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

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Abstract


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. barbara* (Rebel, 1901), *P. glaserorum* (Deschka, 1969) of *P. rebimbasi* (Mendes, 1910), and *P. sardinensis* (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*
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)*

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

**The Tineina of Southern Europe**, p. 197 *(Lithocolletis)*; type locality: France, Monten

**Lithocolletis sardiniensis** Amsel, 1939; *Mem. Soc. Ent. Ital.*, 17: 79; Sardinia, Tempio-Pausania; *syn. n.*


**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 striigulæ 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


**Diagnosis.** Wingspan 7.0–7.5 mm; thorax with a thin white line; forewing ochreous, very similar species; mine on underside of leaf, usually on very low oak bushes; bi- or polyvoltine.

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

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

Phyllonorycter suberifoliella (Zeller, 1850)

(Figs 4, 17, 31)

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


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 thorons 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 of several.

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)


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.

Host plant 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


Diagnosis. Thorax without white line; forewing with brownish 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.

Phyllonorycter rebimbasi sp. n.
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. Papilae 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 undersize, 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)

(Ents. 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.*


Diagnosis. Wingspan 8.0–10.5 mm; thorax with a thin central line and with a narrow border on tegulae; forewing 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. Papilae 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. cocci*fera 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. barbarrella* or a mixture of *P. barbarrella* and *P. joviella*). The locality of Granada is the first mentioned, the reared material is clearly delimited and definable, and *P. barbarrella* 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. graeceus* sp. n. (Figs 8, 22, 36, 46, 47)

Southern European Phyllonorycter species mining Quercus, with two new species

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

Ztschr. Arbeitsgem. Österr. Ent., 35: 4; type locality: Greece, Mt. Olympus, Litohoron

syn. n.


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; peristomial 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


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

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


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 sigmas, 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

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


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 sub-apical 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, Tremonti, San Michele_


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.

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 reaches 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.
1–10: Southern European Phyllonorycter species developing on Quercus; 1 – P. endryella (France, Collobrières), 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, Collobrières), 8 – P. graecus sp. n. (holotype), 9 – P. olympica (Greece, Petralona), 10 – P. barbarella (Spain, Caseria El Monte)
Southern European *Phyllonorycter* species mining *Quercus*, with two new species

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, Collobrières)
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. beloiella* (France, Collobrières), 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, Istra), 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)
Southern European *Phyllonorycter* species mining *Quercus*, with two new species

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)
Phyllonorycter, Quercus, jižní Evropa, nové druhy

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