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Research article

Notes on distribution, habitats and biology of two little-known leafrollers in the Balkans (Lepidoptera: Tortricidae)

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Abstract: *Dichrorampha dinarica* and *Cydia suffuscana* are known from their type localities only, and apart from the period of the imaginal stage, no data on their biology are known. *Dichrorampha dinarica* was discovered in Tomor Mountain (Albania), at a relatively long distance from its type locality. The moths were swept from inflorescences of *Achillea abrotanoides* (Vis.) Vis. (Asteraceae) in the base of 61.2 Alpine calcareous screes (CORINE Biotopes). The larval host plant of *C. suffuscana* was revealed: it is *Lunaria annua* L. (Brassicaceae), while all other closely related species from the *C. succedana* group feed on various Fabaceae. The habitat of the moth after CORINE Biotopes is the margin of 41.45 Thermophilous Alpine and peri-Alpine mixed lime forests. The moths and their habitats are described and illustrated.

Keywords: *Cydia suffuscana, Dichrorampha dinarica,* faunistics, genitalia morphology, host plant

Introduction

The present paper deals with two leafroller species known only from their original descriptions and provides further data on their distribution, habitats and biology.

Dichrorampha dinarica Huemer, Zlatkov & Baixeras, 2012 was described from Korab Mountains in North Macedonia, and is the third recognised taxon from a group of three closely related high-mountain species (along with *D. ligulana* (Herrich-Schäffer, 1851) from the Alps and *D. rilana* Drenowsky, 1909 from the Rila, Pirin, and Vitosha mountains; Huemer et al., 2012). There are no further records of *D. dinarica,* and its host plant was not known. Here we provide new distributional records and information about the probable host plant and habitat of this species. These data were gathered during a short entomological expedition in Albania in 2022, when the subalpine parts of Tomor Mountains were examined. An unidentified *Achillea* was spotted at ca. 2000 m a.s.l., sparsely distributed in the subalpine meadows and with already overblown inflorescences. Further search discovered large patches of the same plant on the northern side of the marble slope of the highest mountain ridge. Several individuals of *Dichrorampha* were swept from the *Achillea* plants, and some further were captured flying around the tufts. The characteristic habitus of the moths immediately classified them as *D. dinarica*.

Cydia suffuscana Zlatkov & Budashkin, 2012 is known only from the type locality in Kresna Gorge, Bulgaria. It belongs to a group of several species with controversial taxonomy, the so-called *C. succedana* group (Zlatkov & Budashkin, 2012). The larval host plant of the species remained unknown for a long time despite field efforts. In 2013, females were observed to lay eggs on *Lunaria annua,* and collected samples confirmed that this is the larval host plant of the leafroller.

Material and methods

Moths were collected in flight at daytime or swept from the vegetation with an aerial net. They were killed with ethyl acetate, set and dried. Genitalia dissections followed Robinson (1976). A stem with inflorescence of the putative host plant of *D. dinarica* was collected and identified in laboratory. Fruits of *L.*

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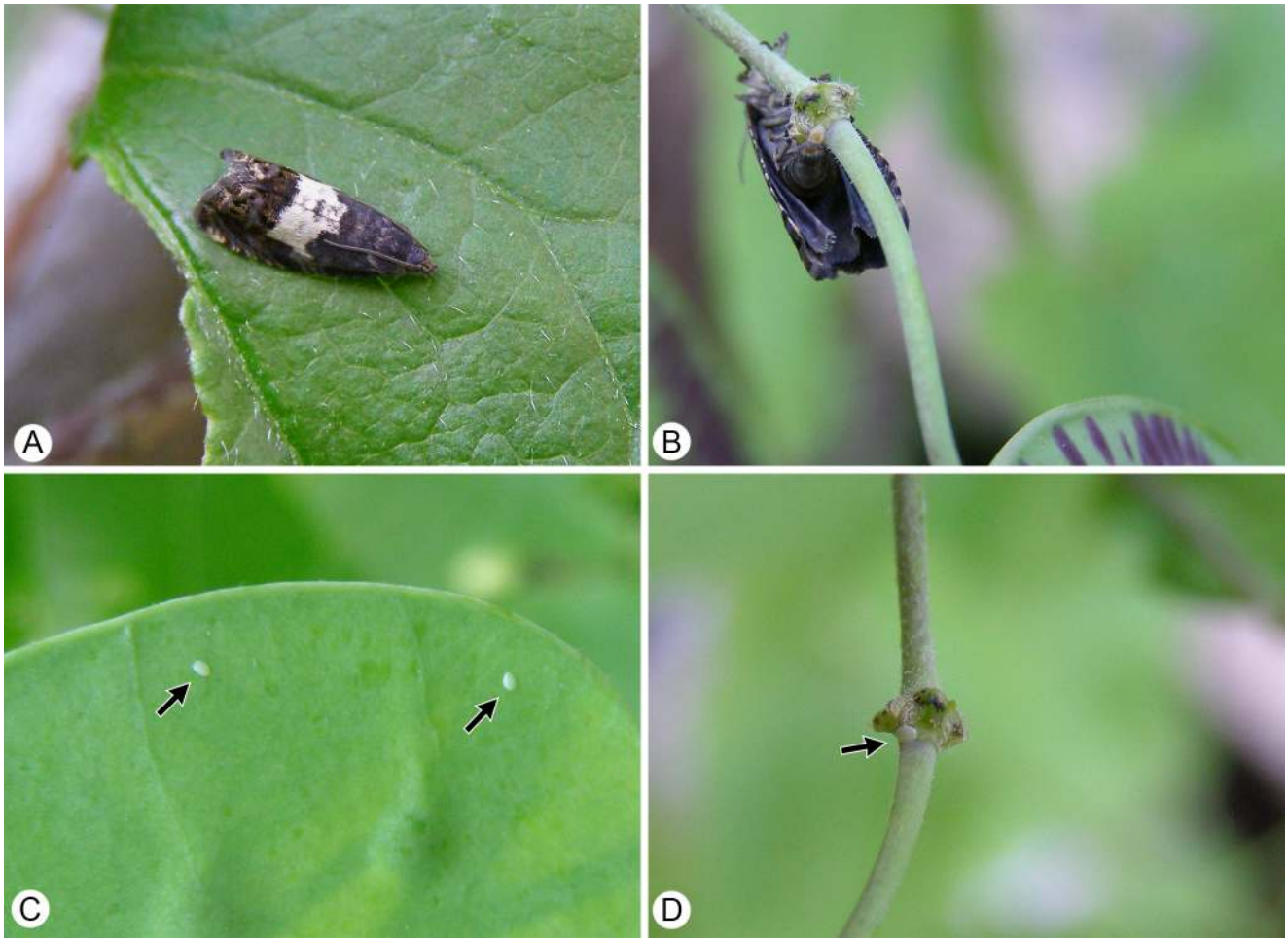


Fig. 1. Field observations on *Cydia suffuscana* – (A) resting female on a leaf of *Clematis vitalba;* (B) a female in the moment of egg laying; (C) two eggs (arrows) in the marginal area of a fruit of *Lunaria annua;* (D) the egg laid in (B) (arrow).

annua with layed eggs of *C. suffuscana* were put in 100 ml plastic containers and were kept at room temperature, with opening of the lid every day until emergence. Photographs of habitats and plants were used for habitat classification. All specimens were preserved in the collection of Institute of Biodiversity and Ecosystem Research, Sofia, Bulgaria.

The habitat identifications followed three major classifications: CORINE Biotopes (AA.VV. 1991), EUNIS (Roug S. 2010), and NATURA 2000 (AA.VV. 2013).

Results

Cydia suffuscana Zlatkov & Budashkin, 2012

Field observations (Fig. 1). The habitat (the type locality) was explored on 13 May 2013. The moths fly sporadically all day, as in the afternoon hours the activity increases. They rest on various substrates. Similarly to many other Olethreutinae representatives, they resemble bird droppings. Several females were observed landing on fruits of *Lunaria annua* and exhibiting oviposition behaviour. Examination of visited fruits confirmed presence of eggs. The eggs were laid on the fruits or at the base of pedicel. Next month the site was explored again and larvae feeding with seeds within the fruits were found. Up to three larvae per fruit were presented.

Rearing. The collected fruits were left unattended (except for daily opening the lid to provide fresh air) and produced only one male moth in February 2014, much earlier than usual period of the imaginal stage (end of April-beginning of June, peak in the first half of May), probably due to higher temperature in the room. No further data on the preimaginal stages were collected.

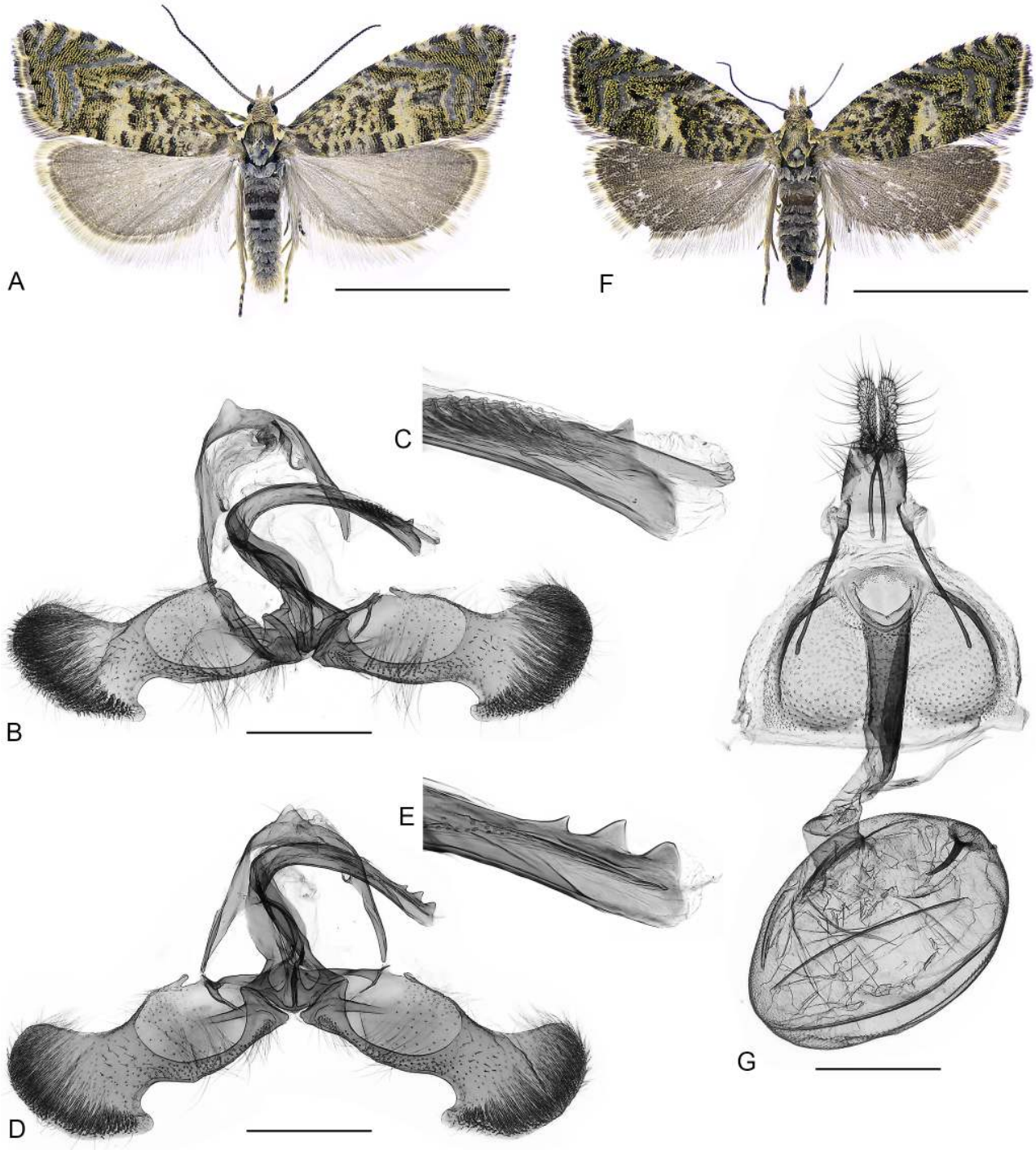


Fig. 2. *Dichrorampha dinarica* from Tomor Mts, Albania – (A) male, genitalia slide No. 1/31.1.2023; (B) genitalia, ibid.; (C) apical part of phallus (with cornuti and endophallite), ibid.; (D) male genitalia, slide No. 1/17.1.2023; (E) apical part of phallus (cornuti shed out, the endophallite is well visible), ibid.; (F) female, genitalia slide No. 2/31.1.2023; (G) genitalia, ibid. Scale bars: (A), (F) 5 mm; (B), (D), (G) 0.5 mm.

Distribution. The species is known only from the type locality.

Habitat (Fig. 3 A, B). 41.45 Thermophilous Alpine and peri-Alpine mixed lime forests (CORINE Biotopes); G1.A5 *Tilia* woodland (EUNIS); 9180* Tilio-Acerion forests of slopes, screes and ravines (NATURA 2000). From a phytosociological point of view it could be referred to as the *Tilio platyphyllis-*

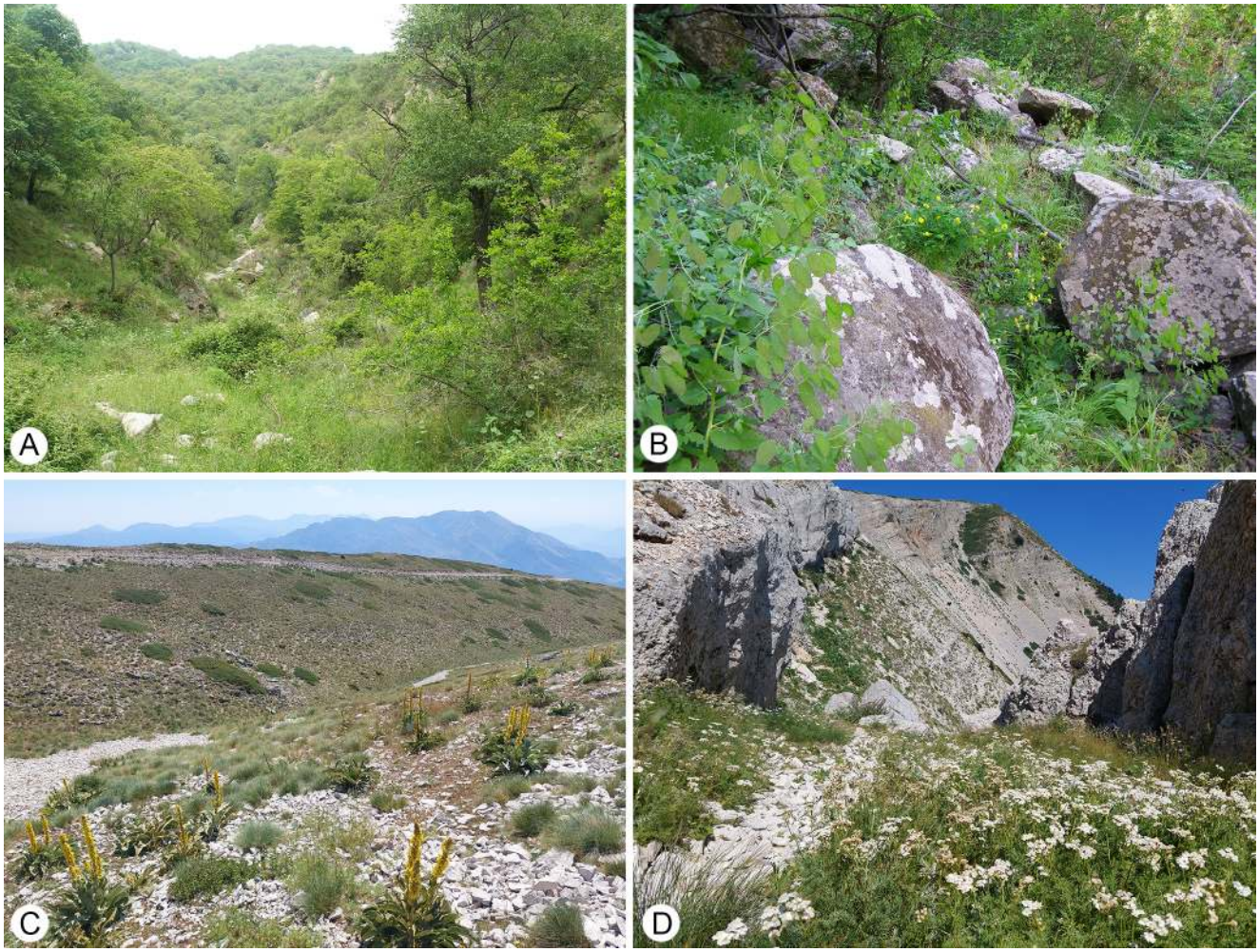


Fig. 3. Habitats – (A) small valley with 41.45 Thermophilous Alpine and peri-Alpine mixed lime forests in Kresna Gorge, type locality of *Cydia suffuscana;* (B) granite rocks and vegetation with *Lunaria annua,* a host plant of *C. suffuscana;* (C) 61.2 Alpine calcareous screes in Tomor Mountains; (D) patches of *Achillea abrotanoides,* the putative host plant of *D. dinarica* in Tomor Mountains.

Acerion pseudoplatani Klika 1955 alliance. The alliance includes mesophilous forests containing lindens and montane maples that grow in deep ravines. Mixed forests of secondary species (*Acer pseudoplatanus, Fraxinus excelsior, Ulmus glabra, Tilia cordata*) of coarse screes, abrupt rocky slopes or coarse colluvions of slopes, particularly on calcareous, but also on siliceous, substrates. A distinction can be made between one grouping which is typical of cool and humid environments (hygroscopic and shade tolerant forests), generally dominated by the sycamore maple (*Acer pseudoplatanus*) – sub-alliance Lunario-Acerenion, and another which is typical of dry, warm screes (xerothermophile forests), generally dominated by limes (*Tilia cordata, T. platyphyllos*) – sub-alliance Tilio-Acerenion. *Lunaria annua* is a species growing on the margin of the habitat but in any case close to the crown of the trees.

Dichrorampha dinarica Huemer, Zlatkov & Baixeras, 2012 (Fig. 2)

Material examined. 3 ♂♂, 2 ♀♀, Albania, Tomor Mountain, N 40.6248°, E 20.1742°, 2100 m a.s.l., 24.vii.2022, leg. B. Zlatkov.

Morphological notes (Fig. 2). The wing pattern of the collected specimens is very similar to the type specimens. The females are slightly darker than the males and with darker hindwings. The

male genitalia demonstrate some variation: the phallus in one of the specimens bears three larger spines (Fig. 2 D, E); in another specimen from Tomor one large and two smaller spines are visible, similarly to specimens from the type locality (Fig. 2 B, C). The female genitalia correspond well the type specimens.

Distribution. The species was known from the type locality only (Korab Mts in North Macedonia), at a similar elevation. The new locality is at ca. 130 km straight line distance from the type locality in the southern direction. New species for Albania.

Habitat (Fig. 3 C, D). 61.2 Alpine calcareous screes (CORINE Biotopes) could be referred to H2.4 Temperate high-mountain baserich screes of EUNIS and 8120 Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*) of NATURA 2000. It belongs to the alliance *Thlaspion rotindifolii* Jenny-Lips 1930. Calcshist, calcareous, or marl screes of the montane to alpine levels under cold climates, with the associations respectively of *Drabion hoppeanae, Thlaspion rotundifolii, Petasition paradoxi*. The putative host plant of *D. dinarica, Achillea abrotanoides,* always grows on the base of the habitat and it is a Balkan endemic species with distribution in southeastern Europe (Greece, Albania, Croatia, and North Macedonia).

Discussion

The observations on *C. suffuscana* revealed an unusual host plant: while the other species of the *C. succedana* group feed on various Fabaceae, *C. suffuscana* larvae utilise a species from Brassicaceae. The two plant families are characterised by different secondary metabolite composition. Morphologically this species differs much from the other representatives of the group, and in combination with a host plant from a different family, it appears to be a relatively distant clade. Further phylogenetic study may reveal its position within the *C. succedana* group.

The collected specimens of *D. dinarica* demonstrate similar wing patterns and genitalia. Some variation was observed in the male genitalia (the size of the spines of the phallus). The new locality of *D. dinarica* is at a considerable distance and relatively isolated from the type locality. The distribution of the potential host plant suggests that *D. dinarica* may have a wider distributional range.

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