Genetic structure of *Corallium rubrum* L. 1758 populations from the Tyrrhenian Sea

M. ABBIATI, G. SANTANGELO & S. NOVELLI

Dipartimento di Scienze dell'Ambiente e del Territorio, Università di PISA (**Italia**)

At the FAO Technical Consultation on Red Coral of the Mediterranean (AA. VV., 1989) the existence of differences in skeletal structures, colouring and growth rate among red coral colonies were pointed out. Differences in morphological types may be related to environmental gradients or genetically determined. Population genetics studies have been used extensively to reveal the genetic affinities among populations (WARD, 1989). In order to obtain a preliminary characterization of the *Corallium rubrum* genetic structure, two Tyrrhenian populations were analyzed by means of enzyme electrophoresis.

C. rubrum specimens were collected at Calafuria cliff (Leghorn) and Elba Island by SCUBA diving. Each coral colony was considered as an individual, because of its origin from a single planula larva (VIGHI, 1972). Only organic material (polyps and a little coenosarc) was used for the electrophoretical analysis. Electrophoretic techniques have been assayed for 12 enzymes. Migrations were performed on cellulose acetate media (ABBIATI & MALTAGLIATI, in press). Banding patterns enabled the calculation of allelic and genotypic frequencies for thirteen loci. Genetic variability of each population was expressed in terms of polymorphism (0,99% and 0.95% criteria), observed and mean heterozygosity, mean number of alleles.

In both samples the same alleles, showing different frequencies were found. In the Calafuria sample three loci were polymorphic at 0,95 criterion and one at 0.99, while in the Elba sample four loci resulted polymorphic at 0,95 and one at 0,99 criteria, the eight further loci being monomorphic. In the Elba sample polymorphic loci had a more even genetic variability than in the Calafuria one, as shown by Standard Error (SE) values (Tab. 1).

Table 1. Summary in genetic variation of *Corallium rubrum* populations (SE in parentheses).

Population	Mean sample size	Mean number of alleles	% Polymorphic loci(99)	% Polymorphic loci(95)	Observed heterozygosity	Mean heterozygosity
Calafuria	91.1	1.46 (0.18)	30.77	23.08	0.085 (0.041)	0.104 (0.054)
Elba	76.3	1.46 (0.18)	38.46	30.77	0.064 (0.029)	0.073 (0.035)

The mean heterozygosity of both populations agrees with the average invertebrate value (AYALA & KIGER, 1987). A slight difference, not significant by T-test, was observed in the mean heterozygosity values of the two samples.

In literature there are very few data about genetic variability in Anthozoa and most of them concern reef corals. In order to compare our data with those regarding *Pocillopord damicornis* (STODDART, 1984) the mean heterozygosity in polymorphic loci was calculated (Tab.2). Genetic variability of *C. rubrum* resulted lower with respect to the reef coral. An explanation could be differences in the life cycles of the two species. *C. rubrum* eggs develop in the coelenteron and the planulae do not have a large dispersal capability. *P. damicornis* too has brooded planulae, but with over 100 days of planktonic life, sufficient to allow dispersal over large distances (RICHMOND & HUNTER, 1990). Moreover, *P. damicornis* samples analyzed by STODDART came from larger populations then our *C. rubrum* samples; this characteristic is of great importance in maintaining the presence of rare alleles (NEVO *et al.*, 1984).

Table 2. Mean heterozygosity of polymorphic loci in *Corallium rubrum* and in three populations of *Pocillopora damicornis* (STODDART, 1984).

Corallium rubrum		*Pocillopora damicornis*	
Calafuria	0.27	Pocill. Reef	0.35
Elba	0.19	Mary Cove	0.44
		Little Island	0.35

Our data represent a first characterization of *C. rubrum* population genetics. An extension of these studies to further Mediterranean samples is required in order to give a more exhaustive picture of the level of populations structuring.

REFERENCES

AA. VV., 1989.- *FAO Fish. Rep.*, 413: 1-162.

ABBIATI M. & MALTAGLIATI F., in press.- *J. mar. biol. Ass.* U.K., 72.

AYALA F.J. & KIGER J.A., 1987.- *Genetica moderna.* Zanichelli Ed.:1-712.

NEVO E., BEYLES A. & BEN-SHLOMO R., 1984.- *Lectures notes in Biomathematics*, 53: 13-213.

STODDART J.A., 1984.- *Coral Reefs*, 3: 149-156.

RICHMOND R.H. & HUNTER C.L., 1990.- *Mar. Ecol. Prog. Ser.*, 60: 185-203.

VIGHI M., 1972.- *Vie Milieu.*, 23 (l,A): 21-32.

WARD R.D., 1989.- In: *Reproduction, Genetics and Distribution of Marine Organisms:* 235-249.