Lipids and Fatty Acids of *Octopus vulgaris* Paralarvae Reared with Enriched On-Grown *Artemia*

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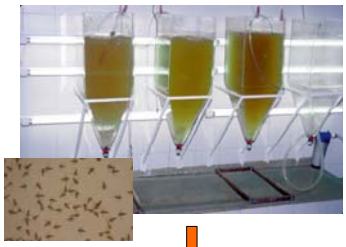
Aim

The use as food of *Octopus* parlarvae of on-grown *Artemia* cultured with the microalgae *Isochrysis galbana* and further enriched with *Nannochloropsis* sp. has proven a certain degree of success during the first month of life. **What is the effect of this diet on the polar and neutral lipid fatty acids of parlarvae as compared with *Artemia* enriched with a high DHA oil?**

Materials and Methods

Artemia on-grown with *Isochrysis galbana* (1.5-2mm)

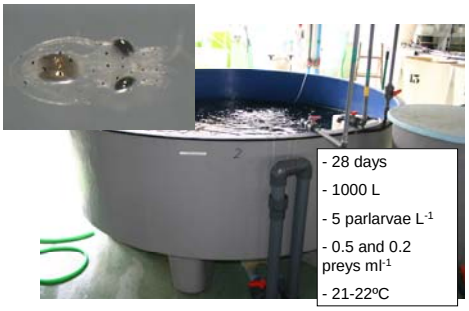


Further enriched with

Emulsion M70

Nannochloropsis sp

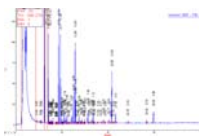
Fed to paralarvae



- 28 days
- 1000 L
- 5 parlarvae L^{-1}
- 0.5 and 0.2 preys ml^{-1}
- 21-22ºC

Gas chromatograpgy

Lipids extracted and fractionated
Into polar and neutral



At the end of the trial:

- No significant differences (t-test p>0.05) were found between the weight of both groups of parlarvae
-Survival at 28 days was roughly estimated at 3% for M70 paralarvae and 22.5% for Nannochloropsis paralarvae.

Results

Selected fatty acids (% of total fatty acids) of the total lipid of enriched on-grown *Artemia*, and of total, polar and neutral lipid of *Octopus vulgaris* paralarvae fed on them (mean, n=3).

	Artemia		Paralarvae					
Fatty acid	Total Lipid		Total Lipid		Polar Lipid		Neutral Lipid	
	M70	Nanno	M70	Nanno	M70	Nanno	M70	Nanno
14:0	1.43	1.13	0.74	1.62	0.58	1.09	2.56	5.19
16:0	10.54	15.71	21.09	21.23	18.53	18.25	20.21	18.22
16:1n-7	5.19	23.69	5.02	4.31	2.07	2.47	16.22	13.01
18:0	7.26	5.40	12.61	12.51	14.21	13.56	10.50	8.19
18:1n-9	16.22	12.31	6.93	8.32	3.94	5.33	12.36	17.25
18:1n-7	9.27	7.89	5.58	5.28	4.08	3.88	6.27	6.10
18:2n-6	12.15	2.34	1.50	2.95	1.11	2.08	2.52	7.06
18:3n-3	5.05	0.38	0.94	0.77	0.22	0.56	0.24	1.81
20:4n-6	2.75	2.88	6.35	5.50	7.69	6.31	1.19	0.49
20:5n-3	11.99	22.55	21.89	20.33	25.73	23.31	5.33	2.31
22:6n-3	8.10	nd	5.55	5.21	6.44	5.63	nd	nd
Sat	20.38	23.33	34.57	35.54	33.73	33.35	34.62	31.94
Mono	31.58	44.19	20.20	20.45	12.81	14.55	36.41	37.19
Poly	44.42	28.96	41.57	40.48	46.06	43.42	11.96	13.99
n-3	27.92	23.04	30.98	29.09	35.45	32.75	5.57	4.56
n-6	16.67	5.62	9.73	10.72	10.75	10.56	4.16	9.25
HUFAn-3	20.93	22.57	29.92	28.00	35.16	32.01	5.33	2.31
HUFAn-6	3.83	3.06	7.02	6.35	8.38	7.12	1.64	1.60

Sat: saturates; Mono: monoenes; Poly: polyunsaturated; HUFA: highly unsaturated fatty acids (>20C). nd: not detected. Standard deviations were bellow 10%

Polar lipids are much richer in 20:5n-3 and 22:6n-3 (absent in the neutrals), which is reflected in a higher polyunsaturated, n-3 and HUFAn-3 content.

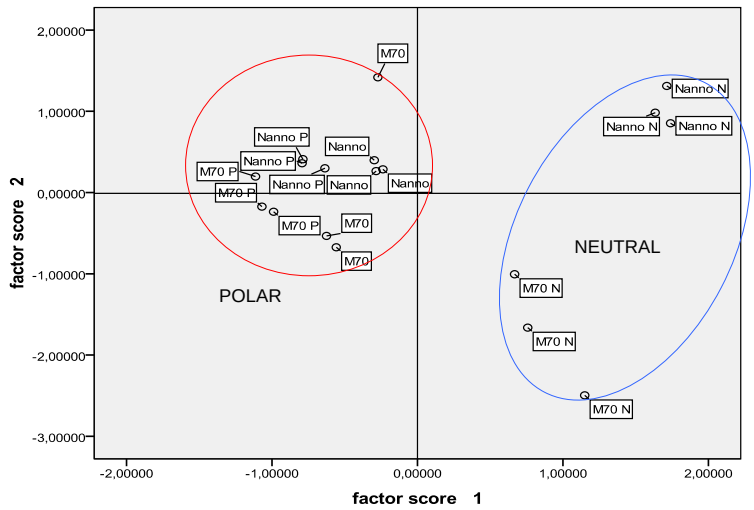
Neutrals on their turn are richer in monounsaturated fatty acids.

Within the polar lipids, M70 treatment generally increases the polyunsaturated, n-3 and HUFA n-3 content with respect to Nannochloropsis.

Within the neutral lipids, Nanno treatment could be associated to higher n-6 content, whereas M70 seems to increase HUFA n-3.

Principal Components Analysis

Fig. 1. Score plot generated after PCA of the fatty acid patterns of *Octopus vulgaris* paralarvae fed two enriched on-grown *Artemia* diets. Nanno, M70: total lipid; Nanno N, M70 N: neutral lipid; Nanno P, M70 P: polar lipid



Conclusion

Although the fatty acid pattern of paralarvae is influenced to more or less extent by the composition of diets, it tends to be more conservative in the structural (polar) lipids, with the neutral lipids reflecting the dietary differences in essential fatty acids.

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