Field observation of asexual reproduction by fission in sea cucumber *Holothuria atra*

Asha P. S. and Diwakar, K.
Tuticorin Research Centre of ICAR-Central Marine Fisheries Research Institute,Tuticorin

Asexual reproduction by fission and regeneration are two primitive characters exhibited by echinoderms. Generally they reproduce asexually fragmentation (fission), budding, parthenogenesis, and polyembryony. Fission (autotomy) a common method of reproduction usually involves the division of the body into two or more parts and regeneration of the missing body parts. This phenomenon can occur in populations that are reproducing sexually also. Around ten species of sea cucumbers have been reported to reproduce asexually including *Holothuria atra*, *H.parvula*, *H.edulis*, *H. leucospilota*, *Actinopyga mauritiana* and *Stichopus chloronotus*. *H. atra* commonly called as Black sea cucumber and locally as "kuchi attai" is the most common holothurian in Gulf of Mannar and Palk Bay.

During field surveys off Tuticorin, the natural fission process was recorded in *H. atra*. It occurred in an enclosed break water system inside the Tuticorin port where adults and fission pieces (both anterior and posterior resulted from autotomy) of *H. atra* were abundantly distributed. The animal followed a twisting pattern of movement in opposite direction, leading to the formation of constriction in the mid body part and throwing out of the internal organs especially the gonad and eventually separating the body into two halves (Fig.1). The entire process lasted for half an hour and the resultant pieces were not having any profound external injuries, unlike those resulting from laboratory experimental induction techniques. The fission pieces were noticed in locations where *H.atra* was densely populated and hardly noticed in locations with sparse populatios. This confirms that natural autotomy is a population density dependent phenomenon among sea cucumbers. It was also observed that the fission pieces dominated during the cooler months, hence environmental factors especially sea water temperature also may have a role in triggering the process of autotomy. A disadvantage of this type of reproduction is the lack of genetic variation, and being genetically identical the progeny cannot withstand big changes in environment. Research on the triggering factors both environmental and hormonal inducing asexual reproduction in *H. atra* and the genetic variation among the populations in Indian waters is needed to throw more light on this aspect.

Fig.1. *Holothuria atra* in the process of fission