

EFFECT OF DIFFERENT COOKING METHODS ON ANTIOXIDANT AND ANTIMICROBIAL ACTIVITIES IN SELECTED SPECIES OF MUSHROOMS

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Mankind consumes numerous natural products which are rich in nutrition, antioxidants, and antimicrobials. Most of them go through a cooking process which can alter the natural composition of metabolites. In this research, the effects of two different cooking methods (boiling and microwaving) on the antioxidant and antimicrobial activities of four different types of mushrooms, Makandura White [*Calocybe alpestris*], Bhutan Oyster [*Lentinula edodes*], American Oyster [*Pleurotus ostreatus*] and Button Mushroom [*Agaricus bisporus*] in Sri Lanka were assessed.

This research is to detect the effect or influence of different cooking methods on antioxidants and antimicrobial activities of selected species of mushrooms. Antioxidant activity was measured by Total Flavonoid Content (TFC), Total Phenolic Content (TPC), Total Antioxidant Content (TAC), Ferric Reducing Antioxidant Potential (FRAP) and Free Radical Scavenging Assay (ABTS). Antioxidant composition of the mushrooms was affected after going through culinary treatments. TAC values after cooking were: Makandura White (Raw – 0.041, Boiled – 0.123, Microwaved – 0.170) and Bhutan Oyster (Raw – 0.157, Boiled – 0.157, Microwaved – 0.178). The order is as follows; raw < boiled < microwaved. In the meantime, there was a significant decrease detected in TAC values in Button Mushroom and American Oyster as follows: raw 0.200, microwaved 0.123, boiled 0.107. However, when considering the cooking methods, microwaved extracts had the highest Total Antioxidant Capacity. Microwaved button mushroom extract had the highest scavenging activity percentage (97% after 120 minutes) which was obtained by ABTS. Antimicrobial study was conducted with *S. aureus* and *E coli*.

Microwaved American oyster had the highest inhibition zone against *S. aureus* (1.4 cm) and microwaved Bhutan oyster had the highest inhibition zone against *E coli* (1.4 cm). This can be mainly due to the breakdown of the cell wall and flowing out of the metabolites. This study suggests that among culinary treatments, microwaving is the best method which can preserve the natural antioxidants and antimicrobials which help to cure free radical and microbial related diseases.

Key words: Free radical, Antioxidant, Antimicrobial, Mushrooms, Cooking methods

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