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Ultrasound-assisted optimization of extraction of antioxidant compounds from *Azolla filiculoides*

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Abstract

The present study was conducted to extract antioxidant compounds from *Azolla filiculoides* using the ultrasound-assisted and Taguchi optimization methods. The results demonstrated that ultrasound sonication time has no significant effect on DPPH radical scavenging and total phenolic compounds ($P>0.05$). The highest concentration of the extracted phenolic compounds was measured in the mixture of ethanol and water ($P<0.05$) as well as in dried sample to solvent with the ratio of 1:15 ($P<0.05$). The percentage of DPPH radical scavenging exhibited a wide range, with the highest level (75.5%) at 15 min ($P>0.05$). Moreover, this index in the ethanol extract was considerably higher than that of in the other treatments ($P<0.05$). Concerning Taguchi optimization method, mean comparison was performed after designing the experiments and revealed that the ethanol extract was chosen as the optimum treatment with the ratio of 1:10 of dried powder to solvent for 15 min. Taken together, *A. filiculoides* could be used as a cost-effective antioxidant source.

Keywords: Antioxidant, Azolla plant, Solvent extraction, Ultrasound