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# Comparative study between phenolic and polysaccharidic extracts of *Suillus collinitus*: chemical characterization and growth inhibitory activity in human tumour cell lines

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**Background:** Mushrooms comprise a vast and yet largely untapped source of powerful new pharmaceutical products. In particular, and most importantly for modern medicine, they represent an important source of compounds with potential antitumor and immunostimulating properties, including low-molecular-weight (LMW, e.g. phenolic compounds) and high-molecular-weight (HMW, e.g polysaccharides) compounds. Furthermore, they may have potential as functional foods and sources of novel molecules. The Northeast of Portugal is one of the European regions with higher mushrooms biodiversity.

**Aim:** To study the antitumor potential of the wild edible ectomycorrhizal mushroom, *Suillus collinitus*, collected from Northeast Portugal, and to characterize their LMW and HMW compounds.

**Methods:** Phenolic and polysaccharidic extracts were prepared. Extract-induced cell growth inhibition was assessed with the sulforhodamine B assay in two human tumour cell lines (MCF-7 and NCI-H460). Studies of cell cycle profile (following PI labelling) and apoptosis (following AnnexinV/PI labelling) were carried out by flow cytometry. Both extracts were further characterized by chromatographic techniques: HPLC-DAD/ESI and HPLC-RI, for analysis of phenolic and polysaccharidic extracts respectively.

**Results:** The phenolic extract proved to be more potent than the polysaccharidic extract, regarding tumour cell growth inhibitory activity. The following compounds were isolated from the mushroom extracts: i) protocatechuic acid ( $5.2 \pm 0.2$  mg/Kg dw), *p*-hydroxybenzoic acid ( $14.1 \pm 1.2$  mg/Kg) and cinnamic acid ( $1.3 \pm 0.2$  mg/Kg) in the

phenolic extract; ii) arabinose ( $30.3 \pm 5.5$  g/Kg), mannitol ( $32.2 \pm 4.1$  g/Kg) and trehalose ( $11.0 \pm 0.2$  g/Kg) following hydrolysis of polysaccharidic extract.

**Conclusions:** The results indicate that *Suillus colinitus* is a promising source of bioactive LMW and HMW compounds and it will be important to study the activity of each of the purified identified molecules.

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