

# Distribution, Morphology, and Taxonomy of *Haploporus suaveolens* (L.: Fr.) Fr., a Rare Polypore Revealing Medicinal Properties

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The search for active producers of metabolites having medicinal importance has been an urgent task for mycologists and biotechnologists for several decades. For successful performance of this task, the knowledge of the biology and ecology of the fungi, as well as the importance of their evolutionary development and natural taxonomical relationships, is necessary.

Being a rare and interesting species, *Haploporus suaveolens* (should not be confused with *Trametes suaveolens* (Fr.) Fr.) has received much attention by mycologists over the two last centuries. There are indications of diverse household and medicinal uses of this fungus within North American indigenous peoples (Blanchette, 1997); however, both in America and Europe the fungus has still not been investigated for medicinal and biochemical aspects. The main reason is its scarce distribution and small number of culture strains. Hence, the study of biological features and revealing the natural taxonomical position of this species could have a great importance.

## SHORT DESCRIPTION

*Haploporus suaveolens* (L.: Fr.) Donk, Proc. Koninkl. Nederl. Akad. Wetenschappen (C) 47: 20, 1971.

– *Boletus suaveolens* L., Sp. Plant., 1177, 1753.  
– *Agaricopulpa suaveolens* (L.) Paul., 1793. – *Polyporus suaveolens* L.: Fr., 1821 (misappl.); *Polyporus odoratus* Sommerf., 1826: Fr., 1828. – *Trametes odora* (Sommerf.: Fr.) Fr., 1838. – *Fomitopsis odora* (Sommerf.: Fr.) P. Karst., 1881 (nom. invalid.). – *Haploporus odoratus* (Sommerf.: Fr.) Singer, 1944; *Ungulina fraxinea* var. *albida* Bourdot, 1932; *Fomitopsis odoratissima* Bond., 1950.

**BASIDIOCARPS:** perennial, sessile, corky, appanate-ungulate to bracket-shaped, 5–15 × 3–7 × 3–6 cm; surface whitish or cream then covered by thin grayish to brownish crust; margin obtuse, pores 3–4(–5) per mm; context corky, soft, zonate and fibrillose, whitish, yellowish or cream, odor very strong, pleasant, aniseed or almond, taste bitter. **HYPHAL SYSTEM** trimitic: skeletal hyphae (2–)2.5–3.5(–5.2) μm, in tube trama weakly dextrinoid and cyanophilous, without these reactions in medullar tissue. Binding hyphae 1.7–2.5 μm wide, IKI and CB–. Generative hyphae (1.5–)1.7–2.2(–3.5) μm, clamped. **CYSTIDIA** none. **BASIDIA** (13.5–)15–20(–22) × 5–5.8(–6.3) μm, clavate, four-spored, fibulate at the base. **SPORES** (5.2–)5.5–6(–7.2) × (3.5–)4–5(–5.3) μm, ovoid to short-cylindrical, thick-walled, often guttulate.

## ECOLOGY AND DISTRIBUTION

The fungus grows mainly on drying *Salix caprea* in old taiga forests but may occur also on *Syringa*, *Padus*, *Cerasus*, *Ulmus*, and *Tilia* (these data were available from herbarium labels; they seem to be correct). It produces slowly developing white rot reminiscent superficially of *Fomes fomentarius*. The main habitats of *Haploporus suaveolens* are moist herb-rich biotopes where the old trees of *Salix caprea* are abundant. The species is widely distributed in the boreal zone of the northern hemisphere and known from North America, Nordic countries, boreal Russia, and East Asia (Bondartsev, 1953; Eriksson, 1958; Bondartseva, 1961; Niemelä, 1971; Gilbertson and Ryvarde, 1986) but everywhere is rare. Most of known records are from the boreal zone of Europe.

## IDENTIFICATION

Characteristic features of *H. suaveolens* are moderately projecting, light-weight rounded caps with obtuse margin and slightly oblique base, obscurely stratified tubular hymenophore with 3–5 pores per mm, and a strong aniseed-almond smell of fresh specimens persisting up to 40 years in herbarium. Pileal form is varying from bracket- or console-shaped to irregular, stalactite-like. *Trametes suaveolens* (Fr.) Fr. is another fungus often growing on *Salix* spp. and having strong aniseed smell; this latter differs by its larger pores (1–3 per mm) with opaque thick dissepiments, and more or less tomentose upper surface. In general, there is no difficulty in identifying *H. suaveolens* in both nature and herbarium.

## NOMENCLATURE

The name *Haploporus suaveolens* (L.: Fr.) Donk is seemingly more correct than *H. odorus* (Sommerf.) Bond. et Singer but is avoided by most polyporologists due to its Friesian (1821) misinterpretation and application to another species, known nowadays as *Trametes suaveolens* (Fr.) Fr. However, the Linnaean (1737) description is undoubtedly intended for the

first species (Donk, 1971), and Fries' "Systema mycologicum" is start-pointed mycological work due to an automatically sanctioned *name* but not a *species concept*. Another argument to use the name *Polyporus suaveolens* L.: Fr. is the ambiguous status of *Polyporus odorus* Sommerf.: Fr. (1828), which was also misapplied by Fries to his *Trametes suaveolens* (Fr.) Fr. (Fries, 1874: 584, see remark to *Trametes inodora* Fr.). No authentic material for either species exists in his herbarium. Therefore, Bondartsev (1950) proposed a new epithet *Fomitopsis odoratissima* Bond. for *Polyporus suaveolens* L.: Fr.; later Niemelä (1971) selected a neotype for *Polyporus odorus* Sommerf. to use this name (as *Haploporus odorus* (Sommerf.) Bond. et Singer). Both operations remain a nomenclatural discussion to be open because Linnaeus' name formally has a priority. Therefore, Donk's (1971) solution seems to be more logical, especially after neotypification of *Trametes suaveolens* (Fr. non L.) Fr. (Ryvarde, 1991).

## TAXONOMICAL POSITION

There are two main concepts on the taxonomical position of the species: 1) this is a trametoid fungus (Haploporaceae, Fomitopsidales – Jülich, 1982); and 2) this is closely related to ganodermoid fungi (Pezizomycotina, Ganodermatales, Knudsen, 1995). We have studied the fine structure of the sporoderm of *H. suaveolens* ( $\times 1500$  magnification, oil immersion) and have received the following results. IKI reaction shows subverrucose to almost smooth outline ("amylose" (+) to amyloextrines+). CB reaction bares the heterogeneity of a spore wall, which contains the acyanophilous fibrillar-crystalline and cyanophilous granular matter. Granules (probably homologous to the pillars of *Fayodia* and *Ganoderma*) compose an exine (up to 1  $\mu\text{m}$  thick) freely fitted by thin uniformly cyanophilous perine. Therefore, a spore surface seems to be granulose, resembling many *Ganoderma* species (SEM of *Haploporus* spores by Niemelä, 1971 are practically identical to those of *Ganoderma* species); then the spores of *H. suaveolens* must be considered as peculiar ganodermoid *hemitectospores*.

Therefore, we disagree with the relationships of *Haploporus* with Ganodermatales, the group con-

taining many resourceful medicinal mushrooms. The species under consideration could be considered as

a possible perspective object for biochemical and medicinal research.

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