

MULTICROP FARMING SYSTEM FOR FARMING MARINE ANIMALS FOR PRODUCING MEDICINES

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INTRODUCTION

It is well known that all physicians who practised Ayurveda, Allopathy, Homoeopathy, Sidha, Unani, etc. were to depend on the pharmacopea systems of preparing medicines from extracts of plants, minerals and elements in the crude forms as well as in the most sophisticated forms even from the pre-vedic periods dating back to 5000 to 7000 BC. Due to the recent advancements in the modern medicines, a new branch of science has been evolved for extraction of bio-active agents or substances from marine organisms and scientists developed many life saving medicines. It is needless to emphasize that there will be shortage for the raw materials, because of the high exploitation. The need for a farming system of these organisms felt necessary to cultivate in the optimum ecological conditions of a sea. The multicrop farming system for marine animals for medicines was developed at CMFRI, Vizhinjam during 1995 to 1998 and the results are presented in this communication.

Medicines from the sea

In almost all developed and developing countries scientists are engaged for the extraction of pharmacologically active compounds from

marine organisms. "Manoalide" an analgesic and antiinflammatory substance extracted from the sponge, *Luffariella variabilis*; "Bryostatin" from the bryozoan, *Bugula neritina* which is potent against mouse leukemia and human ovarian sarcoma; Didemnin-B, isolated from the Caribbean tunicate, *Tridemnin solidum* which is a promising anticancer compound, Palytoxin and highly toxic substance from the zoanthid *Palythoa toxica*, etc. are some of the bioactive compounds reported by Bohlin (1989). Thomas and Rani (1987) while describing the gorgonid resources of India has given many cross references to show the potential medicines extracted from these organisms by various pharmacological departments of foreign institutions and it is pointed out that gorgonids are a potential source for extraction of prostaglandin which can be used for birth control, abortion and induction of menstruation, prevention of peptic ulcer, treatment of asthma and nasal congestion, regulation of blood pressure, etc. The project for farming these organisms along with ascidians, sponges, crynoides, bryozoans are etc. was initiated in 1995 at Vizhinjam. The different species thus farmed given to the National Institute of Oceanography, Panaji, Goa; Department of Pharmacology, University of Andhra, Waltair;

Regional Research Laboratory (CSIR), Bhubaneswar, Orissa; etc. for further extraction of bioactive compounds and for evolving new medicines from them.

Methods of farming

The farming method evolved at Vizhinjam was made simple in simple in such a way that on the subsequent phase the illiterate fishermen and their families can easily adopt these methods in their villages to have a subsidiary income for the family. For this purpose cages were designed to fabricate in the farm area by assembling rectangular frames of 64 cm x 64 cm size using 10 mm M.S. Rod and netted properly with a desirable mesh size. These cages were provided with pedestals to keep them above from sea bottom so that silt will not affect the animals which are stocked in the bottom shelf. Additional lateral pedestals were also provided to these cages so that if the cages fall towards the side, the lateral pedestals will keep the cages above the sea bottom.

Initially the cages were stocked with brown mussel, *Perna indica* and pearl oyster, *Pinctada fucata*. Subsequently associate fauna such as sponges, ascidians, crinoids, bryozoans, etc. also settled on these cages. The desired species was separated while cleaning these cages and farmed for further growth. At Vizhinjam, it was observed that any marine organism could be thus farmed in these cages and could be maintained throughout the year.

As some of the species required certain optimum depth and deep sea conditions, these organisms were successfully farmed in deeper areas and a series of such cages were kept in the open ocean with marker floats and were operated using winches from the boat.

Some of the methods for shallow sea bottom farming by multicrop system was given by Achary *et al.* (1998) These methods were found to be of high application value for farming cum fishing as fish attracting device providing substraction for sedentary species also.

Future programmes and conclusion

It is desirable to develop a separate farming system for farming marine organisms having bio-active medicines. This could be done by cooperative farming by involving fishermen families from fishing villages and various pharmaceuticals and departments involved with this branch of medicinal research can also get involved by providing proper funding facilities. The concerned fisheries departments of the maritime states also can give necessary support to develop this marine resource which has high application value as medicines as well as for improving foreign exchange earnings for the States.

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REFERENCES

- Bohlin, L. 1989. Pharmacologically active compounds from marine organisms. *Actapharm. Nord.*, 1(3): 175-182.
- Thomas, P.A. and Rany Mary George 1987. Gorgonid resources of India. *Mar. Fish. Inf. Sev. T&E Ser.*, 74: 1-3.
- Achary, G.P.K., Joseph Andrews and K.T. Thomas 1998. Shallow sea bottom farming: Multicrop system developed at Vizhinjam. *Mar. Fish Infor. Serv., T&E Ser.*, 156: 16-21.