

*Some Probable Mycorrhizal Associations  
in the Pacific Northwest*

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MYCORRHIZAL ASSOCIATIONS can be demonstrated in certainty only by pure culture synthesis. The technique of tracing hyphae through the soil from sporocarps to mycorrhizae is uncertain when used alone. However, it may be combined with (1) a knowledge of the fungi known to form mycorrhizae; and (2) a knowledge of the obligativity of some fungi to certain tree species. With this combination, valuable leads on probable associations may be obtained.

This type of field observation has been used in the Pacific Northwest, a region in which very little is known about mycorrhizal associations. Field and laboratory identification of sporocarps was by the author. Species with an asterisk were verified by Dr. D. E. Stuntz, of the University of Washington. These associations may be considered very probably mycorrhizal:

*Amanita muscaria* (L. ex Fries) Pers. ex S. F. Gray\*: *Pseudotsuga menziesii* var. *menziesii*. (Previously reported in Australia by Rawlings, 1951.)

Observed along Nisqually River, Washington, at an elevation of about 2,500 feet, and in the Blue Mountains, Oregon, at an elevation of about 3,500 feet.

*Amanita pantherina* (D.C. ex Fries) Secr.: *Pinus contorta*. Observed in Blue Mountains, Oregon, at an elevation of 3,000 feet.

*Boletinus appendiculatus* Peck: *Larix occidentalis*. Observed in Blue Mountains, Oregon, at an elevation of 3,000 feet.

*Boletinus cavipes* (Opat.) Kalchbr.\*: *Larix occidentalis*. (Previously reported in Idaho by Slipp and Snell, 1944.) Observed on east slope of the Cascade Range, Washington, at an elevation of about 3,500 feet, and along the Kootenai River, Montana, at an elevation of about 2,000 feet.

*Boletinus lakeii* (Murr.) Sing.\*: *Pseudotsuga menziesii* var. *glauca*. (Previously reported by Singer, 1949.) Observed on east slope of the Cascade Range, Washington, at an elevation of about 5,000 feet.

*Boletinus ochraceoroseus* Snell: *Larix occidentalis*. (Previously reported in Idaho by Slipp and Snell, 1944.) Observed in Blue Mountains, Oregon, at an elevation of about 3,500 feet.

*Boletus granulatus* L. ex Fries\*: *Pinus contorta*. Observed in Blue Mountains, Oregon, at an elevation of about 4,000 feet. *Pinus ponderosa*. Observed on east slope of the Cascade Range, Washington, at an elevation of about 2,000 feet; in Blue Mountains, Oregon, at an elevation of 4,000 feet; and near Spokane, Washington, at an elevation of 2,000 feet.

*Boletus grevillei* (Klotzsch) Sing.\* (*Boletus elegans*): *Larix occidentalis*. (Demonstrated in pure culture by Melin, 1925, and reported in Idaho by Slipp and Snell, 1944.) Observed on east slope of the Cascade Range, Washington, at an elevation of about 5,000 feet, and in the Blue Mountains, Oregon, at an elevation of about 3,500 feet.

*Boletus scaber* Bull. ex Fries\*: *Populus tremuloides*. Observed in Blue Mountains, Oregon, at an elevation of about 4,000 feet.

*Boletus subaureus* Peck: *Pinus contorta*. Observed in Blue Mountains, Oregon, at an elevation of about 4,000 feet.

*Boletus tomentosus* Kauffm.: *Pinus contorta*. Observed in Blue Mountains, Oregon, at an elevation of about 3,500 and 5,000 feet.

*Cantharellus cibarius* Fries\*: *Pseudotsuga menziesii* var. *menziesii*. Observed near Puget Sound, Washington, at an elevation of about 500 feet.

*Gomphidius rutilus* (Schaeff. ex Fries) Lund. and Nannf.: *Pinus ponderosa*. Observed on east slope of the Cascade Range, Washington.

*Lactarius deliciosus* (L. ex Fr.) Gray: *Pseudotsuga menziesii* var. *glauca* and *Abies grandis*. Both observed in Blue Mountains, Oregon, at an elevation of about 3,000 feet.

*Russula delica* Fries: *Pseudotsuga menziesii* var. *glauca*. Observed in Blue Mountains, Oregon, at elevations of about 3,000 and 4,000 feet.

*Russula emetica* (Schaeff. ex Fries) Pers. ex Fries\*: *Pseudotsuga menziesii* var. *menziesii*. Observed near Puget Sound, Washington, at an elevation of about 500 feet.

*Gyromitra esculenta* Pres. ex Fries has been suggested to form mycorrhizae with *Populus tremula* and *Picea abies* in Finland (Siren and Bergman, 1951). It is closely associated with *Pseudotsuga menziesii* in the Puget Sound area, occurring in natural stands or fruiting at the base of planted seedlings. While it may form mycorrhizae with *Pseudotsuga menziesii*, it is evidently not obligate. Sporocarps sometimes appear on piles of rotten wood or in mineral soil long distances from any roots.

Some of the associations listed above are being tested in pure culture synthesis. These will be reported in a later paper.

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