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Dissolved Petroleum Hydrocarbons along the Oil Tanker Route in the Southern Bay of Bengal*

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Concentrations of dissolved petroleum hydrocarbons during 3 cruises (Nos. 51, 66 and 68) of *R V Gaveshani*, along the oil tanker route, in the southern Bay of Bengal at 0, 10 and 20 m were 19.95 ± 3.38, 16.78 ± 2.53 and 13.45 ± 2.17 μg/l respectively. The values obtained during the cruise 51, along the same route differed significantly from those obtained during the cruises 66 and 68. The difference was largely attributed to the general hydrographic conditions existing during the time of sampling.

Good amount of oil is transported from the Gulf countries across the Laccadive Sea (Lakshadweep) via Sri Lanka (Ceylon), the southern Bay of Bengal and Malacca Strait to Far Eastern countries and Japan. Considering the density of tanker traffic and the proximity of the Indian coastline to this route, oil spillage could be a cause for constant concern. This communication gives the results of the study carried out during cruises 51 (Jan.-Feb. 1979), 66 (Dec.-Jan. 1980) and 68 (Jan.-Feb. 1980) of *R V Gaveshani*. The range of positions for above cruises is given in Table 1. Data from these cruises were combined and averaged out, in order to give a fairly generalized picture of the relative concentrations of petroleum hydrocarbons in the area of study.

A total of about 153 water samples, during 3 cruises, were collected at 3 depths (0, 10, 20 m) and concentrations of petroleum hydrocarbons were measured using UV-absorption spectrophotometry.

Sampling, preservation, extraction and analysis were carried out following the method described earlier[1,2]. Arabian crude oil was used as an arbitrary standard, after evaporating lighter fractions up to 50°C boiling point. Hence, all concentrations reported in this paper are in crude oil equivalents.

Mean values along with the range of petroleum hydrocarbon concentrations during 3 different cruises are given in Table 2, whereas mean values along with the number of observations and range, depthwise up to 20 m, are presented in Table 3. Concentration levels encountered during cruise 51, are higher and differ significantly from those observed during cruises 66 and 68.

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Some of the reasons for this wide difference in concentrations depthwise and areawise (Tables 2 and 3), may be (i) physical, chemical and biological effects on petroleum products in the marine environment over a period of time and (ii) hydrographic conditions existing which may cause oil to be dispersed more quickly. Likewise, frequency of oil liftings along this route, seasonal variations and other oceanographic and meteorological conditions existing during the time when the samplings were made, could all contribute to

Table 1—Range of Positions for Cruises 51, 66 and 68

From		To		Cruise No.
Lat. °N	Long. °E	Lat. °N	Long. °E	
05°30′	78°00′	05°55′	90°00′	51, 66 and 68
06°02′	90°45′	06°22′	93°00′	66 and 68
06°20′	94°38′	05°46′	98°30′	66

Table 2—Dissolved Petroleum Hydrocarbons in the Bay of Bengal, during Three Different Cruises

Cruise No.	Month/Year	Depth m	Range μg/l	Mean μg/l
51	Jan.-Feb. 1979	0	34-165	73 ± 1.3
		10	22-94	61 ± 1.4
		20	24-73	48 ± 1.1
66	Dec.-Jan. 1980	0	4.20-28.8	13.5 ± 1.75
		10	1.40-27.0	11.35 + 1.31
		20	2.2 -21.6	9.25 ± 1.24
68	Jan.-Feb. 1980	0	0-13.2	6.2 ± 1.19
		10	0-15.4	5.14 ± 1.18
		20	0-10.6	2.74 ± 0.98

Table 3—Mean Values, Number of Observations and Range of Petroleum Hydrocarbons, for Three Combined Cruises

Depth m	No. of observations	Range μg/l	Mean μg/l
0	21	1.10 to 67.70	19.95 ± 3.38
10	20	0 to 37.0	16.78 ± 2.53
20	20	1.2 to 30.93	13.45 ± 2.17

these differences. In any case, the oil tanker route, in the Bay of Bengal is far less contaminated as compared to many oil tanker routes in other geographical areas. The petroleum hydrocarbon values reported during the same cruise in the Andaman Sea[3] are lower than the present, thus indicating the Andaman Sea is less contaminated than Bay of Bengal.

Although, the values are well within the range than those reported for other oceans[4], more observations need be made in this region over a period of time, in order to arrive at a more definite picture of the degree of petroleum hydrocarbon contamination as well as its origin, role and fate.

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