

JAPANESE SPECIES OF THE GENUS *APATETRIS* (LEPIDOPTERA, GELECHIIDAE)

Y. Sakamaki, 2000. Japanese species of the genus *Apatetris* (Lepidoptera, Gelechiidae). – Tijdschrift voor Entomologie 143: 211-220, figs. 1-23. [ISSN 0040-7496]. Published 1 December 2000.

Two new species of *Apatetris* from Japan are described: *Apatetris elaeagnella* sp. n. and *A. elymicola* sp. n. *A. elaeagnella* has reduced labial palpi with a single segment, a unique character among the Gelechiidae. *A. elaeagnella* is closely related to *A. panchromatica* (Meyrick) comb. n. *A. elymicola* is closely related to *A. kinkerella* (Snellen) and *Rotundivalva* Janse is treated as a synonym of *Apatetris*. These species will give us important information for revising *Apatetris* and related genera in the future.

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Key-words. – *Apatetris*; single-segmented labial palpus; new species; *Rotundivalva* syn. n.; Gelechiidae.

Staudinger (1879) established the genus *Apatetris*, which is mainly distributed in the Ethiopian and western Palaearctic regions along with some allied genera. Other allied genera are distributed in the New World and the Australian region, while there are few species described from the Oriental and eastern Palaearctic regions. All these genera belong to the tribe Anomologini.

Janse (1951) described many species from South Africa. Others are described by various authors in scattered publications (e.g. Walsingham 1903, Chrétien 1908, Meyrick 1923; see Meyrick 1925 for a detailed list). For some Palaearctic species information on the genital structures has been reported (Janse 1951, Piskunov 1981). The genus *Apatetris* is speciose compared to related genera and includes about 30 species (Meyrick 1925, Janse 1951, and Edwards 1996). However, the status of *Apatetris* among the allied genera remains to be revised. To clarify the status of these genera, it is necessary to describe and illustrate as many taxa as possible, from different areas, in detail.

In the course of this study, I found two new species of *Apatetris* from Japan. These new species are described and illustrated in detail. The diagnostic characters are discussed in the remarks section for each taxon.

Type-depository

The holotypes of the new species are deposited in the collection of the Laboratory of Systematic Entomology in Hokkaido University, Sapporo (EIHU), unless otherwise stated. Most other specimens examined in this study are also deposited there, while some are deposited in the Entomological Laboratory, University of Osaka Prefecture, Sakai, Osaka (UOPJ) and in Transvaal Museum at Pretoria, South Africa (TMSA).

TAXONOMY

Genus *Apatetris* Staudinger

Apatetris Staudinger, 1879: 316. Type species: *Apatetris mirabella* Staudinger, 1879: 317 (by monotypy).

Rotundivalva Janse, 1951: 238. syn. n. Type species: *Rotundivalva blanda* Janse, 1951: 239. (by monotypy) Holotype ♂: 'Pretoria, 30.viii.1948, L. Vari.' 'Genital prep. No. 5154' [TMSA][examined].

For a detailed synonymy see Sattler (1973).

Remarks

The genus *Apatetris* was diagnosed on the basis of an apically bilobed hindwing and basal pectination of the antenna in Staudinger (1879) and Meyrick (1925). Janse (1951) re-examined some type specimens and re-diagnosed the genus, taking the African species into consideration. According to Janse, *Ap-*



Figs. 1-6. Adult *Apatetris* habitus and head in lateral view. – 1, 2, *A. elaeagnella*; 3, 4, *A. elymicola*; 5, 6, *A. kinkerella*.

apatetris is characterized by a combination of the following characters: tongue short or rudimentary; maxillary palpus rudimentary; labial palpus not so long, not so ascending; veins M1 and M2 of the hindwing either rudimentary or absent; in male genitalia, tegumen rather short and narrow; uncus short or absent; gnathos absent. However, his designation was still meagre, because the material for the type species of *Apatetris* was a single female; the type species of *Apatetris* cannot be satisfactorily compared with those of allied genera. Consequently, *Apatetris* is now a very diverse genus morphologically. Once additional

‘male’ specimens have been examined, *Apatetris* may have to be split into several small genera.

Apatetris elaeagnella sp. n.

Type material. – Holotype ♂, Kibune, Kyoto Pref., Honsyū, Japan, 19.v.1967, T. Kumata (Genital. slide no. Gel-93070, Wing slide no. Gel-94030). Paratypes, Japan: Honsyū: 11♂ 12♀, Kamogawa, Tiba Pref., em.1.v.1980, ex *Elaeagnus macrophylla*, S. Takagi; 4♂ 2♀, Niigata Pref., em.13-26.vi.1974, ex *Elaeagnus multiflora* var. *hortensis*, I. Kanazawa; 1♂ 2♀, Nagano

Prof., em. 5-7.vi.1958, ex *Elaeagnus* sp., K. Kamijo; 2♂ 1♀, Matumoto, Nagano Pref., em. 16-25.ii.1996, ex *Elaeagnus umbellata*, K. Sugisima; 23♂ 25♀, Kibune, Kyoto Pref., em. 11.v-7.vi.1967, ex *Elaeagnus pungens*, T. Kumata (1♀ Gen. sl. no. Gel-93047); 1♀, Wakayama Pref., em. 16.iii.1994, ex *Elaeagnus pungens*, M. Murase [EIHU]. Kyūsyū: 3♂ 2♀, Mt. Hikosan, Hukuoka Pref., em. 7-12.vii.1957, ex *Elaeagnus umbellata*, H. Kuroko [UOP]. 1♀, Sendai City, Kagosima Pref., 17.ix.1999, Y. Sakamaki. 1♂ 1♀, Sendai City, Kagosima Pref., em. 19.ix.1999, ex *Elaeagnus umbellata*, Y. Sakamaki [EIHU].

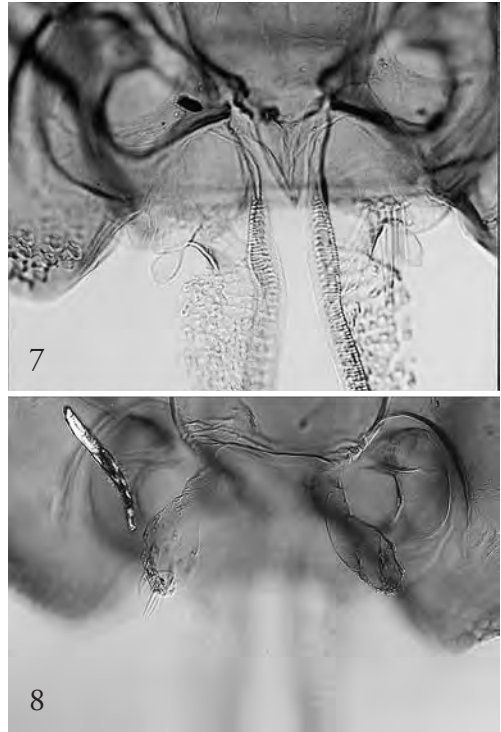
Description

Expanse of wings: 5.4-9.2 mm. Length of forewing: 2.3-4.0 mm. Large variation in wing length is mainly observed in overwintering individuals, while wing length is generally short in the summer generation, ranging from 2.6-3.0 mm.

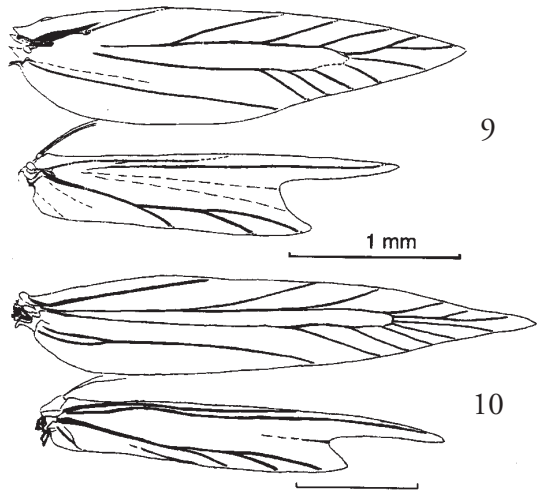
Face and head smooth, brilliant fuscous; neck plumes pressed together, dark fuscous; ocellus small, distinct, and posterior to antennal scape; compound eye small and oval; longest and shortest diameters about $\frac{1}{3}$ and $\frac{1}{4}$ of head-width, respectively. Labial palpus (figs. 2, 8) 1-segmented, rudimentary, clavate, hidden under scales; maxillary palpus (fig. 7) 1-segmented, rudimentary; tongue slender, reaching to caudal margin of middle coxa. Antenna filiform, slightly longer than $\frac{1}{2}$ length of forewing, fuscous; scape slightly flattened and smooth.

Thorax smooth, brilliant purplish fuscous. Legs long and smooth; purplish fuscous; tibiae and all segments of tarsi gold apically; hind tibia with ochre band at middle and bristly scales above; the bristly scales short, sparse, fuscous. Abdomen dark gold dorsally, light gold ventrally.

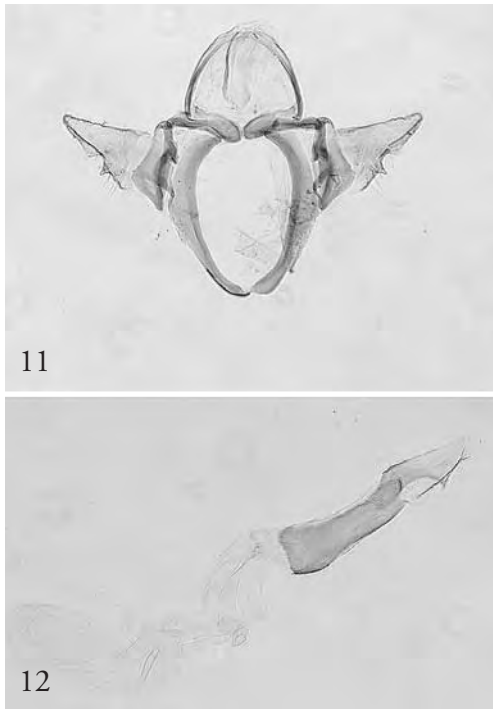
Wing venation (fig. 9). – Discoidal cell of forewing long, occupying basal $\frac{3}{4}$ of wing, nearly parallel-sided apically, becoming narrow and obsolete basally; 12-veined; R1 running from basal $\frac{1}{3}$ of cell to about middle of costa; R2 and R3 from about distal $\frac{1}{4}$ and $\frac{1}{10}$ of cell, respectively; R3 from near upper angle of cell; R4 and R5 stalked, running from upper angle to costa; R5 branched from middle of R4; M1, M2, and M3 remote from each other; CuA1 and CuA2 also remote from and parallel to each other; anal vein unforked, completely coalescent, running to near tornus. Hindwing $\frac{5}{6}$ as long as forewing, bilobed apically due to protrusion of tornus, with an acute apex; costa and dorsum parallel; 6-veined; discoidal cell open, Rs running straight to near apex; M1 and M2 obsolete, appearing as folds extending towards the emargination of termen, not stalked; M3 and CuA1 long stalked, their common stem stalked with CuA2; CuA2 short, running to middle of dorsum, parallel to apical half of CuA1; CuP absent; anal veins rudimentary.



Figs. 7-8. *Apatetris elaeagnella*, caudal view of the mouthparts. – 7, Maxillary palpi; 8, labial palpi.



Figs. 9-10. *Apatetris* wings: shape and venation. – 9, *A. elaeagnella*; 10, *A. elymicola*.



Figs. 11-12. *Apatetris elaeagnella*, male genitalia. – 11, Caudal view, aedeagus omitted; 12, aedeagus.

Wing markings (fig. 1). – Forewing spindle-shaped with acute apex; cupreous black ground colour, shining cupreous violet between plica and dorsum, silver on basal $\frac{1}{7}$; 3 costal silver strigulae running in parallel with each other on median $\frac{1}{3}$ of wing, oblique outward; first strigula reaching $\frac{1}{2}$ of wing-width, other outer 2 strigulae reaching $\frac{2}{3}$; 3 similar strigulae arranged in basal $\frac{1}{2}$ of dorsum, oblique outward; silver blotch occupying apical $\frac{1}{8}$ of forewing and extending on cilia of apical area, 2 white blotches present, one at apical $\frac{1}{4}$ of costa, the other at apical $\frac{2}{5}$ of dorsum; an irregular silver streak running between apical silver blotch and dorsal white blotch; cilia dark fuscous, becoming paler towards dorsum. Hindwing bilobed apically, fuscous; cilia fuscous, becoming paler towards base.

Male genitalia (figs. 11-12). – Uncus and gnathos absent. Tegumen short; pedunculus $\frac{1}{2}$ as long as valva; clavate sclerite separate from pedunculus, developed, long. Valva broad, triangular, with some short setae on inner surface; Sacculus small, sclerotized, forming a triangular process. Saccus absent. Aedeagus long, 1.5 times as long as valva, cylindrical, slightly swollen at base and at apical $\frac{1}{3}$, with an acute trian-

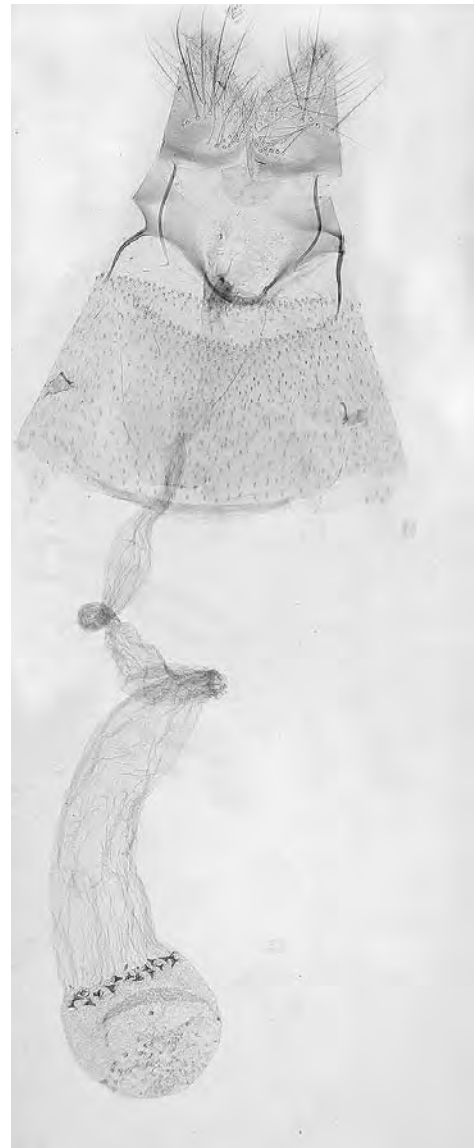


Fig. 13. *Apatetris elaeagnella*, female genitalia in ventral view.

gular process at apical $\frac{1}{4}$; caecum absent.

Female genitalia (fig. 13). – Papillae analis short, round, with many short and long setae over entire surface and many spines on apical $\frac{1}{3}$; joint membrane between papillae analis and 8th abdominal segment very short; apophysis posterioris moderate in length, as long as papillae analis. On 8th abdominal segment sclerotization weakened dorsally, short; apophysis an-

terioris about $\frac{2}{3}$ as long as apophysis posterioris; ostium membranous; lamella antevaginalis sclerotized, narrow, coalescent with sternum VIII; lateral part of sterigma forming a subtriangular plate which is weakly sclerotized; lamella postvaginalis hardly sclerotized. Ductus bursae, long, wrinkled longitudinally. Corpus bursae tapering cylindrical, wrinkled longitudinally, round on cephalic margin, with numerous minute spines on whole surface; signa short, triangular, arranged into uniorbital circle, situated at distal $\frac{1}{3}$ of corpus bursae.

Distribution. – Japan: Honsyû and Kyûsyû.

Host plants. – *Elaeagnus macrophylla* Thunberg, *E. multiflora* Thunberg var. *hortensis* (Maxim.) Servetaz, *E. umbellata* Thunberg and *E. pungens* Thunberg (Elaeagnaceae).

Biology. – Probably bivoltine. Larvae are found mining the leaves of the host plants in summer (June–July) and autumn (September). Under rearing conditions they make cocoons and pupate under the vertical cuticle of leaves in mid-summer and late autumn. The summer generation emerges about 10 days later. The autumn generation overwinters in the leaves and emerges in early summer.

Remarks

To my surprise, the labial palpus of the new species appeared to be lacking at a glance, even using a stereomicroscope. A minute labial palpus appeared to be hidden under the scales. In general, a three-segmented recurved labial palpus is one of the distinct characters of gelechiid moths. Nevertheless, in *A. elaeagnella*, only a single-segmented labial palpus is found. This is unique in the Gelechiidae, and perhaps also in the superfamily Gelechioidea. Someday, this species will be important for clarifying the function of the distinct labial palpus in the Gelechiidae. It may become necessary to separate this species from *Apatetris* on the basis of this unique labial palpus after a detailed global revision of *Apatetris*.

The new species is very similar to *A. panchromatica* (Meyrick, 1926) **comb. n.** in external aspects. However, the new species can be discriminated from the latter by a silver dot at the wing apex. *A. panchromatica* was originally described in *Aristotelia*, from India, then transferred to *Nealyda* by Clarke (1969), probably on the basis of the shape of the hindwing. Meyrick (1926) concluded that the labial palpi were broken. However, since I had doubts about this conclusion, I asked the Natural History Museum in London to check the condition of the labial palpi of the type material. The single type specimen of *A. panchromatica* was in poor condition, with the head badly glued to the thorax and no abdomen. Something that 'could' be a small-segmented appendage on the mouthparts was observed, but there did not ap-

pear to be any labial palpi (K. Sattler and K. Tuck, personal communication). Consequently, I cannot judge whether the labial palpi of the type specimen are broken. Moreover, for a final diagnosis, we must await further material to study the genitalia. Still I tentatively place *A. panchromatica* as the closest relative to *A. elaeagnella*.

I cannot find other members in *Apatetris* related to the new species, because *Apatetris* has been insufficiently revised. From the perspective of male genitalia, most species of *Apatetris* and allied genera have a small uncus, or a related or vestigial structure that unites with the tegumen. These are weakly sclerotized with some setae. In contrast, the uncus of *A. elaeagnella* is completely lacking. *Macrocalcara undina* (Meyrick) (holotype: No. 4280 deposited in TMSA [examined]) might be a related species, based on its male genitalia, which have an extremely short tegumen and no uncus.

Apatetris elymicola sp. n.

Type material. – Holotype ♀, Syari Town, Hokkaidô, Japan, em. 28.ii.1996, ex *Elymus mollis*, larva 30.ix.1995, vernalized to 19.i.1996 in 5°C, Y. Sakamaki. Paratypes, 3♂ 2♀, Syari Town, Hokkaidô, Japan, em. 20-26.vi.1996, ex *Elymus mollis*, H. Torikura [EIHU].

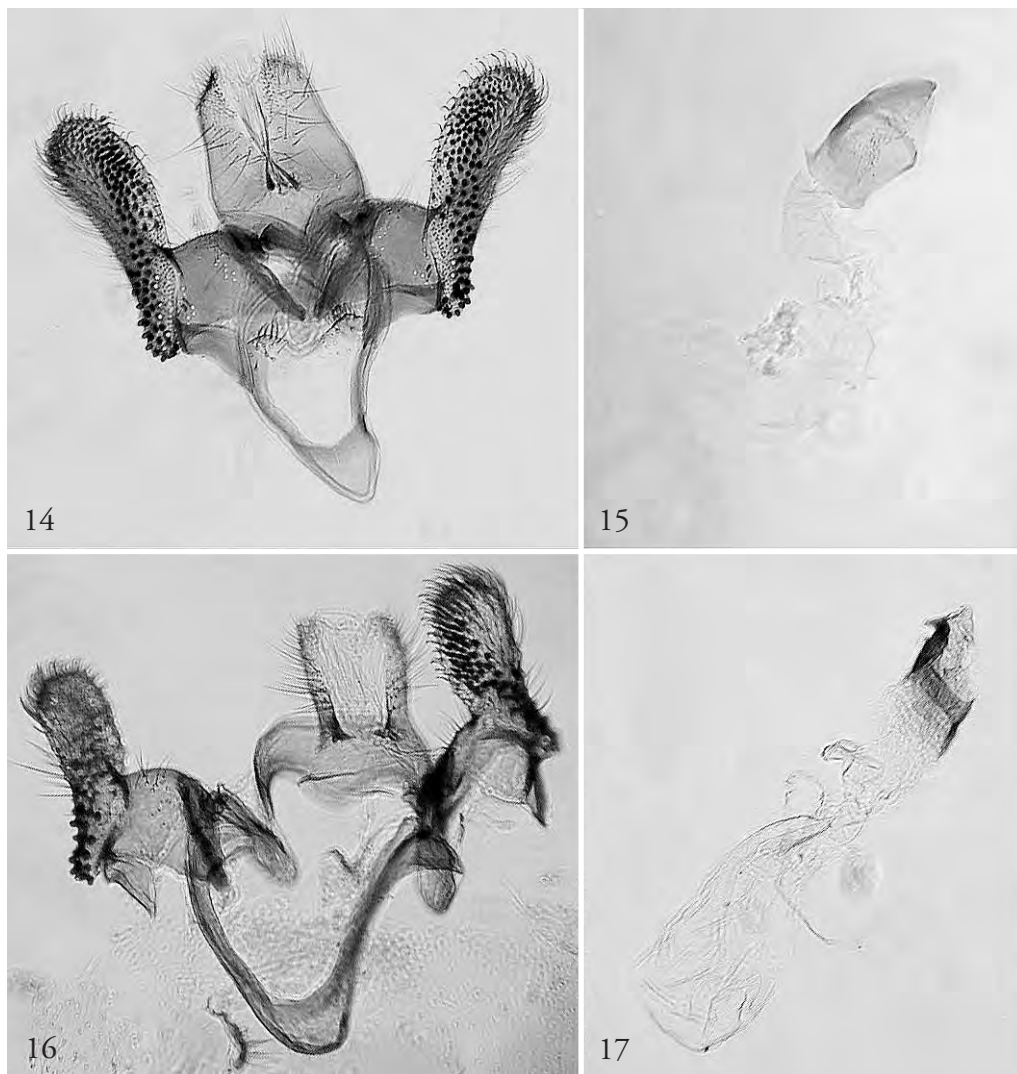
Reference specimens of *A. kinkerella*. – 1♂ 1♀, Buldbjærg, Dania, 21.vi.1975, J. Lundquist [EIHU].

Description

Expanse of wings: 10.1–11.4 mm. Length of forewing: 4.3–4.9 mm.

Head whitish grey; face white. Tongue rudimentary, as long as 2nd segment of labial palpus; maxillary palpus short, 1-segmented. Labial palpus (fig. 4) short and grey; 2nd segment dark grey ventrally; terminal segment $\frac{3}{5}$ as long as 2nd, dark grey ventrally, with a white ring on apical $\frac{1}{3}$. Antenna filiform, $\frac{4}{5}$ times as long as forewing, greyish ochre; scape scarcely flattened, broad, longer than 3 times length of a medial flagellar segment and fuscous except the whitish grey cephalic and caudal margins, with ochre pecten. Thorax whitish grey; tegula grey, becoming darker towards cephalic margin; white hair-pencil occurring near the base of tegula. Fore and mid legs fuscous, irrorated with grey, with a whitish grey ring at apex of each segment. Hind leg whitish grey, with numerous white bristly scales on dorsal side of tibia, and 2 pairs of spurs fuscous and irrorated with white. Abdomen fuscous dorsally, whitish grey ventrally. Sternum II divided into two plates along meson; tergum II forming a transverse belt interrupted around meson on cephalic margin of the segment.

Wing markings (fig. 3). – Forewing pale grey, irrorated with fuscous, becoming darker towards apex; 2



Figs. 14-17. *Apatetris* male genitalia. – 14, *A. elymicola*, caudal view, aedeagus omitted; 15, *A. elymicola*, aedeagus; 16, *A. kinkerella*, caudal view, aedeagus omitted; 17, *A. kinkerella*, aedeagus.

obvious and subtrapezoidal stigmata on plica, one at apical $\frac{1}{2}$, the other at $\frac{3}{4}$; most of cilia covered with bi-coloured scales, each of which is pale grey except on fuscous apical $\frac{1}{6}$; other cilia whitish grey. Hindwing bilobed, fuscous; cilia yellowish grey.

Male genitalia (figs. 14-15). – Uncus short, broad, cylindrical, a little tapering apically, with many long setae on almost entire surface. Gnathos absent. Tegumen short; clavate sclerite separate from pedunculus, developed, long. Valva broad; cucullus much enlarged and blade-like on inner surface with very shortly papil-

late bristles dorsally and longer ones ventrally; similarly papillate bristles also on valvula; cucullus and valvula forming a huge elliptic lobe; proximal part of costa with many long setae; basal process of valva scarcely sclerotized, semicircular, with many short setae on whole surface. Saccus triangular, $\frac{1}{2}$ as long as uncus. Aedeagus short and broad, bullet-shaped, with numerous, minute weakly sclerotized cornuti.

Female genitalia (fig. 18). – Papillae analis short, round, with many short setae and spines on apical $\frac{1}{3}$, and V-shaped ridge developed inside papillae, main-



Figs. 18-19. *Apatetris* female genitalia in lateral view. – 18, *A. elymicola*; 19, *A. kinkerella*.

taining the shape of the papillae; apophysis posterioris usually moderate in length, but I found a specimen without one. Joint membrane very short. Eighth abdominal segment scarcely sclerotized dorsally, short; apophysis anterioris moderate in length, as long as papillae analis; ostium membranous; lamella antevaginalis sclerotized, coalescent with 8th sternum; lamella postvaginalis scarcely sclerotized. Ductus bursae short, wrinkled. Corpus bursae elliptic bulbiform, wrinkled; signa being a pair of triangular plates, with a long projected cephalic angle, which has numerous minute dentations in proximal margin; each signum longer than $\frac{2}{5}$ length of papilla analis.

Distribution. – Japan: Eastern Hokkaidô.

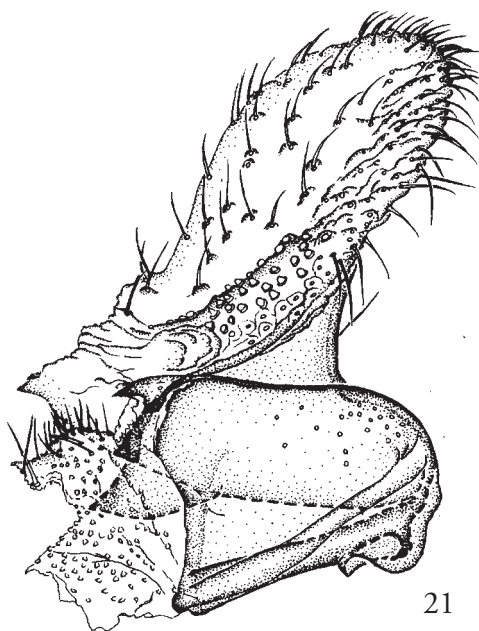
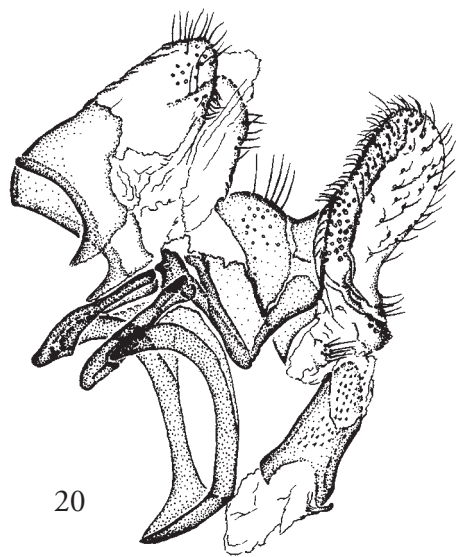
Host plant. – *Elymus mollis* Trinius (Gramineae).

Biology. – Early larvae are found mining the leaves of the host plants in late summer. Three to five larvae often mine a leaf blade and their mines fuse. Mature larvae overwinter therein. They pupate in a dead leaf

blade in late spring. Adults emerge in early summer under rearing conditions.

Remarks

The genus *Rotundivalva* Janse was established on the basis of the not bilobed condition of the hindwing and the unique wing venation, which has M1 and M2 stalked in the forewing (Janse 1951: 238-239, pl. 101, fig. 3). Although it is true that the venation is unique in *Apatetris* and allied genera, except in veins M1 and M2 of the forewing, the male genitalia, wing markings, mouth parts, and pecten of the antennal scape of *R. blanda* are very similar to those in *Apatetris kinkerella* and *A. elymicola* sp. n. The male genitalia of *A. elymicola* (figs. 16-17) and *R. blanda* (figs. 20-21) merely have slightly different arrangements of setae on the valva. Even the forewing veins M1 and M2 of *A. elymicola* sp. n. (fig. 10), which virtually run from a point, are similar to those of *R. blanda*. Consequently,



Figs. 20-21. *Apatetris blanda*, male genitalia. – 20, lateral view, right valva omitted (holotype; slide no. ♂ 5154, in TMSA); 21, right valva (ditto).

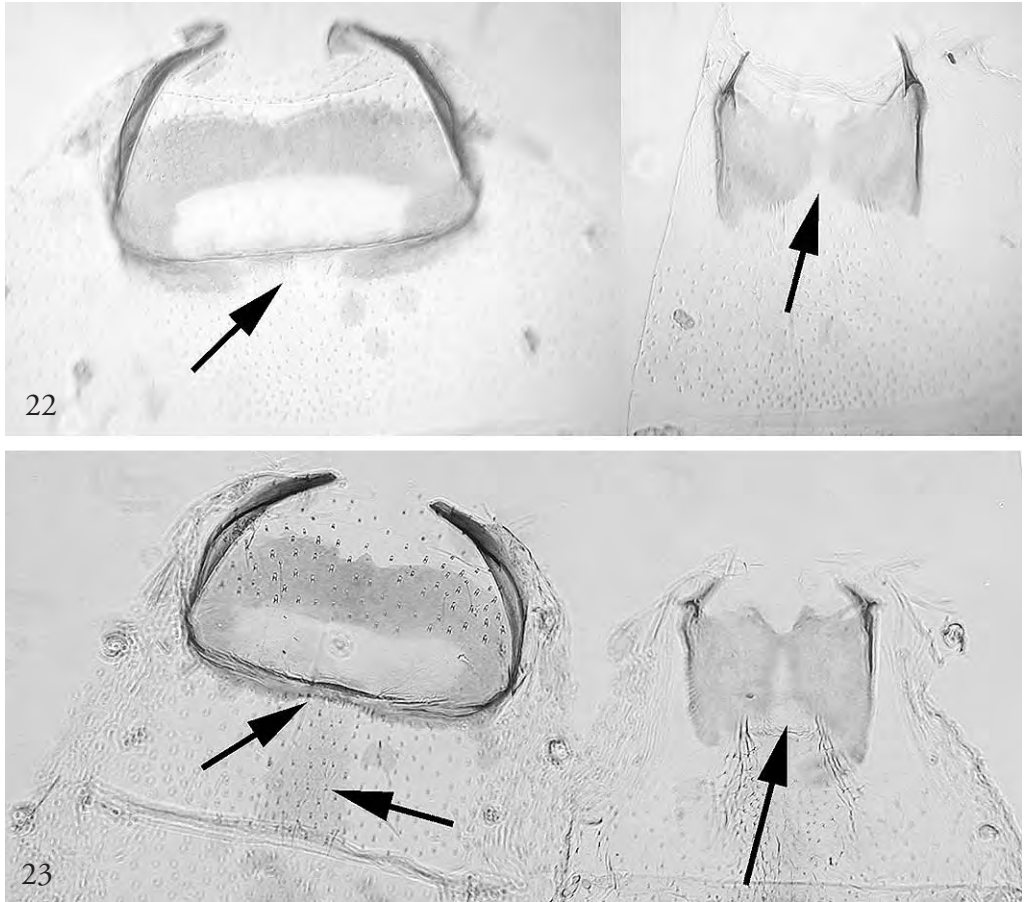
the new combination *Apatetris blanda* (Janse) is established here.

The three species *A. kinkerella*, *A. blanda*, and *A. elymicola* share two distinct characters, which clearly distinguish them from other members of *Apatetris* and allied genera. These characters are: (1) veins M1 and M2 of forewing virtually run from a point or have a very short stalk; (2) valva in male genitalia suddenly contracted dorsally and ventrally at distal half, thus forming a broadly rounded lobe, which is densely covered on the inside with short and papillate bristles.

A. blanda is easily discriminated from the other two species by its large body size (expanse of wings: more than 12 mm). It is, however, difficult to distinguish *A. elymicola* from *A. kinkerella* externally, which only have subtle differences in colour. Superficially, *A. elymicola* is darker than *A. kinkerella*. In *A. elymicola* the grey fore wing becomes fuscous towards the apex with two obvious stigmata at the plica (fig. 3); the labial palpus becomes fuscous ventrally (fig. 4); all the legs are fuscous, at least in ventrally, and fuscous grey spurs of the hind tibia protrude from hairy white scales. In *A. kinkerella*, the white wing becomes pale fuscous towards its apex without stigmata (fig. 5); the labial palpus is creamy white, with some scattered ochre scales (fig. 6); all the legs are creamy white to ochre in the ventral view, and white to creamy white spurs pro-

trude from hairy white scales of the hind tibia.

A. elymicola can easily be distinguished from *A. kinkerella* by the abdominal segments and genitalia. In *A. elymicola*, sternum II is divided into two plates along the meson and the tergite forming as an interrupted belt on the cephalic margin of the segment (fig. 22). In *A. kinkerella*, the sternite is not divided completely and the tergite occupies the middle 1/5 of the ventral aspect of the segment along the meson (fig. 23). The genitalia of *A. elymicola* are distinguished from those of *A. kinkerella* by the following characters: male saccus triangular and pointed anteriorly, cucullus about 3.5x as long as wide, ventral bristles on cucullus of valva longer than dorsal (fig. 14), aedeagus rounded distally without any projection (fig. 15). In *A. kinkerella* the saccus is rounded, the cucullus 3x as long as wide, the ventral bristles on the cucullus shorter than the dorsal (fig. 16), and the aedeagus has a pointed distal hook-like projection (fig. 17). The female genitalia of *A. elymicola* have short or minute covering setae on the papillae analis, and signa longer than 2/5 length of the papillae analis (fig. 18). In *A. kinkerella*, the covering setae are long and distinct, and the signa are shorter than 3/10 of the papillae analis (fig. 19). The female genitalia of *A. elymicola* have a V-shaped ridge in the papillae analis; which is very stiff and so prevents inadvertent dorso-ventral compres-



Figs. 22-23. *Apatetris* species, first and second abdominal segments unrolled. Ventral side left, dorsal side right. – 22, *A. elymicola*; 23, *A. kinkerella*.

sion. *A. kinkerella* does not have such a ridge, which is shown here in lateral aspect (figs. 18-19).

The new species is associated with *Elymus mollis* in Japan, while *A. kinkerella* is associated with *Amphibola arenaria* (L.) Link (Marram grass, Gramineae) in Europe. Both host plants are found in similar habitats, seashore, but their distributions do not overlap completely.

I requested the type specimen of *A. kinkerella* on loan from the National Museum of Natural History at Leiden. Dr. E. J. van Nieukerken kindly replied that he had checked the material of *A. kinkerella* and found that the specimen with a red 'type' label is not actually the type specimen. This specimen was collected 20 years after the holotype, and 15 km south of the type locality. Consequently, he concluded that the holotype is probably lost (van Nieukerken pers. com.).

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