

**RAMARIA FAGICOLA (FUNGI, BASIDIOMYCOTA)
– THE FIRST RECORD FOR POLAND, AND FROM A NEW SUBSTRATUM**

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ABSTRACT

Ramaria fagicola is a rare European species. It was previously known only from three localities in western Europe. The species is reported here from Poland, where it was first observed on decomposing wood of *Pinus sylvestris* in the Wierzchlas reserve in Bory Tucholskie Forest (N Poland). It is the first record of the fungus on conifer wood as habitats associated with deciduous wood, mostly *Fagus*, reported in literature.

KEY WORDS: *Lentoramaria*, Bory Tucholskie Forest, N Poland.

INTRODUCTION

The genus *Ramaria* Fr. ex Bonord. is divided into 4 subgenera: *Ramaria*, *Laeticolora* Marr & Struntz, *Echinoramaria* Corner and *Lentoramaria* Corner, due to differences in the spores morphology, and the structure of vegetative fruit bodies hyphae. *Ramaria fagicola* belongs to the subgenus *Lentoramaria*.

Spores in species of the subgenus *Lentoramaria* are verrucose, almost smooth or smooth, which distinguishes them from other subgenera. Fruitbodies growing on wood or humus. Stem flesh usually inamyloid. Well developed dimittic rhizomorphs. Representatives of the subgenera *Echinoramaria* and *Lentoramaria* are saprobes while species of the subgenera *Ramaria* and *Laeticolora* are thought to be ectomycorrhizal (Petersen 1997).

The genus *Ramaria* comprises ca. 300 species worldwide, ca. 100 species in Europe and 28 species in Poland (Wojewoda 2003; Łuszczynski 2008; Karasiński 2009). The number of species in Poland has increased in recent years in response to the growing interest in the genus and further records of *Ramaria* are likely to be reported from Poland in the future.

The aim of the study is to describe *Ramaria fagicola* as a species new to the mycobiota in Poland. It is interesting that the knowledge on the species is enriched by new ecological data on the development of the mycelium on conifer wood as the fungus was previously observed exclusively on deciduous wood.

MATERIAL AND METHODS

Fruitbodies of *Ramaria fagicola* collected in the Wierzchlas reserve in the Bory Tucholskie Forest were examined. Fresh sporocarps were treated in 10% KOH to determine characteristic colour reactions of rhizomorphs, the stem and the hymenium. Drawings of spores, basidia and hyphae were made from photographs of images taken with a light microscope. Taxonomically important organoleptic characteristics such as the smell and taste were observed from fruitbodies when fresh.

The specimens deposited in the Herbarium of Department of Botany (KTC 3877), Institute of Biology of the Świętokrzyska Academy in Kielce and in the Herbarium of the Tennessee University.

DESCRIPTION OF THE SPECIES

Taxonomy

Ramaria fagicola R.H. Petersen, Bibliotheca Mycologica 43: 112 (1975) – *Gomphaceae* Donk, *Gomphales* Jülich, *Phallomycetidae* K. Hosaka, Kastellano & Spatafora, *Agaricomycotina* Doweld, *Agaricomycetes* Doweld, *Basidiomycota* R.T. Moore, *Fungi* (Kirk et al., 2008).

Macroscopic and microscopic description

Fruitbodies up to 6-7 cm high, slender, caespitose, arising as several elongated stipes, repeatedly branched. Rhizomorphic strings white, up to 1 mm thick, when fresh and treated with 10% KOH become lemon yellow. Stipe slen-

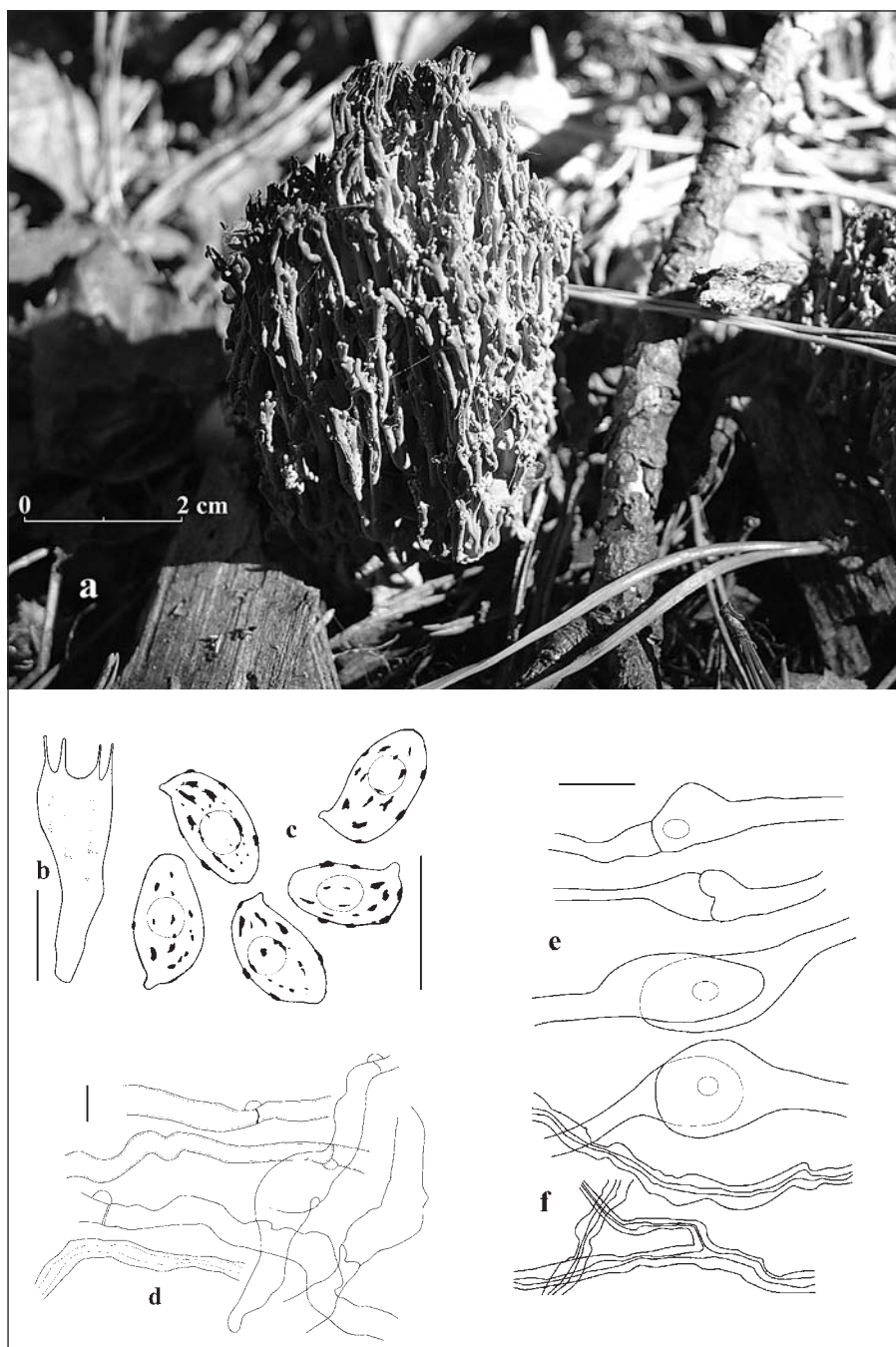


Fig. 1. *Ramaria fagicola*: a – fruit-body; b – basidium; c – spores; d – hyphae of trama in branches; e – clamps connection; f – skeletal hyphae in rhizomorphs; scale bars = 10 μm .

der, up to 1 cm long, up to 3 mm thick, watery yellowish below, and reddish brown above. Branches slender, erect, reddish brown, rebranching irregularly, somewhat flattened, especially near axils. Axils rounded to lunate, sterile, and decurrent in a channel or line. Apices of branches very delicate, slender, erect, finely digitate, weakly yellowish when fresh, and when dried somewhat darker than branches. Hymenium unilateral, when rubbed and/or damaged changing to brown-(vinous) rosa-lilac colour. Fresh flesh white on cross-section, not changing colour when exposed to air. Taste mild and sweetish (never bitter!) but odour resembling rotting wood or cellar-like (not anise!).

Spores of *Ramaria fagicola* measuring 8.1–10.0 \times 5.0–5.4 μm , cylindrical to narrowly ellipsoid, and obscure rough with not prominent apiculus. Basidium with (2)–4 sterigmata, ca. 43 \times 5.4 μm . Hyphae of branches trama monomitic, ge-

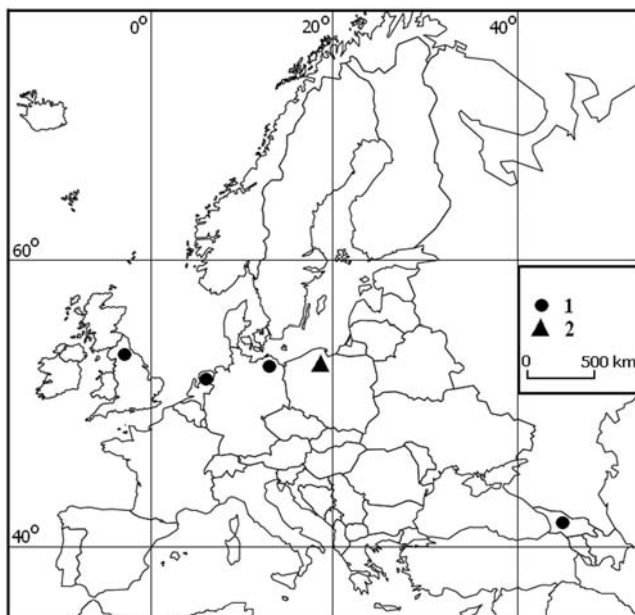
nerative, 3.8–13(17) μm diameter, diverse, from thin- to thick-walled, and also pseudoskeletal with wall up to 2.5 μm . Hyphae in rhizomorphs dimitic, generative and skeletal. Thin-walled generative hyphae, up to 8 μm with ampullate, inflated clumps up to 16 μm broad (Fig. 1). Skeletal hyphae 2.5–4.0 μm diameter, tapering gradually at the end, without septa, rigid, straight, and gnarled. Observed under the microscope in a fresh specimen of subhymenium layer, long cells filled with oil drops, and with gloeocystidia appearance.

Distribution in Poland

Described site is situated in Northern Poland, West Pomeranian, in the Bory Tucholskie Forest, 40 km N of Bydgoszcz city, and ca. 17,5 km SE of Tuchola town, in the Wierzchlas reserve (53°32' N, 18°07' E). The fruit bodies

TABLE 1. Comparison of selected features of the *Ramaria fagicola* and *R. stricta* (acc. to Petersen 1975).

Features	<i>R. fagicola</i>	<i>R. stricta</i>
Spores	8.1–10.0×5.0–5.4 µm	7–10.0×4.0–5.0 µm
System of hyphae	dimitic	dimitic
Colour of apices	weakly yellowish	yellow, yellow-ochre
Colour of flesh in cross-section	whitish	brown-vinous-red
Colour of flesh in 10% KOH	brownish	copper, orange, brownish
Taste	mild and sweetish	mildly spicy to bitter
Odour	rotting wood or cellar-like (not anise!)	anise

Fig. 2. Distribution of *Ramaria fagicola* in Europe: 1 – known localities; 2 – new locality.

grow in groups on the rotting wood of coniferous stump (*Pinus sylvestris*) in oak-linden-hornbeam forest Tilio-Carpinetum with *Pinus sylvestris*.

World distribution

Ramaria fagicola is the species occurring in the Northern hemisphere. This species is very rare and until now was known only from a few places, mainly from Europe, England, Netherlands (Petersen 1975; Jülich 1984), Germany (http://www.uni-greifswald.de/~mycology/kartierung_mv/GesamtlisteMV_qberGesamt11Seite24.html), and also from Asia, Georgia (former USSR, – R.H. Petersen, pers. comm.) (Fig. 2).

DISCUSSION

Ramaria fagicola is very similar in shape and colour especially to *R. stricta*. Comparison of selected features of the *Ramaria fagicola* and *R. stricta* is given (Table 1). *R.*

stricta grows on rotting deciduous and coniferous woods, while *R. fagicola* was until now described only from deciduous wood (*Fagus*). This record is the first case of finding *R. fagicola* specimens in Poland, and collected from a new substratum, conifer wood (*Pinus*). Determination of *Ramaria stricta* during the field collection demands a special care due to the possibility of misidentification. It is characteristic for *Ramaria fagicola* to be distributed mostly in areas under the influence of oceanic or marine climate.

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