water, *viz* dissolved oxygen, carbondioxide and chloride contents[3]. The pH and the temperature of the water were also measured. The number of ectoproct colonies per plant and the number of individuals per colony were counted by random sampling method. The lophophoral activities of the animals were also observed.

There were 4 to 6 colonies per plant and the individuals per colony were 4 to 13. But some plants were not harboured by these ectoprocts. The frequency of lophophoral movements ranged from 4–10 per min. The colonies were observed as small circular, white gelatinous masses from which the tentacular crowns of the basally-fused zooids protruded. Each polypide contained one statoblast, almost circular with one side slightly flattened. The number of colonies/sq m of the pond was calculated to be approximately 2000 to 3000. Assuming that 50% of the plants were colonised by the ectoprocts, and if the total number of plants/sq m and the area inhabited by the plants were known, the number of ectoproct colonies, each with an average of six individuals would give an estimation of these organisms to be of the order of several lakhs.

Analysis of ten samples of pond water, on an average, showed 7.53 ppm of dissolved oxygen, 22.97 ppm of carbon dioxide and 37.48 ppm of chloride. The day temperature of the pond was 25° ± 2° with a range of 20–30° C. The water had a pH of 7.4.

These observations were made during August, September and part of October 1982 and a record of the seasonal variations is being maintained. However, it appears that the ectoprocts are abundant from the onset of monsoon season (July-October) and become scarce after this period. The physiological responses of these ectoprocts to environmental stress are under study.

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MEAN PARASITIC BURDEN OF NEMATODES AND NEMATODE EGGS IN *PERIPLANETA AMERICANA* (L.)

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STUDIES on the biotic association of some domiciliary cockroaches have indicated the potential role of these insects to serve as primary and secondary hosts for several pathogenic helminths[1-3]. Among the intestinal nematodes of the family Thelastomatidae, *Hammerschmidtiella diesingi*, *Leidynema appendiculata* and *Binema mirzaia* have been reported[4-6]. As no specific information exists on the mean parasitic burden (MPB) of these cockroaches, the present study highlights this aspect in relation to nematodes in *Periplaneta americana* from four different sources. Analysis of faecal matter of *P. americana* to study the number of nematode eggs/g of faecal matter (EPG), and a correlation between the population of nematodes and the EPG in faecal matter, have been attempted.

Cockroaches (*P. americana*) (totalling 1760) were collected from four different sources, *viz.* oil mills (492)—I, sewers (310)—II, eating houses (391)—III and human dwellings (567)—IV (hereafter mentioned as sources I, II, III and IV respectively). The alimentary canal of the dissected specimens was removed and its contents examined for nematodes. The frequency with which the cockroaches were infected with different numbers of nematodes was calculated for the four sources. Faecal matter for EPG was analysed by taking a known weight of faecal matter, dissolving it in water and examining the smear under the microscope, for nematode eggs.

Table 1 shows the MPB in cockroaches from the different sources. The adult females from source I had a maximum MPB of 3.78 as compared to the MPB of males (1.59) and nymphs (male nymph 0.99, female nymph 1.01) which indicated no significant difference among themselves. While female cockroaches from source IV indicated a significant difference as compared to the nymphs and males, no such difference was evident in cockroaches collected from sources II and III. Comparison of the MPB of cockroaches from the four sources revealed that the adult males and females from source I had significantly higher MPB than those from sources II, III and IV. Nymphal MPB, however, showed no great variation.

Table 1 also shows the number of nematodes eggs/g of cockroach faecal matter. The female cockroaches

TABLE 1

Calculated mean parasitic burden, number of eggs/g of faecal matter (in 1000's) and percentage of infected cockroaches

Source	Mean parasitic burden				Number of eggs/g of faecal matter (in 1000's)				Percentage of infected cockroaches			
	Adults		Nymphs		Adults		Nymphs		Adults		Nymphs	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Oil mill	1.59	3.78	0.99	1.01	15.20	31.62	7.58	17.78	41.35	65.13	46.43	46.99
Sewers	1.13	2.11	0.60	0.34	22.61	14.63	7.82	5.67	11.74	15.13	17.76	22.90
Eating houses	0.82	1.43	0.77	0.81	10.61	23.50	5.43	11.66	40.10	57.60	42.78	36.38
Dwelling houses	0.87	2.20	0.73	0.92	13.61	24.64	4.74	9.92	32.31	32.31	21.53	35.56
					Critical Difference at 1%							
Between sources		0.56				18.12				14.52		
Between stages		1.06				2.59				6.72		
Between source and stage		0.77				32.36				6.77		

from the four sources had significantly higher EPG than their corresponding males and nymphs. The maximum EPG was from female cockroaches collected from source I which had an EPG of 31,620. There was no significant difference between the EPG 's of different habitats though the EPG of cockroaches from source I was slightly higher.

The number of cockroaches parasitized by the nematodes was also worked out (table 1). Adult female cockroaches from source I were parasitized to the extent of 65.13%. This percentage infection of adult female cockroaches was significantly higher than the percentage infection in nymphs and adult males. The adult females of source III also showed a high rate of infection, whereas the adult male cockroaches from sources I, III and IV indicated no great difference between themselves in the percentage of infection. Male cockroaches from source II revealed very low parasitization. The adult females from sources I and III had a high parasitization rate, while the individuals from sources II and IV had a comparatively lower rate of infection. The male nymph from sources I and III had significantly higher rate of parasitization than the nymphs from sources II and IV. Female nymphs on the other hand did not show much variation in the percentage infection (table 1).

Analysis of the results revealed that female cockroaches are more susceptible to infection of nematodes than the males, the females showing a maximum MPB of 3.78 as against 1.59 in males. Cockroaches with such high MPB had a correspondingly high EPG. Females with an MPB of 3.78 had an EPG of 31,620, the males 15,200. The above data reveal that an increase in the MPB brings about a concomitant rise in the EPG. It may also be added that cockroaches act as intermediate hosts to nematodes of the family Spiruridae which have the rat as the final host[2,7].

The nymphs (IV and V instar) had a lower MPB than the adults, though the nymphs from source I still showed the highest MPB and EPG. These results are in accordance with the findings obtained for adults. But there was no significant difference in the MPB and EPG of cockroaches from sources II, III and IV.

A survey of the number of cockroaches parasitized by nematodes revealed that the percentage of infection was highest in individuals from source I. Cockroaches from sources III and IV ranked next with source II registering the lowest percentage of infection. But MPB of cockroaches from source II was next only to cockroaches from source I.

The nematode eggs per gram (EPG) in the faecal matter of some cockroaches was phenomenally high. In one case an EPG of 1,19,000 eggs was recorded indicating a high infection potential of man from the faecal matter, aptly confirmed by Chandler and Read[1], who stated that "man's failure to utilise insects

as food except accidentally relieves him from common infection with parasites, such as spiruroids, acanthocephala, and most tape worms, which encyst in insects as intermediate host—he is, however, susceptible to a great many of these parasites when they do get access to him."

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ANNOUNCEMENTS

PITAMBAR PANT NATIONAL ENVIRONMENT FELLOWSHIP

The Pitambar Pant National Environment Fellowship for 1983 has been awarded to Dr C. R. Krishna Murti (former Director, Industrial Toxicology Research Centre, Lucknow)/ Centre for Environmental Studies, Anna University, Madras. The award was announced on 5 June 1983, the World Environment Day.

The award is given every year to a scientist with a distinguished record of achievement in environmental sciences, for a period of two years. Under this national Fellowship scheme Dr Krishna Murti besides coordinating on integrated environmental programme on heavy metals, sponsored by the Department of Environment, Government of India, initiates studies on some ecotoxicological problems of relevance to India.

11th INTERNATIONAL CONFERENCE ON MAGNETIC RESONANCE IN BIOLOGICAL SYSTEMS

The 11th International Conference on Magnetic Resonance in Biological Systems will be held at Fort Aguada Beach Resort, Goa (India), during 17-22 September 1984. Further information can be obtained from Prof. Girjesh Govil, Chairman, Organising Committee, XI ICMRBS, Tata Institute of Fundamental Research, Bombay 400 005, India.