

Boletus edulis* Bull. ex Fr.*King bolete****Boletaceae****Ecology**

Description: Native. Cap 8-30 cm wide, convex or bun shaped, brown to yellow brown; undercap pore sponge-like, white when young, then yellowish brown; stalk 8-25 cm long, 2-7 cm thick, white to brown; flesh thick, does not turn blue when bruised; spore print olive brown.

Range and distribution: Temperate forests throughout Northern Hemisphere. Widespread and locally common; solitary or in groups.

Associations: Conifers, especially spruce species in the Pacific Northwest.

Habitat: Terrestrial, woods, and edges.

Successional stage: Clearcutting eliminates fruiting until a new stand is established.

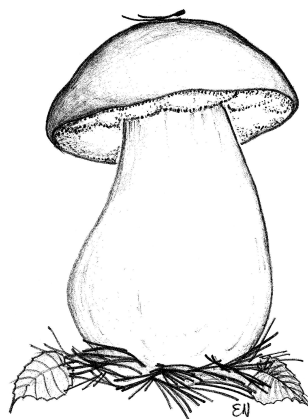
Ecological relations: Forms ectomycorrhizae with range of conifer and hardwood species. Fire ecology is unknown.

Biology

Flowering and fruiting: Main fruiting in autumn, especially on the coast. A complex of similar species fruit from spring through autumn at high elevations.

Seed: Wind-dispersed spores.

Vegetative reproduction: Mycelia might be transported by insects or animals to establish new colonies. New harvestable parts are produced from a perennial mycelium

*Boletus edulis*

Cultivation: Not cultivated in North America.

Transplant viability: Techniques under development in Europe and New Zealand.

Collection

Part harvested: Mushroom (fruiting body, sporocarp).

Harvest techniques: Plucked or cut. Harvested when young or else becomes riddled with insect larvae.

Harvest season: During fruiting season locally.

Regeneration after harvest: Perennial mycelium and ectomycorrhizae.

Uses and Products

Common uses: As food, specialty food in restaurants.

Indigenous uses: As part of diet, cooked on hot stones, baked, or fried.

Common products: Fresh or dried food product.

Types of markets: Specialty food markets, restaurants, and export to Europe.

Comments and Areas of Concern

Long-term reduction of spore dispersal. Effects of timber management on productivity and managing stands to sustain and enhance production.

References

Arora (1986, 1991), Moerman (1998b), Molina et al. (1993)

Cantharellus spp.

Chanterelle

Cantharellaceae

C. formosus Corner, Pacific golden chanterelle
C. subalbidus Smith & Moore, White chanterelle

Ecology

Description: Native. Trumpet shaped; orange to yellow-orange cap 3-15 cm wide, concave or wavy when mature; gills veinlike with folds and ridges running down stalk, same color as cap or paler; solid stalk 2-10 cm long; 0.5-3 cm wide; spore print creamy or yellow; odor fruity like apricots. White chanterelle is off-white, bruises yellow orange, and is more robust.

Range and distribution: Edible chanterelle species widespread globally. *Cantharellus formosus* and *C. subalbidus* restricted to coniferous forests of the Pacific Northwest. Singly, but often in groups, occasionally in fused clusters.

Associations: Douglas-fir/hemlock forests.

Habitat: Terrestrial, conifer forests; *C. formosus* common in young stands, but similar (undescribed) species may be an old-growth associate. White chanterelles in conifer forests and somewhat higher elevations.

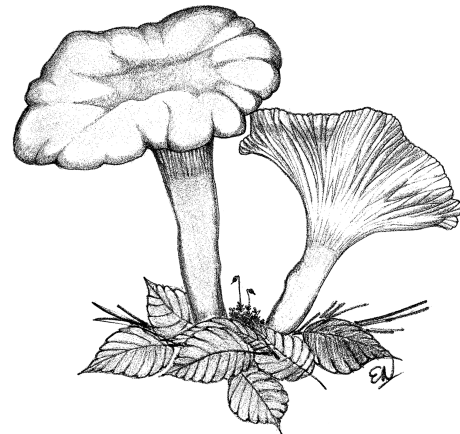
Successional stage: Regenerated stands must be 15 years or older before fruiting resumes.

Ecological relations: Forms symbiotic relations with roots of forest trees through ectomycorrhizae.

Biology

Flowering and fruiting: Fruits in cool, moist weather, summer through autumn.

Seed: Wind-dispersed spores.



Cantharellus

Vegetative reproduction: Mycelia might be transported by insects or animals to establish new colonies. New harvestable parts are produced from a perennial mycelium.

Cultivation: Not cultivated in North America.

Transplant viability: Commercial cultivation not yet achieved, although methods are being developed in Sweden.

Collection

Part harvested: Mushroom (fruiting body, sporocarp).

Harvest techniques: Plucked or cut. Dirty base removed before placing in collection container.

Harvest season: From summer through autumn.

Regeneration after harvest: Regeneration is from perennial mycelium and ectomycorrhizae. Better regeneration if these are not disturbed.

Uses and Products

Common uses: Food for personal use and in restaurants.

Indigenous uses: Only two documented cases in western North America.

Common products: Fresh or canned mushrooms. Occasionally dried and exported.

Types of markets: Specialty produce markets, restaurants, and export to Europe.

Comments and Areas of Concern

Long-term reduction of spore dispersal. Effects of timber management on productivity and managing stands to sustain and enhance production.

References

Arora (1986, 1991), Molina et al. (1993)

Leucangium carthusianum
Tuslane & Tuslane
Oregon black truffle
 Helvellaceae



Leucangium carthusianum

Ecology

Description: Native. Potato-shaped, underground fruiting body, 0.5-4.5 cm broad, round to irregular, minutely warty; dark brown to black; interior solid with pockets of fertile tissue, marbled with paler sterile veins, whitish when young, becoming gray to green-gray; aroma of pineapple.

Range and distribution: Pacific Northwest and Europe. Singly or small groups.

Associations: Douglas-fir forests.

Habitat: Underground with Douglas-fir in the Northwest, other tree genera in Europe.

Successional stage: Most common in young dense plantations at low elevations and valley margins; often on private land.

Ecological relations: Forms mycorrhizae with Douglas-fir. Fire ecology unknown.

Biology

Flowering and fruiting: Late fall through early spring.

Seed: Spores. Sporulates underground; odor induces mammal mycophagy. Spores dispersed in feces.

Vegetative reproduction: Mycelia might be transported by insects or animals to establish new colonies. New harvestable parts are produced from perennial mycelium.

Cultivation: Not cultivated in North America other than informal inoculation trials.

Transplant viability: Anecdotal evidence of spore slurries enhancing production; not confirmed statistically.

Collection

Part harvested: Truffle (fruiting body, sporocarp).

Harvest techniques: Litter and duff layers are raked. Dogs can be used to sniff out ripe truffles. Look for rodent digs. Disturbed duff and litter should be replaced. Marketing unripe truffles can diminish product reputation.

Harvest season: From October through February.

Regeneration after harvest: Perennial mycelium and ectomycorrhizae.

Uses and Products

Common uses: Flavoring, added to sauces, popular gourmet item in restaurants.

Indigenous uses: None documented.

Common products: Fresh, frozen, and preserved in oil.

Types of markets: Restaurants.

Comments and Areas of Concern

Damage to soil, tree roots or truffle mycelium from deep raking. Possible spread of root rot fungi on rake tines.

References

Arora (1986), Molina et al. (1993)

Morchella spp.

Morel

Morchellaceae

M. elata Fr.:Fr. sensu Weber (1995), Natural or black morel

Ecology

Description: Native. Many species. The black morel has a fertile head, 2-17 cm high, 2-6 cm wide, round to cone-shaped, honeycombed with pits and ridges; grayish tan to brown to black; pits lighter color than ridges; cap ingrown to stalk, minutely granular stalk 1.5-10 cm long, 1-4 cm wide, without a sack or cup at base; color from ivory to tan; cap and stem hollow.

Range and distribution: Various species widespread throughout North America; natural or black morel (*M. elata*) common in intermountain West. Widespread; solitary to clustered.

Associations: Mixed conifers at mid to high elevations.

Habitat: Terrestrial, forested, and previously forested areas; streamsides, and burned or disturbed areas.

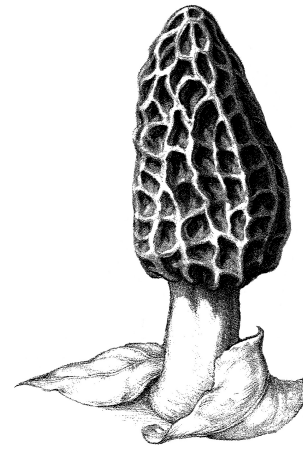
Successional stage: Early to late successional; some species fruit perennially, others in large flushes after fires, tree death, or ground disturbance.

Ecological relations: Most species saprobic, some may be facultatively mycorrhizal; complex life cycles. Large flushes of some morel species fruit for the first spring or two after fires.

Biology

Flowering and fruiting: Fruiting in spring and summer after snowmelt.

Seed: Wind-dispersed spores.



Morchella

Vegetative reproduction: New harvestable parts are produced from a perennial mycelium. Pseudosclerotia serve as nutrient storage structures.

Cultivation: Small cultivation industry in North America.

Transplant viability: Spores generate readily in culture, but difficult to fruit, some commercial cultivation, mycelium can be purchased to establish “patches.”

Collection

Part harvested: Fruiting body.

Harvest techniques: Cut with a knife about 1.5 cm from the ground to obtain clean specimens. Leave the mycelium in the ground and undisturbed. Some of the mushrooms are left, especially old ones (spores mature late). Search areas disturbed the previous year by logging, fire, or tree death.

Harvest season: From spring through summer.

Regeneration after harvest: Unknown mechanism, possibly perennial pseudosclerotia, mycelium, mycorrhizae, or spores.

Uses and Products

Common uses: Food.

Indigenous uses: Documented uses not found.

Common products: Dried or fresh mushroom products.

Types of markets: Specialty produce markets, restaurants, and export to Europe.

Comments and Areas of Concern

Multiple species with differing ecological relations. Potentially reduced spore dispersal among species that only fruit episodically after disturbance.

References

Arora (1986, 1991), Mizerak (1998), Molina et al. (1993), Weber (1988)

Tricholoma magnivelare (Peck)

Redhead

Matsutake, American matsutake, pine mushroom

Tricholomataceae

Ecology

Description: Native. White robust mushroom; stem is solid, firm, and fibrous; 4-15 cm long, 1-5 cm thick, base of stalk tapered and without a bulb; cap 5-20 cm, is smooth; ring on stem develops from a cottony veil; spore print is white; aroma is spicy.

Range and distribution: Widespread in North America, coincides with boreal and temperate conifer forests; most abundant in British Columbia, Washington, Oregon, and northern California: Olympic Peninsula to Cascade Range, sand dunes of coastal Oregon, southern Cascade Range and Klamath Mountains. Fruits from 3-2000 m. Widespread but in clustered patterns; can vary greatly in occurrence, abundance, and distribution from year to year.

Associations: Douglas-fir, western hemlock, grand fir, Shasta red fir, lodgepole pine; in southwestern Oregon and along northern California coast, it often associates with tanoak.

Habitat: Various soils, climates, and host trees. Most abundant in well-drained, infertile soils.

Successional stage: Rarely fruits in stands under 40 years old.

Ecological relations: Forms symbiotic relations with roots of forest trees through its ectomycorrhizae. Mycelium form a dense mat in the soil. Animals eat mushroom and disperse spores. Fire ecology unknown.



Tricholoma magnivelare

Biology

Flowering and fruiting: Fruits in late summer to winter depending on habitat, elevation, and latitude.

Seed: Wind-dispersed spores. Possible dispersal in animal feces.

Vegetative reproduction: New harvestable fruits are produced from a perennial mycelium that may fragment into multiple colonies. Insects or animals may distribute mycelium.

Cultivation: Not cultivated in North America.

Transplant viability: No successes.

Collection

Part harvested: Mushroom (fruiting body, sporocarp).

Harvest techniques: The mushroom is carefully plucked, as cutting the stem destroys its commercial value. Avoid disturbing the mycelium. Do not use rakes or other tools to search under the duff layer. Learn how to spot the mounds that matsutakes make under the ground, and carefully move the soil away. Cover any holes. Commercial harvest concentrated in lodgepole pine, Shasta red fir, and tanoak forests.

Harvest season: Autumn.

Regeneration after harvest: Perennial mycelium.

Uses and Products

Common uses: Eaten fresh.

Indigenous uses: Food and flavoring.

Common products: Fresh mushrooms.

Types of markets: International. Specialty-produce markets and restaurants. Japan imports over 90 percent.

Comments and Areas of Concern

Though a common practice has been raking litter and soil to find young and most valuable mushrooms, this may negatively impact subsequent mushroom production and should be avoided. Long-term reduction of spore dispersal. Optimal habitat may be affected by timber harvest practices.

References

Arora (1986, 1991), Hosford et al. (1997), Mizerak (1998), Molina et al. (1993)

Tuber gibbosum Gilkey
Oregon white truffle
Tuberaceae

Ecology

Description: Native. Potato-shaped, underground fruiting body, 1.5-5 cm broad, round to irregular knobby and firm, color whitish when young, becoming buff to dark brown, exterior lacks hairs or warts; often cracks with age; interior solid, white when young becoming dark brown to red-brown with white veins when mature; odor strong and garliclike when mature.

Range and distribution: Northern California to British Columbia west of Cascades. Singly or more commonly in groups; common in Oregon.

Associations: Douglas-fir.

Habitat: Underground, almost exclusively under Douglas-fir.

Successional stage: Most common in young dense plantations at low elevations and valley margins; often on private land.

Ecological relations: Spores disseminated by rodents; forms mycorrhizae with Douglas-fir. Fire ecology unknown.

Biology

Flowering and fruiting: Late fall through early spring.

Seed: Spores. Sporulates underground. Odor induces mammal mycophagy, spores dispersed in feces.

Vegetative reproduction: Mycelia might be transported by insects or animals to establish new colonies. New harvestable parts are produced from a perennial mycelium.



Tuber gibbosum

Cultivation: Not widely cultivated in North America other than informal inoculation trials.

Transplant viability: Anecdotal evidence of spore slurries enhancing production; not confirmed statistically.

Collection

Part harvested: Truffle (fruiting body, sporocarp).

Harvest techniques: Litter and duff layers are raked. Dogs can be used to sniff out ripe truffles. Look for rodent digs. Disturbed duff and litter should be replaced. Marketing unripe truffles can diminish product reputation.

Harvest season: From October through March.

Regeneration after harvest: Perennial mycelium and ectomycorrhizae.

Uses and Products

Common uses: Flavoring, as gourmet item in restaurants.

Indigenous uses: None documented.

Common products: Fresh, frozen, or preserved in oil.

Types of markets: Restaurants.

Comments and Areas of Concern

Damage to soil, tree roots, or truffle mycelium from deep raking. Possible spread of root rot fungi on rake tines.

References

Arora (1986, 1991), Molina et al. (1993)

Continued