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LITHIUM-ENRICHED MUSHROOMS: BIOAVAILABILITY, GUT MICROBIOTA AND THERAPEUTIC APPLICATIONS

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Mushrooms are fruiting bodies resulting from the sexual reproduction of fungi, mainly belonging to the phylum Basidiomycota, which develop on a wide variety of substrates due to their saprophytic nature. These fungi can absorb and accumulate minerals in the cultivation substrate, converting them into potentially more bioavailable forms. Among the many mushrooms used for mineral enrichment, species of the genus *Pleurotus* spp., commercially known as Shimeji mushrooms and widely consumed worldwide, stand out. These mushrooms produce bioactive compounds with antioxidant, immunostimulatory, and antitumor properties, and exhibit high potential for mineral bioaccumulation, including lithium (Li). Lithium is a mineral naturally found in the Earth's crust, although in low abundance. In its inorganic forms, such as lithium carbonate and lithium chloride, it is widely used in the pharmaceutical and medical industries for the treatment of psychiatric disorders, including bipolar disorder and schizophrenia. Furthermore, depending on the dosage, Li may influence oxidative status and contribute to the prevention and treatment of Alzheimer's disease. Despite its therapeutic benefits, prolonged use may cause side effects such as nausea, diarrhea, tremors, weight gain, sexual dysfunction, and renal impairment. In this context, lithium-enriched mushrooms emerge as a promising alternative, since the mineral is incorporated into organic forms that are potentially more bioavailable and less toxic. Another relevant aspect is the influence of lithium and mushrooms on the gut microbiota and the gut–brain axis, as mushrooms exhibit prebiotic effects. Therefore, studies evaluating the accumulation potential and bioavailability of Li in different mushroom species, as well as understanding gut microbiota

responses to this supplementation, are essential.

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