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SOUTHERN EUROPEAN *PHYLLONORYCTER* SPECIES MINING *QUERCUS*, WITH TWO NEW SPECIES (LEPIDOPTERA: GRACILLARIIDAE)

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Abstract

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A review of 14 species of the genus *Phyllonorycter* Hübner, 1822, mining *Quercus* in southern Europe, is presented with descriptions of two new species, viz. *Phyllonorycter graecus* sp. n. developing on *Quercus ithaburensis* Decne. subsp. *macrolepis* (Kotschy) Hedge & Yalt. from Peloponnisos, Greece, and *P. gerfriedi* sp. n. mining *Quercus coccifera* L. from Crete. Six new synonyms have been established: *Phyllonorycter joviella* (Constant, 1890) and *P. anatolica* (Deschka, 1970) of *P. belotella* (Staudinger, 1859), *P. arkadiella* Derra, 1985 of *P. olympica* Deschka, 1983, *P. neli* Buvat, 1996 of *P. barbarella* (Rebel, 1901), *P. glaserorum* (Deschka, 1969) of *P. rebimbasi* (Mendes, 1910), and *P. sardiniensis* (Amsel, 1939) of *P. sublautella* (Stainton, 1869). The lectotype of *Lithocolletis belotella* Staudinger, 1859 has been designated. Diagnostic characters with figures of all species, brief data on their biology and distribution are given with several new country records. The record of *Phyllonorycter obtusifoliella* Deschka, 1974 in Europe has been mentioned.

Phyllonorycter, *Quercus*, southern Europe, new species

The species of the genus *Phyllonorycter* Hübner, 1822, mining *Quercus,* form a numerous as well as very heterogeneous group in Europe. Apparently, this group is polyphyletic and originated through repeated colonisation of *Quercus* during the speciation of the genus. About 30 species feeding on *Quercus* are reported from Europe at present (Buszko, 1996, 2004; De Prins & De Prins, 2005). A half of them occur more or less northwards up to the central (or southern parts of northern) Europe, often in accordance with the distribution of their hosts, the deciduous oak species. The morphology, biology and distribution of these species are comparatively well known on the whole (cf., e.g. Gregor, 1952; Kuznetsov, 1981; Emmet et al., 1985; Gregor & Patočka, 2001; van Nieukerken et al., 2001). The occurrence of the remaining species is restricted to various parts of southern Europe. The knowledge on these species is insufficient in many cases, with considerable confusion concerning their taxonomy, biology and distribution; however, some authors engaged in particular problems (e.g. Deschka, 1969, 1970 b, 1974, 1983, 1992; Derra, 1985). Several of these species have been included in the keys by Le Marchand (1936), Hering (1957) and Bradley et al. (1969), the distributional data have been summarized by Buszko (1996, 2004) and De Prins & De Prins (2005). The southern European species are attached mostly to evergreen oaks, but there are also several species mining thermophilous deciduous species among them. However, also this group is in no case a monophyletic entity, only small species groups or couples showing closer relationship. This contribution summarizes our results of investigations of the oak-mining *Phyllonorycter* species in various

parts of southern Europe in the past 15 years or so. We also used the collection, partly type material in some cases. Several taxonomic changes, new biological and distributional data are presented, diagnostic characters are given, adults and genitalia are figured. Two new species have been described.

Phyllonorycter endryella (Mann, 1855)
(Figs 1, 15, 29, 42, 43)

Verh. Zool.-bot. Ver. Wien, 5: 569 (*Lithocolletis*); type locality: Corsica, Ajaccio
Lithocolletis meridionella Möschler, 1866; *Berl. Ent. Ztschr*., 10: 144; Spain, Andalusia
Lithocolletis caudiferella Ragonot, 1875; *Bull. Séances Soc. Ent. France*, 1875: lxxiv; France, Montpellier

Material. 19 ♂♂, 24 ♀♀: Portugal, Faro, Assumadas, 21.vi.2006, 1 ♀; Spain, Girona, Anglés, 24.vi.1991, 3 ♂♂, Granada, El Molinillo, 28.vi.1992, 6 ♂♂, 7 ♀♀, leg. A. & Z. Laštůvka, coll. A. Laštůvka, Madrid, Cadalso de los Vidrios 2 km E, 7.viii.1986, 1 ♂, leg. S. Richter & E. J. v. Nieukerken, coll. RMNH, Teruel, Albarracin, 23.vi.1994, 2 ♂♂, Teruel, Montalbán, 4.vii.1991, 2 ♂♂, 2 ♀♀, Zaragoza, Aguarón, 12.vi.2006, 1 ♀; France, Vaucluse, Mirabeau, iv.2000, 2 ♀ ex p. (23.iii.2000, mines on *Quercus ilex*), Var, Collobriéres, v.2006, 3 ♂♂, 6 ♀♀ ex p. (16.iv.2006, mines on *Quercus suber*), Gard, Pouzilhac, v.2006, 2 ♂♂, 5 ♀♀ ex p. (17.iv.2006, mines on *Quercus ilex*), leg. A. & Z. Laštůvka, coll. A. Laštůvka.

Diagnosis. Wingspan 9.0–11.0 mm; thorax with a thin central line; forewing ochreous, only slightly rusty; four costal and two or three dorsal strigulae white, with black edging; the first dorsal very long, oblique, connected by a white line with the wing base; the basal streak short, narrow and even; a distinct black spot and a long hair pencil in apex.

Male genitalia. Valvae asymmetrical; the right valva elongate and narrow, with simple setae on its whole surface, with a rigid thorn at the end and with a thin filament; the left valva broad, with simple setae in dorsal and distal part, and with a strong filament; vinculum pointed; aedeagus long, slender, broad on its end.

Female genitalia. Papillae anales large, with dense short setae caudally and several long setae laterally; apophyses shorter than papillae anales; lamella antevaginalis not sclerotized; ring-shaped sclerotization on 7th segment; signum distinct, with two points.

Host plant and biology. *Quercus ilex* L., *Q. suber* L., *Q. coccifera* L.; mine on underside, large, with folded leaf margin; probably univoltine, larva ix.–iv., adult iv.–vi.

Distribution. Algeria, Morocco, Portugal, Spain, southern France, Corsica and Sardinia, old, not documented data from Croatia (Dalmatia)(Rebel, 1901; Triberti, 1979).

Phyllonorycter sublautella (Stainton, 1869)
(Figs 2, 16, 30)

The Tineina of Southern Europe, p. 197 (*Lithocolletis*); type locality: France, Menton
Lithocolletis sardiniensis Amsel, 1939; *Mem. Soc. Ent. Ital*., 17: 79; Sardinia, Tempio-Pausania; **syn. n.**

Material. 2 ♂♂, 16 ♀♀: France, Vaucluse, Pertuis, 10.vii.1991, 1 ♂, 1♀; Montenegro, Budva, vi.1986, 1 ♂, 12 ♀♀ ex p. (10.vi.1986, mines on *Quercus pubescens*); Greece, Etolia, Skourtou, 12.vi.1997, 1 ♀, Fthiotida, Agios Haralambos, 22.vi.1998, 1 ♀, Lakonia, Nea Marathea, 17.vi.1997, 1 ♀, all leg. A. & Z. Laštůvka, coll. A. Laštůvka.

Diagnosis. Wingspan in spring generation 6.5–6.8 mm, summer generations 4.8–5.5 mm; head rusty; forewing rusty, three or four costal and two dorsal strigulae silvery white, with black edging; a group of black scales in apex; the very similar species, *Phyllonorycter lautella* (Zeller, 1846), has a black head.

Male genitalia. Nearly symmetrical; valva with numerous simple hairs which are more rigid towards end, and with two filaments; vinculum triangular, without a distinct saccus; aedeagus slender, slightly bent, with a little hook on the end; 8th sternum triangular.

Female genitalia. Papillae anales short with dense long hairs; apophyses slender, slightly longer than anal papillae; ostium nearly indistinct, broadly U-shaped.

Host plant and biology. *Quercus pubescens* Willd., *Q. robur* L., and probably other deciduous oak species; mine on underside of leaf, usually on very low oak bushes; bi- or polyvoltine.

Distribution. France, Italy, Sardinia, Croatia, Montenegro, Greece (new to Montenegro).

Remark. The type material of *Lithocolletis sardiniensis* Amsel, 1939 has not been studied, but the original description of this taxon (cf. Hartig & Amsel, 1939) accords in the whole with *Phyllonorycter sublautella*.

Phyllonorycter cocciferella (Mendes, 1910)
(Figs 3, 18, 34)

Broteria, Ser. Zool., 9: 164 (*Lithocolletis*); Portugal, Torres Vedras

Material. 11 ♂♂, 4 ♀♀; Portugal, Santarém, Monsanto, 19.vi.2005, 1 ♂, Faro, Assumadas, 21.vi.2006, 7 ♂♂, 2 ♀♀; Spain, Barcelona, Vilafranca del Penedes, 25.vi.1991, 1 ♂, Tarragona, Gandesa, 4.vii.1994, 1 ♂; France, Aude, Sigean, 6.vii.1992, 1 ♂, 1 ♀, 22.vi.2001, 1 ♀, leg. A. & Z. Laštůvka, coll. A. Laštůvka.

Diagnosis. Wingspan 7.0–7.5 mm; thorax with a thin white line; forewing ochreous rusty, sheeny, three or four costal and three or four dorsal strigulae white, with black edging; the first dorsal below the

basal streak; dispersed black scales from the end of the second dorsal towards apex; a black dot in apex.

Male genitalia. Valvae slightly asymmetrical, with finger-shaped projections and long setae on their ends; filaments large; saccus short, broad; aedeagus long and straight, slender in its basal third, thicker in middle, with a little hook at the end.

Female genitalia. Papillae anales with dense long hairs; apophyses long and slender; 8th segment distinctly sclerotized caudally; lamella antevaginalis broadly sclerotized, U-shaped, with toothed caudal edge and with sclerotized lateral projections; signum in corpus bursae small.

Host plant and biology. *Quercus coccifera* L.; mine on underside; probably univoltine, larva ix.–iv., adult iv.–vii., but Mendes (1910) mentions a second generation in July.

Distribution. Morocco, Portugal, Spain, southern France (new to France).

Phyllonorycter suberifoliella (Zeller, 1850)
(Figs 4, 17, 31)

Ent. Ztg Stettin, 11: 208 (*Lithocolletis*); type locality: Italy, Livorno

Material. 23 ♂♂, 16 ♀♀: Italy, Calabria, Santa Catarina de lo Ionio, 12.vi.2000, 1 ♂; Croatia, Istria, Rabac, vii.1996, 8 ♂♂, 7 ♀♀ ex p. (25.vi.1996, mines on *Quercus ilex*), iv.1999, 14 ♂♂, 9 ♀♀ ex p. (20.iii.1999, mines on *Quercus ilex*), all leg. A. & Z. Laštůvka, coll. A. Laštůvka.

Diagnosis. Wingspan in spring generation 9.0–11.0 mm, in summer generation 8.0–9.0 mm; head whitish; thorax with a thin white line; forewing rusty, with two costal and one dorsal strigula; both first strigulae narrow, long, elongated by narrow lines up to wing base; the basal streak reaching nearly to the middle of wing, slightly bent towards costa at the end; cilia with black ends in the fore part of apex.

Male genitalia. Valvae asymmetrical, with distinct long thorns before their ends and only with very short filaments in basal parts; right valva narrow; left valva broad, large; saccus distinct; aedeagus long, slender, with a little tooth before its end; 8th sternum pointed.

Female genitalia. Papillae anales large, with short hairs caudally and with two groups of several long hairs laterally; lamella postvaginalis broad.

Host plant and biology. *Quercus suber* L., *Q. ilex* L.; mine on underside, large; at least 2 generations.

Distribution. Spain, France, Italy, Croatia, Greece.

Phyllonorycter gerfriedi sp. n.
(Figs 5, 21, 32)

Material. Holotype ♂, Crete, Lasithi, Kato Metohi, 29.iv.–2.v.1993 ex l. (27.iv.1993, mine on *Quercus coccifera*), leg. et coll. G. Deschka; Paratypes 4 ♂♂, 7 ♀♀, same data, leg. et coll. G. Deschka.

Description. Wingspan 7.2–9.5 mm; head and thorax brownish; antenna whitish grey; forewing brownish rusty, nearly unicoloured; the first costal strigula whitish, indistinct, in the middle of the wing, reaching with a narrow line towards base; the inner margin of this strigula with greyish black edging; the next three strigulae indicated by greyish brown scales; the first dorsal very narrow and long, with dark edging on the inner side connected with a group of greyish brown scales in apex; the basal streak absent; hindwing greyish brown, cilia more light; legs mostly unicoloured, whitish ochreous, with a few brownish spots in the first pair.

Diagnosis. Thorax without white line; forewing nearly unicoloured, first strigulae indistinct, oblique and narrow; the basal streak absent.

Male genitalia. Slightly asymmetrical; valvae covered with dense simple hairs which are more rigid towards ends, and with one short subapical thorn; the right valva angled at its end, the left valva rounded; aedeagus even, slender, with a conspicuous projection before its end; vinculum and 8th sternum triangular but rounded cranially.

Female genitalia. Papillae anales short, with very long dense hairs; apophyses long; lamella antevaginalis broadly oval, with sinuate sclerotized projections.

Hostplant and biology. *Quercus coccifera* L.; mine on underside; voltinism unknown.

Distribution. Crete.

Etymology. Named after Gerfried Deschka, who discovered this species and distinguished it as new.

Phyllonorycter rebimbasi (Mendes, 1910)
(Figs 6, 19, 33, 44, 45)

Broteria, Ser. Zool., 9: 163 (*Lithocolletis*); type locality: Portugal, Torres Vedras
Lithocolletis glaserorum Deschka, 1969; *Entomologist´s Rec. J. Var*., 81: 47; Spain, Catalonia, Port Bou; **syn. n.**

Material. 7 ♂♂, 5 ♀♀: Portugal, Santarém, Monsanto, 19.vi.2005, 1 ♀; Spain, Alicante, Puerto de Tudons, 27.vi.1991, 1 ♂, Almeria, Uleila del Campo, 26.vi.1992, 1 ♀, Murcia, La Bermeja, 25.vi.1992, 2 ♀♀, Teruel, Alcorisa, 5.vii.1991, 1 ♂, Teruel, Montalbán, 4.vii.1991, 1 ♂, Teruel, Vivel del Rio, 17.vii.1993, 1 ♂, 21.vi.1994, 1 ♂; France, Var, Réal-Martin, v.2006, 1 ♂, 1 ♀ ex p. (17.iv.2006, mines on *Quercus coccifera*); Aude, Sigean, 23.vi.1991, 1 ♂, all leg. A. & Z. Laštůvka, coll. A. Laštůvka.

Diagnosis. Wingspan 7.2–9.0 mm; head white; thorax with a broad white band; forewing ochreous rusty, with a large white field on the costa near the base and two dorsal and costal strigulae with black edging; a group of black scales above the second dor-

sal; a black dot in apex; a black wave ending with a little hair pencil in the fore part of cilia line.

Male genitalia. Valva short, broadest at the end, with distinct prominent thorn; vinculum triangular, pointed; aedeagus short and thick, bulbous basally and bifurcate distally; 8th sternum broad cranially.

Female genitalia. Papillae anales broad, flat, with dense long setae; apophyses long and slender; lamella postvaginalis broad, distinct; lamella antevaginalis large, sclerotized, with broad ostium bursae; antrum distinct; signum bursae with a bifurcate thorn.

Host plant and biology. *Quercus coccifera* L.; mine on underside, large; probably univoltine, the mines with larvae and pupae have been collected in iii.–iv., adults reared or collected in iv.–vi.

Distribution. Portugal, Spain, southern France (new to France).

Remark. The conspecificity of *Phyllonorycter rebimbasi* and *P. glaserorum* is evident from the original description and the forewing figure by Mendes (1910).

Phyllonorycter belotella (Staudinger, 1859)
(Figs 7, 20, 35, 52, 53)

Ent. Ztg Stettin, 20: 257 (*Lithocolletis*); type locality: Spain, Granada
Lithocolletis joviella Constant, 1890; *Ann. Soc. Ent. France*, 6: 12, pl. 1, fig. 9; France, Alpes Maritimes; **syn. n.**
Lithocolletis (*Phyllonorycter*) *anatolica* Deschka, 1970; *Polskie Pismo Ent*., 40: 739; Asia min., Turkey, Gebze (Izmit); **syn. n.**

Material. 33 ♂♂, 36 ♀♀: Lectotype ♀, Spain, Granada, origin, P. Triberti iv.03 prep. gen., Lepidoptera 2346 Euparal, coll. Staudinger (ZMHB)(designated here); Spain, Almería, Sierra de Baza, El Haza del Riego, 23.vi.2006, 1 ♀, leg. A. & Z. Laštůvka, coll. A. Laštůvka, Cádiz, Punta Paloma, 11.iv.1994, 1 ♀, leg. H. van der Wolf, coll. A. Laštůvka, Girona, 11 km N Figueras, 100 m, 2.iv.–7.v.1980, 2 ♂♂ ex l. (30.iii. and 6.iv.1980, mines on *Quercus coccifera*), leg. et coll. G. Deschka, Girona, Anglés, 24.vi.1991, 2 ♂♂, 3 ♀♀, Granada, Sierra Guillimona, Puerto Pinar, 16.vii.1993, 1 ♀, 29.vi.2003, 1 ♀, Lleida, Benavent, 4.vii.1991, 3 ♂♂, 4 ♀♀, leg. A. & Z. Laštůvka, coll. A. Laštůvka, Segovia, San Ildefonso, 1 ♀, ex coll. Staudinger and coll. Povolný, coll. A. Laštůvka, Teruel, Montalbán, 4.vii.1991, 2 ♂♂, 2 ♀♀, Zaragoza, Aguarón, 12.vi.2006, 5 ♀♀, leg. A. & Z. Laštůvka, coll. A. Laštůvka; Islas Bal., Mallorca, Lluchmayor, 80–150 m, 19.iv.–8.v.1984, 2 ♂♂, 1 ♀ (16.iv.1984, mines on *Quercus coccifera*), 40 m, 24.iv.–7.v.1984, 2 ♂♂, 1 ♀ (21.iv.1984, mines on *Quercus coccifera*), leg. et coll. G. Deschka; France, Alpes Maritimes, Golfe Juan, 1 ♂, 15.iv.[18]93, ex coll. Constant (as '*joviella*') and coll. Povolný, coll. A. Laštůvka, Gard, Pouzilhac, v.2006, 7 ♂♂, 4 ♀♀ ex p. (16.iv.2006, mines with pupae on *Quercus ilex*), Var, Réal-Martin, v.2006, 1 ♂ ex p. (17.iv.2006, mines with pupae on *Quercus coccifera*), Var, Collobriéres, v.2006, 7 ♂♂, 5 ♀♀ ex p. (17.iv.2006, mines with pupae on *Quercus suber*); Croatia, Dalmatia, Gruda, 7.vi.1986, empty mines on *Quercus ilex*; Greece, Fthiotida, Agios Haralambos, 27.v.1999, 3 ♀♀, Ioannina, Asprangeli, 10.vi.1997, 1 ♂, 1 ♀, Pieria, Kato Milia, 23.v.1999, 2 ♂♂, 1 ♀, leg. A. & Z. Laštůvka, coll. A. Laštůvka; Turkey, Smyrna [Izmir], 1 ♂, ex coll. Staudinger and coll. Povolný, coll. A. Laštůvka.

Diagnosis. Wingspan 8.0–10.5 mm; thorax with a thin central line and with a narrow border on tegulae; forewing golden brownish rusty, four costal and two dorsal strigulae white, very sheeny, third and fourth dorsals sometimes indicated by several silvery scales; strigulae with black edging, black scales between tops of strigulae; the basal streak thin, reaching up to one third of the wing, with black edging; a distinct black spot in apex.

Male genitalia. Slightly asymmetrical; valva angular at the end, with simple hairs in the medial part and especially in its distal quarter, with a group of rigid thorns in the ventral angle of its end, and with a strong filament basally; vinculum pointed without distinct saccus; aedeagus straight, thicker in its medial part and with a little hook distally.

Female genitalia. Papillae anales large, with dense long hairs; periostial region large, sclerotized and specialized, ostium distinct; signum of corpus bursae small, with two points.

Host plant and biology. *Quercus ilex* L., *Q. coccifera* L. and *Q. suber* L.; mine on upperside, flat; probably univoltine, larva ix.–v., adult iv.–vi.

Distribution. Algeria, Morocco, Portugal, Spain incl. Baleares, southern France, Italy, Croatia (Istria and Dalmatia), Macedonia, Greece, Turkey (new to Croatia and Baleares).

Remarks. Staudinger´s type series of *Lithocolletis belotella* comprises two species, later named as *Lithocolletis joviella* Constant, 1890 and *L. barbarella* Rebel, 1901. Staudinger (1859) reared his specimens from *Quercus ilex* near Granada (= *P. joviella*) and collected near Chiclana (= *P. barbarella* or a mixture of *P. barbarella* and *P. joviella*). The locality of Granada is the first mentioned, the reared material is clearly delimited and definable, and *P. barbarella* has not been known from *Quercus ilex* until present, therefore the species known as *P. joviella* has been selected as the lectotype.

There are no specific differences between *Phyllonorycter belotella* and *P. anatolica* (cf. Deschka, 1970 a; Derra, 1985; Deschka, pers. comm.).

Phyllonorycter graecus sp. n.
(Figs 8, 22, 36, 46, 47)

Material. Holotype ♂, Greece, Arkádia, Kosmas, vi.1996 ex p. (18.vi.1996, mines on *Quercus ithaburensis* subsp. *macrolepis*); Paratypes 4 ♂♂, 5 ♀♀: same data 2 ♂♂, 3 ♀♀, Etólia, Skourtou, 12.vi.1997, 2 ♀♀, Lakónia, Skou-

tari, 16.vi.1998, 1 ♂, Messinia, Pírgos, 1.vi.1999, 1 ♂, all leg. A. & Z. Laštůvka, coll. A. Laštůvka.

Description. Wingspan 6.0–6.2 mm; head white with several brownish hairs; antenna whitish, with a black first segment; thorax without a white central line; forewing ochreous rusty, four costal (the last indistinct) and two dorsal strigulae white; the first costal large, with black edging also on its distal side, the next strigulae edged with black scales only on their basal sides or on their tops; the edging of the first dorsal is connected with the black line which ends in a large group of black scales in apex; the black line in the fore part of cilia ends with a little hair pencil; the basal streak absent; hindwing whitish grey, cilia whitish, with a black spot in apex in several specimens; legs whitish, with five black spots on ends of segments in fore legs, with four spots in second legs and with two longer and one quite at the end in last legs.

Diagnosis. Very similar to *Phyllonorycter quercus* (Amsel, 1935) habitually. The costal strigulae of this species are less distinct, the black scales and the black line absent in apex and the apical black spot is present. The genitalia of these species are quite different.

Male genitalia. Nearly symmetrical; valvae oval, with simple hairs only, and with large basal processes with short filaments; aedeagus even, with a band-shaped projection on its end; vinculum triangular, pointed cranially; 8th sternum triangular, blunt cranially.

Female genitalia. Papillae anales with dense middle long hairs; apophyses posteriores very long; 8th segment short, sclerotized; ostium bursae and lamella antevaginalis indistinct.

Host plant and biology. *Quercus ithaburensis* Decne. subsp. *macrolepis* (Kotschy) Hedge & Yalt.; mine on underside, large, strongly constricted; pupa in a very fine cocoon; bi- or polyvoltine.

Distribution. Greece, Peloponnisos.

Etymology. Named after Greece (as 'Greek'), country of its origin.

Remark. The new species was collected together with *Phyllonorycter obtusifoliella* Deschka, 1974 (new species to Europe) in the holotype locality. The larvae of this species develop on *Acer sempervirens* L. there.

Phyllonorycter olympica Deschka, 1983
(Figs 9, 23, 37)

Ztschr. Arbeitsgem. Österr. Ent., 35: 4; type locality: Greece, Mt. Olympus, Litokhoron
Phyllonorycter arkadiella Derra, 1985; *Ann. Mus. Goulandris*, 7: 363; Greece, Peloponnisos, Achladokambos; **syn. n.**

Material. 15 ♂♂, 3 ♀♀: Greece, Ahaia, Kalavrita, 5.vi.1999, 1 ♂, 20.vi.1997, 1 ♂, Argolida, Kandia, 14.vi.1998, 1 ♂, 1 ♀, Arkádia, Pigadákia, 22.vi.1998, 1 ♂, Fthiótida, Agios Haralambos, 11.vi.1997, 1 ♂, 22.vi.1998, 1 ♂, Ioannina, Asprángeli, 10.vi.1997, 1♀, Lakonia, Apidia, 15.vi.1997, 4 ♂, 1 ♀, Messinia, Proastió, 19.vi.1998, 2 ♂♂, Préveza, Thesprotikó, 14.vi.1996, 1 ♂, 11.vi.1998, 1 ♂, Thessaloniki, Petralona, vi.1991, 1 ♂ ex p. (25.v.1991, mine with pupa on *Quercus coccifera*), all leg. A. & Z. Laštůvka, coll. A. Laštůvka.

Diagnosis. Wingspan 6.2–8.8 mm; a distinct central line on thorax; forewing ochreous rusty, four costal and two dorsal strigulae white, with black edging; the black colouration not connected between costal and dorsal strigulae in a large black field; the basal streak short, narrow and even; a black dot in apex; a black line of apical scales outside the fourth dorsal strigula.

Male genitalia. Asymmetrical, valvae elongate, with rigid short setae, the right valva broader; filaments of both valvae very long; saccus slender and very long; aedeagus long, even, with a distinct hook-shaped projection on its end; 8th sternum elongate, triangular.

Female genitalia. Papillae anales broad with dense long hairs; apophyses posteriores long; periostial region complicated, sclerotized; 8th segment covered with little thorns; antrum large, sclerotized, with two lateral horns caudally.

Host plant and biology. *Quercus coccifera* L.; mine on underside; univoltine, larva up to v., adult v.–vi.

Distribution. Greece.

Remark. The conspecificity of *Phyllonorycter olympica* and *P. arkadiella* is quite evident from their descriptions (cf. Deschka, 1983; Derra, 1985).

Phyllonorycter barbarella (Rebel, 1901)
(Figs 10, 24, 39)

Dt. Ent. Ztschr. Iris, 13: 176 (*Lithocolletis*); type locality: Algeria, Lambessa
Phyllonorycter neli Buvat, 1996; *Alexanor*, 19 (1995): 167; France, Var, Sainte-Baume; **syn. n.**

Material. 18 ♂♂, 17 ♀♀: Spain, Cuenca, La Toba, 14.vi.2006, 2 ♂♂, Granada, El Molinillo, 28.vi.1992, 1 ♂, 2 ♀♀, Guadalajara, El Pedregal, 15.vi.2003, 1 ♂, Caseria El Monte, 13.vi.2006, 13 ♂♂, 13 ♀♀ (in the growth of *Quercus faginea*), leg. A. & Z. Laštůvka, coll. A. Laštůvka; France, Var, Sainte-Baume, 1 ♂, 1 ♀, ex l. (20.iv.1990, mines on *Quercus pubescens*), leg. Buvat, coll. A. Laštůvka; Maur., 12, [18]93, *barbarella*, Z. T., Stgr., 1 ♀, ex coll. Povolný, coll. A. Laštůvka.

Diagnosis. Wingspan 8.0–9.0 mm; head with orange ochreous hairs; thorax with white central line and with white borders of tegulae; forewing ochreous rusty, four costal and two or three dorsal strigulae white, not as sheeny as in *P. belotella*; the first costal large (narrower in *P. belotella*), without black edging as in other strigulae; dispersed black scales from the

top of the first dorsal towards apex; the forewing pattern very similar to *P. spinicolella* (Zeller, 1846).

Male genitalia. Valva long, narrow and pointed, with rigid setae on its ventral edge, with a distinct thorn subapically and an indistinct little tooth in the middle; filaments very long; aedeagus very long and slender with a little hook at the end; vinculum rounded, without saccus. The genitalia are very similar to *P. spinicolella*; sacculi on valvae are shorter with longer filaments and valvae narrow towards ends in this species.

Female genitalia. Papillae anales short with dense long hairs; apophyses long; 7th segment covered with dense short hairs and with transversal sclerotized band cranially; ostium large; antrum large funnel shaped.

Host plant and biology. *Quercus pubescens* Willd., *Q. faginea* Lam.; mine on underside; mines with larvae were collected in iv., v., adults were reared or collected in v.–vi., a second summer generation is possible.

Distribution. Algeria, Portugal, Spain, southern France.

Remark. The conspecificity of *Phyllonorycter barbarella* and *P. neli* is evident from the description by Buvat (1996) and from his and Staudinger´s material.

Phyllonorycter kusdasi (Deschka, 1970)
(Figs 11, 28, 40)

Ent. Nachr., 14: 81 (*Lithocolletis*); type locality: Italy, Trieste, Opicina

Material: 8 ♂♂, 3 ♀♀: Spain, Cuenca, Boniches, 17.vi.2002, 1 ♀, Gabaldón, 1.vii.2002, 1 ♂; France, Alpes-de-Haute-Provence, Peyruis, 3.vii.1993, 1 ♂; Croatia, Dalmacia, Orašac, 25.viii.2001, 2 ♂♂, 1 ♀, viii.2003, 1 ♂ ex p. (24. vii.2003, mines on *Quercus pubescens*), viii.2006, 1 ♂ ex p. (25.vii.2006, mines on *Quercus pubescens*); Greece, Korinthia, Halkió, vii.1998, 2 ♂♂, 1 ♀ ex p. (21.vi.1998, mines on *Quercus pubescens*), all leg. A. & Z. Laštůvka, coll. A. Laštůvka.

Diagnosis. Wingspan 6.0–7.8 mm; thorax with a white central line; forewing ochreous brown; four costal and two dorsal strigulae white with black edging; first strigulae long, the first costal starts nearly at the wing base; the basal streak narrow, slightly bent towards costa, with black edging; a black dot in apex; a distinct line of black scales in fore part of cilia line outside the fourth costal strigula; the species very similar to *P. ilicifoliella* (Duponchel, 1843) habitually, but distinctly different in its genitalia morphology.

Male genitalia. Valva elongate with numerous thin setae and with a strong apical thorn; vinculum with a long saccus; aedeagus short, straight, more thick in its distal half.

Female genitalia. Papillae anales relatively short, with long hairs; 8th segment sclerotized, with a convex lamella medially; 7th segment with sparse little thorns; antrum indistinct.

Host plant and biology. *Quercus pubescens* Willd.; mine on underside; polyvoltine.

Distribution. Spain, France, Italy, Sardinia, Croatia, Greece, Turkey (new to Spain and France).

Phyllonorycter amseli (Povolný & Gregor, 1955)
(Figs 12, 26, 38)

Ztschr. Wien. Ent. Ges., 40: 81 (*Lithocolletis*); type locality: Montenegro, Igalo near Herceg-Novi

Material. Croatia, Istria, v.1995, 1 ♂, 1 ♀, leg. V. Křenek, coll. A. Laštůvka.

Diagnosis. Wingspan 5.5–7.0 mm; forewing ochreous yellow, two dorsal and costal strigulae whitish, with strong black edging; the first costal in the half of the wing, the second in the third quarter, the first dorsal in the first quarter and the second in the half of the wing; dispersed black scales near the base; a black hair pencil above in the cilia line.

Male genitalia. Nearly symmetrical; valva broad, divided in three lobes distally and with a long filament, the dorsal lobe with dense rigid setae; vinculum triangular, without a distinct saccus; aedeagus bulbous basally, with a conspicuous lateral projection in the middle and with two processes distally; 8th sternum triangular, pointed.

Female genitalia. Papillae anales flat caudally, with dense middle long setae; apophyses long, slightly enlarged in their basal parts; periostial region with numerous furcate thorns in lateral parts; ostium broadly U-shaped; corpus bursae with two signa, the first strongly sclerotized with two connected thorns, the second with weak sclerotization (cf. also Deschka, 1992).

Host plant and biology. *Quercus* ? *virgiliana* Ten.; mine on underside; mines were found in iii. and iv., adults emerged in iv., v.; voltinism unknown.

Distribution. Montenegro, Croatia (new to Croatia).

Phyllonorycter trojana Deschka, 1982
(Figs 13, 25, 54, 55)

Ent. Ber. Amst., 42: 24 (*Lithocolletis*); type locality: Macedonia, Otesevo

Material. 6 ♂♂: Montenegro, Petrovac, vi.1986, 1 ♂ ex p. (12.vi.1986, mines on *Quercus trojana*); Greece, Kozani, Galáni, vi.1997, 2 ♂♂ ex p. (16.vi.1997, mines on *Quercus trojana*), Préveza, Thesprotikó, 24.v.1999, 3 ♂♂, all leg. A. & Z. Laštůvka, coll. A. Laštůvka.

Diagnosis. Wingspan 6.5–7.9 mm (summer generation); thorax without central line; forewing ochreous brownish, strigulae of the same colour; two costal and dorsal strigulae distinct, the third costal indicated; the

first strigulae with edging of greyish black scales, the next only on their basal sides; the basal streak absent; a small black dot in apex; cilia with black ends in fore part of apex.

Male genitalia. Nearly symmetrical; valva elongate, with several simple hairs distally and with two subapical thorns; vinculum with very long and slender saccus; aedeagus thick, with a hook-shaped process on its end; 8th sternum rounded cranially.

Female genitalia. Not studied, see Deschka (1982).

Host plant and biology. *Quercus trojana* Webb., a small underside mine; bi- or polyvoltine.

Distribution. Montenegro, Macedonia, Greece (new to Montenegro and Greece).

Phyllonorycter messaniella (Zeller, 1846)
(Figs 14, 27, 41, 48, 49)

Linn. Ent., 1: 221 (*Lithocolletis*); type locality: Italy, Sicily, Messina, Tremmonti, San Michele

Material. 39 ♂♂, 28 ♀♀: Portugal, Guarda, Manteigas, vi.2006, 2 ♀♀ ex p. (18.vi.2006, mines on *Fagus sylvatica*); Spain, Ávila, Las Vueltas, 15.vi.2006, 1 ♂, Teruel, Vivel del Rio, 17.vii.1993, 1 ♂; France, Gard, Pouzilhac, v.2006, 8 ♂♂, 9 ♀♀ ex p. (16.iv.2006, mines on *Quercus ilex*), Var, Collobriéres, v.2006, 6 ♂♂, 4 ♀♀ ex p. (17.iv.2006, mines on *Quercus suber*), leg. A. & Z. Laštůvka, coll. A. Laštůvka; Sardegna, Tempio-Paus., 27.iv.1933, 2 ♂♂, 1 ♀, leg. Amsel, coll. A. Laštůvka; Italy, Liguria, Lévanto, 12.ix.1997, 2 ♂♂; Sicily, Francavilla di Sicilia, 23.vi.2000, 1 ♀, and mines on *Castanea sativa*, leg. A. & Z. Laštůvka, coll. A. Laštůvka; Croatia, Čilipi, 6.v.1938, 1 ♂, leg. Amsel, coll. A. Laštůvka, Istria, Rabac, iv.1999, 16 ♂♂, 11 ♀♀ ex p. (20. iii.1999, mines on *Quercus ilex*); Greece, Kastoria, Aposkepos, 11.vi.1996, 1 ♂, Préveza, Thesprotikó, 24.v.1999, 1 ♂, leg. A. & Z. Laštůvka, coll. A. Laštůvka.

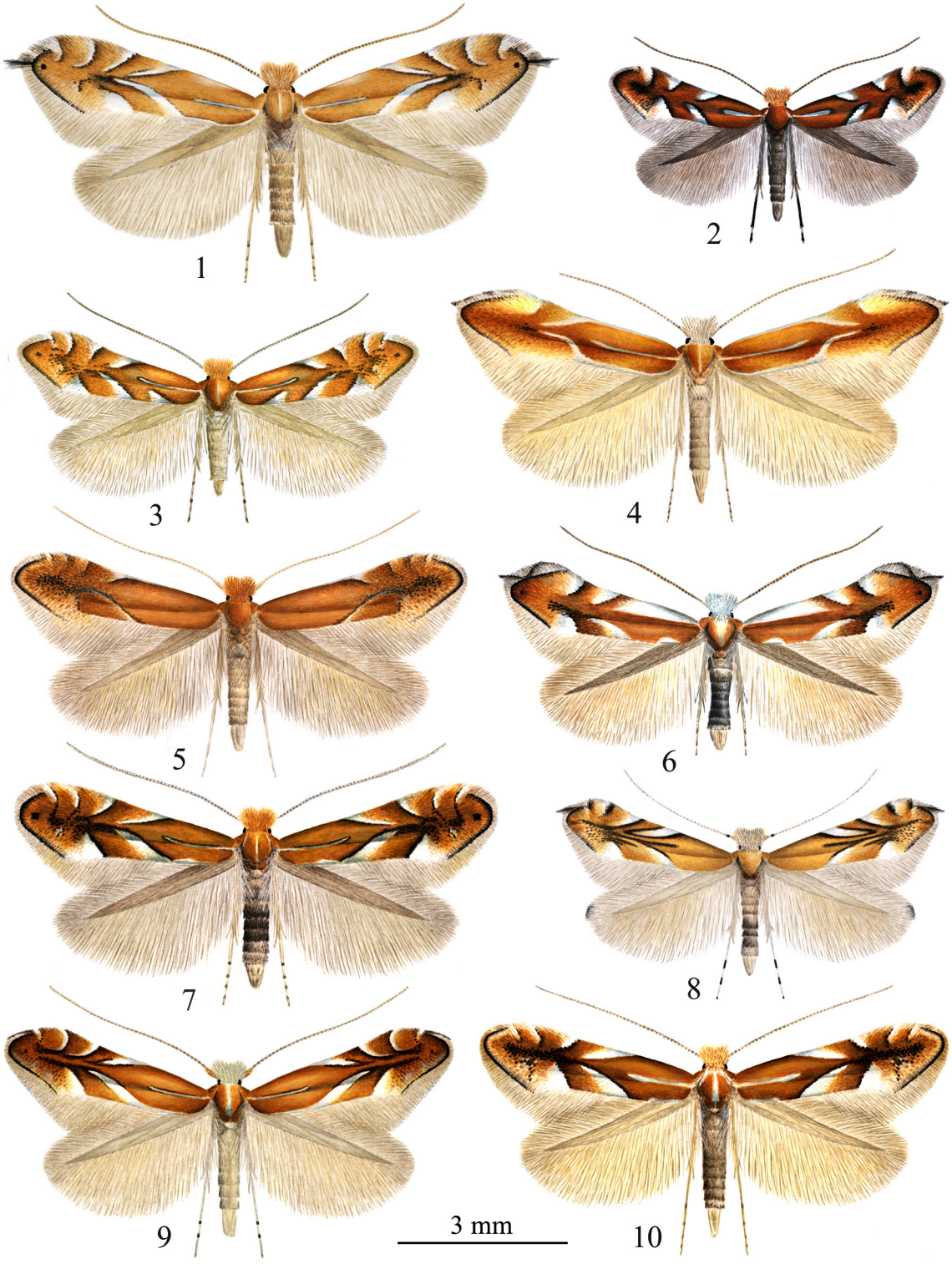
Diagnosis. Wingspan in spring generation 8.5–11.0 mm, summer generations 6.0–8.0 mm; forewing ochreous brown, four costal and three dorsal strigulae only slightly lighter than ground colouration; the basal streak does not reach the middle of the wing, a small brownish black spot below this streak; strigulae and the basal streak with brownish black edging; the basal streak reachs over the middle of the wing in *Phyllonorycter quercifoliella* (Zeller, 1839) and the first dorsal is not so long in this species.

Male genitalia. Valvae asymmetrical with various types of hairs, with rigid thorns in apical parts and with a hair pencil basally; saccus very long; aedeagus long, very slender, angled in its distal third and with a distinct little hook at the end.

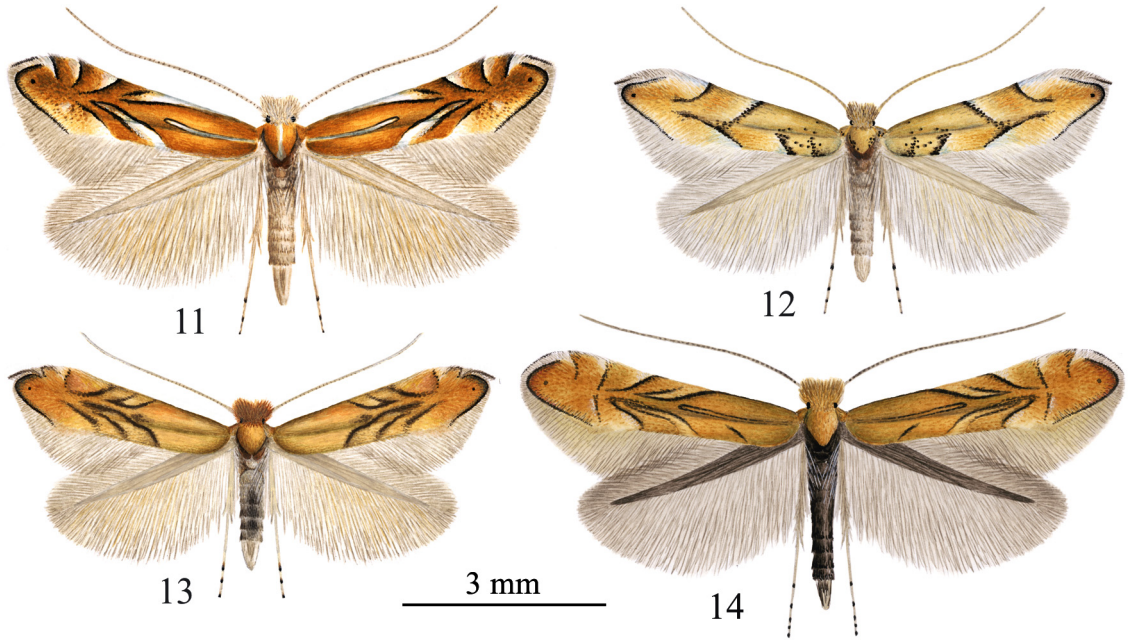
Female genitalia. Papillae anales elongate, with long hairs; 7th segment irregularly sclerotized and with little thorns; ostium and antrum indistinct.

Host plant and biology. *Quercus* spp. (mostly evergreen species as *Q. ilex* L. and *Q. suber* L.), *Castanea sativa* Miller, *Fagus sylvatica* L., less frequent *Carpinus* spp. and also several other trees, partly belonging not in the family Fagaceae (more details e.g. Godfray, 1981; Emmet et al., 1985; De Prins & De Prins, 2005); small underside mine; polyvoltine (at least three generations in warm areas), larva overwinters, adult iv.–xii.

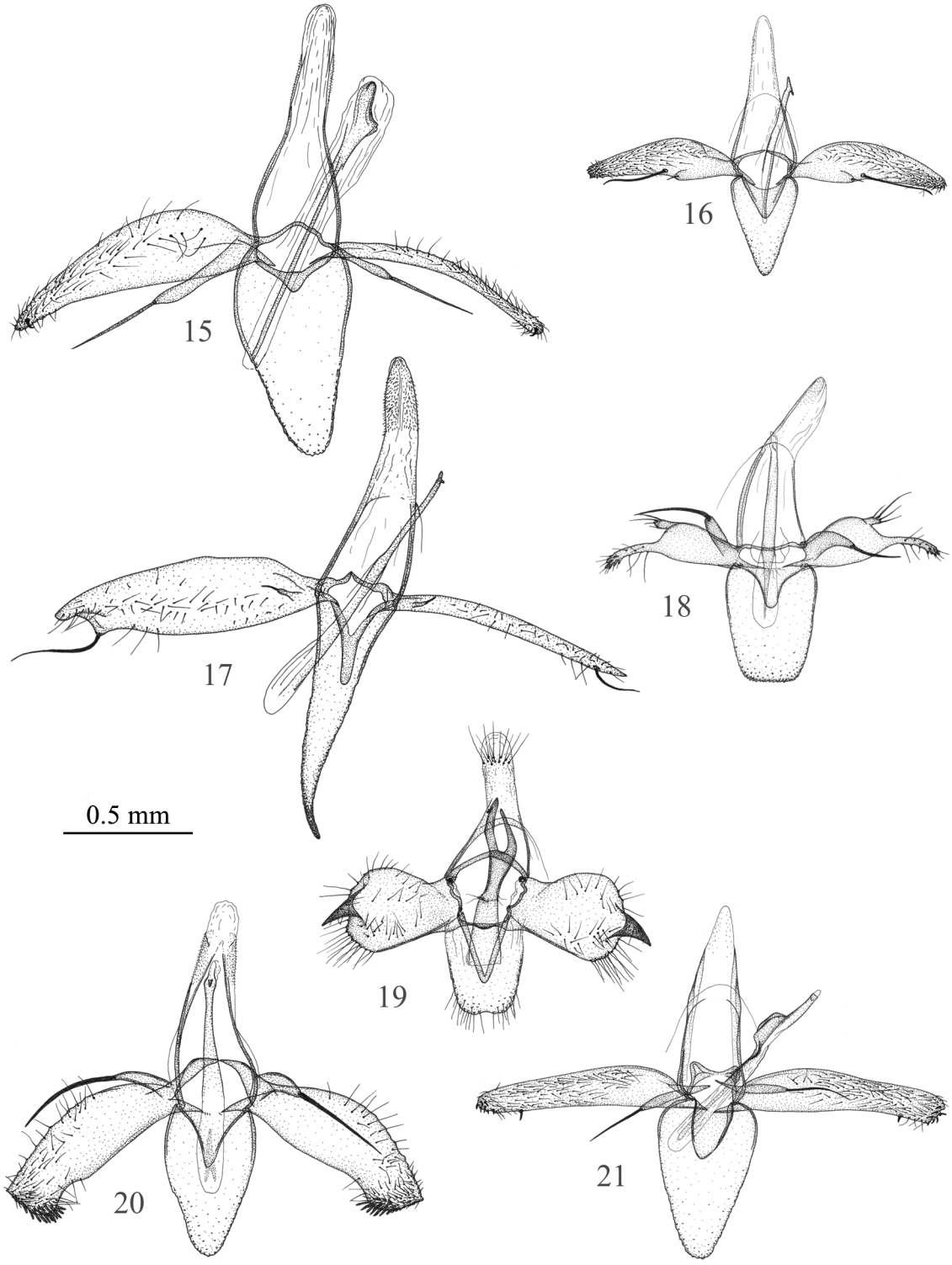
Distribution. The whole Mediterranean, incl. the Azores, Canary Islands, and Madeira, in Europe northwards up to Great Britain and Ireland, the Netherlands, Denmark, Germany, Austria, Hungary, Ukraine, and southern Russia; introduced to the U.S.A., Australia, and New Zealand.



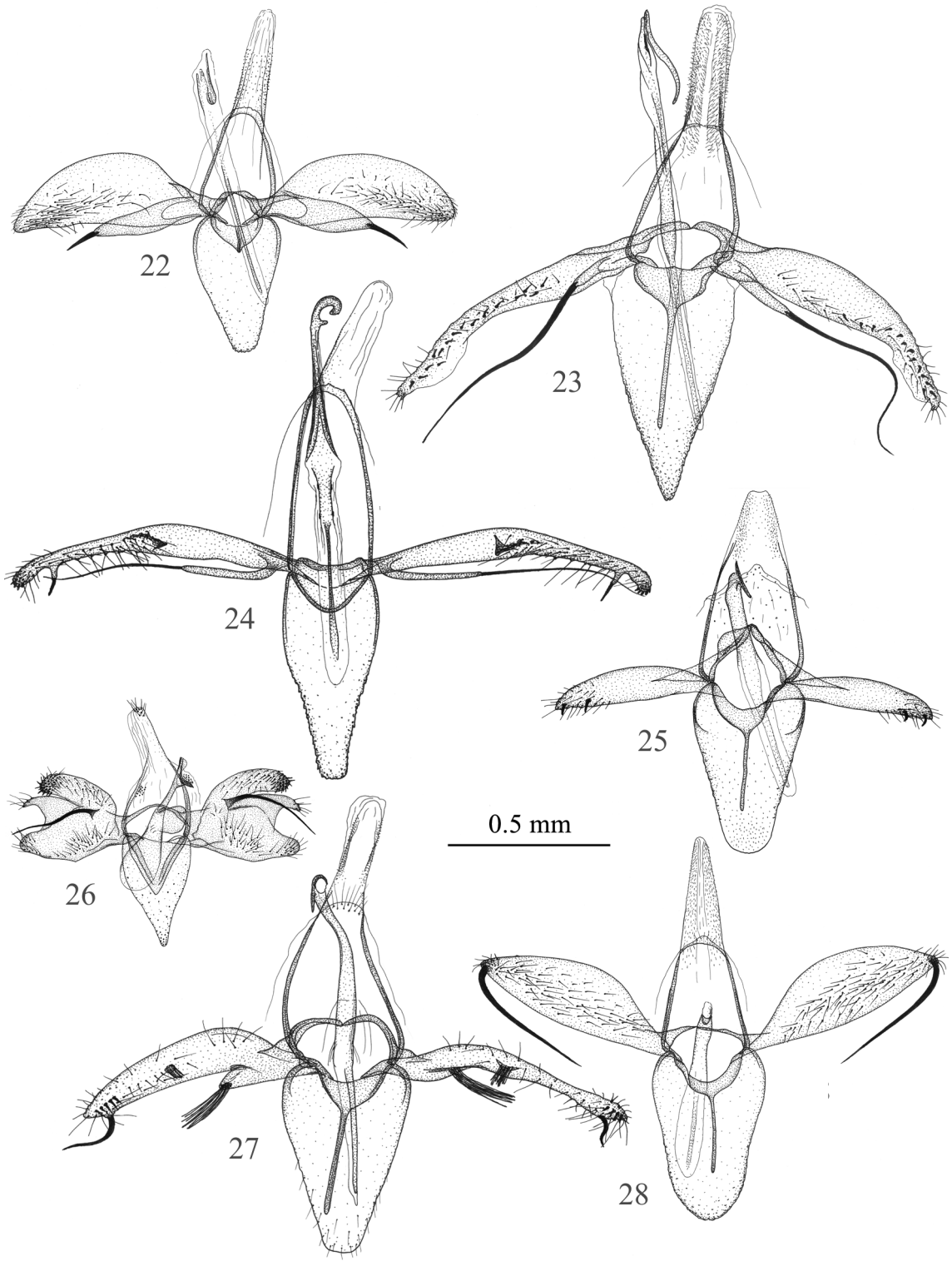
1–10: *Southern European Phyllonorycter species developing on Quercus; 1 – P. endryella (France, Collobriéres), 2 – P. sublautella (Montenegro, Budva), 3 – P. cocciferella (Portugal, Assumadas), 4 – P. suberifoliella (Croatia, Rabac), 5 – P. gerfriedi sp. n. (holotype), 6 – P. rebimbasi (France, Réal-Martin), 7 – P. belotella (France, Collobriéres), 8 – P. graecus sp. n. (holotype), 9 – P. olympica (Greece, Petralona), 10 – P. barbarella (Spain, Caseria El Monte)*



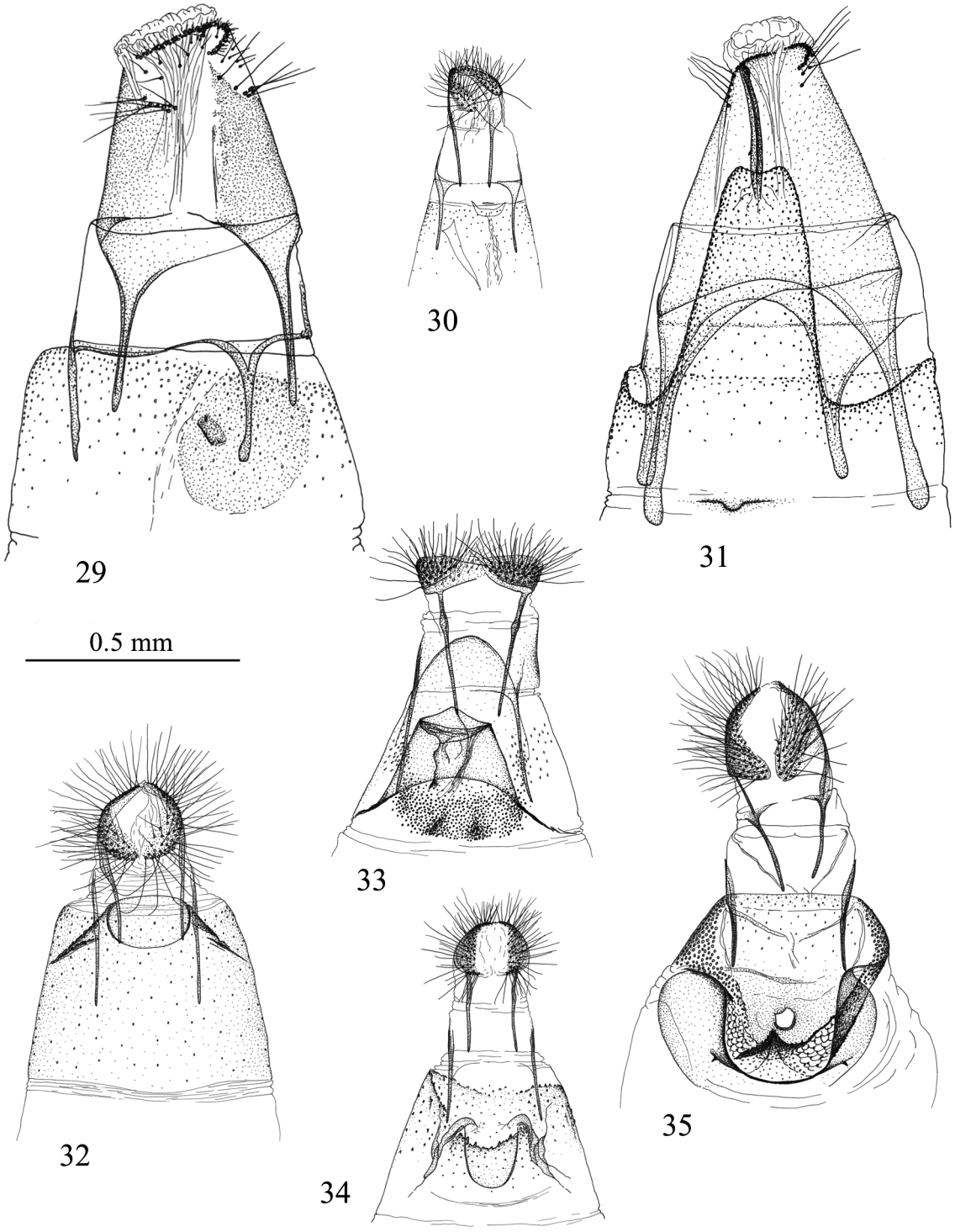
11–14: *Southern European Phyllonorycter species developing on Quercus; 11 – P. kusdasi (Croatia, Orašac), 12 – P. amseli (Croatia, Istria), 13 – P. trojana (Montenegro, Petrovac), 14 – P. messaniella (France, Collobriéres)*



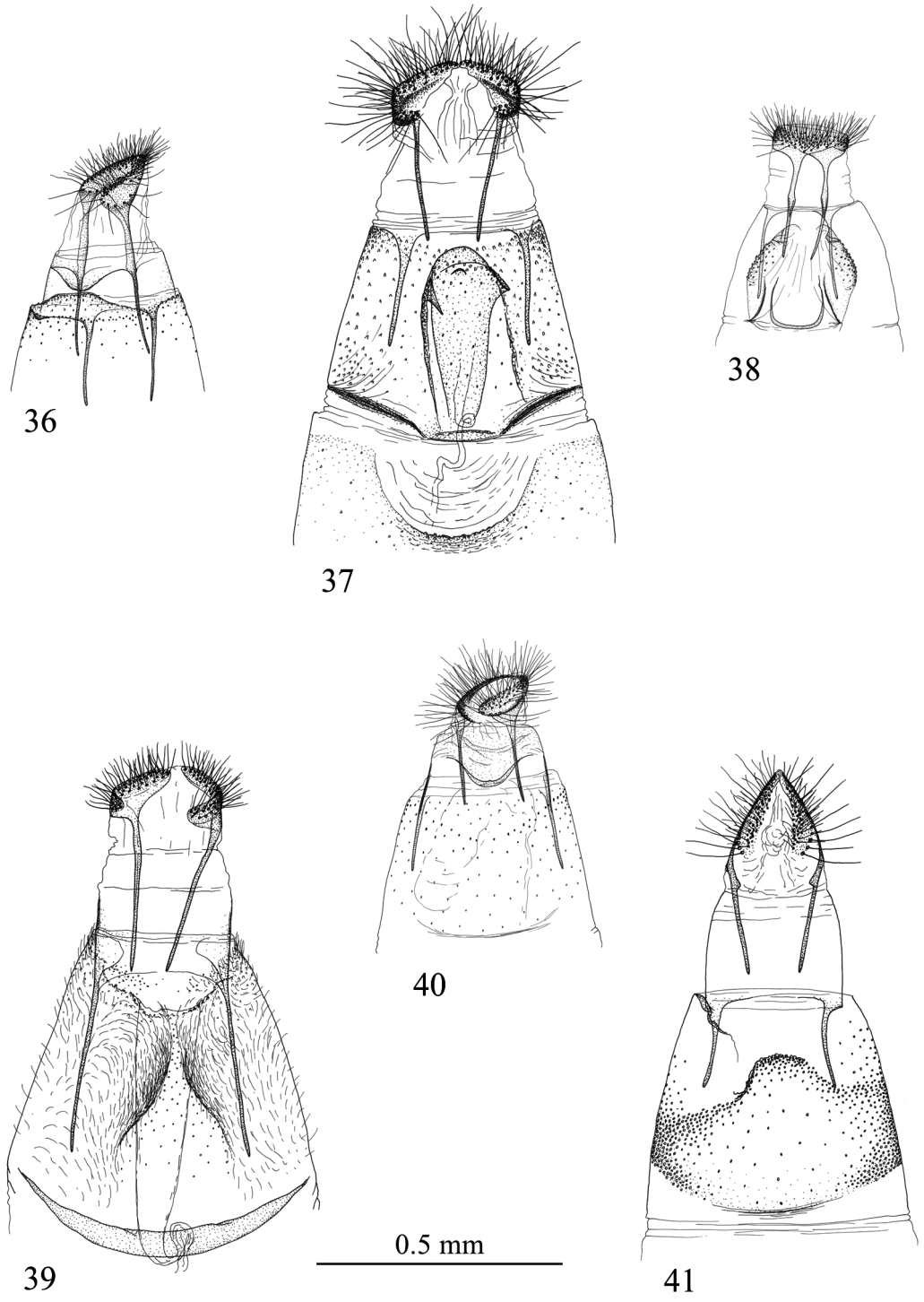
15–21: *Male genitalia; 15 – Phyllonorycter endryella (Spain, Anglés), 16 – P. sublautella (Montenegro, Budva), 17 – P. suberifoliella (Croatia, Rabac), 18 – P. cocciferella (Portugal, Monsanto), 19 – P. rebimbasi (Spain, Montalbán), 20 – P. belotella (France, Collobriéres), 21 – P. gerfriedi sp. n. (Crete, Lasithi)*



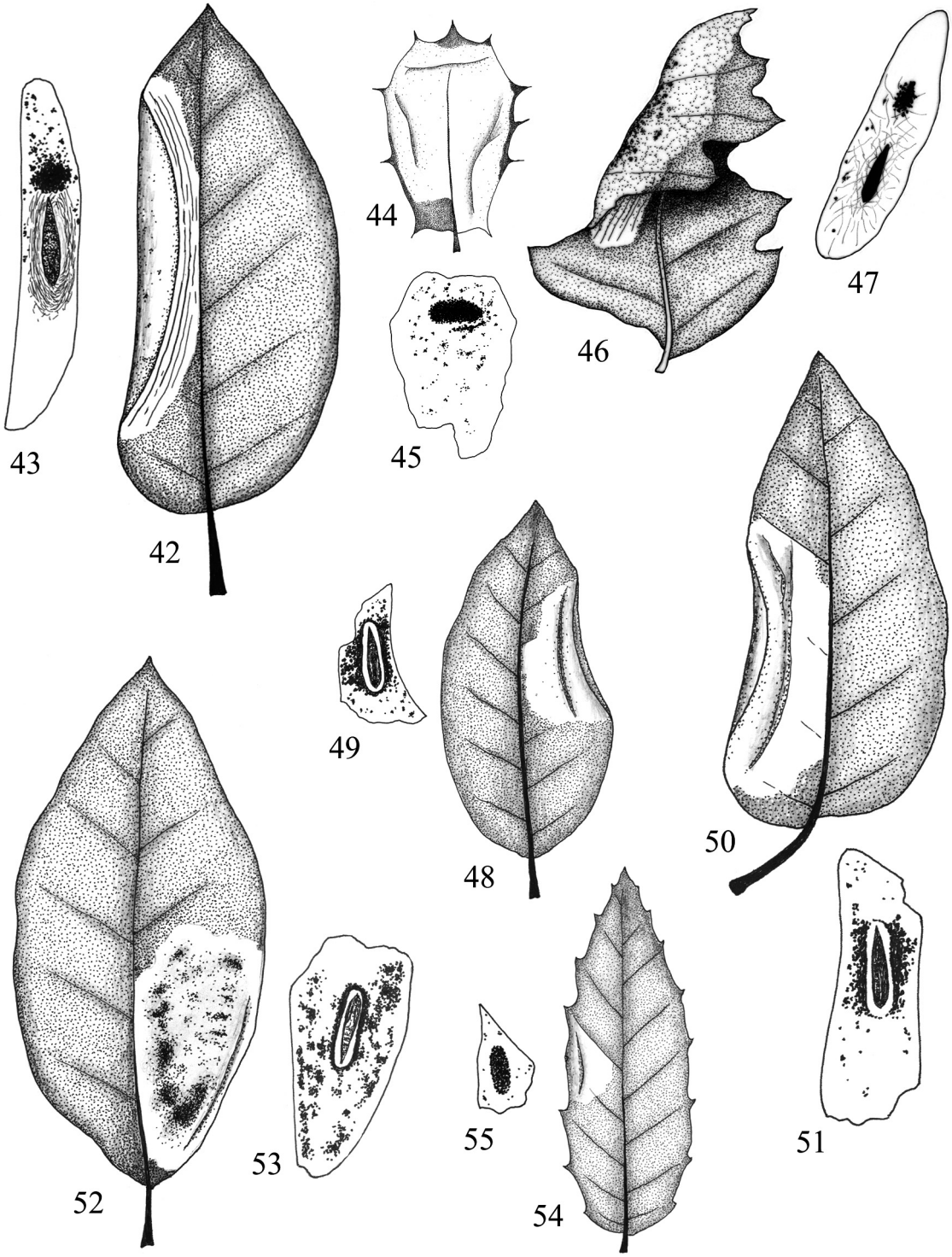
22–28: *Male genitalia; 22 – Phyllonorycter graecus sp. n. (Greece, Kosmas), 23 – P. olympica (Greece, Petralona), 24 – P. barbarella (Spain, Caseria El Monte), 25 – P. trojana (Montenegro, Petrovac), 26 – P. amseli (Croatia, Istria), 27 – P. messaniella (Croatia, Koromačno), 28 – P. kusdasi (Spain, Gabaldón)*



29–35: *Female genitalia; 29 – Phyllonorycter endryella (Spain, Montalbán), 30 – P. sublautella (Montenegro, Budva), 31 – P. suberifoliella (Croatia, Rabac), 32 – P. gerfriedi sp. n. (Crete, Lasithi), 33 – P. rebimbasi (France, Sigean), 34 – P. cocciferella (Portugal, Assumadas), 35 – P. belotella (lectotype)*



36–41: *Female genitalia; 36 – Phyllonorycter graecus sp. n. (Greece, Kosmas), 37 – P. olympica (Greece, Kandia), 38 – P. amseli (Croatia, Istria), 39 – P. barbarella (Spain, Caseria El Monte), 40 – P. kusdasi (Croatia, Orašac), 41 – P. messaniella (Croatia, Rabac)*



42–55: *Mines; 42, 43 – Phyllonorycter endryella on Quercus ilex, 44, 45 – P. rebimbasi on Q. coccifera, 46, 47 – P. graecus sp. n. on Q. ithaburensis, 48, 49 – P. messaniella on Q. ilex, 50, 51 – P. suberifoliella on Q. ilex, 52, 53 – P. belotella on Q. ilex (upperside), 54, 55 – P. trojana on Q. trojana*

SOUHRN

Jihoevropské druhy rodu *Phyllonorycter* minující listy dubů s popisy dvou nových druhů (Lepidoptera: Gracillariidae)

Je zpracován přehled 14 druhů rodu *Phyllonorycter* Hübner, 1822 minujících listy dubů (*Quercus* spp.) v jižní Evropě s popisy dvou nových druhů: *Phyllonorycter graecus* sp. n. vyvíjející se na *Quercus ithaburensis* Decne. subsp. *macrolepis* (Kotschy) Hedge & Yalt. z Peloponésu a *P. gerfriedi* sp. n. minující *Quercus coccifera* L. z Kréty. Je stanoveno šest nových synonym: *Phyllonorycter joviella* (Constant, 1890) a *P. anatolica* (Deschka, 1970) od *P. belotella* (Staudinger, 1859), *P. arkadiella* Derra, 1985 od *P. olympica* Deschka, 1983, *P. neli* Buvat, 1996 od *P. barbarella* (Rebel, 1901), *P. glaserorum* (Deschka, 1969) od *P. rebimbasi* (Mendes, 1910) a *P. sardiniensis* (Amsel, 1939) od *P. sublautella* (Stainton, 1869). Je designován lectotypus *Lithocolletis belotella* Staudinger, 1859. Jsou uvedeny diagnostické znaky, vyobrazena imága a genitálie všech druhů, stručně charakterizována bionomie a rozšíření a doplněny nové faunistické údaje pro některé země. Je zmíněn nález *Phyllonorycter obtusifoliella* Deschka, 1974 v Evropě.

Phyllonorycter, *Quercus*, jižní Evropa, nové druhy

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