other millipedes, *Spirostreptus asthenes*[3] and *Harpurostreptus* sp.[4]

The lower rate of oxygen uptake in a higher acclimated temperature (35° C) and a higher rate at a lower acclimated temperature (20° C) than when transferred to the unacclimated temperatures (20° C and 35° C) shows a clear thermal acclimation in these millipedes. Carlisle and Cloudsley-Thompson[5] also found out similar thermal acclimation in a few tropical terrestrial arthropods.

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A NOTE ON AN AMPHIPOD SWARM ALONG THE SOUTH-WEST COAST OF INDIA

OBSERVATIONS on board the vessel "Blue Fin" during one of the cruises of a joint programme of Central Institute of Fisheries Operatives (C.I.F.O.) and National Institute of Oceanography (N.I.O.) led to the notice of a swarm of amphipods along the coast of Kerala, off Cochin on 9th April 1970. Swarms of planktonic organisms like dinoflagellates, diatoms, polychaetes and cladocerans have been reported by various authors from different coastal waters of India[1-6]. But swarms of amphipods have not been reported earlier. Although in certain regions and in definite seasons hyperiid amphipods do occur in masses in the sub-surface layers and in depths greater than 4000–5000 m they constitute an important member of the plankton (Vinogradov, 1968[7]).

The swarm was first noticed as the ship reached a sounding depth of 130 meters off Cochin (32 nm away from the shore) and it became denser and denser as the depth increased, stretching nearly 12 nm into the ocean, from thereon it decreased. Vertical hauls of plankton were taken using a 200 micra net from station 17 A and B at two depths, one from immediately above and the other from below the thermocline (Table I); but the thermocline was diffuse and ill-defined.

Examinations of the samples revealed that the swarm was constituted (99%) by a single species of amphipod belonging to the family Hyperiidae under the sub-order Hyperiidea. The species has been identified as *Hyperia sibaginis* Stebbing[8] (Fig. 1). Two samples were exclusively constituted by males, while in the other two, although males dominated a few females were also present.

The observed trend in the density of the swarm was a gradual decrease in abundance from station 17 to 18 (Table I). The number

TABLE I

Showing the location and hydrographic data

Station	Date	Time (hrs.)	Latitude	Longitude	Sounding depth (in meters)	Thermocline (in meters)		Stratum sampled (in meters)
						From	To	
17–A	9–4–1970	0108	09° 45′ N	75° 39′ E	164	75	125	75–0
17–B	,,	0055	,,	,,	,,	,,	,,	158–0
18–A	,,	0305	09° 48′ N	75° 28′ E	1005	75	100	75–0
18–B	,,	0410	,,	,,	,,	,,	,,	980–0

Station	Temperature °C (surface)	Salinity ‰	Oxygen (ml/l)	Volume of water filtered	Displacement volume	No. of amphipods		Density 100/M³
						Males	Females	
		(surface)						
17–A	30·4	34·65	4·537	19·8 M³	6·5 ml	1202	20	6100
		(at 150 meter)						
17–B	30·4	34·72	0·8507	71·6 ,,	32·0 ,,	5724	..	7900
		(surfaces)						
18–A	30·1	34·65	4·82	20·2 ,,	3·8 ,,	58	..	290
		(at 980 meters)						
18–B	30·1	34·9	0·5632	250·5 ,,	12·0 ,,	350	..	140

of the specimens represented in the sample from above the thermocline was below to those through the thermocline layer. Although diurnal vertical migration has been recorded in most of the hyperiid amphipods (Shih, 1969[9]) present collections made in the night (ref. Table I) show their presence in greater numbers in the layer of decreasing temperature or just below.

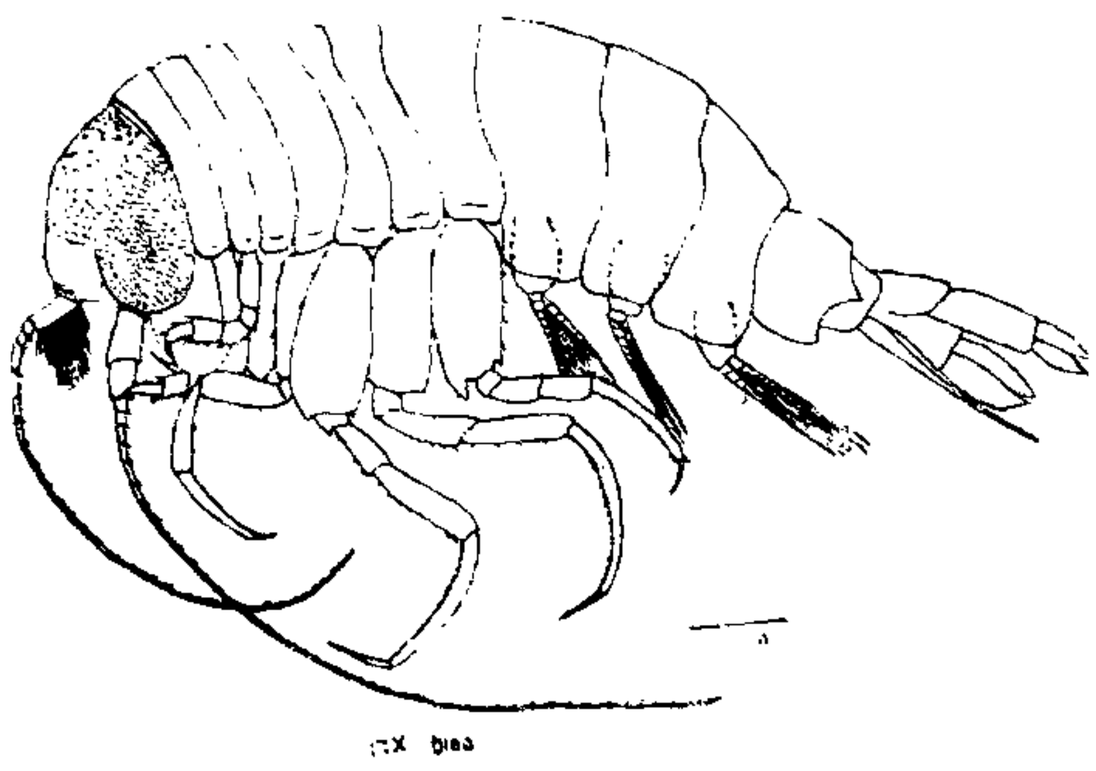

FIG. 1. *Hyperia sibaginis* Stebbing.

At the time of the occurrence of the swarm, it was noted that quite a large number of flying fishes were feeding on them. As the ship proceeded further into the sea, shoals of big sharks were noted and simultaneously the swarm gradually disappeared as indicated by the samples made from this area (st: 18 A and B). The intense predation of the flying fishes and sharks at the time of occurrence of the swarm points to the importance of amphipods as a food for pelagic fishes and the role played by these animals in the food chain. Work in progress on IIOE plankton samples also indicate their great abundance and frequency of these crustaceans further suggesting that they play an important role in feeding the nektons.

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CYTOLOGICAL BEHAVIOUR AND POLLEN FERTILITY IN *SOLANUM MACRANTHUM*

Solanum macranthum Dunn. reported to be native of Brazil[1], is a perennial, non-tuberiferous member of the family Solanaceae and is of horticultural importance.

The material for the present study was collected from Lalbagh, Bangalore. The plant flowers profusely throughout the year. The flowers are large, purplish-blue and about 3 inches in diameter. Fruits are rarely developed. The present work deals with PMC meiosis and pollen germination. Flower buds were fixed in 1 : 3 acetic-alcohol for twenty-four hours and permanent acetocarmine preparations of PMCs were made processing through N-butyl alcohol acetic acid series.

Cytological studies at different stages of meiosis revealed normal behaviour. The haploid number of chromosomes is 12. At diakinesis 12 bivalents have been observed (Fig. 1). Closed bivalents have two chiasmata each, whereas open ones have only one chiasma each. During anaphase I the chromosomes assort regularly to the two poles, with the distribution of 12–12 (Fig. 2). Second meiosis is usually normal; however, sporadic irregularities such as precocious movement of one or two chromosomes at metaphase II (Fig. 3) and occasional laggards at telophase II (Fig. 4) are noticed. Normal tetrads are formed and the spores are of uniform size (Fig. 5).

Pollen grains were germinated on agar-agar and sugar medium (Newcomber's technique)[3]. They germinated readily within about three