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**AGDISTIS MORINI SP. N., A NEW PLUME MOTH FROM
FRIULI-VENEZIA GIULIA (ITALY) (LEPIDOPTERA, PTEROPHORIDAE)**

**AGDISTIS MORINI SP. N., NUOVO PTEROPHORIDAE DEL
FRIULI-VENEZIA GIULIA (ITALIA) (LEPIDOPTERA, PTEROPHORIDAE)**

Abstract - *Agdistis morini* sp. n. is described from Friuli-Venezia Giulia and Veneto regions and compared with the closely related *A. bennetii* (CURTIS, 1833) from the western Mediterranean area. The main characters of the new species are found in the male genitalia and in the adults.

Key words: Lepidoptera, Pterophoridae, *Agdistis morini* sp. n., New species, Taxonomy, Italian fauna.

Riassunto breve - *Agdistis morini* sp. n. viene descritto per il Friuli-Venezia Giulia e Veneto e confrontato con la specie strettamente affine *A. bennetii* (CURTIS, 1833) dell'area mediterranea occidentale. I principali caratteri della nuova specie si riscontrano nei genitali del maschio e nell'adulto.

Parole chiave: *Lepidoptera*, *Pterophoridae*, *Agdistis morini* sp. n., Specie nuova, Tassonomia, Fauna italiana.

Introduction

The genus *Agdistis* is represented in the Palaearctic region by at least 62 species (ZAGULAJEV & BLUMENTAL, 1994; ARENBERGER, 1995; 1997; 1999; GIELIS, 1998; FAZEKAS, 2000). 23 species are reported from Europe (GIELIS, 1996) and only *A. hulli* GIELIS, 1998 has been described from this area more recently. The Italian fauna of *Agdistis* is quite well known and includes 12 species (PROLA & RACHELI, 1984; ARENBERGER et al., 1995). However, recent research studies encouraged by the Museo Friulano di Storia Naturale, Udine, resulted in several most interesting species records for Italy (HUEMER, 2001) among them two new records of *Agdistis* from the Adriatic coast: *A. intermedia* CARADJA, 1920 and a species new to science which is described in this paper.

Material

The type-material for this study was collected by Mr. Lucio Morin, Monfalcone and is

partially deposited in the Museo Friulano di Storia Naturale, Udine (MFSN), the Tiroler Landesmuseum Ferdinandeum, Innsbruck (TLMF) and Coll. Morin. Comparative material was examined from the following collections: Tiroler Landesmuseum Ferdinandeum, Innsbruck (TLMF), The Natural History Museum, London (BMNH), Zoologisk Museum, Copenhagen (ZMUC), and Zoologische Staatssammlung, München (ZSM).

Material examined:

Agdistis morini sp. n.

Holotype: 1 ♂ "I-FRIULI V. GIULIA UL76 GO Grado loc. Bonifica della Vittoria 29-VI-2000 Lucio Morin legit" "GU 00/940 ♂ P. Huemer" (MFSN).

Paratypes: 4 ♂ ♂, same data as holotype (coll. Morin; MFSN; TLMF); 1 ♂, 1 ♀, ditto, but e.l. 8. and 14.9.2000 (larva 28.8.2000) (*Limonium*) (coll. Morin, MFSN); 1 ♂, Gorizia, Grado, e.l. 7.9.1998 (larva 21.8.1998) (*Limonium*), leg. Morin (coll. Morin); 1 ♂, Gorizia, Staranzano, Cona (canale Quarantia), 13.8.2000, leg. Morin (MFSN); 1 ♂, Veneto, Caorle, Brussa, loc. Valle Vecchia, 11.9.1999, leg. Morin (MFSN); including 6 ♂ ♂, 1 ♀, genitalia slides.

Agdistis bennetii (CURTIS, 1833)

England: 2 ♀ ♀, Essex, Canvey Island, e.l. 18.6.1986 (*Limonium vulgare*), leg. Huemer (TLMF); 1 ♂, locality not stated (only slide), coll. Bankes (NHM); Denmark: 1 ♂, Vllissingen, 15.8.1980; 1 ♀, Sjaelland, Glaeno, 29.7.1941, leg. Wolff; 1 ♀, ditto, but 23.8.1970, leg. Karsholt; 1 ♀, ditto, but 12.8.1972, leg. Pyndt; 1 ♀, ditto, but e.l. (larva 4.5.1982) (*Limonium vulgare*), leg. Schnack; 1 ♂, 1 ♀, ditto, but e.l. 27. and 29.5.1999 (larva 13.5.1999) (*Limonium vulgare*), leg. Hendriksen (ZMUC); France: 1 ♂, Pyrénées-Orientales, Alénia, Etang de St. Nazaire, 4.5.1984, leg. Gibeaux (TLMF); Spain: 1 ♀, Huesca, Penalba, 300 m, 28.6.1986, leg. Skou (ZMUC); 1 ♂, Gerona, Llansa, 14.9.1986, leg. Speckmeier (ZSM); including 4 ♂ ♂, 2 ♀ ♀, genitalia slides.

Taxonomic part

Agdistis morini sp. n.

Diagnosis

Adult (fig. 1): Head, thorax and tegulae light grey-brown; head slightly arched forward; antenna grey-brown, with short cilia; wingspan 21-23 mm; forewing grey-brown with some greyish-white and black mottling, central wedge between the folds paler brown without mottling; fold with four black dots, the outer two oblique and close to each other; a further black subcostal dot at four-fifths; fringes usually with distinct black spots on termen, particularly in tornal area.



Fig. 1 - *Agdistis morini* sp. n., adult (wingspan 21.0 mm).

- *Agdistis morini* sp. n., adulto (apertura alare 21.0 mm).



Fig. 2 - *Agdistis bennetii*, adult (wing-span 27.0 mm).

- *Agdistis bennetii*, adulto (apertura alare 27.0 mm).

A. morini sp. n. is very similar to other taxa of the genus in general and the *meridionalis*-group in particular. From the most closely related *A. bennetii* it differs by the distinctly smaller wingspan and the more distinct black spots on termen (figs 1-2, table I). Further, though less reliable, differences are found in the slightly darker wings with additional black and white suffusion.

Genitalia ♂ : (figs 3, 5a-c): 8th abdominal sternite asymmetrically bilobed; tegumen with two large caudal flaps; uncus symmetrical, bilobed with three strong teeth on each lobe; valva slightly asymmetrical, ventromedially weakly excavated; saccus distinct, moderately small; costa symmetrical, large and strongly sclerotised, dorsomedial part without sclerotised flap, distoventrally with distinct excavation, apical portion bent in a right angle, apex with two distinct lobes; juxta bilobed; aedeagus slender, strongly curved.

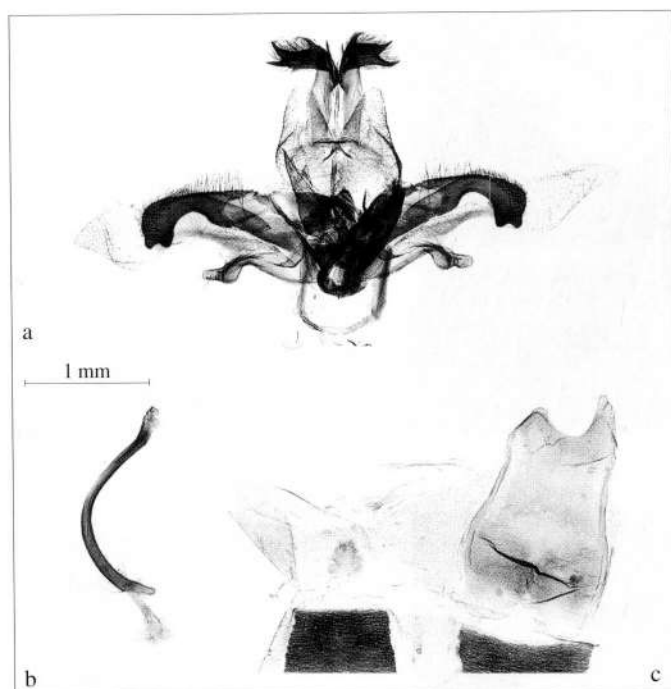


Fig. 3 - Male genitalic structures of *Agdistis morini* sp. n. (GU 00/914 P. Huemer): a) genitalia; b) aedeagus; c) 8th abdominal segment.

- Strutture genitali del maschio di *Agdistis morini* sp. n. (GU 00/914 P. Huemer): a) genitalia; b) aedeagus; c) VIII segmento addominale.

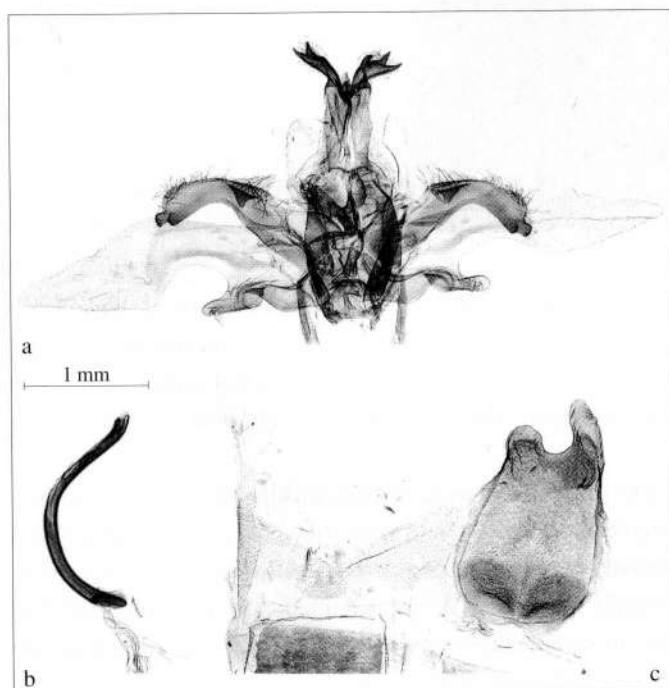


Fig. 4 - Male genitalic structures of *Agdistis bennetii* (PTE 160 P. Huemer): a) genitalia; b) aedeagus; c) 8th abdominal segment.

- Strutture genitali del maschio di *Agdistis bennetii* (PTE 160 P. Huemer): a) genitalia; b) aedeagus; c) VIII segmento addominale.

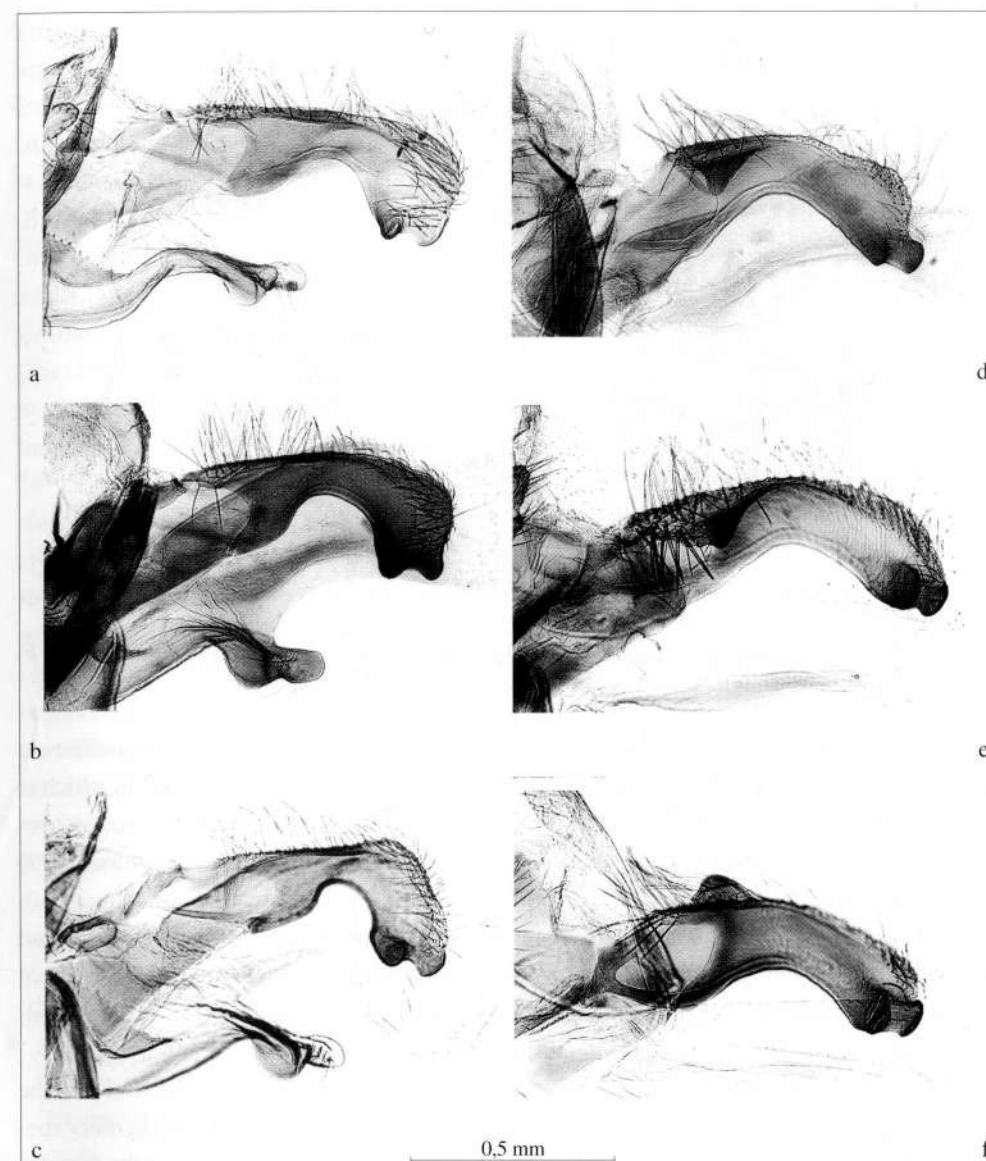


Fig. 5 - Male genitalic structures (details of valva/costa) of: a) *Agdistis morini* sp. n. (GU 00/940 P. Huemer); b) ditto (GU 00/914 P. Huemer); c) ditto (GU 00/942 P. Huemer); d) *Agdistis bennetii* (PTE 160 P. Huemer); e) ditto (GU 00/941 P. Huemer); f) ditto (GU 00/949 P. Huemer).

- Strutture genitali del maschio (particolari di valva/costa) di: a) *Agdistis morini* sp. n. (GU 00/940 P. Huemer); b) idem (GU 00/914 P. Huemer); c) idem (GU 00/942 P. Huemer); d) *Agdistis bennetii* (PTE 160 P. Huemer); e) idem (GU 00/941 P. Huemer); f) idem (GU 00/949 P. Huemer).

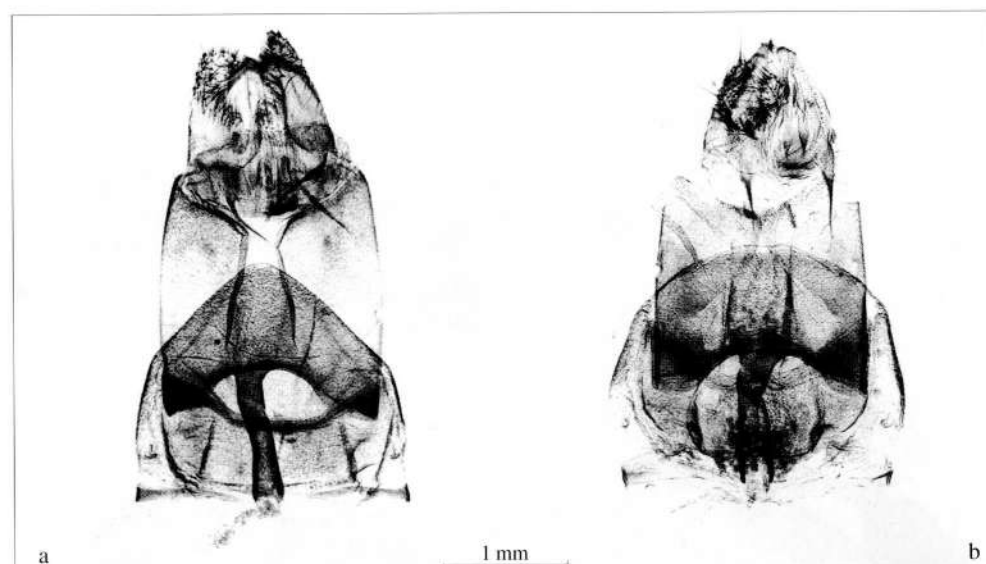


Fig. 6 - Female genitalic structures of: a) *Agdistis morini* sp. n. (GU 00/943 P. Huemer); b) *Agdistis bennetii* (GU 00/946 P. Huemer).

- Strutture genitali della femmina di: a) *Agdistis morini* sp. n. (GU 00/943 P. Huemer); b) *Agdistis bennetii* (GU 00/946 P. Huemer).

A. morini sp.n. is closely related to *A. bennetii* in genitalia. However, it clearly differs in the strongly bent costa and the complete absence of a sclerotised flap on the costa which is always well developed in the latter (figs 4d-f, table I). These characters are figured and regarded of taxonomic value by several authors such as HANNEMANN (1977), ARENBERGER (1995) and GIELIS (1996).

Genitalia ♀ (fig. 6a): 7th sternite caudally tapered; papillae anales with sclerotised dorsal part, covered by microtrichia; apophyses posteriores short; segment 8 simple, proximal margin of the tergite excavated, without apophyses anteriores; antrum a narrow tube, extending to anterior margin of segment 8; ductus bursae short; corpus bursae small, ovoid.

The female genitalia of *A. morini* sp. n. are very similar to *A. bennetii* and based on the limited material available not separable with certainty (fig. 6a-b). However, also in other species with distinct differences in the males (e.g. *A. bennetii* and *A. meridionalis*) the females are very similar.

Habitat/Biology: The type-locality is situated at the northern end of the Adriatic and belongs to a vast lagoon-delta complex between the Po and Isonzo rivers. This part of the Upper Adriatic is classified as a temperate bioclimatic area, with partial oceanic influence. The rich halophilous vegetation of this habitat assumes great and specific biogeographical importance because of the peculiar presence of species of mainly Atlantic distribution (POLDINI,

VIDALI & FABIANI, 1999). The site of the holotype of *A. morini* sp. n. is situated inside a lagoon area bordered by sandy shorelines, with many sandbanks. The area was partially drained and embanked (Bonifica della Vittoria), firstly used as a lagoon fish hatchery and later abandoned, and is now characterised by "*Limonietum*", mostly with *Limonium serotinum* (RCHB.) PIGN. (= *L. vulgare* MILLER p. p.) (Plumbaginaceae). Also Valle Vecchia (Brussa, Caorle), a site of Veneto region on the border with Friuli-Venezia Giulia region, is characterised by "*Limonietum*" which lies along coastal border protected by (fossil) sandbanks. The adults fly at sunset and during the first part of the night they are attracted to various artificial light sources, together with *A. intermedia* CARADJA, 1920 and *A. tamaricis* (ZELLER, 1847). Two generations have been observed, the first flying in June, the second in September (mainly based on bred material). A single, worn male from Cona probably belongs to the first generation. The second generation larva has been collected from 13th to 28th of August by sight on flowers of *L. serotinum* and with the use of a sweep-net. It is very similar to *A. bennetii* (see GIELIS, 1996: pl. 15, fig. 1): greenish mottled with several white spots; distinct whitish-yellow lateral abdominal line; first abdominal tergite with two short reddish horns, 9th abdominal tergite with a single reddish horn. However, the larva of *A. morini* sp. n. has been observed feeding on the inflorescences of *L. serotinum* (breeding observation), whereas *A. bennetii* feeds on the leaves of the host-plant in a characteristic matter (EMMET, 1979; ARENBERGER, 1995; GIELIS, 1996). During the day the caterpillar rests on the inflorescences where pupation also takes place. In contrast the larva of *A. bennetii* rests on the underside and pupates on the upperside of a leaf (EMMET, 1979). It is unknown which part of the plant is eaten by the first generation larva of *A. morini* sp. n., as *Limonium* blooms only in late summer. The adults of the new species emerged after 9-10 days in the first half of September probably during the night. In *A. bennetii* the duration of the pupal stage is three weeks (ARENBERGER, 1995).

Diagnostic characters	<i>Agdistis morini</i> sp. n.	<i>Agdistis bennetii</i>
wingspan	21-23 mm	24-30 mm
terminal dots	distinct	weakly developed
costa	distal part strongly bent (90°), mediodorsal part without sclerotised flap	distal part weakly curved, mediodorsal part with distinct sclerotised flap
sacculus	distinct ventral hump	weak ventral hump
valva	ventromedially weakly excavated	ventromedially strongly excavated

Tab. I - Important diagnostic characters of *Agdistis morini* sp. n. and *A. bennetii*.
- Importanti caratteri diagnostici in *Agdistis morini* sp. n. e *A. bennetii*.

Distribution: At present *A. morini* sp. n. is only known from the northern Adriatic coast. However, records of *A. bennetii* and *A. meridionalis* from the eastern Mediterranean may refer to this species.

Derivatio nominis: The new species is dedicated to Mr. Lucio Morin (Monfalcone) in recognition of his valuable field work in Friuli-Venezia Giulia which has yielded numerous interesting results.

Remarks

A. morini sp.n. belongs to the *meridionalis* species-group as defined by ARENBERGER (1995). Species of this group are characterised by four dots in the fold with the outer two oblique and occasionally merged, the multi-tipped uncus in the male, the simple entrance of the ductus seminalis and the caudally tapered 7th sternite in the female. Further taxa of the group are *A. bennetii* (CURTIS, 1833), *A. meridionalis* (ZELLER, 1847), *A. intermedia* CARADIA, 1920 and probably *A. singula* ARENBERGER, 1995. The identity of these species has been already discussed in detail in foregoing revisions and, with the exception of *A. bennetii*, type material of all species has been traced (ARENBERGER, 1977; 1985). However, the identity of the latter is undisputed due to the description and the type locality (England, Essex: Salterns at Follsbury).

Discussion

Species of the *meridionalis*-group are restricted to various *Limonium* spp. (Plumbaginaceae). This halophytic host-plant is only shared with a few other *Agdistis*, namely *A. paralia* (ZELLER, 1847) and *A. frankeniae* (ZELLER, 1847) of the *frankeniae*-group, which are, however, oligophagous feeders on Plumbaginaceae and Frankeniaceae. Other Lepidoptera with a strong trophic link with *Limonium* are e.g. found in the genera *Goniodoma* (Coleophoridae) and *Acalyptris* (Nepticulidae) (CAPUSE, 1970; LASTUVKA & LASTUVKA, 1997). The species diversity of *Limonium* is very high in Italy and includes 33 species (PIGNATTI, 1982). Numerous species are local endemics. However, monophagy of flight active lepidopterous species on single taxa is unlikely. On the other hand a holomediterranean distribution of *Limonium*-associated Lepidoptera is only known for few species e.g. *A. meridionalis*. Other monophagous *Limonium*-feeders such as *Goniodoma millierella* RAGONOT, 1882 and *G. nemesi* CAPUSE, 1970 are restricted to small areas (KARSHOLT & RAZOWSKI, 1996). *A. morini* sp. n. is hitherto only known from three localities on the Adriatic coast. Probably the species is more widely distributed in the eastern Mediterranean though misidentified as *A. bennetii*. The latter species is thought to have a holomediterranean

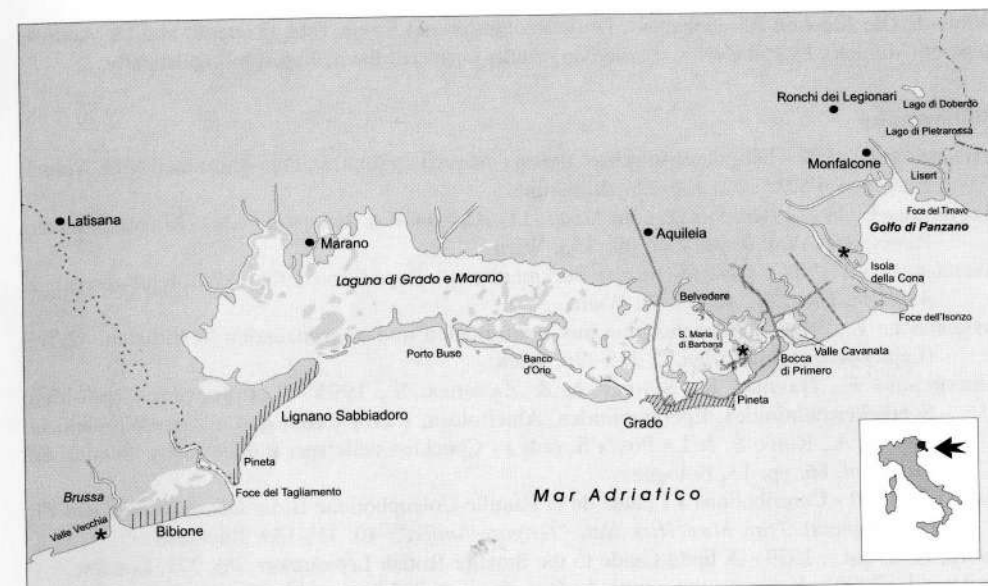


Fig. 7 - Location of the sampling stations of *Agdistis morini* sp. n. (*).
- Località di raccolta di *Agdistis morini* sp. n. (*).

distribution pattern, extending from northern Europe, Great Britain and the Iberian Peninsula to Italy and the Balkans. It was even mentioned from Grado, the type-locality of *A. morini* sp. n. (ARENBERGER, 1995). However, all these records, particularly from the Adriatic coast and from Rumania have to be re-examined and proved by examination of genitalia. Genitalia characters of *A. morini* sp. n. and *A. bennetii* show a close relationship and possibly they are vicarious species. The high specific value of the male costa throughout the group is a convincing argument that two species are involved, particularly as no clinal variation was observed in *A. bennetii* from Denmark, England and Spain (fig. 5d-f). This observation is furthermore supported by the different feeding habits of second generation larvae. The evolution of two species could be explained by the long isolation of the coastal areas of the western and eastern Mediterranean which is also reflected by the speciation within the host-plant genus *Limonium*.

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