

Antioxidant activity of commercially processed laver (*Porphyra tenera*)

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Laver is one of the most consumed edible red algae seaweeds in the genus *Porphyra*^(1,2). Laver is primarily prepared in the form of dried, roasted, and seasoned products⁽³⁾. Dried laver is prepared with raw laver through various processes, whereas roasted laver and seasoned laver are manufactured by roasting and seasoning dried laver, respectively. Dried laver is considered a semi-processed product of roasted or seasoned laver as well as a processed product for direct consumption. Despite the fact that most laver is manufactured and consumed in a processed form, few studies have investigated the antioxidant compounds originating from processed laver.

We investigated the total polyphenol and flavonoid contents of laver products and evaluated the *in vitro* antioxidant properties of solvent extracts in commercially processed laver products. Significant differences were found in the contents of phenolic compounds among differently processed laver samples, ranging from 10.81 to 32.14 mg gallic acid equivalent/g extract depending on the extraction solvent and temperature. The laver contained very few flavonoids (1.75 mg and 0.98 mg catechin equivalent/g extracts). The 2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2'-azino-bis-3-ethylbenzothiazoline-6-sulphonic acid (ABTS) radical scavenging activity of the dried, roasted, and seasoned laver products increased in a concentration-dependent manner (100–1,000 µg/mL). The highest DPPH scavenging capacity was observed in a 70% ethanol extract of dried, roasted, and seasoned laver at 37°C. The percent inhibition of ABTS radical scavenging activities of the dried, roasted, and seasoned laver water extracts (extracted at 37°C) at 1,000 µg/mL were 26.51%, 19.66%, and 16.58%, respectively. The overall results support that the laver samples contained bioactive compounds such as polyphenols and flavonoids, which may have a positive effect on health.

Extraction condition	Con (µg/mL)	ABTS radical scavenging activity (%)					
		Dried laver		Roasted laver		Seasoned laver	
		Mean	SD	Mean	SD	Mean	SD
RT, water	100	4.07 ^a	0.25	3.31 ^a	0.31	2.13 ^a	0.29
	200	6.90 ^{ab}	0.21	5.37 ^a	0.44	3.78 ^a	0.24
	250	8.90 ^{ab}	0.58	6.45 ^{ab}	0.55	5.15 ^a	0.34
	500	15.36 ^b	0.31	11.31 ^b	0.97	9.00 ^{ab}	1.14
	1,000	26.51 ^c	1.95	19.66 ^a	0.73	16.58 ^b	0.91

Data are mean ± standard deviation of triplicate experiments. ^{a–b}Means with different superscripts are significantly different at $P < 0.05$.

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