## A tunicate from a Thai coral reef: a potential source of new anticancer compounds

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Fig. 1 The tunicate, Ecteinascidia thurstoni (white colony)

Tunicates have attracted attention as potential sources of anti-cancer compounds (Wright et al. 1990; Scotto 2002). In Thailand, a colonial tunicate has been found on coral reefs by Suwanborirux et al. (2002). Subsequent identification by Teruaki Nishikawa showed this to be *Ecteinascidia thurstoni* Herdman, 1891 (Fig. 1). A group of alkaloids, the Ecteinascidins (Et), including Et 770 and Et 786, have been isolated with very high yields from *E. thurstoni* pretreated with potassium cyanide. These extracts exhibited potent cytotoxic activity against cancer cells of breast, lung, colorectal, and nasopharyngeal tissues (Suwanborirux et al. 2002).

This tunicate is now only found in one reef area at 1–3 m depth in Phuket Province, southern Thailand, on the Andaman Sea coast. The zooid ranges between 0.8 and 1.2 cm in height. The highest density and abundance of this tunicate is in March, July, and November each year. Analysis of stomach contents of the tunicate revealed the presence of the diatoms *Navicula, Nitzschia* and *Thalassiosira*, and dinofla-

gellates *Protoperidinium, Prorocentrum* and *Triceratium*. Preliminary results from field observations show that the main factor controlling the growth and population density of this tunicate is light, with populations of *E. thurstoni* only occurring where conditions of low light intensity prevail. The life span of *E. thurstoni* is approximately 60 days. Laboratory observations showed that within 12 h of release, 'tadpole like' larvae attach to surfaces by three anterior suckers. The 'tadpoles' then develop and metamorphose into juvenile filter feeders within 24 h.

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References

Scotto KW (2002) ET-743: a novel marine-derived anti-tumor agent. Anti Cancer Drugs 13:3-6

Suwanborirux K, Charupant K, Amnuoypol S, Pumangura S, Kubo A, Saito N (2002) Ecteinascidins 770 and 786 from the Thai tunicate *Ecteinascidia thurstoni*. J Nat Prod 65:935–937

Wright AE, Forleo DA, Gunawardana GP, Gunasekera SP, Koehn FE, McConnell OJ (1990) Antitumor tetrahydroisoquinoline alkaloids from the colonial ascidian *Ecteinascidia turbinata*. J Org Chem 55:4508–4512

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## Reef sites

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