

A new technique for transplantation of red coral *Corallium rubrum* (L.) in laboratory and on artificial reefs

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As far as we know, transplant experiments of Mediterranean Gorgonians already made have consisted of bringing cuttings of ramifications as well as juvenile colonies and placing them in habitats in which the species involved were not usually encountered or had almost disappeared (WEINBERG, 1979). Several transplant techniques were tested (concrete blocks, PVC-racks and transplanted stones) but two main systems of installation were employed :

1 - the branches or the entire ramifications were detached from the colony or from their original substratum and fixed directly to some artificial body (WEINBERG, cit.; F.A.O., 1988);
2 - stones (e.g. coralligenous rocks) bearing juvenile or adult colonies were collected from their environment and firmly transplanted in various sites.

The aim of the method described here is quite different and concerns only the species *Corallium rubrum*. Our object was to find a simple transplant technique for an easy transference of colonies from the laboratory to the field and vice versa. This could be useful to facilitate experiments and biometrical measurements, both in aquaria and at sea, and to have a high survival rate of the branches.

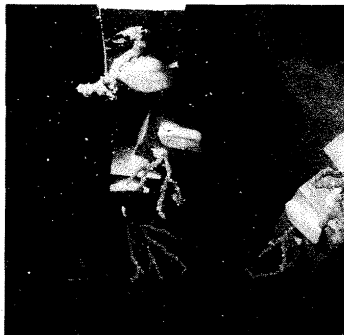
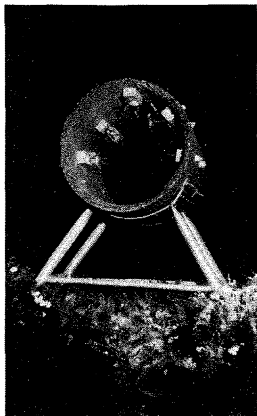
As far as the island of Sardinia is concerned, this must also be considered as the first scientific transplant of red coral onto artificial substratum in shallow waters. A similar experiment was carried out by some of the Authors. However the branches were transplanted directly on natural substrata (CHESSA, com. pers.).

It is worthwhile mentioning that there has been intensive fishing by divers from superficial rocky bottoms and caves along all the Sardinia coast. In almost all of these biotopes this species has been completely destroyed and very few populations with good densities were observed (CHESSA *et al.*, 1991). For the above reasons this research is to be regarded of practical interest.

The experiment was carried out in July 1991 along a rocky coast near Alghero (NW Sardinia). A number of small colonies of *Corallium rubrum* were collected in January 1991 from a shallow cave (15 m deep) where a surprisingly high density of the species was found (CHESSA *et al.*, cit.). Some environmental parameters were monitored *in situ* (e.g. temperature, salinity, dissolved oxygen, pH). The ramifications were detached with a little substratum and quickly put in a thermic bag and kept at the constant temperature of 15°C with aeration. Then they were taken to the laboratory and placed in aquarium under controlled environmental conditions.

The colonies were fed with *Artemia salina* nauplii twice a week for 24 hours at a concentration of about 2 nauplii/cc. In the above conditions the coral survived very well, without any regression of the coenenchima.

After 3 months of acclimatization in the aquarium, 11 ramifications were transplanted onto holes in small tiles. The holes had approximately the same diameter of the base of each colony. They were fixed with a quick-setting cement. These colonies were kept under strict observation for 3 months before being transferred to the sea. In this period no significant alterations in the living tissues at the base of the branches were observed.



Inside view of the pipe with ramifications transplanted (above).

The pipe placed *in situ* (left).

The tiles bearing the colonies were fixed underwater to the inside walls and roof of a small concrete pipe which had a metal base. This pipe was placed on a rocky bottom 25m deep close to calcareous outcrops where red coral was still present.

Checks on the red coral in the tunnel were made after 3 and 4 months and the following considerations can be made:

- 1) all the branches of the colonies survived;
- 2) the materials employed (tiles, cement, etc.) functioned well;
- 3) two portions of ramifications, detached by natural causes, transferred to laboratory are still surviving. They are now ready to be retransplanted into the field;
- 4) the transplant technique seems to be effective and easy to employ.

Even if it is too soon for a technological application of these results, the present experience demonstrated that red coral can be manipulated quite easily and does not seem as delicate as was previously supposed. Taking into consideration all the above reasons we think that a massive transplantation could be undertaken in the near future.

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