

Dissolved Petroleum Hydrocarbons in the Andaman Sea*

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Mean dissolved petroleum hydrocarbons, measured using UV-spectrophotometry, at 0 and 10 m were 51 ± 1 and $55 \pm 1.2 \mu\text{g/litre}$ respectively; range of variation being between 28 and $83 \mu\text{g/litre}$. Very little difference was observed in concentration values between the eastern and the western sides of the island and also in the top 10 m of the water column.

The chief sources of oil pollution are land runoff, natural seepage, accidental discharges from offshore fields, etc. Tanker accidents also play an important role, contributing 5 – 7.5% of the total direct marine pollution¹. Land runoff of oil via sewage, land waste and industrial effluents is the most important source that brings several changes in petroleum hydrocarbons in the coastal waters.

This communication gives the results of the study carried out during cruises 51 and 52 (Jan-Feb. 1979) of *R V Gaveshani* in the coastal Andaman waters. In the light of the ongoing exploration of oil and the recent finding of natural gas in the Andaman Sea the present results may serve as baseline information before any significant oil pollution can occur in this area.

Materials and Methods

Twenty two water samples were collected at 0, 10 and 20 m depths and concentrations of petroleum hydrocarbons were measured using UV-absorption spectrophotometry. Sampling locations are presented in Fig. 1.

Sampling, preservation, extraction and analysis were carried out following the method described earlier^{2,3}. Absorbance of aliquots of samples was measured using a Beckman Acta C III double-beam spectrophotometer in the scanning mode, from 350-190 nm. Maximum absorbance was observed at 210 nm.

Saudi Arabian Oil, after evaporating the lighter fractions up to 50°C, was used as a reference standard. The procedural blanks showed no contribution of hydrocarbons from reagents and solvents. With the instrument and the reagents available, a standard deviation of $\pm 0.6\%$ was obtained by replicate runs of several samples.

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Results and Discussion

The study area is not influenced by oil tanker traffic or significant pollutants coming from sewage or land runoff. However, the existing contamination may be the result of passenger and cargo ships and fishing trawlers traffic and to a certain extent land runoff and atmospheric fall out.

Petroleum hydrocarbons in this area are fairly well mixed and there is no significant difference between the surface and 10 m (Table 1). Not much difference is observed between the eastern and the western sides of the islands indicating that oil contamination in the Andaman Sea originates from the same source all over,

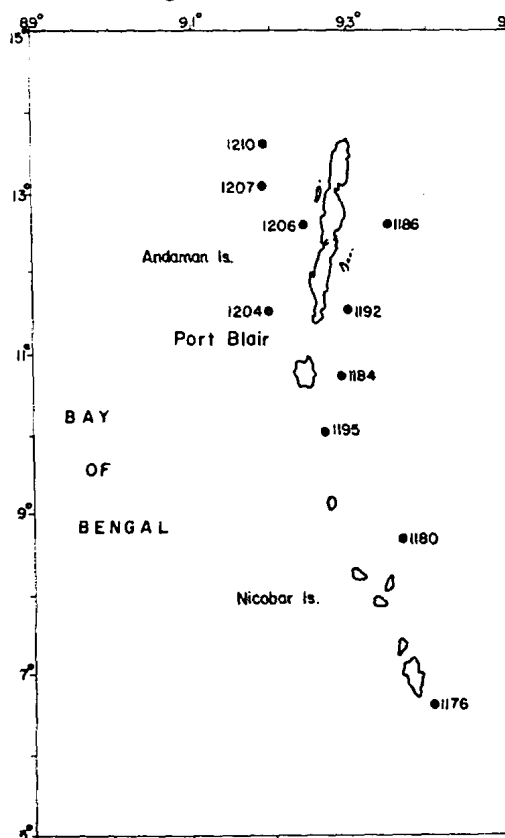


Fig. 1—Station locations in the Andaman Sea

Table 1—Values for Dissolved Petroleum Hydrocarbon Concentrations at Different Depths in the Andaman Sea

St No	Depth (m)	Conc. ($\mu\text{g/l}$)
1176	0*	35
	10 ^f	50
1180	0	44
	10	69
1184	0	48
	10	29
1186	0	48
	10	40
1192	0	62
	10	64
	20	36
1195	0	46
	10	47
1204	0	50
	10	28
	20	49
1206	0	67
	10	83
1207	0	65
	10	61
1210	0	49
	10	75

Av. for all stations: $51 \pm 1 \mu\text{g/l}$,
 $55 \pm 1.2 \mu\text{g/l}$

which is largely because of fishing vessels. However, in most cases, the exact nature of the pollutant is

unknown. Petroleum and its products change their character in a short period of time⁴.

The present values were higher than those reported by Fondekar *et al.*³, for Goa coastal waters. Observations during the same cruises from the oil tanker route across the Bay of Bengal gave values of 73 ± 1.3 and $61 \pm 1.4 \mu\text{g/litre}$ at 0 and 10 m respectively. These indicate that ubiquitously present petroleum hydrocarbons are almost of the same order in this part of the Bay of Bengal. Nevertheless, values from this region are well within the global range⁵ for dissolved petroleum hydrocarbons (0-1000 $\mu\text{g/litre}$) in the oceans.

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