thosites and gabbros are gradational. The anorthosites enclose pods and lenses of chromitites. They often show primary banding with felsic and mafic layers. They consist occasional prophyroblastic garnet and mafic clots. Lineation due to parallel to subparallel disposition of prismatic hornblende is characteristic in anorthosites. Pinch and Swell structure of outcrops of these rocks suggests the fracture controlled emplacement. Selvan[4] has inferred emplacement of basic igneous plutons along the 'Bhavani lineament'. Three sets of joints (NW-SE, E-W and NE-SW with higher angles of dips) are observed. Weathering of anorthosites is characteristic with the development of Kankar.

Petrography

These are medium to fine grained leucocratic rocks with plagioclase felspar and hornblende. Plagioclases are labrado-bytownites. The mafics are mostly, pale green hastingsite ($Z\ C = 19°$; $2v = 70°$) and relict diopside ($Z\ C = 40°$; $2v = 60°$). Plagioclases occur as subhedral grains with triangular junctions. Untwinned grains are also not uncommon. Occasional garnets and common iron ores are accessaries.

Chemical analysis of an anorthosite is presented in column I of table 1. Analyses of gabbros associated with anorthosites are furnished in columns II to IV in table 1. The high aluminous and calcic characters are akin to the anorthosites of Sittampundi[5] complex.

The ultrabasic variant anorthosites and associated gabbros and pyroxenites represent basic magmatic activity in the Karappadi area. The primary nature of anorthosites is clearly exhibited not only by its occurrence as a differentiated band in the gabbros but also due to the preservation of primary banding and the presence of chromitites. The appearance of garnet, secondary foliation and lineation indicate that the suite might have recrystallised at high grade metamorphic conditions.

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Table 1 *Chemical analyses and modal composition of the members of the layered basic suite of the Karappadi area.*

	I	II	III	IV
Sio2	46.59	50.07	51.27	53.47
Tio2	Trace	0.49	0.13	0.12
A12o3	30.98	17.68	11.63	9.84
Fe2o3	0.80	2.38	3.19	2.20
Feo	1.78	6.75	6.59	8.14
Mno	0.00	0.16	0.18	0.29
Mgo	1.93	8.78	14.58	11.23
Cao	15.23	11.35	11.07	9.58
Na2o	2.35	2.48	1.55	2.95
K2o	0.13	0.11	0.07	0.35
H2o	0.30	0.34	0.40	1.08
	100.09	100.59	100.66	99.25
Plagioclase	82.50	45.00	32.80	53.00
Clinoamphibole	9.50	8.20	3.50	0.00
Clinopyroxene (Diopside)	2.50	16.30	26.35	19.50
Hypersthene	0.50	14 60	5.30	2.00
Garnet	0.50	14.00	29.15	24.50
Zoisite and Scapolite	3.50	0.00	0.50	0.00
Accessaries	1.00	1.90	2.40	1.00
	100.00	100.00	100.00	100 00

I Anorthosite
II Hyperite
III Hypersthene gabbro
IV Anorthositic gabbro

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SIZE AND SEX-RELATED TOLERANCE TO CADMIUM IN THE FRESHWATER CRAB, *OZIOTELPHUSA SENEX SENEX*

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THE tolerance capacity to cadmium in the freshwater vertebrates, mainly fishes, is well investigated but very little work has been carried out in the freshwater invertebrates, particularly Crustaceans[1]. Hence this study involving the tolerance capacity of the fresh-

water field crab, *Oziotelphusa senex senex*, to cadmium was undertaken. Since sex and size have a great influence over the physiology of an animal[2], the present study was carried out on sex- and size-controlled basis, so as to assess whether or not the tolerance capacity to cadmium in the crabs is sex- and size-dependent.

Small ($10\,g \pm 1\,g$) and large ($20\,g \pm 1\,g$) crabs of the two sexes were separated into groups of 10 each, exposed to different concentrations of cadmium nitrate and the mortality in each concentration was determined after a period of 96 hr. LC_{50}/96 hr values were calculated from both per cent and probit mortality values[3], and the same was verified by the method of Dregstedt-Behrens as given by Carpenter[4]. Animals maintained in normal water served as controls.

The results of this study indicated that the crab *O. senex senex* is sensitive to cadmium similar to fishes[5], and the tolerance capacity of the crab was size and sex-dependent (figure 1). Thus among the size-groups the large animals were more tolerant than the small ones and the difference was also statistically significant ($P < 0.001$). It may be due to decreased total cell surface area with increasing body-size[6] which leads to the prevention of relatively more diffusion of the toxic ions into the organs of the large crabs than that in the small ones. In addition, the large crabs being metabolically less active[7] the rate of accumulation of the toxic ions in the organs of the crab may be less. Even the detoxication mechanisms may be more active in the large animals than those in the small ones[8]. Among the sex groups more tolerance was observed in the females than in the males. Just as the females are metabolically less active than the males[7], the rate of diffusion of the toxic ions into the organs may also be less. Further, the accumulation of the toxic ions in the inert tissues of females, which are metabolically inactive, may lead to more tolerance capacity in females than in males. However, this sex-dependent variation is more significant in the larger crabs ($P < 0.001$) than in the smaller ones ($P < 0.05$). Hence it may be inferred that while the cadmium tolerance capacity increases with size irrespective of sex, the sex-dependent difference may be more only after some growth of the animal.

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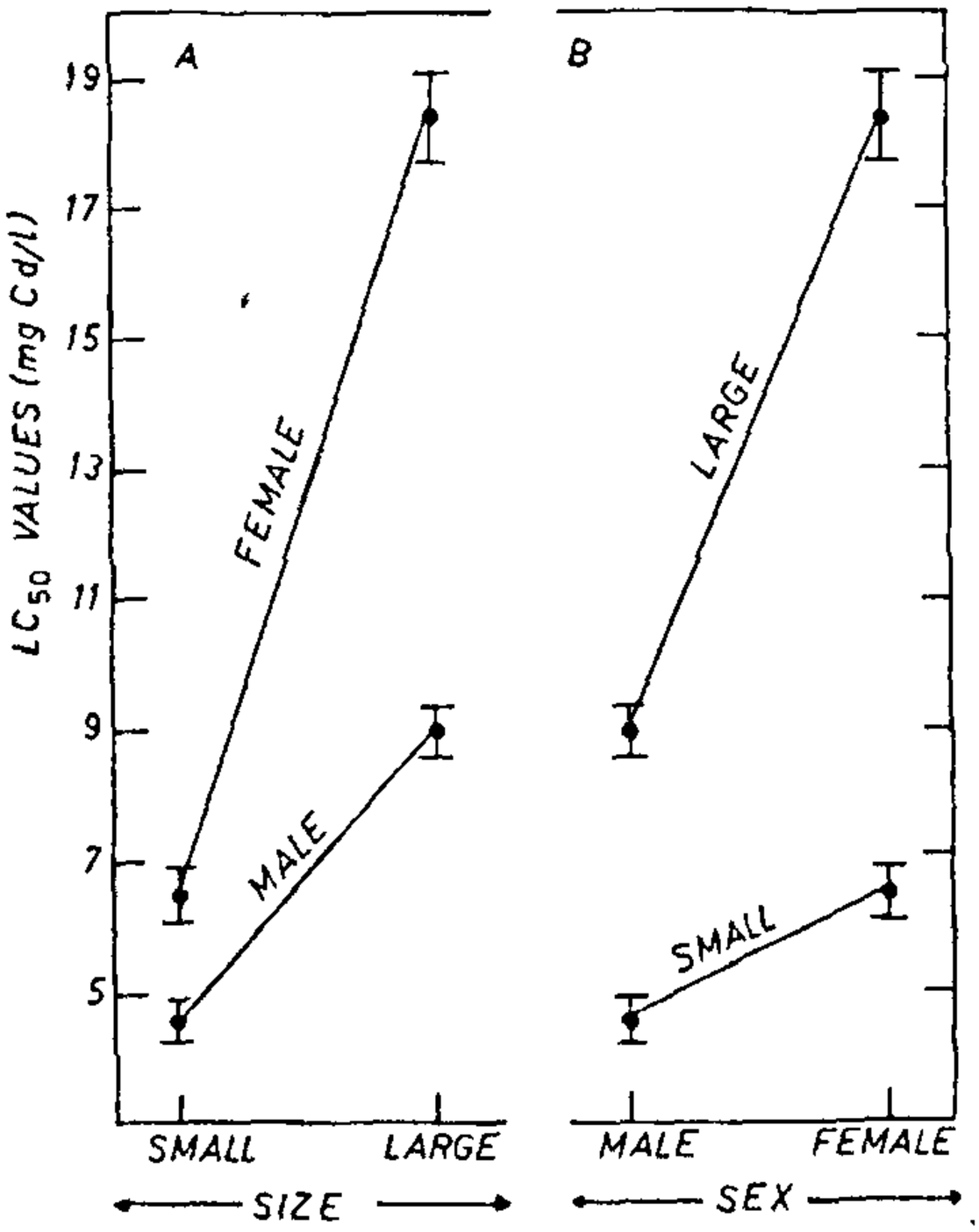

Figure 1. LC_{50}/96 hr in the male and female individuals plotted as a function of size (A) and in the small and large individuals plotted as a function of sex (B). Vertical bars indicate standard deviations.

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