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abstract book

Abstract Book

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ONCOBIOLOGY 18

Glycophenotypic alterations induced by *Pteridium aquilinum* in mice gastric mucosa: synergistic effect with *Helicobacter pylori* infection

Joana Gomes[1,2], Ana Magalhães[1], Ana S. Carvalho[1], Gilberto E. Hernandez[3], Suzanne L. Papp[3], Steven R. Head[3], Valérie Michel[2], Leonor David[1,4], Fátima Gärtner[1,5], Eliette Touati[2], Celso A. Reis[1,4,5]

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The bracken fern *Pteridium aquilinum* is a common toxic plant that has high potential carcinogenic effects in animals and humans that consume or live in bracken-infested areas. However, the biological effects of exposure to this plant within the gastric carcinogenesis process are not fully understood. In the present study, we have analyzed the glycophenotypic alterations induced by *Pteridium aquilinum* in the gastric mucosa of mice, as well as its potential synergistic effect with *Helicobacter pylori* infection. Moreover, we have identified the enzymatic pathways underlying the observed glycophenotypic alterations.

Our results showed histomorphological modifications and an altered glycophenotype in the gastric mucosa of mice exposed to Pteridium aquilinum either in the presence or absence of *H. pylori* infection. Furthermore, a glycotranscriptome analysis indicated that mice treated with *Pteridium aquilinum* displayed altered glycosyltransferase genes expression, including *Galntl4*, *C1galt1* and *St3gal2*. The enzymes codified by these genes are involved in the biosynthesis of simple mucin-type carbohydrate antigens. In addition, we showed that combined exposure to *Pteridium aquilinum* and *H. pylori* infection led to alterations in the transcriptional level of *B3galt1* and *Fut4*. These enzymes participate in the biosynthesis of terminal glycan Lewis antigens and in accordance we detected an increased expression of Sialyl-Lewisx in these mice tissues.

Our results contribute to a better understanding of the molecular mechanisms underlying the role of *Pteridium aquilinum* in the gastric carcinogenesis and demonstrate the synergistic contribution of *H. pylori* infection in this process.

ONCOBIOLOGY 19

Water soluble polysaccharidic and ethanolic fractions of wild edible mushrooms: chemical composition and bioactivity evaluation

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Mushrooms have become attractive as functional foods and as a source of physiologically beneficial bioactive compounds. The huge mushrooms reservoir of Northeast Portugal must be chemically and nutritionally characterized for the benefit of the local populations and for the genetic conservation of wild macrofungi (1). Herein, we describe and compare the chemical constituents (phenolic compounds, macronutrients, sugars, fatty acids, tocopherols and ascorbic acid) of four wild edible mushrooms widely appreciated in gastronomy: *Armillaria mellea* (Vahl) *P. Kumm.*, *Calocybe gambosa* (Fr.) Donk, *Clitocybe odora* (Fr.) *P. Kumm.*, *Coprinus comatus* (O.F. Müll.) Pers. Furthermore, the antioxidant and antitumour potential of their water soluble polysaccharidic and ethanolic fractions was studied by *in vitro* assays: radical scavenging activity, reducing power and lipid peroxidation inhibition for antioxidant activity, and sulforhodamine B assay for cell growth inhibition C. *comatus* revealed the highest concentrations of sugars (43.23/100 g dry weight), PUFA (77.46%), phenolic compounds (45.02 mg/kg), tocopherols (301.03 μg/100 g) and, among all of the fractions tested, its ethanolic fraction showed the highest antioxidant activity (EC_{50} < 2.6 mg/mL). C. *odora* revealed one of the highest ascorbic acid (172.65 mg/100 g) contents and its water soluble polysaccharidic fraction showed the best antioxidant properties (EC_{50} < 3.6 mg/mL) among the polysaccharidic fractions. The studied samples did not cause alterations in the cell growth of four human tumour cell lines (lung, breast, gastric and colon cancer). Therefore, despite the absence of antitumour potential, the studied mushroom species could potentially be used in well-balanced diets, as a source of antioxidant compounds.

References:

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