (Linnaeus, 1771)	줄녹색박각시
		Macroglossum pyrrhostictum (Butler, 1875)	벌꼬리박각시
		Macroglossum saga (Butler, 1878)	검은꼬리박각시
		Rhagastis mongoliana (Butler, 1875)	우단박각시
		Theretra japonica (Boisduval, 1867)	줄박각시
		Theretra nessus (Drury, 1773)	노랑줄박각시
	Sphinginae	*Callambulyx tatarinovii* (Bremer and Grey, 1852)	녹색박각시
		Clanis bilineata (Walker, 1886)	콩박각시
		Parum colligata (Walker, 1856)	닥나무박각시
		Psilogramma increta (Walker, 1865)	큰쥐박각시
Stathmopodidae		*Stathmopoda auriferella* (Walker, 1864)	열매꼭지나방
		Stathmopoda haematosema Meyrick, 1933	털다리꼭지나방
		Stathmopoda masinissa Meyrick, 1906	감꼭지나방
Tortricidae	Olethreutinae	*Ancylis comptana* (Frölich, 1828)	뾰족날개애기잎말이나방
		Epiblema foenella (Linnaeus, 1758)	흰갈퀴애기잎말이나방
		Grapholita delineana Walker, 1863	네줄애기잎말이나방
		Hedya auricristana (Walsingham, 1900)	괴불왕애기잎말이나방
		Loboschiza koenigiana (Fabricius, 1775)	멀구슬애기잎말이나방
		Phaecasiophora fernaldana Walsingham, 1900	흰다리애기잎말이나방
		Piniphila bifasciana (Haworth, 1811)	밤색두줄애기잎말이나방
	Tortricinae	*Adoxophyes orana* (Fischer von Röslerstamm, 1834)	애모무늬잎말이나방
		Eupoecilia ambiguella (Hübner, 1796)	버찌가는잎말이나방
		Pandemis heparana (Denis and Schiffermüller, 1775)	갈색잎말이나방
Xyloryctidae	Periacminae	*Meleonoma malacobyrsa* (Meyrick, 1921)	갈색띠원뿔나방
Yponomeutidae	Yponomeutinae	*Yponomeuta solitariellus* Moriuti, 1977	참회나무집나방

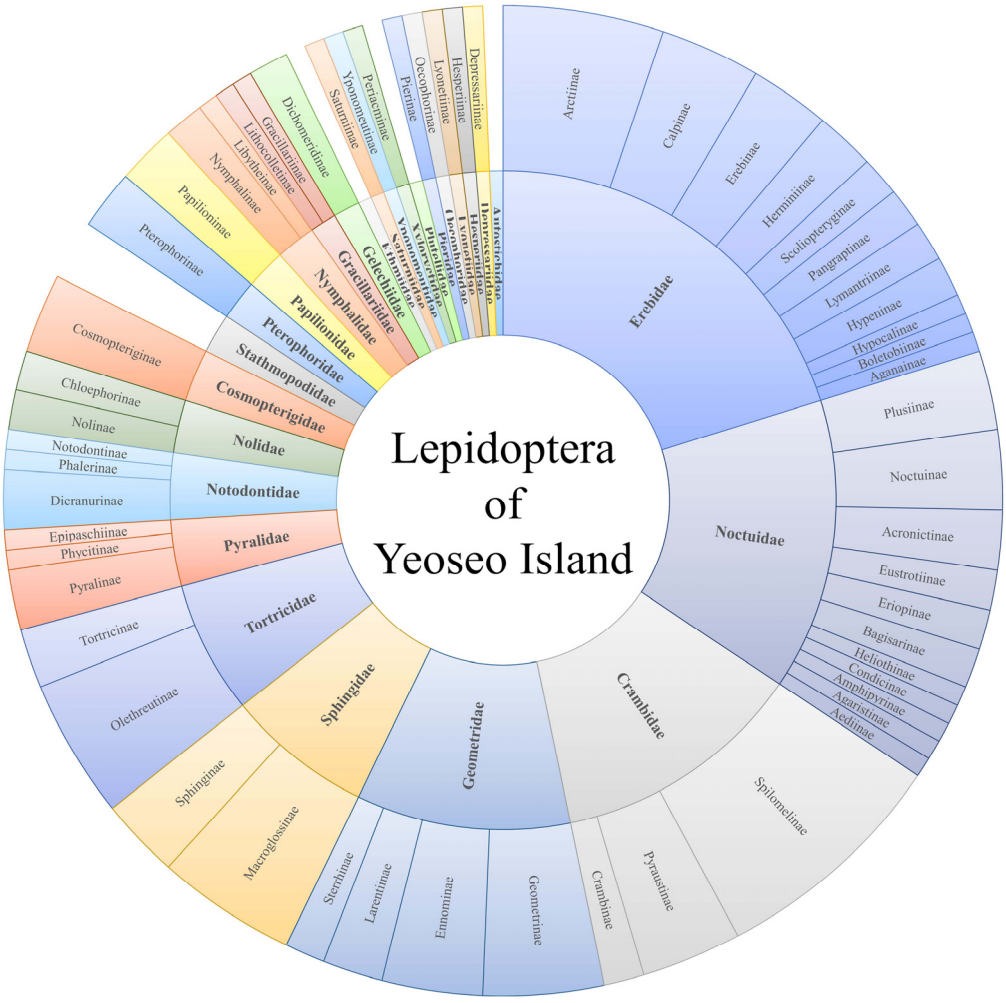

Fig. 2. A sunburst chart based on the families and subfamilies of Lepidoptera surveyed on Yeoseo Island.

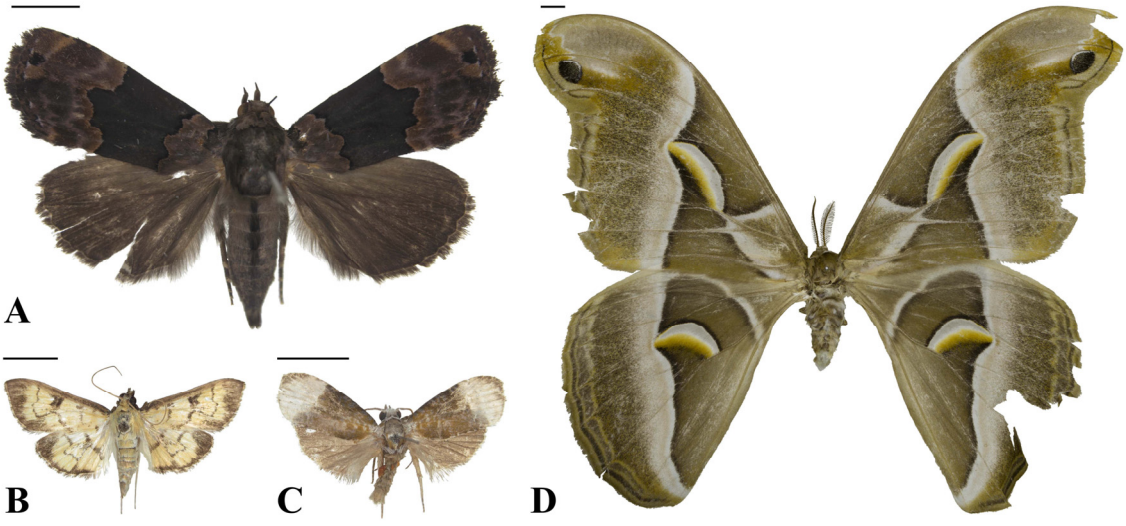

Fig. 3. Management species of Lepidoptera designated by the Ministry of Environment among those surveyed on Yeoseo Island. A, *Dinumma deponens*; B, *Goniorhynchus exemplaris*; C, *Hedya auricristana*; D, *Samia cynthia*. <scale bar = 5.0 mm>.

including *E. nigripedella* Erschiff and *E. xanthoplura* Meyrick.

Systematic Accounts

Family Ethmiidae Busck, 1909

Ethmiidae Busck, 1909: 91. Type genus: *Ethmia* Hübner.

Genus *Ethmia* Hübner, [1819]

Ethmia Hübner, [1819]: 163. Type species: *Phalaena pyrausta* Pallas.

Ethmia lapidella (Walsingham, 1880) 북두칠성먹점뿔나방 (신칭) (Fig. 4)

Hyponomeuta lapidellus Walsingham, 1880: 86. Type locality: India, Punjab, Dharmsala.

Psecadia decempunctella Matsumura, 1931: 1085.

Ethmia lapidella Kun, 2002: 173.

Diagnosis. This species is the most similar to *E. heptasema* (Turner), but differs in the number of black spots on the forewing. In *E. heptasema*, there are nine black spots on the pale gray forewing. However, in this species, the gray forewing exhibits a spot pattern almost identical to *E. heptasema*, but with an additional faint dark gray spot on the posterior margin near the apex. In male genitalia, this species is similar to *E. dimauraorum* Phillips, but has differences at the uncus and valva. In *E. dimauraorum*, the uncus is absent, and the apex of the valva is pointed, with a bundle of feather-like spines present nearby. But in this species, the uncus has the shape of a bifurcated tongue, and the valva is simple and rounded at the apex with no distinctive structures.

Description. Adult (Fig. 4A-C). Wingspan 16.3-20.6 mm. *Head*. Frons pale gray with pale brownish gray blotch at median; vertex gray; occupit gray with dark gray at the median. Antenna gray; dark gray from about 3/14 to apex; scape from 1/3 to apex dark gray at dorsal margin. Labial palpus pale gray with dark gray at the outer side of the lateral margin; second segment pale gray at the junction with the third segment. *Thorax*. Tegula gray with black blotch at the apex. Thorax gray; prothorax pale gray with black at the cephalic margin; mesothorax with black blotch symmetrically on the cephalic margin and a black fascia with silverous gray center on the caudal margin. *Wing*. Forewing gray; costal black, narrowing gradually from base to 1/4; six black spots from base to 1/2 excluding the posterior margin, spots forming a pentagonal shape with relatively regular intervals except for the weakly developed spot near the base, the second spot from the base an elliptical shape twice as large as the other spots; dark gray between the two spots on the costal margin; four spots with relatively regular internals forming a rectangular shape at from 2/3 to 7/8 excluding the posterior margin, the spot at posterior side dark gray and slightly larger than others, the remaining spots black; small black spots with regular intervals along the terminal line, gradually fading toward the base, not reaching apex; cilia pale gray. Hindwing ocherous gray, dark gray toward the apex; cilia pale gray. *Abdomen*. Abdomen ocher.

Male genitalia (Fig. 4D-E). Uncus bifurcated into two tongue-shaped with blunt apex, covered in setae. Valva semi-arrowhead-shaped with blunt vertex, setae at the ventral margin and apex; costa flat, setae at the dorsal margin, apex pointed; sacculus with small sclerotized projection. Aedeagus convex dorsally, sclerotized caudally; apical patch of stimuli sclerotized with acute apex; vesica with two spine-shaped cornuti, sclerotized structure with serrated apex at the caudal margin.

Female genitalia (Fig. 4F). Papillae anales weakly sclerotized with some short setae. Apophyses posteriors long, wider cephalically; apophyses anteriores thick and short. Antrum sclerotized and short. Ductus bursae very long and slender, with multiple coils. Corpus bursae elliptical; signum bar-shaped, located 1/4 from the caudal margin, sclerotized plate on the cephalic margin with V-shaped emargination.

Material examined. 1♂ and 1♀, Korea, Jellanam-do, Wando-gun, Yeoseodo-gil 29-38 (33°59'04"N 126°55'22"E), Altitude: 32m, 08 viii 2023 (leg. S. Kim and I.W. Jeong), gen. slide. no. IPE13308 (♂), 13309 (♀)/ In-Won Jeong; 1♀, Korea, Jellanam-do, Wando-gun, Yeoseo-ri 819-3 (33°59'14"N 126°55'13"E), Altitude: 9m, 10 viii 2023 (leg. S. Kim and I.W. Jeong), gen. slide. no. IPE13307/ In-Won Jeong.

Distribution. Korea (new record), China, India, Japan, and Taiwan (Kun and Szabóky, 2000).

Ecology. Two generations occur from March to May and September to October, with the larvae feeding on *Ehretia resinosa* Hance, 1880 (Boraginaceae) at Kaohsiung and Taiwan (Wei et al., 2007; Yen et al., 2009).

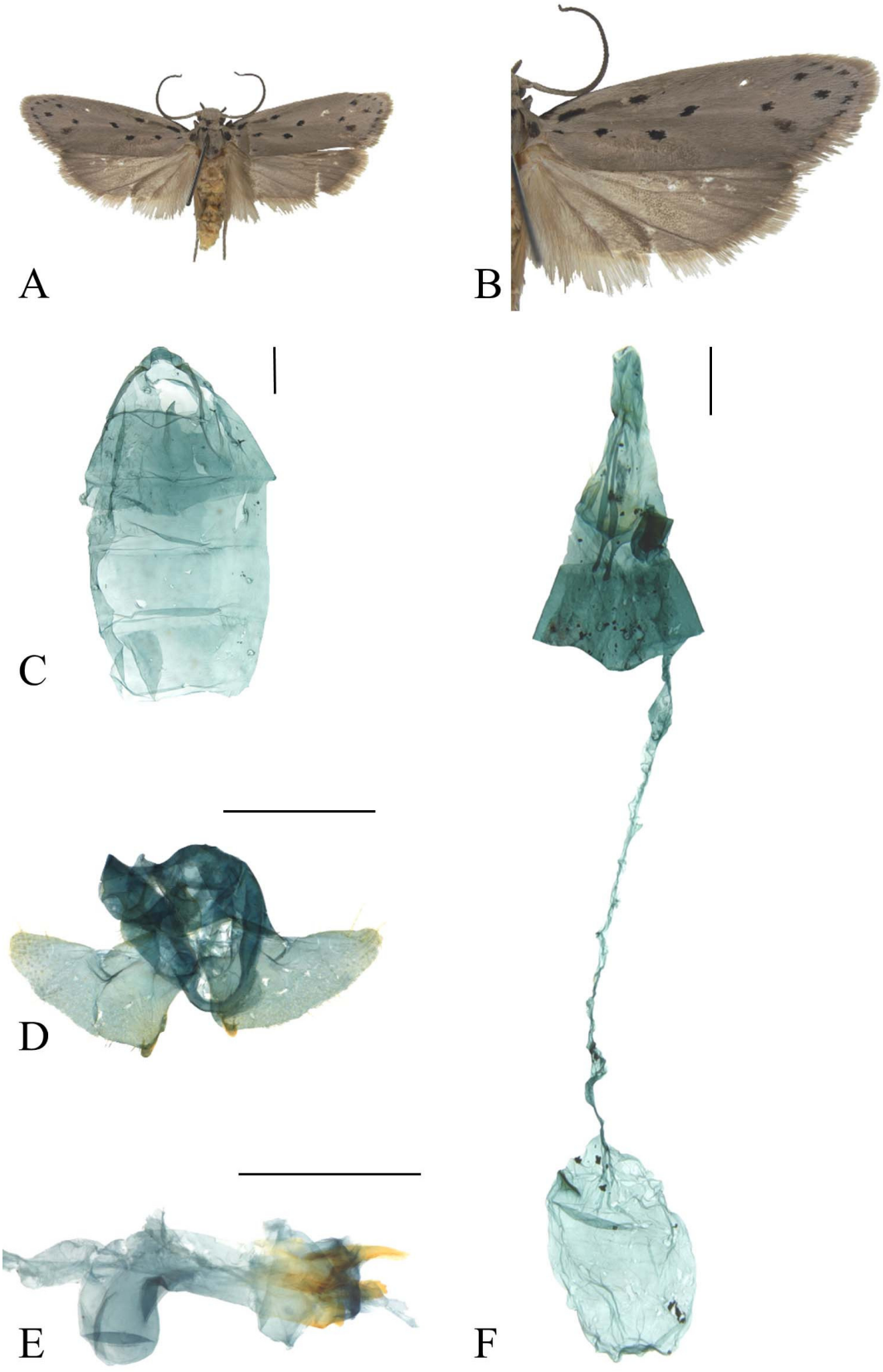

Fig. 4. *Ethmia lapidella*. A, Adult; B, wing; C, abdomen; D, male genitalia; E, aedeagus; F, female genitalia. <scale bar: 0.5 mm>.

Discussion

This study reports the insect diversity of Yeoseo Island, isolated from the mainland, through a checklist of Lepidoptera. A total of 154 species from 27 families were identified, highlighting the island's high biodiversity. Additionally, the significant biological and conservation value of the island was highlighted by reporting *D. deponens*, *G. exemplaris*, *H. auricristana*, and *S. cynthia*, which have been designated for protection by the Minister of Environment, along with one unrecorded species, *E. lapidella*. Regarding the ecology of the newly reported species, additional botanical research is needed to determine whether its host plants, which have not been recorded in Korea, are present in the region. Since the Lepidoptera collection was conducted only in August, when the biodiversity is at its peak, additional sampling during other periods is necessary to understand Yeoseo Island's biodiversity comprehensively.

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Statements for Authorship Position & Contribution

Jeong, I.W.: Jeonbuk National University, Student in MS; Conducted the experiments, wrote the manuscript, morphological identifications, prepared genitalia vouchers and figures, revising

Kim, S.: Jeonbuk National University, Professor; Designed the research, wrote the manuscript, editing, revising, finance support

All authors read and approved the manuscript.

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