



Description of a new species of *Scythris* Hübner, 1825 (Lepidoptera: Scythrididae) from central Spain

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Abstract. *Scythris salsolavermiculatus* sp. nov. is described as new for science from material taken *ex* cocoon in its food-plant: *Salsola vermiculata* L. (Chenopodiaceae) in 2001, in the vicinity of Meco (prov. Madrid, 607 m a.s.l.). Its biology is documented, which includes its host plant and its parasitoid, as well as the basic morphology related to its exuvium and cocoon. The male genitalia is very characteristic, with the uncus divided in two and unusually lengthened, while the gnathos is sclerotised and in the shape of a finch's head. The new taxon is included in the *cistorum* species-group. Its wing morphology is also quite distinct in terms of the three other species included.

Key words: Madrid province, early stages, biocenosis.

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I. INTRODUCTION

The Scythrididae is very well-represented faunistically in Spain and Portugal, with 99 species documented (BENTSSON 1997; NUPPONEN 2013; DELMAS 2016; NUPPONEN & SAVENKOV 2019; RICHTER & ŠUMPICH 2020). Scythridids are diurnal microlepidopterans that are very active on sunny days (BENTSSON 1997). Regional publications that deal with the Spanish fauna of the genus *Scythris* tend to be dispersed throughout the literature, with the most detailed being that by REQUENA & PÉREZ DE-GREGORIO (2017) with 24 species cited from Catalonia (NE Spain), which included a new species for Spain from this northern region. SAUTER (1998) details eight species among the Scythrididae in Aragon (NE Spain), including the sub-desertic Los

Monegros (Lower Aragon); and KING & VIEJO MONTESINOS (2024) describe the biological details of six species. Other papers have dealt with two additional species: *S. xanthopygella* (STAUDINGER, 1859) and *S. inertella* (ZELLER, 1855), which also include data on the original host plant (GÓMEZ DE AIZPÚRUA et al. 1999; GÓMEZ DE AIZPÚRUA et al. 2003; KING 2003; GÓMEZ DE AIZPÚRUA et al. 2011).

II. MATERIAL AND METHODS

Field study area

The *locus typicus* was between the localities of Meco and Los Santos de la Humosa (Madrid, 607 m a.s.l.) in the Tagus basin with high pH soils characterised by chalk, clay and gypsum, as well as other

materials from the Tertiary and post-Tertiary periods. The flora belongs to the order *Artemisio-Frankenietum Thymifoliae*, with *Salsola vermiculata* L. (Chenopodiaceae) in dominance as well as *Artemisia herba-alba* ASSO (Asteraceae) (IZCO 1984).

Early stage material in the form of four dirty-white cocoons (Fig. 1G) (6 mm in length; n=4) of *Scythris salsolavermiculatus* sp. nov. was collected fortuitously in the exposed twigs of *Salsola vermiculata* L. (Chenopodiaceae) on 14.04.2001, and was taken to the laboratory where it was maintained in simple plastic vials, without any special attention to details until the emergence of the adults on 21.05.2001 (♂ 2♀). Such material was kept in the author's private collection (COL. GEK) from 2001 until its analysis in September 2023. The aforementioned cocoons were examined in 96% ethanol in January 2024 in order to extract the *exuvium* of a parasitoid (Hymenoptera: Chalcididae), which was found to have emerged without success (deposited COL. RA). Genitalia preparations were made following the usual protocol: dissection and bathing the last urites in 10% NaOH and left immersed overnight at room temperature, using dimethyl hydantoin formaldehyde as a mounting agent (STEEDMAN 1958; CHICK 2016).

Abbreviations

COL. GEK: personal collection: Gareth Edward KING

COL. RA: personal collection: Richard ASKEW

MNCN: Museo Nacional de Ciencias Naturales, Madrid, Spain.

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III. RESULTS

Systematics

Order: Lepidoptera

Family: Scythrididae

Genus: *Scythris* Hübner, 1825

Scythris salsolavermiculatus sp. nov.

The new name has been registered in Zoobank: urn:lsid:zoobank.org:https://zoobank.org/References/40375B3A-5531-45B2-A79A-0E0900393399

Diagnosis. *Scythris salsolavermiculatus* sp. nov. is very distinctive species, both within the ostensible *cistorum* species-group and as a *Scythris* species *per se*. The alternating vertical bands of lighter and darker scales on the fore-wings suggest it belongs to the scythrid genus *Eretmocera* ZELLER, 1952 (ROBERTS & BENGTTSSON 2023). Within the genus *Scythris*, two of the species in the *cistorum* species-group – *S. cistorum* (MILLIÈRE, 1876) and *S. nieukerkeri* BENGTTSSON, 1989 – have gnathos that are strongly sclerotised, in common with *Scythris salsolavermiculatus* sp. nov. All species of *Scythris* (BENGTTSSON 1997: pl. 9, figs. 18-21) are generically monochrome, with the exception of *S. rondaensis* BENGTTSSON, 1997. Dimorphism exists.

Etymology. The name of the new taxon is derived from the host plant of this new species: *Salsola vermiculata* L. (Chenopodiaceae): the suffix *-us* is the genitive in relation to the genus *Scythris*, which is a neutral noun.

Description. Head: frons golden ochre; labial palps same colour, with distalmost segments blackish in contrast to those anteriorly, which are ochre; antennae filiform blackish-ochre. ♂, wings (Fig. 1A): fore-wing length 8 mm; wing base golden ochre, general colour golden ochre with a metallic sheen; basal area of costa dark ochre; apex golden ochre with two barely discernible spots of pale ochre without a cileal line (line parallel to the apex according to HUEMER & KARSHOLT (2010); anterior zone in from the apex dark ochre, followed by a dark ochre band proximal to a further band of pale ochre, followed by a blackish-ochre band that takes up 80% of the band whilst the other 20% incorporates ochre cilia, followed by a further golden ochre band; upper margin taken up by an incomplete band of blackish ochre; sub-costal streak of blackish ochre. Hind wings metallic golden ochre cilia of the same tone and sheen. Tegula whitish-ochre. Thorax: meso-thorax anteriorly with a dark ochre band. All urites of the abdomen dark ochre with a shine.

Male genitalia (Fig 1. C, D): asymmetrical capsule with narrow and lengthened uncus; apex zone almost spoon-shaped; gnathos sclerotised black in the shape of a finch's head with a short 'beak'; aedeagus sclerotised taking the shape of a relatively long 'boat'; apex curved and very fine; valvae relatively wide taking the shape of an asymmetrical leaf being somewhat narrow at the apex; *saccus* triangular.

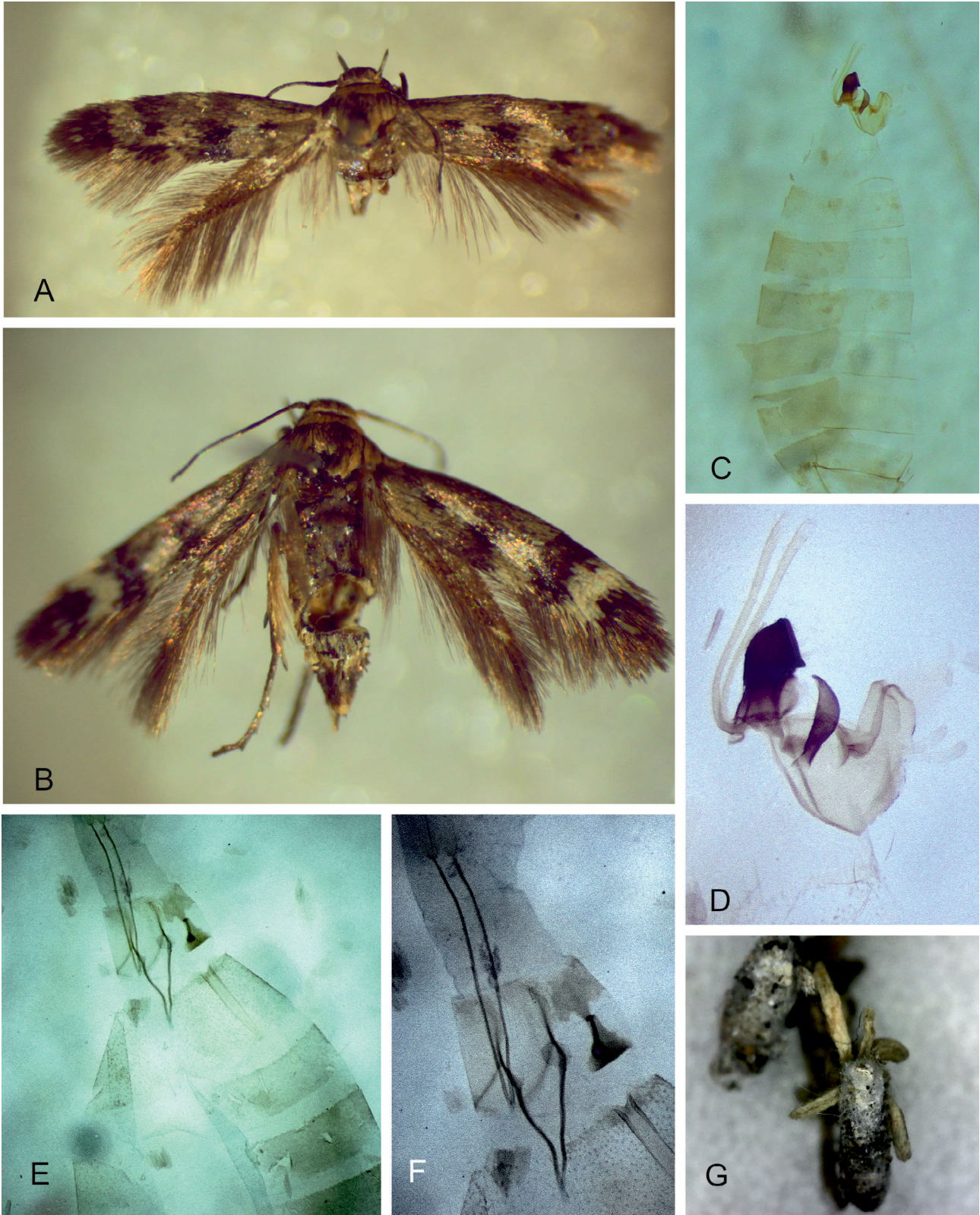


Fig. 1A: *Scythris salsolavermiculatus* sp. nov. ♂ ex pupa: 14.04.2001, Meco, Madrid, 607 m a.s.l.; emerged on 21.05.2001; preparation male genitalia: 2023:162; deposited MNCN Ent No. 410699, Madrid. ×19

Fig. 1B: *Scythris salsolavermiculatus* sp. nov. ♀ ex pupa: 14.04.2001 Meco, Madrid, 607 m a.s.l.; emerged on 21.05.2001; deposited MNCN Ent No. 410701, Madrid. ×22

Fig. 1C: *Scythris salsolavermiculatus* sp. nov. ♂ preparation: 2023:162; lateral view ×30

Fig. 1D: *Scythris salsolavermiculatus* sp. nov. genitalia ♂ preparation: 2023:162; lateral view ×100

Fig. 1E: *Scythris salsolavermiculatus* sp. nov. genitalia ♀ preparation: 2023:161; lateral view ×62

Fig. 1F: *Scythris salsolavermiculatus* sp. nov. genitalia ♀ preparation: 2023:161; lateral view ×90

Fig. 1G: *Scythris salsolavermiculatus* sp. nov. cocoons in *Salsola vermiculata* L.

♀ (Fig. 1B). Head: frons golden ochre; labial palps of the same colour; final segments blackish in contrast to those anteriorly, which are ochre; antennae are filiform blackish-ochre. Fore-wing length 8 mm, general colour golden ochre with a metallic sheen as in ♂, but somewhat paler; basal area of costa dark ochre; apex golden ochre with the same spots as outlined in ♂; differences are noted as follows: apex anteriorly whitish, with an initial band of golden ochre, followed by one whitish-grey and the rest of the fore-wing as in ♂. Hind wings as in ♂. Thorax: meso-thorax anteriorly greyish-black. All urites of the abdomen dark ochre with a shine.

Female genitalia (Fig. 1 E, F): sclerotised sterigma somewhat lengthened taking the shape of a rounded 'arrow', posteriorly darker; two club-shapes sclerotised, triangular in shape positioned in the 8th urite; on the 7th urite one can make out a channel-like form of equal diameter longitudinally, slightly narrowing posteriorly with a folded form anteriorly.

Exuvium, ♀. On extracting the contents of four cocoons in order to obtain the *exuvia*, these were not in an acceptable state; notwithstanding, one was mounted in DMHF and the cremaster can be described as rounded without setae.

Type of material. Holotype (Fig. 1A): ♂ *ex pupa*: 14.04.2001, Gareth Edward KING *leg.* proximity Meco, prov. Madrid, Spain, 607 m a.s.l. (N40°53'71.1, W003°29'72.0); emerged on 21.05.2001; slide preparation 2023-162: No. 410699, deposited MNCN Ent No. Madrid, Spain. Paratypes (Fig. 1B): ♀ *ex pupa*: 14.04.2001, Gareth Edward KING *leg.* locality details as with the holotype; emerged on 21.05.2001, No. 410701, deposited MNCN Ent Madrid. ♀ *ex pupa*: 14.04.2001, proximity of Meco, prov. Madrid, Spain, 607 m a.s.l.; imago mounted with a minucia in poor condition; slide preparation: 2023-161; emerged on 21.05.2001, Gareth Edward KING *leg.* deposited, MNCN Ent No. Madrid; and preparation (no code) of the *exuvium* ♀.

Distribution

The *locus typicus* is in the eastern-most sector of the province of Madrid, which borders on the province of Guadalajara. It is considered probable that *Scythris salsolavermiculatus* sp. nov. is distributed throughout the steppe-like landscape that is characterised by the aforementioned high pH soils of clay, chalk or gypsum, with extensive growth of *Salsola vermiculata*. To this end, a field study was initiated in

February 2024 in Peña Rodada (Torrejón de Ardoz, prov. Madrid) (N40°44'21.3 W003°36'58.0 Madrid, 589m), which is approximately five kilometres west of the *locus typicus per se* with similar characteristics. It has to be said that more than 23 years have passed since the finding of material in 2001, and that despite numerous attempts to find the exact site it has not been located. From February to early May 2024, *Scythris* larvae were collected in *Salsola vermiculata* from the aforementioned site and all those reared out were *S. inertella* (KING, personal observation).

Climate, habitat and biology

In a general sense, localities situated below 600 m a.s.l. in central Spain, as is the case with the *locus typicus*, correspond to a semi-arid Mediterranean (IZCO 1984) or Mediterranean continental (ASCHMANN 1984) climate, with annual precipitation rates below 500 mm. The habitat of *Scythris salsolavermiculatus* sp. nov. corresponds to an *Artemisia*-steppe (*ontinares* in Spanish) (IZCO 1984) with a botanical association present in soils between pH 7.5 to 8, sun-exposed and semi-desertic, which can be regarded as being a continuation of the eastern-south-eastern areas of the Iberian Peninsula, Mahgreb and the central Asian steppe region of the 'Ancient Mediterranean' (Tethys Sea) (HSÜ & GIOVANOLI 1979). With the data we have at our disposal on *Scythris salsolavermiculatus* sp. nov., given that the cocoons were found in April, and with the emergence of the imagines under captive conditions in May, it is not improbable that the new taxon is bivoltine in nature.

Unusually for a newly-described species, we have provided accurate information on the larval food-plant which indicates that in the genus *Scythris*, only *S. inertella* is known to feed on *Salsola vermiculata* (GÓMEZ DE AIZPÚRUA et al. 1999).

IV. DISCUSSION AND CONCLUSIONS

It should be stated that *Scythris salsolavermiculatus* sp. nov. is the third species in the genus *Scythris* to be described from Madrid Province: *S. bengtbengtssoni* VIVES MORENO, 1994 was described from El Regajal, Aranjuez in the south of the province; and *S. villari* AGENJO, 1971 originating from Casa de Campo, a park to the west of the Spanish capital (AGENJO 1971; VIVES MORENO 1994).

Scythris salsolavermiculatus sp. nov. should be included in the *cistorum* species-group (BENGTS-

SON, 1997), which incorporates the following three taxa: *S. cistorum* (MILLIÈRE, 1876), *S. nieukerkeri* BENGTSOON, 1989 and *S. rondaensis* BENGTSOON, 1997. These are all documented from Spain and one from the Ibero-Mahgrebi biogeographical realm more widely. The characteristics they share are:

1 – Asymmetrical male genitalia, strongly sclerotised, valvae very small in *S. cistorum* and *S. nieukerkeri*, although the male genitalia of *S. rondaensis* BENGTSOON, 1997 is unknown.

2 – Wing morphology recognised as having dark fore-wings with paler scatterings of scales within this three-species group (BENGTSOON, 1997). Certainly, *Scythris salsolavermiculatus* sp. nov. is very distinctive for being not monochrome, quite unlike the other three taxa (see the diagnosis).

3 – In the faunistic catalogue of VIVES MORENO (2014) it should be placed after *S. rondaensis* BENGTSOON, 1997, one of the three taxa in the *cistorum* species-group.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

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