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**Two new *Lygephila* Billberg, 1820 species  
from the Himalayan-Sino-Tibetan region  
(Lepidoptera, Noctuidae, Catocalinae)**

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**Abstract** – Two new *Lygephila* species, *L. colorata* sp. n. (Pakistan) and *L. robusta* sp. n. (Nepal) are described. The adults and the genitalia of the *L. vicioides* (HAMPSON, 1926) species group are illustrated. With 31 figures.

**Key words** – *Lygephila*, new species, Himalaya, Pakistan, Nepal.

## INTRODUCTION

The genus *Lygephila* BILLBERG, 1820 has never been revised monographically, although a number of new taxa were described and closely related species-pairs were discussed in the last decades. However, according to FIBIGER *et al.* (2008) it is important to define the main phyletic lineages within the genus as species-groups, this grouping could help both in the taxonomic interpretation of the genus and the identification of the known and the still undescribed species.

The taxonomic treatment of the genus *Lygephila* is still in progress, the major aim is the monographic revision of the entire genus. The present study contains a general overview of two of the main species-groups, the *L. lusoria* and the *L. vicioides* groups. All known taxa of the latter phyletic lineage and certain poorly known Asiatic species of the *L. lusoria* species-group are illustrated here in colour, together with their genitalia, including the descriptions of two new species from Pakistan and Nepal.

## SYSTEMATIC PART

### Characterisation of the *Lygephila lusoria* species-group

The appearance and the genitalia of this species-group differ from those of the other groups of the genus by the following consistent character states:

- uncus well-developed, strong, sabre-shaped, its third quarter broadened and dorsally strongly curved, its tip acute, sometimes even finely hooked;
- costal and ventral margins of valva more or less parallel;
- harpe short or moderately long, narrow, sclerotised, its tip only rarely reaching the valval margin;
- aedeagus cylindrical, short but relatively broad, its distal end somewhat funnel-like;
- vesica everted forward and bent ventrad, having four or five diverticula of various shape and size, all are covered by numerous fine spiculi, basal spinulose field (bar) well-developed;
- ostium bursae large, sclerotised, funnel-shaped, posterior part about three times as broad as proximal end;
- ductus bursae wide, medium long;
- corpus bursae membranous, more or less elliptical.

The *L. lusoria* species-group comprises the following species: *L. amasina* (STAUDINGER, 1878) (Fig. 4); *L. colorata* sp. n. (Fig. 1); *L. lusoria glycyrrhizae* (RAMBUR, 1866); *L. lusoria lusoria* (LINNAEUS, 1758); *L. moellenendorfi* (HERZ, 1904) (Fig. 2); *L. pallida pallida* (BANG-HAAS, 1907); *L. pallida subpicata* WILTSHERE, 1971 (Fig. 3)

### Characterisation of the *Lygephila vicioides* species-group

The external appearance and the genitalia of the group display the following diagnostic characters:

- fore wing narrow triangular with pointed apex and widely rounded-convex outer margin;
- shape of reniform stigma very distinctive: outer half of stigma reduced to a few tiny dots (or fully absent), dorsal half of inner part represented by a fine streak, lower half by a large, elliptical-rounded spot;

- dorsum of body (thorax and abdomen) and fore wing similarly coloured, both are characteristically spotted by fine black hairs and scales;
- hind wing uniformly darkened, with more or less visible discal spot;
- basal line of cilia bright, most often prominently ochreous-yellowish;
- uncus relatively long, narrow, slightly curved;
- valva most often strongly sclerotised and medially broadened, with larger medial costal lobe; distal part of valva rather triangular with pointed apex;
- harpe heavily sclerotised, straight, more or less thorn-like with pointed tip and rather broad basal plate;
- aedeagus cylindrical with narrow, often pointed coecum and fine medial curve;
- vesica everted forward and bent ventrally, composed from numerous diverticula, including three or four characteristically narrow, tubular and pointed ones densely covered by fine spiculi;
- ostium bursae long, sclerotized, funnel-shaped, posterior part about two times as broad as proximal end;
- corpus bursae membranous, relatively small, more or less elliptical-ovoid.

The *Lygephila vicioides* species-group comprises the following four species: *L. angustissima* (DRAUDT, 1950) (Fig. 8); *L. robusta* sp. n. (Fig. 5); *L. vicioides* (HAMPSON, 1926) (Fig. 6); *L. yoshimotoi* KINOSHITA, 1989 (Fig. 7).

## DESCRIPTIONS OF THE NEW SPECIES

### *Lygephila colorata* sp. n. (Figs 1, 9–11)

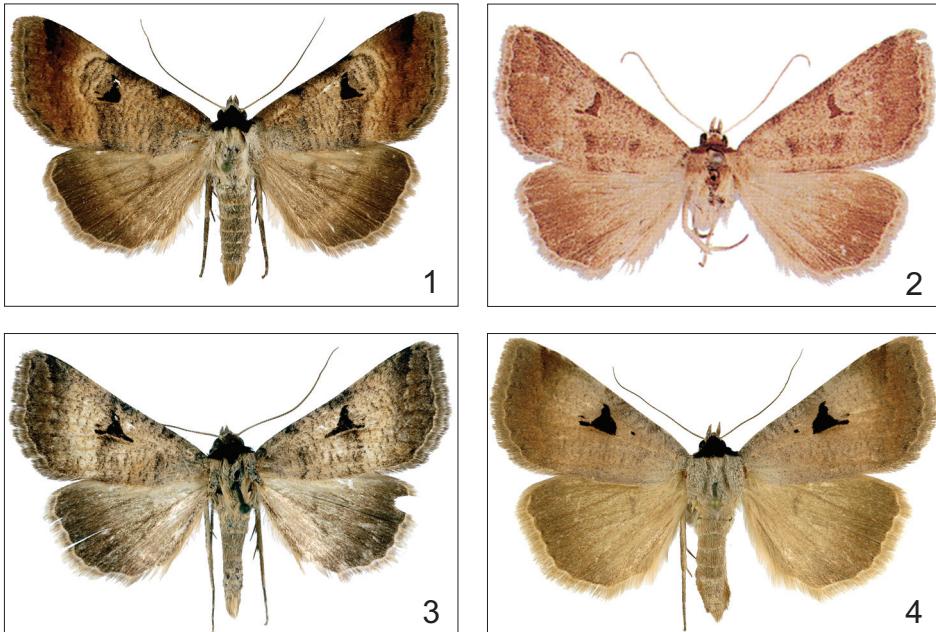
*Type material* – Holotype: male, Pakistan, Karakoram Mts., Naltar valley, 2800 m, 74°12'E, 36°09.6'N, 30.VI.2000, leg. Z. VARGA & G. RONKAY (coll. G. RONKAY, deposited in the HNHM Budapest). Paratypes. Pakistan, Karakoram Mts: 1 male, 1 female, Naltar valley, 12 km NW Nomal, cca. 2000 m, 74°10'E, 36°09'N, 16.VII.1994, leg. B. HERCZIG, Gy. M. LÁSZLÓ & G. RONKAY (coll. B. HERCZIG and G. RONKAY); 4 males, Naltar valley, 2800 m, 74°12'E, 36°09.6'N, 14.VIII.1998, leg. Z. VARGA & G. RONKAY (coll. G. RONKAY); 23 males, 6 females, from the same site, 30.VI. and 8.VII.2000, leg. Z. VARGA & G. RONKAY (coll. G. RONKAY); 7 males, 4 females, from the same locality, 18.VII.1998, leg. G. CSORBA & L. RONKAY (coll. HNHM); 6 males, 1 female, 34 km N of Gilgit, Chaprot valley, 2350 m,

74°16'00E, 36°15'13N, 12.VII.1998, leg. G. CSORBA & L. RONKAY (coll. HNHM); 1 male, 2 females, near Chaprot, above Chalt Nalgar, 2310 m, 18–19.IX.1998, leg. P. GYULAI & A. GARAI (coll. P. GYULAI); 1 female, Naltar valley, 2900 m, 74°09.22'E, 36°11.08'N, 20.VII.1998, leg. G. CSORBA & L. RONKAY (coll. HNHM); 4 males, 3 females, 40 km N of Gilgit, near Juglot, 2400 m, 12.VIII.2001, leg. B. BENEDEK & G. RONKAY (coll. HNHM and G. RONKAY). Pakistan, Hindukush Mts: 10 males, 3 females, 3 km W of Pingal, 12.VIII., 19.VIII. and 24.VIII.2001, leg. B. BENEDEK & G. RONKAY, slide Nos JB262 and JB263 (coll. HNHM and G. RONKAY); 2 males, 5 km E of Shandur pass, 3250 m, 72°38'E, 36°07'N, 20.VIII. and 28.VIII.2001, leg. B. BENEDEK & G. RONKAY (coll. G. RONKAY); 1 male, E of Gupis, Daalti village, 2050 m, 16–17.IX.1998, leg. P. GYULAI & A. GARAI (coll. P. GYULAI); 6 males, 4 females, E of Teru, Samaran village, 2450 m, 17–18.IX.1998, leg. P. GYULAI & A. GARAI (coll. P. GYULAI).

*Diagnosis* – *Lygephila colorata* sp. n. differs externally from the closely related *L. moellendorfii* (HERZ, 1904) and the externally similar but otherwise not closely allied *L. pallida subpicata* WILTSHERE, 1971 by its more colourful fore wings with conspicuous and intense cinnamon-brown marginal suffusion, more prominent, coffee-brown subterminal line being wider at termen, and tapering towards tornus, and the characteristic shape of the reniform stigma (see Figs 1–3). The genitalia of *L. colorata* (Figs 9–11) differ from those of *L. moellendorfii* (Figs 12–13) and *L. pallida subpicata* (Figs 14–16) by their shorter and curved aedeagus and the shorter but stronger harpe (males); the characteristically sphaerical corpus bursae and the somewhat longer and thinner ductus bursae (females). The externally also somewhat similar *L. amasina* (STAUDINGER, 1878) has conspicuously different genitalia in both sexes (see Figs 17–19).

*Description* – Male. Wingspan 36–42 mm, length of fore wing 17–21 mm. Head and collar velvety black. Palpi medium short, pale brown, underside darker brown with whitish hairs; antenna fine cocoa-brown, filiform. Thorax pale beige, abdomen beige. Fore wing ground colour dark beige with deep cinnamon-brown marginal area and well visible reticulate pattern of leaden and black scales; veins partly covered by brown scales. Subbasal line indistinct, pale; antemedial line faded but clearly visible, presented by matt black scales; median fascia a broad, dark shadow; postmedial line distinct. Subterminal line dark brown, sinuous, broad at costal margin with large dark patch at termen, tapering towards tornus. Reniform stigma more or less triangular, lunulate, velvet black, without extensions along cellular vein, sometimes with tiny satellite spot; orbicular stigma missing. Terminal line fine, whitish, followed inside by interrupted, dark grey to black stripe; cilia uniformly dark beige. Hind wing ground colour paler beige irrorated with fine brown scales, transverse line more or less distinct, discal spot greyish-brown; marginal suffusion broad, brown. Terminal line well-discriminable, ochreous brown, cilia paler beige than on forewing. Underside of fore wing pale velvet brown with black irroration along costa, marginal suffusion broad,

velvet black; discal spot narrow, black. Hind wing paler brown with dark irroration, transverse line more or less distinct, marginal suffusion broad, velvet black; discal spot coffee-brown. Female: as male, with somewhat broader fore wings.



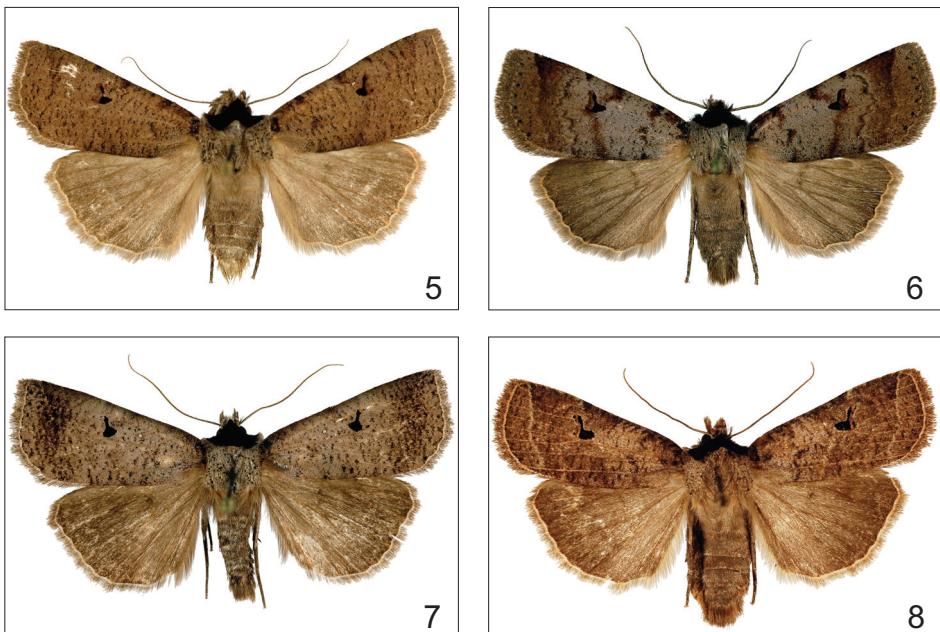
**Figs 1–4.** Adults. 1 = *Lygephila colorata* sp. n., holotype male, Pakistan, 2 = *Lygephila moellendorfi* (HERZ, 1904), male, Russian Far East (after KONONENKO *et al.* 1998), 3 = *Lygephila pallida subpicata* WILTSCHIRE, 1971, male, Iran, 4 = *Lygephila amasina* (STAUDINGER, 1878), male, Turkey

Male genitalia (Figs 9–10). Uncus long, sabre-shaped, third quarter broad, hairy, apically finely hooked. Tegumen symmetrical, long and broad, with small, rounded triangular penicular lobes. Fultura inferior more or less sclerotized, arrowhead-shaped. Valvae finely asymmetrical, distal two-thirds broader, trapezoidal. Harpe sclerotized, short, finger-biscuit shaped, reaching apex of valva; its basal plate long, thin. Sacculus well-developed, dorsal and ventral margins parallel, ended at basal third of valva; without saccular lobe. Aedeagus short, cylindrical, distal part broadened and bent ventrad; carinal plates long, more or less sclerotized, ribbed. Vesica everted ventrad; composed from five short, variably shaped basal and medial diverticula; all diverticula covered by numerous fine spiculi, basal field of spinules well-developed.

Female genitalia (Fig. 11). Ovipositor relatively short, more or less conical. Papillae anales very short, apically rounded, weakly hairy; apophyses posteriores fine, weak, apophyses anteriores relatively long, finely curved. Ostium bursae very large, strongly sclerotized, funnel-shaped, posterior part about three times as broad as proximal end; lateral extremities of posterior edge rounded, posterior margin opened V-shaped; proximal area of anterior part heavily sclerotized. Ductus bursae wide but short, membranous. Cervix bursae dorsal positioned, relatively long, ended with half-helix in shape; corpus bursae membranous, more or less spherical.

*Bionomics and distribution* – The species occurs in the medium-high and higher montane areas of the Karakoram and the Hindukush Mts in the North-western Territories of Pakistan. The known specimens were collected at light in xerothermic, rocky slopes and montane semi-deserts with scarce vegetation. Univoltine, the flight period is relatively long, extending from the very end of June to the mid-September.

*Etymology* – The new species is named by its rather colourful fore wing being unusual within the genus *Lygephila*.

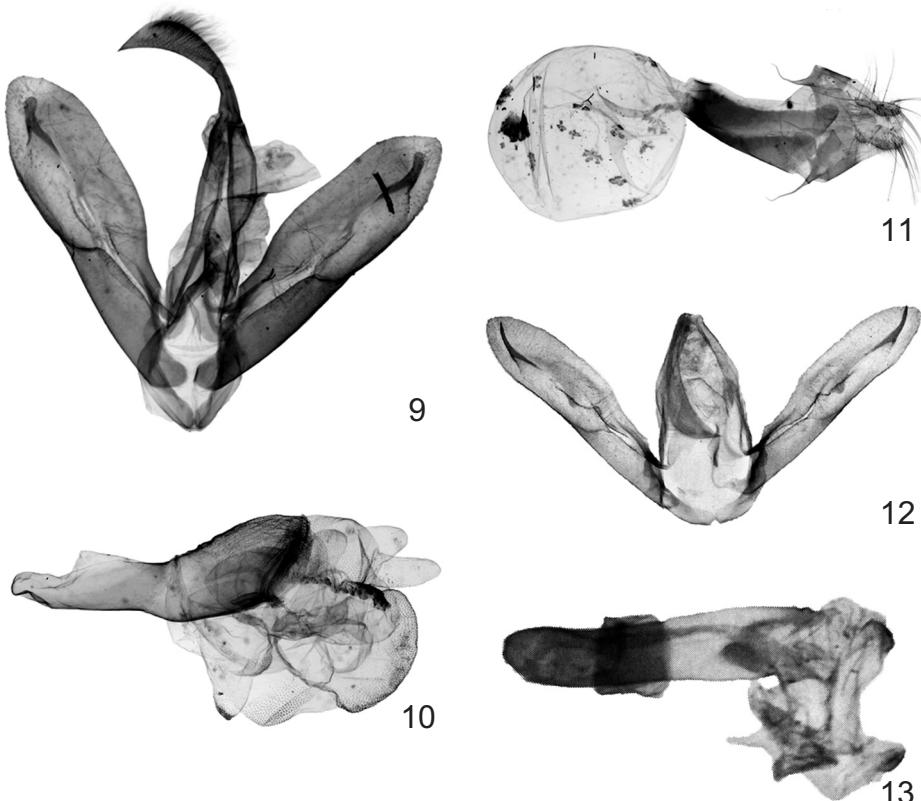


**Figs 5–8.** Adults. 5 = *Lygephila robusta* sp. n., holotype male, Nepal, 6 = *Lygephila vicioides* (HAMPSON, 1926), male, India, 7 = *Lygephila yoshimotoi* KINOSHITA, 1989, male, Taiwan, 8 = *Lygephila angustissima* (DRAUDT, 1950), female, China

**Lygephila robusta** sp. n.  
(Figs 5, 20–22)

*Type material* – Holotype: male, Nepal, Ganesh Himal, 2520 m, near Godlang, 85°17'E, 28°10'N, 19.III.1995, leg. GY. M. LÁSZLÓ & G. RONKAY (coll. G. RONKAY, deposited in the HNHM Budapest). Paratypes. Nepal: Langtang, 1 female, 3 km SE Syabru, 2820 m, 85°21'E, 28°07'N, 27.IX.1994, leg. G. CSORBA & G. RONKAY, slide No. RL7120 (coll. HNHM). Nepal, Ganesh Himal: 1 female, near Godlang, 2520 m, 85°17'E, 28°10'N, 19.III.1995, leg. GY. M. LÁSZLÓ & G. RONKAY, slide No. RL5623 (coll. G. RONKAY); 3 females, from the same locality, 7.V.1995, leg. GY. FÁBIÁN & L. RONKAY (coll. HNHM); 18 males, 16 females, Nesukharka, 12 km S of Somdang, 2700 m, 85°11'E, 28°08'N, 20–21.V. 1995, leg. GY. FÁBIÁN & L. RONKAY, slides Nos RL5555, JB244, JB245 (coll. GY. FÁBIÁN and HNHM); 1 female, 1 km N of Khurpudanda pass, 3850 m, 85°12'E, 28°11'N, 19.IX. 1995, leg. GY. M. LÁSZLÓ & B. HERCZIG (coll. G. RONKAY); 1 male, 1 female, 2 km W of Gheljong, 2420 m, 85°18'E, 28°11'N, 12.X.1995, leg. L. PEREGOVITS & L. RONKAY (coll. HNHM); 3 males, 1 female, 2 km NW of Nesim, 23–25.IX.1995, leg. P. GYULAI & A. GARAI (coll. P. GYULAI). Nepal, Koshi: 1 male, Terhathum area, Tinjure Phedi, 2900 m, 87°27'E, 27°12'N, 13.IV.1996, leg. G. CSORBA & L. RONKAY, slide No. RL7118 (coll. HNHM). Nepal, Annapurna Himal: 4 males, Banthanti village, 2420 m, 83°43'E, 28°22,5'N, 1.VI.1996, leg. GY. M. LÁSZLÓ & G. RONKAY (coll. G. RONKAY); 1 male, valley of Kali Gandaki, Kokethanti village, 2650 m, 17.VI.1996, leg. GY. M. LÁSZLÓ & G. RONKAY, slide No. RL7124 (coll. G. RONKAY).

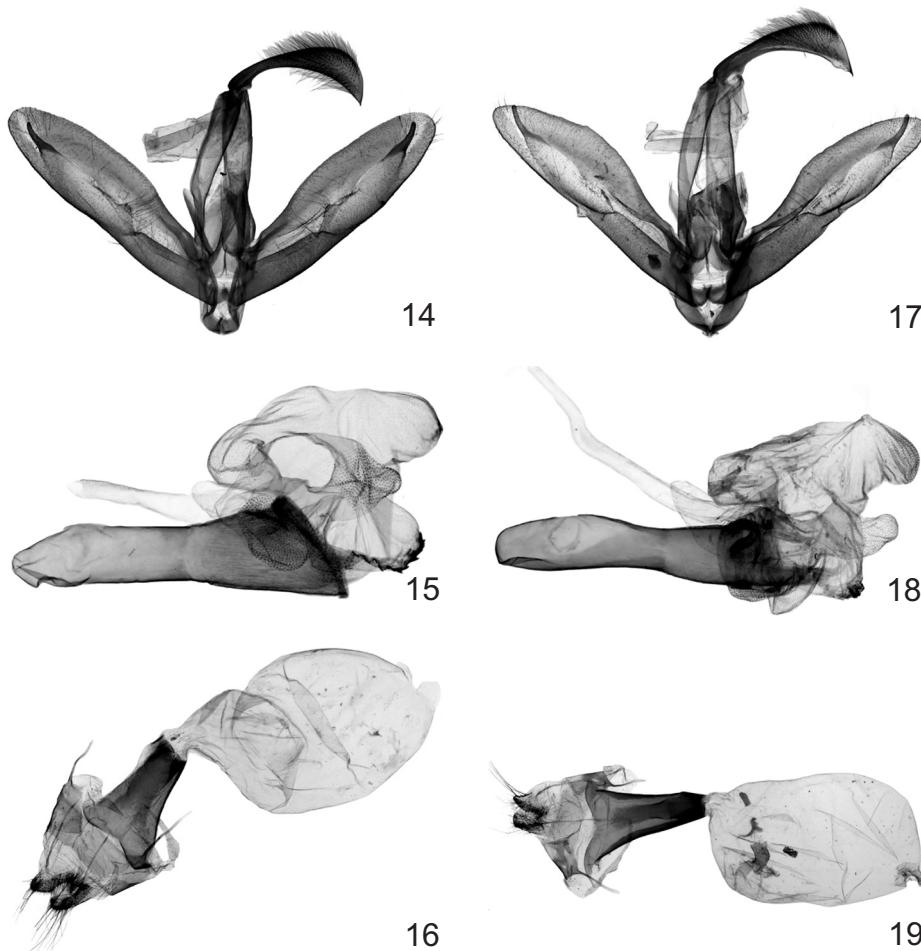
*Diagnosis* – The external appearance of *Lygephila robusta* sp. n. differs from the related *L. vicioides* (HAMPSON, 1926), *L. yoshimotoi* KINOSHITA, 1989 and the more remote *L. angustissima* (DRAUDT, 1950) by its paler, ochreous-brown ground colour without bluish or bluish-grey shade, reduced crosslines except well-discernible creamish-ochre terminal line, and the characteristic reticulate dark (black) irroration (see the Figs 5–8). The male genitalia of *L. robusta* (Figs 20–21) differ from those of *L. vicioides* (Figs 23–24) by their remarkably shorter tegumen, broader, stronger valvae, less curved uncus; shorter and stronger, apically finely curved aedeagus, and dorsally everted vesica; from those of *L. yoshimotoi* (Figs 26–27) by their angular valvae, without digitus. The female genitalia of *L. robusta* (Fig. 22) differs from those of *L. vicioides* (Fig. 25) by their shorter and narrower ductus bursae, different shape of corpus bursae (that of *L. robusta* is broad and relatively short, ellipsoidal; that of *L. vicioides* rather cordiform); from those of *L. yoshimotoi* (Fig. 28) by their smaller and horizontally elliptical corpus bursae. The genitalia of *L. angustissima* (Figs 29–31) rather conspicuously differ from those of the other taxa of the species-group in both sexes.



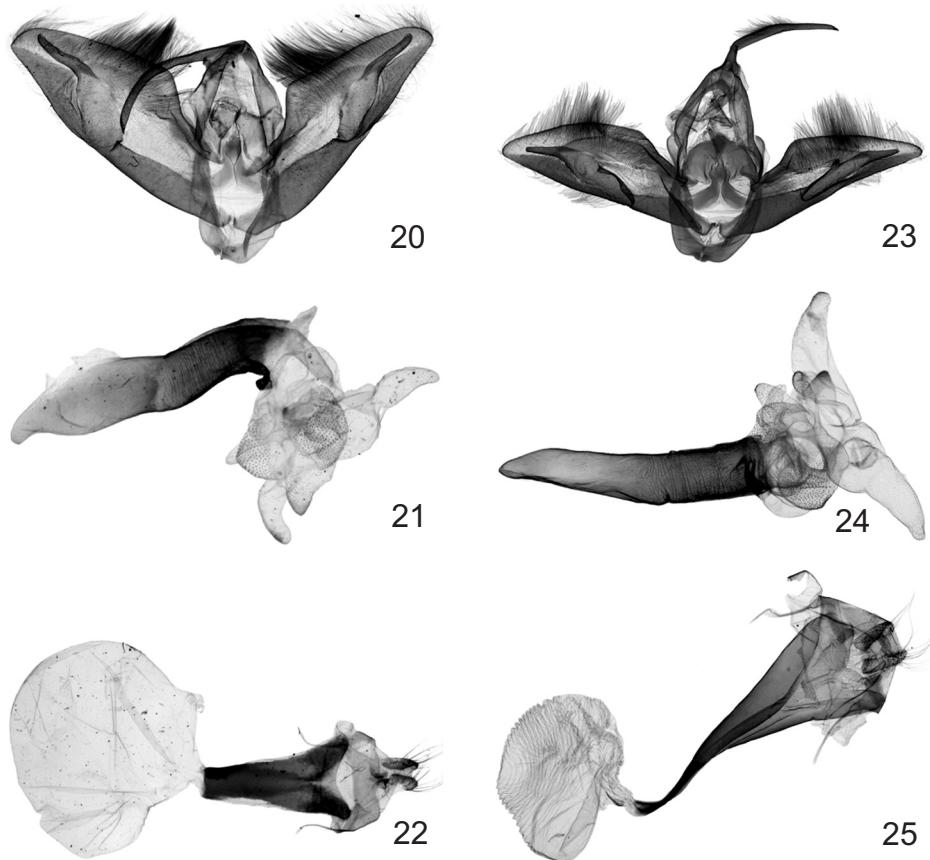
**Figs 9–13.** Genitalia. 9–10 = *Lygephila colorata* sp. n., male genitalia, paratype, Pakistan, slide No. BJ262, 11 = *Lygephila colorata* sp. n., female genitalia, paratype, Pakistan, slide no. BJ263, 12–13 = *Lygephila moellendorfi* (HERZ, 1904), male genitalia, Russia, Far East (after KONONENKO & HAN 2007)

*Description* – Male. Wingspan 34–38 mm, length of forewing 14–17 mm. Head and collar black, finely spinose. Palpi medium-sized, pale brown; antenna greyish-brown, filiform. Thorax pale cinnamon-brown with fine blackish hairs, abdomen pale greyish brown. Fore wing ground colour ochreous-brown with sparse, fine cinnamon-brown and intense black reticulate pattern; veins covered by pale ochreous-brown scales. Subbasal, antemedial, medial and postmedial crosslines rather indistinct or obsolete; subterminal line less discernible, pale beige, defined by brown scales at upper third. Darkened part of reniform stigma reduced to its fine black inner streak with variably long, triangular or rounded black patch at lower edge, outer part of stigma pale red-brownish, sometimes with fine dark dots; orbicular stigma missing. Terminal line well-discriminable, fine, creamish-ochre, with a row of small black-brown spots between veins; cilia darker ochreous-brown than

ground colour, irrorated slightly by brown scales. Hind wing uniformly pale ochre with pinkish shade and intense brown suffusion; marginal area and veins even darker; transverse line missing, discal spot pale brown or indistinct. Terminal line like in the fore wing, cilia pale creamish-ochre. Underside of fore wing velvety brown, with darker irroration, especially at middle of wing; marginal suffusion relatively narrow, paler brown. Underside of hind wing even paler brown, with brown and pinkish irroration, transverse line present but diffuse, discal spot stronger than on upperside, more or less distinct.



**Figs 14–19.** Genitalia. 14–15 = *Lygephila pallida subpicata* WILTSHERE, 1971, male genitalia, Iran, slide No. BJ217, 16 = *Lygephila pallida subpicata* WILTSHERE, 1971, female genitalia, Iran, slide No. BJ218, 17–18 = *Lygephila amasina* (STAUDINGER, 1878), male genitalia, Turkey, slide No. BJ215, 19 = *Lygephila amasina* (STAUDINGER, 1878), female genitalia, Turkey, slide No. BJ216

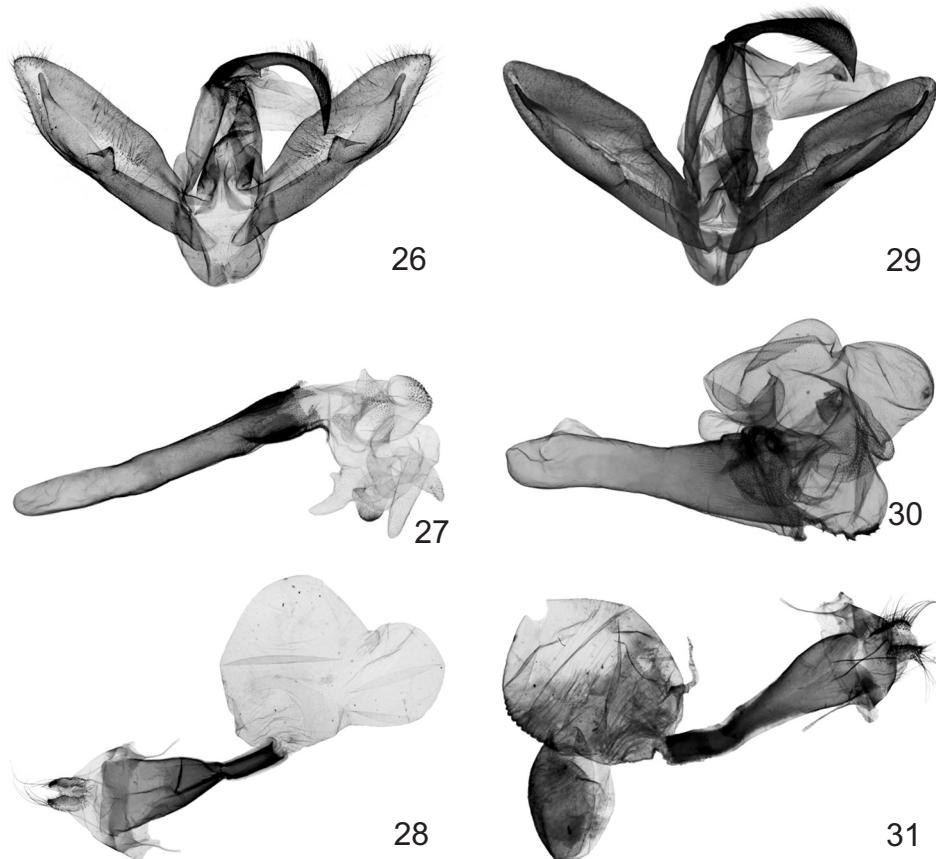


**Figs 20–25.** Genitalia. 20–21 = *Lygephila robusta* sp. n., male genitalia, paratype, Nepal, slide No. BJ244, 22 = *Lygephila robusta* sp. n., female genitalia, paratype, Nepal, slide No. BJ245, 23–24 = *Lygephila vicioides* (HAMPSON, 1926), male genitalia, Pakistan, slide No. BJ276, 25 = *Lygephila vicioides* (HAMPSON, 1926), female genitalia, Pakistan, slide No. BJ277

Male genitalia (Figs 20–21). Uncus relatively long but narrow, slightly curved at middle, apically finally hooked. Tegumen symmetrical, relatively short, wide, with well-developed, rounded trapezoidal penicular lobes. Fultura inferior sclerotized, arrowhead-shaped. Valvae asymmetrical, extended triangular-shaped, with narrower base and broadened distal two-thirds; left valva much broader and somewhat longer than right valva. Harpe heavily sclerotized, basal plate relatively wide, long, erect process relatively long, drawn, slightly curved, more or less parallel bordered. Sacculus well-developed, with parallel margins. Aedeagus short, cylindrical, sinuous at middle, distal half more sclerotized, its

walls transversely wrinkled-ribbed. Vesica everted ventrad; composed from four variably shaped basal and medial diverticula; all diverticula covered by numerous fine spiculi, especially on the two medial ones.

Female genitalia (Fig. 22). Ovipositor relatively short, more or less conical. Papillae anales very short, apically rounded, weakly hairy; apophyses posteriores fine, weak, apophyses anteriores relatively long, finely curved. Ostium bursae huge, strongly sclerotized, funnel-shaped, posterior part about two times as broad as proximal end; lateral extremities of posterior edge rounded, posterior margin bowl-shaped; one fourth of anterior part heavily sclerotized. Ductus bursae wide but short, membranous. Cervix bursae dorsal positioned, helicoid; corpus bursae membranous, horizontally elliptical-ovoid, relatively large.



Figs 26–31. Genitalia. 26–27 = *Lygephila yoshimotoi* KINOSHITA, 1989, male genitalia, Taiwan, slide No. RL7117, 28 = *Lygephila yoshimotoi* KINOSHITA, 1989, female genitalia, Taiwan, slide No. BJ258, 29–30 = *Lygephila angustissima* (DRAUDT, 1950), male genitalia, China, slide No. BJ879, 31 = *Lygephila angustissima* (DRAUDT, 1950), female genitalia, China, slide No. BJ857

*Bionomics and distribution* – The new species inhabits the medium-high forested areas of the southern Himalayas in Nepal (Annapurna Himal, Ganesh Himal, Langtang and the Kanchenjunga Himal), the four known species of the group are completely allopatric (*vicioides*: Pakistan, India: Himachal Pradesh; *robusta*: Nepal; *angustissima*: China: Sichuan, Yunnan; *yoshimotoi*: Taiwan). The phenology data of the species suggest to consider the species as bivoltine but it is also possible that in certain localities the taxon has three generations.

*Etymology* – The new species is named by its unusually robust male genitalia within the genus *Lygephila*.

\*

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