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STUDIES ON THE PHYSICO-CHEMICAL AND BIOLOGICAL PROPERTIES OF TWO MAN MADE LAKES OF CALCUTTA

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INTRODUCTION

Lakes, both natural as well as man made, constitute an important component of fresh water resources, because of their diverse uses. The aquatic environment of such lakes support a variety of flora and fauna which include the biotic community of phytoplankton, macrophytes, zooplankton, benthos, necton etc. Together with the prevailing physico-chemical condition of water and soil, these biotic communities form an interdependent and balanced ecological system. Generally, lakes situated in urban areas are mainly used for recreational purposes like swimming, bathing and other water sports. However, many a times, these water bodies are subjected to undesirable uses such as discharge of industrial and domestic effluents or excessive use by surrounding dense human population for a variety of purposes and thereby degrading the water quality considerably.

In Calcutta metropolitan, there are two medium sized man made lakes viz. Rabindra Sarovar and Subhas Sarovar. Subhas Sarovar, situated in north eastern part of city covers an area of 39.5 acre. Rabindra Sarovar situated in Southern part of city is larger than Subhas Sarovar and covers an area of nearly 72 acres. No organised fishing activity is being carried out in these lakes, except sport angling in Subhas Sarovar. Recently these two lakes have been included in National Lake conservation plan by Ministry of Environment and Forests and Rabindra Sarovar has been declared as National Lake.

Several earlier studies on the urban recreational ponds of the country (Michael, 1962, Sreenivasan, 1964, 1965, 1976; George, 1966; Ganapati and Sreenivasan, 1970; Jana, 1979; Zutsi and Vaas, 1982; Zafar, 1966 Kulshrestha, 1988,) also pointed out their altered ecological condition due to excessive undesirable uses. In spite of their importance in Calcutta Metropolitan, these lakes have yet not been properly investigated. Excepting few earlier studies of specific nature on primary productivity and zooplankton by Khan (1979, 1981, 1985) in Rabindra Sarovar practically no information is available on general limnological condition of these two lakes. Therefore, the present studies were undertaken for two consecutive annual cycles, 1996-97 and 1997-98. with a view point to work out the physico-chemical characteristics of water, phytoplankton, rate of primary production and diversity and abundance of zooplankton of the two lakes.

**NOTES ON THE DERMAPTERA (INSECTA) OF LAKSHADWEEP
WITH THE DESCRIPTION OF A NEW SPECIES**

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INTRODUCTION

Srivastava (1991) recorded two species of Dermaptera, namely, *Euborellia stål*i (Dohrn) now treated as synonym of *Euborellia annulata* (Fabricius) and another *Euborellia* sp. Besides, *Anisolabis annulipes* Lucas was reported on a Male from Minikoi by Burr (1902) which may be treated with reserve since it was determined before the concept of male genitalia was fully introduced in the taxonomy of the Order.

Three more species are reported from the area including an undescribed species.

ANISOLABOIDEA

ANISOLABIDIDAE

ANISOLABIDINAE

Euborellia annulipes (Lucas)

Anisolabis annulipes; Burr, 1902, *The Fauna and Geography of the Maldive and Laccadive Archipelagos*, 1 (2) : 235 (1 Male; Lakshadweep, Minikoi).

Distribution : World wide.

Euborellia sp.

Euborellia sp. Srivastava, 1991. *State Fauna Series 2 : Fauna of Lakshadweep* : 259, figs. 3-6 (Male, 1 Female, 1 nymph : Lakshadweep, N of Agatti Isl.).

Remarks : The above male, female were not named due to the poor condition of male specimen which represent an undescribed species. The brief description and figures were given for the future workers to recognise the species when additional material is available.

Euborellia annulata (Fabricius)

Forficula annulata Fabricius, 1793, *Ent. Syst.*, II : 4 (Sex ?; America Merdionale).

Euborellia annulata; Brindle, 1981, *Entomologists' Rec. J. var.*, 93 : 14 (*Forcinella stáli* Dohrn, 1864—treated as a synonym).

Euborellia stáli; Srivastava, 1991, *State Fauna Series 2: Fauna of Lakshadweep* : 259, figs. 1-2 (Females; Kavaratti and Amini Isls).

Distribution : World wide.

FORFICULOIDAE

SPONGIPHORIDAE

LABIINAE

Circolabia curvicauda (Motschulsky)

(Fig.1)

Material examined : India : Lakshadweep, Minicoy Isl, 1 Male, 1 Female, ex rotten banana stem, 26.ii.2001 (G.K.Srivastava coll.).

Distribution : World wide. First record from the area.

Chaetospania nigriceps (Kirby)

(Figs. 2-3)

Material examined : India : Lakshadweep, Minicoy Isl, 1 Male, 2 Females, ex rotten banana stem, 26.ii.2001 (G.K.Srivastava coll.).

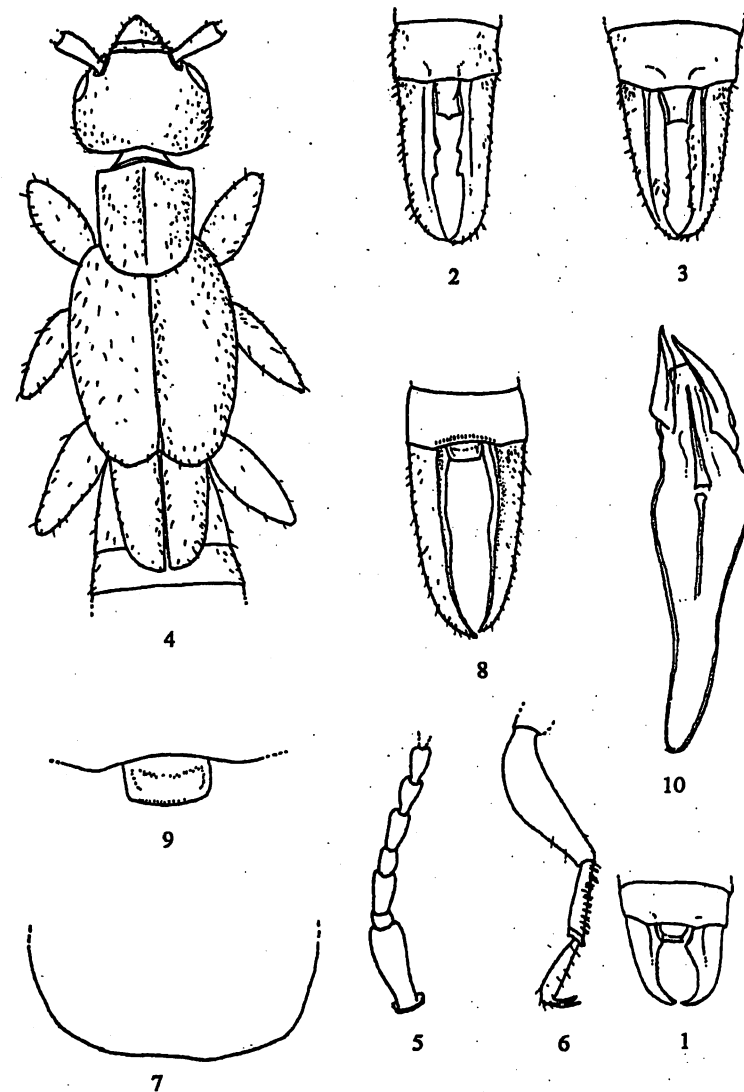
Distribution : India (Andaman & Lakshadweep), Myanmar, Celebes, New Guinea and Solomon Islands.

Reported for the first time from Lakshadweep.

Chaetospania alfredi sp.n.

(Figs. 4-10)

Male: General colour blackish brown; antennae, ultimate tergite and forceps a little lighter in colour; mouth parts, tibiae basally and apically and whole of tarsi yellow. Finely pubescent, sides of abdominal segments and forceps with long pubescence.



Figs. 1-10. *Circolabia curvicauda* (Motschulsky), Male, 1. Ultimate tergite and forceps; *Chaetospania nigriceps* (Kirby), Male, 2. Ultimate tergite and forceps; Female, 3. Ultimate tergite and forceps; *Chaetospania alfredi* sp. n., Holotype Male, 4. Anterior portion of body; 5. A portion of antennae with seven basal segments; 6. Hind tibia & tarsus; 7. Hind portion of penultimate sternite; 8. Ultimate tergite and forceps; 9. Pygidium, enlarged; 10. Genitalia.

Head slightly broader than long, depressed, smooth, postero-lateral angles rounded, hind margin feebly emarginate in middle, sutures obsolete. Eyes shorter than post-ocular area. Antennae 12-segmented, stout, narrowed basally, slightly shorter than the distance between antennal bases; 2nd short, about as long as broad; 3rd long, cylindrical; 4th shorter than 3rd, slightly longer than broad; 5th about as long as 3rd but gently stout, 6th onwards gently stouter, gradually increasing in length and each narrowed at base, segments 11 & 12 thin, rod shaped. Pronotum slightly longer than broad, smooth, sides straight, parallel, depressed, hind margin rounded, median sulcus fine, prozona weakly raised and poorly differentiated from depressed metazona. Elytra and wings well developed, smooth, former with humeral angle prominent, meeting along the median line, hind margin convex; latter about half as long as the elytra, meeting along the median line. Legs short, stout, femora stout, swollen especially fore and hind pair; hind tibia about as long as tarsi; tarsi with first segment slightly longer than third; second segment broader than long, short; claw without an arolium. Abdomen weakly convex, smooth, narrowed at base, gradually enlarging posteriorly. Penultimate sternite transverse, hind margin briefly rounded, scarcely emarginate in middle. Ultimate tergite quadrate, smooth, weakly depressed, gently widened posteriorly, hind margin incarsate, emarginate in middle, above bases of forceps oblique. Pygidium vertical, transverse, subtruncate posteriorly. Forceps separated at base by pygidium, branches tapering apically, almost straight in basal 2/3, afterwards gently incurved in apical one third, tip gently hooked, inner margin with dorsal border sharp, straight, ventral border in middle a little projecting. Genitalia with parameres narrowed apically with tip acuminate; virga stout.

Female : Unknown.

Measurements : (in mm) :

	Holotype
	Male
Length of body	4.6
Length of forceps	1.5

Material examined: India: Lakshadweep, Minicoy Isl, Holotype Male, (genitalia mounted between two coverslips and pinned with the specimen), ex rotten banana stem, 26.ii.2001 (G.K.Srivastava coll.); deposited in the Zoological Survey of India, Kolkata.

The species is named after Dr.J.R.B.Alfred, Director, Zoological Survey of India, in recognition of his contributions to Indian zoology.

Remarks : Amongst the Oriental species of the genus this species comes close to *Chaetospania andersoni* Brinde, 1971, from Sri Lanka but differs in having the head, pronotum, elytra and wings smooth (vs head & pronotum punctured; elytra more strongly punctured, almost rugose and wings less closely punctured in *C. andersoni*); pronotum slightly longer than broad, parallel sided (vs as broad as long, slightly narrowed posteriorly) and parameres narrow, tip acuminate (vs broader in most part, tip acute).

GENERAL REMARKS ON FAUNA

Fauna of the area, on the basis of present studies, appears to be mainly Oriental having close relationship with that of Peninsular India and Sri Lanka. Two species viz. *Euborellia stali* (Dohrn) and *E. annulipes* (Lucas) have world wide distribution but more common in warmer parts of the globe. Most likely unnamed species of *Euborellia* may be endemic to the area. The closeness of new species, *Chaetospania alfredi* to a Sri Lankan species reveals that it is a derivative of essentially Deccan Plateau and Sri Lankan faunal element which has diversified in space and isolation. The other two Spongiphoridae species, namely *Circolabia curvicauda* (Mostchulsky) and *Chaetospania nigriceps* (Kirby) commonly occur under bark of dead and decaying trees and stems of banana. Most likely the distribution of above plants and animals, may be inter-linked. The former has world wide distribution whereas the latter is occurring extensively in the Oriental and Australian (Papua New Guinea & Solomon Isls) Regions.

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