

SOME MITES ASSOCIATED WITH BIRDS' NESTS IN WEST BENGAL,  
WITH DESCRIPTIONS OF ELEVEN NEW SPECIES

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ABSTRACT

Twenty six species belonging to twenty three genera, eighteen families and four suborders are reported here from nests of five species of birds, viz. (1) *Ploceus philippinus* (2) *Passer domesticus*, (3) *Prinia inornata*, (4) *Orthotomus sutorius* and (5) *Streptopelia chinensis*. This included descriptions of eleven new species belonging to the genera *Pronematus* Canestrini, *Chelatacarus* Volgin, *Cunaxa* von Heyden, *Cheylostigmaeus* Willmann, *Stigmaeus* Koch, *Agistemus* Summers, *Spinibdella* Thor, *Bdella* Latreille, *Acheles* Oudemans and *Steatonyssus* Kolenati. Six genera and one species are reported here for the first time from India.

INTRODUCTION

The study of nest associated mites in India was initiated by Ramachandra Rao and Rajagopalan (1970) when they reported 12 species of mites from nests of six species of birds. Later, Gupta and Chattopadhyay (1979) in their study reported 18 species belonging to 16 genera, 12 families in 5 suborders which included one new species and 2 new records from India. The important contributions in this field from the other parts of the world are Moreau (1942), Hoyt (1948), Woodroffe (1953), Woodroffe and Southgate (1951), Nolan (1955), Baker *et al.* (1976), Philips & Dindal (1979), etc. The junior author, while studying the bird behaviour, collected a number of mites along with several other arthropods and arachnids. From those, the present paper is based on the collection of mites. A total of twenty six species belonging to 18 families and 4 suborders are treated, of those, 11 new species are described and

illustrated, while collection records are provided for the other species. Types of all the new species are deposited in the National Collection of the Zoological Survey of India, Calcutta. The entire collection was made by the junior author. All measurements given in the text are in microns.

MATERIAL & METHODS

Nests of five birds, viz. *Ploceus philippinus* Linn. (Fam. Ploceidae), *Passer domesticus* Linn. (Fam. Ploceidae), *Orthotomus sutorius* Latham. (Fam. Musicapidae), *Prinia inornata* (Fam. Musicapidae) and *Streptopelia chinensis* Gmelin (Fam. Columbidae) were collected from village Patharkumkumi (Dist. Midnapur) during 1977-1980. In case of *P. philippinus*, the nests were hanging from *Borassus flabellifer* (Fam. Palmae). These nests were retort shaped with a long vertical entrance tube and were woven out with fine strips of sugarcane, paddy and palm leaves. Blocks

of mud were also seen inside the nest. The nests of *Passer domesticus* were collected from the ceiling of a cottage. The nesting material were dry paddy leaves and other debris with lining of feathers in most of the cases except in one instance where cotton wool was used for inner lining. The nests of *Orthotomus sutorius* were collected from bushes. Two nests were collected from a low mango branch while one was collected from a branch of a fig tree. In all cases 2-3 leaves were beautifully sewed and plastered with cob-web. In case of *Prinia inornata*, one nest was built on a corn leaf, three were built on *Lantana camara* and one was on *Vitex negundo*. In all cases grass was used as building material. The nests were dome or purse shaped with a small side entrance. Nests of *Streptopelia chinensis* was collected from mango tree and one was found in a varandah of a rejected cottage. The nests were built of flimsy pads of thin twigs. In addition, two nests were also collected from a dead tree. All the nests were collected and brought to the laboratory in polythene bags after tightly closing the mouth of the bag with rubber bands. Those were subjected to heat treatments for the extraction of mites. The specimens were preserved in 75% alcohol.

## RESULTS

Altogether 26 species belonging to 4 suborders, viz. Prostigmata, Astigmata, Mesostigmata and Cryptostigmata were collected and, of those, 11 were new to science. Also 6 genera and 1 species are new records for India. The majority are recorded here for the first time from the state of West Bengal. Taking an overall view, it appears that nests of *Ploceus philippinus* offered shelter to the largest number of species. A list of the species

and the nests of birds from where those were collected is given in Table I. Descriptions of new species and collection records for other species are given below.

Suborder : PROSTIGMATA

Family : TYDEIDAE Kramer

Genus : **Pronematus** Canestrini

### 1. *Pronematus bengalensis* sp. nov.

(Figs. 1-6)

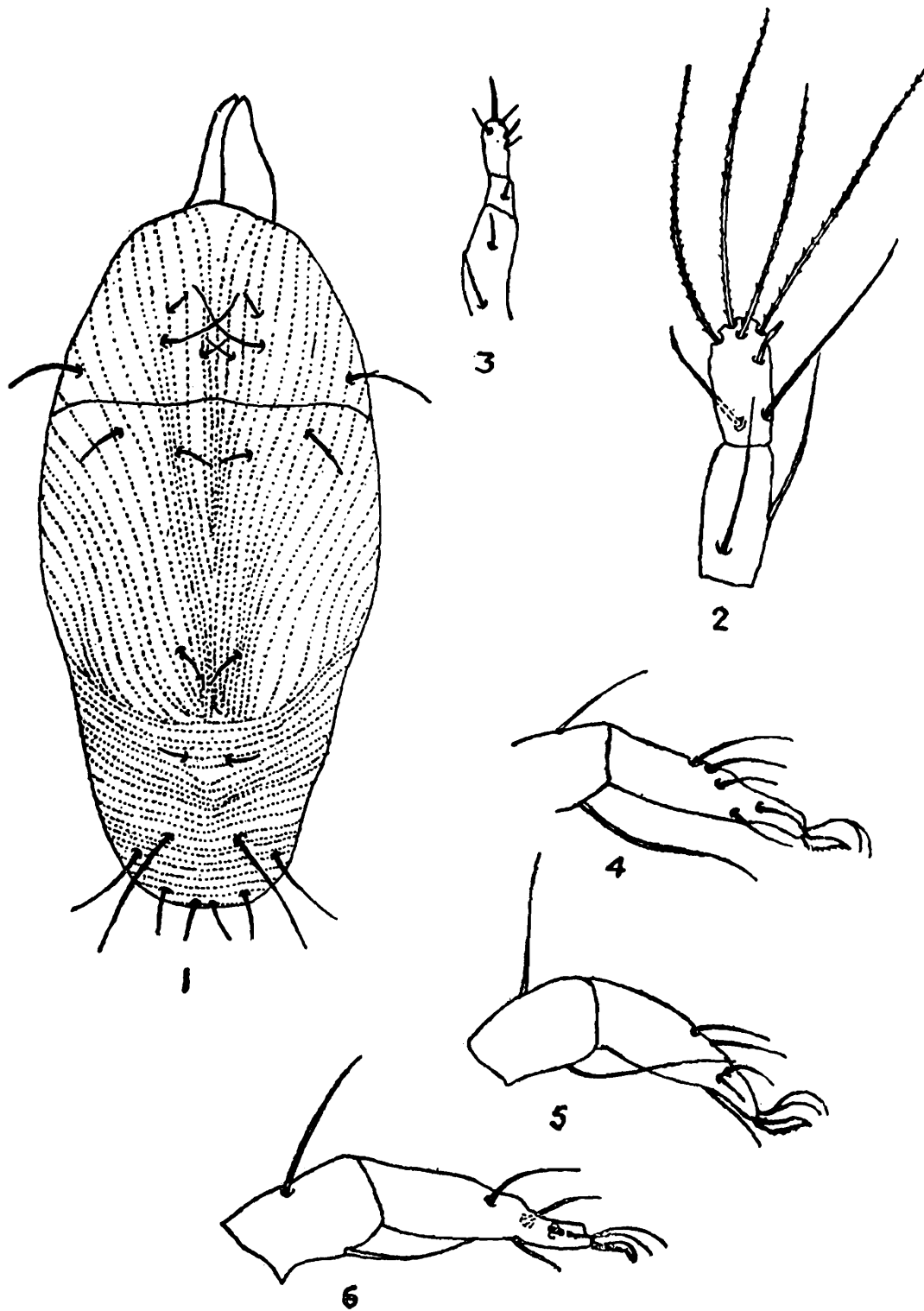
*Female* : Rostrum elongate, palpus elongate, setal pattern typical for the genus; terminal seta 1/2 as long as segment, striae on propodosoma longitudinal with lobes. Seta P1 7, shorter than P2 (14); P2 shorter than P3 (29). S1-38, over  $2\frac{1}{2}$  times as long as P2. Striae on hysterosoma fine, as indicated in figure. Setae D1-D3 almost of similar length (11-12); D4-20 long, D4-25 long. L1 and L2 of same length (20), L3-47 long, L4-38 long. Tarsus I slightly shorter than tibia I (20 : 13); out of 4 terminal setae, two are long (36) and the other two are of same length (25), all being serrate throughout length; solenidion I-6 long, situated more towards the anterior end of the segment; solenidion II slightly thinner but almost of same length. Ventral setae of tibia I-22 long, do not reach middle of the shorter setae of tarsus I; most of the other leg setae serrate. Length of body 291 (from tip of gnathosoma upto posterior tip of body), width 124 (maximum).

*Male* : Unknown.

*Holotype* ♀, INDIA : WEST BENGAL : Midnapur Dist., Vill. Patharkumkumi, 5. vii. 1977, ex nest of baya, *Ploceus philippinus*, ZSI Reg. No. 3216/17.

TABLE 1.

	BIRDS				
	S. O. Passeriformes		Fam. Muscicapidae		S. O. Columbiformes
	Fam. Ploceidae				Fam. Columbidae
	<i>Ploceus philippinus</i>	<i>Passer domesticus</i>	<i>Orthotomus sutorius</i>	<i>Prinia inornata</i>	<i>Streptopelia chinensis</i>
	(1)	(2)	(3)	(4)	(5)
S. O. Prostigmata					
Fam. Tydeidae					
1. <i>Pronematus bengalensis</i> sp. nov.	+	—	—	—	—
2. <i>P. indiana</i> sp. nov.	+	—	—	—	—
Fam. Cheyletidae					
3. <i>Chelatacarus ploceus</i> sp. nov.	+	—	—	—	—
4. <i>Chelacaropsis moorei</i>	+	—	—	—	—
Fam. Cunaxidae					
5. <i>Cunaxa prinia</i> sp. nov.	—	—	—	+	—
6. <i>C. capreolus</i>	+	—	—	—	—
7. <i>C. setirostris</i>	+	—	—	—	—
Fam. Stigmaeidae					
8. <i>Cheyllostigmaeus midnapurensis</i> sp. nov.	—	—	+	—	—
9. <i>Stigmaeus woodi</i> sp. nov.	—	—	—	—	+
10. <i>Agistemus prinia</i> sp. nov.	—	—	—	+	—
Fam. Bdellidae					
11. <i>Spinibdella atyeoi</i> sp. nov.	—	—	—	+	—
12. <i>Bdella bakeri</i> sp. nov.	—	+	—	—	—
Fam. Raphignathidae					
13. <i>Acheles meyeræ</i> sp. nov.	—	—	—	+	—
Fam. Tetranychidae					
14. <i>Eotetranychus</i> sp.	+	—	—	—	—
Fam. Erythraeidae					
(Undet. spp.)	—	+	—	—	—
Fam. Tarsonemidae					
15. <i>Tarsonemus</i> sp.	+	—	—	—	—
S. O. Astigmata					
Fam. Protolichidae					
16. <i>Protolichus</i> sp.	+	—	—	—	—
Fam. Acaridae					
17. <i>Tyrophagus putrescentiae</i>	+	—	—	—	—
other Acarids	+	—	—	+	—
Fam. Glycyphagidae					
18. <i>Glycyphagus domesticus</i>	+	+	—	—	—
19. <i>G. destructor</i>	—	+	—	—	—
S. O. Mesostigmata					
Fam. Phytoseiidae					
20. <i>Amblyseius largoensis</i>	+	—	—	—	—
Fam. Ascidae					
21. <i>Asca pseudospicata</i>	+	+	—	+	—
Fam. Macronyssidae					
22. <i>Ornithonyssus</i> sp.	—	+	—	—	—
23. <i>Steatonyssus flabellifer</i> sp. nov.	+	—	—	—	—
Fam. Ameroseiidae					
24. <i>Lasioseius</i> sp.	+	—	—	—	—
S. O. Cryptostigmata					
Fam. Oribatulidae					
25. <i>Scheloribates albialatus</i>	—	+	—	—	+
Fam. Parakalummidae					
26. <i>Protokalumma</i> sp.	—	—	—	—	+



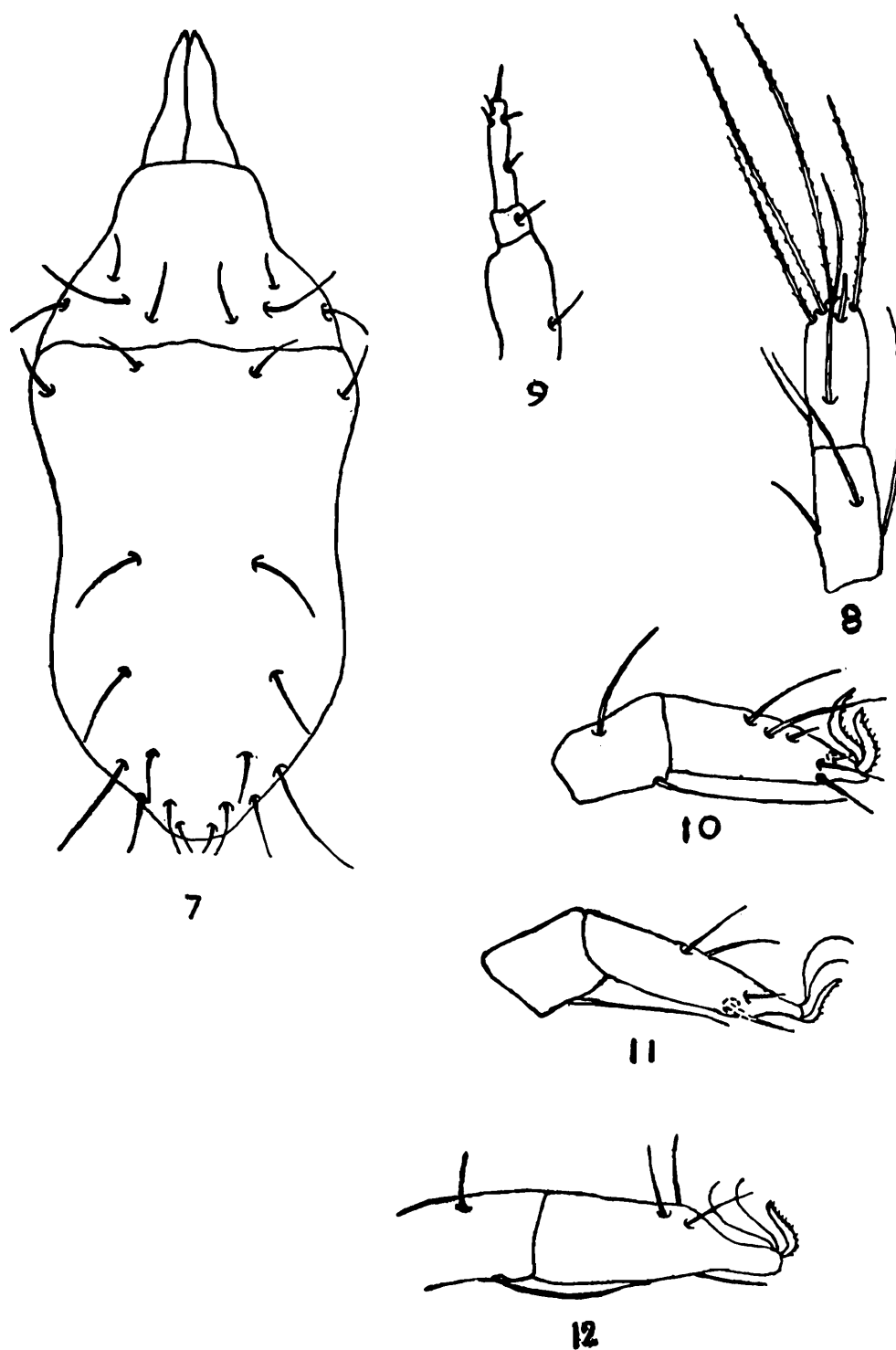
Figs. 1-6. *Pronematus bengalensis*, sp. nov. ♀ : 1. dorsal view, 2, tibia and tarsus I, 3. palpus, 4. tibia and tarsus of leg II, 5. tibia and tarsus of leg III, 6. tibia and tarsus of leg IV.

*Remarks* : This species differs from *P. fleschneri* Baker, in the relative lengths of tarsal setae of leg I, as well as in the relative length of tarsus and tibia of leg I.

## 2. *Pronematus indiana* sp. nov.

(Figs. 7-12)

*Female* : Rostrum elongate but not deeply cleft. Chelicera normal, distal segment of



Figs. 7-12. *Pronematus, indiana* sp. nov. ♀ : 7. dorsal view, 8. tibia and tarsus of leg I, 9. palpus, 10. tibia and tarsus of leg II, 11. tibia and tarsus of leg III, 12. tibia and tarsus of leg IV.

palpus elongate, terminal setae moderately long. Propodosomal reticulations so faint that apparently it is indistinguishable. Seta P1 shorter than P2, P3 being longest, S1-36, ( $1\frac{1}{2}$  times as long as P2); all the propodosomal setae apparently appear to be smooth. Hys-

terosomal striation as presented in figure. The length of D1, D2, D3, D4, D6, L1, L2, L3, and L4 are 25, 29, 27, 27, 16, 23, 34, 58 and 43, respectively. Ventral body setae short, mostly lanceolate. Tarsus I-18, tibia I-20, long, all the terminal setae long, smooth,

2 being longer (67) than the other 2 (47). Solenidion on tarsus I long, almost as long as width of the segment, setae on other legs long, appear to be smooth. Solenidion of tarsus II  $\frac{1}{2}$  as long as solenidion of tarsus I. Body 285 long, 101 wide.

*Holotype* ♀, INDIA : WEST BENGAL : Midnapur Dist., Vill. Patharkumkumi, 5.vii.1977, ex nest of baya, *Ploceus philippinus*, ZSI Reg. No. 3217/17.

*Paratypes* 2 ♀ ♀, locality same as in holotype, ex nest of sparrow, *Passer domesticus*, ZSI Reg. No. 3218/17 and 3219/17.

*Remarks* : This species differs from *P. mcgregori* Baker, in lacking the deep cleft on the rostrum and also in the relative lengths of the idiosomal setae.

Family : CHEYLETIDAE Leach

Genus : **Chelatacarus** Volgin

### 3. **Chelatacarus ploceus** sp. nov.

(Figs. 13-15)

*Female* : Body 433 long, 306 wide, palp tarsal claw with tooth-like projections towards tip. Two pairs of comb-like setae, each possesses at least 15 teeth ; sickle shaped setae 1 pair. Protegmen with fine longitudinal striations. Tegmen also striated. Propodosomal plate finely granulated, with 6 pairs of fan-shaped setae. Eyes 1 pair present between leaf-like and fan-shaped setae. Hysterosomal plate absent but setae present on small platelets ; all setae fan-like. Setae on venter short and simple. Chaetotaxy of femur, genu, tibia and tarsus of legs I-IV are respectively, I : 2-2-3-7 ; II : 2-2-2-7 ; III : 2-2-2-7 ; IV : 1-1-2-8. Genu, tibia and tarsus of leg I with long leaf-like setae, tibia and tarsus of leg II with also similar leaf-like setae, in addition, genu,

tibia, tarsus of leg III and IV also with leaf-like setae, of those, the setae on tarsus of both legs are longer and double the length of setae on genu and tibia. Solenidion on tarsus I quite long, guard seta apparently absent. Claws of leg I smaller than those of legs II-IV. Length of gnathosoma 101, idiosoma-358, leg I-191, tarsus I-78.

*Holotype* ♀, INDIA : WEST BENGAL : Midnapur dist., Patharkumkumi, 15.vii.1977, ex nest of baya, *Ploceus philippinus*, ZSI Reg. No. 3220/17.

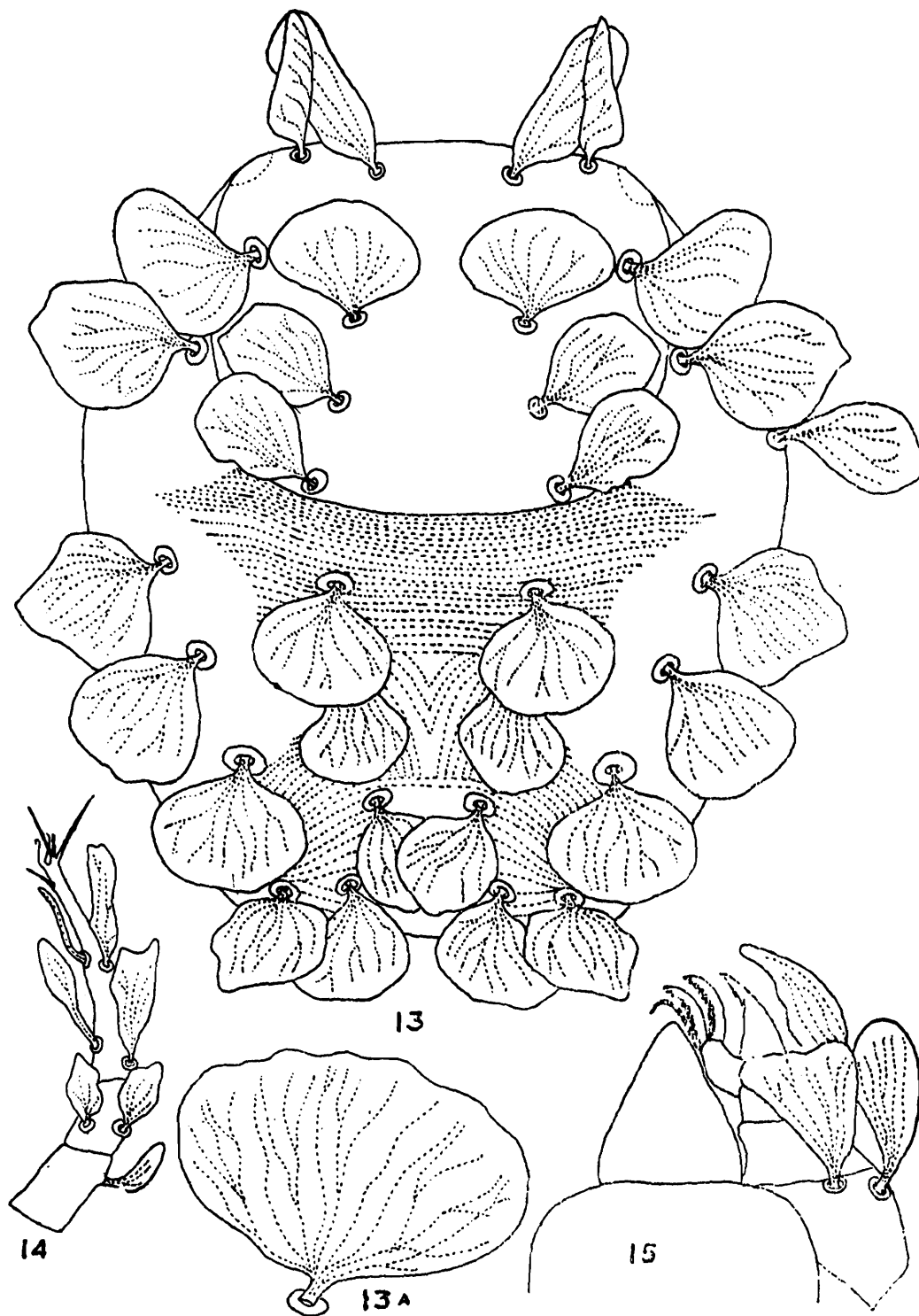
*Remarks* : This species is presently placed in the genus *Chelatacarus* Volgin, because like *Chelatacarus*, it has only a propodosomal plate bearing 6 pairs of setae, palp tarsus with only 2 comb-like setae, body setae fan-shaped and median hysterosomal plate absent, but unlike *Chelatacarus* it lacks teeth along the entire margin of pedipalpal claw and has only one sickle-shaped seta instead of two as in *Chelatacarus*. In spite of the differences this species is kept in *Chelatacarus* until the time further material is obtained enabling the study of the constancy of these characters. This species differs from *Chelatacarus gryphus* Summers and Price, in having only 8 pairs of setae on the hysterosoma, and also in nature of the propodosomal and hysterosomal setae.

Genus : **Chelacaropsis** Baker

### 4. **Chelacaropsis moorei** Baker

*Material examined* : 1 ♀, WEST BENGAL : Midnapur Dist., Patharkumkumi, 15. vii. 1979, ex nest of *Ploceus philippinus*.

*Remarks* : Gupta and Chattopadhyay (1979) also reported this species from the nest of *Lonchura striata* and *Ploceus manyar flaviceps*.

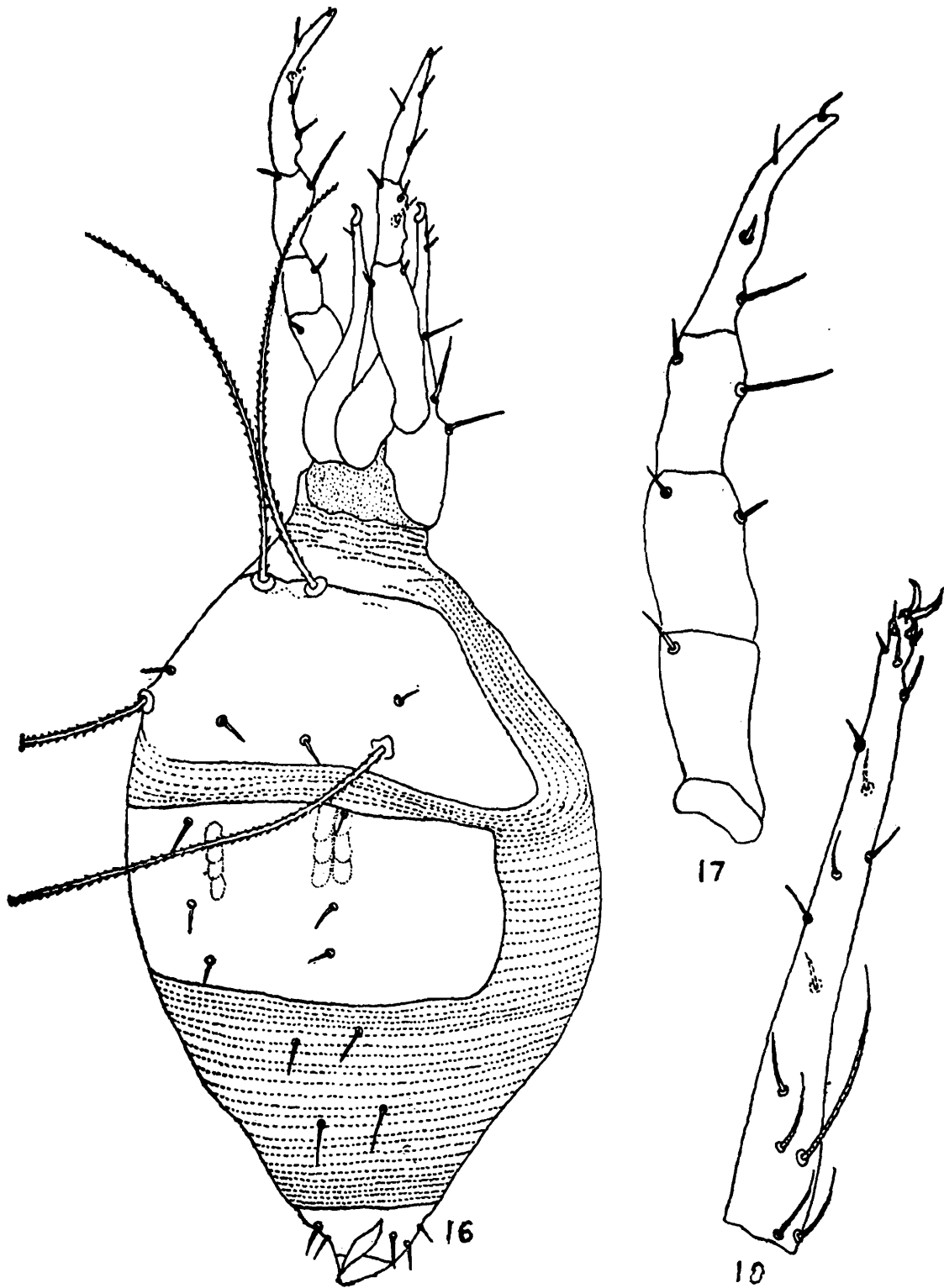


Figs. 13-15. *Chelatacarus ploceus*, sp. nov. ♀: 13. dorsum, 13a. enlarged view of dorsal seta. 14. distal segments of leg I, 15. gnathosoma.

Family : CUNAXIDAE Thor  
Genus : *Cunaxa* von Heyden

5. *Cunaxa prinia* sp. nov.  
(Figs. 16-18)

*Female* : Palp 5-segmented, 146 long, extending well beyond hypostome. Chaetotaxy of palp trochanter-nil, basifemur with one inner lateral seta, telofemur with one short outer lateral seta and one sharp inner lateral seta.



Figs. 16-18. *Cunaxa prinia*, sp. nov. 16. dorsum, 17. left palp, 18. left tarsus I.

all being simple; tibiotarsus with one long simple innerlateral seta, anterior to it one short anterodorsal seta and a short inner lateral seta, anteriorly two outer lateral setae almost of same length. Chelicera broad at base, gradually tapering distally extending

almost upto half the length of palp genu; with sickle shaped movable digit. Gnathosoma rectangular at the base, attenuate distally. Propodosoma with 2 pairs of short setae, of those, anterior pair shorter than posterior pair. Hysterosoma also with a shield having 3

pairs of setae of same length, the outer 2 pairs of hysterosomal setae on scutum. Coxal setal formula 2 : 1 : 1 : 1. Three pairs of ventral setae present between coxae II and posterior tip of body. Leg IV being longest, tarsi longer than other leg segments. Tarsi I-IV with 2 claws. Chaetotaxy of basifemur, telofemur, genu, tibia and tarsus of legs are respectively I : 1, 2, 4+1 solenidion, 4, 14+4 solenidia, II : 2, 2, 2+1 solenidion, 4+1 solenidion, 12+2 solenidia, III : 3, 4, 4+1 solenidion, 5, 8 ; IV : 0, 3, 5+1 solenidion, 3+1 duplex setae, 13. The anterior legs directed forward, posterior legs directed backwards.

*Male* : Unknown.

*Holotype* ♀, India : WEST BENGAL : Midnapur Dist., Patharkumkumi, 18.vi.1980, ex nest of *Prinia inornata*, ZSI Reg. No. 3221/17.

*Remarks* : This species is easily distinguished from all other known species by the character of the dorsal scutum and by the palpal chaetotaxy.

## 6. *Cunaxa capreolus* (Berlese)

*Scirus capreolus* Berlese, 1890, *Acari, Myriapoda et Scorpiones hucusque in Italia*, Fasc. 57 (9).

*Cunaxa capreolus*, Vitzthum, 1929, *Tierwelt Mitteleuropas*, 3 (3) : 60.

*Cunaxa capreolus*, Baker & Hoffman 1948, *An. Esc. Nac. Cienc. Biol. Mexico*, 5 : 231-232.

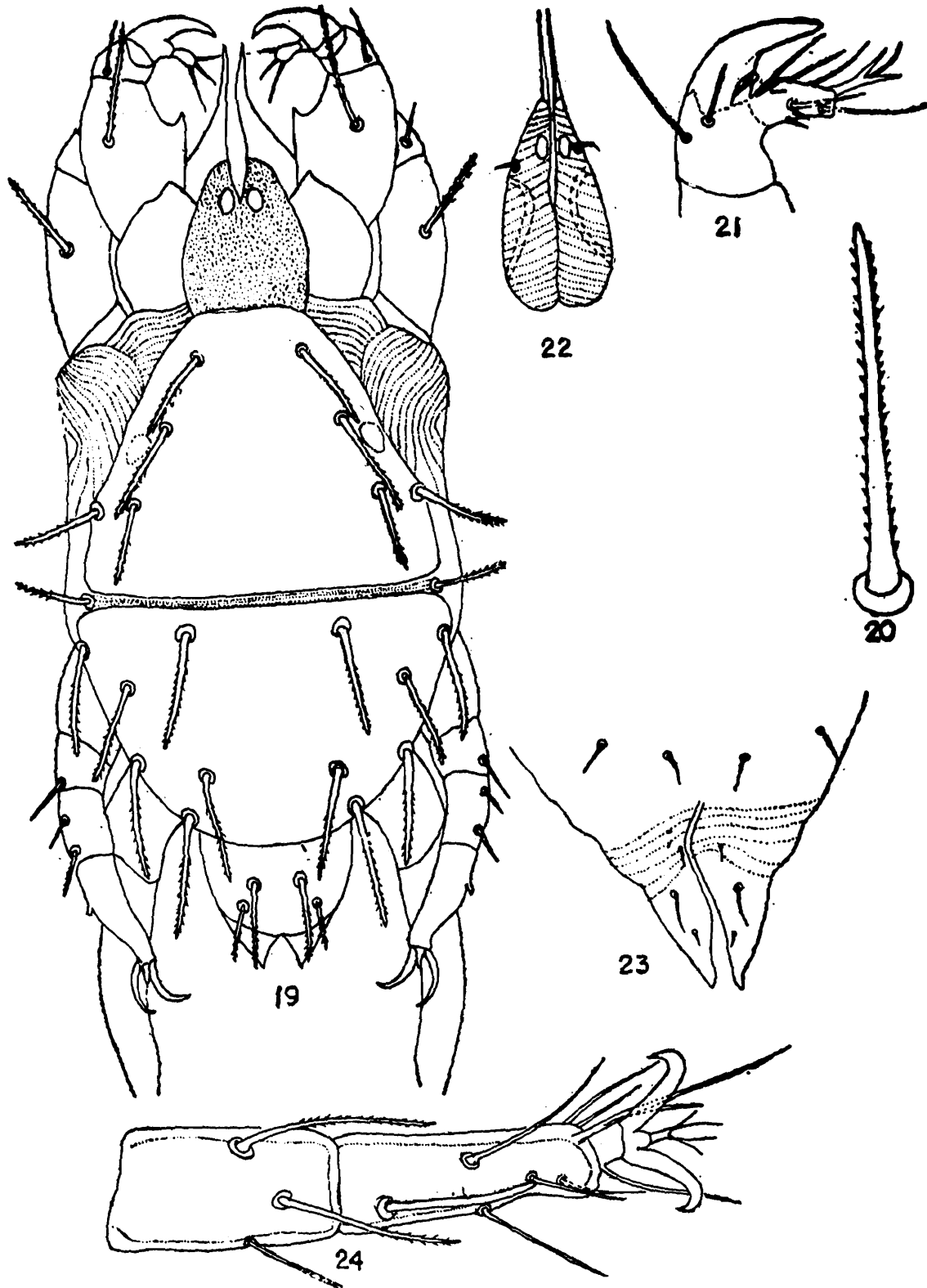
*Cunaxa capreolus*, Muma, 1980, *Ann. Ent. Soc. Amer.*, 53 : 324.

*Female* : Palpi 5 segmented, 192 long, extending beyond hypostome. Chaetotaxy of palpus : trochanter-nil, basifemur-one outerlateral simple seta, telofemur-innersurface with sabre-like hooked process projected upward, one outerlateral simple seta ; genu-inner surface with a strong spine, one anterior midventral seta and one simple outerlateral

seta ; tibiotalrusus-proximally with one spine-like seta outerlaterally adjacent to it one midventral seta and one long simple seta at the inner surface ; anterior to it a small seta at the distal tip ; tibiotalrusus sharply hooked at the distal tip. Chelicera attenuate, broadest at base, extending beyond base of palp genu ; fixed digit absent, movable digit curved and sharply pointed. Gnathosoma subtriangular ; attenuate distally, 3 pairs of long marginal setae. Propodosoma with smooth subrectangular shield with 2 pairs of finely branched sensory setae and 2 pairs of simple setae, Hysterosoma partly covered with a rectangular shield with 4 pairs of simple setae. Posterior to gnathosomal shield fine transverse striae present ; lateral to the shield this striation pattern roughly longitudinal. Coxa I and II contiguous, coxae III and IV also contiguous. Coxal setal formula 2 : 1 : 2 : 1, 5 pairs of setae present between coxae II and distal portion of body. Leg I and II directed anteriorly, III and IV directed posteriorly. Setation of basifemur, telofemur, genu, tibia and tarsus of legs I, II, III and IV are, respectively I : 3, 3, 4+1 solenidion+1 duplex setae, 3+1 duplex setae, 19+3 solenidia ; II : 4, 4, 6+1 solenidion, 5+1 solenidion, 18+2 solenidia, III 3, 4, 4, 4, 16 ; IV : 1, 4, 5, 4+1 trichobothrium, 19. Tarsi I-IV attenuate, longer than combined length of genu+tibia ; tarsi I-IV with 2 claws and empodium. Body 710 long (from base of gnathosoma upto posterior tip of body) and 310 wide.

*Material examined* : 1 ♀, WEST BENGAL : Midnapur Dist., Patharkumkumi, 15.vii. 1979, ex nest of baya, *Ploceus philippinus* ; 1 ♀, same locality and habitat, 18. vii. 1980.

*Remarks* : This is the first record of this species from India. This species is redescribed here since the earlier descriptions are inadequate.



Figs. 19-24. *Cheylostigmaeus midnapurensis* sp. nov. ♂ : 19. dorsal view, 20. enlarged view of dorsal body seta, 21. left palpus, 22. chelicera, 23. opisthosomal region, 24. terminal segment of leg I.

### 7. *Cunaxa setirostris* (Hermann)

*Scirus setirostris* Hermann, 1804, *Mem. Apt.* P. 62.

*Cunaxa setirostris* von Heyden, 1826, *Isis* (Oken), 18 : 608.

*Cunaxa setirostris*, Baker & Hoffman, 1948, *An. Esc. Nac. Cienc. Biol. Mexico*, 5 : 237-238.

*Cunaxa setirostris*, Muma, 1960, *Ann. Ent. Soc. Amer.*, 53 : 324.

*Cunaxa setirostris*, Singh & Mukharji, 1971, *Oriental Ins.*, 5 : 488.

*Cunaxa setirostris*, Gupta & Ghosh, 1980, *Rec. Zool. Surv. India*, 77 : 194-195.

*Material examined* : 1 ♀, WEST BENGAL : Midnapur Dist., Patharkumkumi, 15. vii. 1979, ex nest of *Ploceus philippinus*.

Family : STIGMAEIDAE Oudemans

Genus : *Cheylostigmaeus* Willmann

8. *Cheylostigmaeus midnapurensis* sp. nov.

(Figs. 19-24)

*Male* : Basal segments of chelicera ornamented dorsally with a knob-like process in each chelicera. Rostrum apparently without process. Pedipalp robust, palp femur heavily sclerotized, mesal surface with sharp apophysis, as in figure. Palp tibial claw strong, 2 times as long as tarsus and about  $1\frac{1}{2}$  times as long as tibia. Accessory claw on tibia well developed, tarsus with well developed trifold process; the other setae present as usual. Dorsal idiosomal setae all thick, pubescent specially at tip. Propodosoma with 4 pairs and hysterosoma with 6 pairs of setae. A pair of humerals also present. The measurements of setae : vertical dorsal seta-49, pre-ocular dorsal seta-63, being the longest. The other setae on propodosoma vary between 40-48. The length of hysterosomal setae vary between 50-60, however, their length being shorter than the distance between succeeding setae. Solenidion on tarsus I-33 long. Tarsus of leg I being longest, others of almost same length. Idiosoma -246 long, 180 wide, distance from base of rostrum upto tip of chelicera- 134, posteriormost hysterosomal seta-58. Most of the leg setae being plumose at the tip.

*Female* : Unknown.

*Holotype* ♂, INDIA : WEST BENGAL : Midnapur Dist., Pathakumkumi, 29.iv.1978, ex nest of tailor bird, *Orthotomus sutorius*, ZSI Reg. No. 3224/17.

*Paratype* : 1 ♂, data same as for holotype, (both holotype and paratype mounted on same slide) ZSI Reg. No. 3225/17.

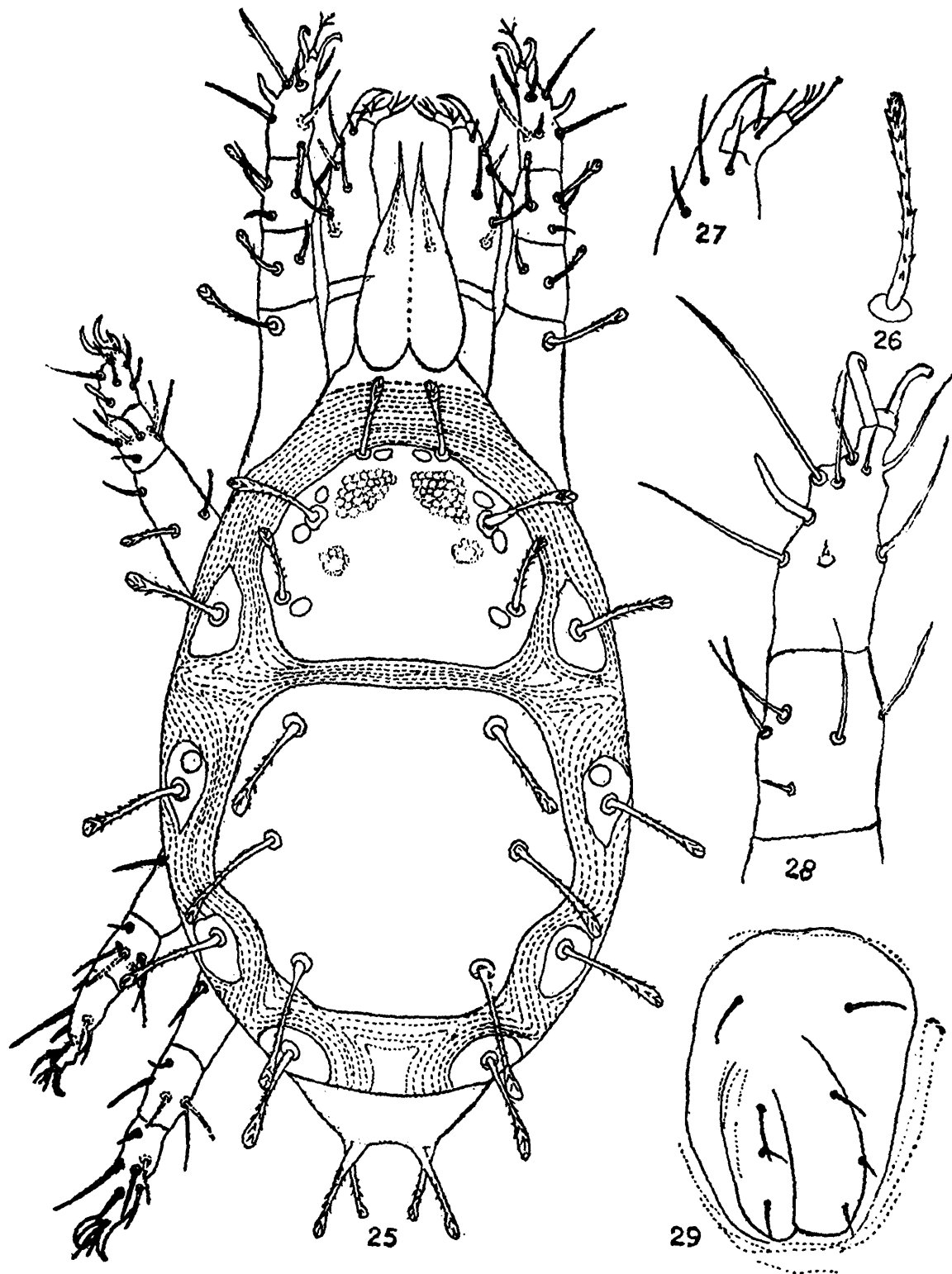
*Remarks* : This species is related to *Cheylostigmaeus torulus* Summers, but differs from the latter in having the palpal claw more strongly developed, in the relative length and nature of the dorsal setae, and in having a simple and sharp apophysis on the palpal femur.

Genus : *Stigmaeus* Koch

9. *Stigmaeus woodi* sp. nov.

(Figs. 25-29)

*Female* : Central plate characteristically shaped as in figure; plates moderately sclerotized, propodosomal plate rugose anteriorly, rest of the plate non-reticulate with 3 pairs of setae (ae, be, ce), all being weakly serrate with spatulate tip, and measuring 39, 49 and 31, respectively. Central plate also possesses 3 pairs of setae, a, b, c, measuring 45, 45 and 47, respectively and are of similar nature as on propodosomal plate. Auxillary plates absent. Humeral plates well separated from propodosomal, non-reticulate, with humeral setae-45. Marginal plate distinct, la-45; lateral zonal plate as illustrated with seta lm-45. Intercalaries well separated, li-52. Setae le-27, being shorter than e (39). Ventrally, anal plate as figured. Macroseta IV spatulate, weakly serrate-27, empodial raylets pointed; striations longitudinal between I and II pairs of legs and also between III and IV pairs of legs but transverse in the region between II and III pairs of legs; striations ">" shaped marginally

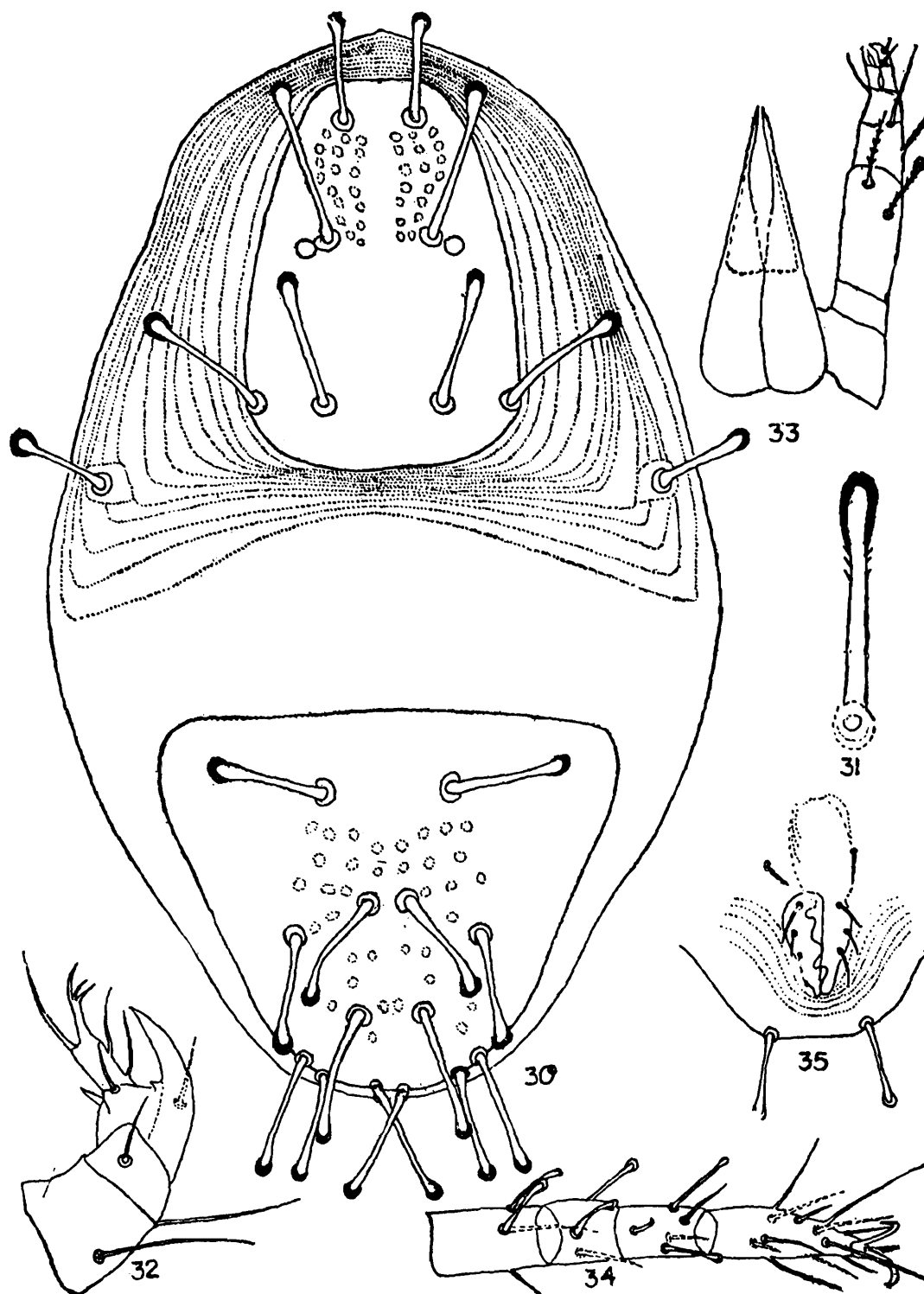


Figs. 25-29. *Stigmaeus woodi* sp. nov. ♀ : 25. dorsal surface, 26. enlarged view of dorsal body seta, 27. palpus, 28. terminal segments of leg I, 29. opisthosoma.

and transverse in the region posterior to IV pairs of legs and upto anal plate. Length of idiosoma (from base of gnathosoma upto posterior tip of body)-358, solenidia w1-20,

w2-11, kI-29, KII-22. Macroseta IV/I'-1.2, be/ce-1.4, striations longitudinal.

*Holotype* ♀, INDIA : WEST BENGAL : Midnapur Dist., Patharkumkumi, 9.v.1980, ex



Figs. 30-35. *Agistemus prinia* sp. nov. ♀ : 30. dorsum, 31. enlarged view of dorsal body seta, 32. palpus, 33. chelicera and palp, 34. terminal segments of leg I, 35. opisthosoma.

nest of dove, *Streptopelia chinensis*, ZSI Reg. No. 3226/17.

*Remarks* : This species is similar to *Stigmaeus scabre* Summers, but can be easily distinguished from the latter by the nature of the dorsal setae.

Genus : *Agistemus* Summers  
 10. *Agistemus prinia* sp. nov.  
 (Figs. 30-35)

*Female* : Fairly large mite with prominent postocular body. Propodosomal plate rugose with 4 pairs of setae, all being thick,

plumose, tip spatulate with hyaline margin. Measurements of setae: vertical-49, preocular-60, postocular I-49, II-56. Area lateral to the propodosomal plate longitudinally striated and the region immediately posterior to the plate transversely striated; humeral seta-40 long. Hysterosomal plate also rugose, with 7 pairs of setae, their length vary between 52-62. Ventrally variously striated, region between I and II legs with longitudinal striations, posterior to that transversely striated, region between III and IV legs longitudinally striated. Three pairs of setae present in the region from base of leg I-IV; 3 pairs of setae present on genital plate, all being equal (18) and one pair present around it anteriorly. Leg II and I contiguous, legs III and IV also contiguous. Pedipalp with femur longest, tibial claw about  $1\frac{1}{2}$  times as long as palp tarsus; the latter with a trifid process. Cheliceral bases ornamented. Tarsus I and tibia I with solenidia, tarsus II and tibia II also with solenidia, all short and almost of equal length.

*Holotype* ♀, INDIA: WEST BENGAL: Midnapur Dist., Patharkumkumi, 9.iv.1979, ex nest of *Prinia inornata*, ZSI Reg. No. 3227/17.

*Paratypes* 2 ♀ ♀, data same as for holotype, ZSI Reg. No. 3228/17.

*Remarks*: This species is easily separated from all the related species by the peculiar idiosomal setae.

Family: BDELLIDAE Dugés

Genus: *Spinibdella* Thor

11. *Spinibdella atyeoi* sp. nov.

(Figs. 36-40)

*Female*: Body 816 long (including rostrum), chelicera almost as long as palpal femur, ves -158 long, des-229 long. Chelicera

longitudinally striated; gnathosomal base of buccal cone striated; dorsal hysterosomal setae simple, 61 long. Dorsal idiosomal striae as represented. Propodosoma cone-shaped, dorsum striated with 3 pairs of setae including 2 pairs of sensilla; both being broken; anterior sensilla separated by 51; posterior sensilla lie apart 138. Hysterosomal setae almost of similar length, internal humeral -77 long, external humeral -76 long. Propodosoma and hysterosome not significantly separated. Ventral idiosomal setae short, somewhat blunt, each genital plate with 5 setae, of those, 4 are in linear arrangement. Two pairs of paraanal setae present. Each claw with about 5-7 rays. Tibia I-71 long, tarsus I-83 long, pretarsus-22 long, tibia IV-40 long, tarsus IV-112 long. Coxal setal formula: 5, 2, 3, 2. Other chaetotaxy of legs not possible to examine because those being crumpled.

*Holotype* ♀, INDIA: WEST BENGAL: Midnapur Dist., Patharkumkumi, 9.viii.1980, ex nest of *Prinia inornata*, ZSI Reg. No. 3229/17.

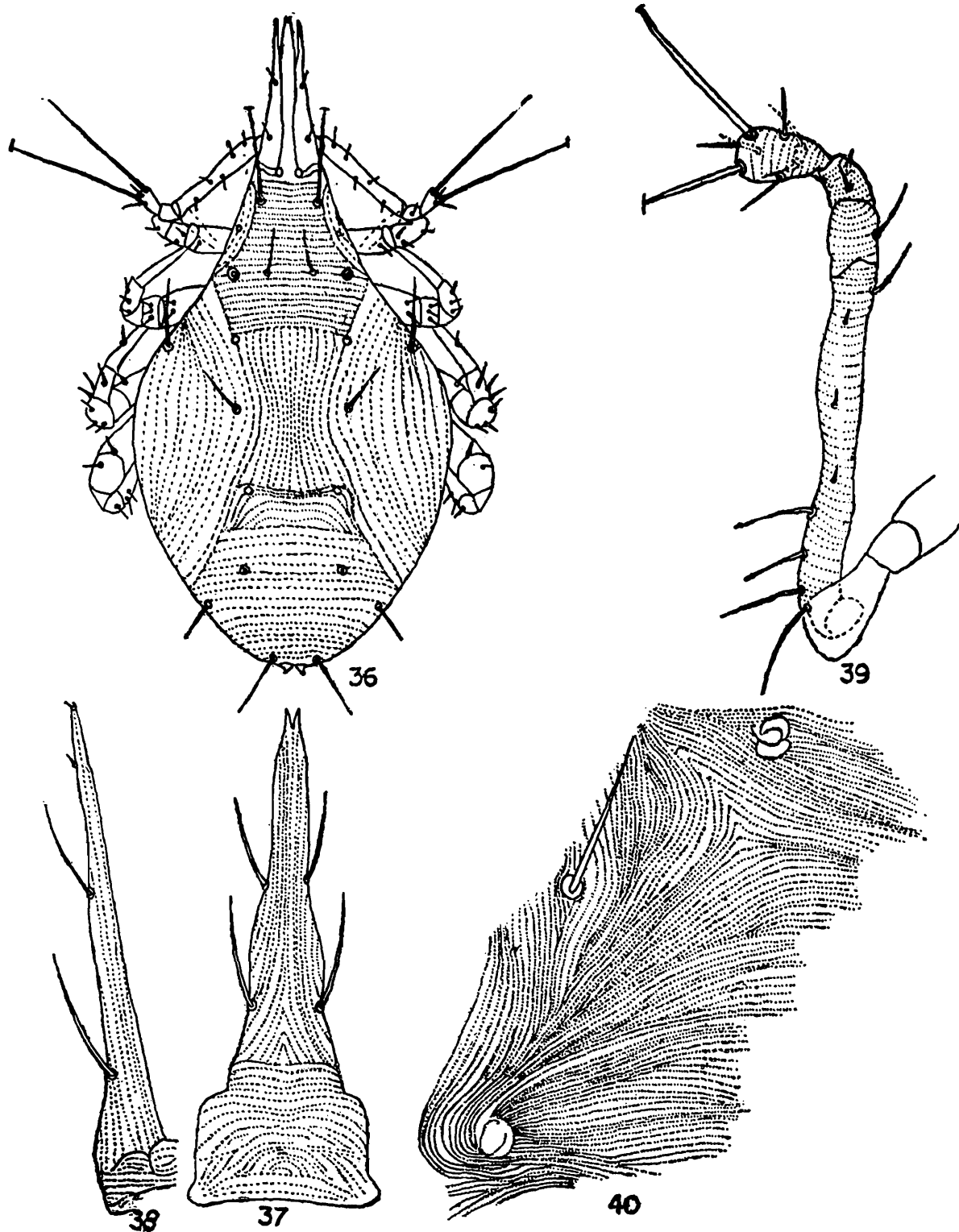
*Remarks*: This species differs from *Spinibdella thori* (Meyer & Ryke), in that the internal humeral seta are longer than the first interspaces.

Genus: *Bdella* Latreille

12. *Bdella bakeri* sp. nov.

(Figs. 41-44)

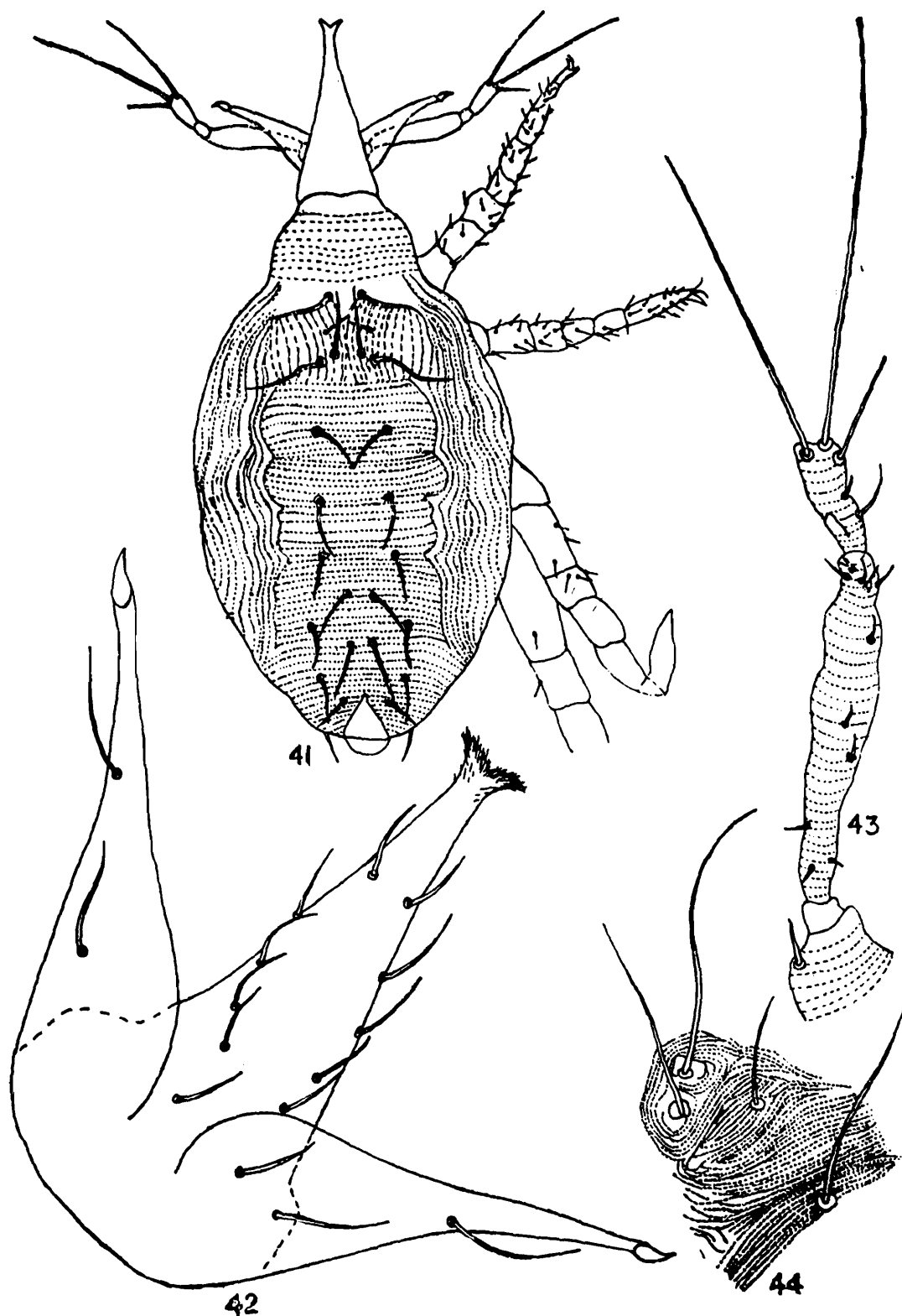
*Female*: Body 965 long. Palpus with telofemur and genu incompletely fused, ves-147, des-189. Chelicera with faint longitudinal striae, 229 long, setae as figured. Gnathosomal base striated; buccal cone with longitudinal striae, dorsal hysterosomal seta -34. Dorsal idiosoma striated; anterior sensillum -112 long, posterior sensillum -102



Figs. 36-40. *Spinibdella atyeoi* sp. nov. ♀ : 36. dorsal surface, 37. ventral aspect of gnathosoma, 38. chelicera, 39. palpus, 40. sensillum and pseudostigmatid organ.

long, median propodosomal seta- 51 long. Hysterosomal setae all simple, internal humeral- 66 long, ventral idiosoma striated. Each genital plate with 7 setae in linear arrangement ; 5 pairs of paragenital and 3 pairs of

paraanal setae. Legs with each claw at least 7 rayed, tibia I- 54 long, tarsus I- 69 long, tibia II -49 long, tarsus II- 56 long, tibia IV- 67 long. Setae of trochanter I-IV : 3, 2, 1, 1 ; basifemur : 8, 6, 4, 7 ; telofemur : 6, 6, 5, 4 ;



Figs. 41-44. *Bdella bakeri* sp. nov. ♀ : 41. dorsal surface, 42. ventral aspect of gnathosoma, 43. palp, 44. sensillum and pseudostigmatid organ.

tarsus IV with a trichoboth and a sensory seta ; tarsus II with 2 blunt sensory setae ; tarsus III also with a trichoboth.

*Male* : Unknown.

*Holotype* ♀, INDIA : WEST BENGAL : Midnapur Dist., Patharkumkumi, 29.vi.1980,

ex nest of dove, *Streptopelia chinensis*, ZSI Reg. No. 3230/17.

*Remarks* : This species differs from *Bdella captiosa* Atyeo, in the striation pattern of the dorsum and in the leg chaetotaxy.

Family : RAPHIGNATHIDAE Karmer

Genus : *Acheles* Oudemans

13. *Acheles meyeræ* sp. nov.

(Figs. 45-47)

*Female* : Body elongated, oval, length (excluding gnathosoma) 302, width 179.

*Dorsum* : Striated, with 4 plates. Anterior median plate bears 3 pairs of setae, of those, the anterior and posterior are of same length, median longer. Lateral plate bears 3 pairs of setae and one pair of eyes. The posterior median plate with 3 pairs of setae. Two pairs of setae present on the striated region, each on small platelets. Anteriorly, interscutal membrane with longitudinal striation, posteriorly striations are transverse. Supraanal plate with 2 pairs of setae.

*Venter* : 3 setae surrounding genital opening. Three pairs of setae present in the region from base of 4th pairs of legs up to anterior end of genital plate; another 2 pairs of setae present between bases of 1st and 3rd pairs of legs; bases of all four legs contiguous.

*Gnathosoma* : Penultimate segment of palp with short claw. Palpal tarsus much longer than claw with 4 blunt setae at tip (setae longer than segment). Chelicerae fused medially, movable chela stylet like. Peritreme ends in basal portion of chelicera.

*Legs* : First and fourth pairs of legs longer, second and third pairs of legs equal but shorter than former two pairs, each leg tarsus possesses 2 well developed claws and empodium. Tarsus I and II each with a

clavate sense organ, that on tarsus III much shorter.

*Male* : Unknown.

*Holotype* ♀, INDIA : WEST BENGAL : Midnapur Dist., Patharkumkumi, 18.vi.1980, ex nest of *Prinia inornata*, ZSI Reg. No. 3231/17.

*Paratype* : 1 ♀, same locality and habitat, as for holotype, 19.vi.1980.

*Remarks* : This species differs from *Acheles aethiopica* Meyer and Ryke in the shape of the plates, in the striation pattern, and in having only two pairs of setae between the anterior median and posterior median plates.

Family : TETRANYCHIDAE Donnadieu

Genus : *Eotetranychus* Oudemans

14. *Eotetranychus* sp.

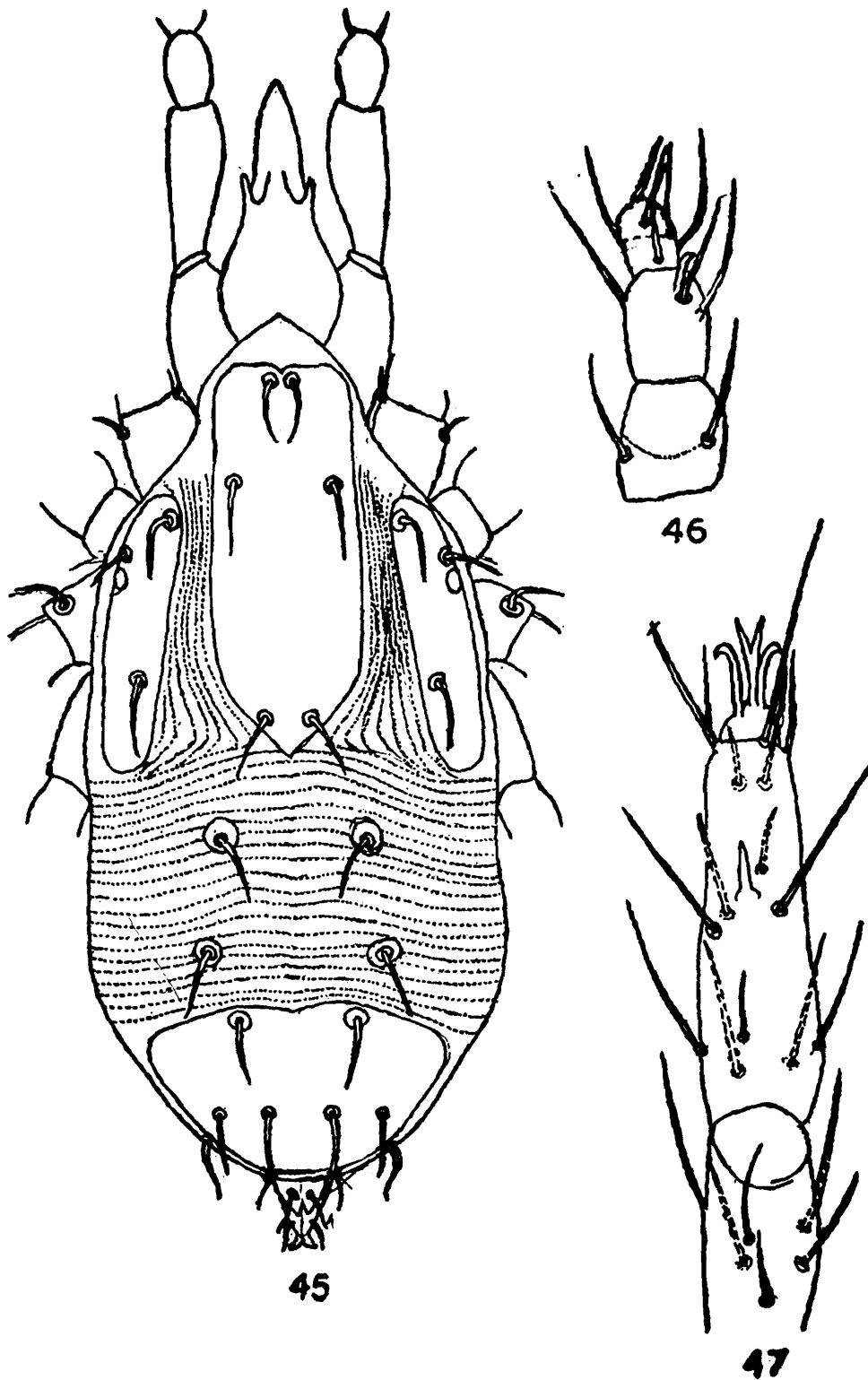
*Material examined* : 1 ♀, WEST BENGAL : Midnapur Dist., Patharkumkumi, 17.vii.1977, ex nest of *Ploceus philippinus*.

*Remarks* : This is a plant feeding species and its occurrence in bird nest is somewhat accidental. The mite might have dropped into the nest from the leaf infested with the mite.

Family : ERYTHRAEIDAE Oudemans

ERYTHRAEID MITE

*Material examined* : One species of erythraeid mite in several examples was collected ex nest of *Passer domesticus*, 21.v. 1979, as well as from nest of *Streptopelia chinensis*, 9.v. 1980. The identity of this species could not be determined for lack of literature.



Figs. 45-47. *Acheles meyeræ* sp. nov. ♀ : 45. dorsal surface, 46. palp, 47. terminal segments of leg I.

Family : TARSONEMIDAE Kramer

Genus : *Tarsonemus* Canestrini & Fanzago

15. *Tarsonemus* sp.

*Material examined* : 1 ♀, West Bengal :

Midnapur Dist., Patharkumkumi, 5.viii.1977,  
ex nest of *Ploceus philippinus*.

*Remarks* : Since no male specimen was available, the specific identity could not be determined.

Suborder : ASTIGMATA

Family : PROTOLICHIDAE

Genus : **Protolichus** Trouessart

16. **Protolichus** sp.

*Material examined* : 1 ♀, WEST BENGAL : Midnapur Dist., Patharkumkumi, 5. vii. 1977, ex nest of *Ploceus philippinus*.

*Remarks* : The specimen was badly damaged and its specific identity could not be ascertained.

Family : ACARIDAE Ewing & Nesbitt

Genus : **Tyrophagus** Oudemans

17. **Tyrophagus putrescentiae** (Schrank)

*Acarus putrescentiae* Schrank, 1718, *Enum. Inst. Aust.* Indig., 521.

*Material examined* : 1 ♀, WEST BENGAL : Midnapur Dist., Patharkumkumi, 26. vi. 1980, ex nest of *Ploceus philippinus*.

*Remarks* : This species was earlier recorded from nest of *Ploceus manyar flaviceps* in West Bengal (Gupta & Chattopadhyay, 1979). This is a cosmopolitan species and occurs in varied habitats.

Genus **Acarus** Linnaeus

18. **Acarus** spp.

*Material examined* : 3 ♀♀, WEST BENGAL : Midnapur Dist., Patharkumkumi, ex nest of *Ploceus philippinus* and *Prinia inornata*.

*Remarks* : Because of damaged conditions and for want of sufficient literature, the specific determination could not be ascertained.

Family : GLYCYPHAGIDAE Berlese

Genus **Glycyphagus** Hering

19. **Glycyphagus domesticus** (DeGeer)

*Glycyphagus domesticus* De Geer, 1778, *Mem. Hist. Ins.*, 7 : 106-109.

*Material examined* : 1 ♀, WEST BENGAL : Midnapur Dist., Patharkumkumi, 26. vi. 1980, ex nest of *Passer domesticus*.

*Remarks* : This is the first record of this species from birds' nest in India. It has been reported from house, especially in damp premises (Evans *et al.*, 1961). Woodroffe (1953) and Woodroffe and Southgate (1951) also reported this species from nests of birds.

20. **Glycyphagus destructor** (Schrank)

*Acarus destructor* Schrank, 1781, *Enum. Inst. Aust.* Indig., 521.

*Material examined* : 1 ♀, WEST BENGAL : Midnapur Dist., Patharkumkumi, ex nest of *Passer domesticus*, 29. vi. 1980.

*Remarks* : This species is reported from bird's nest for the first time from India. It is primarily a pest of stored products and it probably infested the nest through nesting material.

Suborder : MESOSTIGMATA

Family : PHYTOSEIIDAE Berlese

Genus : **Amblyseius** Berlese

21. **Amblyseius largoensis** (Muma)

*Amblyseiopsis largoensis* Muma, 1955, *Ann. Ent. Soc. Amer.*, 48 : 266.

*Material examined* : Several ♀♀, ♂♂, and nymphs, WEST BENGAL, Midnapur Dist., Patharkumkumi, on different dates : 20. viii. 1978, 15. viii. 1979, 21. vii. 1979, 18. vii. 1980, ex nest of *Ploceus philippinus*.

*Remarks* : This mite normally occurs on leaves of plants and sometimes on soil. This species may have infested the nest through twigs, leaves, etc. with which the nest was built.

Family : ASCIDAE Voigtes & Oudemans

Genus : *Asca* von Heyden

22. *Asca pseudospicata* Bhattacharyya

*Asca pseudospicata* Bhattacharyya, 1966, *Proc. Zool. Soc. Cal.*, 19 : 34-35.

*Material examined* : 1 ♀, WEST BENGAL : Midnapur Dist., Patharkumkumi, 21. vi. 1980, ex nest of *Ploceus philippinus*.

*Remarks* : This species was described on the basis of specimens collected from bamboo leaf litter, rotten straw, soil under banana plant, etc. Earlier, Gupta and Chattopadhyay (1979) reported *A. biswasi* Bhattacharyya, in the nest of *Lonchura striata*. It contaminates nests probably through nesting material.

Family : MACRONYSSIDAE Oudemans

Genus : *Ornithonyssus* Sambon

23. *Ornithonyssus* sp.

*Material examined* : 2 ♀ ♀, WEST BENGAL : Midnapur Dist., Patharkumkumi, 21. v. 1979, ex nest of *Passer domesticus*.

*Remarks* : The specimens were damaged and, hence, the species could not be determined. However, whatever examination was made it could be inferred that it belonged to neither of the *Ornithonyssus* species known from India. It may be mentioned here that Ramachandra Rao and Rajagopalan (1970) reported *O. bursa* from the nest of *Passer domesticus* while Gupta and Chattopadhyay (1979) reported *O. bacoti* from the nest of *Lonchura striata*.

Genus : *Steatonyssus* Kolenati

24. *Steatonyssus flabellifer* sp. nov.

(Figs. 48-49)

*Female* : Idiosoma 573 long, 443 wide. Podonotal shield-265 long, 265 wide, opistho-

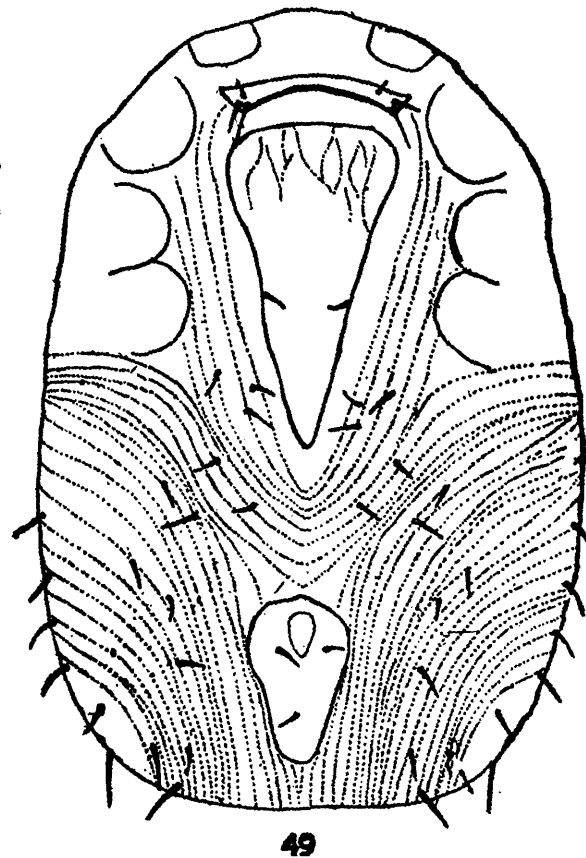
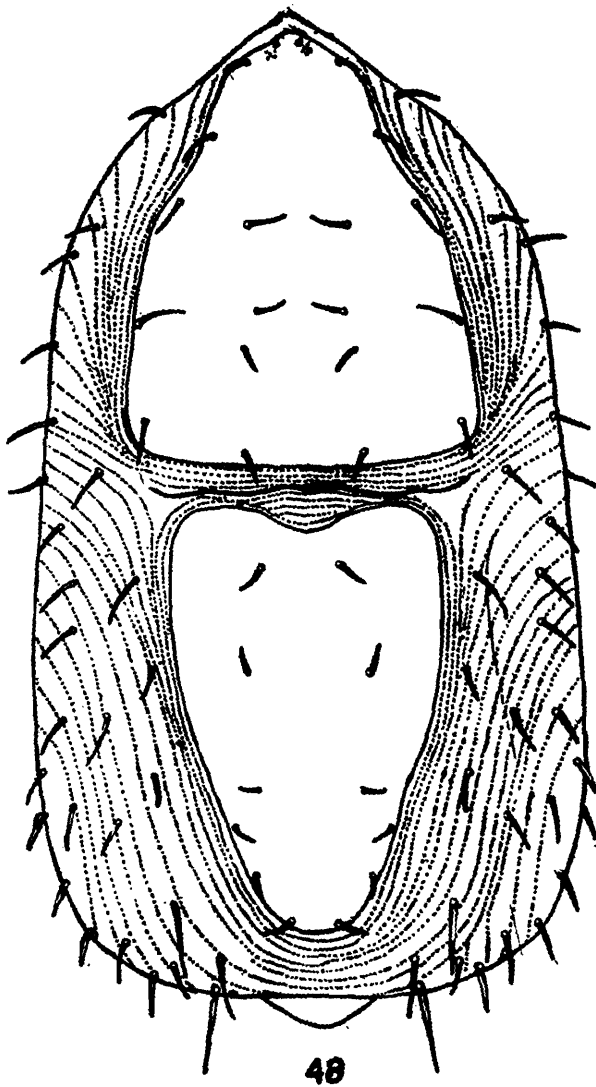
notal shield-295 long, 204 wide. Between podonotal and opisthonotal shields there is transverse striations. Podonotal shield with 10 pairs of setae, measuring 15-38 long; opisthonotal shield with 6 pairs of setae. All the setae smooth, simple, pointed. Striation in between podonotal and opisthonotal regions transverse, area lateral to the opisthonotal plate with longitudinal striations curving inwards. At least 6 pairs of setae present on the interscutal membrane on either side of the podonotal shield and over 16 pairs of setae on interscutal membrane on either side of the opisthonotal shield. Ventrally sternal shield much broader than long, posterior band sclerotized with 3 pairs of setae, posteriormost pair being longest. Genital plate-268 long, 134 wide with a pair of small setae. Anal plate 134 long, 90 wide, anterior margin slightly projected into knob like structure. Ventral surface on the either side of anal plate setose.

*Legs* : All legs of uniform length.

*Holotype* ♀, INDIA : WEST BENGAL : Midnapur Dist., Patharkumkumi, 15.vii.1979, ex nest of *Ploceus philippinus*, ZSI Reg. No. 3232/17.

*Paratypes* : 2 ♀ ♀, data same as for holotype, ZSI Reg. No. 3233/17. Both holotypes and paratypes are on same slide.

*Remarks* : This species is very close to *Steatonyssus allredi* Advani and Vazirani (1981) but is distinguished from it by the presence of 6 pairs of setae on the opisthonotal plate, instead of 5 pairs as in *S. allredi*; the sternal shield is less wide, with setae St 3 much longer; and in having a lesser number of setae in the region around the anal plate. The shape of the anal plate also differs and serves as a distinguishing character.



Figs. 48-49. *Steatonyssus flabellifer* sp. nov. ♀ : 48. dorsal surface, 49. ventral surface.

Family : ASCIDAE Voigts & Oudemans

Genus : *Lasioseius* Berlese

25. *Lasioseius* sp.

*Material examined* : 1 ♀, WEST BENGAL :  
Midnapur Dist., Patharkumkumi, 18.vi.1977,  
ex nest of *Ploceus philippinus*.

Suborder : CRYPTOSTIGMATA

Family : ORIBATULIDAE Thor

Genus : *Scheloribates* Berlese

25. *Scheloribates albialatus* Hammer

*Scheloribates albialatus* Hammer, 1961, *Biol. Skr.*  
*Dan. Vid. Selsk.*, 13 (1) : 94.

*Material examined* : 4 ♀ ♀, WEST BENGAL, Midnapur Dist., Patharkumkumi, ex nest of *Passer domesticus* ; 1 ♀, same locality, ex nest of *Streptopelia chinensis*.

*Remarks* : This is the first report of *Schelorbates* mite occurring in bird nest. Earlier, Nolan (1955) reported *Oribatula* (*Zygoribatula*) sp. and *Trichoribates* from nest of Prairie warbler (*Dendroica discolor*). Ramachandra Rao & Rajagopalan (1970) also reported some undetermined species of oribatid mites from the nests of *Corvus* sp., *Passer domesticus* and *Acridethers tristis*.

Family : PARAKALUMMIDAE Grandjean

Genus : **Protokalumma** Jacot

#### 26. **Protokalumma** sp.

*Material examined* : 2 ♀ ♀, WEST BENGAL : Midnapur Dist., Patharkumkumi, 9.v.1980, ex nest of *Streptopelia chinensis*.

#### DISCUSSION

The results reveal that except *Protolichus* sp. and *Ornithonyssus* sp., none of the other species are true ectoparasites of birds. Most of the other mites are either scavengers or predators upon other microarthropods. The only feather mite which was collected was *Protolichus* sp. It may be mentioned that earlier studies in this regard from India (Ramachandra Rao and Rajagopalan, 1970 and Gupta & Chattopadhyay, 1979) failed to report a single feather mite from birds' nests. The most interesting feature is the variety of prostigmatid mites (8 families) that were collected in the present study and among them, besides Tarsonemidae and Tetranychidae, a majority are known to be efficient predators. As far as the references available to the authors, no report is avail-

able on the occurrence of the mites belonging to the families Bdellidae, Stigmaeidae and Raphignathidae in bird nests. Nolan (1955) reported the occurrence of Tarsonemidae in bird nests while Delfinado (1976, 1978) reported a number of species including some new ones of *Tarsonemus* and *Steneotarsonemus* from bird nests. Another interesting point is the occurrence of a good number of mites belonging to Acaridae which do normally occur in stored products. This confirms the earlier observations of Baker *et al.* (1976) but unlike the latter, no mites belonging to Pyroglyphidae causing house dust allergy was available in the present study. This study also indicates that there is a vast scope of contributing in this aspect in India as the mite fauna of bird nests is not only rich but varied. Many of those, specially the haematophagous species may be of medical and veterinary importance as vectors of different diseases. In addition to mites, various other arthropods belonging to Araneida, Hemiptera, Coleoptera, Collembola, Orthoptera, Neuroptera, Psocoptera, Thysanoptera, Isopoda, Pseudoscorpiones and Dipteran larvae were also in the collection. However, nature of their association with bird nests is yet to be established.

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