

BIOLIVAL



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**Nutritional value, chemical characterization and cytotoxicity in human tumor cell lines of desert truffles.**

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Mushrooms are widely appreciated for their nutritional value, as well as for their health promoting properties [1,2]. Due to their proven bioactive potential, their application in food (*e.g.*, incorporation of mushroom extracts in food products and functional foods) and pharmaceutical (*e.g.*, nutraceuticals and food supplements incorporating mushrooms) industries, or the cosmetics industry (*e.g.*, antiaging products) has been explored [3-5].

The present work intends to determine the chemical and nutritional composition, as also to evaluate the cytotoxicity of samples from a mushroom genus commonly known as desert truffles – *Terfezia*. To this end, three different species were studied, namely *Terfezia arenaria* (Moris) Trappe, *Terfezia magnusii* Mattir., and *Terfezia leptoderma* Tul. The nutritional value (protein, fat, carbohydrates and energetic value) of the species was evaluated following standard procedures, and their content in hydrophilic compounds (*e.g.*, soluble sugars, phenolic and other organic acids) and lipophilic compounds (*e.g.*, fatty acids and tocopherols) was assessed by chromatographic techniques (High Performance Liquid Chromatography and Gas Chromatography). The cytotoxic potential of the samples was also evaluated, testing the mushroom species against a panel of human tumor cell lines (MCF7- breast carcinoma, HeLa- cervical carcinoma, NCI-H460- non-small cell lung carcinoma and HepG2- hepatocellular carcinoma) and against porcine liver primary cells (PLP2).

All samples proved to have high contents in carbohydrates and proteins, being low fat products. Mannitol and trehalose were the main sugars found, being also present bioactive phenolic acids. Among the lipophilic compounds, linoleic, oleic and palmitic acids were the major fatty acids present in the samples, together with different tocopherol vitamers. None of the samples showed cytotoxicity against non-tumor cells being in course the bioassays with human tumor cell lines.

Overall, desert truffles proved to be highly nutritional species with bioactive compounds and potential to be used as cytotoxic agents.

**Keywords:** *Terfezia* spp.; Chemical composition; Nutrients; Cytotoxicity properties.

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