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## *Cydia molybdana* (CONSTANT, 1884) – a valid species

### (Lepidoptera: Tortricidae: Olethreutinae)

With 8 figures

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#### Summary

Because of distinct and constant differences in the male and female genitalia described in this paper, *Cydia molybdana* (CONSTANT, 1884) stat. rev. is removed from the synonymy of *Cydia amplana* (HÜBNER, [1796 – 1799]). Whereas *C. amplana* occurs in large parts of Europe, *C. molybdana* is restricted to the coast and hills close to the Mediterranean Sea.

#### Keywords

Tortricidae, *Cydia molybdana*, *Cydia amplana*, Europe

#### Zusammenfassung

Wegen deutlicher und konstanter Unterschiede in den männlichen und weiblichen Genitalien, die in dieser Arbeit beschrieben werden, wird *Cydia molybdana* (CONSTANT, 1884) stat. rev. aus der Synonymie mit *Cydia amplana* (HÜBNER, [1796 – 1799]) gehoben. Während *C. amplana* in weiten Teilen von Europa vorkommt, ist *C. molybdana* auf die Küste und Hügel, nahe dem Mittelmeer beschränkt.

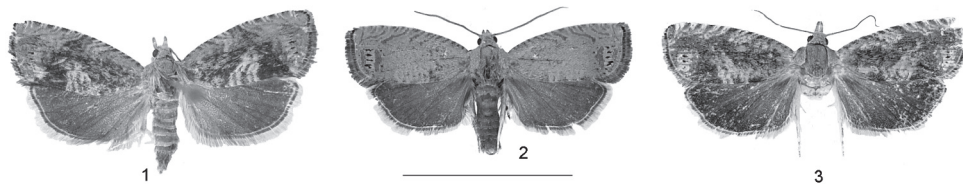
#### Introduction

*Cydia molybdana* (CONSTANT, 1884) is an example how a species can vanish into the synonymy because of an insufficient description of the differences from other species and the lack of interpretation of existing clues.

*Cydia molybdana* was described by CONSTANT (1884) and first figured in KENNEL (1921: Taf. XXIII, fig. 64). The latter mentioned *C. molybdana* as a good species known from Southern France. The figured „Original“ is a male with reduced wing pattern.

DANILEVSKYI & KUZNETSOV (1968: 596 f.) confirmed differences in the female genitalia of the holotype in Museum national d’histoire naturelle Paris (MNHN) and additional material from other parts of the Mediterranean when they compared them with females of *Cydia amplana* (HÜBNER, [1796 – 1799]). They examined males from Noli (Northern Italy, Liguria) from the collection of J. Klimesch (†) and found no significant differences from *Cydia amplana* males. For this reason they considered *Cydia molybdana* to be a subspecies of *C. amplana*. The given distribution of *C. amplana molybdana* is Malta, Southern Italy, Yugoslavia and Cyprus. LERAUT (1980) retained *C. molybdana* as good species. In KARSHOLT & RAZOWSKI (1996) *C. molybdana* is not mentioned, only *C. amplana*. Consequently *C. molybdana* is treated as a synonym of *C. amplana*

in RAZOWSKI (2001) and the following publications (RAZOWSKI, 2003; BROWN et al., 2005). However, CHAMBON (1999) has already given a good indication, that *C. molybdana* should be considered as a distinct species, because he illustrated both species with remarkable differences also in the male genitalia.



**Figs 1-3:** *Cydia amplana* and *molybdana*. Scale: 10 mm: 1 *Cydia amplana* (Hb.), ♀, Austria: Apetlon (MNVD). - 2 *Cydia molybdana* (CONST.), ♂, Greece: Zakynthos (LNK). - 3 *Cydia molybdana* (CONST.), ♀, Greece: Zakynthos (LNK).

## Results

The independent investigations of *Cydia amplana*-material from various regions of Europe, carried out by the authors of this paper, show that *Cydia molybdana* and *C. amplana* are indeed two good species. They are hard to separate only on the basis of wing pattern and colour. Especially *C. molybdana* is very variable. Among specimens with reduced pattern single individuals with a distinctive pattern occur, and they are very similar to *C. amplana*. However, both species are easy to distinguish by the structure of the genitalia. The specimens of the Klimesch-collection from Noli belong indeed to *Cydia amplana* and not to *C. molybdana*, as the dissection has shown. This is the reason for the misinterpretation of the taxon in DANILEVSKYI & KUZNETSOV (1968) and its subsequent status as synonym.

In October 2008 it was possible to study the holotype of *Cydia molybdana*, which is stored in the MNHN. The examination of the female type and especially its genitalia confirmed the remarkable differences in the genitalia in comparison with *Cydia amplana*. *C. molybdana* is only distributed in the coastal regions of the Mediterranean Sea. Already in the mountains of Southern Europe and from there to Central and South-East Europe *C. amplana* is the only species we were able to detect. Though the type(s) of *C. amplana* is lost (HORN et al. 1990), we renounce the determination of a neotypus because the hitherto existing illustrations (f. i. RAZOWSKI, 2001, 2003) allow the identification of *Cydia amplana* without any doubt.

DIAKONOFF (1986) described *Cydia sammuti* from Malta. The figure of the male genitalia of the holotype shows, that this species belongs to *Cydia molybdana*.

Following we list the examined material and give the differences between the two species.

*Cydia amplana* (HÜBNER, [1796 – 1799])

Sammlung Eur. Schmett. 7: pl. 5, fig. 24 (*Tortrix*). Type lost. L. t.: Europe.

**Examined material:**

**Germany:** Oberspreewald, Straupitz, Weinberg, 1 ♂ (gen. slide 2434, Karisch) 18.VII.1992, T. Karisch (coll. Karisch); Harz, Hasselfelde, 1 ♀ (gen. slide 2435, Karisch) 27.VII.2002, T. Karisch (coll. Karisch); Zwintschöna bei Halle (Saale), 1 ♀ (gen. slide 2436, Karisch) 25.VII.1994, T. Karisch (Museum für Naturkunde und Vorgeschichte Dessau = MNVD).

**Austria:** Burgenland: Apetlon, 2 ♂♂ (gen. slide 2440, Karisch) 3 ♀♀ (1 ♀ gen. slide 2441, Karisch) 31.VII.[19]70, W. Thomas (MNVD), Weiden, 1 ♂ 1 ♀ 1.VIII.[19]70, W. Thomas (MNVD), Illmitz, 1 ♀ 6.VIII.1970, W. Thomas (MNVD).

**France:** Digne, 1 ♂ (gen. slide 2588, Karisch) 27.VIII.1968, J. Klimesch (Zoologische Staatssammlung München = ZSM).

**Italy:** Liguria, Capo di Noli, 1 ♂ (gen. slide 2585, Karisch) 1 ♀ (gen. slide 2586, Karisch) A[nfang] IX.1944, J. Klimesch (ZSM). Umbria: Narni (Terni), 240 m, 1 ♀ IX.1953 (gen. slide PREPT 1084, Pinzari), Prola (coll. Pinzari); Assisi (Perugia), Molinaccio, 500 m, 1 ♀ 31.VII.2005 (gen. slide PREPT 1079, Pinzari), Z. & I. Zerunian (coll. Pinzari). Lazio: Cittaducale (Rieti), Cardito, 480 m, 1 ♂ 25.IX.1948 (gen. slide PREPT 1082, Pinzari), Prola (coll. Pinzari); Villa Camponeschi (Rieti), Colle Petruccio, 1000 m, 1 ♂ 12.-13.VII.2001 (gen. slide PREPT 1077, Pinzari), A. Zilli (coll. Pinzari); Vallemare (Rieti), Colle Marcone, 1121 m, 1 ♂ (gen. slide PREPT 1076, Pinzari) 19.VIII.1988, 1 ♀ 25.VIII.1993 (gen. slide PREPT 292, M. Pinzari), 1 ♂ 26.VIII.1993, 1 ♀ 23.VIII.1998 (gen. slide PREPT 1134, Pinzari), 1 ♀ 25.VIII.1998, 1 ♂ 21.VIII.2000, 1 ♂ 15.VIII.2001 (gen. slide PREPT 1139, Pinzari), 1 ♂ (gen. slide PREPT 1138, Pinzari) 1 ♀ (gen. slide PREPT 1132, Pinzari) 25.VIII.2001, 1 ♀ 10.VIII.2003, 1 ♂ 18.VIII.2003, 2 ♀♀ 27.VIII.2006, 3 ♂♂ 2.IX.2006, 1 ♂ 3.IX.2006, 1 ♀ 4.IX.2006, 2 ♂♂ 2 ♀♀ (1 ♀ gen. slide PREPT 1135, Pinzari) 5.IX.2006, 1 ♂ 1 ♀ 6.IX.2006, 1 ♂ 5.IX.2008 (gen. slide PREPT 1136, Pinzari), 1 ♂ 16.VIII.2009, 1 ♂ 17.VIII.2009 (gen. slide PREPT 1137, Pinzari), 1 ♂ 20.VIII.2009, 3 ♂♂ 1 ♀ (1 ♀ gen. slide PREPT 1133, Pinzari) 21.VIII.2009, 1 ♀ 24.VIII.2009, 2 ♂♂ 1 ♀ 25.VIII.2009, 2 ♂♂ 3 ♀♀ 26.VIII.2009, 1 ♀ 1.IX.2009, M. Pinzari (coll. Pinzari). Abruzzo: Vacri (Chieti) 1 ♂ (gen. slide 2589, Karisch) 23.VIII.1955, U. Parenti (ZSM); Ortona dei Marsi (Aquila), Rivoli, 1058 m, 1 ♀, 4.IX.2001 (gen. slide PREPT 668, Pinzari), A. Zilli (coll. Zilli). Campania: S. Maria di Castellabate (Salerno), 50 m, 1 ♂ (gen. slide PREPT 1078, Pinzari) 5.IX.1980, G. Pace (coll. Pinzari), 1 ♀ (gen. slide PREPT 461, Pinzari) 5.X.1980, G. Pace (coll. Pinzari).

**Croatia:** Dalmatien, Umgebung von Gravosa, 1 ♂ 1 ♀ (gen. slide 2587, Karisch) X.1936, J. Klimesch (ZSM).

**Romania:** Baile Herculane, 2 ♀♀ (1 ♀ gen. slide 2443, Karisch) 8.VIII.1971, 1 ♀ (gen. slide 2442, Karisch) 31.VII.1973, W. Thomas (MNVD); Pitesti, 1 ♂ 6.VII.197[?], W. Thomas (MNVD).

**Bulgaria:** Primorsko, MMZ, 1 ♂ (gen. slide 2437, Karisch) 22.VIII.1988, T. Karisch (MNVD); Pirin, Liljanovo, 1 ♂ 1 ♀ (gen. slide 2590, Karisch) 9.VIII.-1.IX.1986, F. Eichler (ZSM).

**Turkey:** Elazik, 1 ♀ (gen. slide 2591, Karisch) 7.-10.IX.1975, Friedel (ZSM).

**Description:**

As described in RAZOWSKI (2003). In general coloration more orange than in *C. molybdana* (fig. 1).

Genitalia ♂ (fig. 4): Tegumen slender, lateral parts clasp-like; minute apical prominence (RAZOWSKI,



Fig. 4: ♂-genitalia of *Cydia amplana* (Hb.), Austria: Apetlon (MNVD).

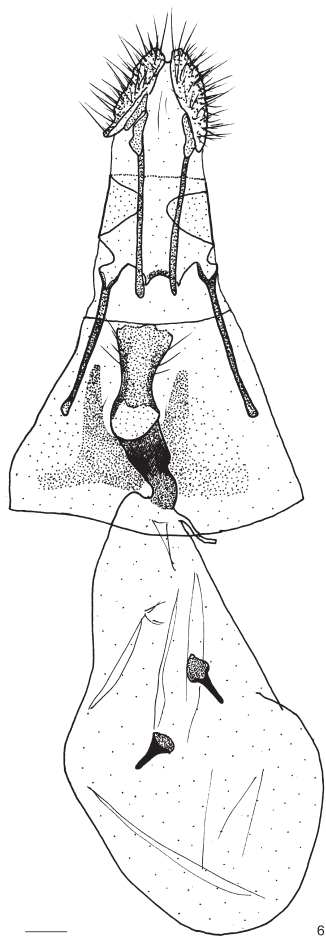


Fig. 6: ♀-genitalia of *Cydia amplana* (Hb.), Romania: Baile Herculane (MNVD).

former Soviet Union up to the Southern Ural Mountains, common on the Crimea and in the Caucasus, and also known from Asia Minor and Syria. In KARSHOLT & RAZOWSKI (1996) mentioned for Western Europe.

All indications for the southernmost localities need confirmation.

2003) not visible in all cases and depending on preparation. Caudal angle of sacculus not prominent; ventral incision with slight convexity and a more or less expressed small horn above. Basal cavity short, nearly oval; field with many strong bristles ventro-proximal of the cavity. Processus basalis small. Cucullus rounded ventro-proximally. Aedeagus rather long, slender in its distal half and with two minute thorns laterally.

Genitalia ♀ (fig. 6): Lamella postvaginalis large, constricted in middle. Ductus bursae short, sclerotized, broadening towards ostium. Bursa copulatrix long, with two signa. Subgenital sternite small, lateral corners of hind margin extended.

#### Larva:

The larva is described in SWATSCHKE (1958). It feeds in acorns (*Quercus* sp. after SWATSCHKE, 1958, HEINEMANN, 1863, SORHAGEN, 1886, WOCKE, 1874, RÖSSLER, 1881; *Quercus pedunculata* (= *Q. robur*) and *Q. iberica* after RAZOWSKI, 1991) and is additionally mentioned in HEINEMANN (1863) and SORHAGEN (1886) for hazelnuts, in SORHAGEN (1886) for walnuts (assumed for these fruits also in KASY, 1965). The two studied specimens from Noli (Liguria) are labelled with „*Quercus ilex*“. SORHAGEN (1886) refers GUENÉE, who has mentioned the larva also from fruits of *Fagus sylvatica* and *Castanea vesca*.

#### Distribution (fig. 8) and habitats:

In oak-rich, thermophilous deciduous forests in Central, South East and Southern Europe, around the Mediterranean common in hills and mountain slopes, scarce at the coast. After DANILEVSKIY & KUZNETSOV (1968) in deciduous forests and forest steppes of the

***Cydia molybdana* (CONSTANT, 1884), stat. rev.**

Annales de la Société entomologique de France (6) 4: 214 f.; pl. 9, fig. 11 (*Carpocapsa*). [Holo]type ♀ in MNHN. L. t.: Alps of Dauphiné.

= *Cydia* (*Kenneliola*) *sammuti* DIAKONOFF, 1986, syn. nov.

Nota lepidopterologica 9: 170 ff., fig. 1, 5.

**Examined material:**

**France:** [Holo]type ♀: „*Carpocapsa Molybdana* (Const)“, „*Carpocapsa molybdana* Const. Ann. Soc. ent. France 1884. p. 214 (Litt[oral] des Alpes Marit.)“, „1911 Coll. Lafaury Museum Paris“, „Type“, „Genitalia J. Bourgogne, prép. No. 1854 ♀“.

**Italy:** Toscana: Ansedonia (Grosseto), 5 m, 1 ♂ X.2002 (gen. slide PREPT 756, Pinzari), M. Pinzari (coll. Pinzari); Burano (Grosseto), 5 m, 1 ♂ 20.IX.2001 (gen. slide PREPT 1141, Pinzari), 2 ♀ ♀ (gen. slides PREPT 759 PREPT 760, Pinzari) 5.IX.2002, A. Zilli (coll. Pinzari). Umbria: Orvieto (Terni), S. Faustino, 500 m, 1 ♂ 1.IX.1944 (gen. slide PREPT 1091, Pinzari), Prola (coll. F. Hartig, Dip. Biol. An. e dell'Uomo Sede di Entomologia, Roma), 1 ♂ 15.IX.1959 (gen. slide PREPT 1083, Pinzari), Prola (coll. Pinzari). Lazio: Tenuta di Castel Porziano (Roma), 0-85 m, 1 ♀ 8.IX.1998 (gen. slide PREPT 449, Pinzari), 1 ♀ 24.IX.1998, 3 ♂ ♂ (gen. slides PREPT 550 PREPT 560 PREPT 562, Pinzari), 1 ♀ (gen. slide PREPT 559, Pinzari), 9.IX.1999, 2 ♀ ♀ 16.IX.1999 (gen. slides PREPT 621 PREPT 623, Pinzari), 1 ♂ 23.IX.1999 (gen. slide PREPT 628, Pinzari), 3 ♂ ♂ (gen. slide PREPT 659, Pinzari) 1 ♀ 13.IX.2000, 1 ♀ 14.IX.2001 (gen. slide PREPT 647, Pinzari), 2 ♀ ♀ 28.IX.2001, 1 ♀ 27.VI.2002 (gen. slide PREPT 1140, Pinzari), 1 ♂ 1.IX.2002 (gen. slide PREPT 1017, Pinzari), 2 ♂ ♂ 2 ♀ ♀ 5.IX.2002, 1 ♀ 6.IX.2002 (gen. slide PREPT 883, Pinzari), 1 ♀ 12.IX.2002, 1 ♂ (gen. slide PREPT 965, Pinzari) 3 ♀ ♀ 17.IX.2002, 1 ♀ 19.IX.2002, 1 ♂ 1.X.2002, 1 ♀ 4.X.2002 (gen. slide PREPT 884, Pinzari), 2 ♂ ♂ 2 ♀ ♀ 10.-15.IX.2003, 1 ♂ 2 ♀ ♀ 19.-25.IX.2003, 1 ♀ 7-14.X.2003, 1 ♀ 19.-25.X.2003 (gen. slide PREPT 1090, Pinzari), 1 ♀ 8.-16.IX.2004, 1 ♂ 6-13.X.2004 (gen. slide PREPT 1013, Pinzari), P. Maltzeff (coll. Pinzari); Parco Nazionale del Circeo (Latina), Quarto freddo, 0-541 m, 9 ♂ ♂, 7 ♀ ♀, 13.IX.1977 (1 ♂ gen. slide PREPT 1080, Pinzari), 1 ♀ 5.IX.1978 (gen. slide PREPT 1081, Pinzari), S. Forestiero, F. Malucelli & Z. Zerunian (coll. Pinzari).

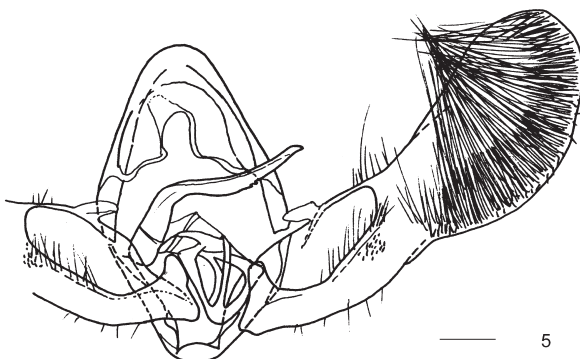
**Croatia:** Dalmatien, Orebic, 1 ♀ (gen. slide 2593, Karisch) 10.-22.IX.1933, Dr. Züllich (ZSM).

**Greece:** Chios: Limnia, 15 m, 1 ♀ (gen. slide 5136, Sutter) 3.IX.[19]96, 1 ♂ (gen. slide 5135, Sutter) 05.IX.[19]96, 1 ♀ (gen. slide 5137, Sutter) 12.IX.[19]96, 1 ♂ (gen. slide 6297, Sutter), R. Sutter (Landessammlungen für Naturkunde Karlsruhe = LNK); Zakynthos: Limnikeriu, 45 m, 1 ♂ (gen. slide 2432, Karisch) 10.IX.2003, 1 ♂ (gen. slide 2438, Karisch) 15.IX.2003, 1 ♂ 16.IX.2003, 1 ♂ 1 ♀ 18.IX.2003, 2 ♀ ♀ (1 ♀ gen. slide 2439, Karisch) 21.IX.2003, R. Sutter (LNK); südl. Vasilikos, 1 ♀ 4.IX.1997, R. Sutter (LNK); Kreta: Psychro, 800 m, 1 ♂ (gen. slide 2592, Karisch) 21.VII.1962, H. Reisser (ZSM).

**Turkey:** Gebze (Izmit) 1 ♀ (gen. slide 2594, Karisch) 2.-3.VI.1969, F. Hahn (ZSM).

**Description:**

Pattern of the forewing very variable, often reduced with only some silvery strigulae from costa, an interrupted silver line in marginal field and weak pale brown suffusion. Speculum with silvery outer lines and black inner spots in a more or less brown field. Dorsal patch of the forewing obsolescent



**Fig. 5:** ♂-genitalia of *Cydia molybdana* (CONST.), Greece: Zakynthos (LNK).



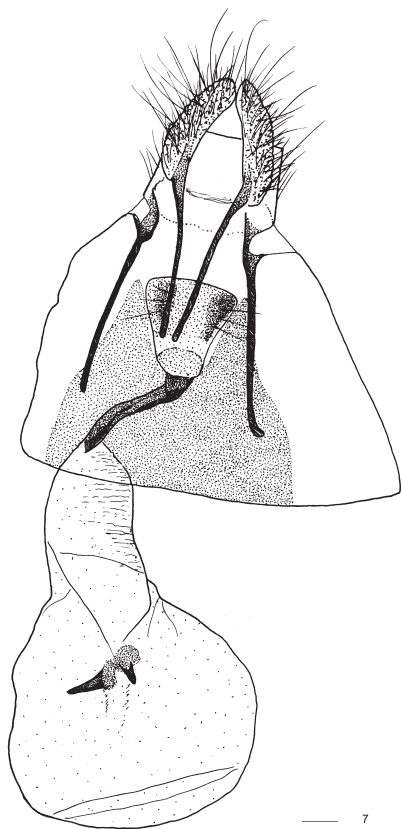


Fig. 7: ♀-genitalia of *Cydia molybdana* (CONST.), France: Alpes maritimes, Holotype (MNHN).

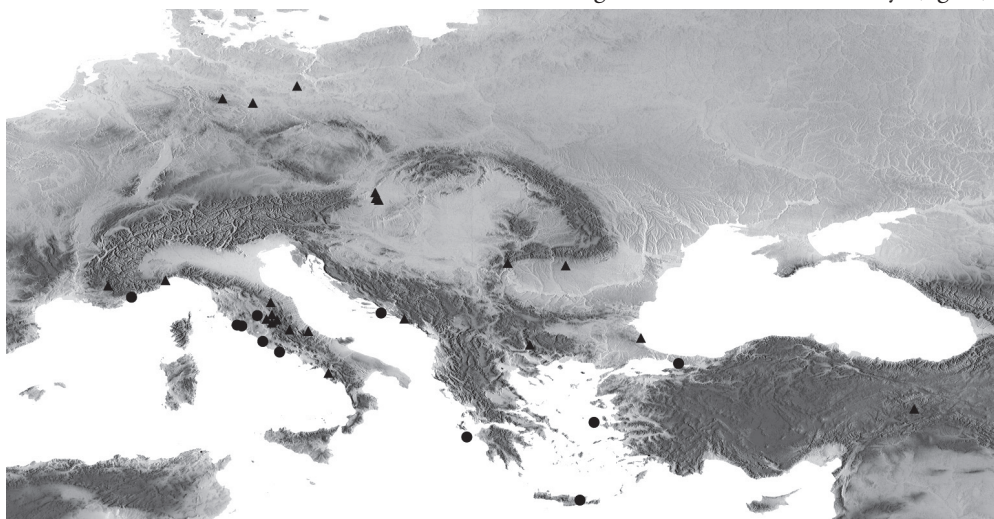


Fig. 8: Localities of the examined material of *Cydia molybdana* (black circles) and *C. amplana* (black triangles).

(fig. 3). Some specimens with a strongly contrasting coloration, a distinct pale dorsal patch and conspicuous pale brownish and silvery strigulae, were found among unicolorous material from the same place and date (fig. 2). In general coloration more brownish than in *C. amplana*.

Genitalia ♂ (fig. 5): Tegumen slender, lateral part clasp-like, without apical prominence. Caudal angle of sacculus not prominent; ventral incision only slight and cucullus joint with gentle thickening. No horn above. Basal cavity longer and more rectangular; field with fewer and short bristles ventro-proximal of the cavity. Processus basalis broad. Cucullus longer, rounded ventro-proximal. Aedeagus rather long and thin, angled and tapered to the apex, with minute thorns laterally.

Genitalia ♀ (fig. 7): Lamella postvaginalis triangular, posteriorly broadened. Ductus bursae rather long and small, sclerotized. Bursa copulatrix long, with two signa. Subgenital sternite broad, lateral corners of hind margin triangular.

#### Larva:

Not yet described. It feeds in fruits of *Quercus ilex* and *Q. suber* (CONSTANT, 1884).

#### Distribution and habitats:

Documented for Southern France, Italy, the former Yugoslavia, Greece and Turkey (fig. 8),

after DANILEVSKIY & KUZNETSOV (1968) also in Malta and Cyprus. Probably widely distributed, especially along the coasts of the Mediterranean Sea.

In Peninsular Italy from coasts to inland hilly areas with Mediterranean vegetation, so far recorded from sites with plenty of holm-oaks (*Quercus ilex* L.), but occasionally also deciduous ones, and often close to moist habitats such as coastal marshes and lagoons.

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