

TAXONOMIC STUDIES ON A COLLECTION OF SCORPIONS (SCORPIONES: ARACHNIDA) FROM WESTERN GHATS IN KERALA, INDIA WITH TWO NEW DISTRIBUTION RECORDS

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ABSTRACT

Systematic account on 19 species of scorpions (Arachnida) under eight genera and three families from Kerala, mainly from the Western Ghats is provided. Two species, namely, *Mesobuthus hendersoni* (Pocock) and *Heterometrus (Chersonesometrus) barberi* (Pocock) are reported for the first time from Kerala.

KEYWORDS

Arachnida, Kerala, new record, Scorpiones, systematic account, Western Ghats

ABBREVIATIONS

F - Female; M - Male; trichobothria: *db* - dorsal basal; *et* - exterior terminal; *eb* - exterior basal; *em*1, 2 - exterior median 1,2; *esb* - exterior sub-basal; *est* - exterior sub-terminal; *Dt* - dorsal terminal; *V*3, *V*4 - ventral 3, 4; WLS - Wildlife Sanctuary

The Western Ghats, one of the hotspots of global biodiversity is under pressure of severe habitat degradation and consequent loss of biota at an alarming rate due to various anthropogenic activities. Conservation, management and sustainable utilization of biodiversity depend on the identification and monitoring of its biotic components. The faunal surveys in Western Ghats and adjacent areas of Kerala conducted by Zoological Survey of India, Western Ghats Field Research Station, Kozhikode has yielded a good collection of scorpions and the present study is based on them.

When compared to other parts of the country, the scorpion fauna of Western Ghats and its environs is poorly documented. According to Tikader & Bastawade (1983) 15 species of scorpions belonging to seven genera under three families occur in Kerala against 127 species under 19 genera and five families known from the country. Indra (2001, 2006) made inventories of the scorpion fauna of Nilgiri Biosphere Reserve comprising of 13 species under five genera and three families and Biligiri Rangaswamy Temple Wildlife Sanctuary, Karnataka comprising four species under four genera and three families. Bastawade *et al.* (2004) inventoried and illustrated 16 species of scorpions from Kerala along with a key to their identification. Recently, Bastawade *et al.* (2005) discovered an interesting new subfamily of Scorpionidae (Rugodentinae) with a new genus *Rugodentus* and species *Rugodentus keralaensis* Bastawade, Sureshan & Radhakrishnan from the forested tracts of part of the southern Western Ghats falling in Kerala. Sureshan *et al.* (2006) also inventoried the scorpion fauna of Parambikulam Wildlife Sanctuary, Kerala and reported six species under four genera and three families. In continuation to the above studies, an attempt is made here to provide a detailed systematic account of the scorpion fauna of Kerala, mainly from the Western

Ghats. The present study includes 19 species under eight genera belonging to three families. Two species, *Mesobuthus hendersoni* (Pocock) and *Heterometrus (Chersonesometrus) barberi* (Pocock) are reported here for the first time from Kerala. All the specimens studied are deposited in the faunal holdings of Zoological Survey of India, Western Ghats Field Research Station, Kozhikode.

Systematic account

Class : Arachnida

Order : Scorpiones

Family : Buthidae

Subfamily : Buthinae

1. *Lychas (Alterotrichus) hendersoni* Pocock

1897. *Lychas (Alterotrichus) hendersoni* Pocock. *J. Bombay nat. Hist. Soc.* 11: 111.

1899. *Archisometrus hendersoni* Kraepelin, *Terr. Scorp. etc.*, 51.

Diagnostic characters: Medium size. Colour dark brownish-black; posterior central carinae on carapace weakly developed; pedipalp slender with longer fingers, outer row of teeth on movable finger do not have unpaired teeth, trichobothria *db* is proximal to *et* only on immovable finger; pectines four times longer than wide, teeth tubular, 17/18 in number, never above 20, sternum small, triangular with a median longitudinal depression; metasoma with telson shorter than segment V, aculeus long, slightly shorter than vesicular length, not much curved, sharp and dark on distal portion.

Distribution: India: Tamil Nadu: Yercaud, Kerala.

Remarks: Tikader & Bastawade (1983) mentioned the occurrence of this species in Kerala.

2. *Lychas (Endotrichus) tricarinatus* Simon

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

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, trichobothria *eb* ad *esb* placed closer to the base of the immovable finger; 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;

^w See Images in the web supplement at www.zoosprint.org

telson shorter than last caudal segment.

Material examined: 8.x.1995, 2 males; 10.x.1995 1 male, Asurakundu, Thrissur district, Kerala, India, coll. K.C. Gopi, (Reg. No. 8066, 8067); 15.ix.1982, 1 female (subadult), Kalluchal, Thrissur district, Kerala, India, coll. K.C. Gopi, (Reg.No.8044); 1 female, Kottackal, Malappuram district, Kerala, India, coll. K.N. Nair & party, (Reg.No. 1008); 19.xi.1996, 1 male, Chinnar, Idukki district, Kerala, India, coll. P.M. Sureshan (Reg. No. 9453); 12 females, 2 males and 9 females (young ones), Parambikulam Wildlife Sanctuary, Parambikulam, Kerala, India, (for details of distribution see Sureshan *et al.*, 2006).

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

Remarks: The most common species of *Lychas* in south, south western and central India; normally found under the bark of large to medium sized trees.

3. *Lychas (Endotrichus) albimanus* Henderson

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

Diagnostic characters: Medium size. Colour brownish, variegated with yellow patches. Carapace entirely and sparsely weakly granular, no carinae developed; pedipalp slender, blackish-brown except manus yellow, femur as long as carapace, carinae weakly developed; pectines well developed and 4x as long as wide; teeth 21/21 in number; 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.

Material examined: 3.i.1984, 1 male, 1 female, Aruvikara, Trivandrum district, Kerala, India, coll. G.U. Kurup, (Reg. No. 3372); 15.ii.1999, 1 female, Perumthodu, Ernakulam district, Kerala, India, coll. P.M. Sureshan, (Reg. No. 11014); 12.viii.1997, 1 female, Kattilappara, Quilon district, Kerala, India, coll. P.M. Sureshan (Reg. No. 10676); 24.iii.1997, 1 male, Parambikulam Wildlife Sanctuary, Parambikulam, Kerala, India, (Reg.No.10664); 27.iii.1997, 1 female, Parambikulam Wildlife Sanctuary, Pezhakunnu, (Reg. No. 10075), coll. K.C. Gopi.

Distribution: India: Kerala, Uttar Pradesh, Orissa, Himachal Pradesh.

Remarks: Not common; mostly restricted to forested areas, prefers to stay under bark.

4. *Charmus indicus* Hirst.

1915. *Charmus indicus* Hirst. *Ann. Mag. nat. Hist.* 15(8): 224-225.

Diagnostic characters: Size very small. Body surface very finely granular, colour dark black variegated with few yellowish spots; pectines 4x longer than wide, teeth 17/17; mesosomal tergites I-IV with a pair or conspicuous < >-< shaped yellow marks; metasoma carinated on segments I & II, otherwise smooth, segment IV short, anal rim smooth, heavily

punctuate and full of black hairs.

Distribution: India: Kerala (Udayagiri)

Remarks: Tikader & Bastawade (1983) mentioned the occurrence of this species in Udayagiri, Kerala. No specimens are collected and examined in the present work.

5. *Mesobuthus hendersoni* (Pocock)

1900. *Buthus hendersoni* Pocock. *Fauna Brit. India. Arachn.* 26.

Diagnostic characters: Medium size. Colour yellowish-brown, entire body covered with coarse granules; carinae very weakly pigmented; pedipalp with globular manus; pectines well developed, teeth 24/25 in male and 21/22 in female, genital operculum wider than long; last mesosomal sternite granular and provided with two pairs of granular carinae; vesicle globular with sharp aculeus.

Material examined: 19.xi.1996, 1 female, Chinnar, Idukki District, Kerala, India, coll. P.M. Sureshan (Reg. No. 9453).

Distribution: India: Andhra Pradesh, Tamil Nadu (Yercaud), Kerala (present study)

Remarks: This is the first record of the species from Kerala.

Subfamily: Centruurinae

6. *Isometrus (Reddyanus) brachycentrus* Pocock

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

Diagnostic characters: Moderately sized. Colour 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 x 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; cuada 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.

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

Distribution: India: Karnataka, Kerala.

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

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

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

2003. *Isometrus (Isometrus) sankeriensis*. Kovarik. *Euscorpius.* 10: 1-19.

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.

Material examined: 27.i.1997, 1 male, Pulickal, Parambikulam Wildlife Sanctuary, coll. P.M. Sureshan (Reg. No. 9861) (Sureshan *et al.*, 2006).

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: Ischnuridae

8. *Liocheles laeviceps laeviceps* (Pocock)

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

Diagnostic characters: Size medium to large. Colour brownish but anterior segments slightly yellowish, telson with clear and conspicuous yellow vesicle; entire body smooth; pedipalp stout and dorsoventrally flat, carinated and smooth; carinae on patella of pedipalp smooth and obsolete; trichobothria on patella in the group *eb* 1-5 placed more closer; pectines moderate, teeth 6/6; mesosoma smooth on all tergites and sternites; metasoma smooth.

Material examined: 21.xi.1999, 1 female, 1 male (young one), Ponganchuvadu, Idamalayar, Ernakulam district, (Reg. No. 11050); 15.xi.1999, 2 females, Perumthodu, (Reg.No.11014); 13.xi.1999, 5 females, 1 male, 4 (young ones), Pannely Rain Forest, (Reg. No. 10995), all specimens collected by P.M. Sureshan.

Distribution: India: Tamil Nadu: Yercaud (type locality)-in Shevaroy hills; Nilgiri hills), Kerala.

Remarks: Burrowing in habit making deep burrows. Also reported from Parambikulam Wildlife Sanctuary (Sureshan *et al.*, 2006).

9. *Liocheles laeviceps malabarensis* (Pocock)

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

Diagnostic characters: Medium size; colour brownish with slight yellowish tint; chelicera brownish on fingers, legs light brown; mesosoma light brown with yellowish tint. Metasoma dark brown with blackish tint. Carapace entirely smooth and finely punctuate; carinae on patella of pedipalp distinct and weakly crenulated 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.

Material examined: 8.x.1995, 1 female, 3 young ones, Asurakundu, Thrissur district, Kerala, coll. K.C. Gopi (Reg. No. 8066); 1 male, 1 female, 3 young ones, data same as above; 20.xi.1999, 1 male, Keerithodu, Idamalayar, Ernakulam district, coll. P.M. Sureshan (Reg. No. 11022).

Distribution: India: Kerala, Karnataka.

Remarks: A rare species, endemic to southern India.

10. *Hormurus australisae* (Fabricius)

1775. *Scorpio australisae*. Fabr. *Syst. Ent.* 399.

1990. *Hormurus australisae* Pocock. *Fauna Brit. India. Arachnida*

: 79.

Diagnostic characters: Small to medium size; colour dark brown, darker on ocular tubercles; carapace and mesosoma smooth and punctuate. Metasoma carinate only on segments I,II and V. Dorsal fang of movable finger of chelicera shorter; pedipalp dorsoventrally flat and manus more flatter; pectinal teeth short and much pointed, 7/7 in number; telson with globular vesicle. Carinae on patella and manus distinct and granular; anterior or inner surface of patella armed with a strong tuberculate denticle; trichobothria *est* on manus placed not much distally to *Dt*; trichobothria *dt* on immovable finger of pedipalp placed closer to it; single inferior median and inferior lateral carinae on metasomal segment regularly crenulate.

Distribution: India: Andaman & Nicobar Islands, Malabar (Kerala).

Remarks: Tikader & Bastawade (1983) mentioned the distribution of the species in Malabar, Kerala. The species is distributed over the whole of the Indo-Malayan and Austro-Malayan area. Specimens are not collected in the present study.

11. *Chiromachetes fergusonii* Pocock.

1899. *Chiromachetes fergusonii* Pocock. *J. Bombay. nat. Hist. Soc.* 12: 7544.

Diagnostic characters: Size large, colour brownish, carapace entirely smooth and finely punctuate, anterior margin with deep median notch; all tergites smooth and finely punctured; metasomal segments thin and smooth; pedipalp very strong with long femur and manus; fingers scalloped at the base; sternum pentagonal, pectines weakly developed with teeth 7/7; metasoma with basal segment slightly less than twice as long as wide, aculeus short, broad at base, less curved and reddish brown on distal portion.

Material examined: 11.viii.1997, 1 female, Kaduvapallam, Thenmala range forests, Quilon district, (Reg. No. 10441); 13.viii.1997, 1 female, 2 young ones, Kuravanthalam, (Reg. No. 10440).

Distribution: India: Kerala (Trivandrum- Type locality), Quilon.

Remarks: Species endemic to forested areas of Kerala. Bastawade *et al.* (2004) also reported this species for the first time from Quilon, Kerala.

Family: Scorpionidae

Subfamily: Rugodentinae

12. *Rugodentus keralaensis* Bastawade, Sureshan & Radhakrishnan

2005. *Rugodentus keralaensis* Bastawade, Sureshan & Radhakrishnan. *Rec. Zool. Surv. India*: 104(3-4): 77-82.

Diagnostic characters: Size medium. Colour black, except reddish on pedipalp manus; pedipalp stout, but not much strong, fingers with rugously granular dentition, spread over in a band along the interior surface; trichobothridial pattern C type; femur shorter than carapace, carinated; genital operculum wider than long, a pair of operculi divided on middle portion, pectines well developed, 3.5 time longer than wide with 12/12 teeth; metasomal segments short, robust, strongly carinated, telson globular, granular on ventral portion with a minute subaculear

granule, aculeus short, as long as vesicular length.

Material examined: 12.ii.1999, 1 male (Holotype), Mallana Reserve Forest, Kodanad, Ernakulam district, Kerala, coll. P.M. Sureshan (Reg. No. 11002).

Distribution: India: Kerala.

Remarks: The Subfamily is represented by a single monotypic genus known only from the type locality.

Subfamily: Scorpioninae

13. *Heterometrus (Heterometrus) keralaensis* Tikader & Bastawade

1983. *Heterometrus (Heterometrus) keralaensis* Tikader & Bastawade. *The Fauna of India. Scorpions. Zool. Surv. India.* III. 528.

Diagnostic characters: Large size. Body almost entirely black, ventral surface blackish-brown. Carapace and tergites weakly granular; all lateral eyes are of same size, pectinal teeth 19/19, manus of pedipalp distinctly longer than wide, metasomal segment V narrowed and almost straight on lateral portion, femur of pedipalp always longer than carapace.

Material examined: 17.viii.1997, 1 female, Kolakunnu, Shendurny Wildlife Sanctuary, Quilon district, (Reg. No. 10434); 1 (Young), Choodal, (other data same as above), coll. P.M. Sureshan, (Reg. No. 10435).

Distribution: India: Kerala.

Remarks: A rare species endemic to Western Ghats, found under stones in higher altitudes.

14. *Heterometrus (Heterometrus) malapuramensis* Tikader & Bastawade

1983. *Heterometrus (Heterometrus) malapuramensis* Tikader & Bastawade. *The Fauna of India. Scorpions. III. Zool. Surv. India* 533.

Diagnostic characters: Large size. Colour dark black, except brownish on chelicerae, pedipalp, vesicle of telson and tarsomere II of legs. Carapace and mesosomal tergites entirely coarsely granular, pectinal teeth 11/11 in number, manus of pedipalp not distinctly longer than wide; metasomal segment V not much narrowed and lateral sides slightly convex and bulging.

Material examined: 14.viii.1997, 1 male (sub adult), Rajakopp, Shendurny Wildlife Sanctuary, Quilon district, Kerala (Reg. No. 10646); 11.viii.1997, 1 female, 1 male, 1 male (sub adult), 4 young ones, Kaduvapallam, Thenmala Range Forests, (Reg. No. 10441); 14.ii.1999, 1 female, 1 male, Manjappara, Kalady R.F., Ernakulam district (Reg. No. 11021); 26.ii.1999, 1 male, Pooyamkutty, (Reg. No. 11023); 18.xi.1999, 1 female, 1 male (young ones), Cherukad, Thundathil, Malayattoor Forests, (Reg. No. 11029); 20.xi.1999, 2 males, 1 female, 5 young ones, Keerithodu, Idamalayar, (Reg. No. 11022); 27.ii.1997, 1 female, 1 males, 8 young ones, Kummamannur, Pathanamthitta district, (Reg. No. 10191); 23.ii.1997, 6 young ones, Moozhiyar, (Reg. No. 10194); 8.ii.1996, 1 female (young), Kakayam, Kozhikode district, (Reg. No. 8582), all specimens coll. by P.M. Sureshan; 11.x.1995, 1 male, Olakkara, Peechi, Thrissur district, (Reg. No. 8051), coll. K.C. Gopi.

Distribution: India: Kerala.

Remarks: Endemic to Kerala.

15. *Heterometrus (Srilankametrus) gravimanus* (Pocock)

1894. *Scorpio gravimanus* Pocock. *Ann. Mag. nat. Hist.* 13(6): 75. 1900. *Palamnaeus gravimanus* Pocock. *Fauna Brit. India. Arachn.* 90.

1981. *Heterometrus (Srilankametrus) indus indus* Couzzijn. *Zool. Verln.* 184: 121.

Diagnostic characters: Size large, body dark reddish brown and darker with blackish tint on mesosomal tergites; chelicera smooth, pedipalp not much stout; carapace smooth, manus of pedipalp fully granular on dorsal surface but granules smooth and obsolete, distal carina distinct but weakly granular and granules not separated, continued on immovable finger; trichobothria *V3* and *V4* placed closer on manus; trichobothria *em2* placed distal to *em1* on patella. Pectines well developed, three times longer than wide, teeth much elongated, 14/14 in number; metasoma with aculeus slightly less than half the length of segment V, not much curved, stout, sharp and dark reddish.

Distribution: India: Tamil Nadu, Kerala; Sri Lanka.

Remarks: Indra (2001) reported this species from Palghat district of Kerala.

16. *Heterometrus (Chersonesometrus) barberi* (Pocock)

1900. *Palamnaeus barberi* Pocock. *Fauna Birt. India. Arachn.* 95. 1981. *Heterometrus (Chersonesometrus) phipsoni phipsoni* Couzzijn. *Zool. Verln.*, 184: 149.

Diagnostic characters: Size large. Body dark blackish-brown with reddish tint; Carapace weakly granular on lateral portion; Pedipalp stout, carinated, strong. Pectines well developed teeth 12/12. Mesosomal tergites entirely smooth except tegite VII; genital operculum wider than long, cephalothoracic sternum pentagonal, deeply notched in the middle. Metasoma strong, carinated, telson with vesicle globular.

Material examined: 14.xi.1996, 1 male, Ernakulam Dist. Vellayikkamalai, (Reg. No. 9454); 21.xi.1999, 1 female, Ponganchuvadu, Idamalayar, (Reg. No. 11050); 24.xi.1999, 1 female, Pooyamkutty, (Reg. No. 11023), all specimens coll. P.M. Sureshan. 1 female, Chimmoni, Thrissur district, 24.ii.1996, coll. C. Radhakrishnan & party (Reg. No. 9047).

Disribuuton: India: Kerala, Tamil Nadu.

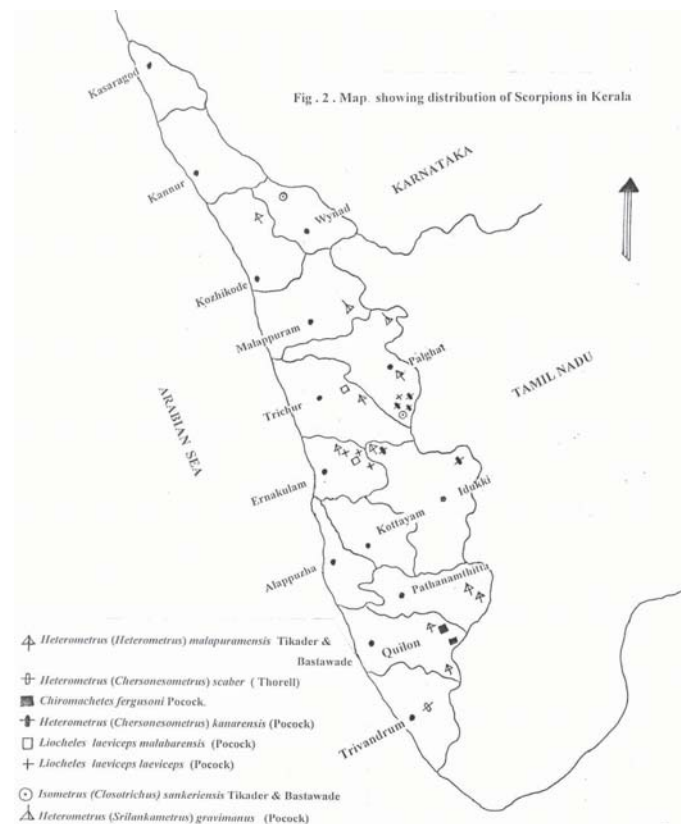
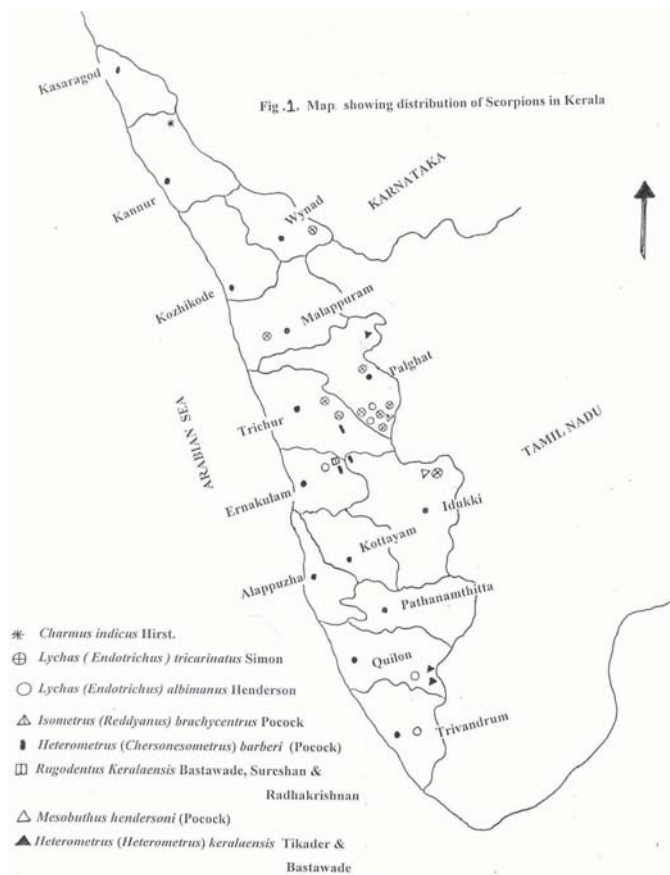
Remarks: The species is endemic to India. Reported for the first time from Kerala here.

17. *Heterometrus (Chersonesometrus) granulomanus* Couzzijn

1981. *Heterometrus (Chersonesometrus) granulomanus* Couzzijn. *Zool. Verln.* 184. 142.

Diagnostic characters: Size large, body dark blackish with reddish brown tint in male; pedipalp flat and more enlarged, fully granular on dorsal portion of manus. Dorsal surface of manus entirely coarsely granular; patella of pedipalp as long as femur; trichobothria *V3* & *V4* of manus placed away; pectines well developed, teeth 15/15 in male; carapace weakly granular on lateral portions; metasoma strong, stout, carinated on segments with slightly compressed telson; aculeus stout, shorter than vesicle not much curved, sharply pointed.

Distribution: India: Puducherry, Tamil Nadu (type



Figures 1-2. Maps showing the distribution of Scorpions in Kerala

locality), Kerala and Madhya Pradesh.

Remarks: Tikader & Bastawade (1983) mentioned the distribution of the species in Kerala.

18. *Heterometrus (Chersonesometrus) scaber* (Thorell)

1877. *Pandinus scaber* Thorell. *Atti. Soc. Ital.* 19: 202.

1981. *Heterometrus (Chersonesometrus) scaber scaber* Couzijn. *Zool. Verln.* 184: 144.

Diagnostic characters: Size large, carapace coarsely granular on lateral portion, Body entirely reddish-brown; pedipalp stout, strong and much lobate on manus; femur of pedipalp shorter than carapace; metasomal segments I & II wider than long; pectinal teeth weakly developed, much sparsely arranged, tapering on distal portion, teeth 12/12 in female; mesosomal tergites I-VI irregularly granular, metasomal segments I & II wider than long, segments III & IV longer than wide, segment V shorter than femur and almost twice as long as wide and as wide as deep, aculeus not much curved sharp, pointed and dark brown in distal portion.

Distribution: India: Kerala, Karnataka.

Remarks: Tikader & Bastawade (1983) mentioned the distribution of the species in Trivandrum and Malabar in Kerala. No specimens are represented in the collection.

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

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

Arachn. 93.

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

Diagnostic characters: Large sized; coloured 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 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.

Material examined: 23.xi.1999, 1 male (sub adult), Narakathodu, Pooyamkutty, Ernakulam district, (Reg. No. 11020); 19.xi.1996, 1 male, Chinnar, Iduki district, (Reg. No. 9453), Coll. P.M. Sureshan.

Distribution: India: Karnataka, Maharashtra, Kerala.

Remarks: The species is distributed commonly in the forested tracts of southern Western Ghats. Bastawade *et al.* (2004) reported it from Kerala (Parambikulam Wildlife Sanctuary) for the first time.

DISCUSSION

The present study reveals the occurrence of 19 species of

scorpions (Scorpionida) belonging to nine genera, four subfamilies and three families mostly from the ghat areas in the state of Kerala. Among the species reported here, *Heterometrus* (*Heterometrus*) *malapuramensis* Tikader & Bastawade, appears to be widely distributed in the forested tracts of Western Ghats and the plains of Kerala. *Heterometrus* (*Chersonesometrus*) *kanarensis* (Pocock), *Lychas* (*Endotrichus*) *tricarinatus* Simon and *Lychas* (*Endotrichus*) *albimanus* Henderson are other species which show a wider distribution in the Western Ghats. Two species viz. *Mesobuthus hendersoni* (Pocock) and *Heterometrus* (*Chersonesometus*) *barberi* (Pocock) are reported here for the first time from Kerala. *Heterometrus* (*Heterometrus*) *keralaensis* Tikader & Bastawade, a rare species, is reported here from the Western Ghats, Quilon district, subsequent to its original description. The species *Liocheles laeviceps laeviceps* (Pocock) and *Liocheles laeviceps malabarensis* (Pocock) which are endemic to peninsular India are also reported from the Western Ghats, represented by a fairly good number of specimens. *Isometrus* (*Isometrus*) *snakeriensis* Tikader & Bastawade is another rare species endemic to the Western Ghats (Sureshan *et al.*, 2006). Though the species, *Lychas* (*Alterotirchus*) *Hendersoni* Pocock, *Charmus indicus* Hirst., *Hormurus australasiae* (Fabr.) *Heterometrus* (*Chersonesometrus*) *granulomanus* Couzijn and *Heterometrus* (*Chersonesometrus*) *scaber* (Thorell) were reported from Kerala (Tikader & Bastawade (1983), their occurrence in the state needs confirmation by further collection of specimens. The recent discovery of an interesting subfamily of Scorpionida viz. Rugodentinae with genus *Rugodentus* Bastawade *et al.*, and species *Rugodentus keralaensis* Bastawade *et*

al., from the Western Ghats indicate the possible occurrence of further interesting taxa in the area.

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