

Hebeloma alvarens, a new species from Estonia

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Hebeloma alvarens Vesterh. & Vauras (Basidiomycota, Agaricales) is described as a new species from open alvar pine forest of Western Estonia. It belongs to the section *Denudata* (Fr.) Sacc., and it is characterized macroscopically by a cinnamon-coloured pileus and a very fragile, floccose stipe.

Key words: *Agaricales*, *Estonia*, *Hebeloma*, *taxonomy*

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Introduction

A special habitat type known as alvar has developed on limestone areas, especially on the coast and islands of Estonia, as well as on the islands Öland and Gotland of Sweden. Different types of alvar habitats include alvar forests, alvar shrublands, alvar grasslands and alvar heaths. They are characterized by a thin mineral soil layer upon limestone or calcareous gravel. The productivity is relatively low, mainly because of the lack of moisture. The fungus flora of the alvars is very interesting. In these areas several fungi are found, which have never been found in Finland, e.g. *Cortinarius terpsichores* Melot, *Entoloma bloxamii* (Berk. & Broome) Sacc., *E. incanum* (Fr.: Fr.) Hesler, *E. roseum* (Longyear) Hesler and *Hygrocybe caliphila* Arnolds.

During the stay of the second author in Hiiumaa island, participating in the Estonian–Finnish Workshop on Fungal Taxonomy on 12–18 Sept. 2001, the fungus season in the area was excellent. A very distinctive *Hebeloma* was found in an open pine forest in the southern part of Hiiumaa,

Estonia. Even in the field the species was eye-catching being cinnamon, distinctly zoned, and having broad lamellae and a very fragile stipe. Later, it was found to have a combination of characters, which do not match any of the known species of the genus.

Microscopical characters were measured and drawn in 5% KOH. The quantitative values D1, D4, O3, P2 used for spore characters in this paper refer to Vesterholt (1995). The colour code refers to Kornerup and Wanscher (1978) and Heilmann-Clausen et al. (1998).

***Hebeloma alvarens* Vesterh. & Vauras, species nova** Figs. 1–2

Pileus 1.3–3.8 cm *latus*, *convexus*, *deinde expansus*, *cinnamomeus*, *zonatus*. *Lamellae* *usque ad* 7 mm *latae*, *ventricosae*, *emarginatae*, *satis distantes*, *pallide brunneae*, *guttis aqueis siccae maculatae*. *Stipes* 3.0–3.8 cm *longus*, 3–6 mm

crassus, cylindraceus, floccosus, albidus, fragilissimus. Cortina nulla. Velum non observum. Odore raphanino. Sporae 11.0–14.0 × 5.5–7.5 µm, ex maxima parte anguste amygdaliformes vel fusiformes. In solo calcareo.

Holotypus: **Estonia.** Hiiumaa. Käina commune, Kassari, Sääre, camping place, open alvar forest with *Pinus sylvestris* and *Juniperus communis*, on calcareous soil, alt. ca. 5 m, 17.IX.2001 J. Vauras 17955F (C; isotypes in H, TAA, TUR).

Pileus 13–38 mm broad, convex to expanded, not umbonate, margin even or slightly crenulate, surface smooth, nearly dry, almost unicoloured cinnamon (6C5–6), very pale brown at the extreme margin, with innate greyish brown fibrils and a narrow, greyish brown ring-zone at half the radius. **Lamellae** deeply emarginate, fairly distant, ventricose, broad to very broad, up to 7 mm, lamellulae abundant, clay-buff, edge uneven, whitish, with small droplets, later spotted from these. **Stipe** 30–38 × 3–6 mm, cylindrical, not distinctly widened at base, not rooting, floccose in the entire length, whitish to greyish white, tinged pinkish buff at base, very fragile. **Cortina** absent. **Uni-**

versal veil not seen. **Smell** raphanoid. **Exsiccat-ae** not blackened.

Spores 11.0–14.0 × 5.5–7.5 µm, on average 12.4–13.3 × 6.1–6.7 µm (four fruitbodies, each 25 spores), narrowly amygdaliform to amygdaliform or fusiform, a large majority narrowing towards the apiculus, often with apical papilla, $Q = 1.70–2.15$, on average 1.88–2.06; ornamentation very distinct (O3), perispore loosening in many spores (P2), dextrinoid reaction weak (D1). **Basidia** 25–32 × 8.5–10 µm, cylindrical to clavate, 4-spored. **Cheilocystidia** 28–65 µm long, 6–9(–10) µm wide at apex, 4–5 µm wide in the median part, 4–11 µm wide near the base, clavate, often also widened in the lower part, a minority ventricose with a cylindrical apical part, apex on average 7.2 µm wide ($n = 25$), hyaline, thin-walled or somewhat thick-walled in the apical part. **Pleurocystidia** not observed. **Gill trama** hyaline to very pale brownish. **Pileipellis** an ixocutis; epicutis about 20–30 µm thick, enclosed hyphae 2–5 µm broad, encrusted, hyaline to brownish; cutis of dark reddish brown elements with encrusting pigment.



Fig. 1. *Hebeloma alvarense* Vesterh. & Vauras, *in situ*. Type, × approx. 1.2, photograph Jukka Vauras.

Ecology

Hebeloma alvarense is only known from the type collection, which was found in open alvar forest with *Pinus sylvestris* and *Juniperus communis*. The type locality has been used as a natural camping area, but not too intensively. The site is characterized by a low vegetation of lichens and vascular plants, e.g. *Filipendula vulgaris*, *Thymus serpyllum*, *Helianthemum nummularium*, *Plantago lanceolata*, and *Antennaria dioica*. Agar-

ics found in the type locality include *Inocybe inodora* Velen., *I. oblectabilis* (Britzelm) Sacc., *Hebeloma senescens* (Batsch) Berk. & Broome and *Russula sanguinea* (Bull.) Fr., all mycorrhizal species with *Pinus sylvestris*, and species characteristic of *Juniperus* alvars, viz. *Entoloma catalaunicum* (Singer) Noordel., *E. excentricum* Bres., *Lepiota alba* (Bres.) Sacc., and *L. oreadiformis* Velen. *Volvariella pusilla* (Pers. : Fr.) Quél. was also collected.

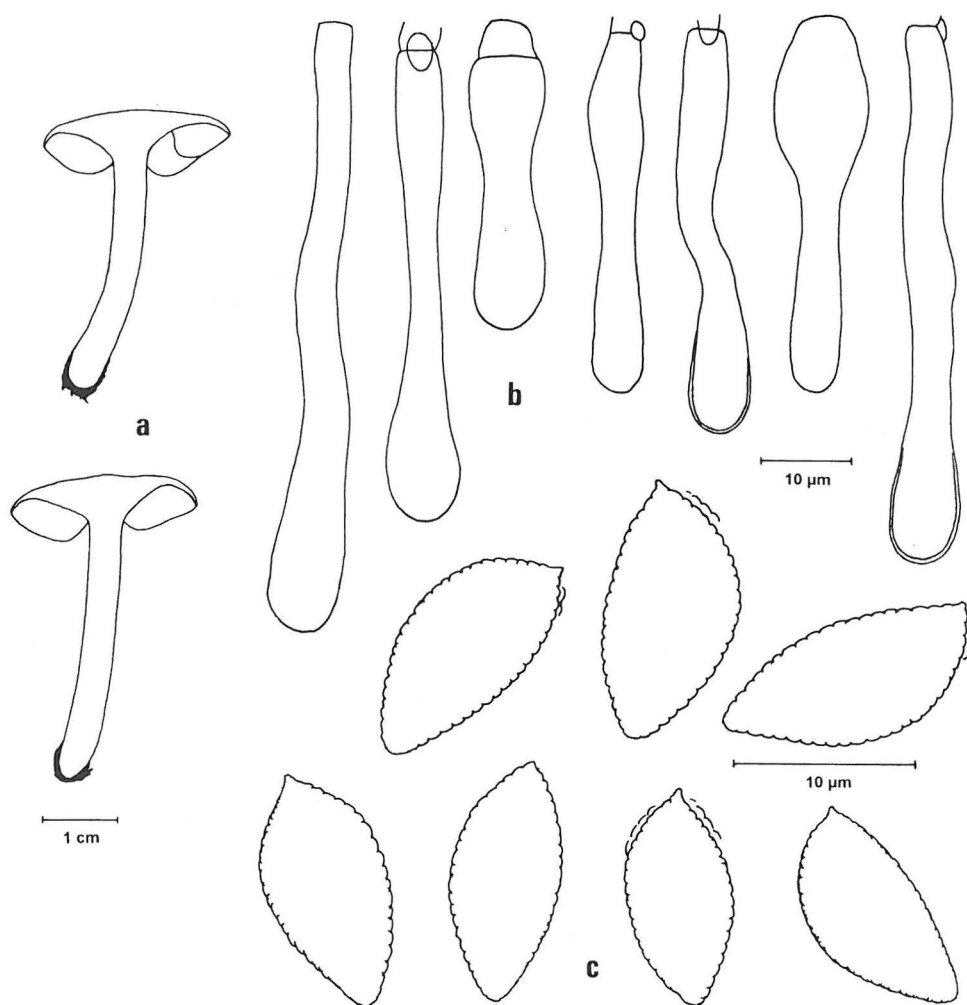


Fig. 2. *Hebeloma alvarense* Vesterh. & Vauras (type). a) fruit bodies, b) cheilocystidia, c) spores.

Discussion

With the droplets formed on the gills, the raphanoid smell, the non-rooting stipe, the strongly ornamented spores and the clavate cheilocystidia, *Hebeloma alvarense* is a member of section *Denudata*, which is typified with *H. crustuliniforme* (Bull.) Quél. The outstanding characters of *H. alvarense* are the cinnamon coloured pileus, the broad and fairly distant lamellae, the fragile stipe, the very thin epicutis and the more or less fusiform spores with a loosening perispore. The zonation of the pileus may also prove to be a useful character to delimit the species, but until more material has been studied it is impossible say whether this character is constant.

The fragile stem and the slightly dextrinoid spores with a loosening perispore are also found in *Hebeloma fragilipes* Romagn., but that species has a much paler cap, and a much thicker epicutis, generally around 100 µm. For a description of *H. fragilipes*, see Romagnesi (1965) and Vesterholt (1995, 2000). In the type material of *H. fragilipes* the cystidia often have thickened walls in the median part. This feature has not been observed in *H. alvarense*. It should be noted that *H. fragilipes* and *H. hiemale* Bres. belong to a species complex that is not yet fully understood, and which probably includes several species varying in a number of characters such as colour, size and spore features. For a description of original material of *H. hiemale*, see Grilli (1997).

The only known species from Europe combining ± fusiform spores and a very thin epicutis is *Hebeloma cremeopallidum* (Esteve-Rav. & Heykoop) Esteve-Rav. & Heykoop (Esteve-Raventós & Heykoop 1990, Heykoop & Esteve-Raventós 1997). Until now it is only known from Spain, and it differs from *H. alvarense* in having a pale cap and longer spores, 12.5–15(–17) × 6–7 µm, on average 14.3 × 6.6 µm (n = 20, own observations), with a strong dextrinoid reaction (D4).

Due to the cinnamon colour, *Hebeloma alvarense* may superficially resemble *H. theobrominum* Quadr. or *H. birrus* (Fr.) Gillet. The former has smaller spores with a non-loosening perispore and a strong dextrinoid reaction, while the latter has a fruity smell, short, ± cylindrical cheilocystidia and spores with a strong dextrinoid reaction. In addition, both of these species have a thicker epicutis than *H. alvarense*, and none of the aforementioned species has broad lamellae or droplets on the lamellae.

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References

- Esteve-Raventós, F. & Heykoop, M. 1990: Notas micológicas. I. *Hebeloma vaccinum* Romagn. y *Hebeloma vaccinum* var. *cremeopallidum* var. nov. – *Cryptogamie Mycol.* 11: 21–29.
- Grilli, E. 1997: Ridescrizione dei caratteri micromorfologici di *Hebeloma hiemale*. – *Bolletino del Gruppo Micologico G. Bresadola – Nuova serie*. BGMB 40: 251–260.
- Heilmann-Clausen, J., Verbeken, A. & Vesterholt, J. 1998: The genus *Lactarius*. – *Fungi of Northern Europe* 2: 1–287.
- Heykoop, M. & Esteve-Raventós, F. 1997: Mycological notes, II. Neotypification of *Hebeloma cistophilum*, a Mediterranean pleurocystidiata species, and combination of *Hebeloma cremeopallidum* (Esteve-Rav. & Heykoop) comb. nov. – *Mycotaxon* 61: 209–213.
- Kornerup, A. & Wanscher, J.H. 1978: *Methuen handbook of colour*. 3rded. – Methuen, London.
- Romagnesi, H. 1965: Etude sur le genre *Hebeloma*. – *Bull. Soc. Mycol. France* 81: 321–344.
- Vesterholt, J. 1995: *Hebeloma crustuliniforme* and related taxa – notes on some characters of taxonomic importance. – *Acta Univ. Ups. Symb. Bot. Ups.* 30: 129–137.
- Vesterholt, J. 2000: *Hebeloma crustuliniforme* and related species. – *Field Mycology* 1: 58–68.