W NIDAMENTAL GLANDS AND MATURITY STAGES IN ILLEX COINDETII (MOLLUSCA: CEPHALOPODA) OF THE STRAIT OF SICILY (CENTRAL MEDITERRANEAN)

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Nidamental glands play a master role in squid reproduction (O'DOR and BALCH, 1985; ARKHIPKIN, 1992) and their macroscopic condition is used as an additional parameter to characterize different maturity stages (see JUANICO, 1983 for a review of maturity scales). Nidamental gland length (NGL) in particular proved to be a good indicator of maturity in *Illex illecebrosus*, when related with mantle length (ML) (Durward *et al.*, 1979). Nidamental gland index (NGI=NGL/ML) was often used afterwards to characterize maturity stages of several squid species (SANCHEZ, 1981; VILLANUEVA and SANCHEZ, 1989; HATFIELD and RODHOUSE, 1992). Here the relationship between NGL and ML, and the use of NGI and a three-stages macroscopic maturity scale referred to Illex coindetii (VERANY, 1837) of the Strait of Sicily is described.

Data come from two years of experimental trawl surveys carried out with seasonal periodicity in the Strait of Sicily (Central Mediterranean) (Levi, 1990). Within a study on the biology of *Illex coindetii*, a macroscopic maturity scale of three stages (1=immature; 2=maturing; 3=mature) was prepared (JEREB and RAGONESE, 1994). NGL (mm) and ML (cm, 0.5) were then related on a subsample of 1996 squid and the relationship analyzed. NGI (NGL/ML x 100) was computed for each maturity stage.

		Nidamental Gland Index				Log_e linear coefficients		
Mat	N	min	max	mean	s.e.	a	b	MSE
1	1073	5.7	39.2	13.3	0.1	-0.980	1.531	0.067
2	248	13.1	54.9	30.6	0.5	----	1.405	0.067
3	675	31.9	71.5	51	0.2	1.886	0.906	0.012
All	1996	5.7	71.5	28	0.4	-3.906	2.880	0.163

Tab. 1 - Descriptive statistics and regression results

The values of nidamental gland indices for each maturity stage are reported in Tab.1. Although a certain amount of overlapping among the different stages does occur, as expected, the scale seemed to work out rather adequately the separation of immature, maturing and mature females, considering the mean values corresponding to each stage. As for the NGL-ML relationship (Fig.1), this clearly showed differences in NGL increments during the different maturity stages. After an initial phase in which the relationship is positively allometric (b>1; stage 1 and 2), even though at a different rate, NGL increments become negatively allometric (b<1; stage 3). Therefore results of the analysis without considering the three stages separately does not give satisfactory results.

Providing that every classification of sexual maturity into stages imposes artificial discontinuities onto what is a continuous process, it is likely that each macroscopic maturity stage will include a broad range of body size and indices of maturity. This considered results obtained were satisfactory and NGI proved to be a good indicator of maturity also for *Illex coindetii* of the Strait of Sicily, once a maturity scale is provided and tested. NGI values obtained in the present case are close to those obtained for *Illex coindetii* of the Catalan Sea (SANCHEZ, 1981), thus supporting the possibility to apply results obtained for the same species also in different areas. Considering that all mated females (spermatophores inside the mantle cavity) were mature, spermatophores presence could be an additional factor to better discriminate between stage 2 and 3 and mating could be the trigger responsible for the differences in the nidamental gland develop-ment. NGL in fact increases with maturity, but the rate of the increment proved to be different in different maturation phases and this variation could follow different patterns in different species. In the present case NGL-ML relationship changes twice during the maturation process. The analysis of this relationship on the base of the maturity scale proposed allowed a better interpretation of the maturation process. It seems therefore that the use of the proposed macroscopic maturity scale and NGL, ML and the notation of the presence/absence of spermatophores (all measurements easily obtained in the field) will provide consistent information to discriminate basic maturity stages in *Illex coindetii* of the Strait of Sicily for fisheries managment purposes.

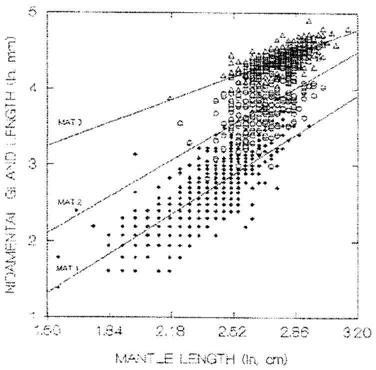

Fig. 1 - NGL- ML log-log relationship

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