



SHILAP Revista de Lepidopterología
ISSN: 0300-5267
avives@eresmas.net
Sociedad Hispano-Luso-Americana de
Lepidopterología
España

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SHILAP Revista de Lepidopterología, vol. 40, núm. 160, diciembre, 2012, pp. 409-418
Sociedad Hispano-Luso-Americana de Lepidopterología
Madrid, España

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Taxonomic account of *Scythris caramani* species-group, with the description of a new species from Turkey (Lepidoptera: Gelechioidea, Scythrididae)

P. Passerin d'Entrèves & A. Roggero

Abstract

The *S. caramani* species-group is assessed, and the main identification characters of the group are listed and discussed. The lectotype of *S. caramani* (Staudinger, 1880) is here established, and its genitalia are represented and described for the first time. A new species belonging to the species-group, *Scythris marashi* Passerin d'Entrèves & Roggero, sp. n., is described from Turkey.

KEY WORDS: Lepidoptera, Gelechioidea, Scythrididae, new species, species-group, Eastern Palearctic, Turkey.

Nota taxonómica del grupo de especies *Scythris caramani*, con la descripción de una nueva especie de Turquía (Lepidoptera: Gelechioidea, Scythrididae)

Resumen

Se trata el grupo de especies *S. caramani*, y se comentan y discuten las características principales para la identificación de este grupo. Se establece el lectotipo de *S. caramani* (Staudinger, 1880) y se representa y describe su genitalia por primera vez. Se describe una nueva especie de este grupo, de Turquía, *Scythris marashi* Passerin d'Entrèves & Roggero, sp. n.

PALABRAS CLAVE: Lepidoptera, Gelechioidea, Scythrididae, nueva especie, grupo de especies, Paleártico oriental, Turquía.

Introduction

Within the large and widespread family Scythrididae the majority of the species (more than 600 at present, see also PASSERIN D'ENTRÈVES & ROGGERO, 2007) are included in the genus *Scythris*, that is further divided in various groups of species (BENGTSSON, 1997a). Besides, many species are not yet included in any species-group, one of the reasons being that sometimes greatly modified genitalia do not show similarities those of any other known species, thus these taxa will end up constituting monotypic groups. Unfortunately, a classification based on a plethora of monospecific taxa is scarcely useful from a taxonomic point of view, and it is not advisable at all, mostly at a subgeneric level.

For a long time, this was also the case for *S. caramani* Staudinger, that was described in 1880 from Karaman province, Turkey. It shows very peculiar, complicated and uncommon genitalia among the other scythridids. Although STAUDINGER (1880) quoted that *S. cicadella* and *S. caramani* have the same size, he also stated that the forewings have very different patterns, and also that genitalia of the two species are unlike.

Only recently some species, whose genitalia share similar features with those of *S. caramani*,

were described - mainly from Eastern Palearctic - as *S. albisaxella* Nupponen & Nupponen, 2000 or *S. eevae* Nupponen, 2007, but also from Turkey (see list below). Authors (NUPPONEN *et al.*, 2000; NUPPONEN & NUPPONEN, 2001; NUPPONEN, 2003, 2005a, 2005b) included these species in the *S. terekholensis* species-group (SACHKOV, 2002), in which they listed several, rather diverse species, that were later placed together in the *S. laminella* species-group as *terekholensis* species-complex (NUPPONEN & SINEV, 2011). While some species resemble *S. caramani*, others markedly differ from it. Likely, these species could constitute at least two different, but strictly related species-groups whose phylogenetic relationships must be carefully studied. The relationships to the *S. laminella* species-group, hypothesized by NUPPONEN & SINEV (2011) must yet be verified due to the conspicuous differences of the whole shape of the genitalia of both sexes that would indeed suggest a mere convergence of some parts, as the valvae.

The aim of the present paper is to throw light on a taxonomic problem concerning a very heterogeneous assemblage of species usually grouped together, which we examined carefully 1) to list the main identification characters of the species-group; 2) to describe a new species belonging to this group; 3) to define the group membership of many others species previously assigned to another *Scythris* species-group.

Material and methods

While studying the material preserved in various Museum collections (PASSERIN D'ENTRÈVES & ROGGERO, 2010), we found some new interesting species that are being described (PASSERIN D'ENTRÈVES & ROGGERO 2011, 2012). Among the specimens preserved in the Museum of Natural History "Grigore Antipa" (MGAB, Bucharest, Romania), an interesting new species was identified; this species shows marked similarities to other species mainly known from Eastern Palearctic Region. The scythruid present literature was checked, and data were compared to extrapolate any useful information about the new species.

The genital features, the main discriminatory characters in Scythruidae, were surveyed, and similarities and differences of the parts were checked on the basis of the literature (KLOTS, 1956; LANDRY 1991; BENGTSSON, 1997a; HODGES, 1998). The preparation of the genitalia slides followed the standard methods usually employed in the Microlepidoptera (ROBINSON, 1976; PASSERIN D'ENTRÈVES, 1976; BENGTSSON, 1997a).

After a careful examination of the scythruid taxa of various Museum collections (MGAB – Museum of Natural History "Grigore Antipa" Bucharest, Romania; ZMHB – Museum für Naturkunde der Humboldt-Universität of Berlin, Germany; collection Passerin d'Entrèves in MIZT – University of Torino Italy), a new species was described herein, and the *Scythris caramani* species-group was assessed, listing the main characters of external morphology and genital features of both sexes.

Results

TAXONOMIC RESULTS

The *Scythris caramani* species-group

The species included in the group have similar external features: medium sized scythruidids (6-13 mm), with a dark complexion. The forewings have a distinctive pattern, with evident spots lighter and darker than the base colour (usually, brown), alternating along the midline.

The male genitalia are characterized by lacking an uncus (likely fused to tegumen), a well-sclerotized and often elongate gnathos, and a globose tegumen that is extended backward. The phallus is almost one third shorter than the tegumen, stout, tapered at apex, and pointed. The valvae are symmetrical, well-developed, more than twice longer than the complex uncus-gnathos-tegumen, rectilinear, sometimes expanded externally and distally to form a spatula. The well-developed,

asymmetrical T8 is more sclerotized in the distal part, with the left joining process often more developed and sclerotized than the right one. The S8 is membranaceous, usually smaller than T8 and subrectangular, strictly joined to the valvae.

Also the females are well differentiated and easily identified, with a developed sterigma arrowhead-shaped, apically pointed and more or less notched at base forming two symmetrical barbs; the triangular distal apex is usually more sclerotized than the proximal part. The distal edge of the sclerotized 7th segment is variously notched, and well-differentiated between the species.

On the basis of the scarce data from literature referring to the collection localities, some are surely high quote species, typical of xerothermic steppe, with *Artemisia* as dominant plant (NUPPONEN & NUPPONEN, 2001; NUPPONEN & SINEV, 2011), but also *Thymus* (NUPPONEN, 2003). Most of the collection localities were in mountainous areas characterized by high altitudes nearby (Fig. 1), although some of the species were collected from lowland areas (i.e., S Urals).

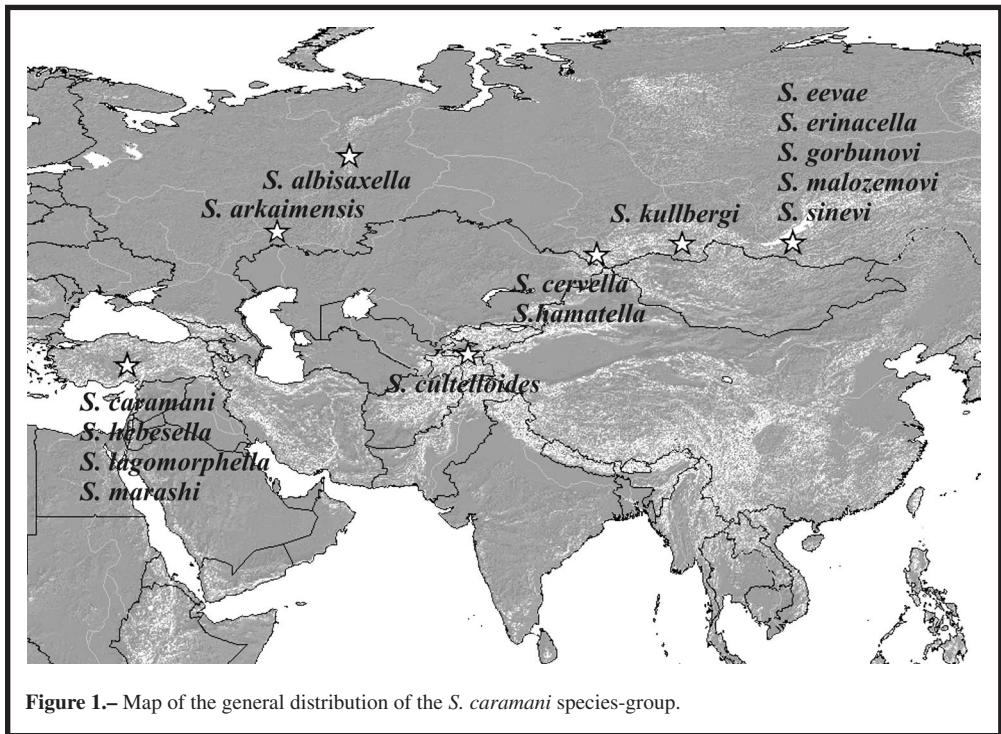


Figure 1.– Map of the general distribution of the *S. caramani* species-group.

List of the species

At present 15 species are included in the species-group, namely

- *Scythris albisaxella* Nupponen & Nupponen, 2000: 10S Urals, Russia
- *Scythris arkaimensis* Bengtsson, 2000: 11 in Nupponen *et al.*.....S Urals, Russia
- *Scythris caramani* (Staudinger, 1880: 400)Amasya, Turkey
- *Scythris cervella* Nupponen & Nupponen, 2001: 83.....Altai Mts., Russia
- *Scythris cultelloides* Nupponen & Sinev, 2011: 122Alai Mts, Kyrgyzstan

- *Scythris eevae* Nupponen, 2007:237.....Buryatia, Russia
- *Scythris erinacella* Nupponen, 2003: 28Buryatia, Russia
- *Scythris gorbunovi* Nupponen, 2003: 29Buryatia, Russia
- *Scythris hamatella* Nupponen & Nupponen, 2001: 85Altai Mts., Russia
- *Scythris hebesella* Nupponen 2005a: 168Cappadocia, Turkey
- *Scythris kullbergi* Bengtsson, 1997b: 95Tuva, Russia
- *Scythris lagomorphella* Junnilainen, 2002: 149.....Konya, Turkey
- *Scythris malozemovi* Nupponen, 2003: 34.....Buryatia, Russia
- *Scythris marashi* Passerin d'Entrèves & Roggero, sp. n.....Kahramanmaraş, Turkey
- *Scythris sinevi* Nupponen, 2003: 41Buryatia, Russia

Distribution

The species-group shows an extended distribution (Fig. 1), following the mountainous ranges from Pontic Range (to Georgia) and Taurus Range (to Iraq) in Turkey along the C Asia Ranges till Southern Urals northwards, and Tuva Republic and Buryatia eastwards. Each species has currently a reduced distribution, being for the most part known only from the typical localities, except for *S. albisaxella* from S Urals and S Uzbekistan, *S. arkaimensis* from S Urals, Middle Volga and E Siberia (Russia), *S. hamatella* from Altai Mts. and Buryatia (Russia), *S. cultelloides* from Alai mts., Trans-Alai mts. and Tien-Shan mts. (Kyrgyzstan), and *S. sinevi* from Buryatia (Russia) and Mongolia.

Diagnosis

The external morphology of these dark scythridids is very constant within the group, with a series of black dots and cream lines alternanting along the midline of the forewings, that is conspicuous in most of the species. Only *S. lagomorphella* and *S. sinevi* show a darker and more uniform complexion, in which the spots are almost undistinguishable (JUNNILAINEN, 2002; NUPPONEN, 2003). The male genitalia are characteristic and well-differentiated, although they show a superficial likeness to other species, as *S. braschiella*, *S. bubaniae* or *S. frankeniella*. The uncus is not apparent, and fused to the tegumen, as in other scythridids included in different species-groups (e.g., *S. crypta*, *S. gozmanyi*, *S. lafauryi*, or *S. laminella*), thus it can be employed to identify the species only together with other characters. The greatly modified and asymmetric gnathos shows two basic models, and is very useful as a diagnostic character among the *Scythris* groups and within the *S. caramani* species-group, since differences between species are quite plain: it is elongate, rod-like and rounded at apex in *S. cervella*, *S. hamatella*, *S. lagomorphella*, and *S. sinevi*, while it is shorter and variously shaped in *S. albisaxella*, *S. arkaimensis*, *S. caramani*, *S. cultelloides*, *S. eevae*, *S. erinacella*, *S. gorbunovi*, *S. hebesella*, *S. malozemovi*, and *S. marashi*. The tegumen is characteristic and evenly conformed, short and globose, expanded backward. This structure shape being relatively common in scythridids, it cannot be considered a good discriminatory character for the group. The valvae are symmetrical, well-developed, usually fused at base (as in *S. hamatella*), rectilinear, and often expanded externally (*S. albisaxella*, *S. arkaimensis*, *S. cervella*, *S. hebesella*, *S. lagomorphella*, and *S. malozemovi*). The valvae of many species, as *S. hamatella* or *S. eevae*, are similar those of *S. braschiella*, but the phallus of these species are very different, being far longer, thicker and triangular-shaped in *S. braschiella* (NUPPONEN & NUPPONEN, 2001). Also the gnathos, the S8 and T8 are greatly differentiated, thus the species cannot be misidentified. Furthermore, due to these marked differences, *S. braschiella*, or any of the species included in the *S. laminella* species-group cannot be included in the *S. caramani* species-group. The phallus is always short, bottle-shaped, or tapering to apex, as in many other scythridids, thus it cannot be used to separate the species-group from the others. Also in the species of the *S. terekholensis* species-group (*S. terekholensis*, *S. heikkii* and *S. arenicola*) the phallus is short and stout, but there are plain differences in the male genitalia and the entirely different T8 of the two groups permits an easy

identification of these species. As a matter of fact, the T8 is extremely differentiated in the *S. caramani* species-group, being always more developed and sclerotized than the S8, carrying also one or two well-sclerotized joining processes. Also the female of the *S. caramani* species-group are well-characterized, with a large arrowhead-shaped sterigma, with a proximal, triangular part more sclerotized and the distal base more or less notched. A few other scythruidids (as *S. langhori* and *S. andersi*) have similar sterigma, but cannot be misidentified with the species of the group, since their facies are entirely different.

Remarks

In the species-group also two unnamed females have been included. One female from Eastern Palearctic was wrongly identified as *S. ammobia* (BENGTSSON 1997b, PASSERIN D'ENTRÈVES & ROGGERO, 2007), and remain yet undetermined since is rather different from the females of any other known species of the group. The other undetermined female (JUNNILAINEN, 2002) was collected from Turkey, and its external features are lighter than the other species, but the unmistakable genitalia allowed it to be placed in the *S. caramani* species-group. This specimen was later identified as *S. hebesella*, and was included in the typical series (NUPPONEN, 2005a).

Thirteen species were transferred from *S. terekholensis* species-group to *S. caramani* species-group, while three species (*S. arenicola*, *S. heikkii* and *S. terekholensis*) are instead maintained for now in the first, since these species require a more detailed and careful examination to elucidate their taxonomic position. Likely, these two well-differentiated species-group are closely related on the basis of the external and genital features. Both groups include medium-sized, dark scythruidids, with homogenous forewing pattern within each group, the *S. caramani* species-group being characterized by lines and/or dots along the midline on an evenly brown upper surface, while the *S. terekholensis* species-group forewings is characterized by greatly modified and partly fused male genitalia, or the short, tough and tapered to apex phallus. The main difference between the two groups is the shape of the valvae, that are elongate and more or less expanded in *S. caramani* species-group, and far shorter, covered by thick setae and often rounded in *S. terekholensis* species-group. Only *S. erinacella* has rounded valvae, but its external features are similar to all the other species of the *S. caramani* group, thus it is included in the group. Also the T8 is very different, since in *S. caramani* species-group it is asymmetrical, carrying on the inner surface well-sclerotized joining hooks, while in the *S. terekholensis* the T8 is rectangular, with two apical prongs and no joining structures on sides.

Scythis marashi Passerin d'Entrèves & Roggero, sp. n.

Type material: Holotype ♂ (Fig. 2), Marasch (now Kahramanmaraş, SE Turkey). Genitalia slide (Figs. 3-4) 185.515 [2116 PdE], In the collection of the MGAB.

Diagnosis: The species has external features very similar to all the species of *S. caramani* group, but can be easily distinguished from the others by the male genitalia that are unmistakable: the T8 is triangular and elongate with a characteristic joining structure hook-shaped on left joint, and the apex is rounded and simple, unlike those of *S. albisaxella*, *S. arkaimensis*, *S. eevae* and *S. sinevi* that are bifid at apex. Only the T8 of *S. hebesella* is not bifid at apex, but it is differently-shaped (i.e., very different joining structures), and cannot be mistaken for the *S. marashi* one. The valvae are long and slender, truncated at apex, similar to *S. caramani*, but differ since in the last species they are not truncated sidelong. The gnathos is short and globose, and differs from any other species of *S. caramani* species-group.

Description (Fig. 2): Wingspan 11.2 mm. Forewings brown, carrying along the midline longitudinally four dark brown short lines alternating to three light brown dots. Fringe brown. Hindwings brown, with the distal part darker. Fringe brown. Head brown. Palpi brown. Proboscis brown. Antenna brown, two thirds as long as the forewing. Thorax and abdomen brown. Legs brown, with a golden hue.

Male genitalia (Figs. 3-4): Uncus not apparent, and fused to tegumen. Gnathos short, with the distal part semicircular and more sclerotized. Tegumen globose, almost as long as the gnathos. Phallus tapering at apex, short, downward curved. Juxta short, triangular. Valvae symmetrical, rectilinear, at least twice longer than the tegumen, slender, partially fused proximally, with the apex diagonally truncated. S8 rectangular, membranaceous, half as long as the T8. T8 triangular-shaped, and large, with a well-sclerotized hook on left inner margin, apex rounded.

Female genitalia: Unknown.

Bionomy: Unknown.

Distribution: Southeastern Turkey. Only known from the type locality.

Etymology: The species was named after the type locality.

Remarks: M. Stanescu (MGAB, pers. comm.) told us that this moth could be part of the material captured between 1897 and 1907 in Oriental Anatolia by the German lepidopterist Max Korb.

Description of the genitalia of *Scythris caramani* (Staudinger, 1880)

Type material: Lectotype ♂ (Fig. 5), Amasya. Paralectotypes: 4 ♂♂ and 4 ♀♀, and a specimen without abdomen, same locality as the lectotype. In the collection of the ZMHB. Genitalia slide (Figs. 6-8) Jä 9006 ♀, I.N. 207 ♂ and Jä 9007 ♂.

Other material: 1 ♂ and 1 ♀, Pont, ex coll. Ragonot. Genitalia slides 2259PdE ♂ and 2260PdE ♀ (MIZT).

Diagnosis: The species clearly differs from any other of the group, *S. marashi* being the more similar (see above) for the shape of the valvae and the phallus. Furthermore, the T8 is globose and asymmetrical, unlike any other species, thus the species cannot be erroneously identified.

Male genitalia (Fig. 7): Uncus not apparent, fused to tegumen. Gnathos asymmetrical, sclerotized, deeply modified into a large rounded plate, carrying a short, fingerlike and pointed projection ventrally, the distal margin slightly sharpening. Tegumen globose. Phallus one fifth as long as the valvae, tapered at apex, slender. Valvae symmetrical, rectilinear, truncated at apex, expanded at base, with expanded joining processes to tegumen. S8 membranaceous, subrectangular, width twice the length, slightly notched in the middle. T8 semicircular, well-sclerotized, asymmetrical, carrying two joining projections well-sclerotized, concave at distal margin.

Female genitalia (Figs. 6 and 8): Apophyses posteriores twice longer than the apophyses anteriores, with papillae anales membranaceous, wrinkled and quadrangular. Sterigma well-developed, sclerotized, dome-shaped, with a deep triangular notch at base, and the apex more sclerotized and pointed. Ostium bursae opening at the tip of the sterigma (Fig. 8). Ductus bursae membranaceous, tubular. Segment VII sclerotized, with a narrow, oval notch distally, and two symmetrical, thick projections.

Remarks

The lectotype was fixed by B. Å. Bengtsson (27-VIII-1994), but was never published before. It is shown here for the first time (Fig. 5). The type series of *Scythris caramani* includes 10 specimens (see above) now preserved in the ZMHB, where the collection of O. Staudinger is housed. All the type specimens of *S. caramani* were collected from Amasya, that is located in the Pontus region and is far from Karaman (Taurus region, Southern Turkey). Since the same Staudinger later (STAUDINGER & REBEL 1901) recorded the species only from Pontus, we here assume that the collection record in the original description is wrong, and that Amasya must be considered as the only and correct locality, discarding Karaman as type locality.

Aknowledgements

We would like to thank Dr. M. Stanescu (Curator of Lepidoptera of the Museum of Natural

History Grigore Antipa, Bucharest, Romania) and Dr. W. Mey (Curator of Lepidoptera Collection of the Museum für Naturkunde der Humboldt-Universität of Berlin, Germany) for the loan of material and useful information. We are also very grateful to B. Å. Bengtsson (Färjestaden, Sweden) for the useful information on the typical material of *S. caramani*. We are very grateful to Dr. A. Vives for the translation of the abstract.

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P. P. E. & A. R.*

Department of Life Sciences and Systems Biology

Via Accademia Albertina, 13

I-10123 Torino

ITALIA / ITALY

E-mail: pietro.passerin@unito.it

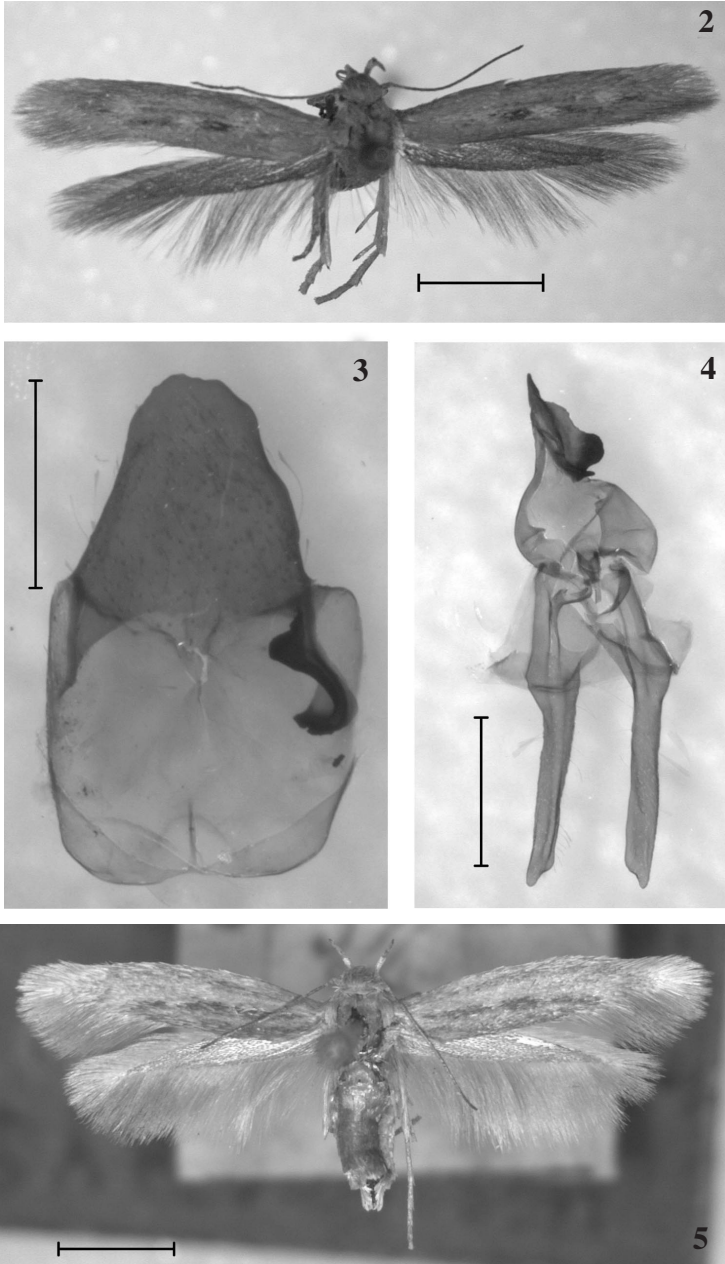
*E-mail: angela.roggero@unito.it

*Autor para la correspondencia / *Corresponding author*

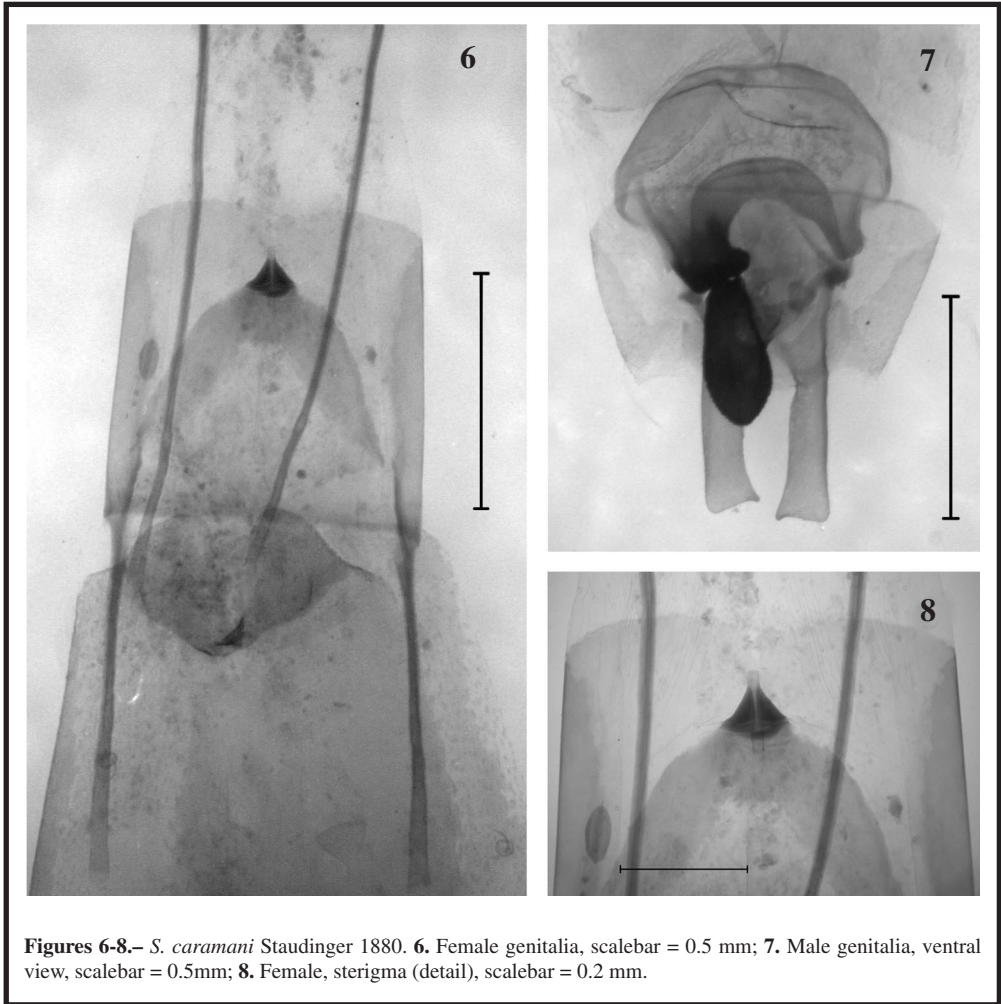
(Recibido para publicación / *Received for publication* 21-III-2012)

(Revisado y aceptado / *Revised and accepted* 27-IV-2012)

(Publicado / *Published* 30-XII-2012)



Figures 2-5.— 2-4. *Scythris marashi* Passerin d'Entrèves & Roggero, sp. n. 2. Facies, scale bar = 2 mm; 3. T8, dorsal view, scalebar = 0.5 mm; 4. male genitalia, complex uncus-gnathos-tegumen-valvae-phallus-vinculum, scalebar = 0.5 mm. 5. *S. caramani* (Staudinger, 1880), lectotype. Facies, scalebar = 2.00 mm.



Figures 6-8.– *S. caramani* Staudinger 1880. **6.** Female genitalia, scalebar = 0.5 mm; **7.** Male genitalia, ventral view, scalebar = 0.5mm; **8.** Female, sterigma (detail), scalebar = 0.2 mm.