Occurrence of the unihorn octopus *Scaergus unicirrhus* in the Sicilian Channel. I : Spatial distribution and abundance

S. RAGONESE*, P. JEREB* and L. DI STEFANO**

* ITPP-CNR, MAZARA (TP) (**Italy**)
** Istituto di Istologia dell'Università di PALERMO (**Italy**)

The unihorn octopus *Scaergus unicirrhus* Orbigny 1840, a by catch of the bottom trawl fishery in the Mediterranean, is much appreciated for its flesh quality and is regularly sold in the fish markets of Greece, Italy and Spain (MANGOLD & BOLETZKY, 1987).

At Mazara (one of the most important landing places of the Mediterranean) this octopus is well known as the so-called "polpo riccio" (curly octopus) and it is widely commercialized either alone or mixed with other valuable octopus species, namely *Octopus vulgaris*, *Eledone cirrhosa* and *E. moschata* (JEREB & RAGONESE, 1990; RAGONESE & JEREB, 1990).

Up to date species has been considered rather uncommon all through its main distributional area (MANGOLD & BOLETZKY, 1987, 1988 ; SANCHEZ & ALVAREZ, 1988) and little information is available for the central Mediterranean.

Data collected during two years (Spring 1985 to Winter 1987) of seasonal, randomly stratified trawl survey carried out within the Sicilian Channel (daily hauls of 1 hour duration; cod-end mesh size of 20 mm/side; see LEVI, 1990, research program TRAWL, for further details), were analyzed to give a description of the distribution of this species and information on its abundance.

The unihorn octopus occurred all over the area investigated (about 51000 square km; see fig.), showing a major concentration over the wide platform or "Banks" (the "Adventure" the "Terrible" and western side, respectively. The central portion of the area, characterized by a reduced continental shelf and sedimentation basin with canyons and valleys more than 800 m deep was poorly inhabited.

Caught between 46 and 776 m depth, the curly octopus seems to prefer a more restricted bathymetric range, being most abundant between 50 and 500 m. The only specimen caught above 50 m and the other 6 (in 4 hauls) caught beyond 500 m in fact, are likely to represent occasional captures, in agreement with that reported for the species in other Mediterranean areas (MANGOLD & BOLETZKY, 1987).

Catches were rather exiguous, considered both individually and as a whole (Tab.), with males dominant over females. Nevertheless it should be pointed out that the bottom trawl used is not selective for octopuses and that during the above mentioned TRAWL (a multispecific research program) daily hauls were taken, when octopuses are likely to be less vulnerable to fishery.

Moreover, a greater abundance was detected on some particularly rough bottoms, characterized by madreporian and barnacles formations, where the hauls were never repeated in order to save the net. Besides, local fishermen considerer this species quite common within the range of exploitation of the near shore trawl fishery.

Taking into account these considerations, our data indicate that *Scaergus unicirrhus* seems to be more common in the Sicilian Channel than previously believed and that its potential for a fishery seems greater than suspected.

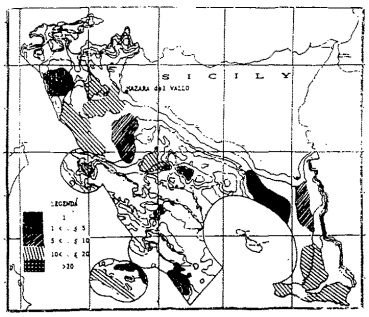

Fig.- Distribution (relative abundance in number) of *S. unicirrhus*.

TRAWL - SEASON	TH	HS.U.	TYm	TCm	MBWm	TYf	TCf	MBWf
1 - SPRING ' 85	55	23	11.6	123	95	3.3	41	80
2 - SUMMER ' 85	53	14	2.4	31	77	1.5	28	55
3 - FALL ' 85	57	17	2.9	45	64	1.2	29	40
4 - WINTER ' 86	58	15	3.3	52	63	2.1	32	65
5 - SPRING ' 86	63	18	4.0	48	83	1.4	29	47
6 - SUMMER ' 86	64	21	2.8	39	72	2.0	37	54
7 - FALL ' 86	71	23	7.1	91	78	2.7	46	59
8 - WINTER ' 87	69	22	4.7	73	64	2.8	49	58

Tab.- Total catch in weigth (TY, kg) and number (TC) and mean body weight (MBW; gr) for sex (m = males; f = females), and trawl season of *Scaergus unicirrhus* in the Sicilian Channell. TH = total number of valid haulus (1-800 m depth range), HS.U. = number of haulus where the species was caught.

REFERENCES

JEREB P. & RAGONESE S., 1990. - *Oebalia*, Suppl., Vol. XVI-2:741-744.
LEVI D., 1990. - NTR-ITPP, nº 15 bis: (mimeo).
MANGOLD K. & VON BOLETZKY S., 1987. - *In*: Fisher W. *et al.*, (eds.). *Fiches FAO d'identification des espèces*, Vol. I: 760 pp.
MANGOLD K. & VON BOLETZKY S., 1988. - *The Mollusca*, Vol. 12: 315-330.
RAGONESE S. & JEREB P., 1990. - *Oebalia*, Suppl., Vol. XVI-2: 745-748.
SANCHEZ P. & ALVAREZ J.A., 1988. - *S. Afr. J. Mar. Sci.*, I(7): 69-74.

Estimation of mortality rates and critical age of *Helicolenus dactylopterus dactylopterus* (Pisces-Scorpaeniformes) in the Sicilian Channel (Central Mediterranean Sea)

S. RAGONESE° and B. REALE°°

°ITPP-CNR, MAZARA (**Italy**)
°°CIBM, LIVORNO (**Italy**)

The bluemouth rockfish (*Helicolenus dactylopterus dactylopterus* Delaroche, 1809) is widely distributed throughout the Sicilian Channel, commonly inhabiting bottoms between 100 and 750 m, where it represents a frequent by-catch species for local trawl fisheries.

In this note, the authors report some estimates of the natural (M) and total (Z) mortality (per year), of the exploitation rate E = (Z-M)/Z, and of the critical age or age of maximum production (T_{mb}) i.e. the time in the life hystory of the population when the cohort is expected to maximize its biomass (ALVERSON & CARNEY, 1975).

In stock assessment and management, estimates of the rates of growth and mortality are basical inputs in order to evaluate the exploitation rates, as to have the minimum risk of a collapse of the whole population.

Data derive from a larger data-base gathered during a multispecies assessment program of the demersal resources in the Sicilian Channel (seasonally, from May 1985 to February 1987, experimental trawl surveys carried on by I.T.P.P.-C.N.R.; see LEVI, 1990 for further details).

We started from previously derived parameters of the Brodyvon Bertalanffy's growth curve: L_{inf} = 39.2 (TL; cm) K = 0.127 and t_o= -1.46 year (RAGONESE and REALE, in prep.);

An estimate of life span (T_{max} = 22 year) was derived according to TAYLOR (1958) with L_{max} = 0 95*L_{inf}.

Two estimates of M (0.20 and 0.31) were calculated according to HOENIG (1983) and PAULY (1979) respectively (in the second case assuming an average water temperature of 14°C).

A first estimate of total mortality rate (Z = 0.639) has been computed transforming the length frequency distributions, from four seasonal trawl surveys, in a length converted catch curve (Fig. 1a) according to PAULY's methodology (cfr. PAULY, 1984).

By regression of the logarithmic (natural; ln) of cumulative frequency (>= L_i) vs. ln (L_{inf} - L_i), i.e. the Jones and van Zalinge's method (in JONES, 1984)(Fig. 1b), the authors found out an estimate of the ratio Z/K = 5.009 and, multiplying for the above K value, a second estimate of Z = 0.636 consistent with the previous one and suggesting a value of Z = 0.64.

Natural mortality is a very critical parameter to be estimated (VETTER, 1988), but in this case the value of M = 0.31 seems more realistic considering that M = 0.2 is generally assumed for longlived species which reach the larger sizes in cold environments.

The resulting fishing mortality rate (F = 0.33) allows the derivation of an exploitation rate (E = 0.51) which is relatively high, supporting the hypothesis of a general overexploitation of demersal Mediterranean stocks (ANON, 1989).

From these data it has been possible to compute (ALVERSON and CARNEY, 1975; AULT & FOX, 1988) two different values of T_{mb}, 5 and 2 years for the unexploited (Z = M = 0.31) and the exploited (Z = 0.64) cohort, respectively.

The first estimate (T_{mb} = 5 years) sounds reasonable, considering that the bluemouth rockfish in the Mediterranean Sea, reaches sexual maturity at 3-4 years of age (BAUCHOT, 1987); the second estimate suggests that the resources is in growth overfishing.

Since the recruitment appears to be continuous enough (RAGONESE & REALE, in prep.), the management decision of delaying the age (size) of recruitment to the gear, e.g. widening the mesh size at the codend (20 mm of side, at present), could improve the status of the stock of the bluemouth rockfish in the Sicilian Channel.

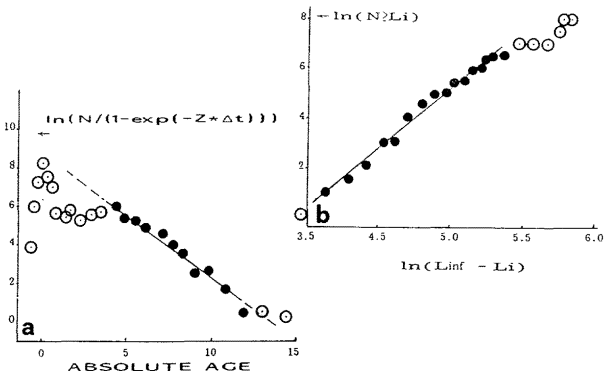

Fig. 1 - a) the length-converted catch curve for the bluemouth rockfish based on the growth data and M = 0.31; b) Jones and van Zalinge's plot. (●) used; (○) not used.

REFERENCES

ALVERSON D.L. & CARNEY J.M., 1975.- *J. Cons. int. Explor. Mer*, 36(2): 133-145.
ANON, 1989.- *General Fisheries Council for Mediterranean (GFCM)*. RM/VII/89/ 3: 34 pp.
AULT J.S. & FOX Jr. W.W., 1988.- *Fisheries Stock Assessment CRSP*, Working Paper Series, Title XII: 72 pp.
BAUCHOT M.L., 1987.- *In*: Fischer W. *et al.* (eds.). *Fiches FAO de identification des espèces (Mediterranée et Mer Noire)*, Vol.2: 1294.
HOENIG J.M., 1983.- *Fish. Bull.*, US, Vol. 82, No. 1:898-903.
JONES R., 1984.- *FAO Fish. Tech. Pap.*, (256): 118 pp.
LEVI D., 1990.- *NTR-ITPP*, n° 15 bis: (mimeo).
PAULY D., 1979.- *J. Cons. int. Explor. Mer.*, 39(3): 175-192.
PAULY D., 1984.- *ICLARM Studies and Reviews*, 8: 325 pp.
TAYLOR C.C., 1958.- *Journal du Conseil*, Vol. XXIII, No. 3: 365-370.
VETTER E.F., 1988.- *Fish. Bull.*, Vol. 86, No. 1: 25-43.

V