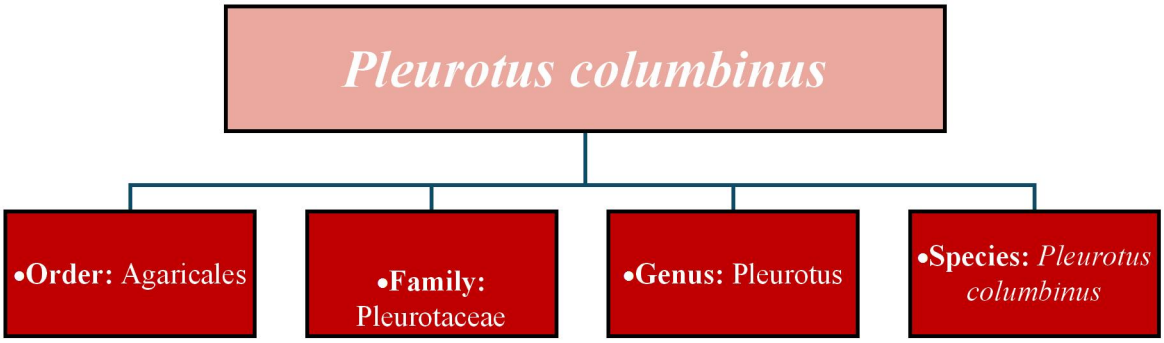
Blue-Grey Oyster Mushroom



Habit and Habitat

The blue-grey oyster mushroom, *Pleurotus columbinus*, thrives in cooler climates and is typically found on dead or decaying hardwood, including logs, branches, and stumps. It is known for its rapid colonisation and strong enzymatic activity, which allows it to efficiently break down lignocellulosic substrates.

Morphology

- **Cap (Pileus):** Typically, dark grey to blue-grey, smooth, and fan-shaped with a slightly wavy margin.
- **Stipe (Stalk):** Short, thick, and typically lateral or absent, depending on the growth conditions.

- **Gills (Lamellae):** White to light grey, densely packed, and decurrent, running down the stipe or directly attached to the substrate.

Reproduction

- **Spore Characteristics:** Spores are smooth, cylindrical, and typically white to grey in colour.
- **Spore Germination:** Germination occurs within 48-96 hours under suitable conditions, forming pure white mycelium.
- **Mycelium Development:** Primary mycelium is clampless and sterile, while secondary mycelium, formed by the fusion of compatible primary mycelia, is fertile and features clamp connections.

Nutrient Content

Blue-grey oyster mushrooms are rich in proteins, dietary fiber, essential amino acids, vitamins (B-complex, C, D), and minerals such as iron, calcium, phosphorus, and potassium. They also contain bioactive compounds with antioxidant, anti-inflammatory, and immunomodulatory properties.

Nutrient Composition of Pleurotus columbinus

Sr. No.	Composition	Percentage (%)
1	Protein	15.0% - 40.0%
2	Carbohydrates	35.0% - 45.0%
3	Fat	0.5% - 5.0%
4	Crude fiber	6.0% - 13.0%
5	Ash	5.0% - 10.0%

Note: Nutritional composition values are approximate and may vary depending on substrate, growing conditions, and analysis methods (Robert et al., 2014; Adel et al., 2023).

Medicinal Properties

Antioxidant Activity

- *Pleurotus columbinus* exhibits significant antioxidant properties. In a study evaluating aqueous extracts of this mushroom it demonstrated potent free radical scavenging abilities, with IC_{50} values of 35.13 ± 3.27 µg/mL for DPPH, 13.97 ± 4.91 µg/mL for ABTS, and 29.42 ± 3.21 µg/mL for ORAC assays. These results indicate its potential in reducing oxidative stress.

Antiviral and Cytotoxic Effects

- It is reported that *P. columbinus* extracts exhibited antiviral activity against adenovirus (Ad7) with a selectivity index (SI) of 4.2.
- Additionally, the extracts showed moderate cytotoxicity against various cancer cell lines, including prostate (PC3, DU-145), colorectal (Colo-205), liver carcinoma (HepG2), cervical cancer (HeLa), breast adenocarcinoma (MDA-MB-231 and MCF-7), leukemia (CCRF-CEM), acute monocytic leukemia (THP1), acute promyelocytic leukemia (NB4), and lymphoma (U937), while exhibiting low cytotoxicity against normal human peripheral blood mononuclear cells (PBMCs).

Protective Effects Against Chemotherapy-Induced Ovarian Failure

- An aqueous extract of *P. columbinus* was found to mitigate premature ovarian failure induced by cyclophosphamide (CTX) in rats.
- The treatment improved serum hormone levels (AMH, E2, LH, and FSH), enhanced ovarian antioxidant enzyme activities (SOD, CAT, GSH, and GSH-PX), and reduced lipid peroxidation and TNF-α levels. These findings suggest its potential in protecting ovarian function during chemotherapy.

Renal Protective Effects

- Polysaccharides extracted from *P. columbinus* demonstrated protective effects against cisplatin-induced oxidative renal injury in rats. The treatment improved renal function markers and antioxidant enzyme activities, indicating its potential in mitigating nephrotoxicity associated with chemotherapy.

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