

New data on the genus *Scythris* Hübner, [1825] from the Canary Islands (Spain), with description of six new species (Lepidoptera: Scythrididae)

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Abstract

The *Scythris petrella* species-group in the Canary Islands is revised based on external morphology, genitalia and DNA barcodes. Eleven species are recognized. Six species are described as new: *Scythris aronaella* Falck, sp. nov. (Spain: Tenerife), *Scythris moyaella* Falck, sp. nov. (Spain: Gran Canaria), *Scythris rupemella* Falck, sp. nov. (Spain: Gran Canaria), *Scythris linealbella* Falck, sp. nov. (Spain: Tenerife), *Scythris solisella* Falck, sp. nov. (Spain: El Hierro and Tenerife) and *Scythris ochrelinella* Falck, sp. nov. (Spain: Tenerife). *Scythris hierroella* Klimesch, 1986, syn. nov. is treated as a synonym of *Scythris petrella* Walsingham, 1908. Photographs of adults and genitalia of all species are provided. All species are DNA barcoded. Analyses of the DNA barcodes support the identifications and distinctiveness of each species as they all appear well-supported and genetically isolated.

Keywords: Lepidoptera, Scythrididae, DNA barcodes, new records, new species, Canary Islands, Spain.

Nuevos datos sobre el género *Scythris* Hübner, [1825] de las Islas Canarias (España), con descripción de seis nuevas especies (Lepidoptera: Scythrididae)

Resumen

Se revisa el grupo de especies de *Scythris petrella* en las Islas Canarias basándose en la morfología externa, la genitalia y los códigos de barras de ADN. Se reconocen once especies. Seis especies se describen como nuevas: *Scythris aronaella* Falck, sp. nov. (España: Tenerife), *Scythris moyaella* Falck, sp. nov. (España: Gran Canaria), *Scythris rupemella* Falck, sp. nov. (España: Gran Canaria), *Scythris linealbella* Falck, sp. nov. (España: Tenerife), *Scythris solisella* Falck, sp. nov. (España: El Hierro y Tenerife) y *Scythris ochrelinella* Falck, sp. nov. (España: Tenerife). *Scythris hierroella* Klimesch, 1986, syn. nov. se trata como sinónimo de *Scythris petrella* Walsingham, 1908. Se facilitan fotografías de adultos y genitalia de todas las especies. Todas las especies tienen códigos de barras de ADN. Los análisis de los códigos de barras de ADN apoyan la identificación y el carácter distintivo de cada especie, ya que todas parecen estar bien sustentadas y aisladas genéticamente.

Palabras clave: Lepidoptera, Scythrididae, código de barras de ADN, nuevos registros, nuevas especies, Islas Canarias, España.

Introduction

Scythrididae are a medium sized family of Gelechioidea with approximately 669 species worldwide (Nieukerken et al. 2011). Since then, a number of species have been described and actually there are 923 species. The male genitalia are characterised by their extraordinary morphological

diversification, including asymmetry and the female genitalia in having a very narrow ductus bursae (Heikkilä et al. 2014, p. 583; Bengtsson, 1997). The Scythrididae fauna of the Canary Islands have been treated in several publications (Walsingham, 1908; Klimesch, 1986; Bengtsson, 1997; Falck & Karsholt, 2019) and until now twenty-one species are known of which eleven are considered to be endemic.

In an attempt to arrange the species in a logical order, Bengtsson (1997) proposed a classification based on male genital morphology, female genital morphology and other characters when known. One of the species groups, the *petrella* species-group, includes *S. arachnodes* Walsingham, 1908, *S. petrella* Walsingham, 1908, *S. hierroella* Klimesch, 1986, *S. pseudoarachnodes* Bengtsson, 1997, *S. brithae* Falck & Karsholt, 2019 and *S. grancanariella* Falck & Karsholt, 2019 all endemic to the Canary Islands. In the male genitalia the group is characterised by a sigmoid or meandering phallus, lateral, rounded protrusion of tegumen, small valvae and asymmetrical segment VIII. In the female genitalia the median fissure of sternum VII is characteristic. Their larva feeds on lichens, another characteristic, and this has not been observed in any other species-groups.

In the present paper the *petrella* species-group is revised, and adults, male- and female genitalia are figured of all known species. One additional species is described, which is impossible to arrange in the classification made by Bengtsson (1997). All the species are barcoded.

Material and methods

Almost 700 specimens from Gran Canaria, El Hierro and Tenerife were examined. Most of the specimens were netted during the daytime and only a few specimens attracted to an 8 watt super actinic light. Genitalia were dissected and prepared following Robinson (1976). Adults were photographed with a Canon EOS 700D camera equipped with a Canon EF 100 mm objective. The genitalia slide were photographed using a Soptop CX40T Trinocular microscope in conjunction with a Touptek P10500A-E3 / E3ISPM05000KPA-E3 / 5.0MP USB3 camera.

DNA samples were prepared from dried legs according to the prescribed standards and processed at the Canadian Centre for DNA Barcoding (CCDB, Biodiversity Institute of Ontario, University of Guelph) to obtain the 658 base-pair long barcode fragment of the mitochondrial COI gene (cytochrome c oxidase I). Intra- and interspecific distances of DNA barcode fragments were calculated using analytic tools of BOLD with the Kimura 2-parameter model of nucleotide substitution. Genetic clusters are presented with their barcode index number (BIN; cf. Ratnasingham & Hebert, 2013). A neighbour-joining tree (Figure 54) was constructed using analytic tools of BOLD with the Kimura 2-parameter model and COI-5P Cytochrome Oxidase Subunit 1-5' Region (15) as marker. Details of successfully sequenced voucher specimens are publicly available through the dataset DS-SCYCA at www.boldsystems.org and at [dx.doi.org/10.5883/DS-SCYCA](https://doi.org/10.5883/DS-SCYCA).

The morphology and the DNA Barcodes of all the species are examined.

Abbreviations used

- GP Genitalia preparation
 PF Collection of Per Falck, Neksø, Denmark
 MNCN Collection of Antonio Vives, Museo Nacional de Ciencias Naturales, Madrid, Spain

Checklist of Scythrididae know from the Canary Islands

- Enolmis acanthella* (Godart, 1824)
Scythris pinkeri Klimesch, 1986
Scythris polycarpaeae Klimesch, 1986
Scythris biacutella Bengtsson, 2002
Scythris arachnodes Walsingham, 1908

Scythris petrella Walsingham, 1908
 = *Scythris hierroella* Klimesch, 1986, **syn. nov.**
Scythris pseudoarachnodes Bengtsson, 1997
Scythris brithae Falck & Karsholt, 2019
***Scythris aronaella* Falck, sp. nov.**
Scythris grancanariella Falck & Karsholt, 2019
***Scythris moyaella* Falck, sp. nov.**
***Scythris rupemella* Falck, sp. nov.**
Scythris guimarensis Bengtsson, 1997
***Scythris linealbella* Falck, sp. nov.**
***Scythris solisella* Falck, sp. nov.**
***Scythris ochrelinella* Falck, sp. nov.**
Scythris klimeschi Bengtsson, 1997
Scythris fasciatella (Ragonot, 1880)
Scythris boseanella Klimesch, 1986
Scythris nipholecta Meyrick, 1924
Scythris eucharis Walsingham, 1907
Scythris amplexella Bengtsson, 2002
Scythris camelella Walsingham, 1907
Scythris albidella (Stainton, 1867)
Scythris mus Walsingham, 1898
Eretmocera medinella (Staudinger, 1859)

Results

Scythris arachnodes Walsingham, 1908 (Figures 1-2, 31, 31a, 44)
Scythris arachnodes Walsingham, 1908, *Proc. zool. Soc. Lond.*, 1907, 972
 Type locality: SPAIN, Tenerife.

Material examined: SPAIN, Arona, 670 m, 10 ♂♂, 3 ♀♀, 21-V-3-VI-2019, leg. P. Falck, genitalia slide 3011PF, 3012PF, 3009PF, 3010PF, DNA samples Lepid Phyl 0385PF/CILEP384-20, 0386PF/CILEP385-20, 0387PF/CILEP386-20; Las Manchas, 1050 m, 1 ♂, 5 ♀♀, 21-V-3-VI-2019, leg. P. Falck, genitalia slide 3013PF (PF, MNCN).

DNA barcodes (Figure 54): Three specimens were sequenced, resulting in 658 bp, full length DNA barcode fragments for one specimen, and fragments of 634 bp for two specimens. The barcodes fall within Barcode Index Number (BIN) BOLD: AEC6071. The intraspecific distance is 0%. The minimum p-distance to nearest neighbour *S. aronaella* is 1.82 %.

Diagnosis: Wingspan 8.5-10 mm. *S. arachnodes* is characterized by the blackish brown colour and two whitish zigzagging fasciae at 1/3 and 2/3. It resembles *S. pseudoarachnodes*, *S. grancanariella*, and especially dark specimens of *S. petrella*. *S. arachnodes* can be distinguished from *S. pseudoarachnodes* by the larger size, from *S. grancanariella* by the much darker ground-colour and from *S. petrella* by the darker ground-colour and by that the inner fascia is not outwardly angulated, however, it is not always possible to identify without genitalia dissection or barcoding. In the male genitalia (Figures 31, 31a) the almost symmetrical valvae each with one long slightly tapering process and two smaller protrusions and the shape of phallus with a straight middle part are characteristic. In the female genitalia (Figure 44) the posterior margin of sternum VII with a median fissure with a weakly sclerotized edge, and the anterior margin with a small, heavily sclerotized V-shaped structure, laterally with a corrugated area are characteristic.

Biology: The larva lives in a silken tube under a rather opaque web, in appearance of a spider's web, on rocks and rough stones in walls, probably feeding on small lichens (Walsingham, 1908, p. 972). The specimens were flying actively or disturbed from rocks in sunny days.

Distribution: Known only from the island of Tenerife, Spain.

Scythris petrella Walsingham, 1908 (Figures 3-8, 32, 32a, 33, 33a, 45-46)

Scythris petrella Walsingham, 1908, *Proc. zool. Soc. Lond.*, 1907, 972-973

Type locality: SPAIN, Tenerife.

= *Scythris hierroella* Klimesch, 1986, *Vieraea* 16, 328, **syn. nov.**

Material examined: SPAIN, Gran Canaria, Los Tilos de Moya, 550 m, 1 ♂, 17-30-IX-2018, leg. P. Falck, genitalia slide 2839PF, DNA sample Lepid Phyl 0712PF/CILEP711-20, same data but, 12 ♂♂, 4 ♀♀, 8-20-VIII-2020, leg. P. Falck, genitalia slide 3409PF, 3410PF, DNA samples Lepid Phyl 0705PF/CILEP704-20, 0706PF/CILEP705-20, 0713PF/CILEP712-20, 0714PF/CILEP713-20, same data but, 1 ♂, 2 ♀♀, 9-22-VI-2021, leg. P. Falck, genitalia slide 3505PF, 3506PF; Carretera, 455 m, 14 ♂♂, 6 ♀♀, 8-20-VIII-2020, leg. P. Falck, genitalia slide 3411PF, 3417PF, DNA samples Lepid Phyl 0703PF/CILEP702-20, 0704PF/CILEP703-20, 0707PF/CILEP706-20, 0711PF/CILEP710-20, same data but, 1 ♂, 1 ♀, 9-22-VI-2021, leg. P. Falck, genitalia slide 3503PF, 3504PF; Teror, 500 m, 3 ♂♂, 1-13-IV-2022, leg. P. Falck, genitalia slide 3677PF; El Hierro, Erese, 700 m, 31 ♂♂, 29 ♀♀, 22-VII-3-VIII-2022, leg. P. Falck, genitalia slide 3748PF, 3759PF, 3765PF, 3767PF, 3778PF, DNA samples Lepid Phyl 1102PF/CILEP1101-22, 1104PF/CILEP1103-22; Frontera, 280 m, 6 ♂♂, 8 ♀♀, 22-VII-3-VIII-2022, leg. P. Falck; Cruz de Las Reyes, 1360 m, 9 ♂♂, 7 ♀♀, 22-VII-3-VIII-2022, leg. P. Falck, genitalia slide 3749PF, 3760PF, 3763PF, DNA samples Lepid Phyl 1105PF/CILEP1104-22, 1106PF/CILEP1105-22; Tenerife, Arona, 670 m, 9 ♂♂, 1 ♀, 21-V-3-VI-2019, leg. P. Falck, genitalia slide 3002PF, 3006PF, 3008PF, 3015PF, same data but, 2 ♂♂, 4 ♀♀, 3-16-VIII-2021, leg. P. Falck, genitalia slide 3509PF, 3512PF; Las Mercedes, 750 m, 1 ♂, 21-V-3-VI-2019, leg. P. Falck, genitalia slide 3021PF; Agumansa, 1050 m, 40 ♂♂, 61 ♀♀, 13-26-VIII-2019, leg. P. Falck, genitalia slide 3081PF, 3088PF, 089PF, 3093PF, 3094PF, DNA samples Lepid Phyl 0399PF/CILEP398-20, 0400PF/CILEP399-20, La Guancha, 930 m, 3 ♂♂, 2 ♀♀, 13-26-VIII-2019, leg. P. Falck, genitalia slide 3082PF, 3092PF, DNA sample Lepid Phyl 0398PF/CILEP397-20; Las Manchas, 1050 m, 1 ♂, 3-16-VIII-2021, leg. P. Falck; Near Chirche, 1100 m, 2 ♂♂, 1 ♀, 3-16-VIII-2021, leg. P. Falck, genitalia slide 3507PF; Güimar, 500 m, 11 ♂♂, 1 ♀, 3-16-VIII-2021, leg. P. Falck, genitalia slide 3508PF, 3516PF (all PF).

DNA barcodes (Figure 54): Sixteen specimens were sequenced, resulting in 658 bp, full length DNA barcode fragments for five specimens, fragments of 648 bp for eight specimens, and fragments of 632 bp, 603 bp and 573 bp for three specimens. The intraspecific divergence is high, and *S. petrella* is divided into three well-separated sub-groups comprised by nine specimens from Gran Canaria (maximum intraspecific distance 0.16%), four specimens from El Hierro (maximum intraspecific distance 0.52%) and three specimens from Tenerife (maximum intraspecific distance 0.32%). The maximum intraspecific distance between the sub-groups is 1.90% between Gran Canaria and El Hierro, 1.86% between Gran Canaria and Tenerife and 2.70% between El Hierro and Tenerife. The minimum p-distance to nearest neighbour *S. aronaella* is 1.12%. The barcodes fall within Barcode Index Numbers (BIN) BOLD: AEG7684 (Gran Canaria), AEW1054 (El Hierro) and AEC3981 (Tenerife).

Diagnosis: Wingspan 7.5-11 mm. *S. petrella* is characterized by the blackish brown colour of the forewing, mottled with white, sometimes forming one or two spots near the apex, an outwardly angulate, indistinct whitish fascia at 1/3 and an outer whitish fascia at 2/3. It exhibits considerable variation both in size and mottling with white scales. It resembles *S. arachnodes* q. v. and especially *S. grancanariella*, which usually is more greyish-white in appearance, but it is often impossible to separate adults of the two species without dissection of the genitalia or barcoding. In the male genitalia (Figures 32, 32a, 33, 33a) the almost symmetrical valvae each with one rather broad, tapering process and one small hook-shaped process laterally, and the long, rather thin phallus with two deep bows near the apex are characteristic. In the female genitalia (Figures 45-46) the posterior margin of sternum VII with a median fissure with sclerotized edge, the anterior margin of sternum VII with a heavily sclerotized V-shaped structure, laterally and posteriorly surrounded by a U-shaped sclerotization and a small beak-shaped extension antero-laterally are characteristic.

Biology: Klimesch (1986, p. 327) mentions that the larva lives under a web on lichen overgrown rocks, but it is unclear if he reared the species himself. The specimens were flying actively in warm and sunny days or disturbed from rocks or stone walls. In hot nights a few specimens were attracted to

light. The adults were observed over a long period of time from the beginning of April until the end of September.

Distribution: *S. petrella* is one of the most widely distributed species of the genus in the Canary Islands, and it is known from the islands of El Hierro, Gran Canaria, La Palma (Baez, 2010) and Tenerife, Spain.

Remarks: Klimesch (1986) treated the Scythrididae fauna of the Canary Islands and described three new species. He also figured the adults and genitalia of two further species, one without naming it (p. 326) and a second with the preliminary name *Scythris* sp. (*hierroella* Jäckh, in litt.). He did not intend to describe *S. hierroella*, probably because the lack of males. Bengtsson (1997, p.139) raised *S. hierroella* to species rank based on this description. However, he apparently had his doubts whether it was a distinct species, as he stated, “Males of *hierroella* caught or reared together with females might definitely solve the taxonomy of these two [*S. hierroella* and *S. petrella*, author’s comment] species”. Examination of the male and female genitalia clearly shows that *S. hierroella* is conspecific with *S. petrella*. However, there is a divergence in the DNA between the populations from Gran Canaria, El Hierro and Tenerife, see the discussion below.

In some populations of *S. petrella* (e. g. Aguamansa, Tenerife and Cruz de las Reyes, El Hierro) almost all the specimens are very dark with diffuse fasciae and with very little white mottling.

Scythris pseudoarachnodes Bengtsson, 1997 (Figures 9-10, 34, 34a, 47)

Scythris pseudoarachnodes Bengtsson, 1997, *Microlepid. Eur.*, 2, 140

Type locality: SPAIN, Tenerife, Icod.

= *Scythris pseudarachnodes* Bengtsson, 1997, *Microlepid. Eur.*, 2, 22, 140, 247, 273, *lapsus calami*

Material examined: SPAIN, Tenerife, Arona, 670 m, 14 ♂♂, 1 ♀, 13-26-VIII-2019, leg. P. Falck, genitalia slide 3083PF, 3084PF, 3513PF, 3514PF, 3515PF, DNA samples Lepid Phyl 0389PF/CILEP388-20, 0390PF/CILEP389-20, same data but, 1 ♂, 3-16-VIII-2021, leg. P. Falck; La Guancha, 930 m, 1 ♂, 13-26-VIII-2019, leg. P. Falck, genitalia slide 3095PF, DNA sample Lepid Phyl 0388PF/CILEP387-20; Güímar, 500 m, 32 ♂♂, 2 ♀♀, 3-16-VIII-2021, leg. P. Falck, genitalia slide 3511PF; Las Manchas, 1050 m, 1 ♂, 3-16-VIII-2021, leg. P. Falck (PF, MNCN).

DNA barcodes (Figure 54): Three specimens were sequenced, resulting in 658 bp, full length DNA barcode fragments for two specimens, and fragments of 633 bp for one specimen. The barcodes fall within Barcode Index Number (BIN) BOLD: AEC2342. The maximum intraspecific distance is 0.32%. The minimum p-distance to nearest neighbour *S. aronaella* is 1.78 %.

Diagnosis: Wingspan 7-7.5 mm. *S. pseudoarachnodes* is characterized by the blackish brown colour of the forewing, mottled with white, sometimes forming one or two indistinct spots near the apex, a zigzagging white fascia at 1/3 and an indistinct white fascia at 2/3. It resembles *S. arachnodes* q.v., *S. petrella* and *S. grancanariella* q.v., in most cases it can be separated from similar species by the smaller wingspan, but it is sometimes impossible to identify without genitalia dissection or barcoding. In the male genitalia (Figures 34, 34a) the asymmetrical valvae, right one with one large slightly tapering process and one small hook-shaped process, left one with one large parallel sided process and one small pointed process, and the rather robust weakly meandering phallus with a slightly bifid apex (almost looks like it is broken) are characteristic. In the female genitalia (Figure 47) the posterior margin of sternum VII with a deep median fissure with the edge sclerotised anteriorly and the sub-trapezoid, laterally incurved profile of segment VII is characteristic.

Biology: The type specimens were reared in August from larvae found on rocks with lichens (Klimesch, 1986, p. 328). The adults were flying actively in the afternoon sunshine in August at altitudes from 500 to 1050 m above sea level.

Distribution: Known only from a few localities on the island of Tenerife, Spain.

Scythris brithae Falck & Karsholt, 2019 (Figures 11-12, 35, 35a, 48)

Scythris brithae Falck & Karsholt, 2019, *SHILAP Revta. lepid.*, 47(186), 329

Type locality: SPAIN, Gran Canaria, Los Tilos de Moya.

Material examined: SPAIN, Los Tilos de Moya, 500 m, 9 ♂♂, 2 ♀♀, 11-24-VI-2018, P. Falck, genitalia slide 2730PF, 2731PF, 2860PF, 2860PF, DNA samples Lepid Phyl 0393PF/CILEP392-20, 0394PF/CILEP393-20, same data but, 20 ♂♂, 3 ♀♀, 8-22-VIII-2020, leg. P. Falck, genitalia slide 3416PF, DNA samples Lepid Phyl 0701PF/CILEP700-20, 0702PF/CILEP701-20, same data but, 5 ♂♂, 1 ♀, 9-22-VI-2021, leg. P. Falck; Carretera, 455 m, 15 ♂♂, 6 ♀♀, 8-20-VIII-2020, leg. P. Falck, genitalia slide 3420PF, 3797PF (PF, MNCN).

DNA barcodes (Figure 54): Four specimens were sequenced, resulting in DNA barcode fragments of 648 bp, 632 bp, 628 bp and 622 bp. The barcodes fall within Barcode Index Number (BIN) BOLD: AEC2413. The maximum intraspecific distance is high 1.18%. The minimum p-distance to nearest neighbour *S. pseudoarachnodes* is 3.69 %.

Diagnosis: Wingspan 7-10 mm. *S. brithae* is characterized by an outwardly oblique stripe at 1/3 from dorsum to the middle of the forewing. It is very similar to *S. aronaella* and it is impossible to separate the two species without dissection of the genitalia or barcoding. In the male genitalia (Figs 35, 35a) the almost symmetrical valvae each with one long slightly tapering process and the two curved bends of the phallus are characteristic. In the female genitalia (Figure 48) the funnel-shaped antrum and the almost invisible median fissure of sternum VII are characteristic.

Biology: Early stages unknown. The adults were flying actively in the afternoon sunshine in June and August.

Distribution: Known only from two localities in the northern part of the island Gran Canaria, Spain.

***Scythris aronaella* Falck, sp. nov.** (Figures 13-14, 36, 36a, 49)

Holotype ♂: SPAIN, Tenerife, Arona, 670 m, 21-V-3-VI-2019, leg. P. Falck, genitalia slide 3001PF (MNCN). Paratypes: SPAIN, Tenerife, Arona, 670 m, 10 ♂♂, 7 ♀♀, 21-V-3-VI-2019, leg. P. Falck, genitalia slide 3004PF, 3005PF, 3007PF, 3014PF, 3016PF, 3017PF, 3087PF, DNA sample Lepid Phyl 0383PF/CILEP382-20; Las Manchas, 1050 m, 2 ♂♂, 2 ♀♀, 21-V-3-VI-2019, leg. P. Falck, genitalia slide 3022PF, 3023PF, DNA sample Lepid Phyl 0384PF/CILEP383-20; Aguamansa, 1050 m, 4 ♂♂, 2 ♀♀, 13-26-VIII-2019, genitalia slide 3080PF, 3085PF, 3090PF, 3091PF, DNA sample Lepid Phyl 0382PF/CILEP381-20; Güfmar, 500 m, 19 ♂♂, 4 ♀♀, 1-13-VI-2022, leg. P. Falck, genitalia slide 3736PF, 3737PF, 3738PF, 3739PF, 3740PF (PF, MNCN).

Description: Wingspan 8-10.5 mm. Labial palp slightly upturned, dark brown, whitish medially and dorsally, segment 3 slightly shorter than segment 2. Antenna blackish brown about 2/3 the length of the forewing, in the male with short ciliae about 0.7 of antenna diameter. Vertex, neck tuft, collar, tegula and thorax dark brown, mottled with pale ochreous scales, especially around the neck and thorax. Forewing dark brown mottled with white especially near the base and in apical half, sometimes forming one or two indistinct blotches near apex; at 1/3 from dorsum an outwardly oblique, whitish stripe sometimes forming an angulated incomplete fascia, at 2/3 an indistinct zigzagging white fascia; fringe dark grey. Hindwing width about 1/2 of the forewing, dark grey; fringe dark grey. Abdomen greyish, in the females segment VII-VIII are clearly more brownish.

Variation: Often there is a rather distinct white stripe in the median part of the forewing from near the base to beyond the inner fascia.

Male genitalia (Figure 36): Valvae asymmetrical. Uncus anvil-shaped posteriorly with a median V-shaped indentation; gnathos small, distal arm with pointed apex; tegumen sub-triangular with lateral, rounded protrusions; valvae sub-rectangular with lateral processes, right one with two long and one short slightly tapering processes, left one with one long tapering process and one smaller slightly bent process; phallus rather robust, almost straight in anterior half, then meandering with two small and one larger bends. Segment VIII (Fig. 36a) almost symmetrical; tergum VIII sub-triangular with two small lateral protrusions; sternum VIII sub-rectangular, posteriorly with two digitate rounded processes.

Female genitalia (Figure 49): Papilla analis elongate, distally rounded; posterior apophysis slender, three times as long as papilla analis; anterior apophysis slightly shorter than half the length of

posterior apophysis; sternum VIII sub-rectangular, posterior margin with a hardly visible median fissure, anterior margin with an irregular U-shaped indentation; sternum VII sub-rectangular, posterior margin with deep median fissure with heavily sclerotized edge, anterior margin with sclerotized V-shaped median structure; tergum VII sub-rectangular, anterior margin with lateral concavity.

DNA barcodes (Figure 54): Four specimens were sequenced, resulting in 658 bp, full length DNA barcode fragments for two specimens, and fragments of 637 bp and 621 bp for two specimens. The barcodes fall within Barcode Index Number (BIN) BOLD: AEC3980. The maximum intraspecific distance is 0.83%. The minimum p-distance to nearest neighbour *S. petrella* is 1.12%.

Diagnosis: The incomplete outwardly oblique inner fascia is characteristic and separates *S. aronaella* from most other members of the *petrella*-group, with the exception of *S. brithae*, where examination of the genitalia or barcoding is necessary to make a safe determination.

In the male genitalia the asymmetrical valvae, the numbers and shapes of the lateral processes on the valvae and the shape of the robust phallus are characteristic. In the female genitalia the weak median fissure of the posterior margin of sternum VIII, the deep sclerotised median fissure of the posterior margin of sternum VII and the shape of tergum VII are characteristic.

Biology: The early stages are unknown, but the larva probably feeds on lichens. The adults were flying actively or disturbed from rock walls with abundant growth of lichens in warm and sunny days from late May to the end of August at altitudes from 500 to 1050 m above sea level.

Distribution: Known only from scattered localities on the island of Tenerife, Spain.

Etymology: The species is named after the small town Arona situated near the type-locality.

Scythris grancanariella Falck & Karsholt, 2019 (Figures 15-16, 37, 37a, 50)

Scythris grancanariella Falck & Karsholt, 2019, *SHILAP Revta. lepid.*, 47(186), 330

Type locality: SPAIN, Gran Canaria, Los Tilos de Moya.

Material examined: SPAIN, Gran Canaria, Los Tilos de Moya, 500 m, 1 ♂, 1 ♀, 11-24-VI-2018, leg. P. Falck, genitalia slide 2732PF, DNA sample Lepid Phyl 0391PF/CILEP390-20; Carreteria, 455 m, 2 ♂♂, 1 ♀, 9-22-VI-2021, leg. P. Falck, genitalia slide 3501PF, 3502PF, same data but, 4 ♂♂, 3 ♀♀, 1-13-IV-2022, leg. P. Falck, genitalia slide 3678PF; Teror, 550 m, 2 ♀♀, 1-13-IV-2022, leg. P. Falck, genitalia slide 3680PF (PF, MNCN).

DNA barcodes (Figure 54): One specimen was sequenced, resulting in 613 bp DNA barcode fragments. The barcode falls within Barcode Index Number (BIN) BOLD: AEC5321. The minimum p-distance to nearest neighbour *S. petrella* is 3.61 %.

Diagnosis: Wingspan 9.5-11 mm. *S. grancanariella* is characterized by the brown colour of the forewing, heavily mottled with greyish white and an outwards angulated white fascia at 1/3. It resembles *S. arachnodes* q.v., *S. pseudoarachnodes* and *S. petrella* q.v. It can be distinguished from *S. pseudoarachnodes* by the larger wingspan and the greyish white colour of the forewing, but it is sometimes impossible to identify it without genitalia dissection or barcoding. In the male genitalia (Figures 37, 37a) the asymmetrical valvae, each with a large semi-oval process, left one with a long narrow curved tapering process and the long slender weakly meandering phallus are characteristic. In the female genitalia (Figure 50) the funnel-shaped antrum and the sclerotised circular dilatation of ductus bursae are characteristic.

Biology: Early stages unknown. The adults were flying actively in the afternoon sunshine from the beginning of April until the end of June.

Distribution: Known only from a few localities in the northern part of the island Gran Canaria, Spain.

***Scythris moyaella* Falck, sp. nov.** (Figures 17-18, 38, 38a)

Holotype ♂: SPAIN, Gran Canaria, Carreteria, 455 m, 4-20-VIII-2020, leg. P. Falck, genitalia slide 3418PF (PF). Paratypes: SPAIN, Gran Canaria, Carreteria, 455 m, 5 ♂♂, 4-20-VIII-2020, leg. P. Falck, genitalia slide 3795PF, DNA sample Lepid Phyl 0699PF/CILEP698-20; Los Tilos de Moya, 500

m, 3 ♂♂, 4-20-VIII-2020, leg. P. Falck, genitalia slide 3419PF, DNA sample Lepid Phyl 0715PF/CILEP714-20, 0716PF/CILEP715-20 (PF, MNCN).

Description: Wingspan 8-9 mm. Labial palp slightly upturned, segment 2 yellowish white mottled with brown apically, segment 3 brownish grey, slightly shorter than segment 2. Antenna about 3/4 the length of the forewing, fuscous, in the male with short ciliae about the length of the antenna diameter. Vertex brownish. Collar yellowish brown. Tegula and thorax brown. Forewing dark brown; a median, quite distinct, irregular yellowish white stripe from near the base to about fi, from dorsum at 1/3 an oblique elongate yellowish white spot reaching median stripe, two irregular yellowish white spots, one above tornus and one near apex sometime confluent, the stripe and spots are irregularly bordered by darker brown scales; fringe dark grey. Hindwing width about 1/2 of the forewing, dark grey; fringe dark grey. Abdomen greyish brown.

Male genitalia (Figure 38): Valvae almost symmetrical. Uncus bilobed, indented posteriorly; gnathos small, distal arm broad tapering towards pointed apex; tegumen sub-triangular with small, rounded lateral protrusions; valvae very short, sub-rectangular with a small rounded lateral protrusion; phallus rather robust, bent before 1/2, tapering towards blunt apex. Segment VIII (Figure 38a) symmetrical. Tergum VIII with two sclerotized, small posterolateral protrusions; sternum VIII X-shaped.

Female genitalia: Unknown.

DNA barcodes (Figure 54): Three specimens were sequenced, resulting in DNA barcode fragments of 648 bp for all three specimens. The barcodes fall within Barcode Index Number (BIN) BOLD: AEG7006. The maximum intraspecific distance is 0.16%. The minimum p-distance to nearest neighbour *S. petrella* is 3.84%.

Diagnosis: *S. moyaella* resembles *S. solisella*, *S. guimarensis* and *S. linealbella*. It can be distinguished from *S. guimarensis* and *S. linealbella* by the brown ground-colour and the yellowish white wing pattern. It is not possible to separate *S. moyaella* and *S. solisella* without genitalia dissection or barcoding. In the male genitalia the bilobed uncus, the very short valva and the large robust phallus are characteristic.

Biology: Early stages unknown. The adults were flying actively in the afternoon sunshine.

Distribution: Known only from the northern part of the island of Gran Canaria, Spain.

Etymology: The species is named after the small-town Moya situated near the type-locality.

Scythris rupemella Falck, sp. nov. (Figures 19-20, 39, 39a, 51)

Holotype ♂: SPAIN, Gran Canaria, Pie de la Cuesta, 500 m, 21-VIII-4-IX-2020, leg. P. Falck, genitalia slide 3412PF (PF). Paratypes: SPAIN, Gran Canaria, Pie de la Cuesta, 500 m, 18 ♂♂, 3 ♀♀, 21-VIII-4-IX-2020, leg. P. Falck, genitalia slide 3413PF, 3414PF, 3415PF, DNA samples Lepid Phyl 0708PF/CILEP707-20, 0709PF/CILEP708-20, 0710PF/CILEP709-20 (PF, MNCN).

Description: Wingspan 7-7.5 mm. Labial palp slightly upturned, greyish brown, whitish medially and dorsally, segment 3 slightly shorter than segment 2. Antenna about 3/4 the length of the forewing, blackish brown, in the male with short ciliae about the length of the antenna diameter. Vertex, collar, tegula and thorax brown. Forewing brown mottled with beige in apical area; at 1/3 an irregular diffuse beige fascia, at 2/3 an irregular diffuse beige fascia not reaching costa; fringe dark grey. Hindwing width about 1/2 of the forewing, dark grey; fringe dark grey. Abdomen dark grey mottled with beige scales.

Male genitalia (Figure 39): Valvae asymmetrical. Uncus sub-rectangular bilobed, postero-laterally pointed, posterior margin with V-shaped indentation; gnathos small, distal arm tapering towards pointed apex; tegumen sub-triangular with rounded lateral protrusions; right valva short, sub-rectangular, postero-laterally one long process with rounded apex, antero-laterally a small triangular tip, left valva short, sub-rectangular, postero-laterally a long slightly broadening process with rounded apex, antero-laterally a long tapering process slightly curved near pointed apex; phallus long and narrow, weakly meandering in posterior half with three bends. Segment VIII (Figure 39a) symmetrical.

Tergum VIII X-shaped with small lateral protrusion; sternum VIII sub-triangular, posteriorly with a rather pointed, sclerotized process.

Female genitalia (Figure 51): Papilla analis elongate, distally rounded; posterior apophysis slender, slightly longer than twice the length of papilla analis; anterior apophysis approximately 0.8 the length of posterior apophysis; sternum VIII sub-rectangular with two sclerotized crescent structures, anteriorly wrinkled, posterior margin with a small V-shaped median fissure; antrum triangular; ductus bursae membranous, narrow; sternum VII sub-rectangular, posteriorly with deep median fissure edge weakly sclerotised, anteriorly with sclerotised V-shaped median structure, anterior margin rounded and sclerotised, laterally with small indentation; tergum VIII sub-rectangular.

DNA barcodes (Figure 54): Three specimens were sequenced resulting in DNA barcode fragments of 648 bp for all three specimens. The barcodes fall within Barcode Index Number (BIN) BOLD: AEG6553. The maximum intraspecific distance is 0.65%. The minimum p-distance to nearest neighbour *S. guimarensis* is 4.30%.

Diagnosis: *S. rupemella* resembles *S. petrella*, *S. arachnodes* and *S. pseudoarachnodes*. It can be distinguished by the brown ground-colour and the beige diffuse fasciae. In the male genitalia the bilobed uncus, the long-pointed process on the left valvae and sternum VIII with a pointed sclerotised process are characteristic. In the female genitalia the crescent structures in sternum VIII, the posteriorly deep median fissure and rounded sclerotised margin of segment VII are characteristic.

Biology: Early stages unknown. The adults were disturbed from a vertical rock surface with abundant lichen growth during warm and sunny days from the end of August until the beginning of September.

Distribution: Known only from the type-locality nearby the small village Pie de la Cuesta situated in the southern part of the island of Gran Canaria, Spain.

Etymology: The species is named after the Latin word: *rupem* (= rock). The name alludes to the vertical rock surface at the type-locality.

Scythris guimarensis Bengtsson, 1997 (Figures 21-22, 40, 40a)

Scythris guimarensis Bengtsson, 1997, *Microlepid. Eur.*, 2, 47

Type locality: SPAIN, Tenerife, Güímar.

Material examined: SPAIN, Tenerife, Güímar, 500 m, 3 ♂♂, 1-13-VI-2022, leg. P. Falck, genitalia slide 3744PF, 3798PF, DNA samples Lepid Phyl 1096PF/CILEP1095-22, 1097PF/CILEP1096-22, 1098PF/CILEP1097-22 (PF).

DNA barcodes (Figure 54): Three specimens were sequenced, resulting in 658 bp, full length DNA barcode fragments for one specimen, and fragments of 614 bp and 587 bp for two specimens. The barcodes fall within Barcode Index Number (BIN) BOLD: AEU7743. The intraspecific distance is 0%. The minimum p-distance to nearest neighbour *S. petrella* is 2.75%.

Diagnosis: Wingspan 7.5 mm. *S. guimarensis* is characterized by the blackish brown colour of the forewing, three white spots, one near the base bordered by black scales, an outwardly oblique streak at 1/3 bordered by black scales and one spot above tornus. It resembles *S. moyarella* q.v., *S. solisella* q.v. and certain forms of *S. linealbella* q.v. In the male genitalia (Figures 40, 40a) the symmetrical valvae, the sub-quadrate, postero-laterally pointed uncus, the simple elongate apically rounded valvae and the near base curved and tapering phallus are characteristic. Female genitalia unknown.

Biology: Hostplant lichens on stones (Bengtsson, 1997). The adults were flying actively in the afternoon sunshine in June.

Distribution: Known only from the type-locality situated nearby the small town Güímar, Tenerife, Spain.

***Scythris linealbella* Falck, sp. nov.** (Figures 23-25, 41, 41a, 52)

Holotype ♂: SPAIN, Tenerife, Las Manchas, 1050 m, 21-V-3-VI-2019, leg. P. Falck, genitalia slide 3018PF (MNCN). Paratypes: SPAIN, Tenerife, Arona, 670 m, 6 ♂♂, 1 ♀, 21-V-3-VI-2019, leg. P.

Falck, Las Manchas, 1050 m, 14 ♂♂, 10 ♀♀, 21-V-3-VI-2019, leg. P. Falck, genitalia slide 30198PF, 3020PF, DNA sample Lepid Phyl 0407PF/CILEP406-20; Las Mercedes, 750 m, 1 ♂, 21-V-3-VI-2019, leg. P. Falck; Aguamansa, 1050 m, 11 ♂♂, 7 ♀♀, 13-26-VIII-2019, leg. P. Falck, genitalia slide 3078PF, 3079PF, DNA samples Lepid Phyl 0404PF/CILEP403-20, 0405PF/CILEP404-22, 0406PF/CILEP404-22, same data but, 2 ♀♀, 1-13-VI-2022, leg. P. Falck; Güfmar, 500 m, 5 ♂♂, 1 ♀, 1-13-VI-2022, leg. P. Falck (PF, MNCN).

Description: Wingspan 7-8 mm. Labial palp slightly upturned, dark brown, paler dorsally, segment 3 slightly shorter than segment 2. Antenna about 2/3 the length of the forewing, fuscous, in the male with short ciliae about 0.5 width of the antenna diameter. Vertex dark brown. Collar dark beige. Tegula whitish, brown basally. Thorax dark brown. Forewing dark brown; a median distinct, off-white stripe from the base to the fringe-line; fringe dark grey. Hindwing width about 1/2 of the forewing, dark grey; fringe dark grey. Abdomen dark greyish brown. Variation: The median stripe is sometimes broken and bordered by blackish brown scales (Figure 25).

Male genitalia (Figure 41): Valvae symmetrical. Uncus sub-trapezoid, posterior margin weakly rounded; gnathos robust, corrugated, distal arm sickle-shaped; tegumen sub-triangular; valvae simple, approximately twice as long as broad, apex rounded; phallus longer than valvae, S-shaped and tapering towards apex. Segment VIII (Figure 41a) symmetrical. Tergum VIII sub-trapezoid; sternum VIII sub-trapezoid, anteriorly and posteriorly with deep U-shaped indentations.

Female genitalia (Figure 52): Papilla analis elongate, distally rather pointed; posterior apophysis slender, slightly more than twice the length of papilla analis; anterior apophysis approximately 0.8 the length of posterior apophysis; sternum VIII sub-rectangular, posteriorly a median sub-trapezoid sclerotisation, posterior margin with small V-shaped indentation; sternum VII sub-rectangular, posteriorly with a small median fissure with postero-medial edge slightly concave, sclerotised; tergum VII sub-rectangular.

DNA barcodes (Figure 54): Four specimens were sequenced, resulting in 658 bp, full length DNA barcode fragments for one specimen, fragments of 634 bp for two specimens and 631 bp for one specimen. The barcodes fall within Barcode Index Number (BIN) BOLD: AEC1613. The maximum intraspecific distance is 0.67%. The minimum p-distance to nearest neighbour *S. petrella* is 3.49%.

Diagnosis: *S. linealbella* can be distinguished from all other *Scythris* species known from the Canary Islands by the distinct white stripe, however, the white stripe is rarely broken, and such specimens resembles *S. moyaella* q.v., *S. solisella* q.v. and *S. guimarensis*. It can be distinguished by the small white stripe above tornus, in *S. guimarensis* the white spot above tornus is rounded. In the male genitalia the posteriorly rounded uncus, the wrinkled part of gnathos and the S-shaped phallus are characteristic. In the female genitalia the sclerotised median part of sternum VIII and the slightly concave, sclerotised median fissure of segment VII are characteristic.

Biology: Early stages unknown. Adults were flying actively in warm and sunny days in rocky areas.

Distribution: Known only from scattered localities on the island of Tenerife, Spain.

Etymology: The species is named after the white stripe on the forewing, in Latin *linea alba* (= white stripe).

Remarks: Klimesch (1986, p. 326) described the above mentioned species, but without naming it.

Scythris solisella Falck, sp. nov. (Figures 26-29, 42, 42a, 53)

Holotype ♂: SPAIN, Tenerife, Aguamansa, 1050 m, 13-26-VIII-2019, leg. P. Falck, genitalia slide 3801PF (MNCN). Paratypes: SPAIN, El Hierro, Frontera, 280 m, 3 ♀♀, 22-VII-3-VIII-2022, leg. P. Falck, genitalia slide 3757PF, 3769PF; Cruz de Las Reyes, 1360 m, 11 ♂♂, 46 ♀♀, 22-VII-3-VIII-2022, leg. P. Falck, genitalia slide 3758PF, 3761PF, 3764PF, 3766PF, 3768PF, 3770PF, 3771PF, 3776PF, 3777PF, DNA samples Lepid Phyl 1099PF/CILEP1098-22, 1100PF/CILEP1099-22, 1101PF/CILEP1100-22; Tenerife, Aguamansa, 1050 m, 19 ♂♂, 27 ♀♀, 13-26-VIII-2019, leg. P. Falck,

genitalia slide 3796PF, 3076PF, DNA samples Lepid Phyl 0401PF/CILEP400-20, 0402PF/CILEP401-20, 0403PF/CILEP402-20 (PF, MNCN).

Description: Wingspan 7.5-9 mm. Labial palp slightly upturned, segment 2 greyish brown paler dorsally, segment 3 greyish brown, slightly shorter than segment 2. Antenna about 2/3 the length of the forewing, fuscous, in the male with short ciliae about 0.7 of the antenna diameter. Vertex brownish. Collar yellowish brown. Tegula and thorax brown. Forewing brown; a median quite distinct yellowish stripe from the base to about 1/2, from dorsum at about 1/3 an outwardly oblique elongate yellowish spot confluent with median stripe, above tornus an irregular yellowish spot, sometimes a small yellowish dot near apex; fringe dark grey. Hindwing width about 1/2 of the forewing, dark grey; fringe dark grey. Abdomen greyish brown. Fresh specimens have a bluish tinge. Variation: Specimens from El Hierro differ consistently from specimens from Tenerife by the almost black ground-colour, the white spots and the lack of a median stripe.

Male genitalia (Figure 42): Valvae symmetrical. Uncus sub-rectangular, posterior edge with median concavity; gnathos small, distal arm thorn-shaped; tegumen sub-triangular; valvae sub-rectangular, approximately twice as long as broad, slightly tapering distally, apex rounded, medially with a small setosed flap; phallus clearly shorter than valvae, curved and tapering towards apex. Segment VIII (Figure 42a) symmetrical. Tergum VIII sub-trapezoid posteriorly rounded; sternum VIII sub-triangular posteriorly forked, antero-medially a small spike.

Female genitalia (Figure 53): Papilla analis elongate, distally pointed; posterior apophysis slender, twice as long as papilla analis; anterior apophysis half the length of posterior apophysis; sternum VIII sub-rectangular, anterior half wrinkled in median third; antrum funnel-shaped; sternum VII sub-rectangular, posteriorly a small median fissure, edge slightly sclerotized; tergum VII sub-rectangular.

DNA barcodes (Figure 54): Six specimens were sequenced, resulting in 658 bp, full length DNA barcode fragments for two specimens, and fragments of 637 bp, 634 bp, 632 bp and 588 bp for four specimens. The barcodes fall within Barcode Index Number (BIN) BOLD: AEC2342. The maximum intraspecific distance is 0.51% (El Hierro population) and 0.16% (Tenerife population), the maximum intraspecific distance between the populations is 0.99%. The minimum p-distance between the populations is 0.65%. The minimum p-distance to nearest neighbour *S. aronaella* is 2.60%.

Diagnosis: *S. solisella* resembles *S. moyaella* q.v., *S. guimarensis* and *S. linealbella*. It can be distinguished from *S. guimarensis* and *S. linealbella* by the distinct outward oblique spot at 1/3 and the distinct tornal spot. In the male genitalia the sub-rectangular valvae with medial flap, the curved phallus and the triangular sternum VIII forked posteriorly are characteristic. In the female genitalia the very long posterior apophysis, the wrinkled median part of sternum VIII and the posterior margin with a small median fissure of segment VII are characteristic.

Biology: Early stages unknown. Adults were flying actively in warm and sunny days in rocky areas often together with *S. petrella*.

Distribution: Known only from a few localities on the islands of El Hierro and Tenerife, Spain.

Etymology: The species is named after the Latin word *solem* (= the sun) referring to the species flying actively in sunny weather.

Remarks: The difference in the colouration between populations of *S. solisella* from El Hierro and Tenerife is not unique. Several species from El Hierro generally have a darker grey or blackish colouration than from other of the Canary Islands, e. g. *Chersogenes klimeschi* (Gozmány, 1975) (Autostichidae), *Agdistis bifurcatus* Agenjo, 1952 (Pterophoridae), *Pempeliella canariella* Asselbergs, 2016 (Pyrilidae).

Scythis ochrelinella Falck, sp. nov. (Figures 30, 43, 43a, 43b)

Holotype ♂: SPAIN, Tenerife, Arona, 21-V-3-VI-2019, leg. P: Falck, genitalia slide 3003PF, DNA sample Lepid Phyl 0397PF/CILEP396-20 (PF later MNCN).

Description: Male. Wingspan 11.5 mm. Labial palp slightly upturned, segment 2 dark brown, whitish dorsally, segment 3 dark brown slightly shorter than segment 2. Antenna slightly more than 1/2

the length of the forewing, fuscous, with short ciliae about 0.5 of the antenna diameter. Vertex dark brown. Collar and tegula brown mottled with beige. Thorax blackish brown. Forewing blackish brown, lighter brown along dorsum, mottled with few white scales, especially near dorsum and in apical area; from near the base to about 1/2 an ochre-coloured distinct median stripe, upwards bordered by white, just below the stripe a small white spot and another white spot at the end of the cell; fringe dark grey. Hindwing width about 1/2 of the forewing, dark grey; fringe dark grey.

Male genitalia (Figure 43): Valvae symmetrical. Uncus sub-rectangular, posterior margin with broad U-shaped indentation, lateral lobes shortly setosed; gnathos triangular, distal arm short, pointed; tegumen sub-triangular, postero-laterally with two large, triangular pointed projections; valvae narrow, distally forked, each arm with a longitudinal flap; phallus slightly shorter than half the length of valvae, curved. Segment VIII symmetrical. Tergum VIII (Figure 43b) sub-trapezoid; sternum VIII (Figure 43a) sub-trapezoid, posteriorly with deep U-shaped indentation.

Female genitalia: Unknown.

DNA barcodes (Figure 54): The specimen was sequenced, resulting in DNA barcode fragments of 638 bp. The barcode falls within Barcode Index Number (BIN) BOLD: AEC1614. The minimum p-distance to nearest neighbour an undescribed *Scythris*-species is 6.94%.

Diagnose: *S. ochrelinella* resembles superficially *S. rondaensis* Bengtsson, 1997. It can be distinguished by the distinct ochre stripe bordered by black and white and the dark grey hindwing, in *S. rondaensis* the forewing is black with two indistinct, smaller ochre dots, the hindwing is brownish and more pointed. In the male genitalia the tegumen with lateral, triangular projections and the forked valvae with longitudinal flaps on each arm are characteristic.

Biology: Early stages unknown. The specimen was flying actively in a warm and sunny day.

Distribution: Known only from the type-locality nearby the small town Arona, Tenerife, Spain.

Etymology: The species is named after the characteristic ochre-coloured stripe on the forewing.

Remarks: It is not possible to place *S. ochrelinella* into one of the *Scythris* species-groups erected by Bengtsson (1997). *S. rondaensis* belongs to the *cistorum* species-group, which in the male genitalia is characterized by strongly sclerotized, more or less asymmetrical parts in the male genitalia; valvae with small lobes (Bengtsson, 1997, p. 124).

Discussion

The taxonomy of *Scythris petrella* is not entirely unproblematic, as it exhibits high variability in the adult appearance and high intraspecific values in COI between populations from separate islands of the Canary Islands. However, no differences were observed in the genitalia neither in males nor females between the populations and there is no correlation between divergence in COI and populations with entirely dark- (Aguamansa, Tenerife) nor entirely whitish speckled specimens (Arona, Tenerife). A high intraspecific variation in COI between species from separate islands of the Canary Islands is commonly observed (Falck et al. 2021, p. 298; Falck et al. 2022, p. 108; Falck & Karsholt, 2023). It can be interpreted as a snapshot of the evolutionary process.

All the known *Scythris*-species from the Canary Islands are easily recognizable by the genitalia, with only minor internal variation.

The molecular analyses support the taxonomic arrangement. All identified species are genetically distinct from other species with p-distance values between species ranging from 1.12% (between *S. aronaella* and *S. petrella*) to 6.94% (between *S. ochrelinella* and *Scythris* sp.). Although the minimum divergence between *S. aronaella* and *S. petrella*, *S. pseudoarachnodes* and *S. arachnodes* (1.12%, 1.78% and 1.82% respectively) are below the 2% threshold suggested as a putative guideline for species delimitation by Hebert et al. (2003), *S. aronaella* is described as a new species, because of the distinct and constant differences in the morphology in the male- and female genitalia and in the appearance of adults.

S. guimarensis Bengtsson, 1997 is transferred from the *klimeschi* species-group to the *petrella*

species-group based on the close genetically relationship in the group and because it is also a lichen-feeding species, however, there is a large diversity in the male genital morphology in the group.

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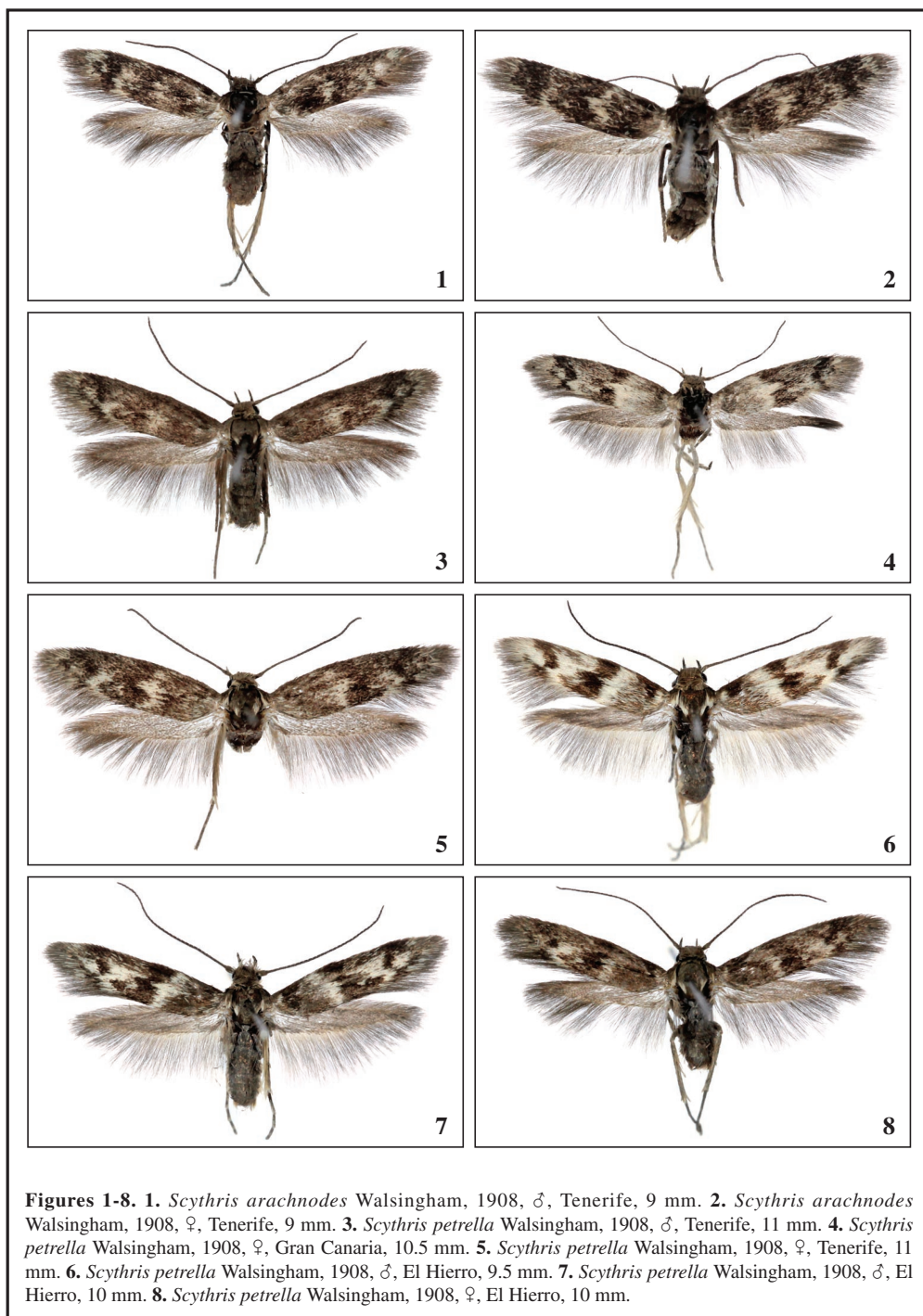
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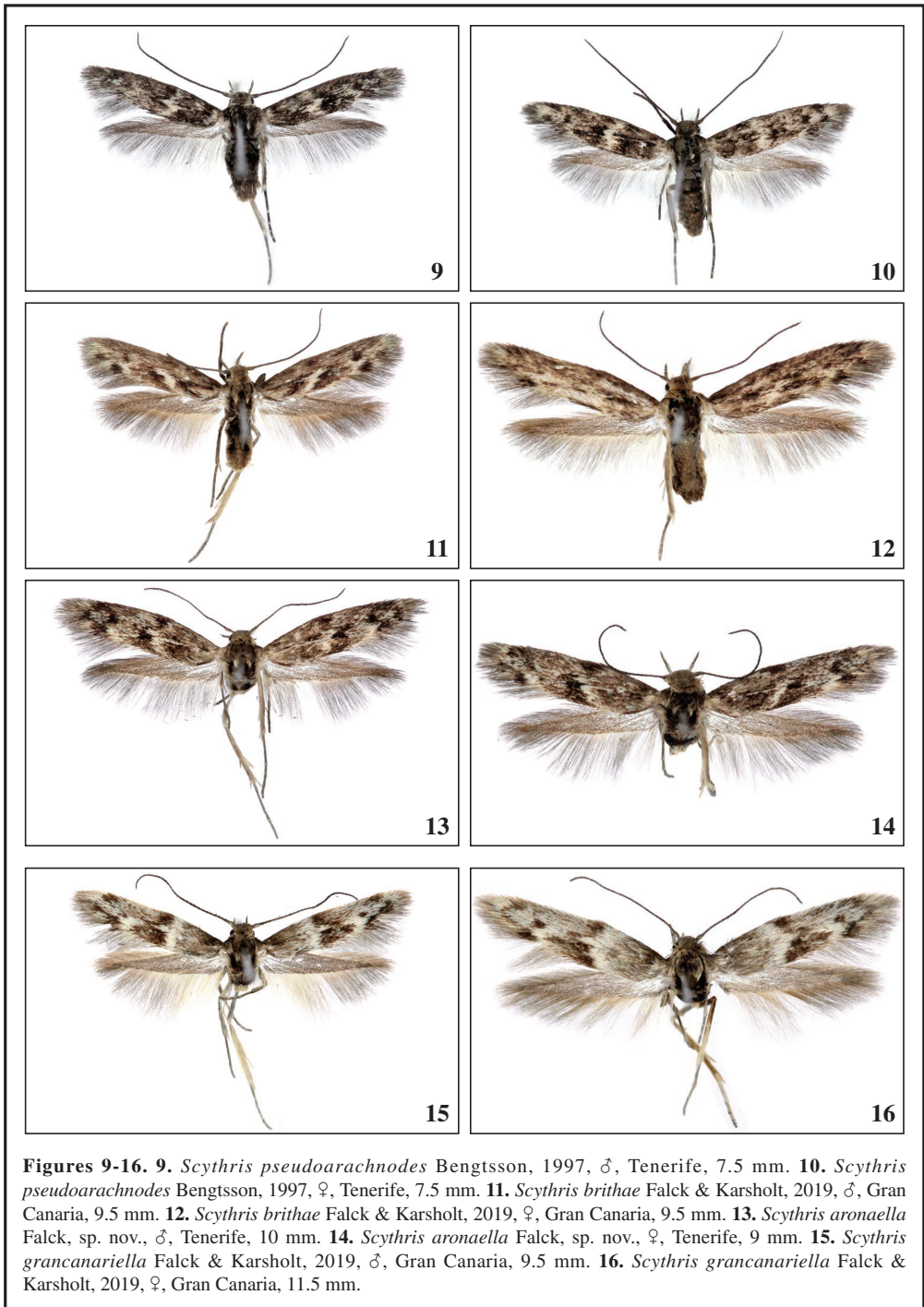
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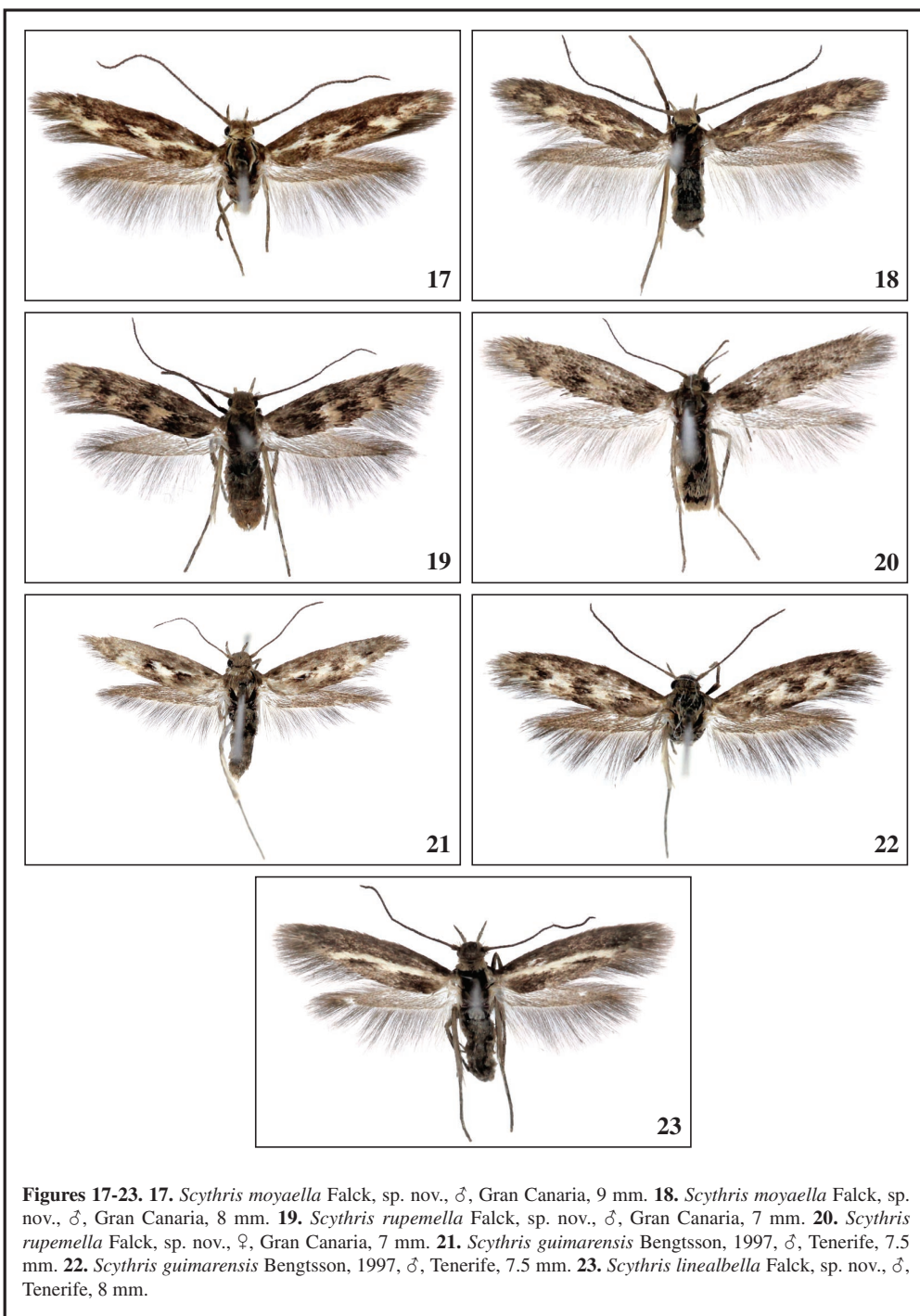
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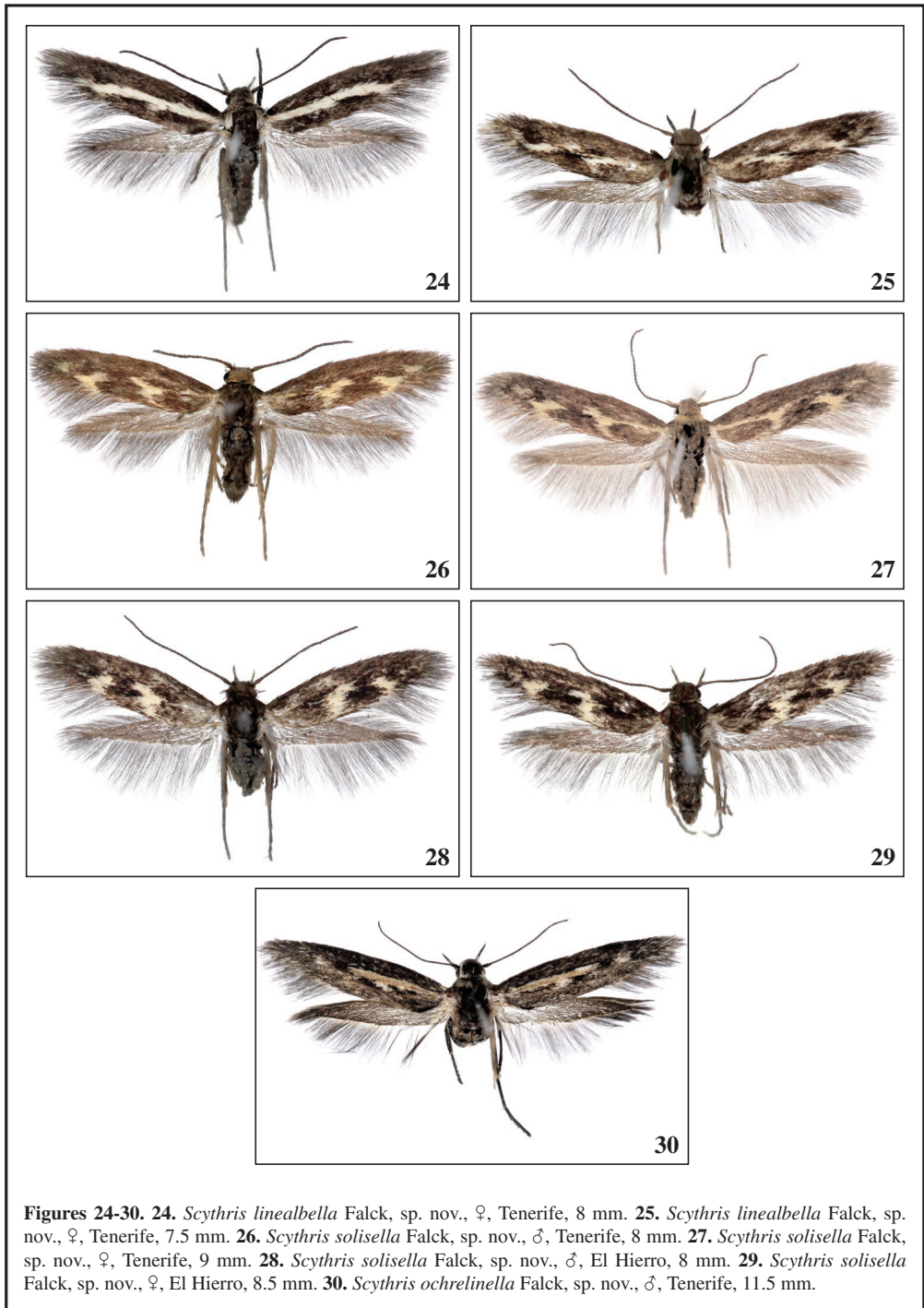


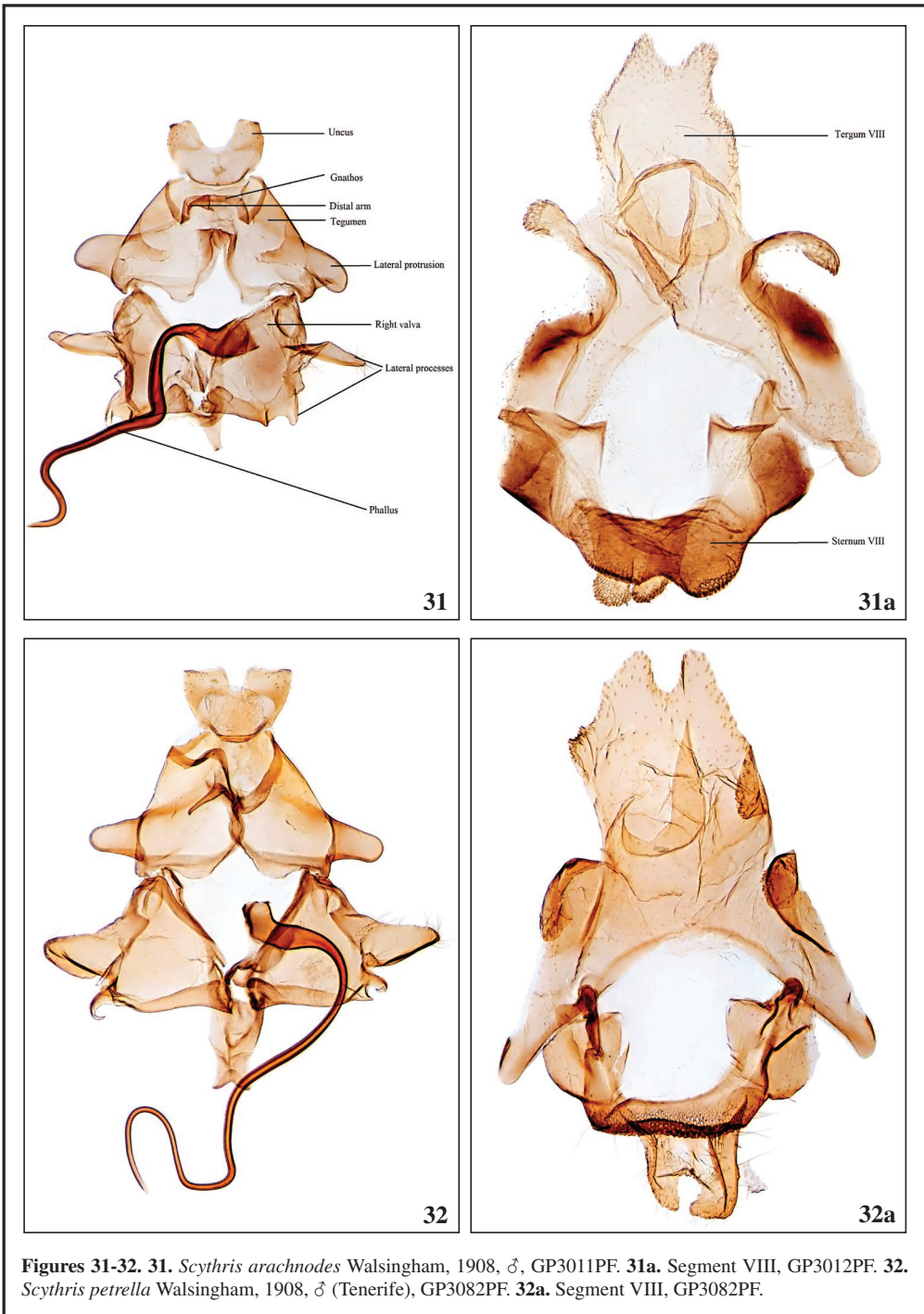


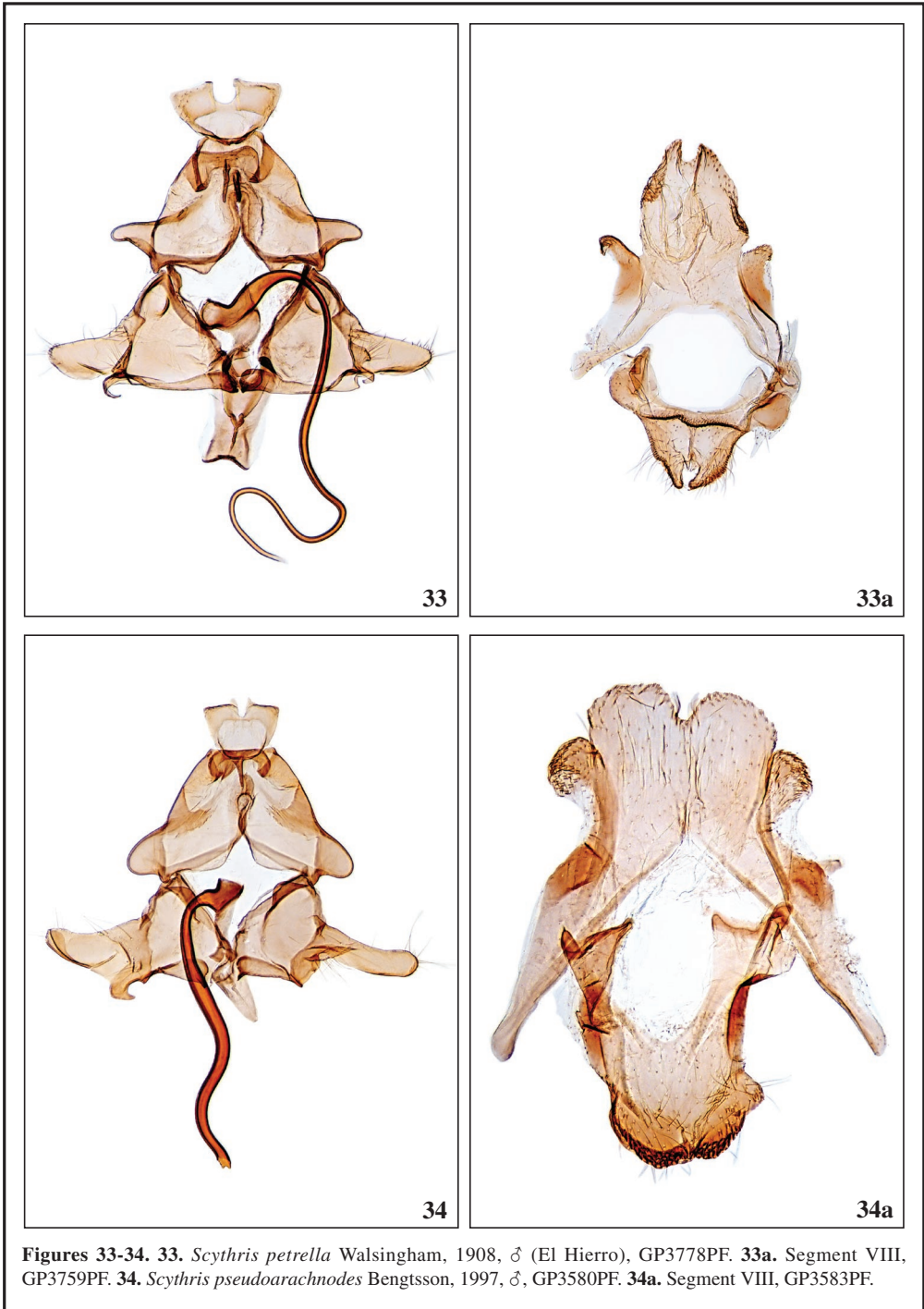
Figures 9-16. **9.** *Scythris pseudoarachnodes* Bengtsson, 1997, ♂, Tenerife, 7.5 mm. **10.** *Scythris pseudoarachnodes* Bengtsson, 1997, ♀, Tenerife, 7.5 mm. **11.** *Scythris brithae* Falck & Karsholt, 2019, ♂, Gran Canaria, 9.5 mm. **12.** *Scythris brithae* Falck & Karsholt, 2019, ♀, Gran Canaria, 9.5 mm. **13.** *Scythris aronaella* Falck, sp. nov., ♂, Tenerife, 10 mm. **14.** *Scythris aronaella* Falck, sp. nov., ♀, Tenerife, 9 mm. **15.** *Scythris grancanariella* Falck & Karsholt, 2019, ♂, Gran Canaria, 9.5 mm. **16.** *Scythris grancanariella* Falck & Karsholt, 2019, ♀, Gran Canaria, 11.5 mm.



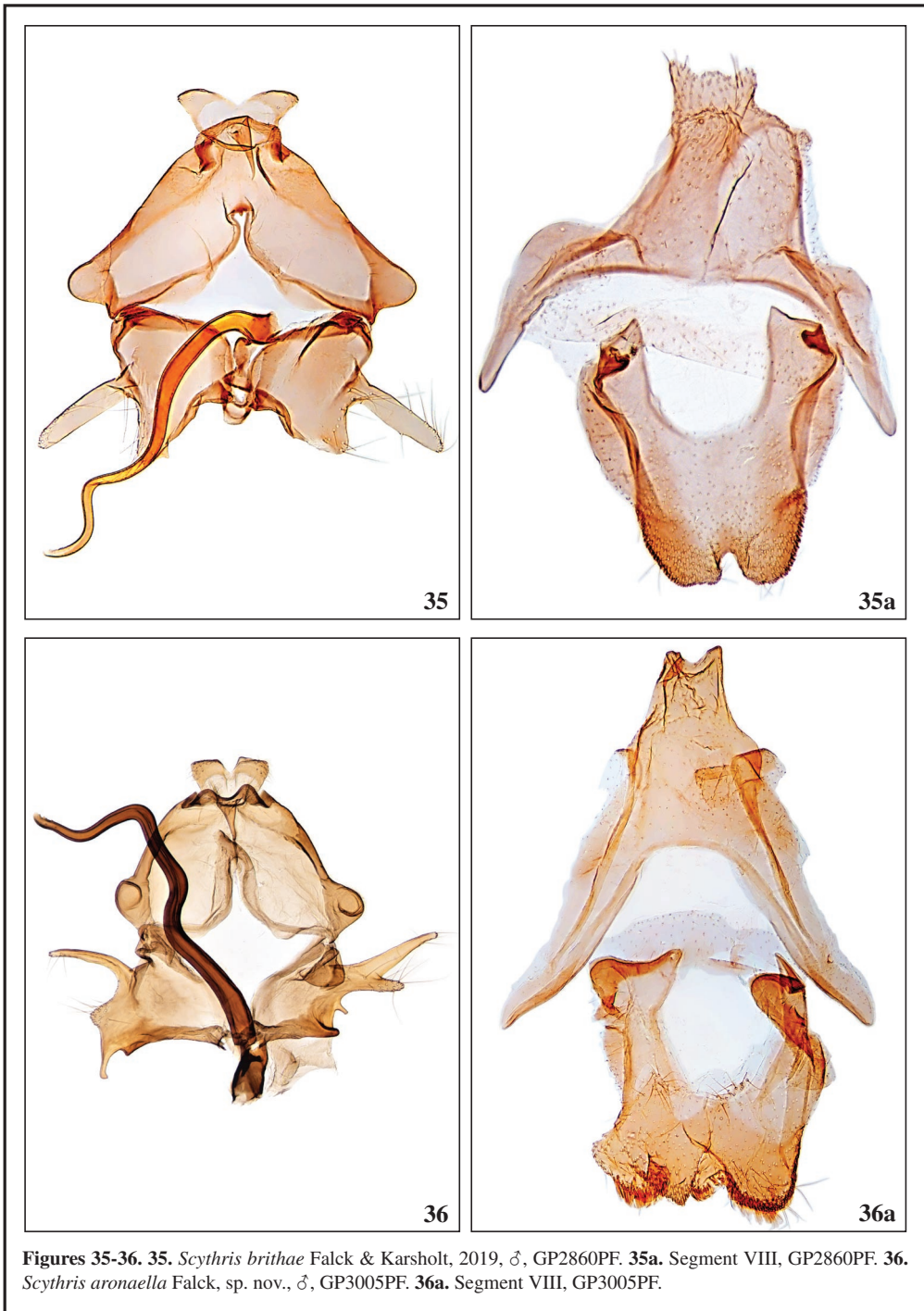
Figures 17-23. 17. *Scythris moyaella* Falck, sp. nov., ♂, Gran Canaria, 9 mm. 18. *Scythris moyaella* Falck, sp. nov., ♂, Gran Canaria, 8 mm. 19. *Scythris rupemella* Falck, sp. nov., ♂, Gran Canaria, 7 mm. 20. *Scythris rupemella* Falck, sp. nov., ♀, Gran Canaria, 7 mm. 21. *Scythris guimarensis* Bengtsson, 1997, ♂, Tenerife, 7.5 mm. 22. *Scythris guimarensis* Bengtsson, 1997, ♂, Tenerife, 7.5 mm. 23. *Scythris linealbella* Falck, sp. nov., ♂, Tenerife, 8 mm.

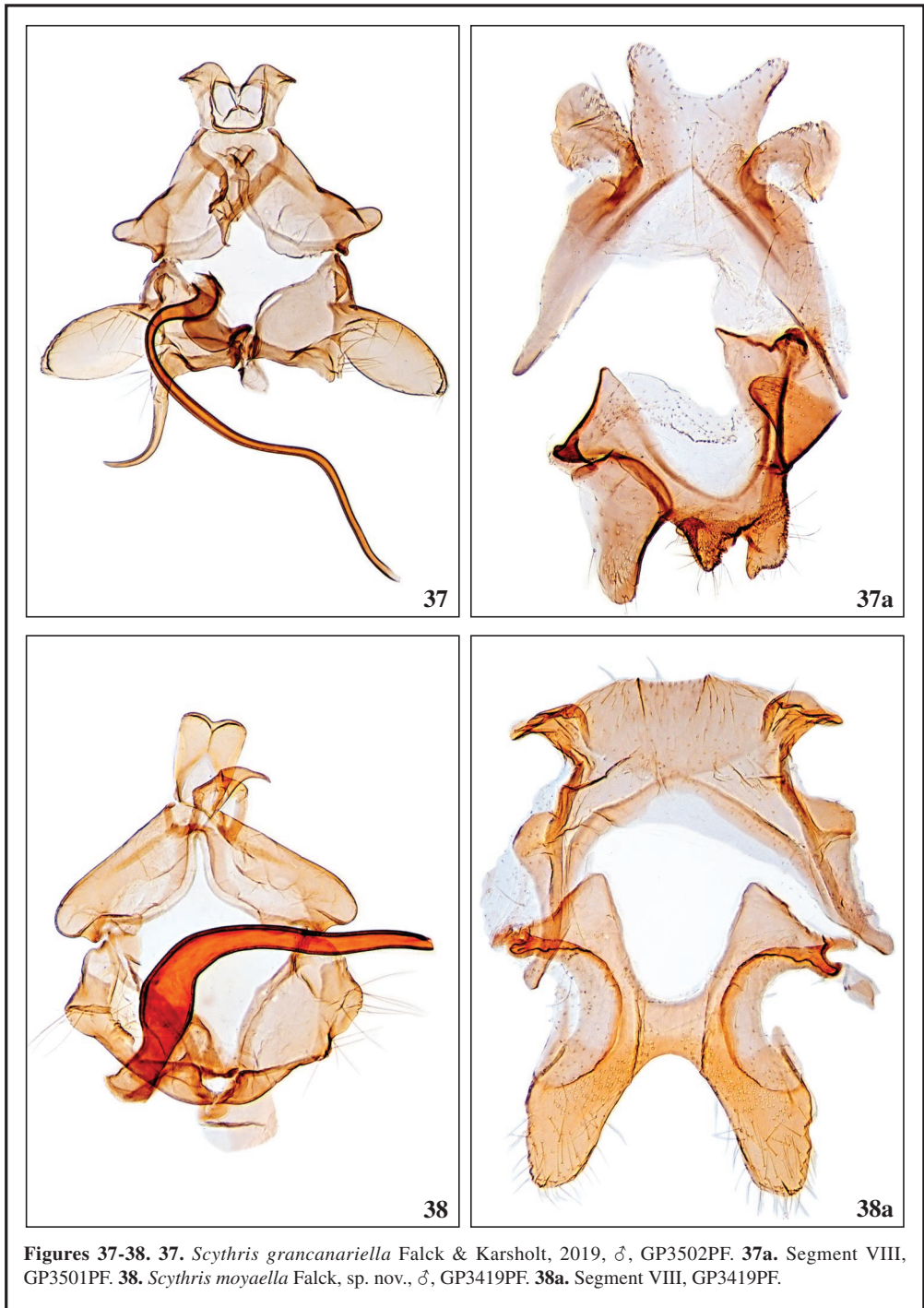




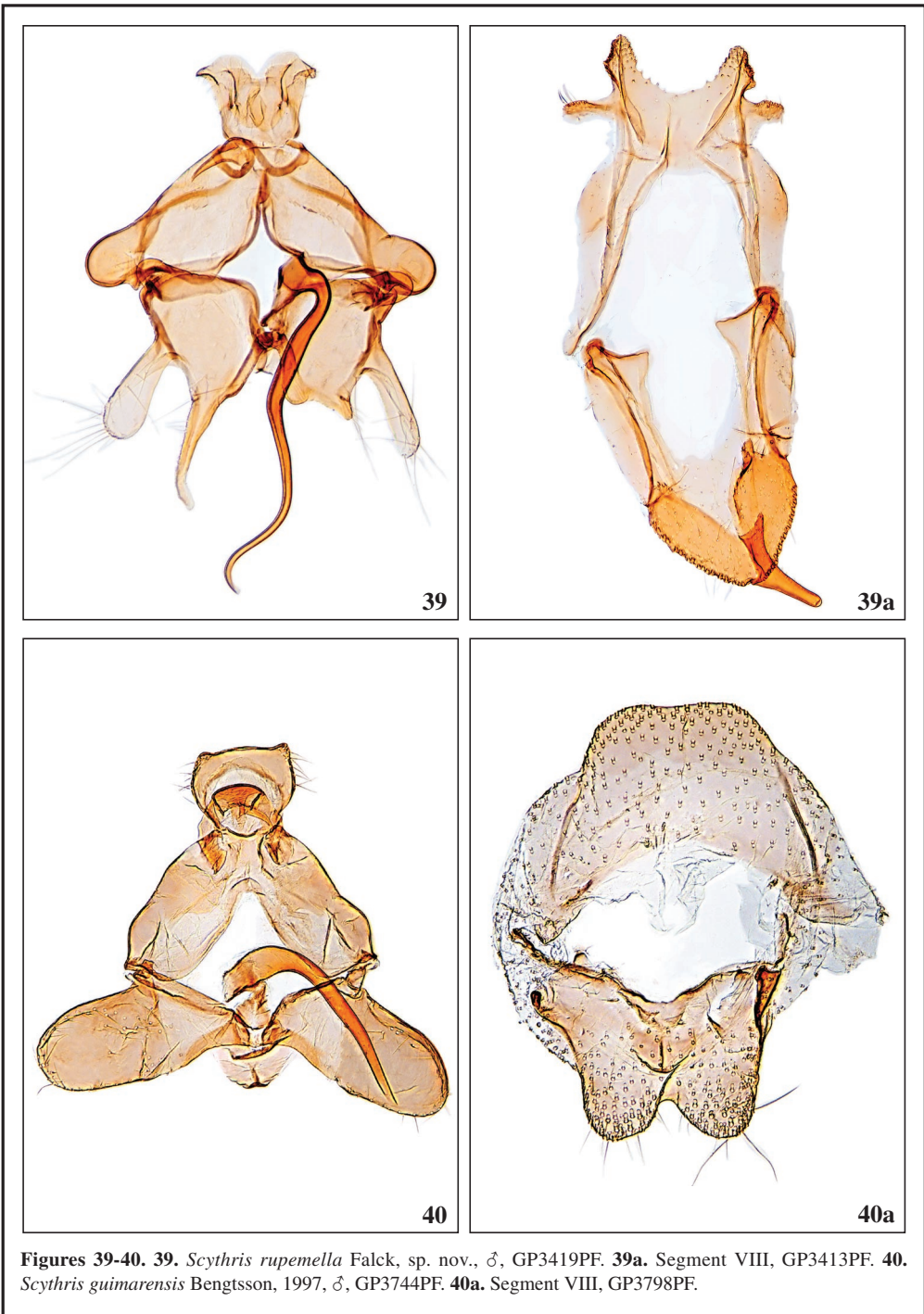


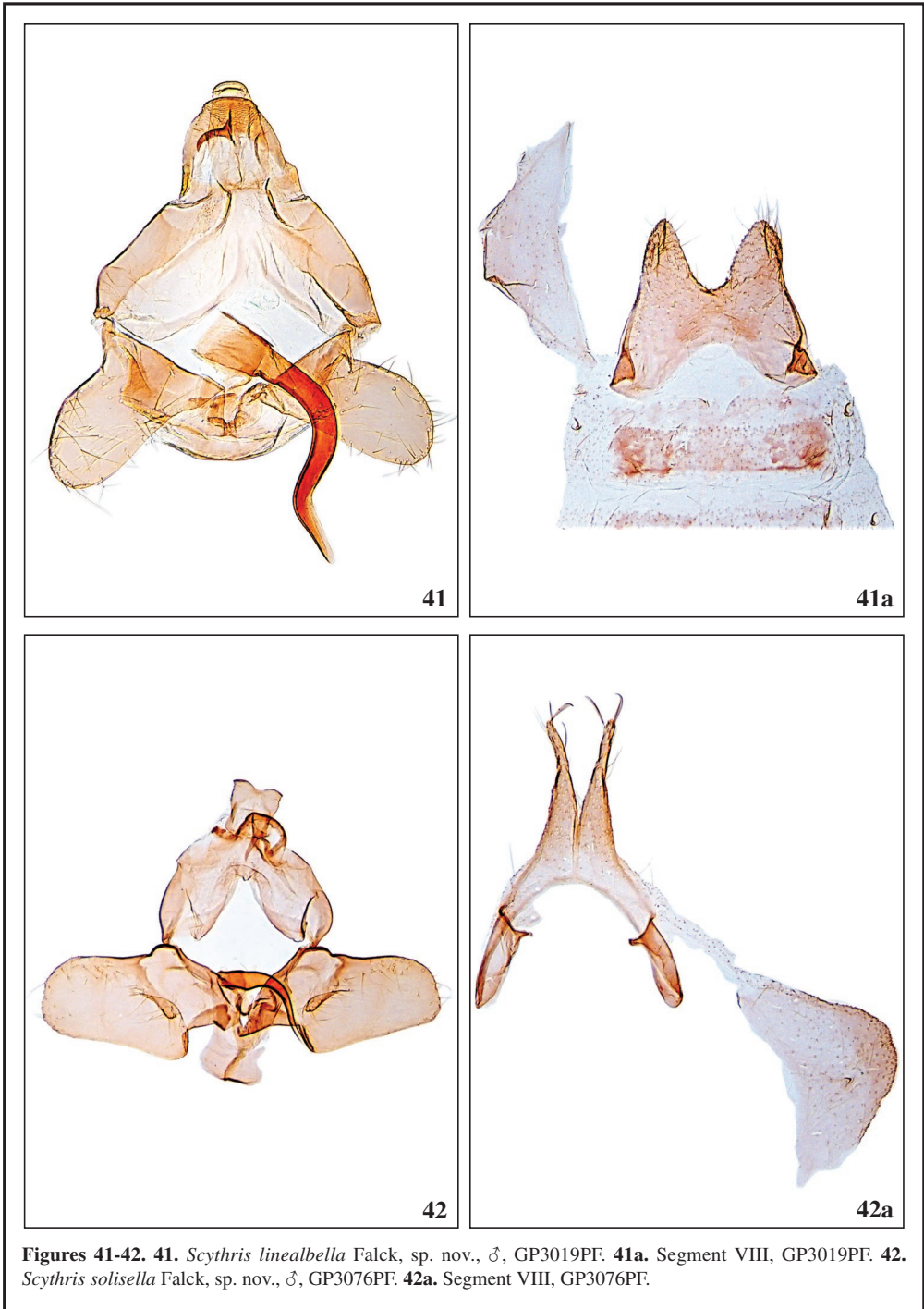
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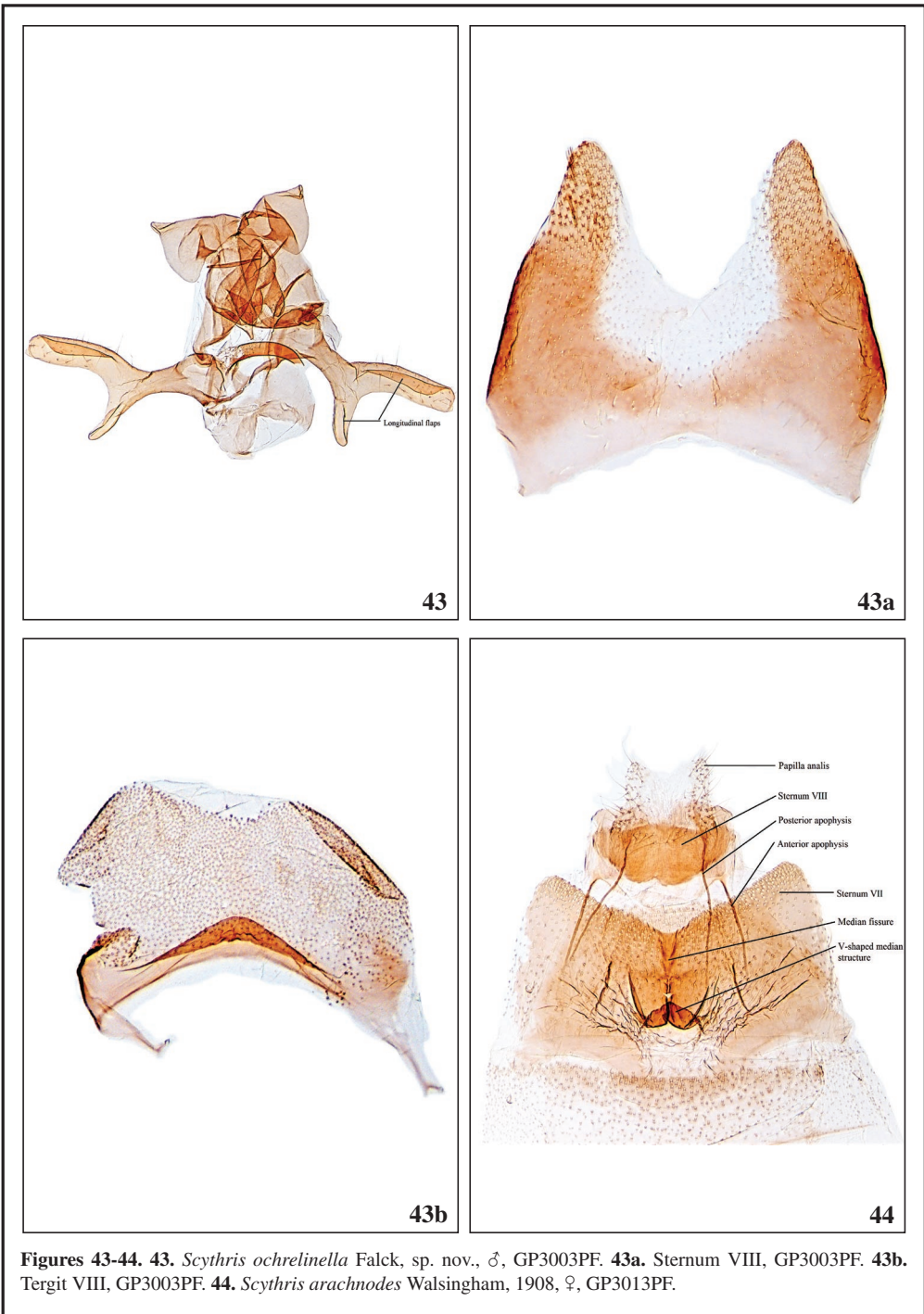


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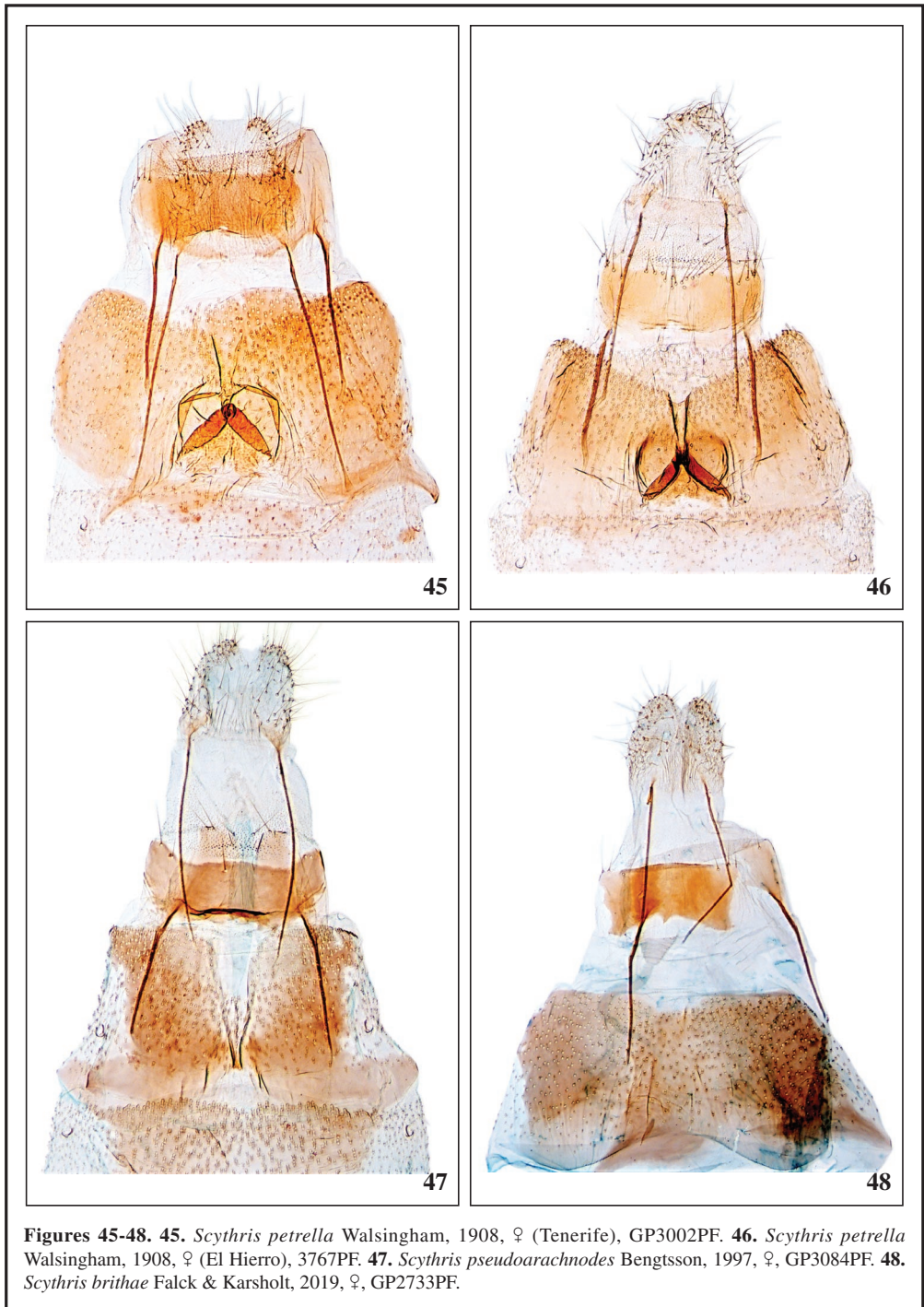




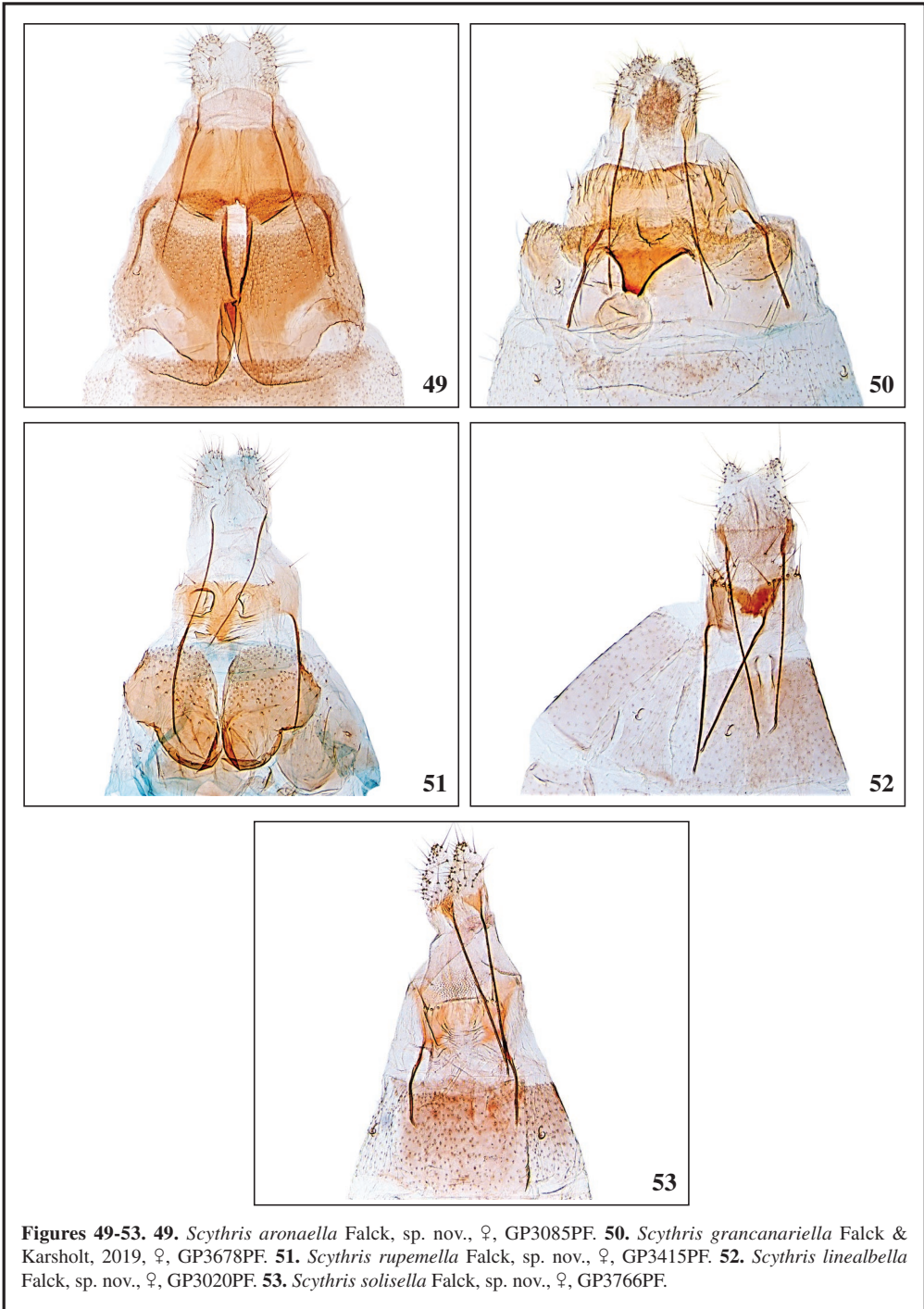
Figures 41-42. 41. *Scythris linealbella* Falck, sp. nov., ♂, GP3019PF. 41a. Segment VIII, GP3019PF. 42. *Scythris solisella* Falck, sp. nov., ♂, GP3076PF. 42a. Segment VIII, GP3076PF.



Figures 43-44. 43. *Scythris ochrelinella* Falck, sp. nov., ♂, GP3003PF. 43a. Sternum VIII, GP3003PF. 43b. Tergite VIII, GP3003PF. 44. *Scythris arachnodes* Walsingham, 1908, ♀, GP3013PF.



Figures 45-48. 45. *Scythris petrella* Walsingham, 1908, ♀ (Tenerife), GP3002PF. 46. *Scythris petrella* Walsingham, 1908, ♀ (El Hierro), 3767PF. 47. *Scythris pseudoarachnodes* Bengtsson, 1997, ♀, GP3084PF. 48. *Scythris brithae* Falck & Karsholt, 2019, ♀, GP2733PF.



Figures 49-53. 49. *Scythris aronaella* Falck, sp. nov., ♀, GP3085PF. 50. *Scythris grancanariella* Falck & Karsholt, 2019, ♀, GP3678PF. 51. *Scythris rupemella* Falck, sp. nov., ♀, GP3415PF. 52. *Scythris linealbella* Falck, sp. nov., ♀, GP3020PF. 53. *Scythris solisella* Falck, sp. nov., ♀, GP3766PF.

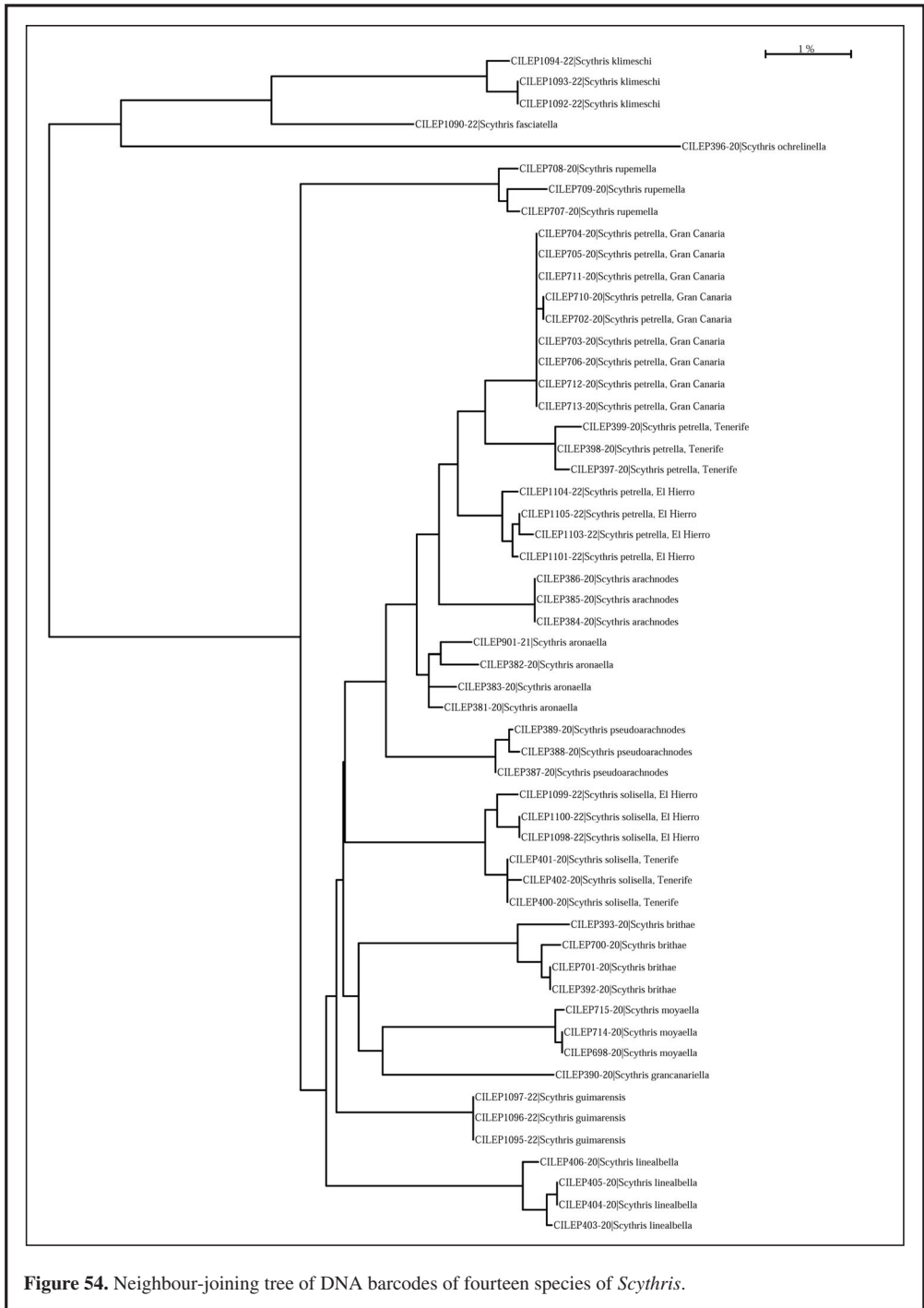


Figure 54. Neighbour-joining tree of DNA barcodes of fourteen species of *Scythris*.