Notes on the little-known species *Epicallima kuldzhella* (Lvovsky, 1982) (Lepidoptera, Oecophoridae) from Central Asia

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Abstract. Extensive collecting in Central Asia resulted in the first description of the female of *Epicallima kuldzhella* (Lvovsky, 1982). Colour photographs of adults of both sexes and of habitats are included along with a distribution map, illustrations of the male and female genitalia, and some aspects of the biology.

Introduction

The family Oecophoridae is distributed nearly worldwide, with approximately 3400 described species, primarily in Australia (Pohl et al. 2018). *Epicallima* is a genus of little observed moths in this family. The genus was established by H. G. Dyar in 1903 as a replacement name for *Callima* Clemens, 1860. It is distributed mainly in the Palaearctic and Nearctic regions (Hodges 1974; Kim et al. 2019) except the northernmost areas. Lvovsky (2006) considered that there are probably more than 30 *Epicallima* species described so far but the exact number of species is difficult to determine as this genus is very close to the species-rich genus *Promalactis* Meyrick, 1908. However, Kim et al. listed only 17 species of *Epicallima* recorded worldwide. Of these, seven species are known from Central Asia: *Epicallima bisinuella* (Erschoff, 1874), *E. dushanbella* (Lvovsky & Arutjunova, 1992), *E. formosella* (Denis & Schiffermüller, 1775), *E. gerasimovi* (Lvovsky, 1984), *E. haasi* (Rebel, 1902), *E. kuldzhella* (Lvovsky, 1982), and *E. tadzhikella* (Lvovsky, 1982). In the above-mentioned work, Kim et al. gave the characteristics of the genus as well as the difference from the genus *Promalactis* based on the wing-pattern. The forewings of *Epicallima* are yellow or ochre-yellow with brown spots and those of *Promalactis* are red ochre with silvery white stripes. Most *Epicallima* species occur in mountain forests (Lvovsky 2013) and most of them are known to feed on decaying material under the bark of trees but there are exceptions, such as *E. bisinuella* and *E. formosella* that feed on lichens. An unusual food substrate, palm scales, was recorded in southern Spain for the species *E. mikkolai* (Lvovsky, 1995) described from northern Africa (Lvovsky 2009).

Epicallima kuldzhella was described from only two males (Lvovsky 1982) from Yining (former Kuldzha, North-Western China). As the result of two entomological expeditions of Polish entomologists to Central Asia in 2018 and 2019, several specimens of *E. kuldzhella* were collected,

including females. The objectives of this study are to provide: a description of the female of *E. kuldzhella*, an updated distribution map, and brief notes on the biology.

Material and methods

Most of the examined specimens were taken as adults, some of them having been attracted to light. Two specimens were reared from a larva and a pupa that were collected in the field.

The genitalia were dissected in the usual way for small Lepidoptera (Robinson 1976) except that some of the preparations were temporarily stored in glycerol or sugar solutions in small plastic tubes or shell vials, while others were embedded in Euparal on glass slides. Drawings of the genitalia were made with Indian ink on transparent sheets of drawing paper.

Taxonomy

Family Oecophoridae Bruand, [1851]
Epicallima kuldzhella (Lvovsky, 1982)

Callima kuldzhella Lvovsky, 1982. Entomologicheskoe obozrenie 61(3): 584–586.

Examined material. N-W China, 2♂, holotype and paratype, Kuldzha 1884; 5♀, Xinjiang Uygur Autonomous Region, 2–6.viii.2007, collector unknown, coll. Nankai University in Tianjin, China, and Zoological Institute, Academy of Sciences, St. Petersburg (collection of M. F. Wocke); Kazakhstan, 2♂, 1♀, near Alma-Ata, 23.vii–9.viii.1957, A. Danilevsky and V. Kuznetzov leg.; 1♂, 1♀, the same place, 30.vi.1957, M. Falkovich leg.; 3♂, 1♀, Zailiysky Alatau ridge, 8–15.vii.1957, M. Falkovich leg.; 1♂, Ketmen ridge, vil. Podgornoe, 8.vi.1957, M. Falkovich leg.; 1♂, 1♀, Aksu-Dzhabagly Nature Reserve, vil. Novonikolaevka, 8–12.viii.1987, S. Seksjaeva leg.; Kyrgyzstan, 1♀, near Naryn, 26.vii.1981, S. Sinev leg.; 2♂, 1♀, near Naryn, ridge Naryntau, 2200 m, 28.vii–2.viii.1988, V. Mironov leg.; 2♂, 5♀, Cholpon-Ata, 30.vii–7.viii.1987, O. Nikiforova and A. Lvovsky leg.; 3♀, near Bishkek, vil. Razdolny, 22.vii.1987, O. Nikiforova and A. Lvovsky leg., all coll. Zoological Institute, Academy of Sciences, St. Petersburg; 2♀, Arslanbob, 41.3454N, 72.8822E, pupa 7.v.2018 (*Betula* sp.), e.p. 11.v.2018, R. Plewa leg.; Balykchy, 42.452880N, 76.162228E, 23.vi.2019, to light, T. Jaworski leg., gen. pr. Z. Tokár No 13658; 2♂, the same locality, 24.vi.2019, to light, T. Jaworski leg., Ala-Archa, 42.6288N, 74.4885E, larva 13.v.2018 (*Phelinus* sp. growing on a trunk of *Hippophae rhamnoides*), e.l. 19.vi.2018, R. Plewa leg., all coll. T. Jaworski.

Description. Adult, female (Fig. 1). Forewing length 6–7.5 mm, wingspan 13–16 mm. Head and thorax yellow. Labial palpi upwardly curved, middle segment grey, apical segment white. Antennal flagellomeres each ringed alternately grey and white. Forewing yellow with four brown spots that vary greatly in size and shape: a narrow, subtriangular spot near base, a small quadrate spot near the dorsal margin at 2/5, a large sub-trapezoidal spot extending from mid-costa to mid-cubitus, and a large almost crescentic area extending from subterminal area from apex to near tornus. Basal and dorsal spots partly narrowly edged with white scales; scattered white scales near fringe; fringe mostly brown, yellow apically. Hindwing and abdomen grey.

Adult males generally differ from the adult females in the colour of the fringe scales of the forewings (Fig. 2), which are predominantly yellow in the former and brown in the latter.

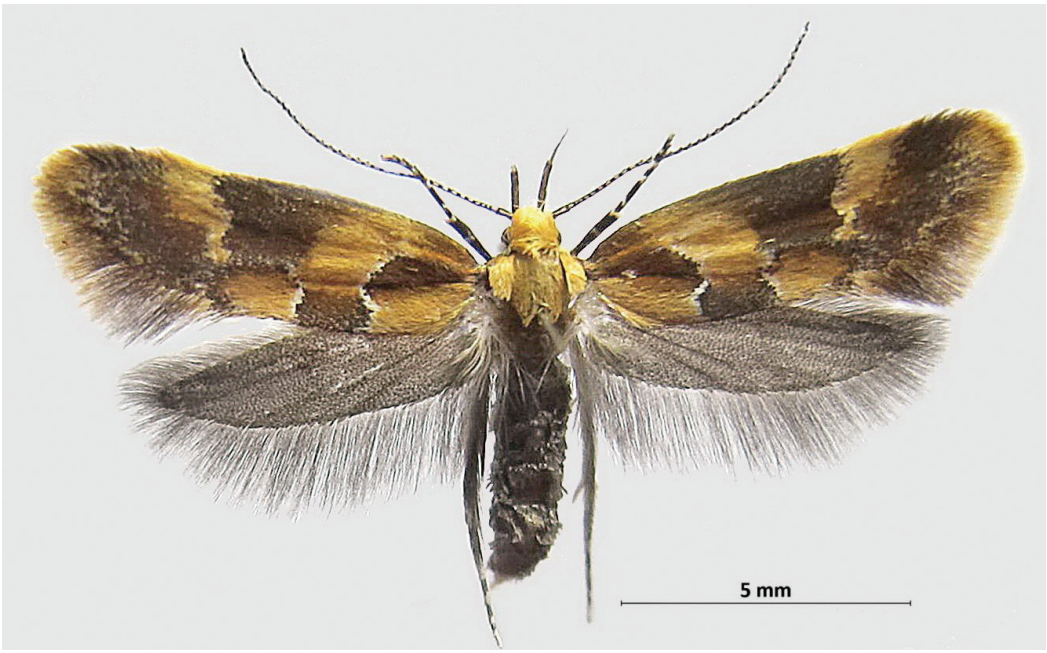

Figure 1. *Epicallima kuldzhella*, female, Arslanbob, ex pupa 11.v.2018.

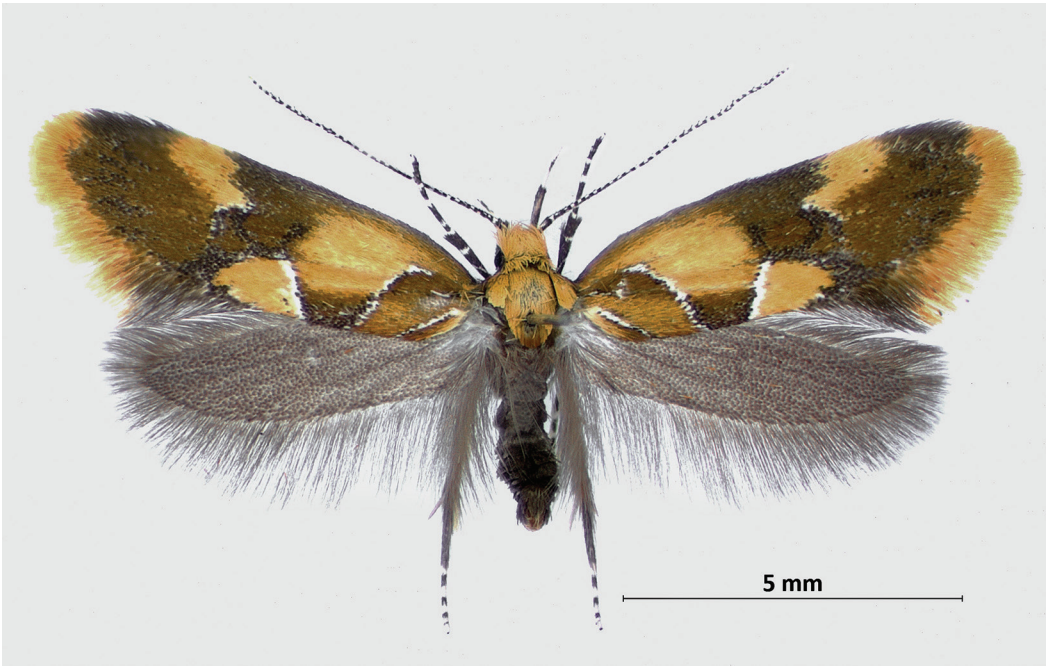

Figure 2. *Epicallima kuldzhella*, male, Ala-Archa, ex larva 19.vi.2018.

Female genitalia (Fig. 3). Ovipositor of the standard moderate length of an oecophorid. Apophyses anteriores slightly shorter than apophyses posteriores. Ostium situated near posterior margin of sternum VII. Antrum cup-shaped, sclerotized. Ductus seminalis from anterior part of ductus bursae. Sclerotized part of ductus bursae octagonally convex. Several narrow, small and inwardly

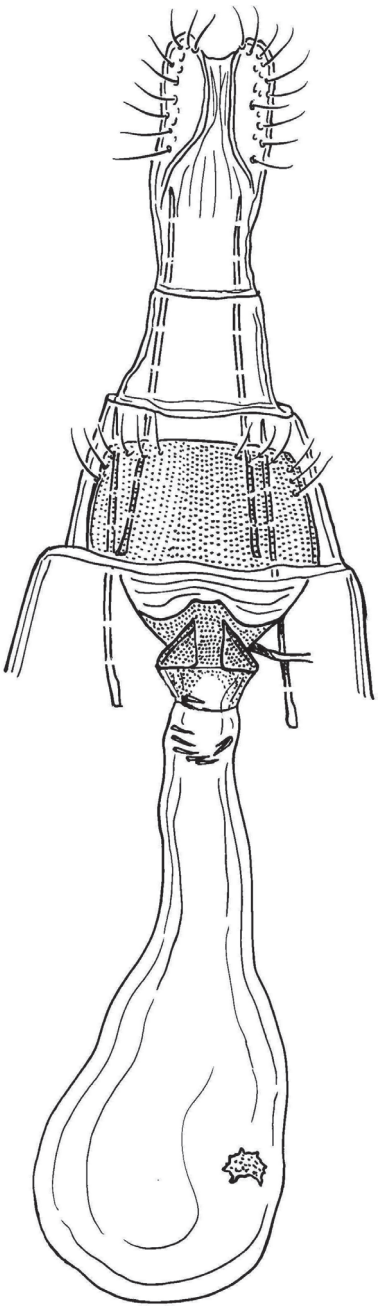

Figure 3. Female genitalia of *Epicallima kuldzhella*.

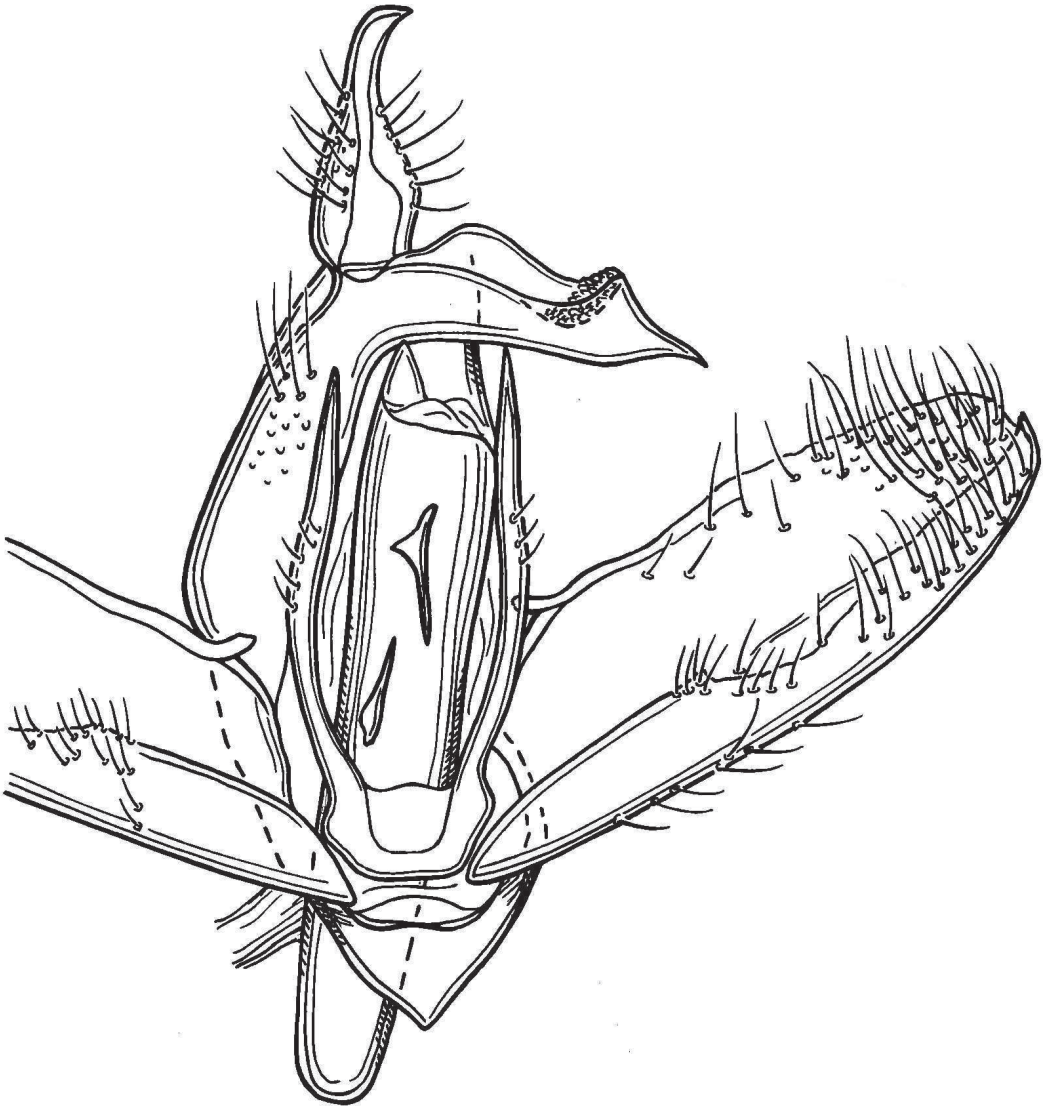

Figure 4. Male genitalia of *Epicallima kuldzhella*.

projecting “thorns” at the end of sclerotized part or also at the beginning of membranous part of ductus bursae. Ductus bursae widening into oval corpus bursae. Signum small, rounded with minute teeth, on anterior part of corpus bursae.

Male genitalia (Fig. 4). These mostly match the overall structure characteristic of *Epicallima* (= *Callima* according to Hodges (1974)). Uncus with basal half broad, tapering to slender distal half. Gnathos slipper-like with pointed apex. Valva with well developed saccular margin, more heavily sclerotized than medial part of valva; distal process directed dorsad along distal margin of valva to

Figure 5. Distribution map of *Epicallima kuldzhella.*

a broad point. Juxta with a pair of lateral lobes tapering gradually to apex, 3/5 of length of valva. Aedeagus cylindrical, vesica with two thorn-shaped cornuti.

Distribution (Fig. 5). Kazakhstan: near Almaty (Alma-Ata), Talgar, Shymkent, Aksu-Zhabagly Nature Reserve, mountain ridges Zailiysky Alatau and Ketmen. Kyrgyzstan: near Bishkek (Ak-Jol), near Naryn, mountain ridge Naryntau, Cholpon-Ata, near Arslanbob, Balykchy, Ala-Archa. North-Western China: near Yining (Kuldzha), Xinjiang Uyghur Autonomous Region.

Biology. Moths are on the wing from the beginning of June to the middle of August. In the daytime adults can be found on the trunks of *Populus nigra* var. *italica* Koehne (= *pyramidalis* Roz.) (Salicaceae). The eggs are oval and dirty white. They are thought to be laid in crevices in the bark and/or on the fruiting bodies of wood-decaying fungi. Larvae feed under the bark and inside fungal bodies, however confirmation is required as to whether their true diet consists of wood or fungal tissues. The body of the larva is translucent dirty white. Head light brown with brown mandibles and black stemmata. Prothoracic plate light brown, anal plate dirty white. Larvae hibernate. Pupation takes place in the middle of spring. The only reliably recorded data concerning the habitat characteristics of sites in Kyrgyzstan where *Epicallima kuldzhella* was collected are those where the following tree/shrub species are present: Ala-Archa: *Hippophae rhamnoides* L. (Elaeagnaceae), *Salix* spp. (Salicaceae), *Malus* spp., *Prunus* spp. (Rosaceae); Arlsanbob: *Betula pendula* Roth. (Betulaceae), *Juglans regia* L. (Juglandaceae), and *Crataegus* sp., *Malus* spp., *Prunus* sp. (Rosaceae). These biotopes are shown in Figures 6, 7.

Figure 6. Biotope of *Epicallima kuldzhella* – vicinity of Arslanbob (Kyrgyzstan, 1740 m.a.s.l., 7.v.2018).

Figure 7. Biotope of *Epicallima kuldzhella* – Ala-Archa (Kyrgyzstan, 1680 m.a.s.l., 13.v.2018).

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