seagrasses, the aesthetic value will be more and water quality inside the aquarium also will improve. A simple protocol for transplanting seagrass to set up a marine aquarium is described here. Seagrass *Cymodocea serrulata* along with rhizomes and roots collected from Tuticorin coast were acclimatized in the laboratory providing light and aeration for four days. Shoot containing rhizome and lateral roots were tied to thin wooden reapers (85 x 0.5 cm) at every 10 cm interval. Five such reapers were attached together longitudinally with 7 cm interval between and placed inside a glass aquarium tank of 90 x 36 x 38 cm. A narrow 50 cm long siphon was also attached at one of the corners. The tank was filled with 100 litres filtered seawater of 33 ppt. Beach sand collected at the lowest low tide level was slowly added to the tank to fill 10 cm height uniformly ensuring the wooden raft is well below the sand. The turbid water along with floating debris if any were siphoned out. Freshly filtered seawater of 33 ppt was slowly added to the tank without disturbing the bed so that the water level was maintained about 35 cm. Aeration was provided and the tank was illuminated for 10 hours through two fluorescent lamps set from the top of the tank with a regime of 10:14 h light/dark period. Nutrient solutions (Sol. A & B) of Walne’s medium at a concentration of 0.5 ml/L each were administered fortnightly through the siphon using a hypodermic syringe so that the nutrient solutions diffused directly to the sediment. The aquarium tank settled within a week and the seawater became clear allowing fish to be introduced. During the 70 days observation period, though the old leaves were shed and fresh leaves appeared regularly, no fresh shoot emerged from the nodes of the rhizomes. The above protocol for transplanting seagrasses in marine aquarium will also be useful for acclimatization studies, nursery rearing of seagrasses through vegetative propagation and for carbon sequestration studies under different levels of dissolved CO₂ and temperatures.

**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 populations. 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.

A note on the Slug *Oxynoe viridis* inhabiting seaweeds

Veena, S." and Kaladharan, P.2

1Mangalore Research Centre of ICAR-CMFRI, Mangaluru
2ICAR-Central Marine Fisheries Research Institute, Kochi

Sacoglossa (Mollusca, Opisthobranchia) consists of mostly herbivorous, marine and estuarine sea slugs with nearly 400 described species. This note reports the observation of *Oxynoe viridis* (Pease, 1861) and its association with seaweed *Caulerpa racemosa*. While on a hydrographic data collection trip to Thotlakonda, Visakhapatnam, seaweeds were collected by the first author from the shallow waters of less than 2 m for laboratory observations on 23rd August 2009. The identification of the associated sea slug among the seaweeds was carried out according to Rudman (1999).

**SYSTEMATICS**

Order SACOGLOSSA von Ihering, 1876
Superfamily OXYNOOIDEA Adams, H. & A., 1854
Family OXYNOIDAE Stoliczka, 1868
Genus: *Oxynoe* Rafinesque, 1814
  *Oxynoe viridis* (Pease, 1861)

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

The specimen was 15 mm in length and had a fragile bubble-shaped shell partially enclosed by parapodial flaps. Spots colouring bluish white were seen on the margins of the parapodia (Fig. 1). A sticky white secretion oozed out when the animal was disturbed and caught by hand during shifting. In our