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Article

On the distribution of *Mythimna phlebitis* (Püngeler) in Kazakhstan (Lepidoptera: Noctuidae: Noctuinae: Leucanini)

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Abstract
A little-known Noctuidae species *Mythimna* (*Sablia*) *phlebitis* (Püngeler, 1904) is reported from Kazakhstan for the first time. The previously unknown female of the species is illustrated and described. Adults as well as male and female genitalia are illustrated.

Key words female, Ili River basin, new record, upper Irtysh River, Zaisan Depression.

Introduction

Mythimna phlebitis (Püngeler, 1904) was described from a single male from the western Xinjiang Province of China. In his paper devoted to the Hadeninae fauna of Mongolia, Varga (1974) reported this species from various localities in the southern and western parts of the country. Later, after examination of the holotype of *M. phlebitis*, Hreblay (1990) attributed the Mongolian specimens cited by Varga to his new species *Mythimna jutka* Hreblay, 1990, which was subsequently synonymised by him (Hreblay 1992) with *Mythimna atrata* Remm & Viidalepp, 1979. Since then, *M. phlebitis* remained know only from its type locality in Xinjiang until Korb *et al.* (2017) reported it from eastern Kyrgyzstan. In the course of the extensive studies of the Lepidoptera fauna of Kazakhstan, *M. phlebitis* was found by the authors of the present paper in a few localities in East and Southeast Kazakhstan, which significantly extends the known range of the species to the north.

Material and methods

Abbreviations of the depositories used: CAV = research collection of Anton Volynkin (Leominster, UK); MDS = collection of Marek Dvořák (Smrčná, Czechia); PGC = collection of Pavel Gorbunov (Yekaterinburg, Russia); SMC = collection of Sergey Melyakh (Yekaterinburg, Russia).

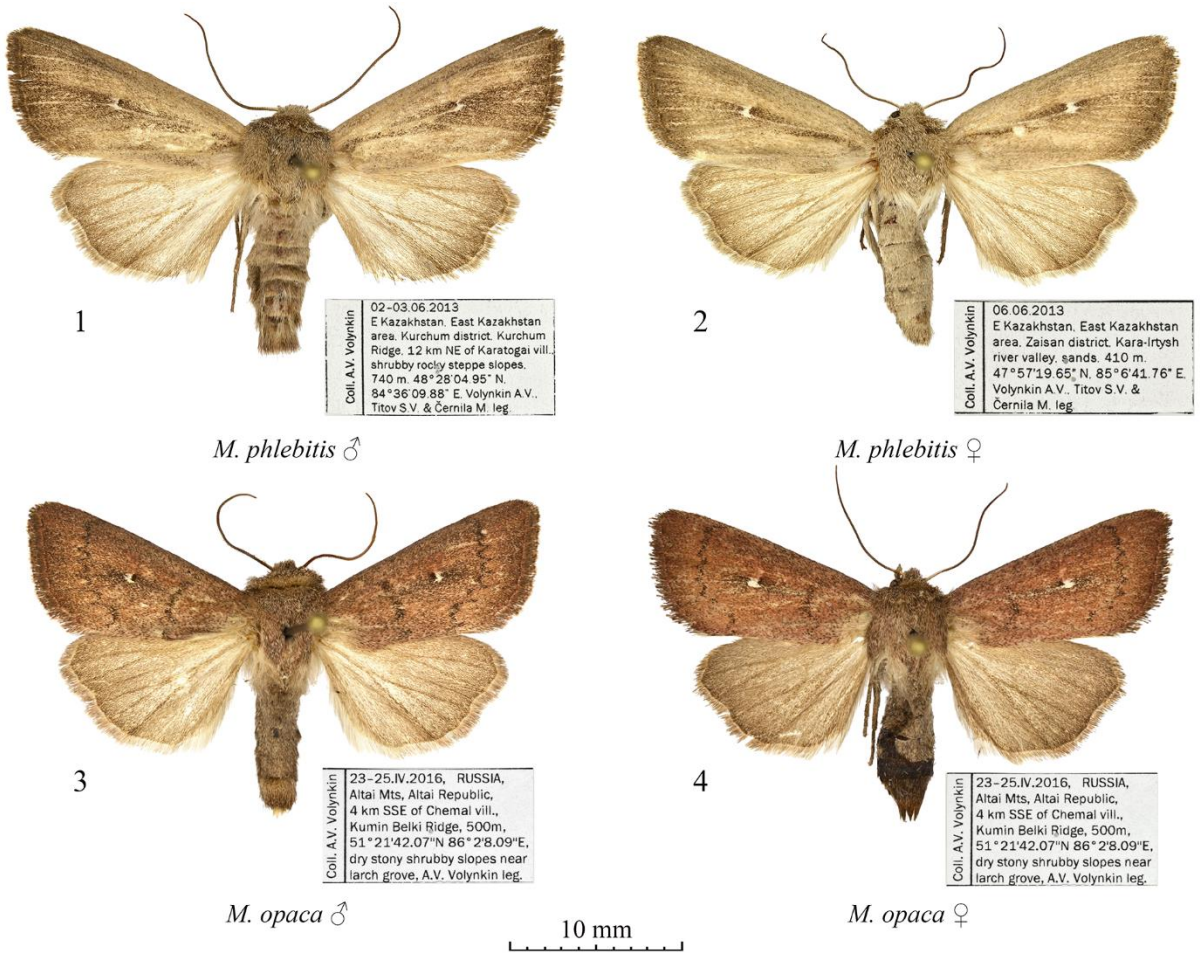
Moths were collected at night using light traps equipped with mercury vapour bulbs and actinic tubes. The photographs of collection specimens were taken using a Nikon D3100/AF-S camera equipped with a Sigma 105 mm F2.8 EX DG Macro OS lens. Adult in nature was imaged using a camera NIKON D7100 equipped with a Micro Nikkor 105 mm f/2.8 lens. All photographs were processed using the Adobe Photoshop CC 2018 software.

The male and female genitalia terminology follows Fibiger (1997) and Kononenko (2010). The distribution maps were constructed using the online resource SimpleMappr (www.simplemappr.net).

Results

Mythimna* (*Sablia*) *phlebitis (Püngeler, 1904)
(Figs 1, 2, 5, 6, 8)

Leucania phlebitis Püngeler, 1904, *Societas entomologica*, 19(16) 130 (Type locality: [China, Xinjiang] "Aksu").



Figures 1–4. *Mythimna* spp.: adults, dorsal view. The specimens are deposited in CAV.

Material examined. 1 male, 1 female, 02–03.VI.2013, E Kazakhstan, East Kazakhstan area, Kurchum district, Kurchum Ridge, 12 km NE of Karatogai vill., shrubby rocky steppe slopes, 740 m. 48°28'04.95"N, 84°36'09.88"E, Volynkin A.V., Titov S.V. & Černila M. leg. (CAV); 1 male, 1 female, 06.VI.2013, E Kazakhstan, East Kazakhstan area, Zaisan district, Kara-Irtysh river valley, sands, 410 m. 47°57'19.65" N, 85°6'41.76" E, Volynkin A.V., Titov S.V. & Černila M. leg. (CAV);1 female, 20.VI.2014, E Kazakhstan, Altai Mts., Kurchum distr., 26 km SE of Barak-Batyr vill., unnamed mountain massif, gravelly slopes, 610 m, 48º29'14"N, 84º07'02"E, Volynkin A.V. & Titov S.V. leg. (CAV); 2 males, 1 female, E Kazakhstan, Zaisan District, 30 km NW of Maikapchagai, Bozaigyrkum Sands, 530 m, 47°41'N 85°20'E, 16.V.2017, P. Gorbunov leg. (MDS); 1 male, 1 female, same data as previous but 27.V.2018 (SMC); 1 female, SE Kazakhstan, Almaty Region, Charyn River valley, 1000m, 43°17'N 78°59'E, 24.V.2016, P. Gorbunov leg. (SMC); 3 males,1 female, SE Kazakhstan, Almaty Region, Tuzkol' Lake, 6 km SE of Karasaz settl., 2100m, 43°00'N 79°57'E, 26.V.2016, P. Gorbunov leg. (PGC).

Remark. The species was described from a single male (Püngeler 1904), which is a holotype by monotypy. The holotype was illustrated by Korb *et al.* (2017: pl. 14, fig. 12, as 'syntype') while its male genitalia were illustrated by Hreblay (1990).

Diagnosis. *Mythimna phlebitis* (Figs 1, 2) is similar to *M. opaca* (Figs 3, 4), from which it differs in the somewhat more elongate forewing, the pale ochreous-brown head, thorax and forewing colouration (vs. brick red in *M. opaca*), the lack of the ante- and postmedial lines, and the intense grey suffusion in the terminal area of the forewing. The male genital capsules of the two species are very similar and that of *M. phlebitis* (Fig. 6) can be distinguished from *M. opaca* (Fig. 7) only by the somewhat narrower digitus, harpe and distal saccular process. In the vesica, *M. phlebitis* differs from the similar congener in the shape of its elongate cluster of spinules, which has a shorter distal section consisting of long spines, and a dilated anterior end, in comparison to the corresponding structures of *M. opaca*. The female genitalia of *M. phlebitis* (Fig. 8) are distinguished from *M. opaca* (Fig. 9) by the somewhat shorter posterior sclerotised plate in the ductus bursae, the smaller corpus bursae, and the more elongate and narrower sclerotised and rugose apical plate in the appendix bursae.

Figure 5. *Mythimna phlebitis*: adult in nature, Southeast Kazakhstan, Almaty Region, Tuzkol' Lake, 6 km SE of Karasaz settl., 2100m, 43°00'N 79°57'E, 26.V.2016 (photo by P. Gorbunov).

Re-description. **External morphology of adults** (Figs 1, 2). The forewing length is 14.5–15.0 mm in both sexes. Antenna filiform in both sexes. Body pale ochreous brown. Forewing ground colour pale ochreous brown. Basal dash dark greyish-brown, diffuse, stretching along vein M posteriorly in basal

6

M. phlebitis
E Kazakhstan, Kara-Irtysh River, slide AV1423

7

M. opaca
Russia, Altai Mts, Kumin Belki Range, slide AV7454

8

M. phlebitis
E Kazakhstan, 26 km SE Barak-Batyr, slide AV8454

9

M. opaca
Russia, Altai Mts, Aygulaksky Range, slide AV7455

Figures 6–9. *Mythimna* spp.: male (6, 7) and female (8, 9) genitalia, ventral view. The specimens dissected are deposited in CAV.

third of wing. Medial dash dark greyish-brown, diffuse, broader than basal one, stretching in cell along vein M and reaching discal spot. Discal spot small, white, with irregular margins. Area between veins

M2 and Cu2 and along outer margin intensely suffused with dark greyish-brown. Forewing cilia greyish-brown. Hindwing pale greyish-brown, paler in cell and along anal margin. Hindwing cilia pale greyish-brown. **Male genitalia** (Fig. 6). Uncus slender, downcurved, distally tapered, medially densely setose. Arms of tegumen posteriorly dilated and fused in posterior quarter. Penicular lobes narrow. Vinculum more or less equal in length to tegumen, U-shaped with heavily sclerotised and anteriorly dilated arms. Valva lobular, medially dilated, with clavate cucullus with an elongate and slender 'neck'. Corona dense, occupying distal half of cucullus. Costal process (digitus) short, stick-shaped and apically rounded, directed distally. Clasper broad with strongly convex outer margin protruding beyond valva margin; harpe short, digitiform, directed inwards. Sacculus broad, with elongate, digitiform, smoothly upcurved and distally gradually tapered but apically rounded distal process reaching middle of clasper. Transtilla heavily sclerotised, ribbon-like, apically dentate. Juxta shield-like, weakly sclerotised. Phallus tubular, medially downcurved, with broad teardrop-shaped coecum. Vesica elongate and tubular, distally dilated, granulose and bearing long and robust spike-like terminal cornutus and long cluster of spines stretching along its dorsal wall. In latter, distal half dilated and consisting of long spines while proximal half consisting of short spinules and dilated anteriorly. **Female genitalia** (Fig. 8). Papillae anales broad and heavily sclerotised, trapezoidal with longer and fused dorsal margins. Apophyses elongate, slender but well-sclerotised, apophysis anterioris shorter than posterioris one. Antrum short and narrow, cup-shaped with medially swollen dorsal wall. Ductus bursae elongate, its posterior section dorso-ventrally flattened, with elongate sclerotised plate and gelatinous and irregular lateral margins. Anterior section of ductus bursae tubular, anteriorly curved left, with robust longitudinal sclerotised wrinkles continued into proximal section of appendix bursae. Corpus bursae membranous, elliptical. Appendix bursae situated postero-laterally on left side, originating from anterior end of ductus bursae, its proximal section broad and with sclerotised wrinkles medially and along its posterior margin, and with gelatinous broadly conical protrusion of anterior wall terminating with ductus ejaculatorius. Distal section of appendix bursae elliptical, gelatinous with elliptical rugose sclerotised plate with irregular margins.

Distribution. The species is currently known from the western Xinjiang Province of China (Püngeler 1904), eastern Kyrgyzstan (Korb *et al.* 2017), and East and Southeast Kazakhstan (present study) (Fig. 10).

Figure 10. Distribution map of *Mythimna phlebitis*.

Figure 11. Habitat of *Mythimna phlebitis*: East Kazakhstan, Zaisan District, 30 km NW of Maikapchagai, Bozaigyrkum Sands, 530 m, 47°41'N 85°20'E, 16.V.2017 (photo by P. Gorbunov).

Figure 12. Habitat of *Mythimna phlebitis*: East Kazakhstan, Kurchum District, Kurchum Ridge, 12 km NE of Karatogai vill., 740 m. 48°28’04.95” N, 84°36’09.88” E 03.VI.2013 (photo by A. Volynkin).

Figure 13. Habitat of *Mythimna phlebitis*: East Kazakhstan, Kurchum distr., 26 km SE of Barak-Batyr vill., unnamed mountain massif, 610 m, 48º29'14"N, 84º07'02"E, 21.VI.2014 (photo by A. Volynkin).

Figure 14. Habitat of *Mythimna phlebitis*: Southeast Kazakhstan, Almaty Region, Tuzkol' Lake, 6 km SE of Karasaz settl., 2100m, 43°00'N 79°57'E, 26.V.2016 (photo by P. Gorbunov).

Bionomics. The species is found in various habitats. In eastern Zaisan Depression (including Kara-Irtysh River valley), *M. phlebitis* inhabits sand deserts overgrown with bunches of xerophytic grasses and wormwoods (*Artemisia*), as well as bushes of *Halimodendron halodendron*, *Calligonum rubicundum* and *Hippophae rhamnoides* (Fig. 11). On the Kurchum Ridge and its foothills, the species

was collected in the dry steppe with extensive rock outcrops and stone screes with sparse bunches of xerophytic grasses, wormwoods (*Artemisia*), and bushes of the genus *Caragana* (Figs 12, 13). On the Tuzkol' Lake shores, *M. phlebitis* inhabits dry steppe with rock outcrops overgrown with xerophytic grasses (including the genus *Achnatherum*) and wormwoods (*Artemisia*) (Fig. 14). The preimaginal stages and the food plants are unknown.

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