

Analysis of Functional Properties of Fresh and Dried Mustard, Radish, and Mung Bean Microgreens

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Abstract

Micro greens are immature greens that have gained recognition as functional foods due to their rich phytochemical profile. It consists of a central stem, a pair of cotyledon leaves, and the first true leaves, and these have harvest maturity around two weeks from sowing. Micro greens have excellent sensorial appeal with vibrant colours, delicate flavours, and a crunchy texture, allowing them to be rawly consumed as excellent salad crops. Although microgreens have higher functional benefits it has a challenging limited shelf life of around 3 to 5 days at ambient temperature. This study examined the phytochemical composition of fresh and dried mustard, radish, and mung bean microgreens to evaluate the application of excess microgreens as a culinary powder, dried at 40°C until a constant weight. One gram of equivalent dry-weight basis samples was taken from both fresh and dry microgreens and the methanolic extract of samples was used to evaluate total phenolic content (TPC), total flavonoid content (TFC) and DPPH radical scavenging antioxidant activity (inhibition %). The results indicated dry powder of mustard microgreens has higher antioxidant activity (72.40%) and TFC (51.38%) but lower TPC (42.75%) and radish microgreen dry powder has higher antioxidant activity (23.33%), but lower TFC (55.67%) and TPC (54.20%) than fresh microgreens. Mung bean microgreen dry powder has higher antioxidant activity (84.90%) and similar TFC but lower TPC (42.37%) than fresh microgreens. Dry powder of radish microgreens was reported to have the highest TPC (133.98 ± 0.14 mg (GAE)/g), TFC (203.40 ± 0.70 mg (RE)/g) and antioxidant activity ($80.50 \pm 0.59\%$ inhibition) values. The study found that dried microgreens exhibited higher antioxidant activities and total flavonoid content (in mustard), however, they reported less total phenolic contents than their fresh counterparts in these three varieties. Overall, this study provides information on the suitability of excess microgreens as a culinary powder.

Keywords: Antioxidant activity, microgreens, total flavonoid content, total phenolic content