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Two new species of the subfamily Phycitinae (Lepidoptera: Pyralidae) from West Kazakhstan

Два новых вида из подсемейства Phycitinae (Lepidoptera: Pyralidae) из Западного Казахстана

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Русское энтомологическое общество, Санкт-Петербург, Россия
Russian Entomological Society, St Petersburg, Russia. E-mail: tsvcountcal@rambler.ru

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Ключевые слова: Lepidoptera, Pyraloidea, Pyralidae, Phycitinae, *Asalebria*, *Gymnancyla*, новые виды, Казахстан.

Abstract. *Asalebria (Exophora) vernalis* sp. n. and *Gymnancyla subgilvella* sp. n. are described from Atyrau and Mangistau Regions of Kazakhstan. Male and female genitalia of these species are illustrated. *Asalebria (Exophora) vernalis* sp. n. differs by wing colouration and by genitalia structure from all known *Asalebria* species. *Gymnancyla subgilvella* sp. n. can be mixed with two *Gymnancyla* species, *G. gilvella* (Ragonot, 1887) and *G. nomiella* (Ragonot, 1887). The differences from two mentioned species are found in both male and female genitalia and also in venation.

Резюме. *Asalebria (Exophora) vernalis* sp. n. и *Gymnancyla subgilvella* sp. n. описаны из Атырауской и Мангистауской областей Казахстана. Приводятся иллюстрации гениталий самцов и самок этих видов. *Asalebria (Exophora) vernalis* sp. n. отличается окраской крыльев и строением гениталий от всех известных видов рода *Asalebria*. *Gymnancyla subgilvella* sp. n. может быть спутан с двумя видами рода *Gymnancyla*, *G. gilvella* (Ragonot, 1887) и *G. nomiella* (Ragonot, 1887). Отличия от двух упомянутых видов имеются в строении гениталий самцов и самок, а также в жилковании.

Introduction

The subfamily Phycitinae is divided into four tribes: Anerastiini, Cabniini, Cryptoblabini and Phycitini. Two described below species belong to the genera *Asalebria* Amsel, 1953 and *Gymnancyla* Zeller, 1848 of the tribe Phycitini.

The representatives of the genus *Asalebria* inhabit southern areas of the Palaearctic. West and Central Asia are the regions of species richness. The ecology of the most number of species is not studied, it is known that *Genista* (Fabaceae) is a hostplant for *A. venustella* (Ragonot, 1887) and *A. florella* (Mann, 1862) [Roesler, 1993].

Considering the recent taxonomic changes we conclude that the genus *Asalebria* consists of nearly 15 species [Leraut, 2001, 2014; Asselbergs, 2007; Anikin et al., 2017; Slamka, 2019].

Division into two subgenera, *Exophora* Roesler, 1988 and *Asalebria* Amsel, 1953 was proposed by Roesler

[1988]. The difference between these subgenera is mainly in maxillary palps structure. Male maxillary palps are very small and always without scale tufts in the subgenus *Exophora* (type species *Nephopteryx (sic) florella* Mann, 1862), while males of the subgenus *Asalebria* (type species *Salebria venustella* Ragonot, 1887) have larger maxillary palps which bear brush like scale tufts. The subgenus *Praesalebria* Amsel, 1954 (= *Postsalebria* Amsel, 1955) was recently established for *Asalebria pseudoflorella* (Schmidt, 1934) [Vives Moreno, Gastón, 2017]. Later *Exophora* was regarded as a junior synonym of *Praesalebria* [Slamka, 2019]. However, the maxillary palps of *A. ferruginella pseudoflorella* bear scale tufts. So, possibly *Praesalebria* should be regarded as a synonym of *Asalebria*. A new *Asalebria* species is described here in the subgenus *Exophora*.

The genus *Gymnancyla* Zeller, 1848 was placed to so-called trifine Acrobasiina in the classification of Roesler [1973], a group of species, belonging to the subtribe Acrobasiina. The genus was considerably enlarged after establishing the synonymy with *Bazaria* Ragonot, 1887 [Leraut, 2014] and during the last years it was completed with several new species [Du, Yan, 2009; Liu, Li, 2010; Alipanah et al., 2014; Gastón, Vives Moreno, 2018]. So, at present it includes nearly 24 species.

Gymnancyla species occur in the south of the Palaearctic. They inhabit arid places, often semideserts and saline lands. The hostplants were listed for different species of *Gymnancyla*: *Atriplex halymus*, *Atriplex nitens*, *Anabasis aphylla*, *Halocnemum strobilaceum*, *Salsola* sp., *Halothamnus* sp., *Haloxylon* sp. (Chenopodiaceae) and *Nitraria* sp. (Nitrariaceae) [Roesler, 1973, 1993; Falkovitsh, 1999]. The genus is divided into four subgenera: *Gymnancyla* Zeller, 1848, *Spermatophthora* Lederer, 1852, *Dentinodia* Ragonot, 1887 and *Bazaria* Ragonot, 1887.

Material and methods

In May, 2016 the author have undertaken first expedition to West Kazakhstan. The visited localities were along the route Atyrau – Kulsary – Beineu – Shetpe. These

places present various hyperthermic habitats: semidesert or steppe saline lands, sandy semideserts, chalk steppes and rocky mountain places. Formally the territory belongs to Atyrau and Mangistau Regions of Kazakhstan.

Energy saving fluorescent lamp (85 W, 6400 K) was used for attracting to light, collecting by a net during the day and evening time didn't give results (except for some single specimens from other groups of Lepidoptera). Among the collected Phycitinae rather large series of two unknown species were distinguished. Later, after the examination of genitalia they were recognized as *Asalebria* sp. and, probably, *Gymnancyla* sp. These species seemed to be undescribed, however, it was not certainly clear for a time, even considering the revision of these genera [Roesler, 1973, 1988, 1993] and fully data on the recently described species. More detailed verification of the status was then carried out taking into account some unrevised names of taxa and also some little known taxa [Ragonot, 1893; Ragonot, Hampson, 1901; Chrétien, 1913; Zerny, 1914; Toll, 1948].

Another author's expedition to West Kazakhstan was along the same route in late April and in the beginning of May, 2019. The same two species were observed and photographed (Figs 21, 22), additional material was collected including the specimen of *Asalebria* sp. from the newly found locality in the Mangistau Mountain Range.

Asalebria (Exophora) vernalis sp. n.

(Figs 1–5, 11–14, 19, 21)

Material. Holotype, ♂ (Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia): Kazakhstan, Atyrau Region, Akkergeshen Plateau, 47°19'14"N / 54°24'14"E, 1.05.2016, (leg. E.V. Tsvetkov). Paratypes: 10♂, the same label as in holotype; 1♂, 6♀, Kazakhstan, Mangistau Region, 11 km E Sarga village, terrace of Ustyurt Plateau, 3.05.2016 (leg. E.V. Tsvetkov); 10♂, the same locality, 25.04.2019 (leg. E.V. Tsvetkov); 1♀, Kazakhstan, Mangistau Region, S environs of Akmysh spring, 44°13'13"N / 51°58'51"E, 3.05.2019 (leg. E.V. Tsvetkov). Some paratypes are deposited in collection of Zoological Institute of Russian Academy of Sciences (St. Petersburg); 11 paratypes (10♂, 1♀) collected in 2019 are kept in the author's collection.

Description. Head and body. Abdomen, thorax and legs covered with mixture of white and blackish scales. Head covered with white and dark grey scales. Frons convex, chaetosemata present behind ocelli. Antennae slightly longer than 1/2 of the forewing with tiny sharp spine on the last flagellomere. Scape nearly 3 times as long as wide. Male flagellum with three spine-like projections on flagellomeres 2–4. Flagellomere 5 bears a minute spine. Sinus very small. Dorsal side of flagellum chequered (dark grey and whitish areas on each segment). Cilia whitish, longer in males (1/2 of segment width) than in females (1/3 of segment width or shorter). Labial palps 1.5 diameter of eye in length, pointed up and ahead. Maxillary palps very small with rounded segments, covered with flat scales (Figs 3, 4).

Wings (Figs 1, 2, 21). Venation (Fig. 5). Forewing. Length 8–9 mm. Forewing relatively wide and short, triangular with slightly convex edges. Basal area pale-ochreous, whitish, sprinkled with dark grey or black scales. Its part adjacent to antemedial line lighter and lacks grey suffusion, usually with small blackish markings at A vein and at the cell. Black antemedial line angular, starts from nearly 1/3 of costa, directed almost at right angle to hind margin of the wing. The line contrasted by pale ochreous area from inner side and fused with greyish color of medial area from outer side. Area between antemedial and postmedial lines much darker than basal area, greyish (black, dark grey and brownish scales), partly lightened (pale ochreous or whitish).

Two black discal spots stretched along veins, especially the lower spot which is larger than the upper. Black postdiscal line wavy and sometimes unclear. It is angled inwards at M_1 vein and also abruptly angled inwards at A vein. Submarginal area pale ochreous with small darkening at costa, sometimes suffused with blackish scales. Outer edge of the forewing contrasted with blackish scales forming dotted marginal line. Fringe white with two thin brownish parallel lines or brownish blurred band. Hindwing pale brown with thin dark brown marginal line. Fringe white. Forewing underside brown with darker medial area. Hindwing underside pale brown. Thin marginal brown line present on both wings.

Male genitalia (Figs 11, 13, 14). Uncus almost triangular with blunt apex. Its side edges curved down and strongly sclerified. Gnathos elongate with conically pointed apex and small caudally pointed spine. Proximal part of gnathos curved up and stretched into thin process. Branches of gnathos relatively short, ribbon like and slightly wavy, broadened at their ends and pointed cranially at junction with gnathos. Side lobes of tegumen very short and broad. Valva elongate, tapering from the base to rounded apex. Sacculus narrow, strongly sclerified, occupies some less than a half of valva length. Costa well sclerified but apical part of valva lacks costal sclerotization. Transtilla long and not strongly sclerified. Its anterior edge arcuate, central part broadened, posterior edge with V-shaped hollow. Anellus nearly heart shaped with more heavily sclerified U-shaped part. This U-shaped structure consists of two connected triangular lobes. Vinculum rounded with tapering side edges. Aedeagus cylindrical with excavation from ventral side at proximal 1/4 occupied by ductus ejaculatorius base. Large cornutus abruptly curved at its base. Eighth sternum weakly sclerified, especially in its posterior part. Anterior margin of the sternum slightly convex with heavy sclerotization along the edge. Culcita as pair of scale tufts (thin scales) on the sides of sternum (Fig. 12).

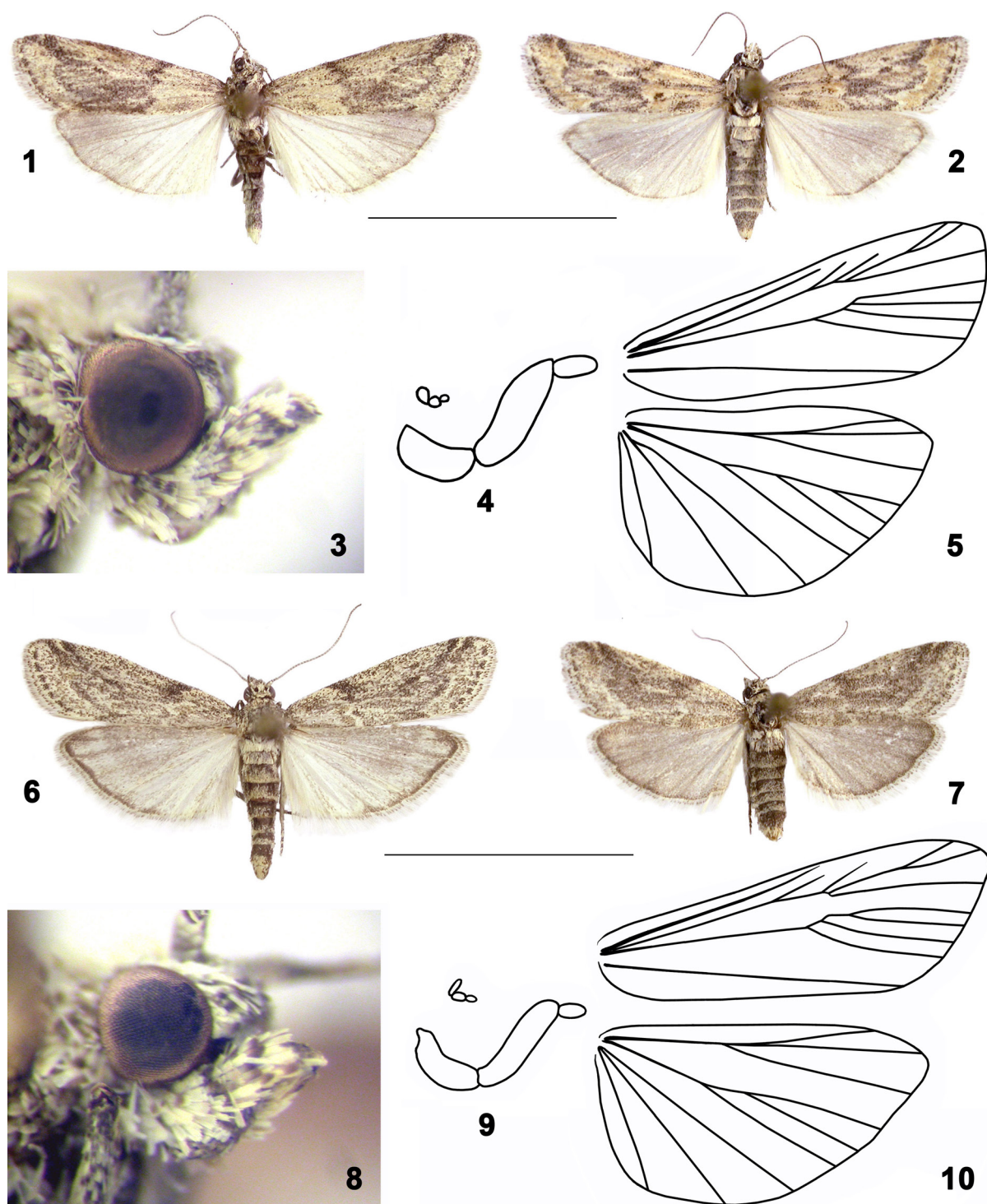
Female genitalia (Fig. 19). Papillae analis elongate, not tapering, nearly 0.4 mm. Anterior apophyses equal to posterior apophyses and nearly 0.7 mm in length. Both pairs of apophyses bear flat widenings in posterior 1/3 and also at their ends. The widenings at the base of anterior apophyses angulate from one side. Eighth tergum trapezoidal with very broad posterior margin, straight anterior and posterior edges. Posterior margin with large hollow, an area of weak sclerotization occupies central part of tergum.

Antrum broad and flat, almost rectangular and well sclerified. Ductus bursae with slightly shorter and broader sclerite and very short membranous part between the sclerite and antrum. Corpus bursae elongate, membranous, anteriorly rounded. Its conical posterior part (1/6–1/5 of corpus bursae) located behind the base of ductus bursae and it is hidden by ductus bursae in ventral view. Seminal duct arises from the apex of the cone.

Diagnosis. *Asalebria vernalis* sp. n. is well distinguished from other species of the genus in the wing colouration. Some external similarity with little known *A. palella* (Caradja, 1916) and *A. pallidisignata* (Toll, 1948) should be mentioned. In male genitalia of the described species cornutus is abruptly curved at its base (almost at right angle) which allows to distinguish the species from other *Asalebria* by males. Besides, in *A. palella* uncus with abrupt side convexities in contrary to *A. vernalis* sp. n. *Asalebria pallidisignata* (known by a female) contrastingly different in female genitalia [Toll, 1948].

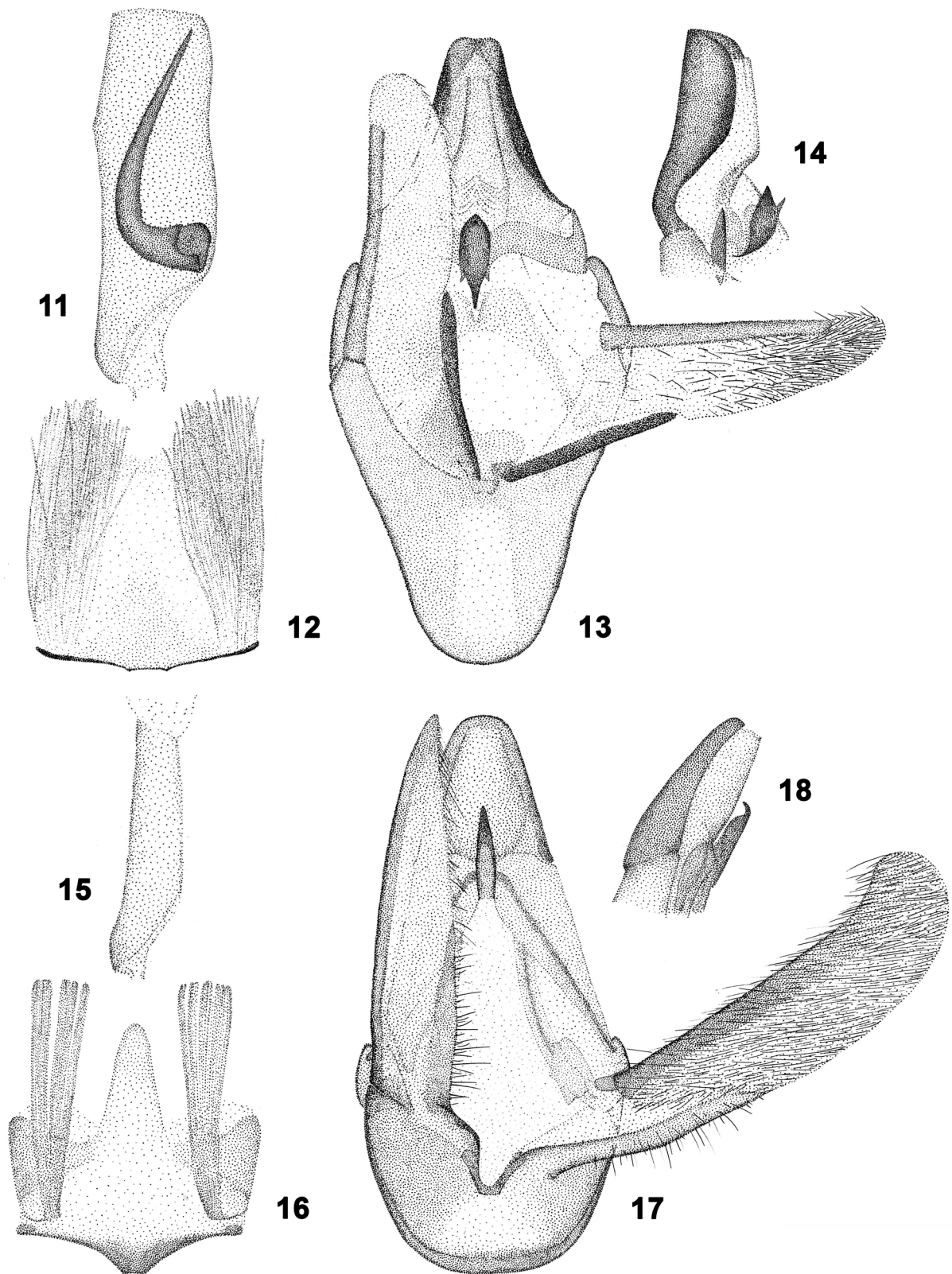
Asalebria aralensis (Kusnetzov, 1908) is also known from West Kazakhstan, type material of this species was examined [Sinev, 1990]. Its male genitalia are quite different from those of *A. vernalis* sp. n.

Biology. The series of the described species were taken in chalk steppe, saline semidesert lands and rocky places. Its flight period is in late April and early May.



Figs 1–10. *Asalebria vernalis* sp. n. (1–5) and *Gymnancyla subgilvella* sp. n. (6–10), morphology and habitus of imago. 1–2, 6–7 – type specimens (scale bars 1 cm): 1, 6 – males, holotypes, 2, 7 – females, paratypes; 3–5, 8–10 – head and venation: 3, 8 – head in lateral view, 4, 9 – labial and maxillary palps, 5, 10 – venation.

Рис. 1–10. *Asalebria vernalis* sp. n. (1–5) и *Gymnancyla subgilvella* sp. n. (6–10), морфология и внешний вид имаго. 1–2, 6–7 – типовые экземпляры (масштабные линейки 1 см): 1, 6 – самцы, голотипы, 2, 7 – самки, паратипы; 3–5, 8–10 – голова и жилкование: 3, 8 – голова латерально, 4, 9 – губные и челюстные щупики, 5, 10 – жилкование.



Figs 11–18. Male genitalia and eighth sternite of *Asalebria vernalis* sp. n. (11–14) and *Gymnancyla subgilvella* sp. n. (15–18).

11, 15 – aedeagi; 12, 16 – eighth sternites; 13, 17 – genitalia (aedeagus extracted); 14, 18 – uncus and gnathos, lateral view. Scale bar 1 mm.

Рис. 11–18. Гениталии и восьмой стернит самцов *Asalebria vernalis* sp. n. (11–14) и *Gymnancyla subgilvella* sp. n. (15–18).

11, 15 – эдеагусы; 12, 16 – восьмые стерниты; 13, 17 – гениталии (эдеагус извлечен); 14, 18 – ункус и гнатос латерально. Масштабная линейка 1 мм.

Gymnancylla subgilvella sp. n.

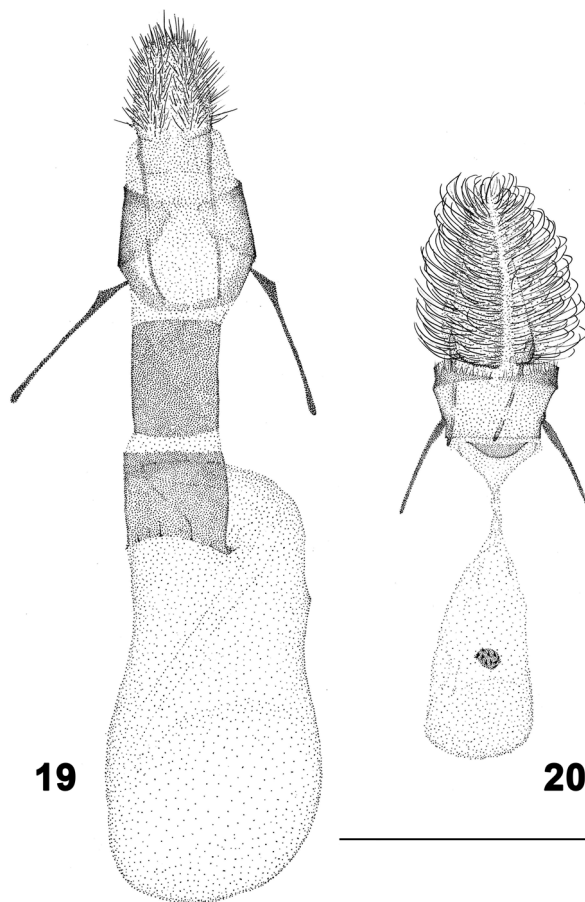
(Figs 6–10, 15–18, 20, 22)

Material. Holotype, ♂ (Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia): Kazakhstan, Mangistau Region, 11 km E Sarga village, terrace of Ustyurt Plateau, 3.05.2016 (leg. E.V. Tsvetkov). Paratypes: 15♂, 4♀, the same label as in holotype; 3♂, 1♀, the same locality, 25.04.2019 (leg. E.V. Tsvetkov); 5♂, Kazakhstan, Mangistau Region, 9 km SW Sai Otes village, canyon, 7.05.2016 (leg. E.V. Tsvetkov); 1♂, Kazakhstan, Atyrau Region, Akkergeshen Plateau, 47°19'14"N / 54°24'14"E, 1.05.2016 (leg. E.V. Tsvetkov). The most of paratypes are deposited in collection of the Zoological Institute of the Russian Academy of Sciences (St Petersburg, Russia), 4 paratypes (3♂, 1♀) collected in 2019 are kept in the author's collection.

Description. Head and body. Abdomen, thorax, legs and head covered with mixture of white and blackish scales. Frons convex without crest, chaetosemata present behind ocelli. Antennae nearly 2/3 of the forewing with pointed last flagellomere. Scape nearly 2 times as long as wide. Each of male flagellomeres 2–5 with hardly noticeable apical spine. Sinus not expressed. Dorsal side of flagellum chequered (dark grey and whitish areas on each segment). Cilia whitish, in males much longer (1.5–2 of segment width) than in females (1/2 of segment width). Labial palps nearly 1.5 diameter of eye, pointed up and ahead (Figs 8, 9). Concavity on the inner side of second segment absent. Maxillary palps small, segment 1 thin and elongate (Fig. 9). Segments 2 and 3 rounded, covered with long scales forming a tuft.

Wings (Figs 6, 7, 22). Venation (Fig. 10). Forewing. Length 8–9 mm. Forewing triangular with slightly convex edges. Ground color grey or brownish grey (a mixture of white and dark brown or blackish scales). Black antemedial line straight, directed at right angle to hind edge of the wing. The line is extensive from costa to Cu + M stalk at which it is interrupted. From Cu + M stalk to the hind edge of the wing only a small black spot at A vein is visible. The spot is marked with V-shaped white line from the inner side. This V-shaped line is the most clear part of angulate light line bordering antemedial black line. In basal area a trace of ochreous small spot adjacent to hind edge of the wing and to V-shaped white line sometimes present. Two small discal spots often unclear. Black postdiscal line oblique, angled inwards at M₁ and A veins. Sometimes it is marked from the outer side with thin light line. Short black apical streak adjacent to this line. Black marginal line thin and dotted. Fringe white with two brownish parallel lines. Hindwing pale brown with dark brown marginal line. Fringe whitish with one clear brownish line and also short brownish line parallel to it. The second (outer) line starts from costa and then fading. Forewing underside dark brown. Submarginal area pale brown or whitish, so as the costal streak and hind 1/4 of the wing. Costal streak narrow, occupies small sector from costa to Sc vein. The streak starts from the base of the wing and interrupts reaching R₃ vein. Dark brown dotted marginal line present. Hindwing underside pale brown, anal 1/2 whitish; brown marginal line present.

Male genitalia (Figs 15, 17, 18). Uncus triangular, broad at the base and rounded at apex. Gnathos elongate, apically pointed, narrowed and slightly curved up at distal 1/3. Branches of gnathos very stout, evenly narrowing to their ends. Lateral lobes of tegumen as small well sclerified elongate vanes. Transtilla components adjacent to lobes of tegumen. The components are relatively large weakly sclerified angulate plates. Valva long and narrow with almost parallel costal and ventral edges. Its apex widely rounded, distal 1/6 of valva upcurved. Costa well sclerified from the base to 5/6 of valva. Costal sclerotization widening to apex from 1/6 to 1/3–1/2 of valva width. Sacculus occupies nearly half of ventral edge of valva. It is narrow with stout basal prominence occupying 1/3 of sacculus. Distal 2/3 of sacculus slightly convex. Anellus as nearly U-shaped plate. Vinculum short and widely rounded. Aedeagus cylindrical with excavation from ventral side at proximal 2/5 occupied by ductus ejaculatorius base. Sclerified elements in vesica absent. Anterior edge of eighth



Figs 19–20. Female genitalia of the described Phycitinae species.
19 – *Asalebria vernalis* sp. n.; 20 – *Gymnancylla subgilvella* sp. n.
Scale bar 1 mm.

Рис. 19–20. Гениталии самок описываемых видов подсемейства Phycitinae.

19 – *Asalebria vernalis* sp. n.; 20 – *Gymnancylla subgilvella* sp. n.
Масштабная линейка 1 мм.

sternum flatly V-shaped with adjacent well sclerified narrow area. Areas of sclerotization also on the sides of the sternum. Large prominence of posterior margin present in the centre and also two much shorter convexities on the sides. Culcita as pair of scale tufts (thin scales) on the sides of sternum (Fig. 16). The tufts are easily damaged and often lost during preparation.

Female genitalia (Fig. 20). Papillae analis relatively large (0.6–0.7 mm), tapering, densely covered with long curved bristles. Anterior apophyses nearly equal to posterior apophyses and rather short (0.35–0.4 mm). Eighth tergum trapezoidal with very broad posterior margin, straight anterior and posterior edges. Small membranous hollow in the centre of posterior margin. Antrum broad cup like, weakly sclerified. Ductus bursae very narrow and short, membranous. Corpus bursae elongate pear shaped, membranous. Signum present on corpus bursae as very small rounded spiny plate.

Diagnosis. *Gymnancylla subgilvella* sp. n. is similar to *G. gilvella* (Ragonot, 1887) and *G. nomiella* (Ragonot, 1887) in the habitus. Large series of the last two species were collected in West Kazakhstan in the same localities and the imagines clearly differed from *G. subgilvella* sp. n. by larger size and by less sharply pointed forewing. *Gymnancylla nomiella* can be also distinguished by presence of crest on the frons and by longer labial palps. Veins M₂ and M₃ are on common stalk in *G. nomiella* (merged in



Figs 21–22. Imagoes in nature, Sarga village environs, 26.04.2019, males.
Рис. 21–22. Имаго в природе, окрестности пос. Сарга, 26.04.2019, самцы.
21 – *Asalebria vernalis* sp. n.; 22 – *Gymnancyla subgilvella* sp. n.

G. subgilvella sp. n.), male and female genitalia of these two species are quite different.

In distinguishing from the described species, *G. gilvella* is with veins M_2 and M_3 on common stalk on the hindwing. In male genitalia aedeagus is with group of small cornuti in vesica, clasper present as small well sclerified crest, vinculum angled. Females of the compared species have two large spiny plates on bursa copulatrix which allows to distinguish them easily from females of *G. subgilvella* sp. n. having one very small signum on bursa.

Biology. In West Kazakhstan the species occurs in different types of open habitats: semidesert lands with chalky or saline soil, rocky canyons. Its flight period is in late April and first decade of May.

Taxonomic notes

Subgeneric position of *G. subgilvella* sp. n. is questionable and the problem is mainly in poorly developed taxonomy of the genus *Gymnancyla* and several related genera. The genus *Gymnancyla* is close to *Prorophora* Ragonot, 1887 and *Christophia* Ragonot, 1887. According to the Roesler's system [1973, 1993] it was distinguished from two mentioned genera by the wing venation and some details in the head structure. But clear differences can hardly be defined after the genus enlarging. A number of *Gymnancyla* species (some species of the subgenus *Bazaria*) have a crest like structure on the frons which is typical for *Prorophora* and *Christophia*. The genitalia of several species are much similar to those of some *Prorophora* and *Christophia*. Rather variable head structure and variable venation in the genus *Gymnancyla* are also worth mentioning. So, the accepted system and species composition of these three genera are disputable. Obviously, the revision of *Gymnancyla* and several related generic and subgeneric taxa is demanded.

Taking into account hindwing venation of *G. subgilvella* (veins M_2 and M_3 merged) and the structure of female genitalia, the species should be referred to the subgenus *Gymnancyla*. However, the head, male

genitalia and also habitus much resemble *Bazaria* representatives, in particular, there is a close similarity with *G. (Bazaria) gilvella* (Ragonot, 1887). So, yet we refrain from referring the new species to any subgenera.

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