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Remarks on *Seticosta* Razowski, with Descriptions of seven new Species from Ecuador (Lepidoptera: Tortricidae)

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Abstract

The taxonomic history of *Seticosta* is discussed, and morphological characters of the genus are reassessed. Seven new species from Ecuador are described: *S. egregia* Razowski & Pelz, sp. n., *S. ariadnae* Razowski & Pelz, sp. n., *S. cigcligrapha* Razowski & Pelz, sp. n., *S. argentichroa* Razowski & Pelz, sp. n., *S. phrixotricha* Razowski & Pelz, sp. n., *S. chlorothicta* Razowski & Pelz, sp. n., *S. retearia* Razowski & Pelz, sp. n., and *S. triangulifera* Razowski & Pelz, sp.n.). A list of the 22 species currently included in the genus is provided.
KEY WORDS: Lepidoptera, Tortricidae, *Seticosta*, new species, Neotropics

Observaciones sobre *Seticosta* Razowski, con la descripción de siete nuevas especies de Ecuador (Lepidoptera: Tortricidae)

Resumen

Se discute la historia taxonómica de *Seticosta* y se reafirman los caracteres morfológicos del género. Se describen siete nuevas especies de Ecuador: *S. egregia* Razowski & Pelz, sp. n., *S. ariadnae* Razowski & Pelz, sp. n., *S. cigcligrapha* Razowski & Pelz, sp. n., *S. argentichroa* Razowski & Pelz, sp. n., *S. phrixotricha* Razowski & Pelz, sp. n., *S. chlorothicta* Razowski & Pelz, sp. n., *S. retearia* Razowski & Pelz, sp. n., y *S. triangulifera* Razowski & Pelz, sp.n.). Se proporciona una lista de 22 especies corrientemente incluidas en el género.
PALABRAS CLAVE: Lepidoptera, Tortricidae, *Seticosta*, nuevas especies, Neotrópico

Introduction

Seticosta Razowski, 1986 (type-species: *Eulia homosacta* Meyrick, 1930) was established to accommodate three South American species (i.e., *arachnogramma, homosacta, tholeraula*). BROWN (1986) subsequently transferred to *Seticosta* six previously described species, one of which (i.e., *Tortrix mirana* Felder & Rogenhofer, 1875) is not included herein, and another of which (i.e., *Eulia hypsithrona* Meyrick, 1926) has been transferred to *Punctapinella* (RAZOWSKI & BECKER, 1999). RAZOWSKI (1988) and RAZOWSKI & BECKER (1999) described additional species from South America, and BROWN & NISHIDA (2003) recently described the only known congener from Central America. The seven species described herein bring the total to 22 (see list below).

BROWN (1991) provided a preliminary hypothesis of relationships among *Punctapinella, Anopinella, Apolychrosis* and *Seticosta*, and RAZOWSKI & BECKER (1999) reassessed that phylogeny, adding *Chirotes* Razowski & Becker (subsequently synonymized with *Strophotina* Brown, 1998). In both phylogenetic hypotheses *Seticosta* is the putative sister group to *Punctapinella* based on the presence of a row of strong setae on the costa of the valva. While no autapomorphy for *Seticosta* was given by BROWN (1991), RAZOWSKI & BECKER (1999) mentioned the presence of a dorso-proximal pro-

cess of the aedeagus at the opening of the ductus ejaculatorius, a hairy wart in the basal portion of the valva, the reduced terminal plate of the gnathos, the broad, spiny lobes of the transtilla, and the presence of terminal or subterminal processes (lobes) of the uncus. The addition of new species to the genus has revealed the need to reassess the consistency of these characters.

The most characteristic feature of the male genitalia of *Seticotsa* is the presence of a dorso-proximal process of the aedeagus, which is a tube-like sclerite opening proximally, covered by a membrane through which the ductus ejaculatorius and bulbus ejaculatorius enter. It is large in several species, such as *aeolozona, arachnogramma* and *tridens*; weak and partially membranous in *tholeraula*; and significantly reduced in *sagmatica* and *paranica*. In three species (i.e., *retearia, multifidana, triangulifera*) the aedeagus is completely different than in the remaining species of *Seticosta*. It is broad, with a rather short coecum penis, and the dorso-proximal process of the aedeagus is inconspicuous or absent in slide-mounted preparations. The presence of the dorso-proximal process of the aedeagus is fairly consistent with the presence of subterminal lobes of the uncus. In several species, such as *tholeraula, punctum*, and those with the broad aedeagus, the uncus is simple and rod-like, presumably the plesiomorphic condition. The shape of the gnathos likewise is not uniform throughout the genus. In the species with a dorso-anterior process of the aedeagus, the gnathos may either terminate in a small plate or have slender arms with a submembranous terminal portion. A large, presumably plesiomorphic terminal plate is present in *multifidana* and *triangulifera*. The setae of the costa of the valva are present in all species (except *rubicola*), but the area supporting the setae is variably shaped - in *multifidana* and *triangulifera* it extends ventrad to form a triangular lobe. A wart-like, hairy structure at the base of the valva mentioned by RAZOWSKI & BECKER (1999) may be small, subdorsal, or absent. The only exception is *argentichroa* in which there is one cornutus very similar to that in *Punctapinella.*

The forewing pattern, which is similar among most species, may be of apomorphic importance; however, it often is completely reduced, replaced by a triangular costal blotch. In the majority of species, the pattern is represented by two fasciae: one extending from the postbasal region of the costa, and the other from the terminal region of the costa, with the two fasciae terminating near mid-dorsum. Their median parts are less defined so that only their edges form pale lines in the middle of the wing. In the postbasal third of the forewing the pattern is completed by additional oblique lines. The presence of pale scales along the forewing veins may be of convergent importance.

Note. At present the holotypes of the newly described species are in the collection of V. Pelz, Ruppichteroth and eventually in the Senckenberg Museum, Frankfurt/Main.

List of species of *Seticosta*

S. aeolozona (Meyrick, 1926a: 252); CLARKE,1958: 116. Colombia
S. arachnogramma (Meyrick, 1926a: 252); CLARKE, 1958: 116. Colombia
S. egregia Razowski & Pelz, sp. n. Ecuador
S. ariadnae Razowski & Pelz, sp. n. Ecuador
S. cigcligrapha Razowski & Pelz, sp. n. Ecuador
S. argentichroa Razowski & Pelz, sp. n., Ecuador
S. phrixotricha Razowski & Pelz, sp. n. Ecuador
S. tridens Razowski, 1988: 400. Colombia
S. rubicola Brown & Nishida, 2003: 114. Costa Rica
S. chlorothicta Razowski & Pelz, sp. n. Ecuador
S. sagmatica (Meyrick, 1912a: 680); Clarke 1958: 136. Colombia
S. charagma Razowski & Becker, 1999: 427. Ecuador
S. cerussographa Razowski & Becker, 1999: 326. Ecuador
S. homosacta (Meyrick, 1930: 610); CLARKE, 1958: 128. Ecuador
S. paranica Razowski & Becker, 1999: 426. Brazil
S. retearia Razowski & Pelz, sp. n. Ecuador
S. triangulifera Razowski & Pelz, sp. n. Ecuador

S. multifidana (Zeller, 1877: 47). Peru
S. tholeraula (Meyrick, 1912a: 680); CLARKE, 1958: 140. Argentina
S. punctum Razowski & Becker, 1999: 527. Brazil
S. senecta Razowski & Becker, 1999: 428. Brazil
S. versabilis (Meyrick, 1926a: 251); CLARKE, 1958: 143. Peru
S. tambomachaya Razowski, 1988: 401. Peru

Descriptions of species

***Seticosta egregia* Razowski & Pelz, sp. n.** (Fig. 1)

Holotype, female: "Ecuador: Zamora -Chinchipe- Prov. 22 km E Loja, PN Podocampus, San Francisco Ranger Stt, 2200 m, 3º 59' 15'' S, 79º 53' 37'' W, 9-X-2002, sta 22, leg. Gelis & Pelz"; GS 1603 - V. P.

Wing span 17 mm. Head whitish cream, labial palpus ca. 4, brownish grey, except for edges laterally; thorax brown, except for median portion and postmedian part of tegula cream. Forewing brownish, finely strigulated with brown; in terminal part brownish, tinged with cream, distinctly and densely strigulated with brown; remnants of ground colour in form of two oblique fasciae extending from 1/5 and 3/5 of costa to dorsum, with distinct edges and densely strigulated median parts; dorsum cream with some brown strigulae or overscaling; base of wing brown with cream lines. Cilia brownish. Hindwing whitish grey at base, brownish grey towards periphery, diffusely strigulated with brownish grey; cilia creamy white, browner in apical part, with similar basal line.

Female genitalia (Fig. 23). Ovipositor fairly long; apophyses posteriores long, slender; sterigma weakly sclerotized, indistinctly edged posteriorly with small anteostial part; ductus bursae slender; ductus seminalis posterior; spinulation in basal third of ductus bursae, primarily in distal part of corpus bursae.

Male genitalia unknown.

Diagnosis. Externally, *egregia* is reminiscent of *arachnogramma*, from which it can be distinguished by the weakly expanding terminal parts of the posterior fascia and the shallow, weakly convex posterior blotch of the forewing.

Etymology: The species name refers to the overall appearance of the moth - Latin: egregius - remarkable.

***Seticosta ariadnae* Razowski & Pelz, sp. n.** (Fig. 2)

Holotype, female: "Ecuador: Loja -Prov. 60 km N Loja, 5 km N San Lucas, 2965 m, 3º 40' 56'' S, 79º 16' 9'' W, 10-X-2002, sta 23, leg. Gelis & Pelz"; GS 1502 - V. P.

Wing span 22.5 mm. Head brownish cream scaled brownish, labial palpus ca. 5, greyish brown; thorax brownish, scaled and spotted greyish brown. Forewing brownish, spotted dark brown, more grey in distal third; costa and termen dotted cream; fasciae whitish cream, distinctly suffused brown internally; dorsal part of distal edge of anterior fascia atrophied, oblique line from its end to postbasal portion of dorsum and parallel line from dorsum towards costa; posterior fascia strongly narrowed, medially marked with cream veins in dorsal third. Cilia brownish. Hindwing greyish white, greyer on periphery, strigulated grey; cilia whitish grey.

Male genitalia (Figs 9,10). Uncus strong, rather short, provided with weak lateral lobes subterminally, rounded apically; socius large, somewhat constricted submedially; gnathos strong, rather short; terminal plate minute; valva broad proximally with distinct neck, distal corner of sacculus and cucullus both well developed; spines of costa of valva long, asymmetrical (3-4); transtilla deeply incised dorsally, with proportionally short submedian lobes; aedeagus stout, short; dorso-anterior process almost as long as coecum penis.

Female genitalia unknown.

Diagnosis. *S. ariadnae* is very similar to *arachnogramma*, especially in the arrangement of the lines in the basal part of the forewing. It differs in the much shorter costal part of the anterior fascia. The male genitalia are distinguished by the short distal part of the aedeagus and the small lateral lobes of the uncus.

Etymology: The species name refers to the Greek goddess Ariadna who spun threads, referring to the thread-like lines of the forewing of this species.

***Seticosta cigcligrapha* Razowski & Pelz, sp. n.** (Fig. 3)

Holotype, male: "Ecuador: Napo - Prov., 5 km W Papallacta, Laguna Papallacta, 3430 m, 0º 22' 27'' S, 78º 9' 50'' W, 28-X-2002, sta 40, leg Gielis & Pelz"; GS 1518 - V. P.

Wing span 26 mm. Head brownish, labial palpus over 3, vertex scaled cream. Forewing pale brownish, mixed with brownish red primarily along middle; numerous brown and whitish strigulae and spots all over wing, including costa and termen. Inner parts of fasciae brownish; white cream lines as in *ariadne* and *arachnogramma* but distal edge of anterior fascia bent at radial arm of median cell. Cilia (worn) creamy brownish. Hindwing paler than in *ariadne*, with stronger transverse strigulation.

Male genitalia (Figs 11,12). Uncus rather short with slender terminal part, well developed dorsal lobe and pair of short lateral lobes postmedially; socius fairly broad, with well sclerotized outer edge; gnathos well defined, with short, rounded terminal plate.

Female genitalia unknown.

Diagnosis. *S. cigcligrapha* is distinguished by the reddish ferruginous median area of forewing and the shape of creamy white lines; the dorsal part of the posterior fascia is much broader than in *ariadnae*, with longer cream lines.

Etymology. The species name refers to the presence and form of creamy lines in the basal part of the forewing; Latin from Greek (kigklis): cigclis - grate, grapho - to draw.

***Seticosta chlorothicta* Razowski & Pelz sp. n.** (Fig. 4)

Holotype, female: "Ecuador: Loja - Prov. 10 km SE Loja, PN Podocarpus, Cajanuma Ranger Stt, 2850 m, 4º 6' 58'' S, 79º 10' 19'' W, 8-X-2002, sta 21, leg. Gelis & Pelz"; GS 1744 - V. P.

Wing span 17 mm. Head creamy grey, labial palpus over 4, brownish; thorax white-grey, white distally, tegula brown. Forewing costa distinctly convex, apex pointed, termen somewhat oblique, sinuate beneath apex. Majority of wing pale ferruginous brown, finely strigulated with brown; costal third and terminal areas distinctly suffused brown, the last with some smaller spots; brown spot at end of median cell accompanied by two minute whitish dots. Ground colour whitish basally, suffused and sprinkled yellowish green and slightly so with rust; pattern limited to oblique postbasal fascia connecting with base of wing along anal vein and some spots at tornus, near apex and in middle subterminally. Cilia reddish ferruginous, brown at apex. Hindwing whitish, strigulated with greyish, greyer towards apex; cilia whitish cream.

Male genitalia (Figs 13, 14). Uncus rather slender with sharp terminal part and two similarly sized lateral processes; arms of gnathos slender, terminal plate atrophied; socius rather short; valva without neck; distal angle of sacculus rounded; distal part of valva rather uniformly broad; group of setae from beyond middle of disc to before apex; transtilla with broad lateral lobes; aedeagus slender with slender dorso-proximal process.

Female genitalia (Fig. 24). Apophyses slender, long; sterigma broad, convex proximally; ductus bursae finely spined.

Diagnosis. This species apparently is closely related to *tridens* but is easily distinguished by the much broader forewing and the absence of a white discal spot. From *cerussograpta* it differs mainly in the presence of the dorso-proximal process of aedeagus.

Etymology. The species name refers to the green admixture in the ground colour elements; Greek: chloros - green, Latin: thictus - touched.

***Seticosta argentichroa* Razowski & Pelz, sp. n.** (Fig. 8)

Holotype, male: "Ecuador: Loja -Prov. 10 km SE Loja, PN Podocarpus, Cajanuma Ranger Stt, 2850 m, 4º 6' 58'' S, 79º 10' 19" W, 7-X-2002, sta 20, leg. Gelis & Pelz"; GS 1736 - V.P. Paratype, female: "Ecuador, Azuay Prov., PN Cajas, Laguna Llaviuco, 3225 m, 20º 50' 38" W, 79º 8' 35" N, 5-X-2002, Sta 17, leg. Gielis & Pelz"; GU 1948 - V. P.

Wing span 17-18 mm. Head and thorax white; labial palpus brown-grey to before end laterally, antenna excluded the scape blackish. Ground colour of forewing silvery white sprinkled and strigulated with blackish grey especially in dorsal third of wing. Markings black, grey-black inside: Basal blotch in form of a costal triangle; median fascia reaching mid-wing; subapical blotch divided into two or three spots; two spots at mid-dorsum; terminal blotch median, convex proximally. Cilia white tinged pale reddish proximally with similarly coloured dividings. Hindwing whitish tinged pale brownish distally with diffuse brownish grey strigulation; cilia white. Female forewing without strigulation, markings paler, grey edged with black; terminal markings divided into two parts or in major part grey (assymetric). Hindwing white without strigulation, tinged pale brownish in distal third.

Male genitalia (Figs. 15,16). Uncus simple, not expanding terminally; socius broad; arm of gnathos well developed, slender; terminal plate of gnathos distinct; neck of valva well developed; distal corner of sacculus well expressed; ventro-proximal angle of cucullus subtriangular; transtilla fairly broad, not concaving dorso-medially; coecum penis large, terminal part of aedeagus very short; dorsal process strong; cornutus present.

Female genitalia (Fig. 25). Papilla analis broad; apophyses delicate; sterigma short with slender lateral arms and convex proximal portion; ductus bursae slender; corpus bursae long, without any scleri-tes.

Diagnosis. A distinct, peculiar species externaly reminiscent *homosacta*. Male genitalia showing a mixture of characters: A typical process of aedeagus and setose costa of valva (as in *aeolozona*), distinct neck of valva (as in *arachnogramma*), and the presence of cornutus similar to that in *Punctapinella*.

Etymology: The name refers to colouration of forewing: Argentum-silver, chroa - complexion.

***Seticosta phrixotricha* Razowski & Pelz, sp. n.** (Fig. 5)

Holotype, male: "Ecuador: Loja - Prov. 60 km N Loja, 5 km N San Lucas, 2965 m, 3º 40' 56'' S, 79º 16' 9'' W, 10-X-2002, sta 23, leg. Gielis & Pelz"; GS 1501 - V. P.

Wing span 23.5 mm. Head brownish grey, vertex creamy whitish, labial palpus over 3, grey; thorax (worn) greyish, base of tegula dark grey-brown. Forewing greyish brown diffusely spotted with blackish brown; some whitish spots mainly along costa; termen distinctly spotted whitish; dorsum and fasciae whitish, sprinkled grey-brown; blackish brown blotch followed by very large median blotch almost reaching anal veins; blackish grey suffusion edging apex posteriorly. Cilia (worn) whitish divided blackish. Hindwing dirty whitish, mixed greyish apicad, strigulaed with grey; anal tuft with blackish scales; cilia whitish with blackish grey (worn) basal line.

Male genitalia (Figs 17,18). Uncus large with subterminal lateral lobes; socius rather slender, curved terminally; gnathos weak, short, terminal plate reduced to a small median prominence; ventro-lateral parts of tegumen extending medially to form rounded, scaled lobes; valva tapering from beyond sacculus, without neck, armed with numerous spines the largest group of which is ventro-proximally; setae of costa fairly short; median incision of transtilla deep, submedian lobes tapering laterally; aedegus very slender, tapering beyond zone distally; dorso-anterior process curved.

Female unknown.

Diagnosis. The forewing pattern of *S. phrixotricha* is similar to that of *aeolozona* but has a more convex outer edge of the posterior blotch. The male genitalia are easily distinguished by the unique shape of the valva with a reduced neck and cucullus.

Etymology: The species name refers to the arrangement of the setae of the valva; Greek: trichos - seta, hair; phrixos - bristled.

***Seticosta retearia* Razowski & Pelz, sp. n.** (Fig.6)

Holotype, male: "Ecuador: Loja - Prov. 60 km N Loja, 5 km N San Lucas, 2965 m, 3º 40' 56'' S, 79º 16' 9'' W, 10-X-2002, sta 23, leg. Gielis & Pelz"; GS 1927 - V. P. Paratype an identically labelled female, GS 1503 - V. P.

Wing span 18 mm. Head brownish cream, labial palpus ca. 4, greyish brown; thorax greyish, brown anteriorly, end of tegula cream. Forewing brown, paler terminally, with dorsum cream, sprinkled with brown; veins whitish cream except in large costal blotch. Fasciae cream, mixed brownish along middle; anterior fascia terminating beneath median cell, without additional line directed backwards beyond middle (cf. *egregia*); posterior fascia gently concave, only weakly broadening at dorsum; terminal area of wing slightly convex anteriorly. Cilia brownish. Hindwing cream, slightly mixed grey towards periphery; cilia mostly concolorous.

Male genitalia (Figs 19,20). Uncus large, rod like; socius short; gnathos arm strong; valva slender, neck indistinct, costa armed with row of setae; sacculus long, with short free termination; transtilla deeply concave dorsally with sharp submedian lobes; aedeagus large, stout; coecum penis broad.

Female genitalia (Fig. 26). Ovipositor short; apophyses moderately long; anteostial part of sterigma broad, rounded proximally; postostial part broad, with sclerotized lateral arms; ductus bursae broad, rather short, with small weakly sclerotized portions and large minutely spiny areas extending into corpus bursae.

Male unknown.

Diagnosis. This species is easily distinguished from *phrixotricha* by the presence of a wedge-shaped blotch between the distal edge of the costal blotch and the posterior fascia.

Etymology: The species name refers to the forewing markings; Latin: retearia - net.

***Seticosta triangulifera* Razowski & Pelz, sp. n.** (Fig. 7)

Holotype, male: "Ecuador Tungurahua - Prov. 20 km E Banos, San Francisco, 1200 m, 1º 24' 39'' S, 78º 14' 23" W, 21-X-2002, sta 33, leg. Gielis & Pelz", GS 1954.

Wing span 16 mm; head creamy brown, labial palpus ca. 3, brown, concolorous with thorax; end of tegula brownish cream. Forwing brown, markings, dorsum, and veins cream. Dorsal apex of costal triangle sharp, posterior edge straight, distinctly oblique. Inner parts of fascia suffused with brownish. Cilia brownish. Hindwing brown; cilia paler.

Male genitalia (Figs 21, 22). Uncus very long; socius slender; terminal plate of gnathos broad, short; neck of valva weakly developed; costa provided with large setose triangle; dorsal edge of transtilla with small rounded concavity; aedeagus moderately broad.

Female unknown.

Diagnosis. This species is externally similar to *multifidana* but has a slenderer terminal blotch. The male genitalia differ from those of *multifidana* primarily in the small dorsal prominences and small median incision of the transtilla.

Etymology: The name refers to the triangular lobe of the valva; Latin: triangulum - triangle, ferre - to carry.

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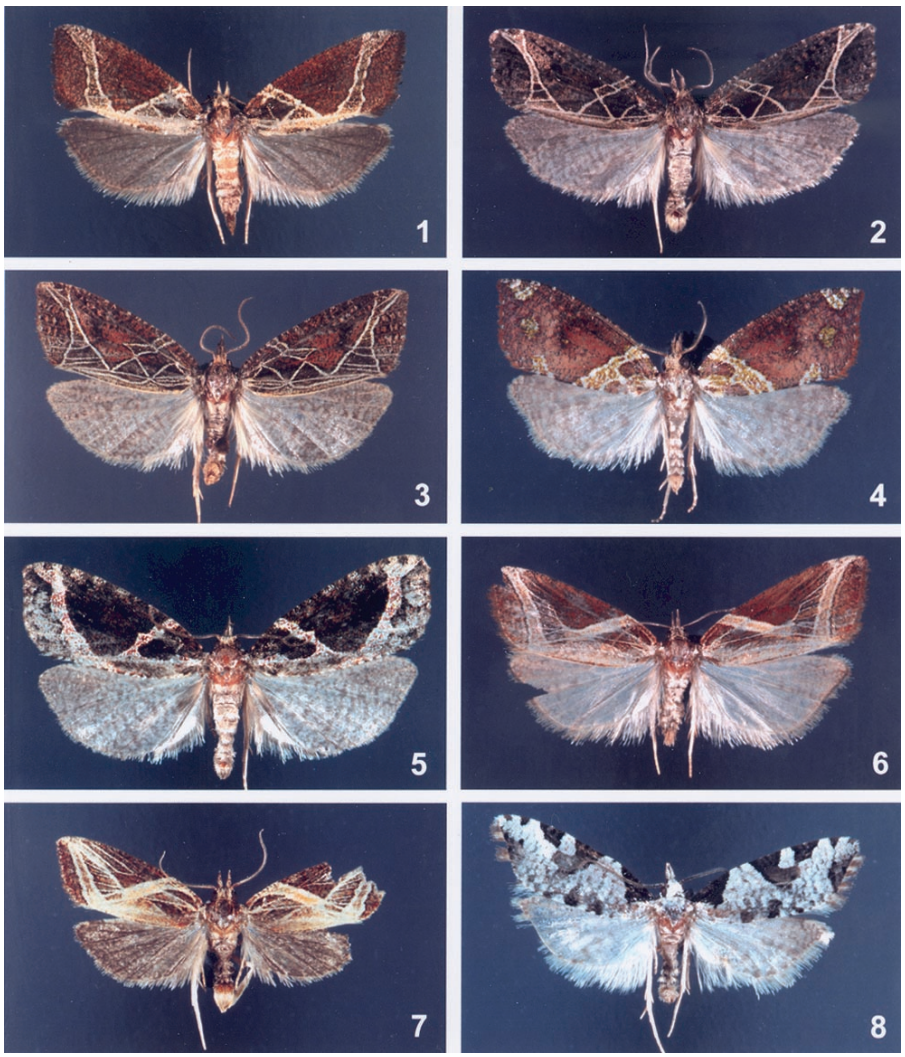
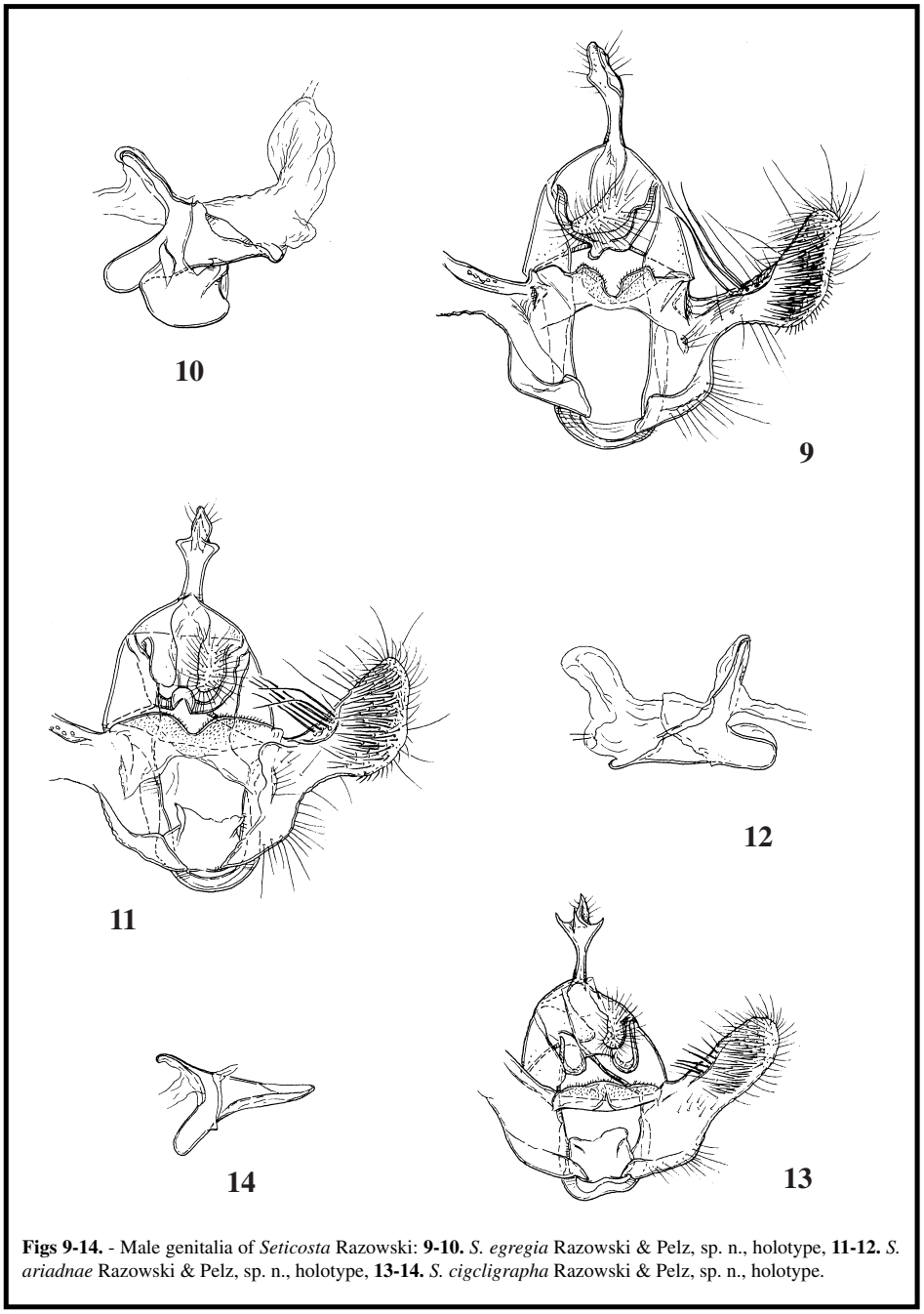
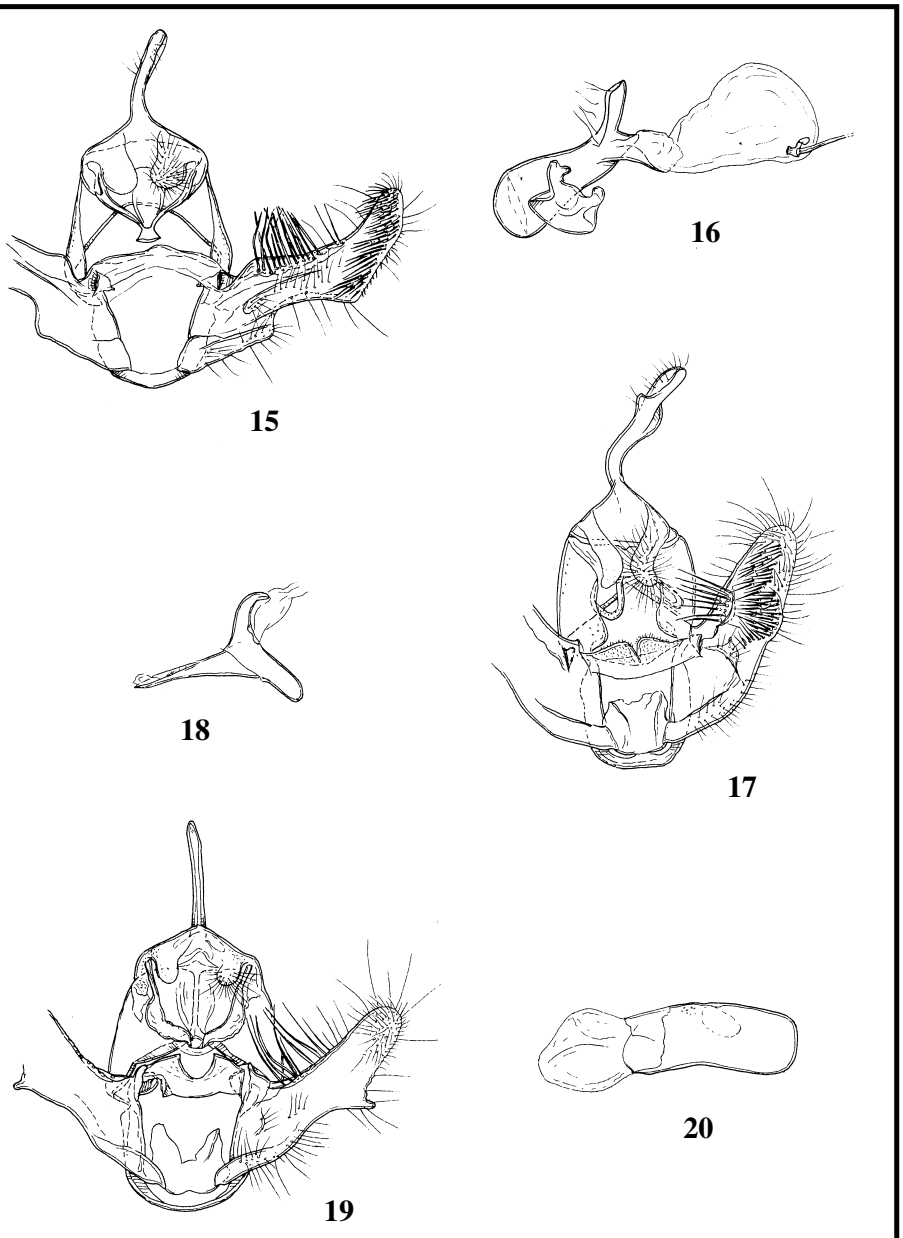


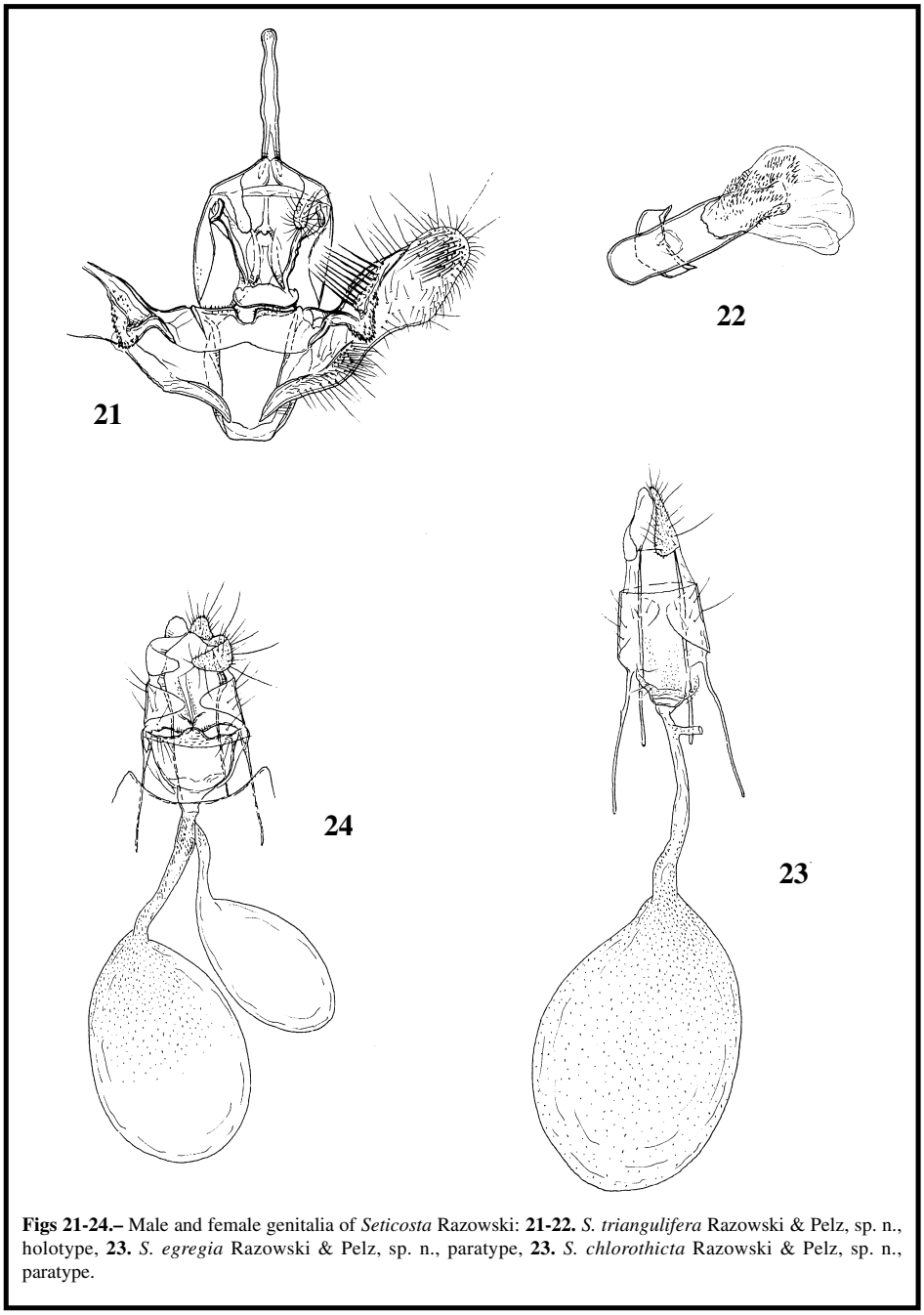
Figs 1-8.– Adults of *Seticosta* Razowski: **1.** *S. egregia* Razowski & Pelz, sp. n., holotype, **2.** *S. ariadnae* Razowski & Pelz, sp. n., holotype, **3.** *S. cigcligrapha* Razowski & Pelz, sp. n., holotype, **4.** *S. chlorothicta* Razowski & Pelz, sp. n., holotype, **5.** *S. phrixotricha* Razowski & Pelz, sp. n., holotype, **6.** *S. retearia* Razowski & Pelz, sp. n., paratype female, **7.** *S. triangulifera* Razowski & Pelz, sp. n., holotype, **8.** *S. argentichroa* Razowski & Pelz, sp. n., holotype.



Figs 9-14. - Male genitalia of *Seticosta* Razowski: **9-10.** *S. egregia* Razowski & Pelz, sp. n., holotype, **11-12.** *S. ariadnae* Razowski & Pelz, sp. n., holotype, **13-14.** *S. cigcligrapha* Razowski & Pelz, sp. n., holotype.



Figs 15-20.– Male genitalia of *Seticosta* Razowski: **15-16** - *S. argentichroa* Razowski & Pelz, sp. n., holotype, **17-18** - *S. phrixotricha* Razowski & Pelz, sp. n., holotype, **19-20.** *S. retearia* Razowski & Pelz, sp. n., holotype.



Figs 21-24.– Male and female genitalia of *Seticosta* Razowski: **21-22.** *S. triangulifera* Razowski & Pelz, sp. n., holotype, **23.** *S. egregia* Razowski & Pelz, sp. n., paratype, **23.** *S. chlorothicta* Razowski & Pelz, sp. n., paratype.

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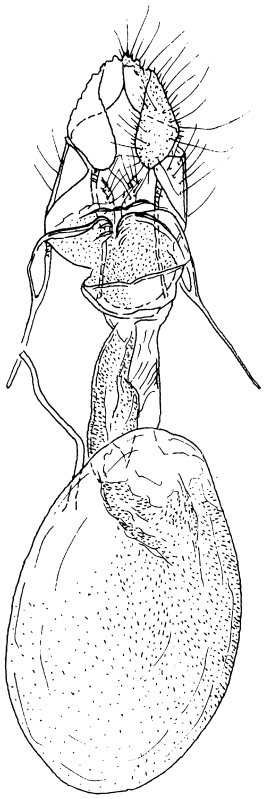

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Figs 25-25. - Female genitalia of *Seticosta* Razowski: **25.** *S. argentichroa* Razowski & Pelz, sp. n., paratype, **26.** *S. triangulifera* Razowski & Pelz, sp. n., paratype.