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CENTIPEDE FAUNA OF CORBETT NATIONAL PARK, UTTAR PRADESH, INDIA (CHILOPODA : SCOLOPENDROMORPHA : SCOLOPENDRIDAE)

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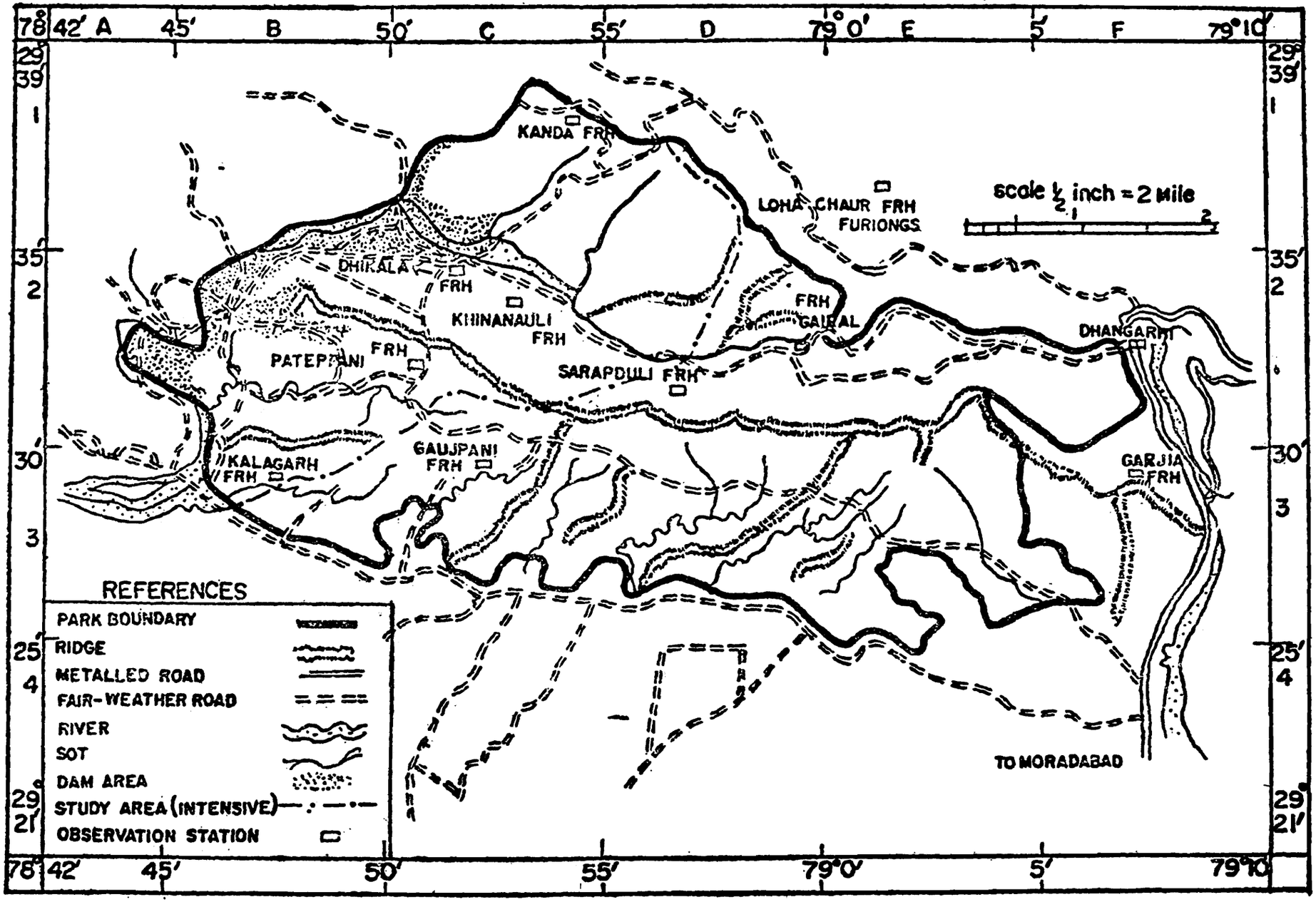
INTRODUCTION

The centipede fauna of India, in general and of Western Himalaya in particular had received very little attention till very recently when Khanna and Kumar (1984), Khanna and Tripathi (1985a, 1985b and 1986) and Khanna (1987) made some useful contributions in the field of taxonomy and ecology. Khanna (1995 and in press) have also inventorised the species of scolopendrid centipedes from other Conservation Areas of U. P. State, like Rajaji National Park and Nanda Devi Biosphere Reserve. Present communication is one more such step in the inventoristation of the fauna of Conservation Areas. Jangi and Dass (1984) have, however, reported and described as many as 48 species from Peninsular States (i. e., Tamilnadu, Kerala, Karnataka, Andhra Pradesh, Orissa and Madhya Pradesh and Maharashtra).

Khanna (1987) has updated the check-list of the Indian species of scolopendrid centipedes provided earlier by Khanna and Kumar (1984) and has reported 86 species, including subspecies, from India, spreading over three tribes (Scolopendrini, Asanadini, and Otostigimini) and seven genera (viz., *Scolopendra*, *Cormocephalus*, *Asanada*, *Otostigmus*, *Rhysida*, *Ethmostigmus* and *Digitipes*. The genera *Trachycormocephalus* and *Arthrorhabdus* have now came to be designated as junior synonyms of the genus *Scolopendra* Linn. (Lewis, 1986) and the genus *Pseudocryptops* as the junior synonym of the genus *Asanada* (Jangi and Dass, 1978). Of these 86 forms, 24 species belonging to five genera are recorded from Uttar Pradesh, of which 11 species referrable to four genera are reported from Corbett National Park, in the present paper.

MAP OF THE STUDY AREA: THE CORBETT NATIONAL PARK



CORBETT NATIONAL PARK—A Brief Account

Corbett National Park, the first National Park ever created in the state of Uttar Pradesh, was demarcated under "United Provinces National Park Act 1934", comprising an area of 99·07 sq. miles in the hills of outer himalaya in the famous Patli Dun and the hill forests to the south of it. Today the Park covers an area of about 520 sq. kms between 29°13′ to 29·35′ N· Lat., 78°33′ to 78°46′E. Long., spreading over Nainital and Pauri districts of Western Himalaya, U. P.

The Corbett National Park promises to be a wealth of experience for the Wildlife enthusiasts, ornithologists and botanists alike.

The natural forest of the Park is confined to Bhabar Tract of Shivalik formations at an altitude of 400-1200m above MSL., with varied topography of many marshy depressions, revines and plateau land. The river Ram Ganga runs right through the Park. Another major source of water is the reservoir formed by the Ram Ganga Multipurpose Hydro-electric Project at Kolagarh.

There are three distinct seasons in the Park. The temperature ranges from 3°C in December to 42°C in June, a maximum winter temperature rarely exceeding 30°C and the minimum summer temperature normally remaining above 23°C. The rainfall occurs from mid June to Septemper with maximum in the month of August. The North-east monsoon ushers in another wet spell in December to February receiving the maximum of winter rains. November is the driest month with minimal rainfall. Because of the park being located at the forested hills of outer himalaya, it remains adequately humid throughout the year.

Flora, in which the Park abounds, is of the most abundantly growing Sale stre (*Shorea robusta*), Shishum (*Delbergia sissoo*), Katha (*Acacia catechu*) and Bamboo, besides various varieties of trees, bushes, ferns and other herbs like elephant grass, etc.

The centipede fauna of Corbett National Park resembles with that of overall Western Himalaya, U. P but differs considerably from the adjoining 'Terai Tract' fauna in Uttar Pradesh.

SYSTEMATIC ACCOUNT

Class : CHILOPODA
Order : SCOLOPENDROMORPHA
Family : SCOLOPENDRIDAE
Subfamily : SCOLOPENDRINAE
Tribe : SCOLOPENDRINI

1. Cormocephalus dentipes Pocock, 1891

1891. *Cormocephalus dentipes* Pocock, *Ann. nat. Hist., Ser.* 6/7 : 66/67.
Type Locality : India, Bengal.

Material examined : Dhikala, 3.iii.1973, 2 exs., (Reg. No. NRS. A-4192); 2.xii.1971, 1 ex. (A-4022); 3.iii.1973, 1 ex. (A-4199); 28.vi.1971, 4 exs. (A-4233); 3.iii.1973, 3 exs. (A-4234), all Asket Singh coll.; 13.viii.1975, 5 exs., R.N. Chopra coll. (A-4232); Boxar, 22.i.1971, 1 ex., J. C. Tripathi coll. (A-4206); Sarapduli. 29.1.1971, 1 ex. (A-4207); 1.xii.1972, 1 ex. (A-4238), all J. C. Tripathi coll.; Bijrani, 22.xi.1972, 5 exs. (A-4212); 23.xi.1972, 7 exs. (A-4204). 19.xi.1972, 1 ex. (A-4223), all J. C. Tripathi coll.; Malani, 29.i.1971, 7 exs., J. C. Tripathi coll. (A-4205); 17.iii.1970, 2 exs., Asket Singh coll. (A-4208); Amdanda, 24.ii.1973, 28 exs. Asket Singh coll. (A-4225); Paterpani, 25.i.1971, 4 exs., J. C. Tripathi coll. (A-4227).

Remarks : *Cormocephalus dentipes* Pocock recorded from Parasnath (Bihar) by Gravely (1910) was redescribed by Jangi and Dass (1980) and compared with the specimens collected from Delhi, proposing earlier certain sexually dimorphic characters (Jangi and Dass, 1975). Ahmed (1980) reported it from Andaman Isls. Khanna and Tripathi (1984 b and 1985) reported it to be a widely distributed species occurring throughout Uttar Pradesh. Jangi and Dass (1984) reported it from Madhya Pradesh and Orissa. Khanna and Tripathi (1984b) have, however, discussed seasonal incidence in this species in Western Himalaya, U. P. Khanna (1987 and 1995) does not agree to the so called, "sexually dimorphic characters", proposed by Jangi and Dass (l. c.) on the basis of the material studied. There is a tremendous amount of overlapping of the characters that Jangi and Dass (l. c.) describe as males or females. It is also difficult to sex the juvenile specimen as also suggested by Jangi and Dass (l. c.) themselves.

2. Scolopendra morsitans Linn. 1758

1758. *Scolopendra morsitans* Linnaeus, *Syst. nat.*, Ed. 10 : 638.

Material examined : Sarapduli, 1.iv.1973, 2 exs., R. N. Chopra coll. (A-4160) ; 3.xi.1972, 2 exs., (A-4168) ; 26.i.1971, 1 ex. (A-4178), all J. C. Tripathi coll. ; Dhikala, 13.viii.1975, 1 ex., R. N. Chopra coll. (A-4176) ; 3.iii.1973, 2 exs., Asket Singh coll. (A-4187) ; Kanda, 13.xii.1970, 1 ex., Asket Singh coll. (A-4186).

Remarks : *Scolopendra morsitans* Linn. is a cosmopolitan species occurring throughout the year in all types of ecological habitats. It is morphologically very much a variable species occurring in various colour forms and sizes and has, therefore, been described by various authors under different specific and subspecific names, which they gave to the specimens in various stages of development. Khanna (1987) has redescribed the species, incorporating the variations noticed by various authors, as also in the material collected from Western Himalaya, U. P.

Tribe : OTOSTIGMINI

Subfamily : OTOSTIGMINAE

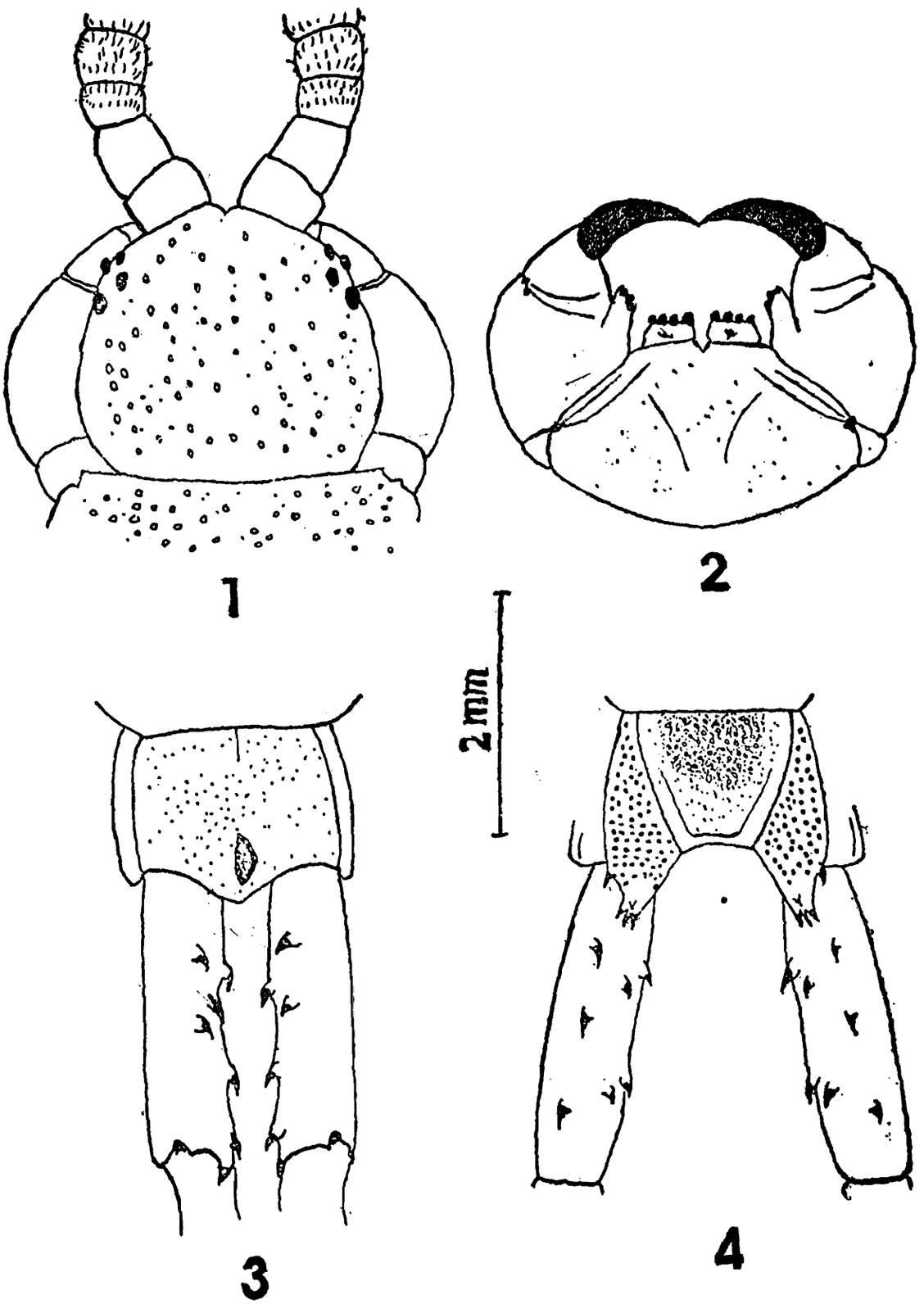
3. Otostigmus amballae Chamberlin, 1913

(Fig. 1-4)

1913. *Otostigmus amballae* Chamberlin, *Ent. News.* Philad., 24 : 74.
Type Locality : India : Ambala (Haryana).

Material examined : Dhikala, 6.iii.1970, 11 exs., Asket Singh coll. (A-4026 and A-4339) ; Ramnagar, 26.ix.1978, 3 exs., Arun Kumar coll. (A-4338).

Remarks : Like *Cormocephalus dentipes* Pocock, this species is also fairly abundant in Western Himalaya, U. P. and H. P. (Khanna and Kumar, 1984 and Khanna and Tripathi, 1986). Also like *C. dentipes* and S. *morsitans* this species too exhibit a great degree of morphological variations within the same population. The data on the intra-specific variations have been recorded by the author by studying the huge collection from Western Himalaya, U. P. On the basis of which the species has been redescribed and illustrated here, incorporating the important ranges of variations of



Otostigmus amballae (Figs. 1-4)

1. Head (Dorsal view); 2. Coxosternum; 3. Endtergite with anal leg prefemur (Dorsal view); 4. Endsternite with coxopleurae and anal prefemur.

morphological characters so as to eliminate the taxonomic anarchy within the same or different populations.

Description: *Colour*: Antennae, head and 1st Tergite dark olive green; rest of the tergal segments including anal legs light olive green; coxosternum and anterior 2 to 3 segments of the sternites olive to yellowish green; rest of the sternal segments and legs yellowish green. *Antennae*: 17-19 segmented (in two samples 20 and in one case 16 on the right and 17 on the left); the average no. of antennal segments is 18; with 2-1/4 to 2-2/3 basal segments glaborous. Apical eight seggments dark olive green and basal light yellowish green with a clearcut demarcation of the colour. Reflexed antennae reaching the middle of the 5th segment. *Head*: Cephalic plate sparsely punctate, bearing anteriorly a short median groove; head shield dome shaped, almost equal in length and width, distinctly overlapped by the 1st tergite (fig. 1). *Tergites*: Sparsely punctate, non-granulate with complete paramedian longitudinal furrows beginning from the middle of the 3rd segment; in couple of the specimens studied the furrows are complete on 2-19 or 20th segment also; the lateral emargination of tergites begins as early as from 6th segment; endtergite shield shaped, broader than long with its posterior margins curving in on their sides and meeting posteriorly in a round bulge; endtergite also with a median depression at the posterior end and a very small furrow (fig. 3) anteriorly also [in contrast to Attems (1930)] wherein the position of depression has been described anterior and furrow posterior]. *Sternites*: Sparsely punctate and granulate in the posterior segments; 2-19 segments with a pair of complete paramedian longitudinal furrows (variations, 3-19 or 2-20); additionally an intermittantly broken median sulcus on segment 3-19 is also visible; endsternite also sparsely punctate (fig. 4) without furrows, tapering posteriorly with its posterior margin incurved, slightly longer than wide. *Coxopleura*: Densely punctate process of the coxopleura almost a third of its length extending behind endsternite, tipped with 4+4 spines on average, alongwith a spine on its lateral margins (variations : 3+3, 3+2, 3+1 or 4+2). The size of the puncts predominently (fig. 4) large. *Legs*: 1-2, 1-3, 1-4, 1-5, 1-6, 1-7 or 1-8 pair of legs with two spurs to the first tarsal segment; 21st pair of legs without such spurs; all legs with 2 spurs to the claws. *Anal legs*: Prefemur of the anal legs nearly 4 times longer than wide with 4-2-3-3 thorns arranged in four rows; prefemoral process present fig. 3, 4).

The species earlier recorded from Ambala (Haryana) by Chamberlin (1913), was first recorded from Uttar Pradesh by Khanna and Kumar (1984) and later by Khanna and Tripathi (1986) from Himachal Pradesh.

4. **Otostigmus nudus** Pocock, 1890

1890. *Otostigma nudum* **Pocock**, *Ann. nat. Hist. Ser.*, (6) 5 : 247.
Type Locality : **India, Madras (Tamil Nadu).**

Material examined : Dhikala, 3.iii.1973, 1 ex., Asket Singh coll. (A-4330).

Remarks : Reported earlier to occur in Madras (Tamil Nadu) by Attems (1930) and Himachal Pradesh by Khanna and Tripathi (1986) this is the first record of the species from Uttar Pradesh from within the parimeter of Corbett National Park.

5. **Rhysida afra cuprea** Kraepelin, 1903

1903. *Rhysida cuprea* **Kraepelin**, *Mitt. Mus.*, **Hamburg, 20 : 153-154.**
Type Locality : **Bhutan.**

Material examined : Dhikala, 3 iii.1973, 1 ex., Asket Singh coll. (A-4323).

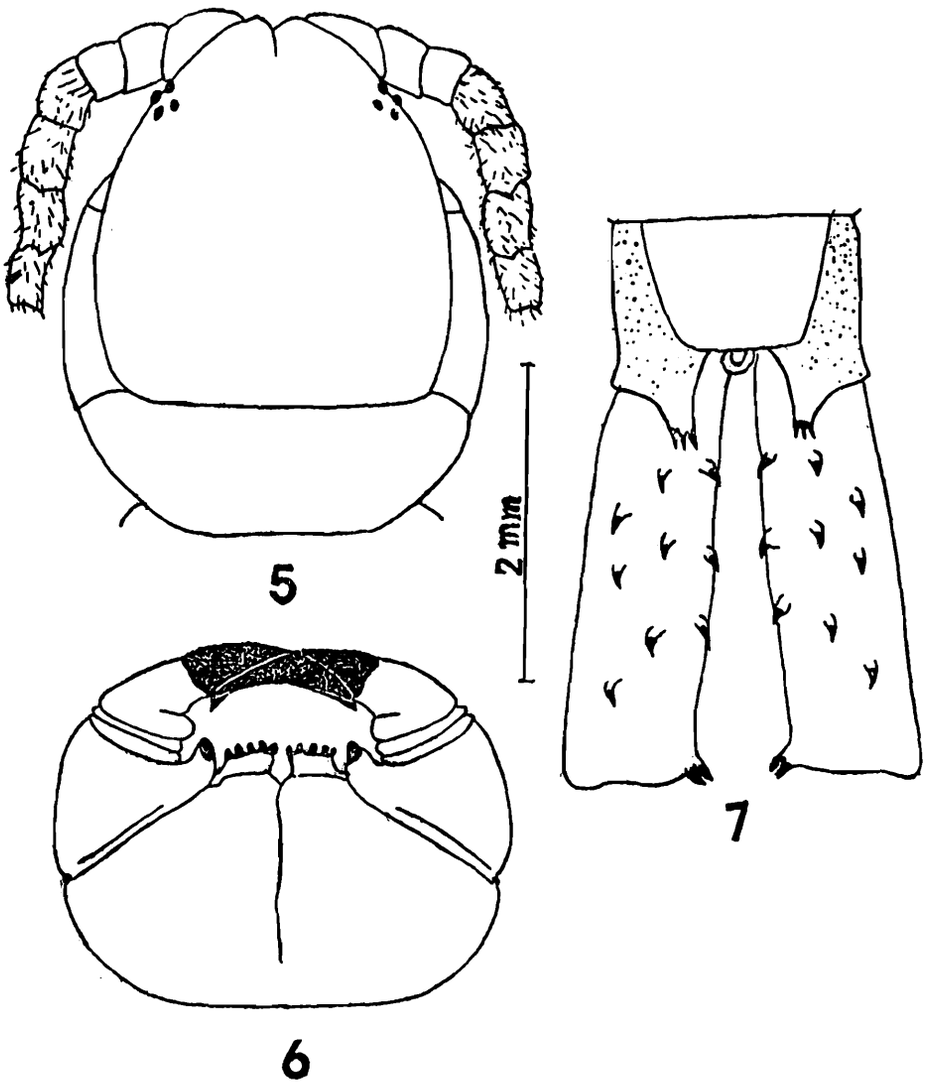
Remarks : The species was described by Kraepelin (l. c.) from Southern slopes of Bhutan Himalaya as *R. cuprea*. Attems (1930) relegated it to the subspecies of *R. afra* (Peters). Gravely (1912) recorded it from West Bengal and Assam. Khanna and Kumar (1984) have already reported this species to occur in Western Himalaya, U. P.

6. **Rhysida corbetti** sp. nov.
(Figs. 5-7)

Material examined : Sarapduli, 26.i.1971, 6 exs., J. C. Tripathi coll. (A-4292 ; Holotype and A-4293 ; Paratypes) ; Dhikala, 29.1.1972, 3 exs., Asket Singh coll. (A-4294, Paratypes).

Description : *Colour* : The colour of the animal completely decolourised due to long preservation. *Antennae* : 18 segmented with its 3 basal segments glaborous (fig. 5) ; reflexed antennae reaching to the middle of 3rd tergite. *Head* : Cephalic plate smooth, longer than wide with an anterior median groove (fig. 5). *Coxosternum* : Dental plate of the coxosternum with 5 + 5 separate teeth, without post-dental spur ; prefemoral process of the coxosternum unidentate ; base of the dental plate smooth but with a median sulcus running almost up to sternite-I ; no oblique or oblong sutures visible

(fig. 6). *Tergites* : Smooth, not punctate ; 5-19 segments with a pair of complete paramedian longitudinal furrows, feebly represented in the middle segments ; endtergite without furrow ; emargination of tergal segments beginning on 19th ; endtergite broader than longer ; arched laterally ; posteriorly without any notch or sutures. *Sternites* : Smooth, 2-19 segments with a pair of deep paramedian longitudinal furrows ; endsternite tapering posteriorly with posterior margin truncate ; almost equal in length and width (fig. 7). *Coxopleura* : Sparsely punctate process of coxopleura with 3 spines at its apex ; without dorsal or lateral spines, extending slightly behind the endsternite (fig. 7). *Legs* : 1st pair of walking legs with 2, 2-19 with 1 spur to the 1st tarsal segment ; 20th and 21st without such spur ; all legs with 2 spurs to the claws. *Anal legs* : Anal leg prefemur about 3 times longer than its width ; 9 thorns arranged in 3 rows of 3



Rhysida corbetti sp. nov. (Figs. 5-7)

5. Head & 1st tergite (Dorsal view) ; 6. Head (Ventral view) ; 7. Endsternite with coxopleura and anal legs prefemur.

each ; prefemoral process with 2 spines at the apex (fig.7). *Affinities* : *Rhysida corbetti* sp. nov. resembles *R. neocrassispina* Jangi and Dass, 1984 in having 2-19 sternal segments with complete paramedian longitudinal furrows but differs from it in having 1st pair of legs with two spurs on tarsal segment (vs. 1-3 pairs); 20th pair of leg without tarsal spur (vs. with tarsal spur) ; 3 basal segments of antennae glabrous (vs. 4-12) ; tergal emargination beginning on 18th (vs. 6th) segment ; coxosternal teeth 5+5 (vs. 4+4) ; coxopleural process tipped with 3 spines (vs. 2 spines).

7. Rhysida monalii Khanna and Kumar, 1984

1984. *Rhysida monalii* Khanna and Kumar, *Uttar Pradesh J. zool.*, 4 (1) : 93-95.
Type Locality : India, Almora (U. P.).

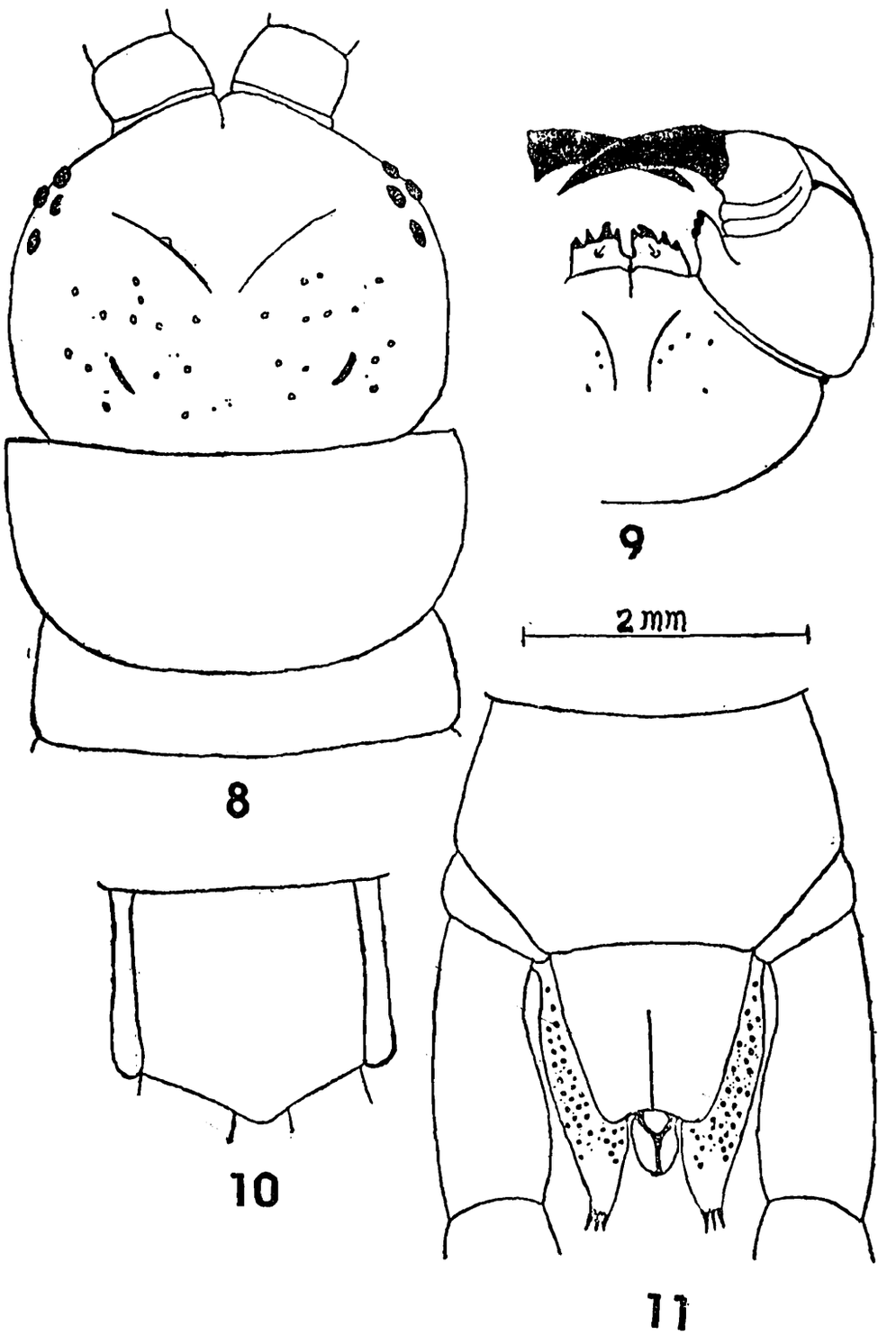
Material examined : Gairal, 10.x.1972, 3 exs., J. C. Tripathi coll. (A-4261) ; 2 exs., 8.iii.1973, Asket Singh coll. ; 2 exs., 6.iii.1973, Asket Singh coll. (A-4267) ; Mohan, 30.i.1971, 5 exs., J. C. Tripathi coll. (A-4246) ; Malani, 29.i.1971, 1 ex., J. C. Tripathi coll. (A-4248) ; Sultan, 7.iii.1973, 5 exs., Asket singh coll. (A-4253) ; 24.i.1971, 4 exs., J. C. Tripathi coll. (A-4258) ; 1.xii.1971, 1 ex., R. K. Bhatnagar coll. (A-4280) ; Bijrani, 31.i.1971, 1 ex., J. C. Tripathi coll. (A-4268) ; Dhikala, 16.viii.1975, 1 ex., R. N. Chopra coll. (A-4247) ; Sarapduli, 26.i.1971, 50 exs., J. C. Tripathi coll. (A-4257) ; 1.xii.1972, 1 ex., J. C. Tripathi coll. (A-4260).

Remarks : It is a widely distributed species occurring throughout in U. P., H. P., and Jammu and Kashmir (Khanna and Kumar, 1984 ; Khanna and Tripathi, 1985).

8. Rhysida lithobioides kumaoensis s. sp. nov.
(Figs. 8-14)

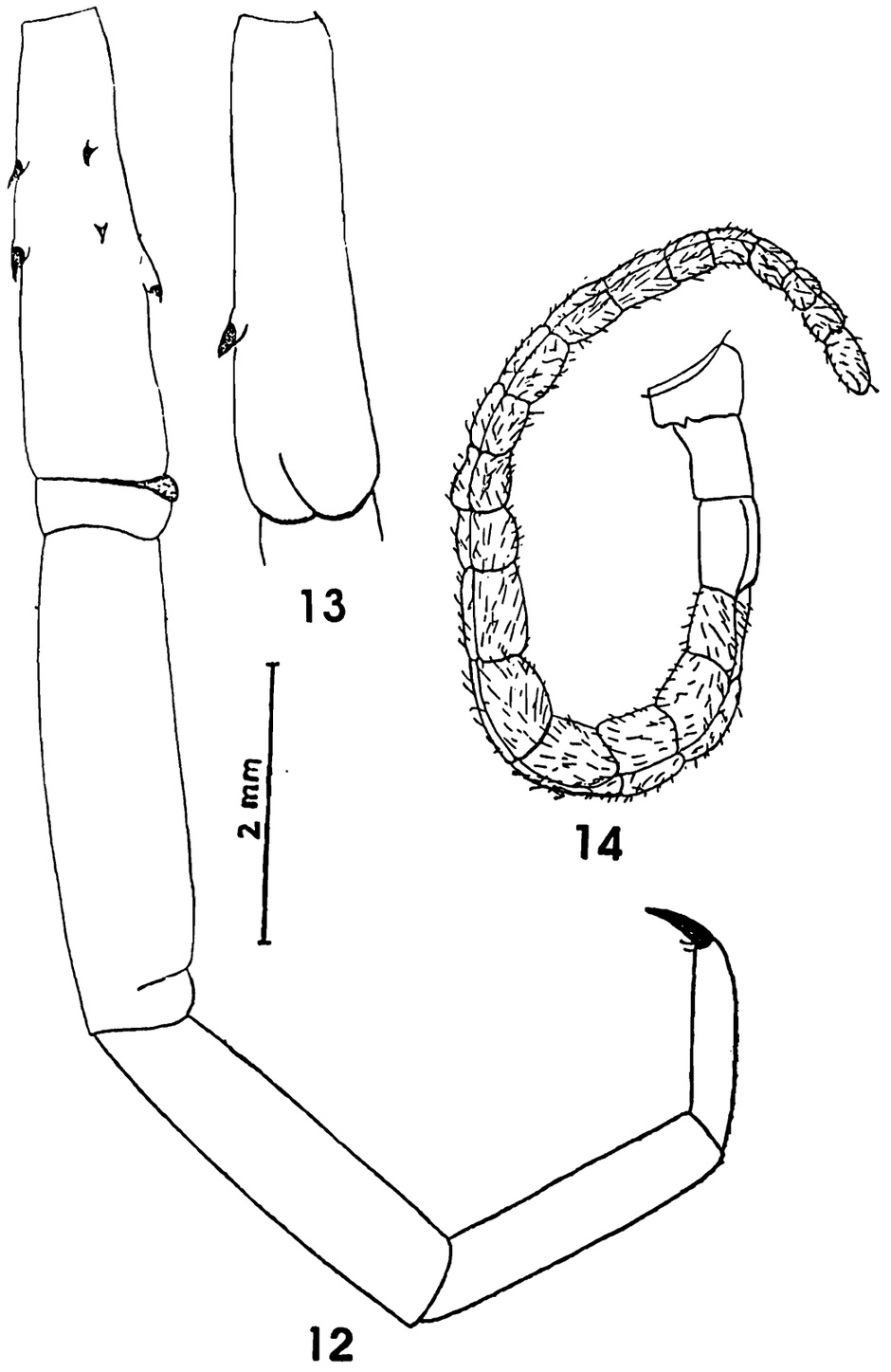
Material examined : India : U. P. : Nainital, Bijrani, 31.i.1971 1 ex., J. C. Tripathi coll. (A-4290, Holotype). Paratypes bearing the same data (4 exs.) (A-4291). Elsewhere : India : U. P. Terai : Lakhimpur Kheri, Chandan Chauki (Dudhwa National Park), 21.xii.1985, 3 exs., Raj Tilak coll.

Description : *Colour* : cephalic plate and anal legs dark olive green ; sternites, coxosternum and legs yellow to yellowish green. *Antennae* : 21 segmented, with its 3 basal segment glabrous ; reflexed antennae reaching up to the end of 3rd tergite or beginning of the 4th tergite. A deep longitudinal groove running all along the length of



Rhysida lithobioides kumaonensis s. sp. nov. (Figs. 8-14)

8. Anterior body segments showing punctation of cephalic plate & shape of the first tergal seg ;
9. Head (Ventral view) ; 10. Endtergite ; 11. 20th and endsternite with coxopleura.



Rhysida lithobioides kumaonensis s. sp. nov.

12. Anal leg showing the arrangement of spines on prefemur and relative length of tarsal 1 & 2;
13. Anal leg prefemur (Dorsal view) ; 14. 21 segmented antennae showing lateral furrow.

antennae is visible (fig. 14). *Head* : Cephalic plate sparsely punctate with a deep median notch present anteriorly ; without median or longitudinal furrows ; broader than long (fig. 8). *Coxosternum* : Dental plate with 4 + 4 teeth ; base of the coxosternal plate sparsely punctate (fig. 9) with a very small median furrow present only anteriorly ; prefemur of the coxosternum tridentate ; dental plate longer than wide, with a post dental spur. *Tergites* : Smooth ; 5 or 6 to 18 (or 20) with 2 complete paramedian longitudinal furrows ; tergal emargination from 18th segment ; endtergite without a median sulcus (fig. 10) ; *Sternites* : Without paramedian longitudinal furrows ; endsternite tapering (fig. 11) posteriorly with a median notch ; median sulcus present at posterior 2/3rd of endsternite. *Coxopleura* : Densely punctate process of coxopleura a third of its length longer than endsternite, at the apex studded with 3 spines but no sub-apical or lateral spine present (fig 11). *Legs* : 1-18 pair of walking legs with 2 spurs to 1st tarsal segment ; 19th with one and 20th without such spur ; all legs with 2 spurs to the terminal claws. *Anal Legs* : Prefemoral spines on anal legs confined only proximally ; medially with 1, ventromedially with 2, ventrolaterally also with 2 spines (fig. 12 & 13) ; a deep transverse groove present ventrally at the prefemur, visible laterally up to middle on the femur ; Tarsal II is about half the length of Tarsal 1st (fig. 12). *Affinities* : *Rhysida lithobioides kumaonensis* ssp. nov. is quite different from *R. l. abessynica* and *R. l. paucidens* in possession of 3 apical spines on coxopleural process (vs. 2 apical spines) and conspecific with *R. l. trispinosus* and *R. l. shivalikensis* Khanna. However, it differs from *trispinosus* in having 18-21 tergal segments laterally emarginate (vs. 13-21), as in *shivalikensis* from which it differs in possession of 21 segments on antennae (vs. 19) and endsternite with a median furrow (absent both in *shivalikensis* and *trispinosus*). It also differs from *trispinosus* in having none of the sternal segments with paramedian longitudinal furrows, the character which it shares with *shivalikensis* ; 20th pair of legs without tarsal spurs (vs. with, both in *shivalikensis* and *trispinosus*).

The species *R. lithobioides* (Newport), in India, is represented by 5 subspecies viz., *R. l. paucidens* and *R. l. trispinosus* from Peninsular India (Jangi and Dass, 1984), *R. l. lithobioides* from Terai, U. P. (Khanna and Tripathi, 1985), *R. l. shivalikensis* Khanna from Rajaji National Park, U. P. (Khanna, 1995) and *R. l. kumaonensis* ssp. nov. from Corbett National Park.

9. Rhysida nuda nuda (Newport), 1845

1845. *Branchiostoma nudum* Newport, *Trans. Linn. Soc.*, London.
Type Locality : Paramata, New South Wales, Australia.

Material examined : Sarapduli, 1.xi.1972, 1 ex., J. C. Tripathi coll. (A-4311).

Distribution : Assam, Andhra Pradesh, Karnataka, Maharashtra, Orissa and Tamilnadu.

Remarks : This is a first record of the species from Uttar Pradesh.

10. Rhysida nuda immarginata (Porath), 1876

1876. *Branchiostoma immarginatum* Porath, *Bih. svenska vet. Akad.*, 4 (7) : 24.
Type Locality : Manilla, Philippines.

Material examined : Bijrani, 28.ii.1973, 2xs., Asket Singth coll. (A-4313) ; Sultan, 23.xi.1971, 2 exs., Asket Singh coll. (A-4314) ; Gairal, 15.xi.1972, 8 exs., J. C. Tripathi coll. (A-4315) ; Dhikala, 23.xi.1973, 1 ex., Asket Singh coll. (A-4316).

Remarks : Reported earlier by Gravely (1912) from Nainital (U. P.), Darjeeling, Calcutta and Punkhabari (West Bengal), Nareil and Jessore (Bangladesh) ; by Khanna and Tripathi (1985) from Lakhimpur Kheri (U. P.) and Khanna and Kumar (1984) from Almora and Dehradun, this is a further record of the species within the state from Corbett National Park.

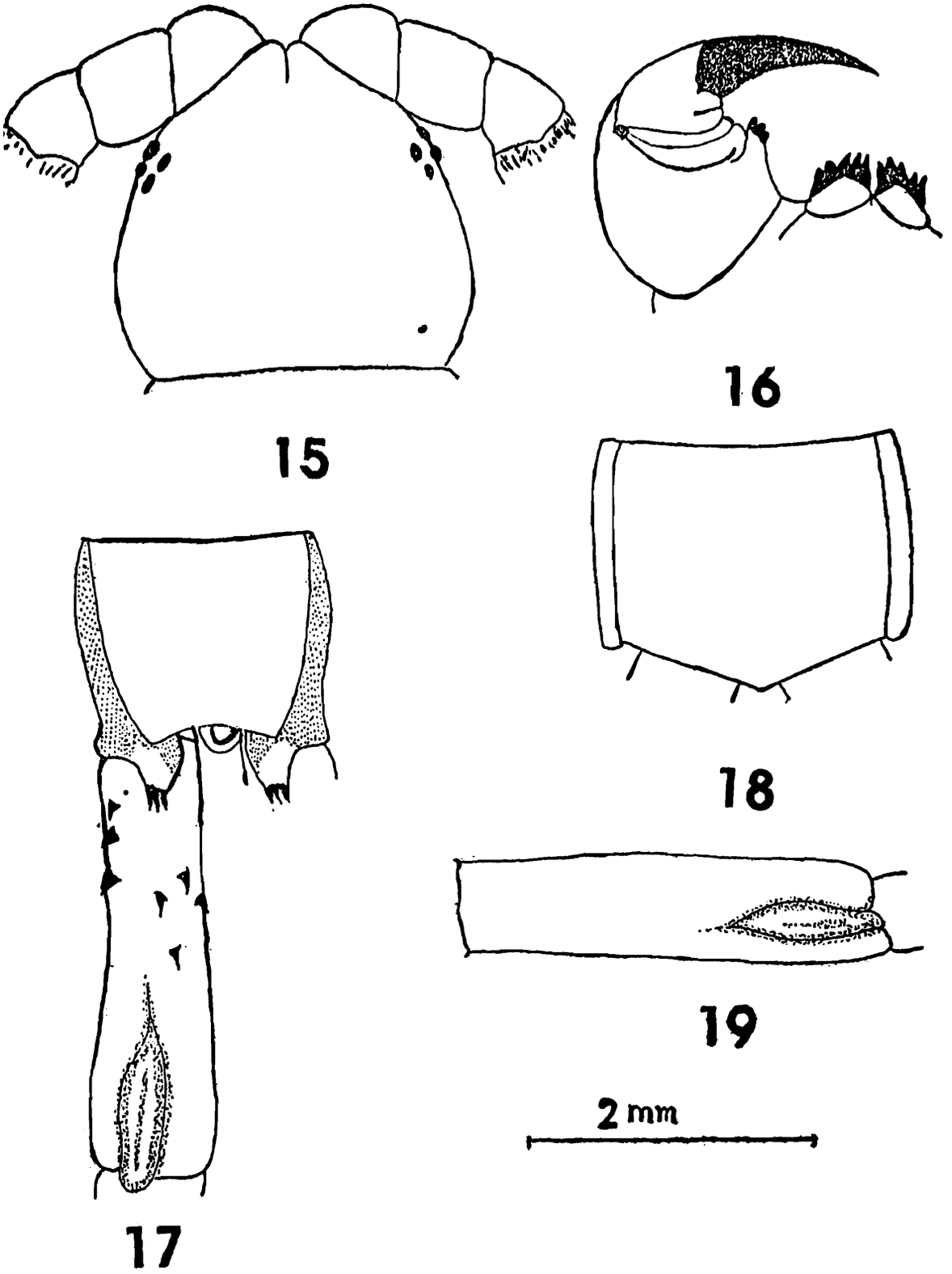
11. Rhysida stuhlmanni himalayanus ssp. nov.
(Figs. 15-19)

Material examined : India : Uttar Pradesh : Nainital Kaladungi-Mangoli Road, 30.xi.1986, J. C. Tripathi coll. (Holotype). Paratypes : Mohan (C. N. P.), 30.i.1971, 6 exs., J. C. Tripathi coll. (A-4292 and 4293) ; Dhikala, 29.1.1972, 3 exs., Asket Singh coll. (A-4294).

Material collected from outside Park in Western Himalaya, U. P.

India : U. P. : Nainital, Kaladungi-Mangoli Road 1.xii.1986, 2 exs., J. C. Tripathi coll. ; Chamoli. Guptkashi, 16.x.1975, 5 exs., J. C. Tripathi coll.; Uttar Kashi, Barkot, 13.xi.1973, 1 ex., Asket Singh coll. ; Dharansu, 4.ii.1972, 1 ex., J. C. Tripathi coll.

Description : *Body Length* : 66 mm, including antennae and anal legs. *Colour* : Head, antennae, tergites and legs olive green ; sternites and ventral surface of the head greenish yollow (in specimen preserved in 70% Alcohol). *Antennae* : Long, composed of 20 segments ; 3 basal segments glabrous ; reflexed antennae reaching back to the end of 5th or begining of the 6th tergite. *Head* : Cephalic plate smooth, broader



Rhysida stuhlmanni himalayanus s. sp. nov. (Figs. 15-19)

15. Head (Dorsal view); 16. Coxosternum; 17. Endsternite, Coxopleura & Anal leg prefemur; 18. Endtergite; 19. Femoral segment (Anal leg).

than long, with a deep median notch anteriorly followed by a small median furrow confined just below the notch ; head shield clearly overlapped by 1st tergite (fig. 15). *Coxosternum* : Dental plate with 5+5 teeth, the three inner being more closer but not coaleased and separated from the outer two by a definitve gap ; without any post dental spur ; prefemoral process of the maxillipede tridentate ; base of the coxosternum smooth, without furrows ; dental plates meeting each other at an angle of 120° (fig 16.) *Coxopleura* : Densely punctate process of coxopleura, strong and slender extending slightly behind the endsternite, at the apex with three thorns ; no dorsal or lateral thorn present (fig. 17). *Tergites* : All tergal segments without any indication of the presence of paramedian longitudinal furrows, however, very small transverse furrows can be seen anteriorly on the posterior tergal segments and sternites as well ; only endtergite laterally emarginate (fig. 18). *Sternites* : Smooth; only very small paramedian longitudinal furrows visible on posterior body segments ; endsternite longer than wide with its lateral margins a little arched outward and posterior margin incurved (fig. 17). *Legs* : 1-19 pair of legs with 2, 20th with 1 and 21st without spur on first tarsal segment ; all legs with 2 spurs to the claws. *Anal legs* : Prefemur of the anal legs nearly five times longer than its width, with 7 thorns present in the proximal half, ventrolaterally with 1, laterally with 2, medially 1 and dorsolaterally with 3 thorns ; prefemoral process ("eckdorn") absent. A deep depression seen on the distal end of the anal leg prefemur (fig. 17) and femur (fig. 19). Pretarsus about five times longer than end claw. *Affinities* : *Rhysida stuhlmanni himalayanus* ssp. nov. resembles *R. stuhlmanni* Kraepelin in a number of characters but differs from it in having a tridentate projection on the prefemur of coxosternum (vs. unidentate) ; 20 segmented antennae (vs. 17-18) and disposition of spines on the anal leg prefemur.

The species *R. stuhlmanni* Kraepelin, 1903 should, therefore, be treated as *Rhysida stuhlmanni stuhlmanni* Kraepelin* (forma typica), which is an element of Ethiopean fauna.

Key to the Indian Species of the Genus *Rhysida* Wood

1. All tergites except anterior with a pair of complete paramedian longitudinal furrow ... ... 2.

   All tergite either without paramedian longitudinal furrows or only very small furrows partly visible on some of the segments ... 17.

* Khanna (in press) recently recorded *R. stuhlmanni stuhlmanni* from North East States, India.

2. Tergite preceeding 21st segment normally not marginate laterally ... ... *Rhysida nuda* : 3.

Tergites preceeding 21st segment clearly marginate and several of them involved ... ... 4.

3. 20th pair of walking legs without tarsal spur ; apex of the process of coxopleura tipped with 3 spines ; antennae 19 segmented ... *Rhysida nuda immarginata* (Porath)

20th pair of walking legs with one tarsal spur ; apex of the process of coxopleura tipped 2 spines ; antennae (18)—(21) segmented ... *Rhysida nuda nuda* (Newport)

4. Process of coxopleura studded with lateral spines *Rhysida longipes* (Newport) : 5.

Process of coxopleura without lateral spines ... 7.

5. Prefemur of the anal legs without 'eckdorn' ; 1-5 pair of legs with 2 spurs to the 1st tarsal segment ... *Rhysida longipes simplicior* Chamberlin

Prefemur of the anal legs with 'eckdorn' ; 1-12 pairs of legs with 2 spurs to the first tarsal segment ... ... 6.

6. Emargination of tergites begining from 15th segment ; dorsal median streak on tergum absent ... *Rhysida longipes longipes* (Newport)

Emargination of tergites beginning from 9th segment ; dorsal median streak visible throughout the tergum ... *Rhysida longipes punctata* Khanna

7. Sternites either at all without paramedian longitudinal furrows or only anteriorly with very small furrows ... ... 8.

Majority of the sternites with a pair of complete paramedian longitudinal furrows ... ... 15.

8. Tergite from 5th segment onwards with a longitudinal median carina ... ... *Rhysida carinulata* (Haase)

None of the tergal segments with a median carina ... *Rhysida lithobioides* (Newport) : 9

9. Process of the coxopleura at the apex tipped with 3 spines 10.

Process of the coxopleura at the apex tipped with 2 spines 12.

10. 20th pair of walking legs with a spur to the first tarsal segment, endsternite without median furrow ... ... 11.

20th pair of walking legs without spur to the first tarsal segment ; endsternite with a median furrow ... *Rhysida lithobioides kumaonensis* ssp. nov.

11. Prefemoral process of the coxosternum with a tridentate projecton ; emargination of the tergites beginning on 17 or 18th segment ; paramedian furrows on sternites not present ... *Rhysida lithobioides shivalikensis* Khanna

Prefemoral process of the coxosternum with a quadri-dentate projection ; emargination of the tergites beginning on 13th segment ; small paramedian longitudinal furrows on sternites visible ... *Rhysida lithobioides trispinosus* Jangi and Dass

12. Endsternite without a median groove ... 13.

Endsternite with a median groove ... 14.

13. 1-18 pair of walking legs with 2 spurs to 1st tarsal segment ... *Rhysida lithobioides lithobioides* (Newport)

1-15 pair of walking legs with 2 spurs to 1st tarsal segment ... *Rhysida lithobioides abessynica* Attems

14. 1-19 pair of walking legs with 2 spurs to 1st tarsal segment ; process of coxopleura long ... *Rhysida lithobioides longopito* Dobroruka

1-18 pair of walking legs with 2 spurs to 1st tarsal segment ; process of coxopleura short ... *Rhysida lithobioides paucidens* Pocock

15. Only first pair of legs with 2 tarsal spurs ... 16.

1-3 pair of walking legs with 2 tarsal spurs ... *Rhysida neocrassispina* ... Jangi & Dass

16. Emargination of tergites begins from 5th or 6th segment ; 20th pair of walking legs with 1 tarsal spur ... *Rhysida crassispina* Kraepelin

Emargination of tergites begins from 18th segment ; 20th pair of walking legs without tarsal spur ... ... *Rhysida corbetti* sp. nov.

17. None of the tergite with paramedian longitudinal furrows ... 19.

Only very small paramedian longitudinal furrows on tergites visible, restricted either anteriorly or posteriorly on tergal segments ... 18.

18. 1-9 pair of walking legs with 2 spurs to 1st tarsal segment ; only endtergite : emarginate ; paramedian longitudinal carinae on tergites not present ; only small furrows on sternites visible only anteriorly ... *Rhysida stuhlmanni himalayanus* ssp. nov.

1-15 pair of walking legs with 2 tarsal spurs ; 14-21 tergal segments with their lateral margins emarginate ; 4-20 tergal segments with a pair of pronounced paramedian longitudinal carina ; all sternites without longitudinal furrows ... *Rhysida longicarinulata* Khanna and Tripathi

19. Emargination of tergites begins from 6th segment ... *Rhysida ceylonica* Gravely

Only endtergite laterally emarginate ... ... 20.

20. 20th pair of walking legs with 1 tarsal spur; all sternites without paramedian longitudinal furrows ... *Rhysida monalii* Khanna and Kumar

20th pair of walking legs without tarsal spur; very small paramedian longitudinal furrows visible on sternites anteriorly on ateriorior body segments only ... *Rhysida afra cuprea* Kraepelin

SUMMARY

In the the present paper altogether eleven species, belonging to four genera, collected from Corbett National Park, Uttar Pradesh, have been reported, of which two subpsecies, *Rhysida lithobioides kumaoensis* and *R. stuhlmanni himalayanus* and one species *R. corbetti*, are new additions to science, described from the park. Further extension of range of distribution of species like *Scolopendra morsitans* Linn., *Cormocephalus dentipes* Pocock, *Rhysida afra cuprea* Kraepelin, *Rhysida monalii* Khanna and Kumar, *Rhysida nuda nuda* Newport, *Rhysida nuda immarginata* Porath, *Otostigmus amballae* Chamberlin and *O. nudus* have been given. Additional characters of taxonomic importance in *O. amballae* Chamberlin have been discussed. A key to facilitate the indentification of Indian species of the genus *Rhysida* wood has also been provided.

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TABLE SHOWING THE DISTRIBUTION OF CENTIPEDES IN CORBETT NATIONAL PARK, UTTAR PRADESH

Name of the species	District PAURI						District NAINITAL					
	Dhikala	Kanda	Khinanauli	Paterpani	Boxar	Gairal	Sarapduli	Sultan	Mohan	Malani	Amdanda	Bijrani
1. *Cormocephalus dentipes* Pocock	+	—	—	+	+	—	+	—	—	+	+	+
2. *Scolopendra morsitans* Linnaeus	+	+	—	—	—	—	+	—	—	—	—	—
3. *Otostigmus amballae* Chamberlin	+	—	—	—	—	—	—	—	—	—	—	—
4. *Otostigmus nudus* Pocock	+	—	—	—	—	—	—	—	—	—	—	—
5. *Rhysida corbetti* sp. nov.	+	—	—	—	—	—	+	—	—	—	—	—
6. *Rhysida afra cuprea* Kraepelin	+	—	—	—	—	—	—	—	—	—	—	—
7. *Rhysida monalii* Khanna and Kumar	+	—	—	—	—	+	+	+	+	+	—	+
8. *Rhysida lithobioides kumaonensis* ssp. nov.	—	—	—	—	—	—	—	—	—	—	—	+
9. *Rhysida nuda nuda* (Newport)	—	—	—	—	—	—	+	—	—	—	—	—
10. *Rhysida nuda immarginata* (Porat)	+	—	—	—	—	+	—	+	—	—	—	+
11. *Rhysida stuhlmanni himalayanus* ssp. n.	+	—	—	—	—	+	—	—	+	—	—	—

Note :

1. Sarapduli is partly in Nainital and partly in Pauri Dist.
2. Boxar is now completely submerged under water.

(+) Present
(−) Not present

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