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## **SCORPION FAUNA (ARACHNIDA : SCORPIONIDA) OF PARAMABIKULAM WILD LIFE SANCTUARY, KERALA, INDIA**

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### **INTRODUCTION**

Scorpions (Arachnida : Scorpionida) are venomous arachnids which occupy a wide range of habitats in the terrestrial ecosystem. They are found in the burrows of the soil, rock crevices, barks of trees, surface debris, and also in deep caves. Order scorpionida is composed of 9 living families of which five are represented in the Indian subcontinent (Buthidae, Chaerilidae, Euscorpiidae, Ischnuridae and Scorpionidae). It is estimated that there are about 1500 described species of scorpions belonging to 112 genera are presently known from the world (Williams 1987). Pocock (1900) reported 60 species and 20 subspecies within five families from India, Sri Lanka and Myanmar. Tikader & Bastawade (1983) provided detailed systematic account of 99 species of scorpions under 18 genera and five families from India. Later, 3 new species of scorpions were described from India (Bastawade, 1986a, b, 1992) and currently there are more than 110 known species of scorpions from India.

When compared to the other parts of India, scorpion fauna of the Deccan region is well known and represents 27 species. The state Kerala is so far known to comprise 16 species of Scorpions belonging to 7 genera under three families (Tikader and Bastawade, 1983, Indra, 2001, and Bastawade *et. al.*, 2003). The present paper is based on a collection of scorpions from Parambikulam Wild Life Sanctuary, an important conservation area in Kerala. An account of 6 species belonging to 4 genera under 3 families is provided here with diagnostic characters and details of collection. The scorpion fauna of Parambikulam wild life sanctuary is practically unknown and the present account will form a basis for further investigations on the group from the area.

Parambikulam wild life sancturay located in Palakkad district of Kerala lies in a valley between Anaimalai and Nelliampathy hills. It lies between 10°20'–10°32' N latitude and 76°35'–76°50' E longitudes. It is contiguous with the Anamalai wild life sanctuary of Tamil Nadu in the east. The area is characterised by tropical evergreen and semi evergreen forests along the western part besides South Indian moist deciduous forest, riparian forests and teak plantations. Collections were made from different environs within the sanctuary during the year 1995-1996. All the specimens studied are deposited in the faunal holdings of the Zoological Survey of India, Calicut.

### SYSTEMATIC ACCOUNT

Class ARACHNIDA

Order SCORPIONIDA

Family BUTHIDAE

Subfamily BUTHINAE

#### 1. *Lychas (Endotrichus) tricarinatus* Simon

(Photo 1)

1884. *Lychas tricarinatus* Simon, *Ann. Mus. civ. sto. nat. Genova*, **20** : 371.

*Material examined* : 1 female, India : Kerala : Parambikulam Wildlife Sanctuary, Pulikkal, 1.xi.1995, coll. (Reg. No. 8480); 1 female, Padippara, 28.x.1995, (Reg. No. 8529); 2 females, 2 males, Muthalakayam, 6.xi.1995 (Reg. No. 8455); 1 female, Venkoil, 27.x.1995 (Reg. No. 8457); 3 females, 1 male, 9 female yound ones, Kamathalchi, 30.x.1995 (Reg. No. 8456); 1 female, Anchupoolai, 3.xi.1995 (Reg. No. 8451); 1 female, Thunakkadavu, 2.xi.1995 (Reg. No. 8452); coll. P. M. Sureshan; 1 female, Peruvaripallam, 25.i.1997 (Reg. No. 9874); 1 female, 1 male, Venkoli, 23.i.1995 (Reg. No. 9875), coll. K. C. Gopi.

*Diagnostic characters* : Size medium to large; colour brownish yellow; entire surface of carapace coarsely granular; anterior margin very weakly invaginated in the middle; pedipalp with femur shorter than carapace and carinated; hand smooth; trichobotrha *eb* and *esb* placed closer to the base of the immovable finger of pedipalp; pectines well developed, 5x longer than wide, teeth 23/23 in number; genital operculum with two sclerites pointed on latero median portion, united in the middle; mesosomal tergites II-IV with three carinae; cauda five times as long as carapace, basal segment slightly wider than long; telson shorter than last caudal segment.

*Distribution* : INDIA : Madhya Pradesh, Maharashtra, Karnataka, Kerala, Andhra Pradesh, Tamil Nadu.

*Remarks* : Most common species of *Lychas* in south, south western and central India; normally found under the bark of large to medium sized trees; female gives birth to 10–15 young ones which are carried on the back until the initial four instars are completed; feeds on small insects.

## 2. *Lychas (Endotrichus) albimanus* Henderson

(Photo 2)

1919. *Lychas albimanus* Henderson, *Rec. Indian Mus.*, **16**(5) : 379-381.

*Material examined* : 1 male, Parambikulam, 24.iii.1997 (Reg. No. 10,664); 1 female, Pezhakunnu, 27.iii.1997 (Reg. No. 10,075), coll. K. C. Gopi.

*Diagnostic characters* : Medium sized; coloured brownish, variegated with yellow patches; carapace entirely and sparsely weakly granular, no carinae developed; anterior margin slightly invaginated in the middle; pedipalp slender, blackish brown except manus yellow; femur as long as carapace, carinae weakly developed; pectines well developed and 4x as long as wide; fulcra not distinguished; teeth 21/21 in number, genital operculum sclerites weak, not well sclerotised, fused in the middle; mesosomal tergites I-VI yellowish brown with a pair of yellow elliptical spots in the middle portion and with >>--<< shaped marks; tergite I without carinae; II-IV with a median granular carina developed only on posterior portion, VII with two pairs of weakly granular carina; cauda more than 5x as long as carapace; sub aculear teeth of vesicle furnished with a pair of minute teeth just near the tip.

*Distribution* : INDIA : Kerala, Uttar Pradesh, Orissa, Himachal Pradesh.

*Remarks* : Not common, mostly restricted to forested areas, prefers to stay under bark, no information available on biological aspects.

### Subfamily CENTRURINAE

## 3. *Isometrus (Reddyanus) brachycentrus* Pocock

(Photo 3)

1899. *Isometrus brachycentrus* Pocock, *J. Bombay nat. Hist. Soc.*, **12** : 263.

*Material examined* : 1 male, 1 female, Kamathalachi, 30.x.1995, (Reg. No. 8456); 1 male, 1 female, Kariyanchola, 22.i.1997 (Reg. No. 9891), coll. P. M. Sureshan.

*Diagnostic characters* : Moderately sized; coloured dark brown, dark black on metasoma; ventral surface pale brown; pectines yellowish brown; entire surface of carapace finely and almost closely granular without carinae; five pairs of lateral eyes; pedipalp with femur flat and as long as carapace; trichobothria *db* placed always proximal to *et* but distal to *est* on immovable finger of manus; tarsomere I provided with a pair of pedal spurs; pectines 3.5 times longer than wide, teeth 12/12 in number; genital operculum wider than long; mesosomal tergite I without carina; II-IV with only single median carina; cauda thin long and almost six times as long as carapace; basal segment always longer than wide; telson with subaculear spine provided with three pairs of small denticulate granules on inner margin.

*Distribution* : INDIA : Karnataka, Kerala.

*Remarks* : Endemic to Peninsular India. No information available on biological aspects.

4. *Isometrus (Isometrus) sankeriensis* (Tikader & Bastawade)

(Photo 4)

1983. *Isometrus (Closotrichus) sankeriensis* Tikader & Bastawade. Fauna India. Scorpions. III. 311.

*Material examined* : 1 male, Pulickal, 27.i.1997 (Reg. No. 9861), coll. P. M. Sureshan.

*Diagnostic characters* : Small in size, slender and delicate bodied, colour yellowish white; body variegated with black to brown bands and spots. Entire surface of carapace coarsely granular, anterior margin nearly straight; five lateral eyes; pedipalp slender, long, variegated with dark colour; both fingers of manus longer than carapace; trichobothria *db* placed always distal to *et* on immovable finger of manus; pectines well developed, teeth elongated 15/16 in number in male; mesosomal tergites coarsely and finely granular with single median carina; cauda more than six times as long as carapace; telson with vesicle globular, as wide as caudal segment V, aculeus curved.

*Distribution* : INDIA : Karnataka, Kerala.

*Remarks* : Rare and endemic to peninsular India, prefers to inhabit forested areas, lives under barks of large trees, no other biological details known.

Family SCORPIONIDAE

Subfamily SCORPIONINAE

5. *Heterometrus (Chersonesometrus) kanarensis* (Pocock)

(Photo 5)

1900. *Palamnaeus scaber kanaraensis* Pocock, *Fauna Brit. India Arachn.*, 93.

1981. *Heterometrus (Chersonesometrus) phipsoni kanaraensis*, *Couzijn. Zool. Verln.*, **184** : 151.

*Material examined* : 1 male, Parambikulam, 24.iii.1997, 1 male, Pezhakunnu, 27.iii.1997, coll. K. C. Oopi (Reg. No. 10664 & 10075); 5 young ones, Kamathalachi, 30.x.1995, 1 female, 1 male, Anchupoolai, 3.ii.1995, 1 female, 1 male, Pulickal, 1.xi.1995, 3 young ones, Sirkaipathi, 29.x.1995, 1 female, Venkoli, 27.x.1995, coll. P. M. Sureshan (Reg. Nos. 8450, 8451, 8454, 8456, 8457).

*Diagnostic characters* : Large sized; colour dark blackish brown or brown; carapace weakly granular on anterior portion, otherwise smooth; anterior margin with deep notch; lateral ocular tubercle much elevated with three contiguous eyes; pedipalp stout, strong, convex on manus; femur always longer than carapace; tarsomere I provided with a pedal spur, pectines well developed, teeth not much tapering, 11/11 in number in male and 9/9 in female; mesosomal tergites smooth, without carinae; cauda slightly less than four times as long as carapace; basal segment longer than wide; telson with vesicle almost as long as caudal segment II.

*Distribution* : INDIA : Karnataka, Maharashtra, Kerala.

*Remarks* : The species is represented by a good number in the collection. In Kerala, this species is reported only from the forested tracts of Parambikulam wild life sanctuary. Burrowing in habit

and prefers to live in deep burrows under large boulders or logs lying in forested areas. Heavy rains make them to shift to some protections such as stones and crevices. Feeds on medium to large insects, sometimes smaller mammals; found in the vicinity of burrows in about 1–2 meters radius. Female gives birth to 12–20 young ones; young ones of 1-2 generations share the same burrow.

#### Family ISCHNURIDAE

##### 6. *Liocheles laeviceps laeviceps* (Pocock)

(Photo 6)

1890. *Iomachus laeviceps laeviceps* Pocock, *Ann. Mag. nat. Hist.*, 5(6) : 242.

*Material examined* : 1 male, Parambikulam, 24.iii.1997 (Reg. No. 10664); 1 female, Muthuvarachal 5.xi.1995 (Reg. No. 8453), coll. P. M. Sureshan.

*Diagnostic characters* : Medium to large sized; colour brownish with slight yellowish tint on tergites; telson with clear and conspicuous yellow vesicle; carapace entirely smooth, anterior margin invaginated; pedipalp stout and dorsoventrally flattened, femur and patella longer than carapace; Trichobothria *est1* placed distal to *est2* and *est3* on patella; two trichobothria *dsb* and *dst* on dorsal surface of immovable finger of manus; pectines moderately developed, teeth small, 6/6 in number; genital operculum narrowed posteriorly and without a median suture; mesosomal tergites smooth and finely punctate; cauda weak and slightly longer than two and half times as long as carapace.

*Distribution* : INDIA : Kerala, Tamil Nadu, Andhra Pradesh, Gujrat, Rajasthan, Bihar.

*Remarks* : Burrowing in habit and makes the burrows quiet deep in soft soil, feeds around the burrow; gives birth to 8–12 young ones.

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