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Tracking disappeared species II. Occurrence of Coleophora salicorniae in Hungary (Lepidoptera: Coleophoridae)

Csaba Szabóky[1] & Attila Takács[2]*

[1] *H-1034 Budapest, Bécsi út 88, Hungary. E-mail: bothv@t-online.hu*
[2] *H-1172 Budapest, Jászivány utca 64, Hungary. E-mail: molyirto@gmail.com*

Abstract – A revision of the *Coleophora* collection of the Hungarian Natural History Museum three years ago revealed that identification of specimens treated as *Coleophora salicorniae* Heinemann et Wocke, 1877 was incorrect. The species is lacking from the collection. However, several papers mention *C. salicorniae* as present in Hungary. During the last two years this species was found in two new localities by the authors, compared to previous studies. Larva, case and adult of the species are illustrated, and image of habitat as well as the distribution map in Hungary are presented. With 5 figures.

Key words – *Camphorosmetum annuae* association, faunistics, Microlepidoptera, new records, *Salicornia*

INTRODUCTION

The family Coleophoridae (casebearing moths) is represented in Hungary by four genera (*Augasma* Herrich-Schäffer, 1853, *Metriotes* Herrich-Schäffer, 1853, *Goniodoma* Zeller, 1849, and *Coleophora* Hübner, 1822), with *Coleophora* being the most speciose, containing 220 species in Hungary (Pastorális *et al*. 2016). Larvae of the species in this genus bear cases and are leaf-miners. Most of the species are monophagous, but some are polyphagous. The cases have distinctive, often species-specific habitus, however for their identification it is important to know the host plant.

Coleophora salicorniae Heinemann et Wocke, 1877 was described in the second half of the 19th century (Heinemann & Wocke 1877). According to Karsholt & Razowski (1996) it occurs in Austria, Belgium, Denmark, Finland, France, Greece, Italy, Portugal, Romania, Spain, Sweden, the Netherlands, United Kingdom and the former Yugoslavia.

*Corresponding author.

Gozmány (1968) and Karsholt & Nieukerken (2013) listed this species as present in Hungary. The host plant of this species is *Salicornia perennans* Willd. (Amaranthaceae) (= *Salicornia prostrata* Pall., see Freitag 2011), which occurs in saline grasslands in Hungary (Király *et. al.* 2009), hosting several interesting herbivore species. This plant is an obligate halophyte (requiring at least 2.5–3% salinity). It becomes red in autumn (Fig. 1), and its seeds become mature in autumn.

The collection of the Hungarian Natural History Museum (HNHM) does not harbour any voucher specimen of *C. salicorniae*. Previously two *Coleophora* specimens were treated as *C. salicorniae,* but their identification was proved to be incorrect: dissection of genitalia showed that both are *C. binotapennella* (Duponchel, 1843) (Buschmann & Richter 2016).

Fig. 1. *Salicornia perennans*, the host plant of *Coleophora salicorniae* (photo by Csaba Szabóky)

MATERIAL AND METHODS

The host plant (*Salicornia perennans*) and the moth (*C. salicorniae*) were searched by us in Fejér county (halophytic meadow near Pákozd; Sárkány Lake and Hatházi Lake near Sárkeresztúr; Sós Lake near Sárszentágota; halophytic meadow on Gödör street, Székesfehérvár; Dinnyési-fertő Lake); in Budapest (11th District, halophytic meadow in Kőérberek) and in Hajdú-Bihar county (halophytic meadows of Hortobágy).

RESULTS

Localities – The host plant, together with the larvae of *C. salicorniae* were found at the localities near Sárkeresztúr on 17 October 2018, and near Székesfehérvár on 26 October 2018. Only the host plant was found near Pákozd, Sárszentágota, the Dinnyés-fertő Lake and the Hortobágy (Fig. 2). Neither the host plant nor the moth species were found in the 11th District of Budapest.

Observations on life cycle – Larvae of L4 instars were collected, and kept in plastic vials separately, with some soil on the bottom. All specimens left their case in 24 hours after collecting and pupated in the soil within few minutes. The mature larvae were off-white, 4 mm long (Fig. 3). The larvae made a 5 mm long cocoon of soil particles, lined with silk (Fig. 4). Cocoons were kept outdoors, rinsed with 2–3 ml water once in every month. After overwintering they were moved to room temperature. Adults emerged in 2019 on the following days (with number of specimens in parentheses): 12 May (1), 24 July (1), 1 August (2), 2 August (2), 13 August (6), 21 August (1), 22 August (4), 26 August (3), 28 August (2), 29 August (2), 16 September (2), 20 September (1).

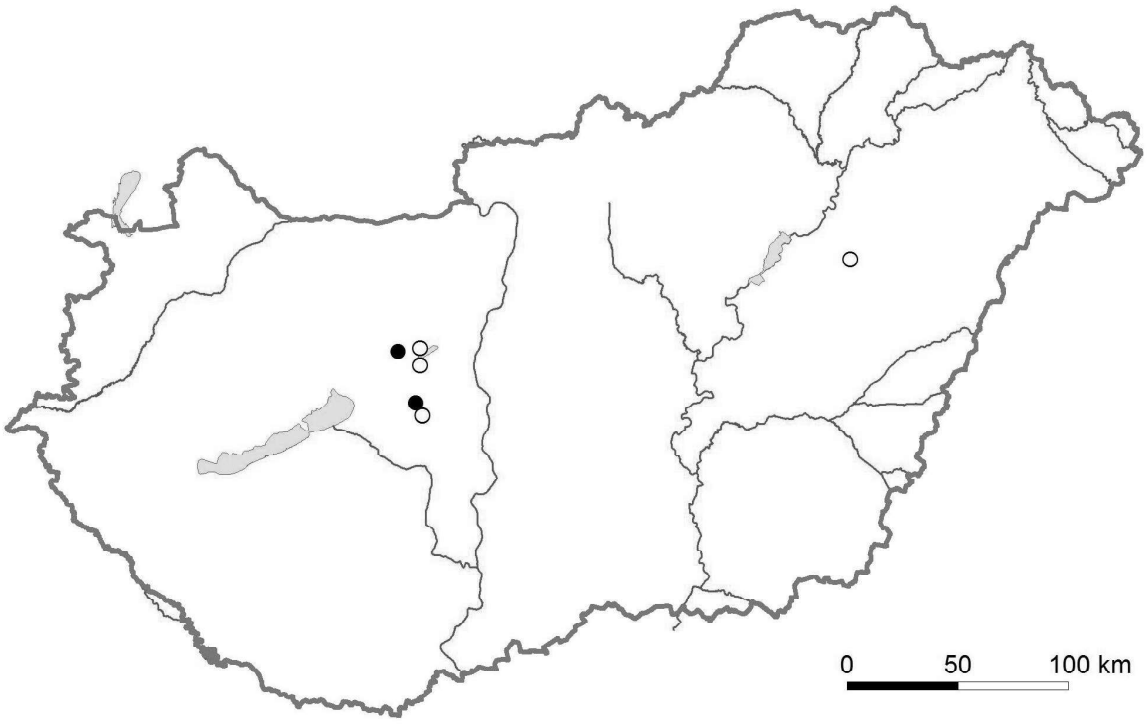
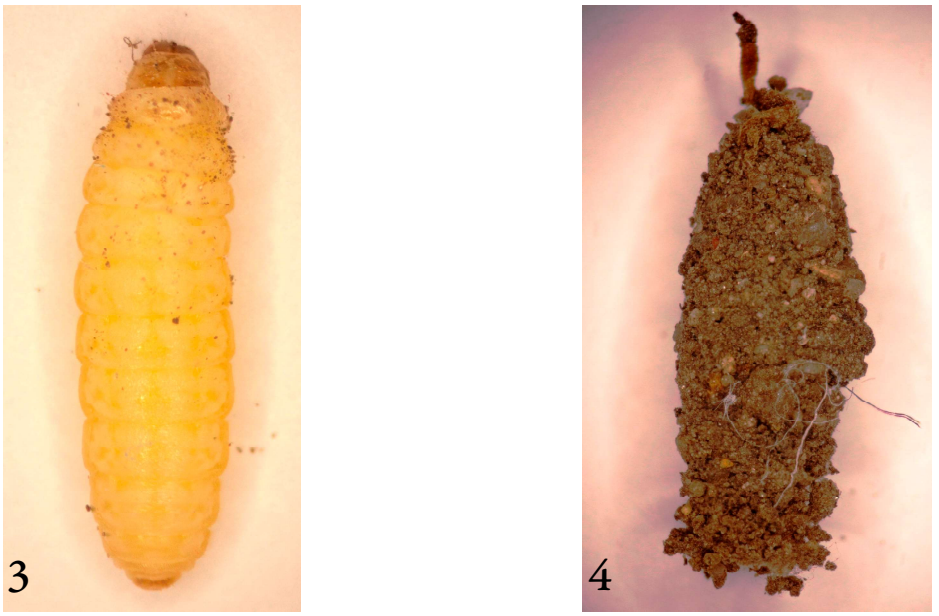


Fig. 2. Records of *Coleophora salicorniae* and *Salicornia perennans* in Hungary.
Black dots: the moth and the plant are present, black rings: only the plant was found



Figs 3–4. Larva, 3 = The mature larva of *Coleophora salicorniae* is off-white, **4** = The larva of *Coleophora salicorniae* overwinters and pupates in a cocoon made of soil particles (photos by Attila Takács)

Fig. 5. Adult of *Coleophora salicorniae* (photo by Csaba Szabóky)

Two larvae did not leave its case and did not pupate in the soil. One larva was kept without soil, this specimen left its case, made a silken cocoon and pupated in it.

The adult moths (Fig. 5) layed eggs. The larva entered in the stem and fed in the vegetative part and seeds. This act resulted in a tubular cavity which was used by the larva as its case. This case is always perpendicular to the axis of the stem, making it easy to find (Fig. 6). The larval development was rapid: only ten days passed from hatching to pupation.

Diagnosis of the adult – Wingspan 10–12 mm. Ground colour of forewing pale brown, paler than the fur of a roe (*Capreolus capreolus*); basal 2/3 of costa plumbeous as well as two large, pale-bordered patches situated where three-third sections of wing meet. The pattern of *C. salicorniae* is somewhat similar to that of *C. binotapennella*, but the patches of the former species are much bigger and lighter than in the latter.

Fig. 6. Case of *Coleophora salicorniae* larva (photo by Csaba Szabóky)

DISCUSSION

According to Gozmány (1956) the case of *C. salicorniae* is "similar to leaf- or core-cases in shape but leaf pieces arise from its whole surface, becoming gradually smaller towards the posterior end. Opening by two doors." Our results show that the case does not have any arising parts and its posterior end does not have any door.

We conclude, from movement of cases, that larvae feed only before frost, in contrary of Szőcs (1977) who wrote that larvae feed from October to May with overwintering in the soil. This scenario is certainly incorrect because the host plant completely vanishes before spring due to drying. It is worth mentioning that the host plant can be completely flooded from time to time.

Emergence of adults showed an interesting schedule. If a specimen emerges in May, it will not find any suitable host plant since these plants just start growing in that period and they are too small. Most of the moths emerged in August when the host plants are developing seeds.

Gozmány (1956) and Szőcs (1977) recorded *C. salicorniae* from the Dinnyési-fertő Lake and Kőérberek, localities where we were unable to find it. Even the host plant remained undetected by us at the latter site.

The locality near Pákozd is in use by hunters: food for game population was placed just on the host plants. This action was survived only by a dozen *Salicornia* specimens; such low abundance cannot support a strong population of the moth.

Salicornia perennans occurs also in the saline grasslands of the Hortobágy where meadows are extensively grazed. If the moth species occurred there, perhaps grazing decreased the abundance of population under detection level.

After publication of this paper two specimens of *Coleophora salicorniae* will be deposited in the HNHM.

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