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Preliminary distributional data on *Hericiaceae* (*Basidiomycetes*) in Italy

Abstract

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The present paper is the first in a series that will outline the known distribution of *Aphyllorales* in Italy. The family *Hericiaceae* is treated, with 5 species of the 3 genera *Creolophus*, *Hericium*, and *Mucronella*.

Introduction

Recently, a national programme has been set for recording and mapping the fungi of Italy (Lo Bue 1996). Studies on the distribution of *Aphyllorales* were initiated about 15 years ago, and the first, still provisional results can now be reported, starting with the family *Hericiaceae* Donk. In Italy, the *Hericiaceae* comprise 3 genera, *Creolophus*, *Hericium*, and *Mucronella*, with 5 species in total.

Material and methods

The local and national mapping programmes adopt the grid system of the Italian Institute for Military Geography (I.G.M.I.), based on Greenwich co-ordinates. There are two series of maps of Italy, at the scales 1 : 50,000 and 1 : 25,000 (series 25). For the purpose of our distribution maps, the 652 map sheets at 1 : 50,000 were used as grid units: each covers 12' of latitude by 20' of longitude (on average, c. 27 × 22 km, or c. 600 km², depending on latitude). Each such sheet is equivalent to four map sheets 1 : 25,000 of which there are 2298 in total, covering 6' lat. × 10' long., or c. 150 km².

Most of the collections used for mapping purposes are deposited in the herbarium, Institute of Plant Pathology, Bologna University (HUBO), but some specimens are various private herbaria.

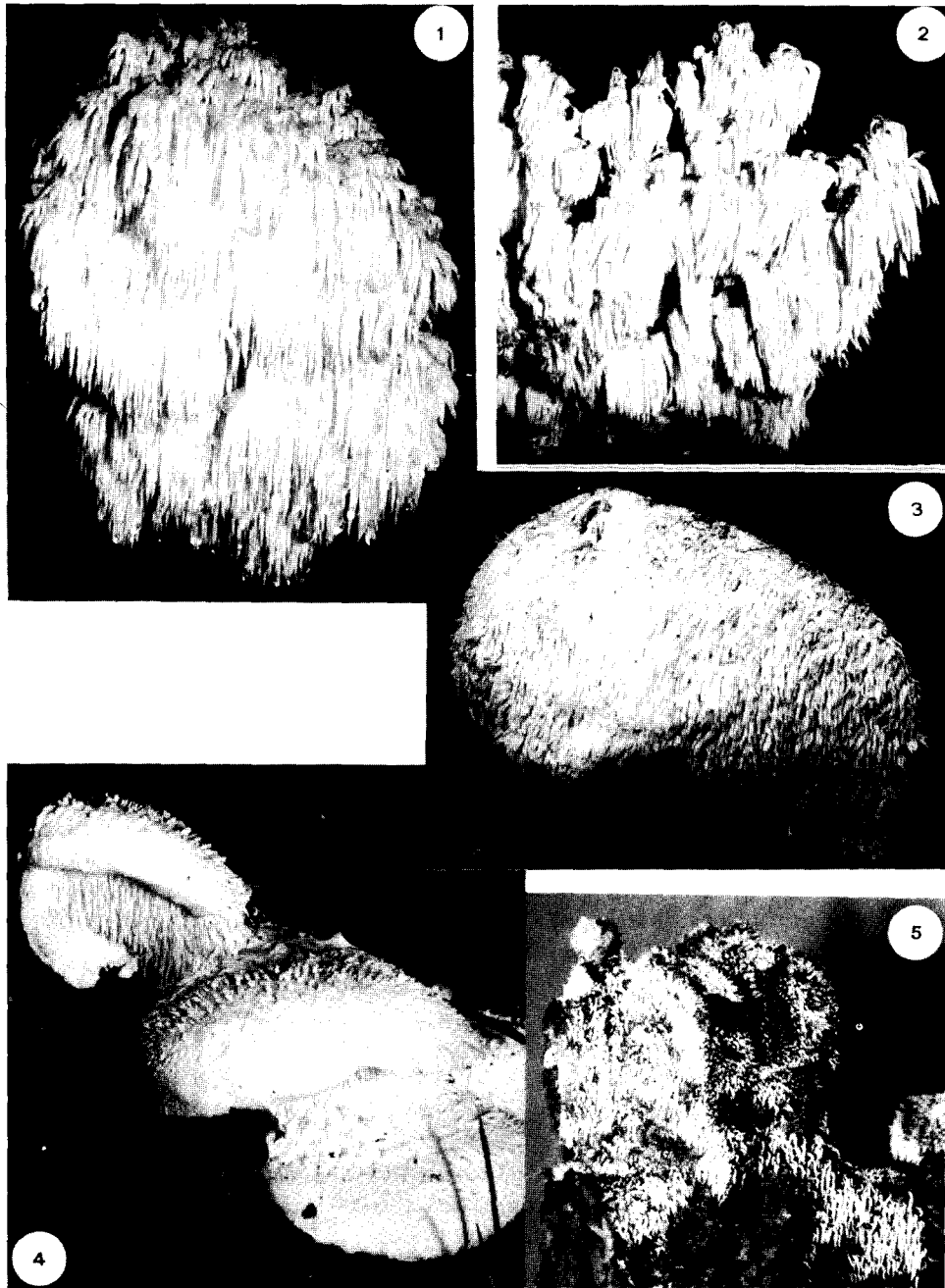


Fig. 1-5. Fruiting bodies of Italian *Hericiaceae*. – 1, *Hericium alpestre*; 2, *Hericium coralloides*; 3, *Hericium erinaceum*; 4, *Creolophus cirrhatus*; 5, *Mucronella calva* (photographs: 1, 4-5, F. Padovan; 2, A. Zuccherelli; 3, S. Curreli).

***Creolophus* P. Karst.**

This genus is monotypic. Its only species, *Creolophus cirrhatus* (Pers.: Fr.) P. Karst., is unmistakable. It is widely distributed in Europe (Austria, Denmark, Finland, France, Germany, Italy, Norway, and Sweden; see Jülich 1989).

Creolophus cirrhatus differs from the species of *Hericium* by its non-amyloid (IKI –) context and by dorsiventrally flattened fruiting bodies. In both genera, gloecystidia are present (Maas Geesteranus 1962; Fig. 12). For a detailed description of macro- and microscopical characters, see Breitenbach & Krazlin (1986) and Jülich (1989).

The species is uncommon in Italy, where it is known to form multipileate basidiocarps, showing a sporadic distribution in some regions (Fig. 6). It appears to be mainly associated with *Fagus sylvatica* L. and has been found in beech forests or *Fagus-Abies* forests, from the end of the summer to winter time. It has been collected mostly on *Fagus* (7 times), but also once on *Malus* and once on *Carpinus* (Fig. 4). Two collections are deposited in HUBO, the others are in herb. Jamoni and the herbaria of the Gruppo Micologico di Bolzano and the Gruppo Micologico di Belluno.

***Hericium* Pers.**

Following Hallenberg (1983), we recognize three species in Europe: *Hericium alpestre* Pers., *H. coralloides* (Scop.: Fr.) Pers., and *H. erinaceum* (Bull.: Fr.) Pers. There has been much confusion over the correct application of the name *H. coralloides*. Traditionally the species growing on *Fagus* had been given that name. Then Maas Geesteranus (1959), followed by other authors, applied the binomial to the species growing on *Abies* in Central Europe, designating the species found on *Fagus* as *H. clathroides* (Pallas: Fr.) Pers. This has changed again, with *H. clathroides* now being considered a synonym of *H. coralloides*, while the closely related species growing mainly on *Abies* is named *H. alpestre*.

No original material of *Hericium coralloides* by either Scopoli or Fries is known to exist, and Hallenberg (1983) therefore designated a neotype. Both specimens of *H. alpestre* in Persoon's herbarium are in bad shape. Many European authors have misinterpreted and perhaps often confused the two species in question, that Scopoli and Fries themselves failed to recognize as distinct.

In Europe *Hericium alpestre* seems to follow the natural range of *Abies* in its distribution (Austria, France, Germany, Italy, the Netherlands, Switzerland, and former Yugoslavia; Jülich 1989).

The macromorphological appearance and the arrangement of spines in the basidiocarps are very variable (Fig. 1). Specimens with fleshy, branched, tufted and pendent spines occur side by side with others in which the spines are distributed on the lower surface of the branches like the teeth of a comb. The microscopical features, however, are nearly constant. Besides the different host, *Hericium alpestre* can best be distinguished from *H. coralloides* by its amyloid (IKI +) basidiospores being larger ($5-6.5 \times 4.5-5.5 \mu\text{m}$; Fig. 8). It is by now evident that all specimens, mostly associated with *Abies*, that have larger spores must be assigned to *H. alpestre*, while those growing on angiosperm trees, with smaller spores, are *H. coralloides*.

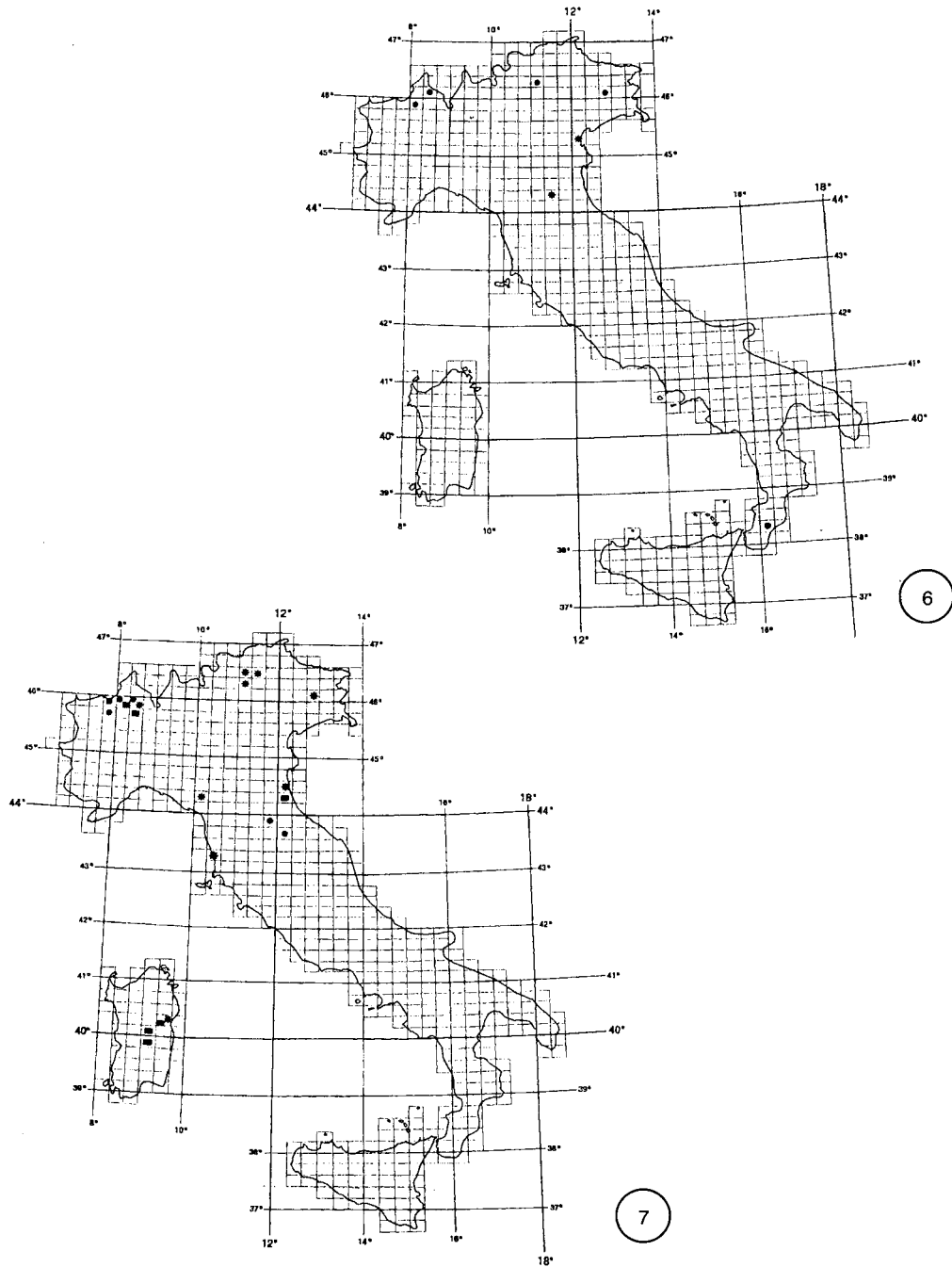


Fig. 6. Distribution of *Creolophus cirrhatus* (●) and *Mucronella calva* (★) in Italy.

Fig. 7. Distribution of *Hericium alpestre* (●), *H. coralloides* (★), and *H. erinaceum* (■) in Italy.

In Italy, *Hericium alpestre* has been found both on living *Abies* trees, at 2-3 meters above the ground, and on newly fallen trunks. It follows *Abies alba* Mill. in its presence, being a rare species with infrequent appearances in the Alps and Apennines (Fig. 7). Three collections are deposited in HUBO, four in herb. Jamoni. The indications of Bresadola (1932, "Italia borealis") and Saccardo (1888, "ad truncos abietinos in subalpinis Italicis") are too generic for mapping.

Hericium coralloides grows most often on *Fagus sylvatica* and is widespread in Europe (Austria, Czechoslovakia, France, Germany, Italy, the Netherlands, Sweden, and Switzerland; Jülich 1989).

Same as *Hericium alpestre*, *H. coralloides* shows a variable basidiocarp macromorphology; almost all Italian collections are branched, with very rare spines limited to the lower surface of the branches, as also described by Hallenberg (1983; Fig. 2). The basidiocarps are large and grow on fallen trunks and stumps of angiosperm trees. The most important microscopic difference from *H. alpestre* is the smaller size ($3.5\text{-}5 \times 3\text{-}4 \mu\text{m}$) of its amyloid (IKI +) basidiospores (Fig. 11).

Hericium coralloides is not a common species but is widespread in Italy, both in the lowlands and on mountains, being more frequent than *H. alpestre* (Fig. 7). The main host is *Fagus* in the north but *Quercus* in central Italy. Of our specimens, 4 were found on *Fagus* (HUBO and herbarium of the Gruppo Micologico di Bolzano), 5 on *Quercus* (HUBO, herbarium of the Gruppo Micologico di Ravenna, herb. Curreli), 1 on *Malus* (herb. Jamoni), 1 on *Betula* (herbarium of the Gruppo Micologico di Bolzano), 1 on *Morus* (herb. Ricci), with one record for *Castanea* (Mori 1886).

Hericium erinaceum, in Europe, has mainly a central and southern distribution (Austria, Czechoslovakia, Denmark, France, Germany, Great Britain, Italy, the Netherlands, Norway, Sweden, and Switzerland; Jülich 1989).

Macromorphologically, *Hericium erinaceum* differs from *H. alpestre* and *H. coralloides* by its compact basidiocarp with long spines exclusively borne in terminal tufts, not hanging down from the underside of the branches like teeth of a comb (Photo 3). In long-section the spines are seen to be inserted along continuous, even lines. Like the other *Hericium* species it has long gloeopleurous hyphae with a moniliform aspect in the hymenium. The basidiospores, subglobose and amyloid (IKI +), appear slightly echinulate in Melzer's reagent (Fig. 9).

Hericium erinaceum seems to be a rare species in Italy (Fig. 7), where it is mostly found on living oak (5 collections: HUBO; herb. Curreli; Mori 1889; herbarium of the Gruppo Micologico di Parma) and beech trees (2 collections in herb. Jamoni), rarely (once) on *Castanea* (herb. Curreli). It is mainly found in mountainous areas and has been collected from the end of the summer to late autumn.

***Mucronella* Fr.**

At first included by Corner (1950) and Donk (1964) in the *Clavariaceae* Chevall., *Mucronella* it is now considered to be closer to *Hericiaceae*, even if it apparently lacks a gloecystidial system. In Italy it is represented by a single species.

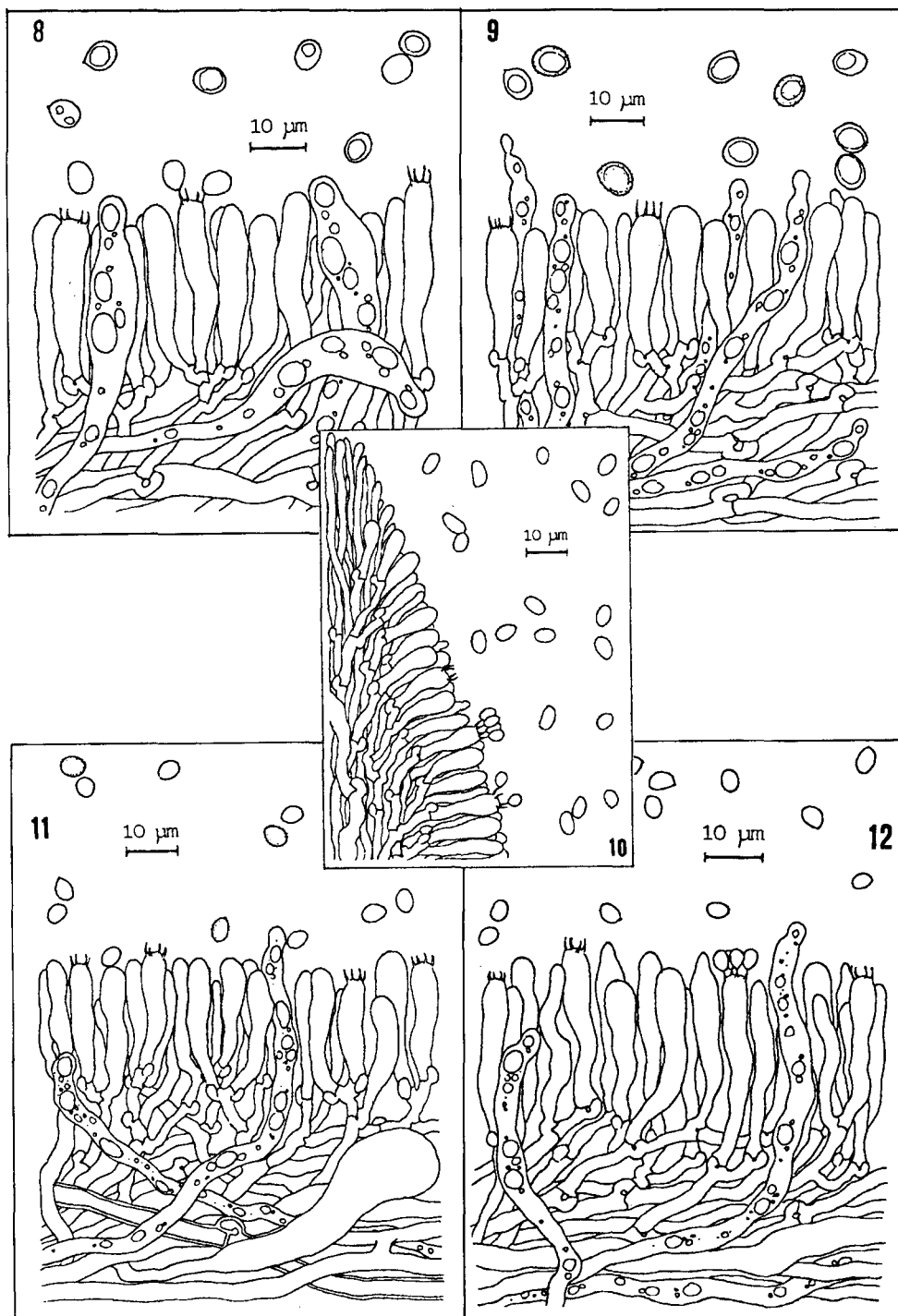


Fig. 8-12. Hymenial elements of Italian *Hericiaceae*. – 8, *Hericium alpestre*; 9, *Hericium erinaceum*; 10, *Mucronella calva*; 11, *Hericium coralloides*; 12, *Creolophus cirrhatus*.

The spines of *Mucronella calva* Fr. are 1-3 mm long, scattered, never gregarious, individually distinct (Fig. 5), pointing vertically downward, white then yellowish, thin, rigid, subulate, with a sterile bundle of hyphae emerging at their apex. The species has a non-amyloid context and subglobose, weakly amyloid basidiospores measuring $4-6.5 \times 2.5-3.5 \mu\text{m}$ (Fig. 10). It is very similar to *M. bresadolae* (Quél.) Corner, which has larger spores and longer spines (Breitenbach & Kränzlin 1986).

Mucronella calva is a very rare species in Italy (Fig. 6). It was collected in winter time, on strongly rotten *Abies* wood, in the Apennines not far from Bologna; and on broad-leaved trees close to Venice (herb. Losi).

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