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Editorial

The Most Important Poisonous Mushrooms Identified in Iran

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Mushrooms have been scientifically validated as a rich source of medicinal bioactive molecules. Furthermore, edible mushrooms provide valuable nutritional components such as carbohydrates, fiber, and high-quality protein.

Many poisonous mushrooms resemble edible species, making accurate identification challenging. Evidence indicates cases of mushroom poisoning are increasing worldwide. In many regions, rainy conditions have led to proliferation of both edible and poisonous wild mushrooms. The similarity between mushrooms can lead to the accidental consumption of poisonous mushrooms, resulting in severe illness or even death.

It is important to ensure that mushrooms are properly identified and prepared before consumption. When consumed mindfully and with consideration to individual health factors, edible mushrooms offer a nutritious and safe dietary option (Anyiam et al., 2025). Although most cases of mushroom poisonings present with gastrointestinal symptoms alone and patients usually recover, liver function impairment can occur in some cases and may lead to life-threatening complications (Dadpour et al., 2017).

Raising public awareness about wild mushroom hazards is crucial. Training physicians and nurses in the accurate diagnosis and management of poisoned patients would improve survival rates (Pajoumand et al., 2005).

Among the most common poisonous mushrooms identified in Iran are (Soltaninejad, 2018):

-*Lepiota brunneioncarnata*

L. brunneoincarnata, a lethal species within the genus *Lepiota* (Agaricales), features a small white cap adorned with scale-like remnants that fragment into concentric rings. This morphology often leads to misidentification as edible taxa, including *Leucoagaricus spp.*, *Macrolepiota procera*, *Tricholoma terreum*, and *Lentinus edodes* (Zhao et al., 2022). This species contains α-amanitin, a cyclopeptide toxin that causes delayed-onset hepatorenal syndrome. In addition, initial gastrointestinal distress (nausea, vomiting, diarrhea) may appear 6-12 h after ingestion, followed by liver and kidney failure.

-*Amanita virosa* (Destroying Angel)

A. virosa, known as the Destroying Angel due to its deadly nature, is characterized by its pure white appearance, which resembles a veil of angels. Its stipe is smoother than that of *A. verna*. Like other *Amanita* species, it emits a sweet smell and has a sweet taste. The cap is white, turning yellow or brown at the center as it matures. The spores are white, measuring 8-10 µm in diameter, with a length-to-width ratio less than 1.25 (Tavassoli et al., 2019). *A. virosa* contains amatoxins, which is similar to α-amanitin. Its consumption causes delayed gastrointestinal symptoms (5-12 h post-ingestion), followed by a deceptive "recovery" phase before severe liver damage ensues.

-*Hypholoma fasciculare* (Sulfur Tuft)

The Sulfur Tuft mushroom grows in dense clusters so tightly packed that the caps often cannot fully expand. Its common name refers to the bright sulfur-yellow color of the caps, which are sulfur yellow with a tan center. The caps are convex or slightly umbonate, with dark velar remnants attached to the margins. The flesh is firm and sulfur yellow. The stems are similarly colored but browner near the base, measuring 5 to 10 mm in diameter and 5 to 12 cm in length, often curved (First Nature, 2025). *H. fasciculare* has a mild mushroom odor and a very bitter taste (Kuo, 2014). Consuming it can lead to gastrointestinal irritation and, in severe cases, fulminant hepatitis. Nausea,

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vomiting, diarrhea, and abdominal pain, typically delayed by 5-10 h, are the common symptoms.

-*Coprinopsis atramentaria* (Inky Cap)

C. atramentaria, commonly called the common ink cap or inky cap, was previously classified as *Coprinus atramentarius.* It is the second most well-known ink cap species after *C. comatus.* These mushrooms grow in clumps following rainfall from spring to autumn, often in urban or disturbed areas such as vacant lots, lawns, and grassy fields (Heleno et al., 2014). This mushroom contains coprine, which causes a disulfiram-like reaction when combined with alcohol. Symptoms include flushing, tachycardia, nausea, and vomiting if alcohol is consumed within 72 h of ingestion.

-*Amanita phalloides* (Death Cap)

The Death Cap, *A. phalloides*, has a sleek, moist cap that is greenish-yellow, deeper in color at the center, and faintly streaked in a radial pattern. The cap measures between 6 and 12.5 cm across and is easily peeled. The white stalk is polished, standing 6 to 12.5 cm tall, featuring an uneven ring near the upper part and a swollen cup-like base (volva). The mushroom emits a sweet, agreeable fragrance, and survivors report an appealing flavor. It is characterized by its irregular ring near the top of the stalk, the bulbous volva at the base, and white gills that are free from attachment to the stalk (Garcia et al., 2015). *A. phalloides* contains amatoxins, similar to *A. virosa*. Eating this mushroom causes delayed hepatotoxicity, leading to liver failure.

-*Galerina marginata*

G. marginata typically grows on decaying wood and has a viscid, strongly hygrophanous cap. The stem features a membranous ring. Previously classified as a *Pholiota*, its cap is usually moist or humid rather than greasy or shiny (Gulden et al., 2001). This species contains amatoxins with symptoms similar to *Amanita* poisoning, with delayed liver damage.

As noted, certain poisonous mushrooms, which must never be consumed, bear a striking resemblance to harmless ones. The key principle is that cooking cannot neutralize the toxins in poisonous mushrooms. Mushrooms must never be picked or eaten unless you can confidently and accurately identify them. Due to the presence of highly potent toxins in some mushrooms, poisoning demands urgent medical attention. Nevertheless, in up to 80% of poisoning cases, the exact specific ingested remains identified. Therefore, diagnosis should primarily rely on visible symptoms.

Raising awareness about this issue is essential for both the general public and professional organizations to effectively mitigate its consequences (Turan Gökçe et al., 2024). According to investigations, the safest and healthiest approach is to consume only packaged mushrooms with health licenses. Wild mushrooms should be consumed only if verified safe by an expert.

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