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Tumour cell growth inhibitory potential of mushroom extracts from the genus *Suillus*

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Mushrooms are a source of compounds with promising antitumour activity.[1] We have been working on the identification of wild mushrooms with promising antitumour activity and a *Clitocybe alexandri* extract which induces cell cycle arrest and apoptosis in a lung cancer cell line has been previously identified by part of the team.[2] The objective of this work was to continue the identification of mushrooms from the Northeast of Portugal with tumour cell growth inhibitory potential.

Thirty six wild edible mushrooms were collected and taxonomically identified. Various extracts were prepared and screened for growth inhibitory potential with the SRB assay, in four human tumour cell lines: MCF-7 (breast), NCI-H460 (NSCLC- Non-Small Cell Lung Cancer), AGS (gastric) and HCT-15 (colon). These screens allowed the identification of two Suillus species whose methanolic extracts presented potent activity: *S. collinitus* and *S. luteus*. The *S. collinitus* extract was more potent in the MCF-7 cells (GI_{50}=25.2±0.16 μg/ml), causing G1 cell cycle arrest and increasing apoptosis. An increase in p53 and p21 was verified, suggesting that the effect was p53-mediated.[3] The *S. luteus* extract was slightly more potent in the HCT-15 cells (with mutant p53, GI_{50}=17.8 ± 1.6 μg/ml) than in the other cell lines tested, indicating that its effect was not p53-dependent. In fact, it increased the levels of p53 but the alterations in proteins transactivated by p53 (*e.g.* Bax) were not consistent with a p53-mediated effect. Growth inhibition in the HCT-15 cells was mostly due to inhibition of cell proliferation and cell cycle arrest in G1, rather than induction of cell death. Finally, this extract had no effect in primary cultures of porcine hepatocytes (GI_{50}>400 μg/ml).

In conclusion, these two Suillus species present promising tumour cell growth inhibitory effect and the *S. luteus* extract may be particularly interesting considering that most tumours present mutant p53.

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