Comparison of n-3 polyunsaturated fatty acid and total lipid content of spawning and nonspawning Australian blacklip abalone

XQ Su[1], KN Antonas[1], D Li[2]

[1]*School of Life Sciences and Technology, Victoria University, Melbourne, 3000*
[2]*Department of Food Science, Hangzhou University of Commerce, Hangzhou, China, 310035*

Seafood has been reported to have health benefits due to the high concentration of n-3 polyunsaturated fatty acids (PUFA) in the forms of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) (1). Previous studies showed that there was a variation of n-3 PUFA concentration and total lipid content between spawning and nonspawning fish and shellfish (2,3). However, no data are available on the variation of fatty acid concentration between spawning and nonspawning abalone in Australia.

This study investigated the fatty acid and total lipid contents in spawning and nonspawning blacklip abalone (*Haliotis rubra*), collected from Port Phillip Bay, Victoria, Australia. The total lipid was extracted with methanol-chloroform containing butylated hydroxytoluene. The fatty acid methyl esters were prepared by standard methods, and fatty acids were separated by capillary gas liquid chromatography. The results are given below.

	Spawning (n = 8)	Nonspawning (n = 8)
20:5n-3(mg/100g)	29 ± 5	26 ± 5
22:5n-3 (mg/100g)	51 ± 4	46 ± 6
22:6n-3 (mg/100g)	5 ± 1	5 ± 1
Total n-3 PUFA (mg/100g)	90 ± 9	83 ± 10
Total n-6 PUFA (mg/100g)	78 ± 7	84 ± 14
SFA (mg/100g)	176 ± 34	203 ± 23
MUFA (mg/100g)	114 ± 14	108 ± 7
Total lipid (g/100g)	2.2 ± 0.2	2.5 ± 0.9*

Values are means ± SD. SFA = saturated fatty acids, MUFA = monounsaturated fatty acids. *P<0.05.

There were no significant differences in the concentration of total n-3 PUFA, 20:5n-3, 22:5n-3 and 22:6n-3 between the spawning and nonspawning samples. The concentration of total n-6 PUFA and MUFA also did not show a significant variation. It is likely that spawning has a tendency to decrease the concentration of SFA although the variation was not significant ($P = 0.06$). Total lipid content was significantly reduced in spawning samples compared with that in nonspawning samples ($P < 0.05$), which may indicate that more energy was consumed during spawning period.

References

1. Simopoulos AP. Human requirement for n-3 polyunsaturated fatty acids. Poult Sci 2000; 79: 961–970.
2. Styrishave B, Andersen O. Seasonal variations in hepatopancreas fatty acid profiles of two colour forms of shore crabs, *Carcinus maenas*. Marine Biology 2000; 137: 415–422.
3. Tocher DR, Sargent JR. Analyses of lipids and fatty acids in ripe roes of some northwest European marine fish. Lipids 1984; 19: 492–499.

The research was funded by Victoria University. All samples were provided by Ocean Wave Seafoods, Victoria.
Key words: n-3 PUFA, spawning/nonspawning abalone