INTRODUCTION

Mites belonging to the family Tetranychidae, commonly known as spider mites as they spin webs like spiders, are of immense economic importance as all are exclusively phytophagous and many are pests of a large number of agricultural crops, fruit trees, vegetables, etc. often doing colossal economic loss to the growers. The common damage symptoms caused due to these mites are stunting of plant growth, severe defoliation, reduction in yield and often various types of malformations and deformations of plant parts, fruit trees, etc. Besides causing direct damage, some species are known to transmit plant viral diseases e.g. potato virus-Y by *Tetranychus urticae* (Schulz, 1963), Dolichos Enation Mosaic Virus by *T. ludeni* (Rajagopalan, 1974), Beans Mosaic Virus, Cotton Curliness, etc. (Jeppson *et al.*, 1975). In the recent years, the random use of chlorinated hydrocarbons on one hand for killing general pests which has caused heavy destruction of natural enemies and the use of high yielding varieties and improved agricultural practices on the other, which accelerate the reproductive potentiality of mites, many tetranychids previously known to be innocuous have turned into major pests. This is the reason why the study of tetranychid mites has received worldwide attention and a good amount of work has been done on taxonomy, bio-ecology and control of these mites.

The family Tetranychidae was erected by Donnadieu (1875). Some of the monographic taxonomic works are : McGregor (1950), Bagdasarian (1957), Pritchard & Baker (1955), Wainstein (1960), Baker & Pritchard (1960), Tuttle & Baker (1964, 1968), Meyer (1974), Jeppson *et al.* (1975), Tuttle *et al.* (1974, 1976), Chaudhri *et al.* (1974), Smith-Meyer (1987), etc. Besides these, the other important taxonomic works are : Womersley (1940), Manson (1963-1967, 1967c), Reck (1948, 1959), Beer & Lang (1958), Fletchmann & Baker (1970, 1975), Chaudhri (1971-1972), Baker (1979), Baker & Tuttle (1972), Mitrofanov (1977) ; Mitrofanov *et al.* (1975), etc. According to Baker (1979) about 800 species are known from the world.

The Indian works on tetranychid taxonomy are : Hirst (1923, 1926), Rahman & Sapra (1940), Ghai (1964), Ghai & Menon (1971), Menon & Ghai (1968, 1968a), Prasad (1975, 1975a, 1975b, 1975c), Gupta (1970, 1976), Gupta & Gupta (1976), Sadana (1985), Sadana & Chhabra (1980, 1980a, 1980b), Sadana *et al.* (1983, 1985), Gupta & Gupta (1976a, 1977, 1978), Nassar & Ghai (1981), ChannaBasavanna & Banu (1972), ChannaBasavanna & Lakkundi (1977), etc. ChannaBasavanna (1971), Prasad (1974), Gupta (1979) and Gupta (1983) reviewed the taxonomic works on Indian Tetranychidae

and reported 21 species, 31 species, 55 species and 83 species, respectively. Gupta (1985) in his Handbook on Indian plant mites included 82 species under 18 genera while Gupta (1991) in his State of Art Report on Indian mites reported the occurrence of 100 species under 20 genera from India.

The present paper includes a total of 101 species under 2 subfamilies, 6 tribes and 19 genera so far known from India. Out of these, descriptions and illustrations are provided for 87 valid species including 6 new ones. Besides, for the known species, synonymies, host records in India and abroad, detailed distributions and economic importance for pest species are provided. The remaining 14 species, which are included at the end as "Dubious Records", are those which were not accessible to the authors for re-checking their identities or their occurrences in India appeared doubtful due to various reasons or some appear to be cases of misidentifications. So, for those species, only the relevant references along with their hosts and distributions are provided without giving their detailed descriptions, illustrations and, except in respect of 1 or 2 species, most of those were not included in Keys pending establishing their true identities. In addition, a brief discussion has been made regarding general morphology having relevance on taxonomy of the family and zoogeographical distribution.

All the measurements given in the descriptions of species are in microns. The types of the new species described here are in the National Collection of the Zoological Survey of India.

General Morphology

The body is differentiated into gnathosoma and idiosoma (Fig. 1).

Gnathosoma: This part includes a pair of chelicerae and pedipalpi with mouth opening lying in between.

Chelicera: It is a fine needle-like structure (Fig. 2) enclosed in stylophore formed by fusion of cheliceral bases.

Pedipalpi: Each pedipalp is 5 segmented, possesses a thumb claw complex and each segment bears a complement of setae. Dorsal setae on second palpal segment of male is usually swollen and the terminal sensillum on the 5th palpal segment of male is usually more slender than that of female. Three tactile setae and 4 sensory setae are present on 5th segment. Out of sensory setae, one is fusiform, 2 are tapering and 1 is the terminal sensillum rounded at the tip. Shape and chaetotaxy of palpi vary (Figs. 3-14) and these form important taxonomic characters.

Peritreme : It is provided with two arms (Fig. 15) which diverge on the dorsal

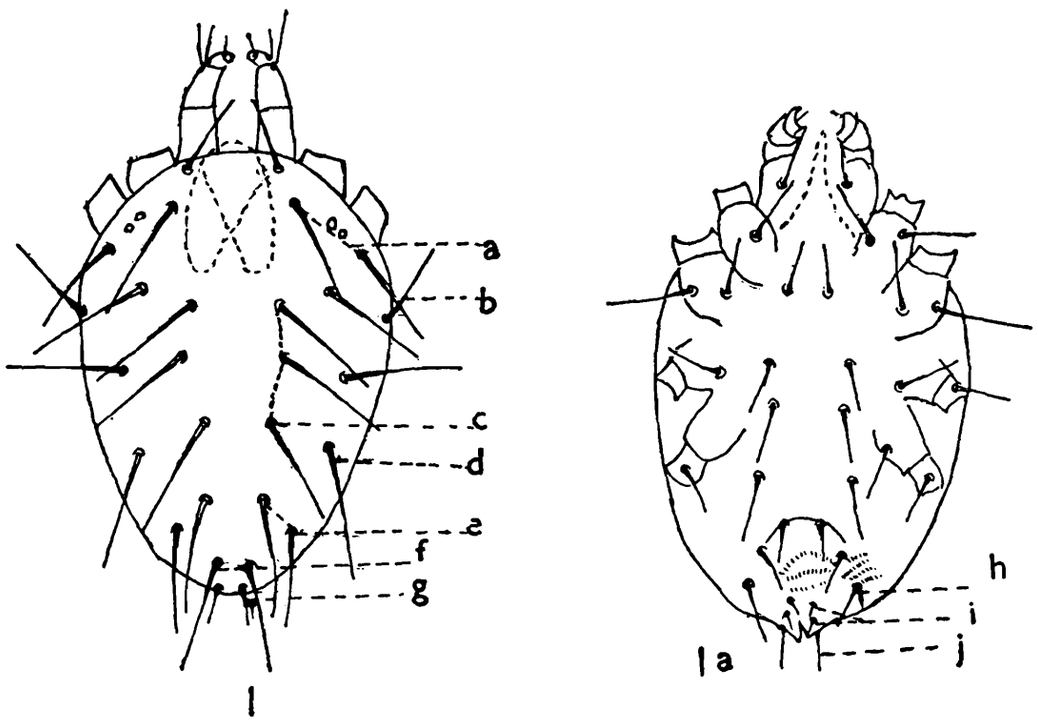


Fig. 1 : Dorsum of body of a tetranychid mite showing dorsal idiosomal setae : a- Propodosomal seta, b- humeral seta, c- dorsocentral hysterosomal setae, d- dorsolateral hysterosomal seta, e- sacral setae, f- clunal setae, g- postanal seta.

Fig. 1a : Venter of body of tetranychid mite showing ventral setae : h- anterior paraanal seta, i- anal setae, j- postanal seta.

surface of stylophore. The ends of the bulb may be simple, bulging or anastomosing or sometimes hooked (Figs. 15-29).

Idiosoma :

Dorsal surface : Dorsal integument may be variously striated and this pattern serves as important character for separation of species. Idiosoma is composed of two parts, the anterior part or Propodosoma which bears 3-4 pairs of setae and a pair of eyes (Fig. 1) and the posterior part or the Hysterosoma bearing 8-13 pairs of setae arranged in different rows like dorsocentral, dorsolateral, humeral, sacral and clunal (Fig. 1). Propodosoma may be with anterior projections (Figs. 45-46) e.g. *Monoceronychus* with 3 projections (one median, two lateral), *Mesobryobia* with 2 projections (both lateral) or *Bryobia* with 2 projections each with a palmate seta or the projections are altogether lacking as in most of the genera. Striation pattern of propodosoma is mostly longitudinal. Idiosomal setae are of diverse types (Figs. 30-43), may or may not borne on tubercles. The nature of setae, number of setae, relative length of setae and relative position of setae serve as important taxonomic characters,

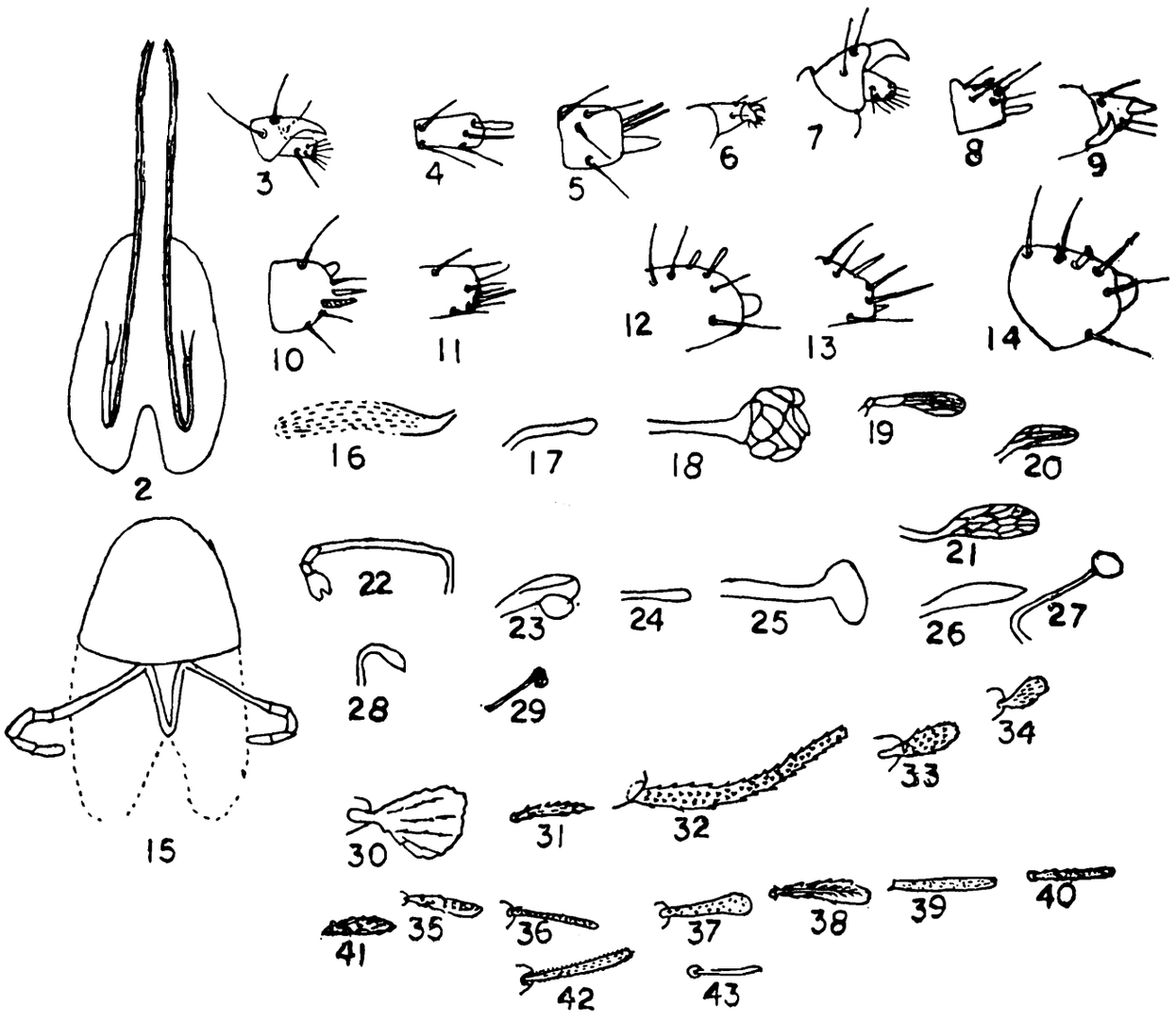


Fig. 2 : Stylophore and chelicerae of tetranychid mite.

Figs. 3- 14 : Terminal sensilla of palpi of female in different tetranychid genera. 3- *Bryobia*, 4- *Bryobiella*, 5- *Porcupinychus*, 6- *Mesobryobia*, 7- *Neopetrobia*, 8- *Eutetranychus*, 9- *Tenuipalponychus*, 10- *Schizotetranychus*, 11- *Bakerina*, 12- *Panonychus*, 13- *Eotetranychus*, 14- *Tetranychus*.

Fig. 15 : Anterior portion of propodosoma of tetranychid mite (*Eotetranychus uncatus*) showing location of peritreme (after Pritchard & Baker, 1955).

Figs. 16-29 : Termination of peritreme in different tetranychid genera : 16- *Bryobia*, 17- *Bryobiella*, 18- *Porcupinychus*, 19- *Mesobryobia*, 20- *Monoceronychus*, 21- *Neopetrobia*, 22- *Petrobia*, 23- *Eutetranychus*, 24- *Aponychus*, 25- *Tenuipalponychus*, 26- *Schizotetranychus*, 27- *Bakerina*, 28- *Panonychus*, 29- *Platytetranychus*.

Figs. 30-43 : Dorsal idiosomal setae in different tetranychid genera : 30- *Bryobia*, 31- *Bryobiella*, 32- *Porcupinychus* 33- *Mesobryobia*, 34- *Monoceronychus*, 35- *Neopetrobia*, 36- *Petrobia*, 37- *Eutetranychus*, 38- *Aponychus*, 39. *Tenuipalponychus*, 40- *Schizotetranychus*, 41- *Bakerina*, 42- *Panonychus*, 43- *Platytetranychus*.

Ventral surface : Ventral portion (Fig. la) also possesses striae showing variations specially at the opisthosomal region. The number of anal and preanal setae serves as

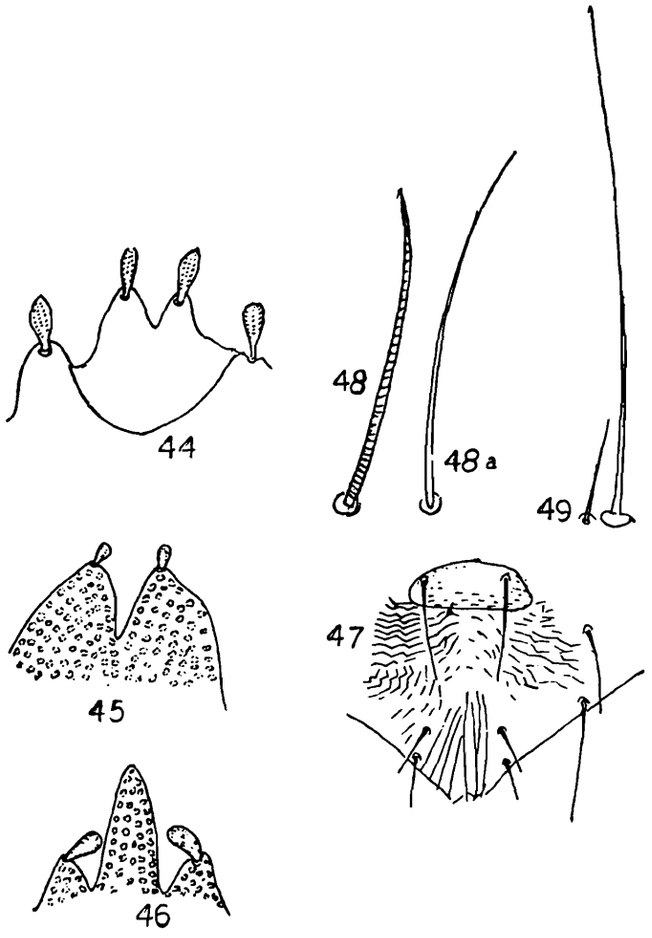
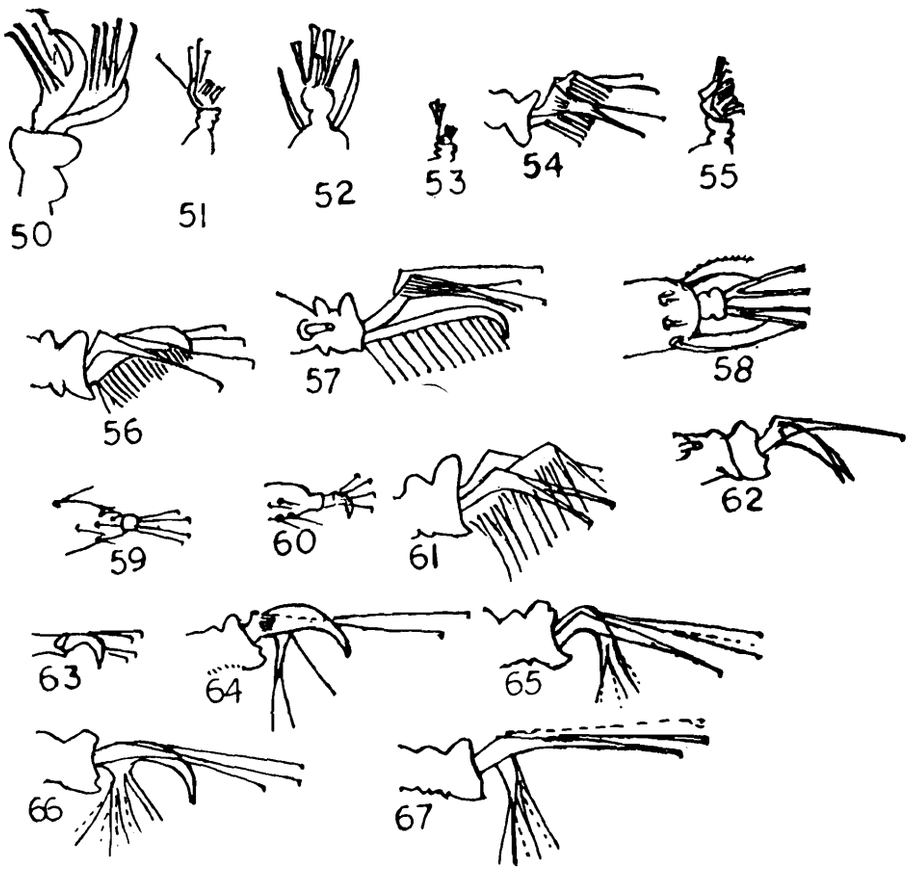


Fig. 44 : Female prodorsal lobes (enlarged) of *Bryobia*.
Fig. 45 : Female prodorsal lobes (enlarged) of *Mesobryobia*.
Fig. 46 : Female prodorsal lobes (enlarged) of *Monoceronychus*.
Fig. 47 : Opisthosomal venter showing setation of genital area.
Fig. 48 : Sensory seta.
Flg. 48a : Tactile seta.
Fig. 49 : Duplex setae.

useful tool for separation of species. Genital portion of female possesses characteristic wrinkles (Fig. 47) which is lacking in males.

Legs : Nymphs and adults have 4 pairs of legs while larvae have 3 pairs of legs. All the 6 leg segments possess setae and those on tibia and tarsus are of two types, sensory, being thin walled, blunt tipped with transverse striation (Fig. 48) and tactile, being thick walled, pointed tipped and smooth (Fig. 48a). Tarsi of leg I and II have

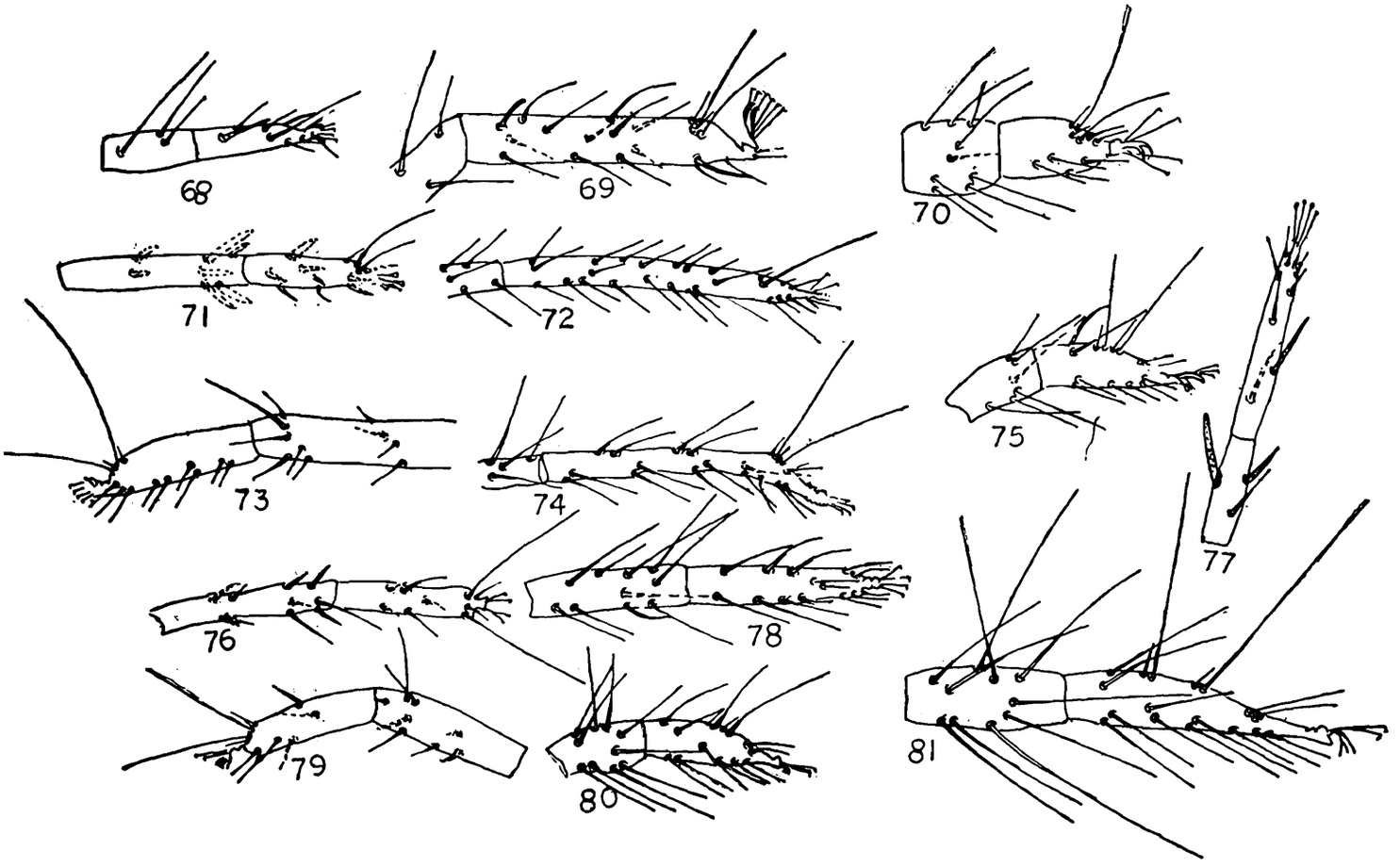
a specialised pair of setae called duplex setae (Fig, 49) and the position of duplex setae helps in separation of genera. The pretarsi is furnished with 2 claws and empodium,



Figs. 50-67 : Tarsal appendages in different tetranychid genera : 50-*Bryobia*, 51-*Bryobiella*, 52-*Porcupi -nychus*, 53-*Mesobryobia*, 54-*Monoceronychus*, 55-*Neopetrobia*, 56-*Petrobia*, 57-*Tetranychus*, -58-*Eutetranychus*, 59-*Aponychus*, 60-*Tenuipalponychus*, 61-*Aplonobia*, 62-*Schizotetranchus*, 63-*Bakerina*, 64-*Panonychus*, 65-*Eotetranychus*, 66-*Oligonychus*, 67-*Tetranychus*.

Claws may be provided with tenent hairs (Fig. 50) or those may be lacking. The variation in structure of pretarsi as shown in figs. (Figs. 50-67) serves as important tool in separation of genera. The chaetotaxy of tibia and tarsus I of female varies in different genera (Figs. 68-81) and that character helps in separation of genera.

Aedeagus : Aedeagus of male is of diverse shape and this is one of the most important characters for identifying species.



Figs. 68-81 : Tibia and tarsus I of female in different tetranychid genera : 68-*Bryobiella*, 69-*Bryobia*, 70-*Schizotetranychus*, 71-*Porcupinychus*, 72-*Tetranychina*, 73-*Mesobryobia*, 74-*Petrobia*, 75-*Oligonychus*, 76-*Monoceronychus*, 77-*Aponychus*, 78-*Eutetranychus*, 79-*Neopetrobia*, 80-*Eotetranychus* 81-*Tetranychus*.

Family : TETRANYCHIDAE Donnadieu

Tetranycides Donnadieu, 1875 : 9.

Tetranychidae Murray, 1877 : 93 ; Pritchard & Baker, 1955 : 4 ; Wainstein, 1960 : 88 ; Tuttle & Baker : 1968 : 1 ; Gupta, 1985 : 39.

Key to the Subfamilies, Tribes and Genera of Tetranychidae known from India : (after Smith-Meyer 1987)

1. Empodium with tenent hairs ; females with 3 pairs of anal setae and males with 5 pairs of genitoanal setae ... Bryobiinae, 2

— Empodium without tenent hairs or empodium may be absent ; females with 2 or 1 pair of anal setae and males with 3-4 pairs of genitoanal setae ... Tetranychinae, 10

2.	True claw uncinate or if pad-like, prodorsum with well developed setiferous lobes, empodium pad-like ...	Bryobiini, 3
—	True claw pad-like, pad rarely with a strong hook on midventral surface ; anteriorly prodorsum may have 0-3 setiferous lobes ; empodium pad-like or uncinate ...	... 4
3.	Prodorsum with 6 (3 pairs) setae ...	*Bryobiella*
—	Prodorsum with 8 setae (4 pairs) ...	*Bryobia*
4.	True claw prd-like but rarely with a mid-ventral hook; empodium pad-like	Hystrichonychini, 6
—	True claw pad-like and empodium uncinate distally with midventral hook ...	Petrobiini 5
5.	Dorsal body setae not on tubercles ...	*Petrobia*
—	Dorsal body setae on tubercles ...	*Tertanychina*
6.	Opisthosoma with 8 or 9 pairs of dorsal body setae ...	*Porcupinychus*
—	Opisthosoma with 10 or more pairs of dorsal body setae ...	... 7
7.	Propodosoma with projections or elevations over rostum, body elongate, about twice as long as broad or nearly so ...	... 8
—	Propodosoma without projections over rostrum ; body not elongate, considerably less than twice as long as broad ...	... 9
8.	With 2 anterior projections over rostrum ...	*Mesobryobia*
—	With 3 anterior projections over rostrum ...	*Monoceronychus*
9.	Dorsal body setae not on tubercles or set on small tubercles...	*Neopetrobia*
—	Some at least 4th pair of dorsocentrals and dorsolaterals ... or all dorsal body setae set on strong tubercles ...	*Aplonobia*
10.	Tarsus I dorsally with a single set of usually loosely associated duplex setae or duplex setae absent ...	Eutetranychini, 11
—	Tarsus I dorsally with 2 sets of closely associated duplex setae ...	Tenuipalpodini & Tetranychini, 13
11.	Female with 2 pairs of anal setae, 4th pair of dorsocentral setae in normal position ...	*Eutetranychus*
—	Female with 1 pair of anal setae, 4th pair of dorsocentral setae marginal ...	... 12

12.	Opisthosoma with 10 pairs of dorsal body setae ...	*Aponychus*
—	Opisthosoma with 9 pairs of dorsal body setae ...	*Stylophoronychus*
13.	Opisthosoma with 4th pair of dorsocentral setae marginal ...	Tenuipalpodini *Tenuipalponychus*
—	Opisthosoma with 4th pair of dorsocentrals in normal dorsal position or if more widely spaced than preceding three pairs of dorsocentrals, those setae situated well proximal to body margin ...	Tetranychini, 14
14.	With 2 pairs of paraanal setae	15
—	With 1 pair of paraanal setae	18
15.	Empodium claw-like, entire or splits bilaterally into 2 claw-like structures	16
—	Empodium ending into a tuft of hairs ...	*Eotetranychus*
16.	Empodium a single claw-like structure	17
—	Empodium splits bilaterally into 2 claw-like structures, usually with appendent hairs ...	*Schizotetranychus*
17.	Empodium without proximoventral hairs ...	*Bakerina*
—	Empodium with proximoventral hairs ...	*Panonychus*
18.	Tarsus I with duplex setae distal and approximate ...	*Oligonychus*
—	Tarsus I with duplex setae well separated dividing segments into 3 more or less equal parts ...	*Tetranychus*

Subfamily 1. BRYOBIINAE Berlese

Bryobiini Berlese, 1913 : 17.

Bryobiinae Reck, 1950 : 122 ; Pritchard & Baker, 1955 : 12 ; Wainstein, 1960 : 91 ; Tuttle & Baker, 1968 : 2 ; Meyer, 1974 : 5 ; Gupta, 1985 : 45 ; Smith-Meyer, 1987 : 6.

Tribe 1. BRYOBIINI Berlese

Bryobiini Berlese, 1913 : 17.

Genus 1. Bryobia Koch

Bryobia **Koch, 1836 : 8-9 ; Pritchard & Baker, 1955 : 14-15 ; van Eyndhoven, 1958 : 927-929 ; Meyer & Ryke, 1959 ; 354 ; Wainstein, 1960 : 94-100 ; Manson, 1967 : 76-80 ; Tuttle & Baker, 1968 : 4 ;**

Livshitz & Mitrofanov, 1971 : 5-48 ; Meyer, 1974 : 13 ; Gupta, 1976 : 329 ; Tuttle *et al.*, 1976 : 4 ; Gonzalez, 1977 : 634 ; Gupta, 1985 : 45 ; Smith-Meyer, 1987 : 6.

Nuciforella Vacante, 1984 : 74-71.

Type : *Bryobia praetiosa* Koch

Diagnosis : Adults have 4 pairs of setae on prodorsum, anterior 2 pairs on prominent lobes ; 12 pairs of dorsal setae located on opisthosoma ; 4th pair of dorso-central setae marginal ; peritreme either ends simply or anastomoses distally, all true claws or those on tarsi II-IV uncinate or provided with tenent hairs ; empodia II-IV pad-like and bears rows of tenent hairs, empodium on tarsus I may have one or more pairs of tenent hairs.

Key to the species of *Bryobia* known from India :

1.	Propodosomal and hysterosomal setae broadly spatulate	...	*praetiosa*
—	Propodosomal and hysterosomal setae subspatulate	...	*eharai*

1. Bryobia eharai Pritchard & Keifer
(Figs. 82-86)

Bryobia cristata Pritchard & Baker, 1955 : 22-26.

Bryobia eharai Pritchard & Keifer, 1958 : 506 ; Bindra & Singh, 1970 : 17-24 ; Gupta *et al.*, 1971 : 296-299 ; ChannaBasavanna & Banu, 1972 : 67-69 ; Prasad, 1974 : 112 ; Gupta, 1985 : 47.

Male : Not known.

Female : Body including rostrum 675 long, 498 wide. Terminal sensillum and dorsal sensillum absent, palp tarsus with 6 setae. Distal end of peritreme pad-like. Dorsal idiosomal setae 16 pairs, spatulate with serration and borne on tubercles. Tibia I with 10 tactile setae, tarsus I with 1 sensory and 7 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 4 tactile setae, tarsus II with 5 tactile setae proximal to duplex setae. Hysterosoma with widely spaced transverse striae, also slightly granulate. Inner sacrals slightly longer than outer sacrals ; clunals and outer sacrals of same length.

Known host in India : *Chrysanthemum* sp.

Known hosts outside India : *Chrysanthemum* sp., *C. morifolium*, *Colocasia antiquorum*.

Distribution : India (Maharashtra, Karnataka, Uttar Pradesh, Delhi, Jammu & Kashmir, Himachal Pradesh), Japan, Taiwan.

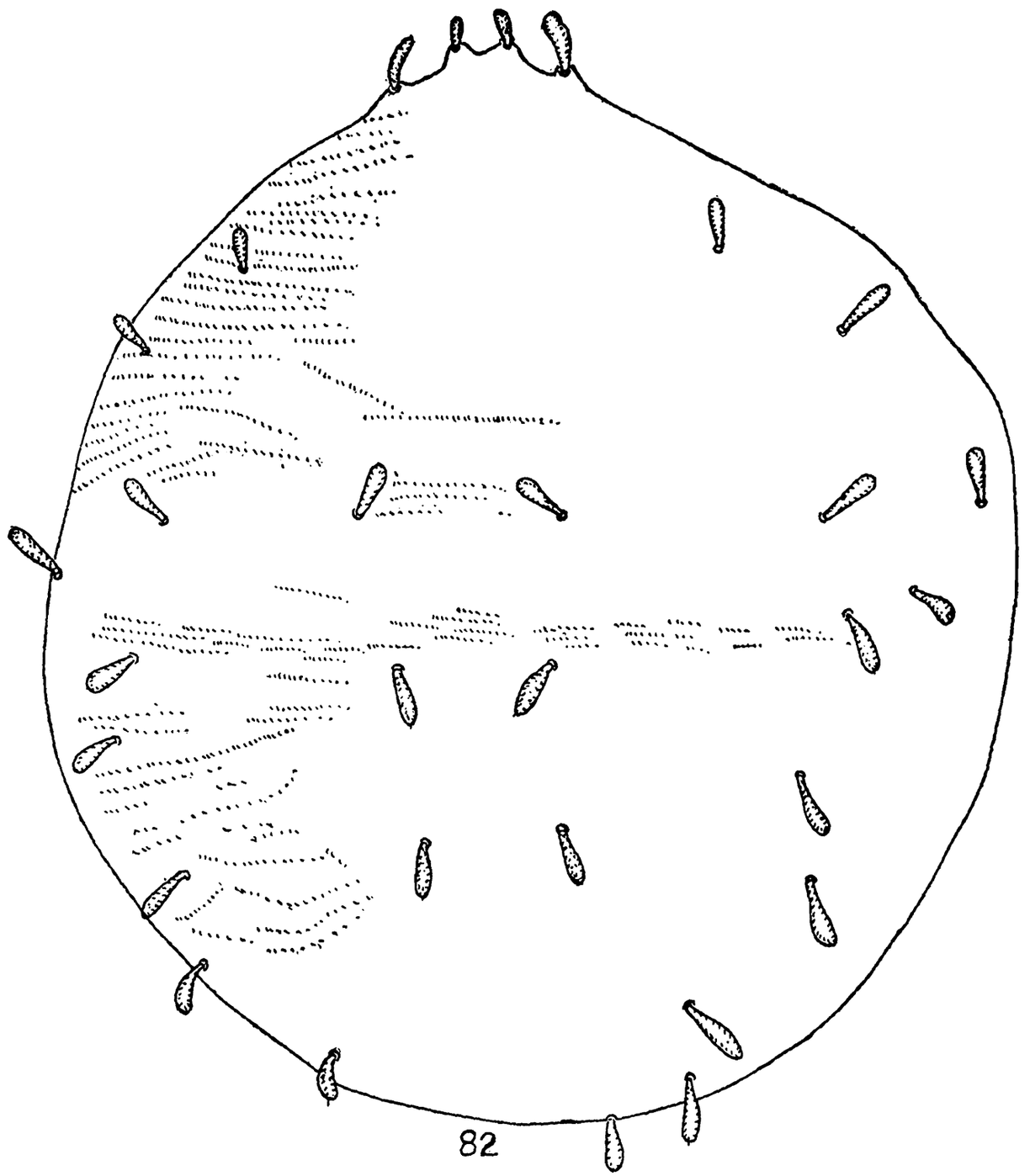
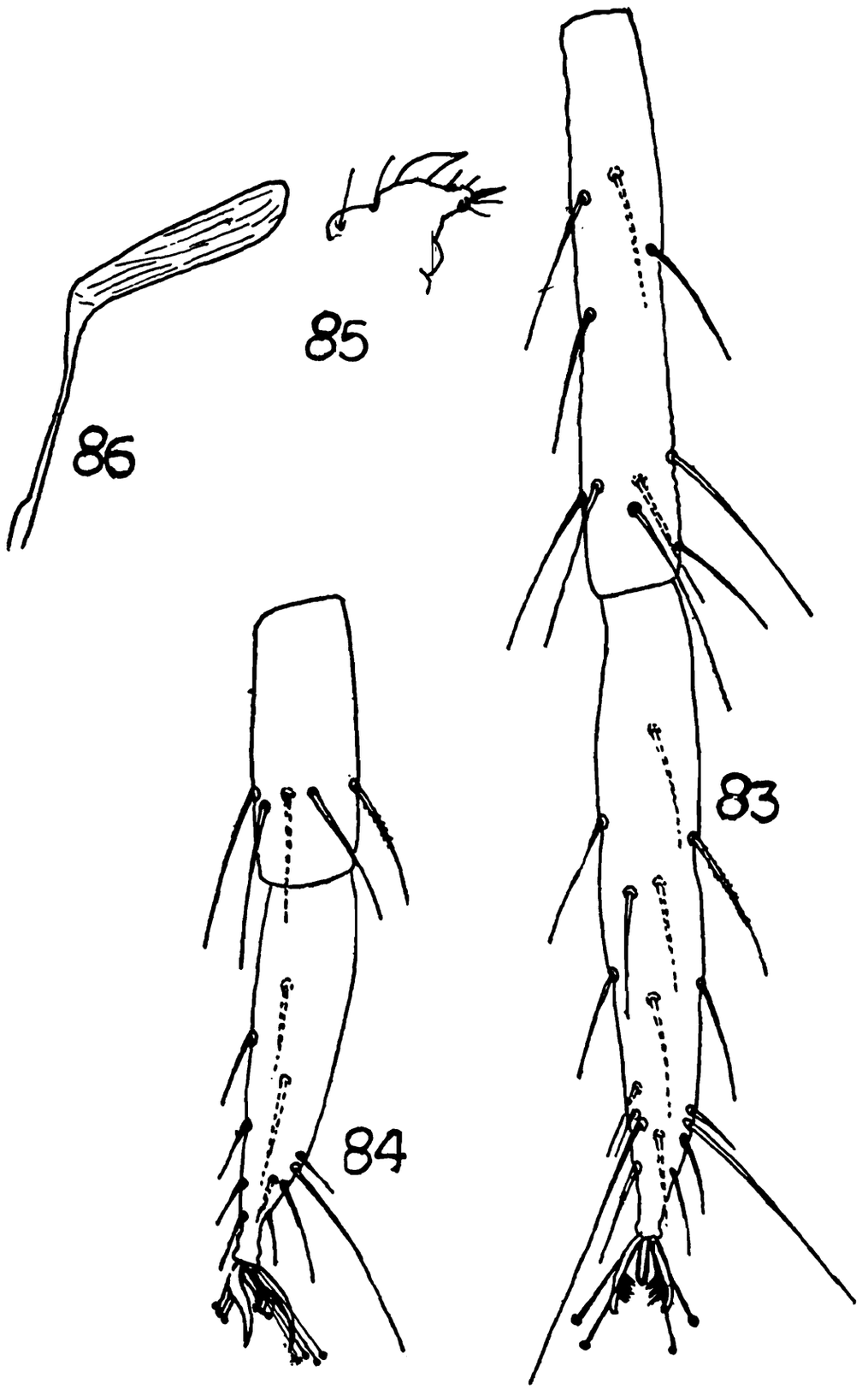


Fig. 82 : *Bryobia eharai* **: dorsum of female.**



Figs. 83-86 : *Bryobia eharai* : 83-tibia and tarsus I of female, 84-tibia and tarsus II of female, 85-distal segment of palpus of female, 86-peritreme of female.

2. Bryobia praetiosa Koch
(Figs. 87-91)

Bryobia praetiosa Koch, 1836 : 8 ; Pritchard & Baker, 1955 : 26 ; Meyer & Ryke, 1959 : 354-357 ; Mathys, 1961 : 295-304 ; Tuttle & Baker, 1968 : 6 ; Menon & Ghai, 1968a : 88 ; Prasad, 1974 : 112 ; Prasad, 1975b : 13 ; Tuttle *et al.*, 1976 : 5 ; Livshitz & Mitrofanov, 1971 : 59-60 ; Meyer, 1974 : 20-21 ; Gupta, 1985 : 47 ; Smith-Meyer, 1987 : 9-10.

Male : Not known.

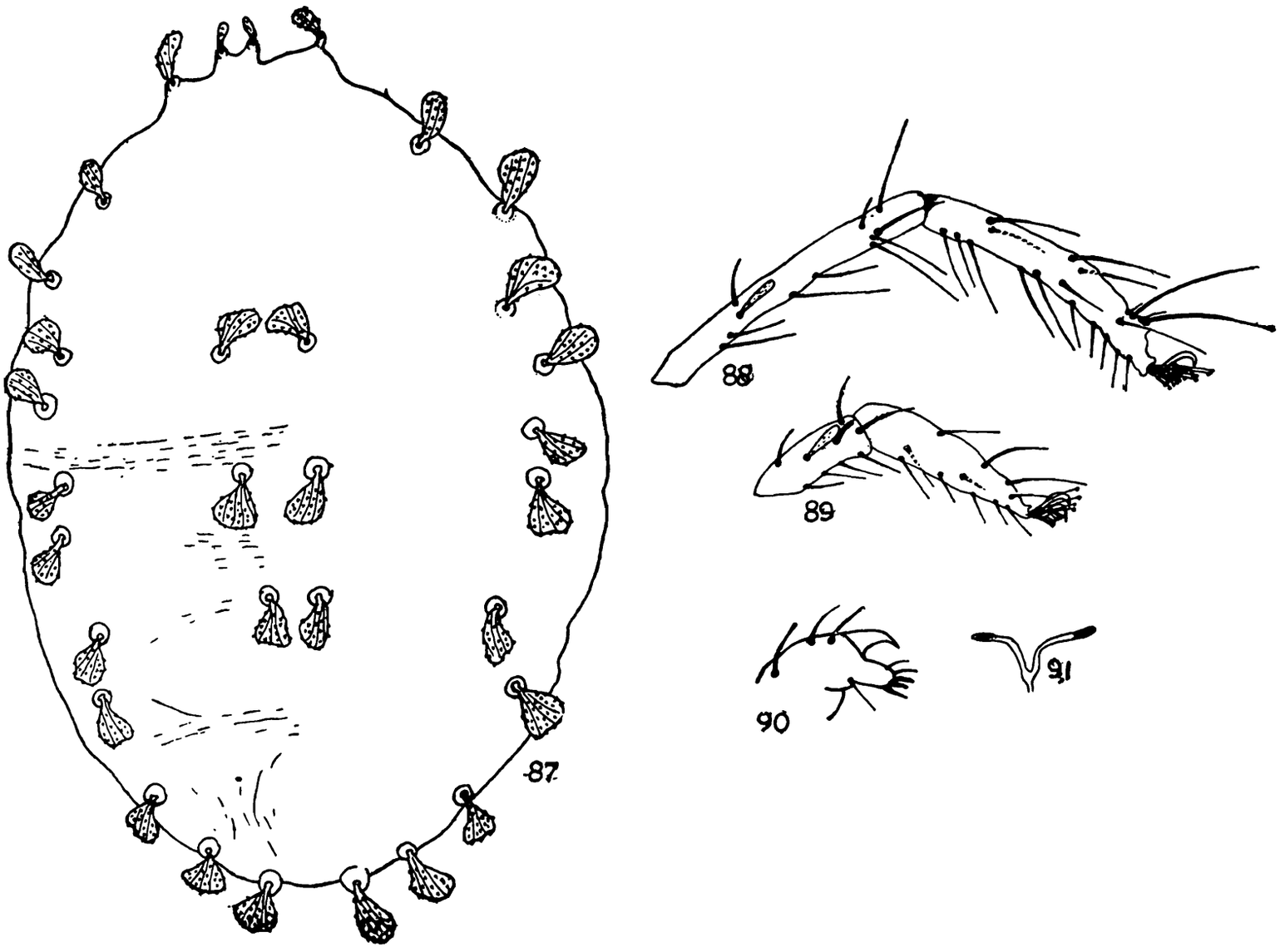
Female : Body including rostrum 693 long, 357 wide, 1st leg 653 long and longer than other 3 legs which are of same length and as long as body. Peritreme at distal end long and slender. Dorsum with 16 pairs of distal setae, spatulate, serrate and distal end broader with proximal end narrow making triangular fan-shaped. Tibia I with 2 sensory and 9 tactile setae ; tarsus I with 6 tactile setae proximal to duplex setae ; tibia II with 5 sensory and 5 tactile setae ; tarsus II with 4 tactile setae proximal to duplex setae. Outer, inner sacrals and clunals almost of same length and widely spaced. Genital flap with transverse striae. Medioventral setae of moderate size.

Known hosts in India : *Prunus communis* (plum), *Pyrus communis* (pear).

Known hosts outside India : *Abies pindrow*, *Achyranthes aspera*, *Adhatoda* sp., *Aesculus hippocastanum*, *Agropyron desertorum*, *A. smithi*, *Alnus nitida*, *Alternanthera* sp., *Althea rosea*, *Arctotheca calendula*, *Artemisia nova*, *A. tridentata*, *Atriplex cinerea*, *Atriplex suberecta*, *Brassica campestris*, *Brassica oleracea*, *Brassica rapa*, *B. rapa* var. *silvestris*, *Bromus willdenowii*, *Campanula medium*, *Chaerophyllum* sp.. cherry, *Chrysanthemum* sp., *C. nauseosus*, *Cornus* sp., *Crataegus monogyna*, *Crotoneaster bacillaris*, *Cucurbita pepo*. *Cupressus sempervirens*, *Daphne papyoacea*, *Debergeesis hypoleuca*, *Dianthus* sp., *Dicliptera clinopodea*, *Ficus palmata*, *Fragaria* sp., *Fragaria vesca*, *Forskaolea candida*, *Fumeria indica*, grass, *Hedera helex*, *Helianthus annuus*, *Heliotropium carassavicum*, *Hordeum vulgare*, Ibea creeper, *Iberis amara*, *Indigofera tinctoria*, *Juniperus* sp., *Lantana* sp., *Lectica*, Lentil, Liliaceae, *Litchi chinensis*, *Lonicera* sp., loquat, *Lycium europaeum*, *Malva parviflora*, *Medicago sativa*, nectarine, *Nerium indicum*, *Passiflora edulis*, *Pelargonium* sp., *Pentzia suffruticosa*, *Peristrophe* sp., *P. bicalyculata*, *Pinus* sp., *P. wallichiana*, *Prunus* sp., *P. cerasus*, *P. communis*, *P. domestica*, *P. persica*, *P. triloba*, *Pschscholizia california*, *Pyrus communis*, *P. malus*, *Ranunculus lactus*, *Raphanus sativus*, *Rhamnus virgata*, *Ribis inerme*, *Rosa indica*, *Sarcobatus vermiculatus*, sarcossa, *Senebiera didyma*, *Senecio barchellii*, *Senecio cineraria*, *Sphaera bonwilensis*, *Sphenoclea seylanica*, *Spinacea oleracea*, *Solanum dulcamara*; *S. tuberosum*, *Tagetes tenuifolia*, *Taxus baccata*, *Trifolium* sp., *Triticum aestivum*, *Verbascum thapsus*, *Vitis vinifera*, *Zantecleschia aethiopica*, *Zizyphus mauritiana*.

Distribution : India (Delhi, Himachal Pradesh, Punjab, Jammu & Kashmir, Uttar

Pradesh, West Bengal), Pakistan, Japan, Taiwan, Europe (Eastern part), U.S.A., South America, Southern part of Africa, Australia, New Zealand.



Figs. 87-91: *Bryobia praetiosa*: 87-dorsum of female, 88-tibia and tarsus I of female, 89-tibia and tarsus II of female, 90-Distal segment of palpus of female, 91-peritreme of female.

Remarks: It is often a serious pest of pear specially in northern India causing heavy defoliation.

Genus 2. Bryobiella Tuttle & Baker

Bryobiella Tuttle & Baker, 1968 : 15 ; Meyer, 1974 : 8 ; Gupta, 1985 : 48 ; Smith-Meyer, 1987 : 20.

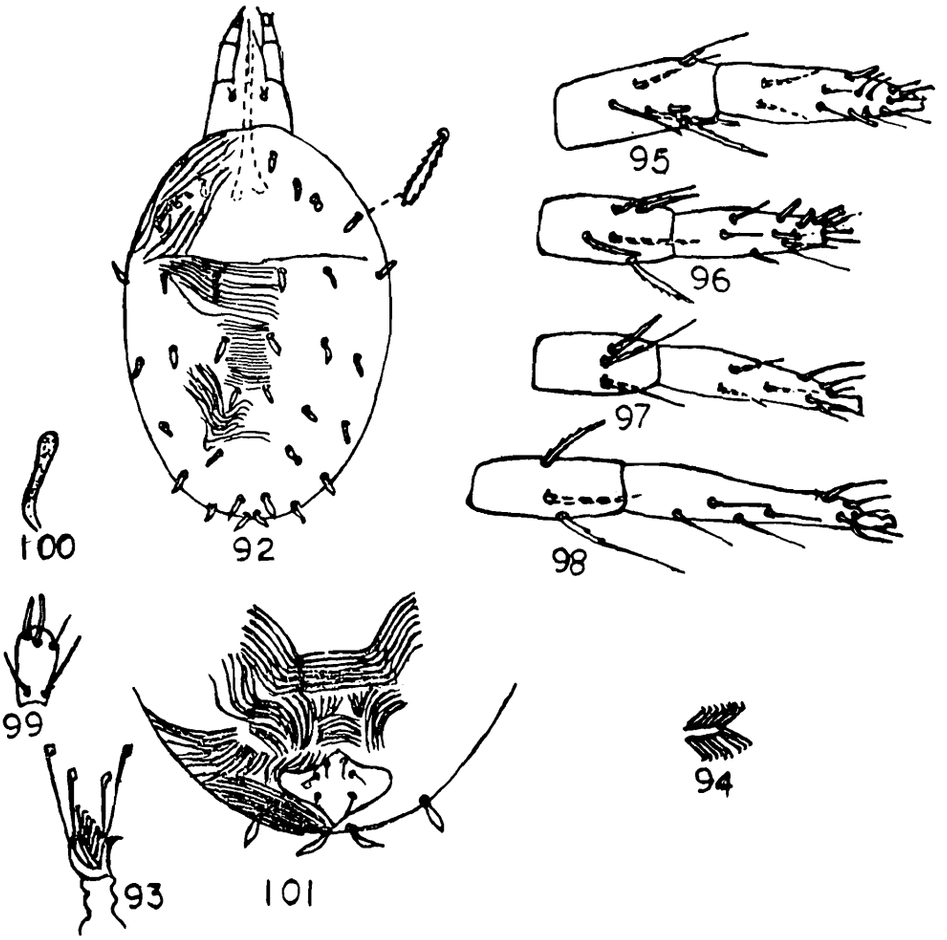
Type : *Bryobiella desertorum* Tuttle & Baker

Diagnosis : Three pairs of setae present on prodorsum, 14 pairs of opisthosomal setae including humeral, 2 pairs of paraanal setae located dorsally anterior to anal opening which is present terminally, true claws uncinate and each bearing a pair of tenent hairs ; duplex setae absent on tarsus I and II but solenidion present numbering 2 and 1 respectively.

3. **Bryobiella punjabensis** Prasad
(Figs. 92-101)

Bryobiella punjabensis **Prasad, 1975b : 13-16 ; Gupta, 1985 : 48-49.**

Male : Not known.



Figs. 92-101 : ***Bryobiella punjabensis*** **(after Prasad, 1975b) : 92- dorsum of female, 93- palp tarsus of leg I of female, 94- empodium of leg I, 95- tibia and tsrsus I of female, 96- tibia and tarsus II of female, 97- tibia and tarsus III of female, 98- tibia and tarsus IV of female, 99- palp tarsus of female, 100- distal end of peritreme of female, 101- opisthosomal region showing ventral striation and chaetotaxy.**

Female : Body including rostrum 547 long, 423 wide, stylophore simple, removed anteriorly. Dorsal side of palp with a small tubercle present on each side. Peritreme ends in simple bulb. Dorsal idiosomal setae 17 pairs ; 3 pairs on propodosoma and 14 pairs including 1 pair of humeral and 2 pairs of paraanals on hysterosoma. All setae short, leaf-like and borne on small tubercles. Two pairs of heavy, finely serrate setae present in genital area of which lateral being longer ; anals 2 paired, short and forked. Tibia I with 1 sensory, tarsus I with 2 sensory and tarsus II with 4 sensory setae.

Known host in India : House sparrow nest.

Known host outside India : Nil.

Distribution : India (Punjab).

Tribe 2. HYSTRICHONYCHINI Pritchard & Baker

Hystrichonychini Pritchard & Baker, 1955 : 35 ; Wainstein, 1960 : 120 ; Gupta, 1985 : 49.

Genus 3. **Porcupinychus** Anwarullah

Porcupinychus Anwarullah, 1966 : 71 ; Meyer, 1974 : 51 ; Gupta, 1985 : 54 ; Smith-Meyer, 1987 : 26.

Type : *Porcupinychus abutiloni* Anwarullah

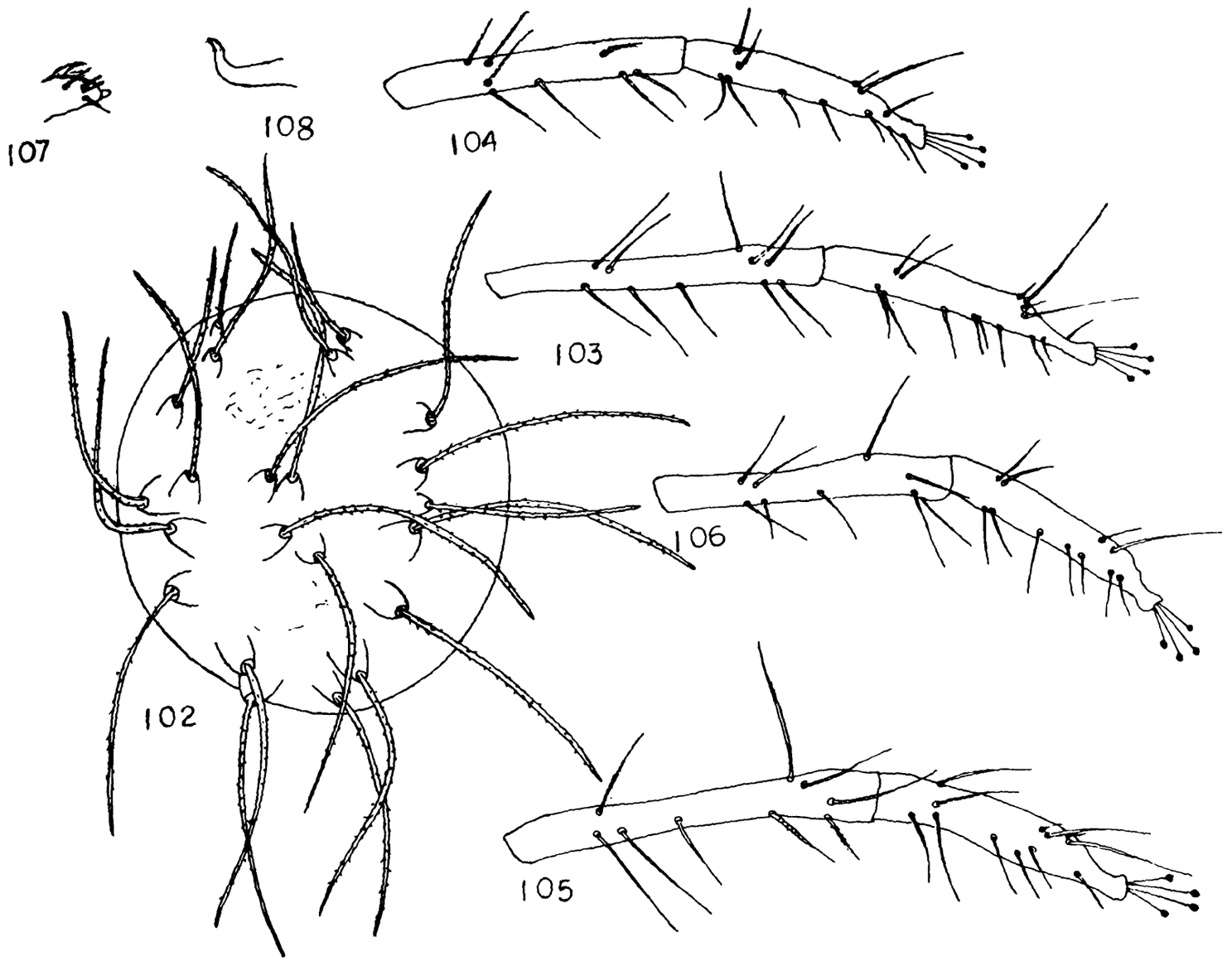
Diagnosis : Three pairs of setae on propodosoma ; 8 pairs of setae on opisthosoma ; dorsal body setae located on strong tubercles, opisthosomal setae consist of 3 pairs of dorsocentral setae, 1 pair of humeral and 4 pairs of dorsolateral setae, humeral setae contiguous with 1st pair of dorsolateral setae ; first 2 pairs of dorsocentral setae also contiguous, 3rd pair of dorsocentral setae marginal. True claws and empodia short pads, each bearing a pair of tenent hairs ; tarsus I with 2 pairs of duplex setae and tarsus II with 1 pair of duplex setae. Peritreme anastomosing distally.

4. **Porcupinychus abutiloni** Anwarullah
(Figs. 102-108)

Porcupinychus abutiloni Anwarullah, 1966 : 71 ; Tuttle & Baker, 1968 : 71 ; Prasad, 1975c : 24 ; Gupta, 1985 : 54-55 ; Smith-Meyer, 1987 : 26-27.

Male : Body including rostrum 432 long, 177 wide. Palpus with terminal sensillum small and conical ; dorsal sensillum not very clear. Peritreme elongated distally. Body more or less oval. Dorsal idiosomal setae 11 pairs, borne on strong tubercles, serrate and distal end pointed. Dorsal idiosomal setae much longer than the interval between their

longitudinal bases except second pair of dorsocentral setae which is much longer than others. Tibia I with 3 sensory and 6 tactile setae ; tarsus I with 5 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 8 tactile setae ; tarsus II with 1 sensory and 6 tactile



Figs. 102-108 : *Porcupinychus abutiloni* **: 102- dorsum of female, 103- tibia and tarsus I of female, 104- tibia and tarsus II of female, 105- tibia and tarsus I of male, 106- tibia and tarsus II of male, 107- dorsal segment of palpus of female, 108- aedeagus.**

setae proximal to duplex setae. All the legs with pad-like claws and empodia. Aedeagus shaft bends dorsal with a slightly sigmoid curve.

Female : Body including rostrum 393 long, 213 wide. Body oval shaped. Palpus with terminal sensillum longer than broad. Peritreme at the distal end enlarged. Dorsal

idiosomal setae long, slender, serrate and pointed at tips, borne on strong tubercles. Tibia I with 1 sensory and 9 tactile setae ; tarsus I with 1 sensory and 2 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 7 tactile setae ; tarsus II with 1 sensory and 2 tactile setae proximal to duplex setae. Genital flap with transverse striae. Medioventral setae of moderate size.

Known host in India : *Sida* sp.

Known hosts outside India : *Abutilon indicum Alhagi camelorous*, *Cassia holosericea*, *Cupressus sempervirens*, *Euphorbia* sp. ; *Malvastrum* sp., *Nerium indicum*, *Petunia alba*, *Pithecolobium dulce*, *Prosopis spicigera*.

Distribution : India (Punjab, Gujarat), Pakistan.

Genus 4. **Mesobryobia** Wainstein

Mesobryobia Wainstein, 1956 : 73 ; Tuttle & Baker, 1968 : 49 ; Gupta, 1985 : 51 ; Smith-Meyer, 1987 : 32.

Monoceronychus (*Mesobryobia*) Wainstein, 1960 : 124 ; Meyer, 1974 : 70.

Type : *Mesobryobia cervus* Wainstein

Diagnosis : Rostrum with 2 anterior projections each bearing a seta, 4th pair of dorsocentral setae situated further apart than first 3 pairs but not quite marginal ; last three pairs of opisthosomal setae may be on tubercles ; claws and empodia pad-like with tenent hairs ; peritreme elongate and anastomosing terminally.

5. **Mesobryobia jobneri** Prasad
(Figs. 109-114)

Mesobryobia jobneri Prasad, 1975c : 20-22 ; Gupta, 1985 : 51 ; Smith-Meyer, 1987 : 34.

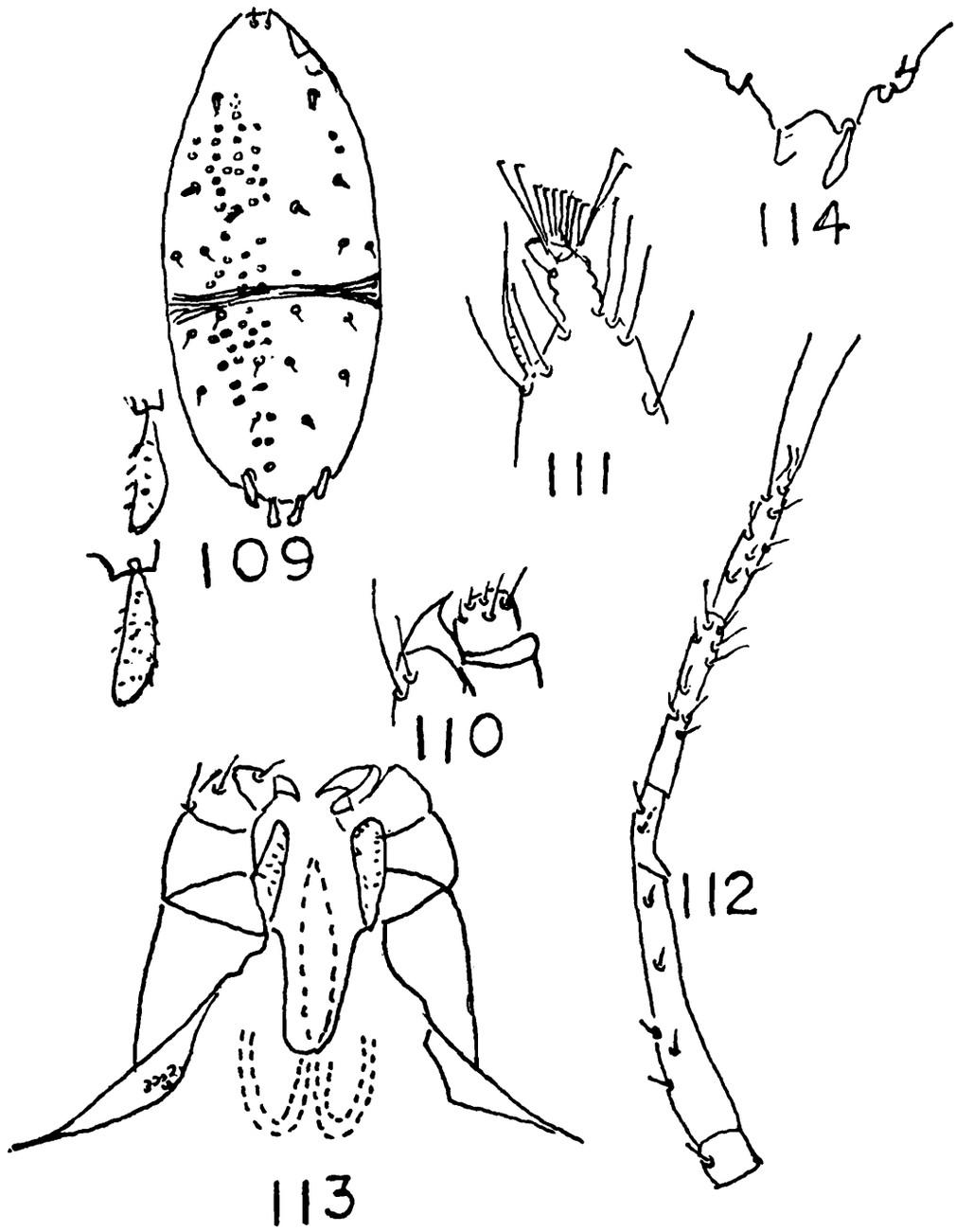
Male : Not known.

Female : Body including rostrum 485 long, 248 wide. Stylophore rounded anteriorly. Peritreme anastomosing at distal end. Palpal thumb with 1 sensory and 4 tactile setae. Dorsal idiosomal setae 13 pairs, all setae comparatively very thin and small except medio-propodosomal one, two, lateral hysterosomal 4 and clunals which are well separated, large. Laterohysterosomal 4 and clunals borne on tubercles. Leg I comparatively longer than first leg. Some proximal setae on femur I borne on tubercles.

Known host in India : Napier grass.

Known host outside India : Nil.

Distribution : India (Rajasthan).



Figs. 109-114 : *Mesobryobia jobneri* (after Prasad, 1975) : 109- dorsum of female, 110- palp tarsus of female, 111- distal end of tarsus I, 112- leg I, 113- anterior part of propodosoma and gnathosoma, 114- posterior end of opisthosoma.

Genus 5. **Monoceronychus** McGregor

Monoceronychus McGregor, 1945 : 100 ; Pritchard & Baker, 1955 : 74 ; Wainstein, 1960 : 123 ; Tuttle & Baker, 1968 : 30 ; Meyer, 1974 : 78-79 ; Tuttle *et al.*, 1976 : 11 ; Gupta, 1985 : 51 ; Smith-Meyer, 1987 : 37.

Type : *Monoceronychus californicus* McGregor

Diagnosis : Body elongate, prodorsum with 3 projections and 3 pairs of dorsal setae ; opisthosoma bears 10 pairs of dorsal body setae ; 4th pair of dorsocentral setae widely spaced and usually located marginally ; true claws and empodium pad-like.

6. **Monoceronychus terpoghossiani** Bagdasarian
(Figs. 115-116)

Petrobia ter-poghossiani Bagdasarian, 1959 : 139-142.

Monoceronychus terpoghossiani, Wainstein, 1960 : 126-128 ; Menon & Ghai, 1968a : 88 ; Prasad, 1974 : 115-116 ; Gupta, 1976 : 329 ; Gupta, 1985 : 51-52.

Mesobryobia ter-poghossiani Tuttle & Baker, 1968 : 47.

Diagnosis : The peritreme at the distal end anastomosing. Rostrum having 2 projections each having a seta. All idiosomal setae not borne on tubercles and much apart from the rest three pairs. The 4th laterals and 5th dorsocentrals elongate. Empodial claws pad-like with tenent hairs.

Known host in India : An unidentified species of grass.

Distribution : India (Delhi), Armenia.

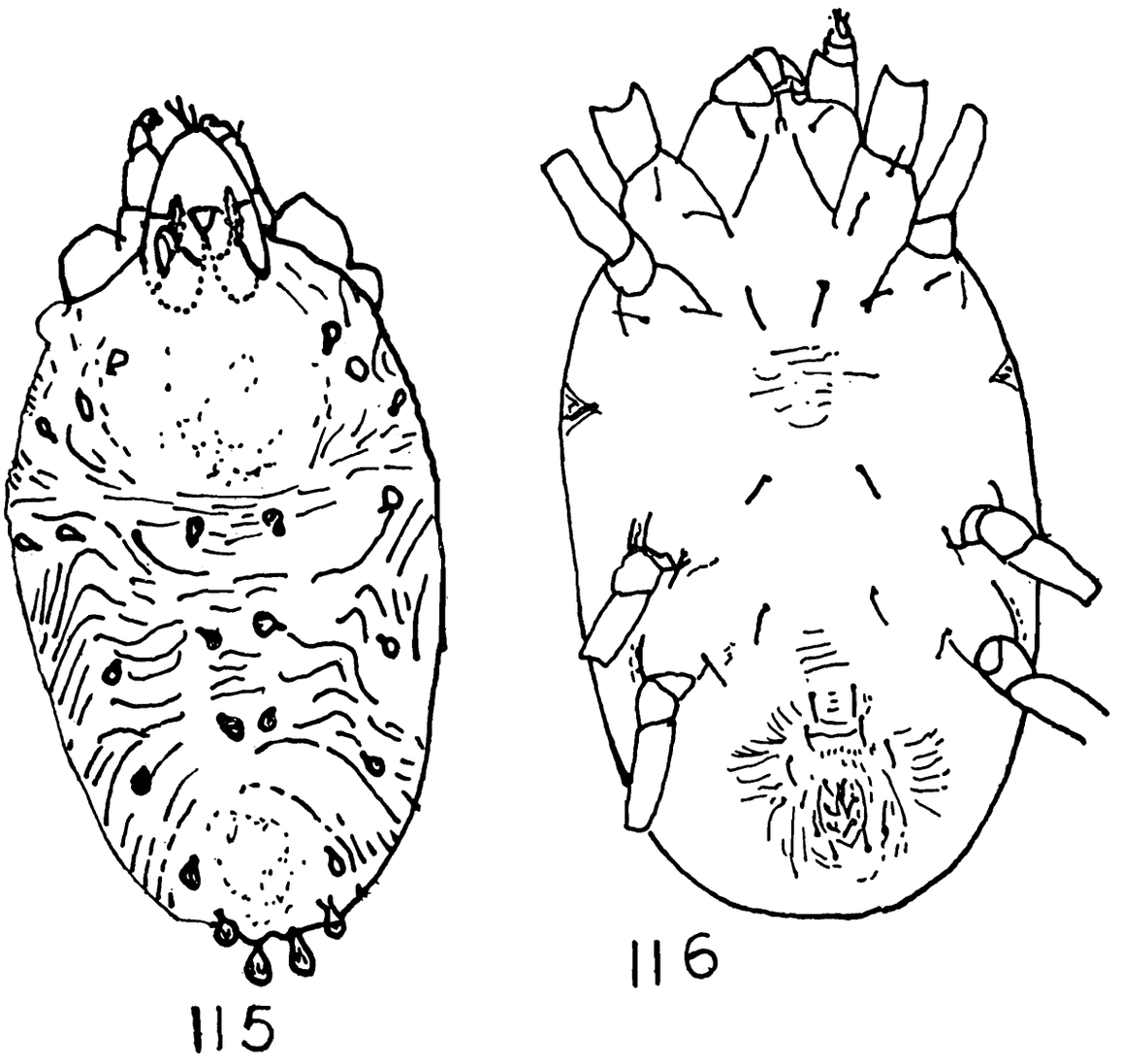
Genus 6. **Aplonobia** Womersley

Aplonobia Womersley, 1940 : 252 ; Pritchard & Baker, 1955 : 58 ; Wainstein, 1960 : 139 ; Tuttle & Baker, 1968 : 47 ; Meyer, 1974 : 102.

Georgiobia Wainstein, 1960 : 217 ; Wainstein 1960a : 138-139 ; Tuttle & Baker, 1968 : 58 ; Baker & Tuttle, 1972 : 12 ; Meyer, 1974 : 102 ; Tuttle *et al.*, 1976 : 25 ; Gupta, 1985 : 49 ; Smith-Meyer, 1987 : 39.

Type : *Tetranychopsis histricina* Berlese

Diagnosis : Some dorsocentral setae (at least 4h pair) borne on strong tubercles ; 4th pair of dorsocentral setae contiguous with 1st pair of dorsolateral setae ; claws and empodia pad-like and provided with tenent hairs. Peritreme anastomoses distally.



Figs. 115-116: *Monoceronychus terpoghossiani* **(after Wainstein, 1960); 115- dorsum of female, 116- Ventral surface of female.**

7. **Aplonobia sphaeralceae** (Tuttle & Baker)
(Figs. 117-119)

Georgiobia sphaeralceae **Tuttle & Baker, 1968 : 69 ; Sadana & Chhabra, 1980a : 105-106 ; Gupta, 1985 : 50-51.**

Male : Not known.

Female : Body including rostrum 533 long. Rostrum short, stylophore rounded anteriorly. Peritreme anastomosing distally. Propodosoma with few irregular striae, anterior pair of propodosoma setae shorter than others which are subequal in length. Dorsal idiosomal setae strong, slightly lanceolate. Humeral setae smaller than others. Hysterosomal setae similar to those of propodosoma except for shorter 5th pair of

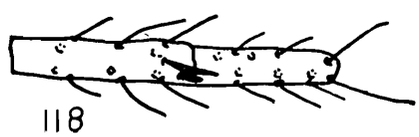
dorsocentral setae, first pair well separated, second, third and fourth pairs contiguous. Hysterosomal tubercles very strong, weak transverse striae. Leg setae slightly serrate.

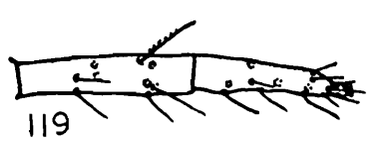
Known host in India : *Ranunculus* sp.

Known host outside India : *Sphaeralcea ambigua.*

Distribution : India (Punjab), U.S.A. (Arizona).

Remarks : This species is distinctive in having medium length setae set on strong tubercles, the 2nd to 4th pair of dorsocentral setae being contiguous, the peritreme at the distal end anastomosing.





Figs. 117-119 : *Aplonobia sphaeralceae* : **117- dorsum of female, 118- tibia and tarsus I of female, 119- tibia and tarsus IV of female.**

Genus 7. **Neopetrobia** Wainstein

Neopetrobia **Wainstein, 1956a : 1151 ; Wainstein, 1960 : 128 ; Tuttle & Baker, 1968 : 57 ; Meyer, 1974 : 93-94 ; Gupta, 1985 ; 53 ; Smith-Meyer, 1987 : 48.**

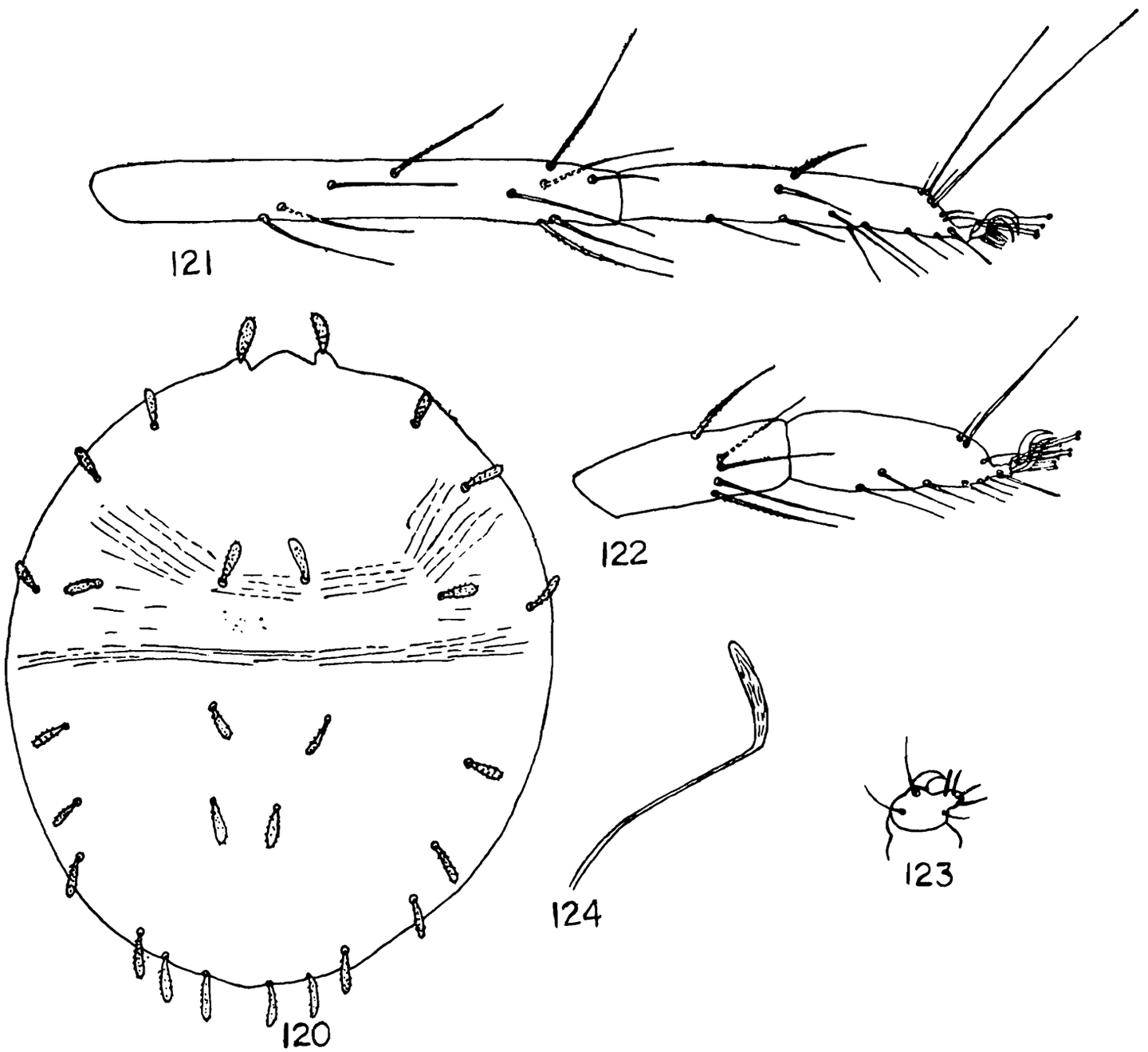
Type : *Neopetrobia dubinini* Wainstein

Diagnosis : True claws pad-like each bearing a pair of tenent hairs, empodial pad longer than true claws, bearing a row of tenent hairs distally, not coalescent ; dorsum with

3 pairs of prodorsal setae and 10 pairs of opisthosomal setae being short, spatulate/spindle shaped, setae tubercles absent, 4th pair of dorsocentral setae variously spaced but not marginal. Peritreme anastomosing distally.

8. Neopetrobia simlaensis Prasad
(Figs. 120-124)

Neopetrobia simlaensis Prasad, 1975b : 16-18 ; Gupta, 1985 : 53,



Figs. 120-124 : *Neopetrobia simlaensis* : 120- dorsum of female, 121- tibia and tarsus I of female, 122- tibia and tarsus II of female, 123- distal segment of palpus of female, 124- peritreme of female.

Male : Note available.

Female : Body including rostrum 498 long, 432 wide. Palpus without terminal sensillum, dorsal sensillum small and slender. Peritreme long, slightly broad at distal end, anastomosing. Dorsal idiosomal setae slender and blunt at the distal end and shorter than interval between their longitudinal bases ; 4th dorsocentral setae widely spaced. Body slightly sclerotized, membranous, hysterosoma with transverse striae. First leg longer than other three legs. Tibia I with 5 sensory and 5 tactile setae ; tarsus I with 1 sensory and 6 tactile setae ; tarsus II with 1 tactile setae proximal to duplex setae. Genital flap with transverse striae. Medioventral setae of moderate size.

Known hosts in India : Bamboo, grass.

Distribution : India (Himachal Pradesh, Jammu & Kashmir).

Tribe 3. PETROBIINI Reck

Petrobiinae Reck, 1952 : 423.

Petrobiini Pritchard & Baker, 1955 : 42 ; Wainstein, 1960 : 131 ; Tuttle & Baker, 1968 : 71 ; Gupta, 1985 : 55.

Genus 8. **Petrobia** Murray

Petrobia Murray, 1877 : 118 ; Womersley, 1940 : 254 ; McGregor, 1950 : 363 ; Pritchard & Baker, 1955 : 42-44 ; Meyer & Ryke, 1959 : 358 ; Wainstein, 1960 : 133 ; Baker & Pritchard, 1960 : 458 ; Tuttle & Baker, 1968 : 71 ; Meyer, 1974 : 129 ; Tuttle *et al.*, 1976 : 26-28 ; Gupta, 1985 : 55 ; Smith-Meyer, 1987 : 70.

Type : *Trombidium lapidum* Hammer=*Petrobia latens* (Muller) by monotypy

Diagnosis : Prodorsal setae 3 pairs, opisthosomal setae 3 pairs not set on tubercles ; dorsal integument simply striate, true claws pad-like and empodia uncinate, both with tenent hairs.

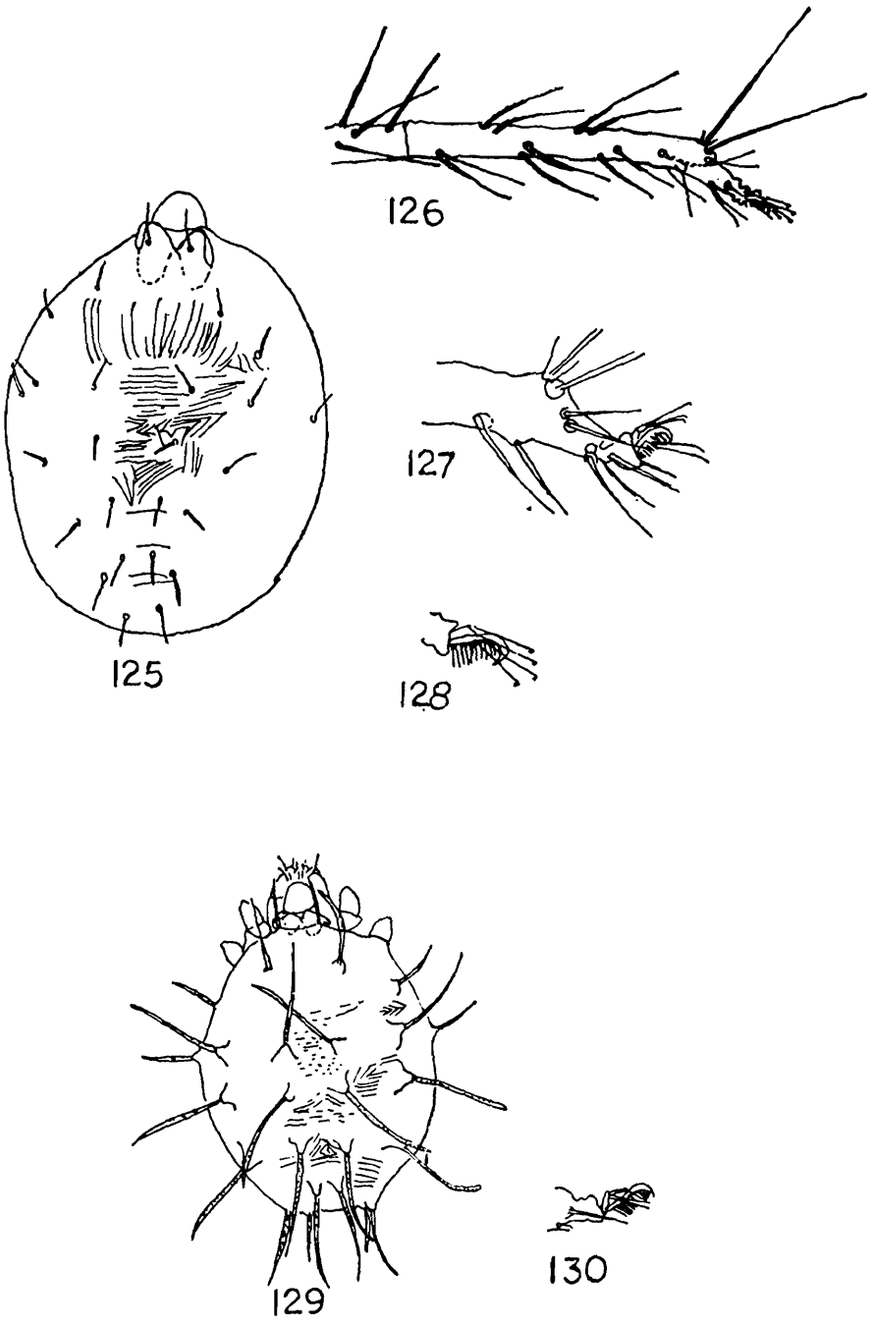
9. **Petrobia (Petrobia) latens** (Muller) (Figs, 125-128)

Acarus latens Muller, 1776 : 187.

Petrobia latens, Oudemans, 1915 : 144 ; Oudemans, 1929 : 285 ; Ehara, 1961 : 143-148 ; Menon & Ghai, 1968 : 77.

Petrobia (Petrobia) latens, Tuttle & Baker, 1968 : 71-72 ; Meyer, 1974 : 130 ; Gupta, 1976 : 331-332 : Tuttle *et al.*, 1976 : 28 ; Gupta, 1985 : 56-57 ; Smith-Meyer, 1987 : 71-72.

Diagnosis : This species can be recognised in having dorsal setae which are set on tubercles and are shorter than their longitudinal intervals. The anterior pair of legs being much longer than body. Peritreme ends in a slender enlargement which is longer than it is broad. Empodium with claw-like structure.



Figs. 125-128 : *Petrobia latens* : 125- dorsum of female, 126- tibia and tarsus I of female, 127- distal segment of palpus of female. 128- empodial appendage of female.

Figs. 129-130 : *Tetranychina harti* : 129- dorsum of female, 130- empodial appendage of female.

Known hosts in India ; *Cajanas cajan*, *Chenopodium album*, *Citrus* sp., *Convolvulus arvensis* ; *Cynodon dactylon*, *Fumeria indica* (Gajri), *Hordeum vulgare* (barley), Liliaceae, *Trifolium* sp., *Triticum aestivum* (wheat), *Vicia hirsuta*, *Zea mays*.

Known hosts outside India : *Acacia erioloba*, *Allium cepa*, *Althea rosea*, *Andropogon sorghum*, *Athanasia sativa*, *A. trifurcata*, *Avena sativa*, *Bromus willdenowii*, *Chenopodium album*, *Cinevaria lyrata*, *Commelina africana*, *Fragaria vesca*, *Echinochloa crusgallii*, *Eragrostris curvula*, Gladiolus plant, *Heliophila deserticola*, *Hordeum vulgare*, *Hyparrhenia hirta*, *Imperata cylindrica*, *Iris* sp., *Medicago sativa*, *Mentha incana*, *Morus japonica*, *Oxalis* sp., *Paspalum*, *dilalatum*, *Pentzia suffruticosa*, *Rumex* sp., *Sorghum vulgare*, *Triticum aestivum*, Undet. species of grass.

Remarks : This is a very serious pest of wheat in the areas where the crop is grown under unirrigated condition. The leaves turn drying from tip backwards affecting growth of the crop. Besides wheat, it also attacks coriander and barley producing yellowish spots.

Genus 9. **Tetranychina** Banks

Tetranychina Banks, 1917 : 195 ; McGregor, 1950 : 300 ; Meyer, 1974 : 131 ; Tuttle *et al.*, 1976 : 29 ; Smith-Meyer, 1987 : 73-74.

Type : *Tetranychina apicalis* Banks (as per Tuttle & Baker, 1968

Diagnosis : Prodorsum bears 3 pairs of setae and opisthosoma with 10 pairs of dorsal setae ; some or all opisthosomal setae set on tubercles ; true claw pad-like, each with a pair of tenent hairs ; empodium uncinate, hooked distally, ending simply or branched.

10. **Tetranychina harti** (Ewing)
(Figs. 129-130)

Neophyllobius harti Ewing, 1909 : 405.

Petrobia harti, Pritchard & Baker, 1955 : 45-47 ; Ghai & Menon, 1971 : 97 ; ChannaBasavanna & Banu, 1972 : 67 ; Meyer, 1974 : 132 ; Prasad, 1974 : 120 ; Tuttle *et al.*, 1976 : 29.

Petrobia (*Tetranychina*) *harti*, Tuttle & Baker, 1968 : 72 ; Gupta, 1976 : 330 ; Gupta, 1985 : 55-56 ;

Tetranychina harti, Smith-Meyer, 1987 : 74.

Diagnosis : Dorsal idiosomal setae long, borne on strong tubercles, clunals much smaller than inner and outer sacrals. In case of male, first dorsocentral setae long, as compared to the other three pairs of the dorsocentral setae. First leg very long and about more than two times longer than the length of body in both sexes.

Known hosts in India : *Oxalis corniculata*, *O. pilosa*, Sarkanda, *Viola* sp.

Known hosts outside India : *Ageratum conyzoides*, *Artocarpus integrifolia*, *Crotalaria angyroides*, *Gnaphalium pensylvanicum*, *Medicago sativa*, *Oxalis corniculata*, *O. corymbosa*, *O. latifolia*, *O. pilosa*, *Pelargonium* sp., *Petunia hybrida*, *Plantago lanceolata*, *Pyrus malus*, *Raphanus sativus*, *Solanum melongena*, *Syzygium cumini*.

Distribution : India (Delhi, Karnataka, West Bengal); Africa, Australia, Brazil, Hawaii, Japan, Middle East, North America, Taiwan.

Remarks : This mite is not of any known economic importance.

Subfamily 2. TETRANYCHINAE Berlese

Tetranychinae Reck, 1950 : 123 ; Pritchard & Baker, 1955 : 96 ; Wainstein, 1960 : 145 ; Meyer, 1974 : 132 ; Gupta, 1985 : 57 ; Smith-Meyer, 1987 : 74.

Tribe 4. EURYTETRANYCHINI Reck

Eurytetranychinae Reck, 1950 : 123 ; Wainstein, 1960 : 223 ; Tuttle & Baker, 1968 : 81 ; Meyer, 1974 : 132 ; Gupta, 1985 : 57 ; Smith-Meyer, 1987 : 74.

Genus 10. **Eutetranychus** Banks

Neotetranychus (*Eutetranychus*) Banks, 1917 : 197.

Eutetranychus Banks, McGregor, 1950 : 257 ; Pritchard & Baker, 1955 : 111 ; Meyer & Ryke, 1959 : 352 ; Baker & Pritchard, 1960 : 460 ; Wainstein, 1960 : 226-227 ; Tuttle & Baker, 1968 : 82 ; Meyer, 1974 : 136 ; Tuttle *et al.*, 1976 : 31 ; Gutierrez, 1985 : 87 ; Gupta, 1985 : 61 ; Smith-Meyer, 1987 : 76.

Type : *Tetranychus banksi* McGregor

Diagnosis : Empodium rudimentary consisting of a small rounded knob, true claws pad-like, tarsi I and II each bearing a pair of loosely associated setae may be homologous to 1st pair of duplex setae ; 2 pairs each of anal and paraanal setae. Opisthosoma with 10 Pairs of dorsal setae.

Key to the species of *Eutetranychus* known from India :

1. Striae forming V-pattern between second and third pairs of dorsocentral hysterosomals 2
— Striae longitudinal between second and third pairs of dorsocentral hysterosomals 4

2. Dorsocentral hysterosomal setae relatively much longer reaching to the bases of setae next behind ; 3rd pair even going beyond the lengths of 4th pair ... *maximae*

— Dorsocentral hysterosomal setae very short, not reaching to the bases of setae next behind 3

3. Propodosomal mediodorsal striae with less developed lobes, 3rd pair of dorsolateral setae tapering, 3rd and 4th dorsocentral hysterosomal setae forming a rectangle pattern ... *phaseoli*

— Propodosomal mediodorsal striae with well developed lobes, 3rd pair of dorsocentral setae similar to other lateral setae ; 3rd and 4th dorsocentral hysterosomal setae forming a square ... *orientalis*

4. Propodosoma with mediodorsal striae anastomosing ... *africanus*

— Propodosoma with mediodorsal striae not anastomosing 5

5. Peritreme ending in simple bulb, longitudinal striae starting at bases of second pair of dorsocentral hysterosomal setae 6

— Peritreme ending in bilobed bulb ; longitudinal striae starting behind the bases of second dorsocentral hysterosomal setae ... *bilobatus*

6. Tibia II with 5 tactile setae 7

— Tibia II with 6 tactile setae ... *nagai*

7. All the dorsocentrals, humerals and 3rd pair of propodosomals not set on tubercle ... *citri*

— All the setae on idiosoma set on tubercles ... *caricae*

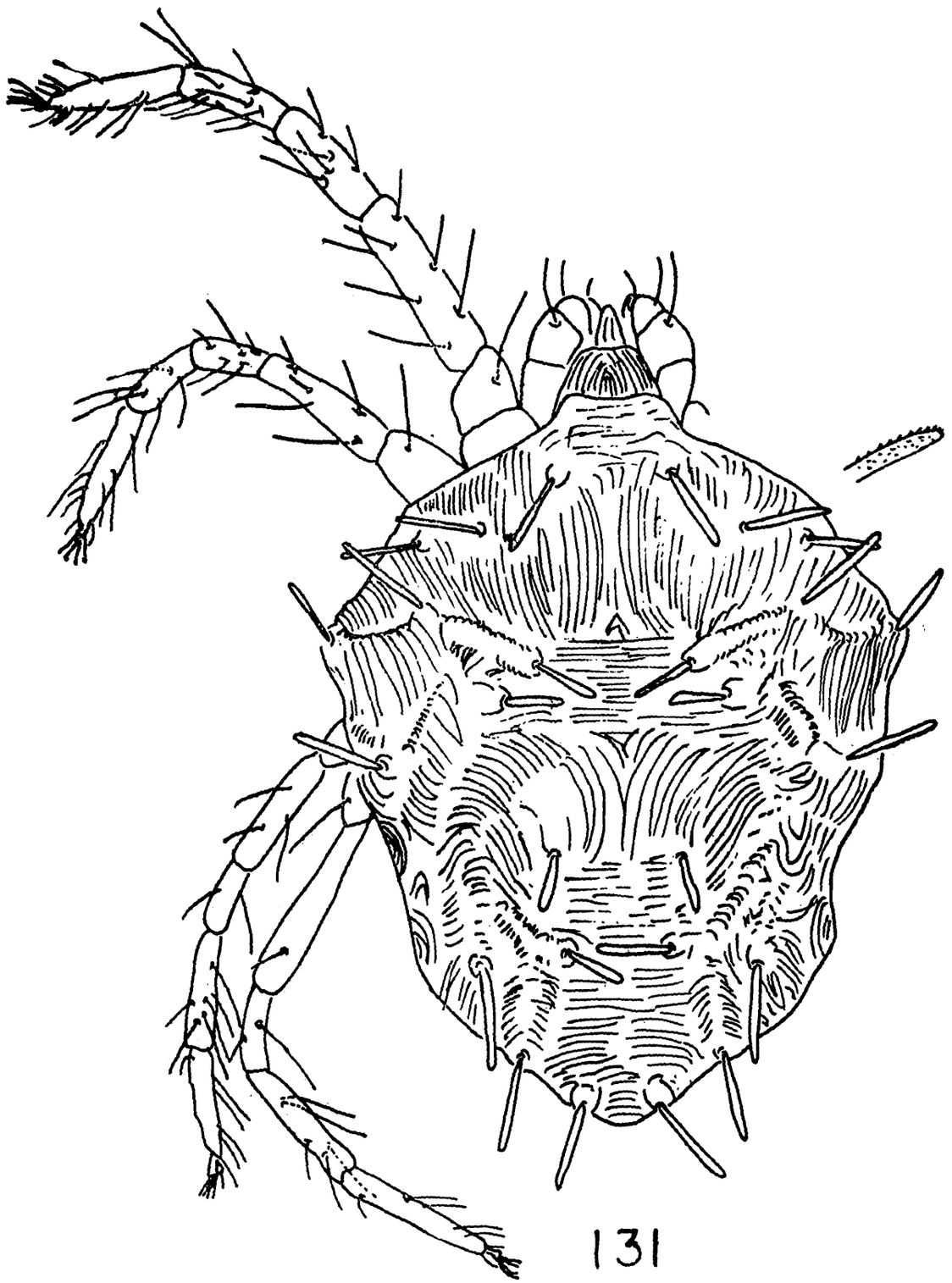
11. **Eutetranychus africanus** (Tucker)
(Fig. 131)

Anychus africanus Tucker, 1926 : 15.

Eutetranychus banksi, Moutia, 1958 : 60 ; Baker & Pritchard, 1960 : 464 ; Manson, 1963 : 352 ; Prasad, 1974 : 114 ; Gupta, 1985 : 62-63 ; Smith-Meyer, 1987 : 82-83.

This species was originally described from Durban, Natal, on orange, lemon and frangipani. The specimens that closely agree with it are from Bean Bassim, Mauritius, on peach and loquat and from Radient, Mauritius from citrus. The identification of this species is based on the original description (Baker & Pritchard, 1960). The female specimens which were collected from citrus have much shorter setae than those have been

figured and the dorsocental hysterosomol vary being shorter and more spatulate. Pritchard & Baker (1955) considered this species to be a synonym of *E. banksi* (McGregor).



Fg. 131 : *Eutetranychus africanus* : dorsum of female.

Known hosts in India : *Citrus aurantium* (orange), ***Solanum melongena.***

Known hosts outside India : ***Artocarpus integrifolia, A. incisa, Bauhinia candida, Citrus*** sp., *Citrus lemon, Cordia utilissima, Cryptostegia madagascarensis, Eriobotrya japonica* (loquat), Frangipani, *Plumeria alba, Prunus persica* (peach), ***Pterospermum semisagitatum,*** *Ricinus communis, Tectona grandis* (Teak), *Vitis labrasca.*

Distribution : India (Assam, Karnataka), Durban, Natal.

Remarks : In contrast to *E. orientalis*, the coxa II of both female and male bears 2 setae, femur IV provided with 1 seta. The distribution of setae and solenidia on leg segments of the female is as follows according to Smith-Meyer (1987) : coxae : 2-2-1-1 ; femora : 8-6-3-1 ; genu : 5-5-2-2- ; tibia 9(1)-6-6-7 ; tarsi 15(2-3)-13(1)-10(1)-10(1). The chaetotaxy of legs of male : coxa : 2-2-1-1 ; femora : 8-6-4-1 ; genu : 5-5-2-2 ; tibia : 9(4)-6(2)-6-7 ; tarsi : 15(2)-13(2)10(1)-10(1). The solendion and proximal tactile seta of the loosely associated seta on tarsi I and II of both female and male are about equal in length.

12. **Eutetranychus bilobatus** Nassar & Ghai
(Figs. 132-135)

Eutetranychus bilobatus Nassar & Ghai, 1981 : 343-345 ; Gupta, 1985 : 63.

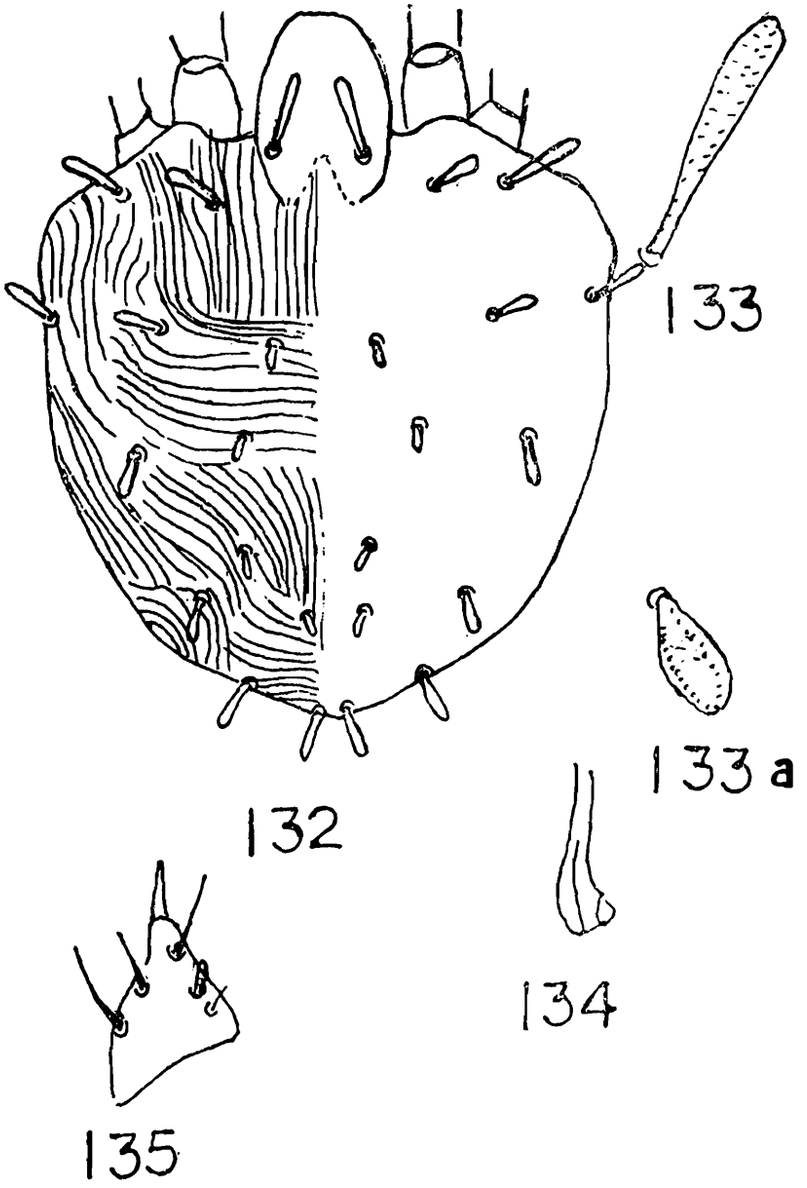
Male : Body including rostrum 312 long, 210 wide. Dorsolateral hysterosomals as well as first and fourth pair of dorsocentral setae longer than those of female. Genital area with 1 pair of pregenital and 4 pairs of genital setae. Terminal sensillum on the palpus about 1·5 times as long as its greatest thickness and relatively shorter than the dorsal sensillum.

Female : Body including rostrum 421 long, 290 wide. Stylophore incised anteriorly, terminal sensillum on the palp tarsus about 4 times as long as broad, dorsal sensillum 0·67 the length of terminal sensillum. Peritreme bilobed distally. Three pairs of propodosomal and 10 pairs of hysterosomal setae set on tubercles on the dorsum, all setae strongly serrate and varying in length, much less than the intervals between their bases and decidedly more spatulate than dorsolaterals, which tend to be more subspatulate except the 4th pair of dorsocentral hysterosomals which are palmate. Humerals and first pair of dorsolateral hysterosomals situated anterior to 1st pair of dorsocentral hysterosomal. Propodosoma having longitudinal striae provided with distinct lobes. Hysterosoma with striae between 2nd and 3rd pair of dorsocentrals longitudinal ; striae on hysterosoma slightly lobed.

Known host in India : *Zizyphus* sp.

Distribution : India (Delhi).

Remarks : This species is very near to *E. anneckei* but differs in having peritreme bilobed distally and in difference of chaetotaxy in legs.



Figs. 132-135 : *Eutetranychus bilobatus* (after Nassar & Ghai, 1981) : 132- dorsum of female, 133, 133a- enlarged view of dorsal idiosomal setae, 134- termination of peritreme, 135- distal segment of palpus.

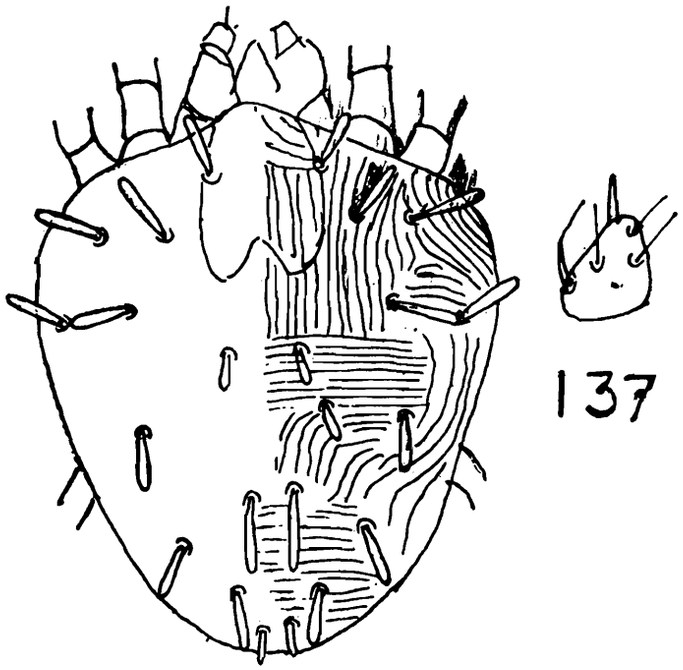
13. **Eutetranychus caricae** Nassar & Ghai
(Figs. 136-137)

Eutetranychus caricae Nassar & Ghai, 1981 : 347 ; Gupta, 1985 : 64.

Male : Not known.

Female : Body including rostrum 352 long, 252 wide. Stylophore notched anteriorly. Terminal sensillum on the palpus about 2·5 times as long as broad, dorsal

sensillum about 0.33 the length of terminal sensillum. Peritreme simple. Three pairs of propodosomal and 10 pairs of hysterosomal setae set on strong tubercles on dorsum; all setae strongly serrate and varying in length; propodosomal setae, humerals and dorsolateral hysterosomal setae serrate, rod-like and enlarged distally. These are relatively longer than dorsocentral hysterosomals reaching to the base of 4th pair of dorsocentral



Figs. 136-137 : *Eutetranychus caricae* (after Nassar & Ghai, 1981) : 136- dorsum of female, 137- distal segment of palpus.

hysterosomal; 1st and 4th pair of dorsocentral hysterosomals equal in length and longer than 2nd and 3rd pair of dorsocentrals, humeral and 1st pair of dorsolaterals situated anterior of first pair of dorsocentral hysterosomals. Third pair of dorsocentral hysterosomals forming a square with the 4th pair of dorsocentral hysterosomals. Propodosoma having longitudinal striae with weak lobes, hysterosoma with striae between 2nd and 3rd pair of dorsocentrals.

Known host in India : *Ficus carica.*

Distribution : India (Delhi).

14. **Eutetranychus citri** Attiah

Eutetranychus citri Attiah, 1967 : 1-16 ; Meyer, 1974 : 15-16 ; Gupta, 1985 : 64-65 ; Smith-Meyer, 1987 : 64-65.

This species is also closely related to *E. orientalis* (Klein) but can be separated from the latter by the 1st pair of dorsolaterals and the humerals which are situated anterior to the first pair of dorsocentrals and third pair of dorsocentrals forming right angle with fourth pair of dorsocentrals. Tibia I bears 9 tactile setae and tibia II with 5 tactile setae.

Known host in India : *Citrus* sp.

Known host outside India : *Tilia platyphyllos.*

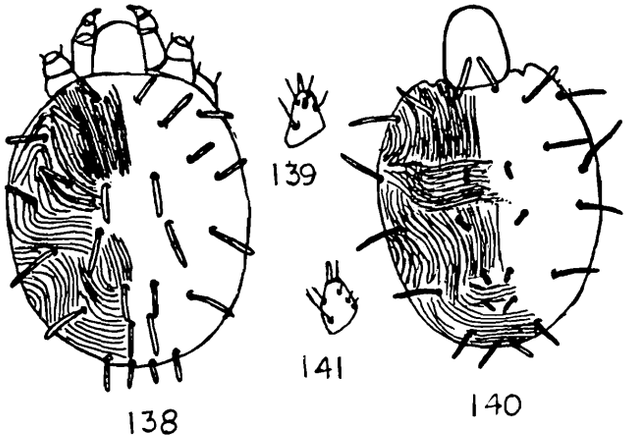
Distribution : India (Delhi), Egypt, South Africa.

15. **Eutetranychus maximae** Nassar & Ghai
(Figs. 138-139)

Eutetranychus maximae Nassar & Ghai, 1981 : 339 ; Gupta, 1985 : 65.

Male : Not Known.

Female : Body including rostrum 448 long, 321 wide. Stylophore rounded anteriorly and indentate, terminal sensillum on the palp tarsus about 3 times as long as



Figs. 138-139 : *Eutetranychus maximae* (after Nassar & Ghai, 1981) : 138- dorsum of female, 139- distal segment of palpus.

Figs. 140-141 : *Eutetranychus nagai* (after Nassar & Ghai, 1981) : 140- dorsum of female, 141- distal segment of palpus.

broad, dorsal sensillum about 0·93 the length of terminal sensillum. Peritreme simple. Three pairs of propodosomal and 10 pairs of hysterosomal setae set on strong tubercles on dorsum, all dorsal setae long, serrate and mostly rod-like except 3rd propodosomals, humerals, 2nd and 3rd pair of dorsolateral setae which are mostly tapering ; dorsal setae varying in length, dorsocentral hysterosomals very long and reaching the bases of setae next behind ; 3rd pair of dorsocentral and dorsolateral setae situated anterior to humerals, 3rd pair of dorsocentrals extending behind the bases of 4th pair and both forming rectangle. Propodosoma having longitudinal striae with strong lobes, striae between 2nd and 3rd pair of dorsocentral hysterosomals forming V-pattern, hysterosomal striae provided with fine lobes.

Known hosts in India : *Cucurbita maxima* (sweet gourd), *Hibiscus rosa-sinensis*, *Zizyphus mauritiana*.

Distribution : India (Delhi).

Remarks : This species is close to *E. orientalis* (Klein) but differs in having irregular V-shaped pattern between 2nd and 3rd pair of dorsocentral hysterosomals, dorsal setae long and mostly rod-like.

16. **Eutetranychus nagai** Nassar & Ghai
(Figs. 140-141)

Eutetranychus nagai Nassar & Ghai, 1981 : 347-349 ; Gupta, 1985 : 65.

Male : Not known.

Female : Body with rostrum 393 long, 207 wide. Stylophore notched anteriorly. Terminal sensillum on the palp tarsus about 4 times as long as broad ; dorsal sensillum on the palp tarsus about 0·5 the length of the terminal one. Peritreme terminating in a big bulb. Three pairs of propodosomal and 10 pairs of hysterosomal setae on prominent tubercles on dorsum except humerals and dorsocentrals. All setae strongly serrate and varying in length. Propodosomals, humerals and dorsolateral hysterosomals which tend to be subspatulate. Distance between the dorsolateral hysterosomals 1·5 as long as the length of dorsolateral setae ; 1st pair of dorsolateral setae situated anterior to humerals and 1st pair of dorsocentral setae ; 3rd pair of dorsocentral hysterosomals forming a square with 4th pair of dorsocentrals. Propodosoma having longitudinal striae, strongly lobed. Hysterosoma with striae between 2nd and 3rd pair of dorsocentral longitudal, hysterosomal striae slightly but distally lobed.

Known host in India : *Eriobotrya japonica* (loguat).

Distribution : India (Delhi).

Remarks : This species is close to *E. africanus* (Tucker) but differs in having terminal sensillum on palptarsus about 4 times as long as broad.

17. **Eutetranychus orientalis** (Klein)
(Figs. 142-149)

Anychus orientalis Klein, 1936 : 3 ; Sayed, 1946 : 143.

Anychus rusti McGregor, 1917 : 582.

Anychus ricini Rahman & Sapra, 1940 : 194.

Eutetranychus bredini, Sing & Putatunda, 1974 : 51 (misidentification).

Eutetranychus orientalis, Baker & Pritchard, 1960 : 464 ; Meyer & Rodrigues, 1966 : 14 ; Attiah, 1967 : 15 ; Guiterrez & Helle, 1971 : 45-48 ; Meyer, 1974 : 138-139 ; Manson, 1963 : 351 ; Ghai, 1971 : 2 ; Gupta *et al.*, 1971a : 484 ; Gupta *et al.*, 1971 : 296-299 ; Sadana & Kanta, 1971 : 530 ; Sadana & Kanta, 1972 : 525-526 ; Gupta, 1985 : 66-67 ; Smith-Meyer, 1987 : 80-82.

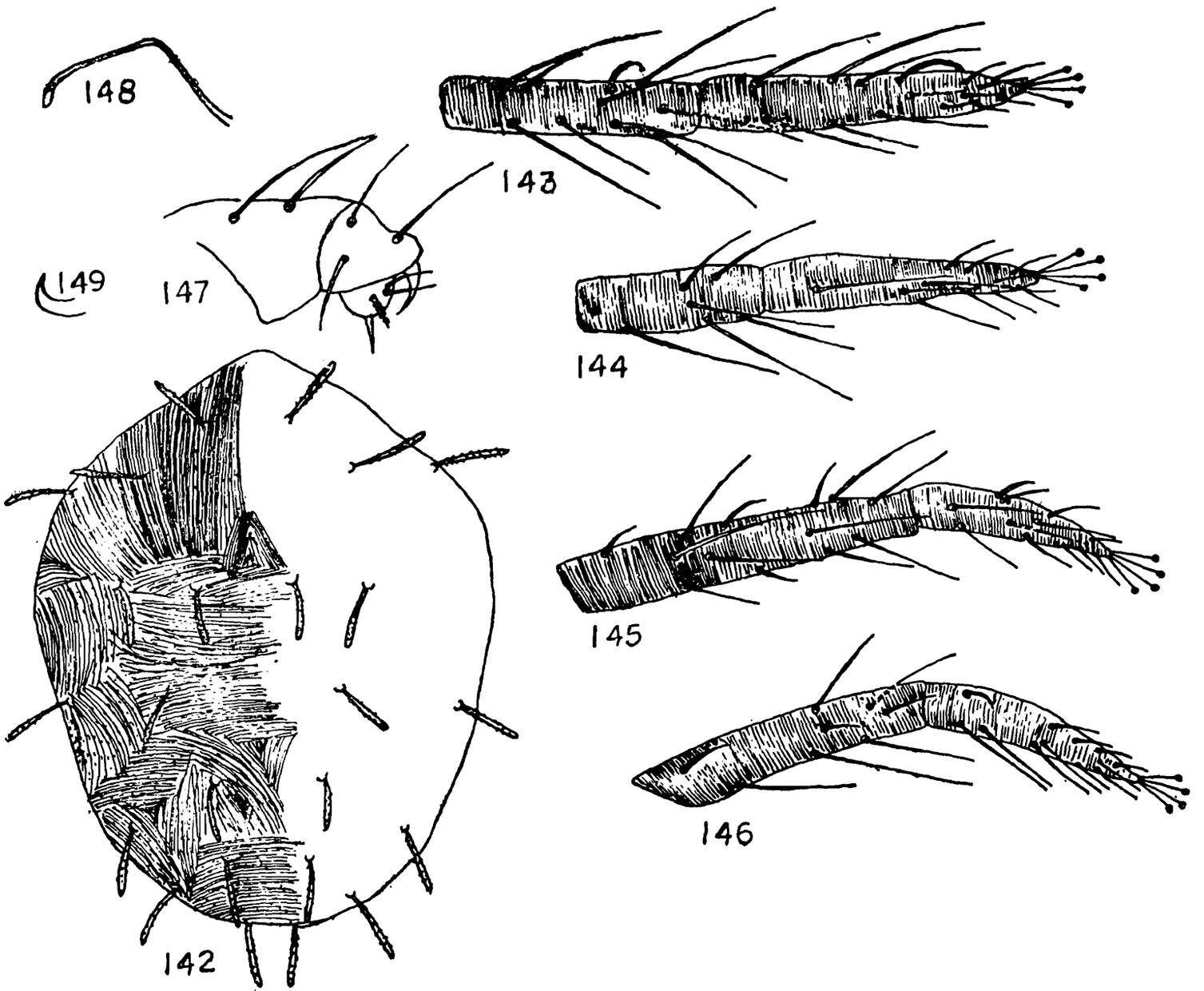
Eutetranychus anneckei Meyer, 1974 : 148-149 ; Nassar & Ghai, 1981 : 349.

Male : Body including rostrum 393 long, 249 wide. Terminal sensillum of palptarsus 3 times as long as wide, dorsal sensillum long, slender. Dorsal idiosomal setae set on small tubercles. The length and shape of dorsal setae varies from host to host. Tibia I with 5 sensory setae and 8 tactile setae. Tibia II with 5 tactile and 3 sensory setae, tarsus II with 1 sensory and 11 tactile setae. Striations on the body clearly visible as figured. The shape of aedeagus more or less hook-like structure in which distal bent longer than the dorsal margin of the shaft which is slightly concave.

Female : Body including rostrum 498 long, 321 wide. Terminal sensillum of the palp tarsus 4 times as long as wide, dorsal sensillum conical and about half of the terminal sensillum. Peritreme slightly dialated distally. Dorsal idiosomal setae borne on strong tubercles and hairy, when examined under higher magnification. Tibia I with 2 sensory and 8 taetile setae ; tarsus I with 1 sensory and 14 tactile setae. Tibia II with 1 sensory and 11 tactile setae. Striations on the propodosomal region longitudinal and having distinct lobes in the region of propodosoma and hysterosomal siriations sometimes forming triangular pattern in the region of hysterosoma.

Known hosts in India : *Arachis hypogaea* (ground nut), *Artocarpus integrifolia* (jack fruit), *Azadirachta indica* (Neem), *Cajanas cajan* (pigeonpea), *Carica papaya* (papaya), *Cassia fistula*, *Citrus limon*, *Citrus medica acida*, *Citrus paradisica*, *C. reticulata*, *C. sinensis*, *Cocos nucifora*, *Croton* sp., *Dolichos lablab*, *Eichornia* sp., *Erythrina indica*, *Euphorbia* sp., *Ficus cunea*, *Glyricedea* sp., *Gossypium herbaceum*, *Juglans* sp. (walnut), *Luffa acutangula*, *Melia azadirachta*, *Morus alba*, *Nerium indicum*, Parijath, *Polyalthea longifolia*, *Prunus amygdalus* (almond), *Prunus communis* (plum), *Prunus persica* (peach),

Psidium guajava (guava), *Pyrus communis* (pear), Ramphal, *Ranvolfia serricentina* (Sarpagandha), *Ricinus communis*. *Rosa indica* (rose), Sapota, *Sesamum indicum*, *Tabernaemontana coronaria*, *Terminalia arjuna*, *Zea mays*, *Zizyphus mauritiana*.



Figs. 142-149 : *Eutetranychus orientalis* : 142- dorsum of female, 143- tibia and tarsus I of female, 144- tibia tarsus II of female, 145- tibia and tarsus I of male, 146- tibia and tarsus II of male, 147-distal segment of palpus of female, 148- peritreme of female, 149- aedeagus.

Known hosts outside India : *Acacia modesta*, *A. nilotica*, *Acer* sp., *Alanthus excelsa*, *Albizzia procera*, *Althea rosea*, *Amaranthus* sp., *Ananas comosus*, *Anona* sp., *Anona squamosa*, *Artocarpus Integra*, *Arundo donax*, *Azadirachta indica*, *Bauhinia purpurea*, *B. variegata*, *Blumea membranacea*, *Boerhaavia diffusa*, *Calotropis gigantea*, *Canabis sativa*, *Carica*

papaya, *Cassia* sp., *Cassia holosericea*, *C. occidentalis*, *Chrysanthemum norifolium*, *Cichorium intybus*, *Citrus* sp., *Citrus aurantium*, *Citrus limon*, *C. sinensis*, *Croton* sp., *Cupressus sempervirens*, *Dahlia* sp., *Dahlia pinnata*, *Dalbergia sissoo*, *Durio zibethinus*, *Eucalyptus globulus*, *Euphorbia* sp., *Ficus palmata*, Frangipini, *Glyricidea* sp., *Gossypium hirsutum*, Grape fruit, *Grewia populifolia*, *G. villosa*, *Gynandropsis gynandra*, *Hamelia patens*, *Hedera japonica*, *Helianthus annuus*, *Ipomoea* sp., *Jatropha multifida*, *Kochia indica*, *Lantana camara*, *Lathyrus odoratus*, *Luffa acutangula*, *Malvastrum tricuspidatum*, *Manihot* sp., *Melia azadirachta*, *Mentha piperita*, *Moringa oleifera*, *Morus* sp., *Morus alba*, *Mullongo hirto*, *Mumtingia calabura*, *Murrata paniculata*, *Musa sapientium*, *Nerium indicum*, *Pachira macrocarpa*, *Pachalia pinnata*, *Parrea americana*, *Phosphocarpus tetragonolobus*, *Pongamia excelsa*, *P. pinnata*, *Prunus amygdalus*, *Prunus persica*, *Pterocarpus macrocarpus*, *Punica granatum*, *Pyrus pyrifolia*, *Ricinus communis*, *Salvadora oleoides*, *Schismatoglottis* sp., Shaddock, *Solanum melongena*, *S. nigrum*, *Sorbus domesticas*, Squash, *Tagetes tenuifolia*, *Tamaryx aphylla*, *Terminalia catappa*, *Theobroma cacao*, *Thevetia peruviana*, *Trianthema monogyna*, undet. species of grass, *Verbena bonariensis*, *Vigna cylindrica*, *Vitis vinifera*, *Withania somnifera*.

Distribution : India (Andaman & Nicobar Isls., Assam, Delhi, Gujarat, Karnataka. Madhya Pradesh, Maharashtra, Orissa, Punjab, Haryana, Himachal Pradesh, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal) ; Afghanistan, Cyprus, Iran, Taiwan, Hongkong, Israel, Japan, Thailand, Philippines, Pakistan, Sudan, South Africa.

Remarks : This is a serious pest of citrus in India. All stages of mite suck sap from the leaves, tender shoots, bark and fruits. The affected leaves turn yellowish brown which afterwards dry up and fall off. Because of the leaves being enveloped with thick webs where dust particles adhere, the physiological activities are disrupted. The trees on the sides of untarred roads get more infestation because of more dust gets accumulated on the leaves providing better protection of mites.

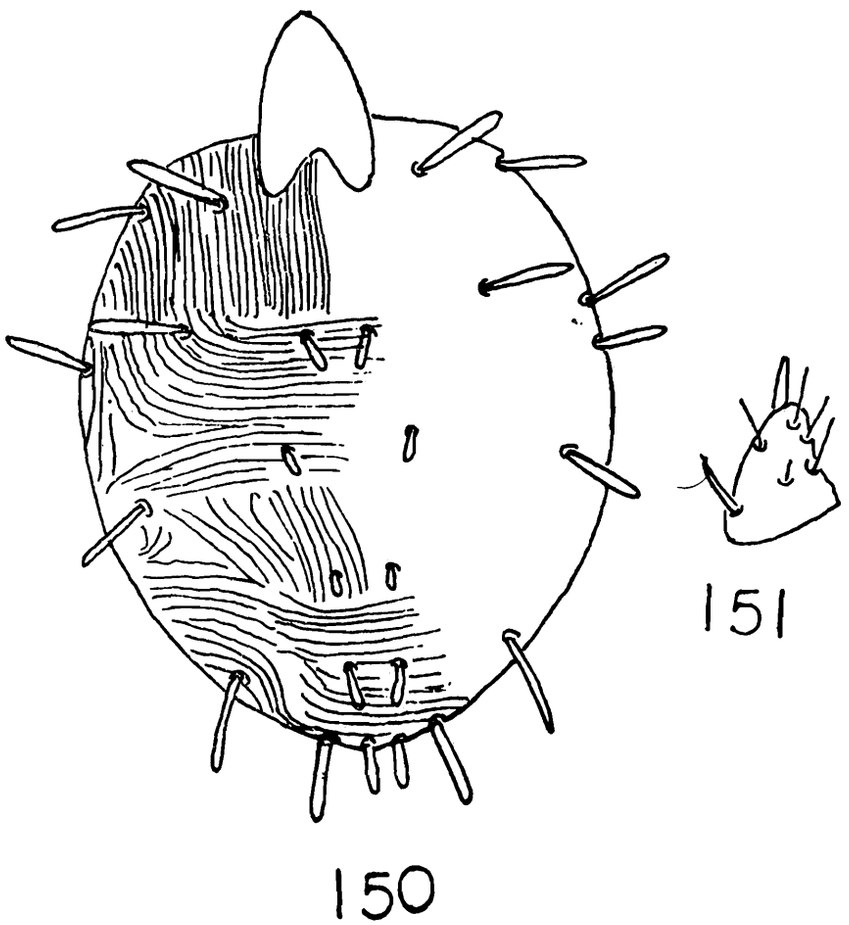
18. **Eutetranychus phaseoli** Nassar & Ghai
(Figs. 150-151)

Eutetranychus phaseoli Nassar & Ghai, 1981 : 341-343. Gupta, 1985 : 67.

Male : Body including rostrum 369 long, 214 wide. Dorsal setae shorter than those of females and set on small tubercles. Genital area with 1 pair of paragenital setae and 4 pairs of genitoanal setae. Terminal sensillum about 2·5 times as long as broad and slightly shorter than dorsal sensillum.

Female : Body including rostrum 462 long, 276 wide. Stylophore strongly incised anteriorly. Terminal sensillum on palptarsus about 3 times as broad, dorsal sensillum about 0·33 the length of terminal sensillum. Peritreme simple. Three pairs

of propodosomal, 10 pairs of hysterosomal setae set on prominent tubercles on the dorsum; all setae strongly serrate and varying in length. Dorsocentral hysterosomal setae short, much less than the intervals between them and subspatulate while dorsolateral hysterosomals long and subspatulate except first pair of dorsolateral hysterosomal situated anterior to first pair of dorsolaterals and humeral setae ; 1st pair of dorsolateral hysterosomals



Figs. 150-151 : *Eutetranychus phaseoli* **(after Nassar & Ghai, 1981) : 150- dorsum of female, 151- distal segment of palpus of female.**

equal in length to 4th pair of dorsocentral hysterosomals and both longer than second and third pair of dorsocentral hysterosomal setae. Propodosoma with longitudinal striae provided with weak lobes ; striae between 2nd and 3rd pairs of dorsocentral hysterosomal setae forming a V-pattern bearing weak lobes.

Known host in India : *Phaseolus vulgaris.*

Distribution : India (Delhi).

Remarks : This species is closely related to *E. orientalis* but differs in having rectangles between 3rd and 4th pair of dorsocentral hysterosomals ; femur II with 7 tactile setae and in chaetotaxy of legs.

Genus 11. **Aponychus** Rimando

Aponychus Rimando, 1966 : 105 ; Tuttle & Baker, 1968 : 82 ; Meyer, 1974 : 156 ; Chaudhri *et al.* 1974 : 135 ; Gupta, 1985 : 57 ; Smith-Meyer, 1987 : 84.

Type : *Aponychus corpuzae* Rimando

Diagnosis : Presence of 1 pair of anal setae ; 13 pairs of dorsal body setae, of which, the 4th pair of dorsocentrals ; 3rd and 4th pairs of dorsolaterals situated marginally. Empodium reduced to knob.

Key to the species of *Aponychus* known from India (based on females) :

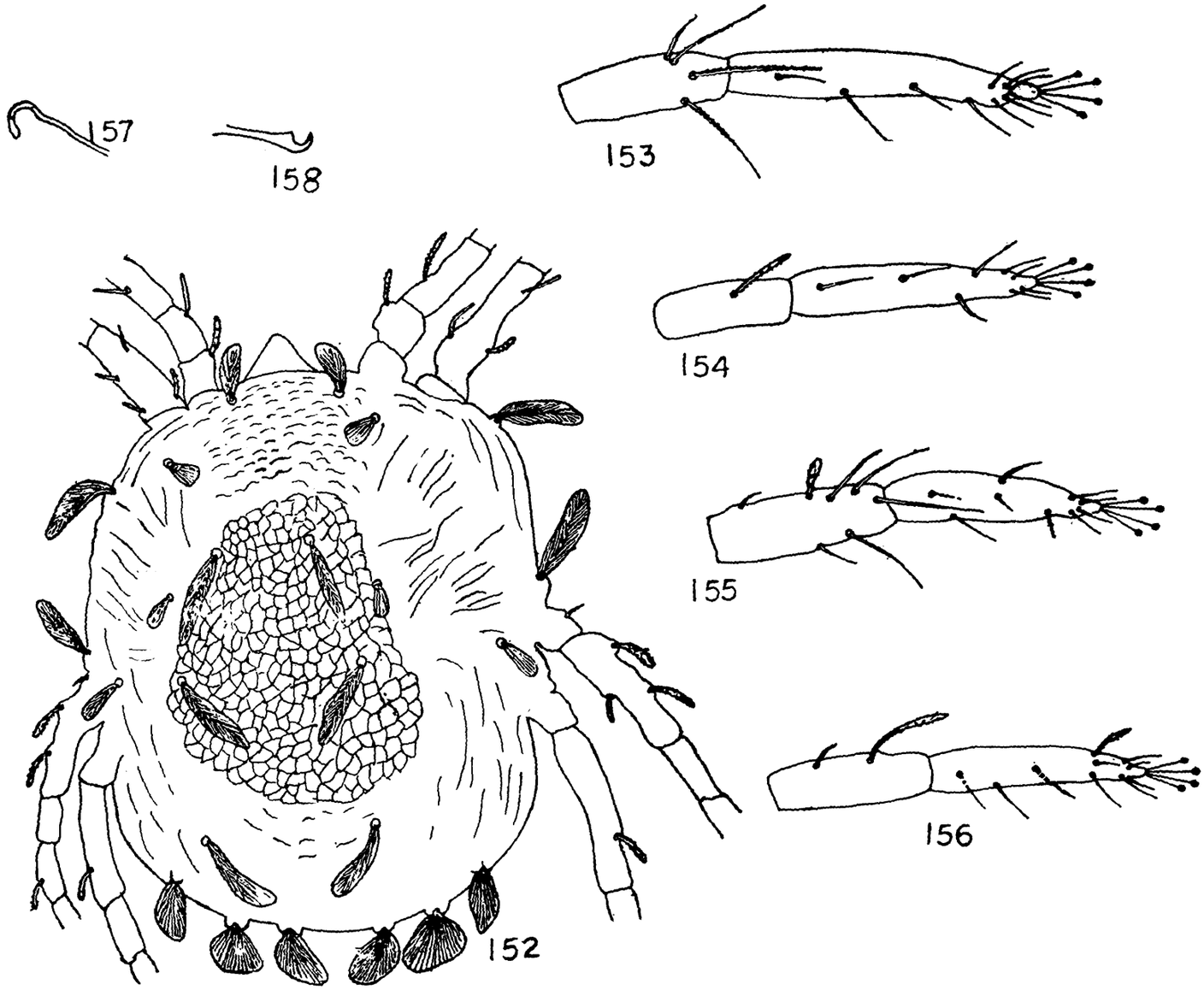
1.	Dorsocentral hysterosomal setae as long as the interval between their longitudinal bases ...	*bambusae*
—	Dorsocentral hysterosomal setae much shorter than the interval between their longitudinal bases ...	... 2
2.	First to third dorsocentral setae broad and spatulate ...	... 3
—	First to third dorsocentral setae narrow and spatulate ...	*corpuzae*
3.	13 pairs of idiosomal setae ...	... 4
—	12 pairs of idiosomal setae ...	*kodaikanalensis*
4.	Outer sacral smaller than the rest idiosomal setae , outer and inner sacrals not of same length but inner sacrals and clunals of same length ...	*sarjui*
—	Outer sacrals longer in size ; outer, inner sacrals and clunals of same length ...	*sulcatus*

19. **Aponycbns bambusae** Gupta & Gupta
(Figs. 152-158)

Aponychus bambusae Gupta & Gupta, 1990 : 16.

Male : Body including rostrum 285 long, 159 wide, oblong. Peritreme at distal end forming hook-like structure. Palpus with terminal sensillum slender. Idiosoma with dorsal integument wrinkled, Idiosomal setae small, serrate and spatulate. Dorsal propodosomal, humeral, second dorsolateral, inner sacrals, clunals almost of same length.

Outer sacral absent. Legs with spatulate setae. Tibia I with 1 sensory, 1 spatulate and 5 tactile setae; tarsus I with 1 sensory and 8 tactile setae. Tibia II with 1 sensory, 1 spatulate setae; tarsus II with 1 spatulate setae and 9 tactile setae. Aedeagus more or less hook-like structure.



Figs. 152-158: *Aponychus bambusae*: 152- dorsum of female, 153- tibia and tarsus I of female, 154- tibia and tarsus II of female, 155- tibia and tarsus I of male, 156- tibia and tarsus II of male, 157- peritreme of female, 158- aedeagus.

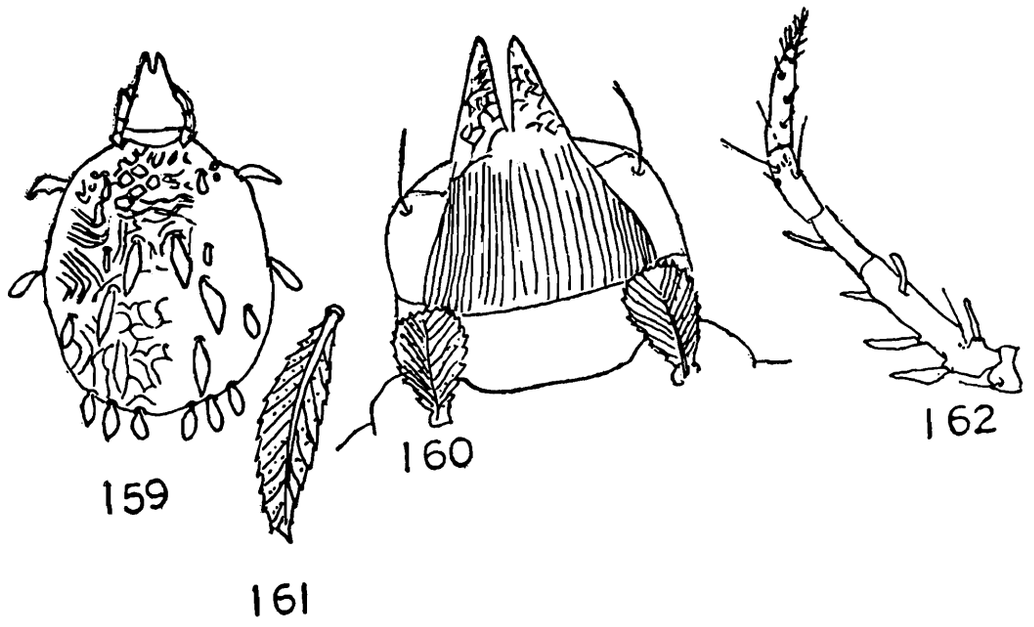
Female: Body including rostrum 393 long, 159 wide, oblong. Peritreme hook-like distally. Palpus with terminal sensillum slender. Idiosomal setae spatulate. I-III propodosomals, inner sacrals, clunals and third dorsocentral setae short with fan-like

appearence. Tibia I with 1 sensory, 2 spatulate and 1 tactile setae ; tarsus I with 10 tactile setae. Tibia II with 1 spatulate setae ; tarsus II with 8 tactile setae. Genital flap with transverse striae.

Known hosts in India : *Bambusa aurandinacea* (bamboo), *Saccharum officinarum* (sugar cane).

Distribution : India (Arunachal Pradesh, West Bengal).

Remarks : This species resembles *Aponychus nakaoi* Ehara & Wongsiri (1975) in the absence of outer sacrals but is easily distinguished from it in having the dorsocentral setae being 5 times longer.



Figs. 159-162 : *Stylophoronychus lalii* (after Prasad, 1975a) : 159- dorsum of female, 160- dorsal view of gnathosoma with anterior portion of propodosoma, 161- enlarged view of dorsal idiosomal seta, 162- leg I of female.

[For description of species, please see Page No. 48.]

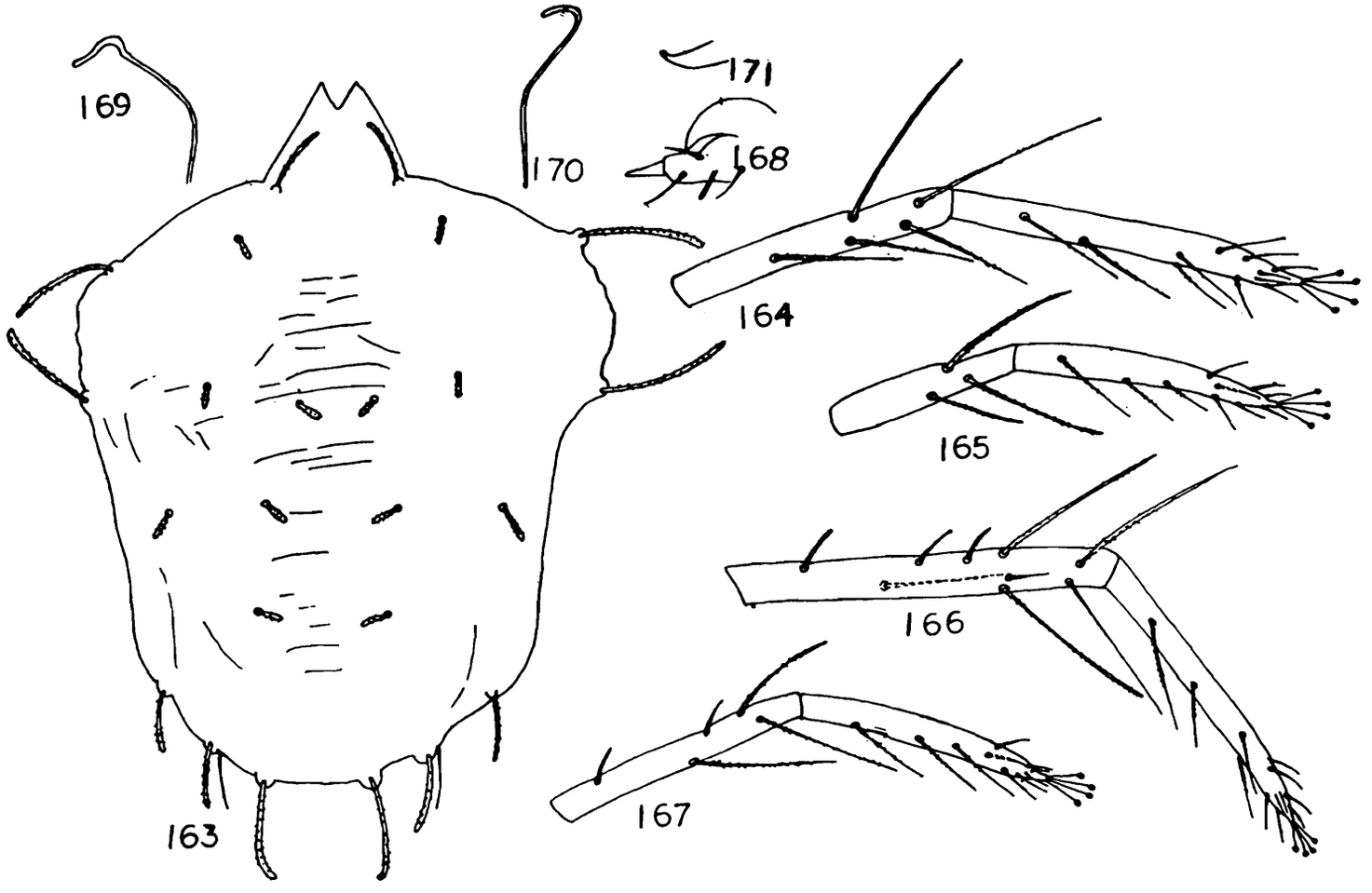
20. **Aponychus corpuzae** Rimando
(Figs. 163-171)

Aponychus corpuzae Rimando, 1966 : 107 ; Ehara 1969 : 87 ; Gupta, 1976 : 332-333 ; Gupta, 1985 : 59.

Male : Body dorsoventrally depressed, including, rostrum 299 long, 166 wide. Terminal sensillum of palpus thin and small, dorsal sensillum slender. Peritreme hooked distally. Dorsal idiosomal setae serrate. Clunals spatulate. Tibia I with 6 sensory and

3 tactile setae. Aedeagus as figured, abruptly bent dorsad near distal end, then upturned, slightly sigmoid. Leg I longer than other legs.

Female : Body dorsoventrally depressed, including rostrum 432 long, 267 wide. Palpus with terminal sensillum slender and subconical, dorsal sensillum very slender. Peritreme slender, dialate distally. Dorsal idiosomal setae of different size. Propodosomal



Figs. 163-171 : *Aponychus corpuzae* : 163- dorsum of female, 164- tibia and tarsus I of female, 165- tibia and tarsus II of female, 166- tibia and tarsus I of male, 167- tibia and tarsus II of male, 168- distal segment of palpus of female, 169- peritreme of female, 170- peritreme of male, 171- aedeagus.

setae I-III pair not of same length, spatulate, smaller than humeral but equal to dorsolateral and inner sacrals, clunals slightly longer. Dorsocentral setae I-III and dorsolateral setae I-II pairs of same length but 3rd dorsolateral setae longer. Outer sacral setae long and slender. Tibia I with 5 sensory setae ; tibia II with 3 sensory setae. Genital flap with transverse striae. Medioventral setae of moderate size.

Known hosts in india : *Bambusa tulda*, *B. vulgaris*, *Pyrus communis* (pear).

Known hosts outside India : *Bambusa stenostachya*, *Schizostaehyum lima*.

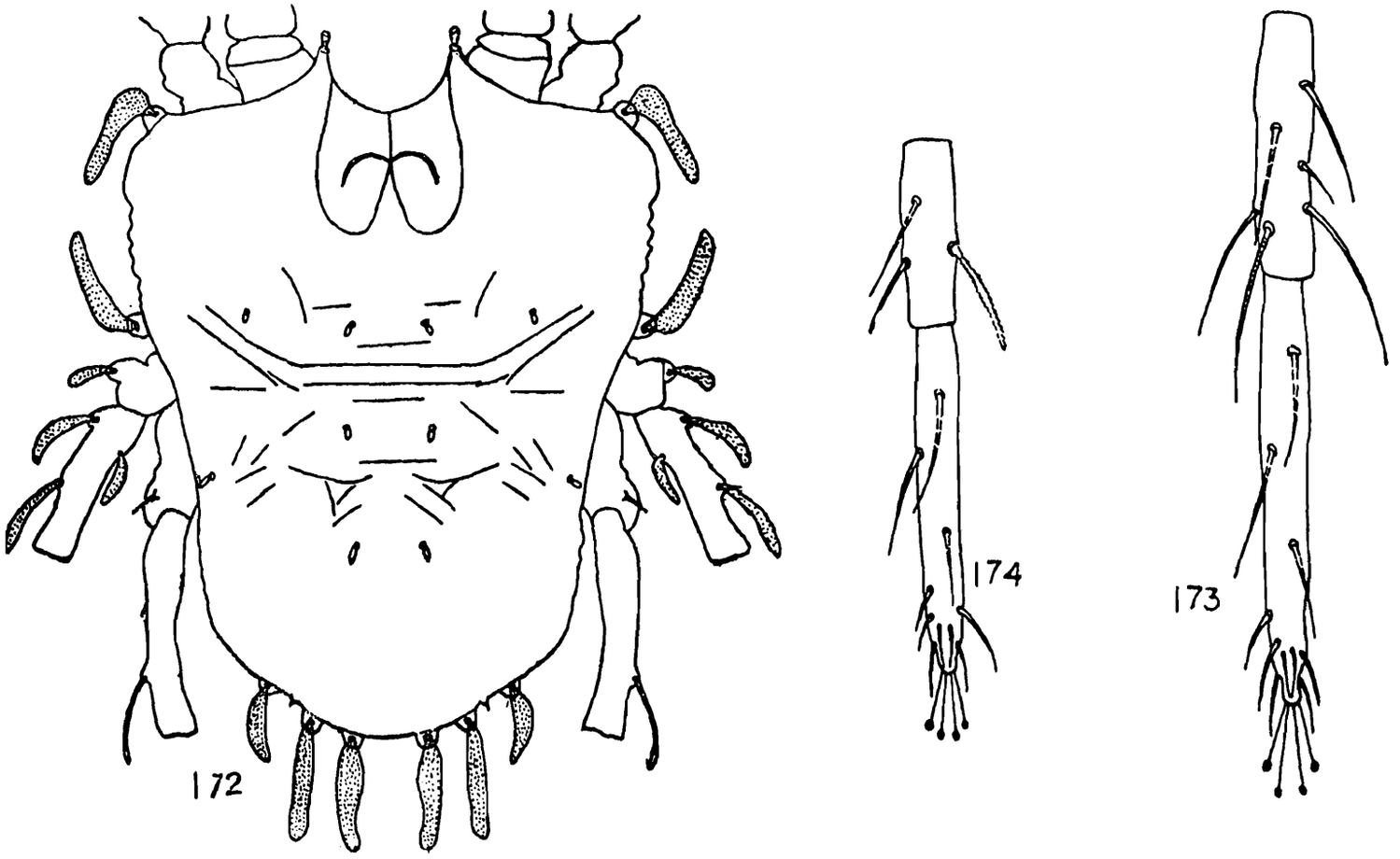
Distribution : India (Andaman & Nicobar Isls., Meghalaya, Uttar Pradesh, West Bengal), Japan, Philippines, Thailand, Taiwan.

21. **Aponychus sarjui** Gupta
(Figs. 172-174)

Aponychus sarjui Gupta, 1980 : 111-112 ; Gupta, 1985 : 60.

Male : Unknown.

Female : Body including rostrum 511 long, 234 wide, oblong. Palpus with terminal sensillum slender, dorsal sensillum small. Peritreme U-shaped. Dorsal idiosomal



Figs. 172-174 : *Aponychus sarjui* **: 172- dorsum of female, 173- tibia and tarsus I of female, 174- tibia and tarsus II of female.**

setae spatulate, serrate. Legs with spatulate setae. Tibia I with 1 sensory and 5 tactile setae ; tarsus I with 10 tactile setae. Tibia II with 1 sensory and 2 tactile setae ; tarsus II with 10 tactile setae. Inner sacrals small and outer sacrals and clunals large

and of same length. Genital flap with transverse striae. Medioventral setae of moderate size.

Known host in India : *Bambusa aurandinacea* (bamboo).

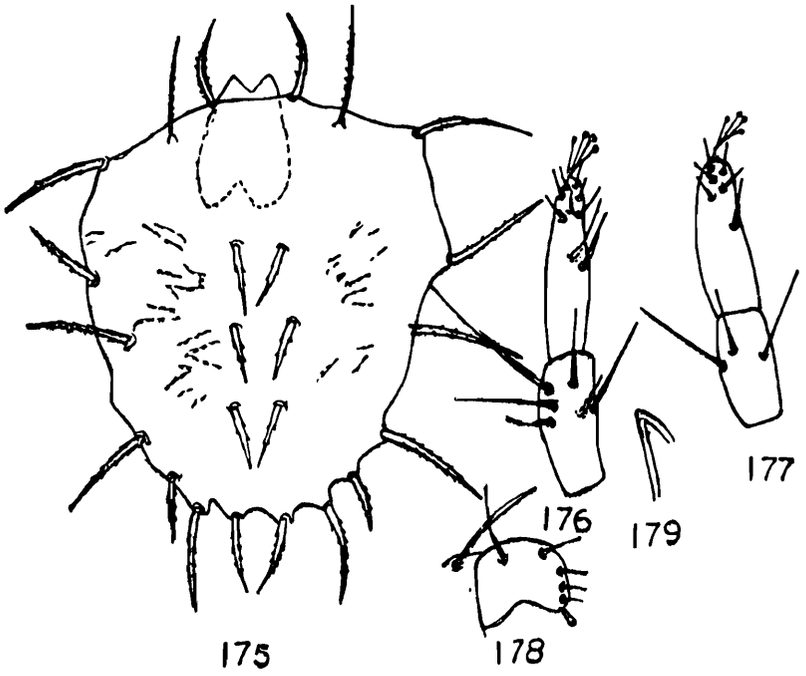
Distribution : India (Andaman & Nicobar Isls.).

22. Aponychus kodaikanalensis Gupta
(Figs. 175-179)

Aponychus kodiakanalensis Gupta, 1984 : 238-239.

Male : Unknown.

Female : Body oblong, including rostrum 400 long, 250 wide with dorsal integument wrinkled as figured. Dorsal idiosomal setae lanceolate and hairy ; 2nd and 3rd propodosomals, humeral, lst and 2nd dorsolateral and inner sacrals large. I-III



Figs. 175-179 : *Aponychus kodaikanalensis* : 175- dorsum of female, 176- tibia and tarsus I of female, 177- tibia and tarsus II of female, 178- distal segment of palpus of female, 179- peritreme of female.

dorsocentral, 3rd dorsolateral medium sized while first propodosomals and clunals same length. Outer sacrals absent. Peritreme at distal end anastomosing. Genital flap with transverse striae. Stylophore deeply cleft mediodistally. Medioventral setae of moderate size. Palpus with terminal sensillum slender and twice as long as broad. Tibia I with 5

tactile and 1 sensory setae ; tarsus I with 8 tactile and 1 sensory setae. Tibia II with 2 tactile and 1 sensory setae ; tarsus II with 6 tactile and 1 sensory setae.

Known host in India : *Bambusa aurandinacea* (bamboo).

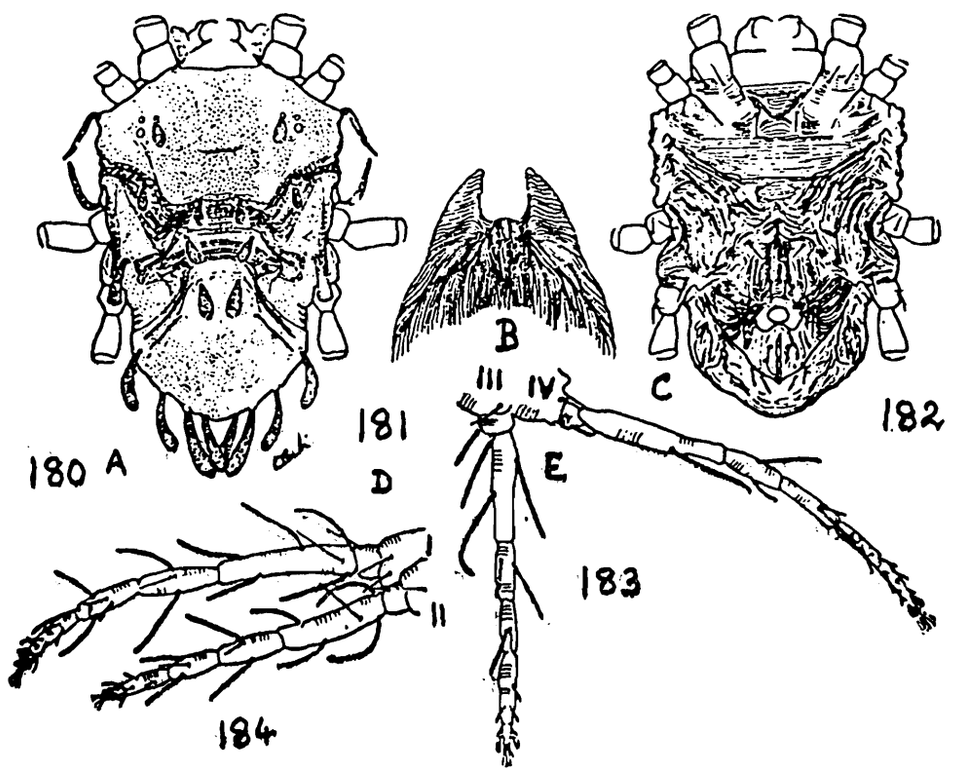
Distribution : India (Tamil Nadu).

23. **Aponychus sulcatus** Chaudhri
(Figs. 180-184)

Aponychus sulcatus Chaudhri, 1972 : 164 ; Sadana *et al.* 1982 : 398.

Male : Not known.

Female : Body oblong, including rostrum 377 long, 255 wide. Stylophore with striations having 2 strong lobes. Peritreme slender with slightly broad at distal end.



Figs. 180-184 : *Aponychus sulcatus* (after Chaudhri, 1972) : 180- dorsum of female, 181- stylophore, 182- ventral surface of female, 183- legs I and II, 184- legs III and IV.

Dorsum finely granulated having prominent transverse furrowed wrinkles in the middle. Propodosomals 3 pairs, I pair strongly serrate, broadly spatulate on tubercles. Humerals 1 pair, crescentic, strongly serrate on tubercles. Dorsocentral hysterosomal 3 pairs,

fan-shaped, strongly serrate, on tubercles. Dorsolateral 3 pairs, fan-shaped, spatulate and strongly serrate. Dorsocentral I and dorsolateral I do not form a straight line. Dorsolateral I smaller than dorsocentral I. Sacrals 2 pairs, marginal, spatulate, on tubercles, strongly serrate, not of same length. Clunals marginal, on tubercles, spatulate, strongly serrate.

Known host in India : *Carica papaya* (papaya).

Known hosts outside India : *Arundo donax, Boerhanvia diffusa.*

Distribution : India (Punjab), Pakistan.

Remarks : This species differs from *A. corpuzae* in having outer sacral setae being marginal position, propodosomal setae I being one and half times length of seta II ; femora III and IV with 3 and 1 setae, respectively and clunal setae shorter than inner sacral.

Genus 12. **Stylophoronychus Prasad**

Aponychus (*Stylophoronychus*) **Prasad, 1975 : 2-4.**

Type : *Aponychus* (*Stylophoronychus*) *baghensis* **Prasad**

Diagnosis : Smith-Meyer (1987) raised the subgenus *Stylophoronychus* **Prasad** to generic level with its diagnosis as below : presence of 9 pairs of dorsal setae on opisthosoma, 3 pairs of caudal setae in marginal position ; dorsal body setae mostly shorter than longitudinal distance between their bases ; stylophore with pointed cone-like projections distally.

Key to the species of *Stylophoronychus* known from India :

1. Median dorsal propodosomal almost touches bases of the following setae, central dorsal propodosomal seta II almost as long as broad, more or less fan-like ... *lalii*

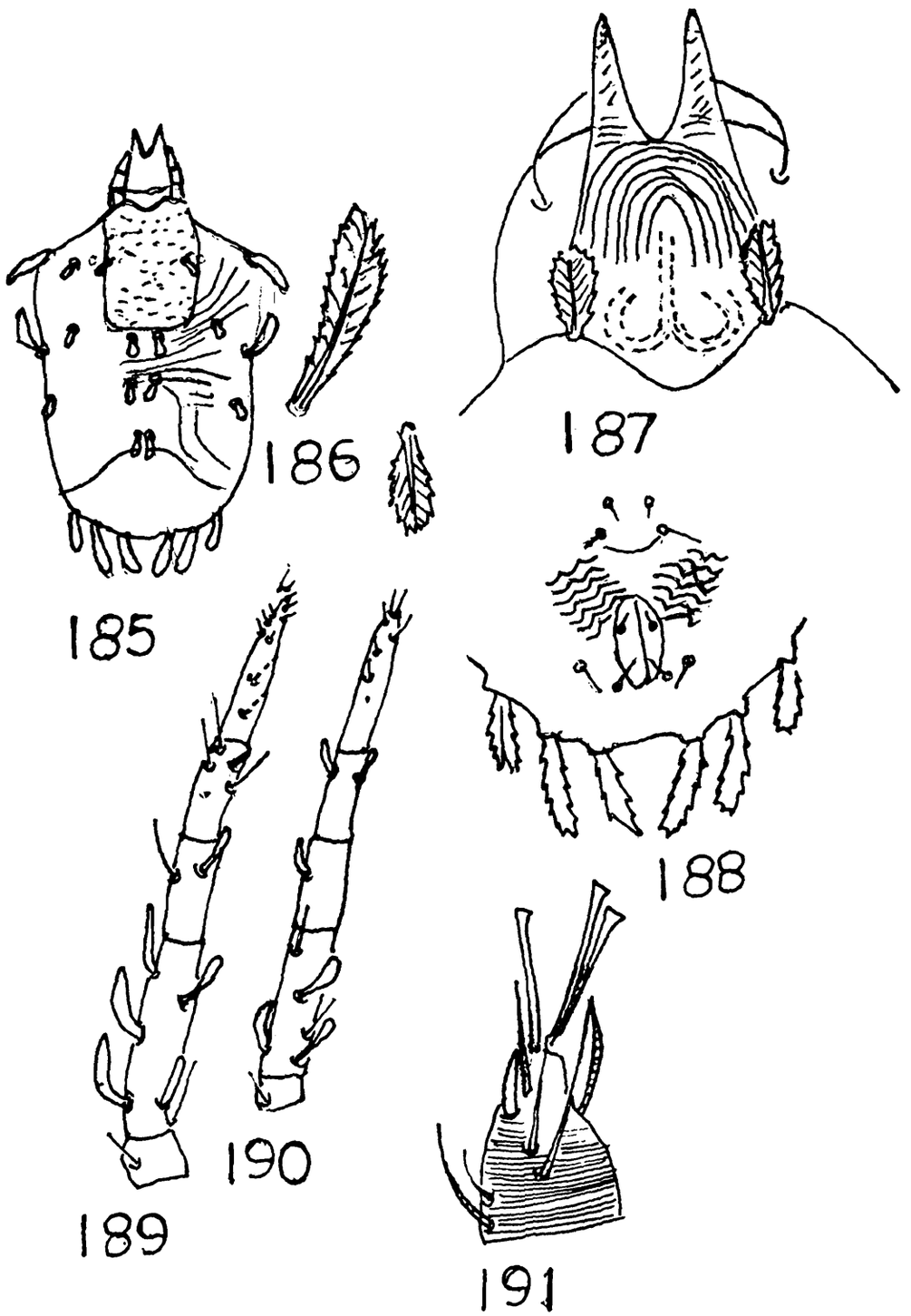
— Median dorsal propodosomal much shorter and never touches bases of the following setae, lateral dorsal propodosomal seta II much longer than broad ... *baghensis*

24. **Stylophoronychus baghensis** (Prasad)
(Figs. 185-191)

Aponychus (*Stylophoronychus*) *baghensis* **Prasad, 1975 : 2-4 ; Gupta, 1985 : 59.**

Male : Unknown.

Female : Body including rostrum 352 long, 250 wide. Stylophore with pointed cones and well developed striae. Palpal segments not clearly visible but femur and genu



Figs. 185-191 : *Stylophoronychus baghensis* (after Prasad, 1975) : 185- dorsum of female, 186- enlarged view of dorsal idiosomal seta, 187- dorsal view of gnathosoma with anterior portion of p^r podosoma, 188- ventral opisthosomal region, 189- leg I of female, 190- leg II of female, 191- distal part of tarsus I.

with 1 seta each. Dorsal idiosomal setae 12 pairs, fan-like, serrate and borne on prominent tubercles, clunals, dorsal propodosomals, laterohysterosomals, humeral, dorsal propodosomals well elongated ; 4th laterohysterosomals absent. Tibia and tarsus I with 1 sensory seta each. Paraanals 2 pairs, simple, slightly shorter.

Known host in India : *Bauhinia aurandinacea* ? (bamboo).

Distribution : India (Karnataka).

25. Stylophoronychus lalii (Prasad)
(Figs. 159-162)*

Aponychus (*Stylophoronychus*) *lalii* Prasad, 1975a : 8-10 ; Gupta, 1985 : 60.

Male : Unknown.

Female : Body including rostrum 325 long, 285 wide. Gnathosomal region similar to that of *S. baghensis* Prasad. Peritreme ends in simple bulb. Body oval with 12 pairs of setae, fan-like, serrate and borne on tubercles. Mediohysterosomals I, II III very long and approaching to the bases of next setae. Lateral propodosomal II, mediohysterosomal IV, laterohysterosomal III, humerals and clunals moderately long, leaf-like and placed marginally on tubercles. Laterohysterosomal I very short and thin. Tibia I and tarsus I with very short sensory setae.

Known host in India : *Bambusa* sp. (bamboo).

Distribution : India (Bihar).

Tribe 5. TENUIPALPODINI Pritchard & Baker

Tenuipalpodini Pritchard & Baker, 1955 : 97 ; Wainstein, 1960 : 145 ; Tuttle & Baker, 1968 : 83 ; Gupta, 1985 : 68 ; Smith-Meyer, 1987 : 88.

Genus 13. Tenuipalponychus ChannaBasavanna & Lakkundi

Tenuipalponychus ChannaBasavanna & Lakkundi, 1977 : 23-26 ; Gupta, 1985 : 68 ; Smith-Meyer, 1987 : 91.

Type : *Tenuipalponychus citri* ChannaBasavanna & Lakkundi

Diagnosis : This genus is similar to *Tenuipalpoides* Reck & Bagdasarian in the dorsal aspect of body and in tarsal appendages. However, it differs in that tarsus II bears

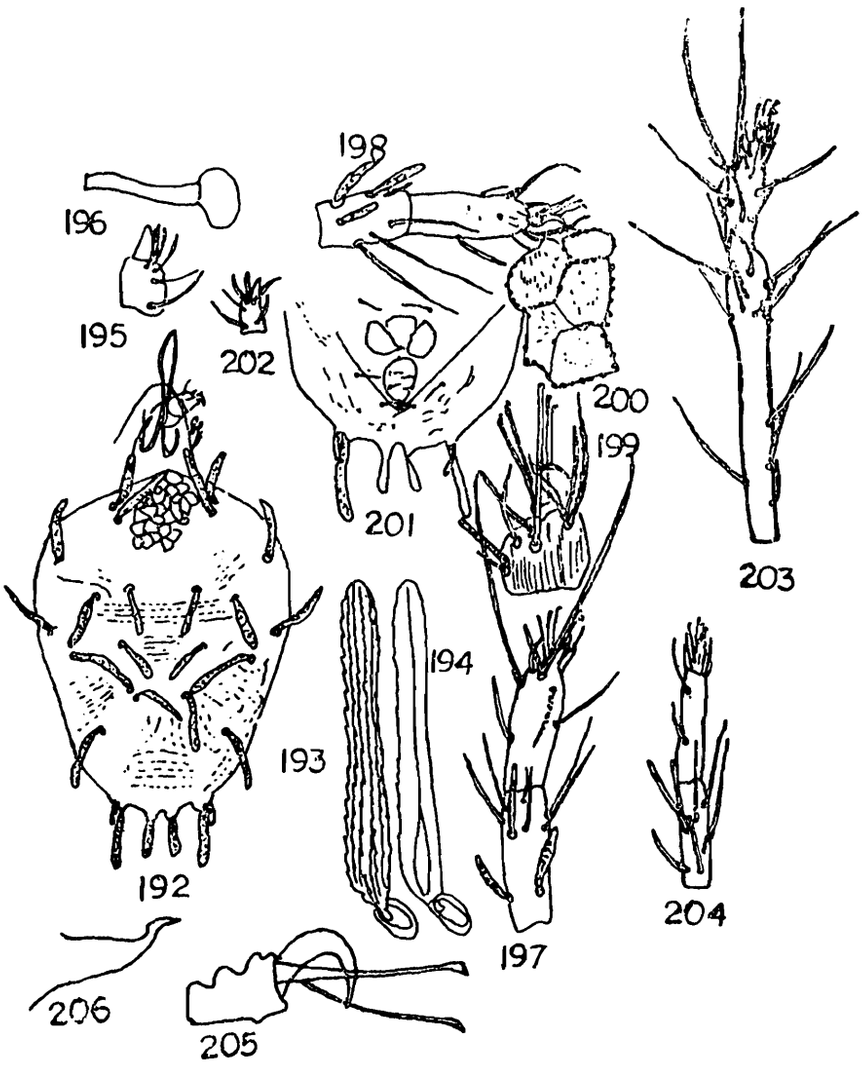
*For Figs. 159-162, please see Page No. 41.

a normal set of duplex setae, its distal member is a long, tapered solenidion and peritreme ends in simple bulb.

26. **Tenuipalponychus citri** ChannaBasavanna & Lakkundi
(Figs. 192-206)

Tenuipalponychus citri ChannaBasavanna & Lakkundi, 1977 : 22-23 ; Gupta, 1985 : 60.

Male : Body including rostrum 455 long, 202 wide. Dorsal idiosomal setae 13 pairs resembling those of females in shape but posterior region more pointed. Dorsolateral



Figs. 192-206: *Tenuipalponychus citri* : 192- dorsum of female, 193- & 194- enlarged view of dorsal idiosomal setae, 195- terminal segment of palpus of female, 196- peritreme, 197-tibia and tarsus I of female, 198- tibia and tarsus II of female, 199- tarsal appendage of leg I, 200- propodosomal reticulation, 201- ventral aspect of female, 202- terminal segment of palp of male, 203- leg I of male, 204- leg II of male, 205- tarsal appendage of male, 206- aedeagus.

hysterosomals about twice as long as dorsocentrals. Propodosoma medially reticulated as in female. Hysterosoma mostly with striae.

Female : Body including rostrum 430 long, 370 wide. Stylophore rounded anteriorly. Peritreme ends in a simple bulb. Palp tarsus with terminal sensillum about two and half times as long as broad, taparing bluntly at rounded end. Dorsal idiosomal setae 13 pairs, rod-like. All setae on moderate tubercles and ventral surface having serrations along one margin and median longitudinal line. Dorsal hysterosomals slightly longer than corresponding dorsocentrals. Two pairs of preanals and 2 pairs of anal setae present. True claws pad-like each with a pair of tenent hairs. Empodium claw-like, prominent, strongly hooked without appendages.

Known host in India : *Citrus sinensis* (orange).

Distribution : India (Karnataka).

Remarks : This genus is known only from its type.

Tribe 6. TETRANYCHINI Reck

Tetranychini Reck, 1950 : 123 ; Pritchard & Baker, 1955 : 124 ; Wainstein, 1960 : 147 ; Gupta, 1985 : 70.

Genus 14. **Bakerina** Chaudhri

Bakerina Chaudhri, 1971 : 195 ; Meyer, 1974 : 183 : Prasad 1975c : 18-19 ; Gupta, 1985 : 69 ; Smith-Meyer, 1987 : 95.

Type : *Bakerina lepidus* Chaudhri

Diagnosis : The genus is diagnosed by Smith-Meyer (1987) as : dorsal body integument reticulated . on propodosoma and striated on opisthosoma, 12-13 pairs of thick, finely pilose or sometimes lanceolate to subspatulate dorsal body setae present ; 4th pair of dorsocentral setae located in a normal or almost marginal position ; female dorsal body setae set on small tubercles ; 2 pairs of paraanal setae on venter. Peritreme slightly hooked and simple. Empodial claw uncinate and longer than pad of true claw ; tarsus II with distal member of duplex setae long and tapering.

Key to the species of *Bakerina* known from India :

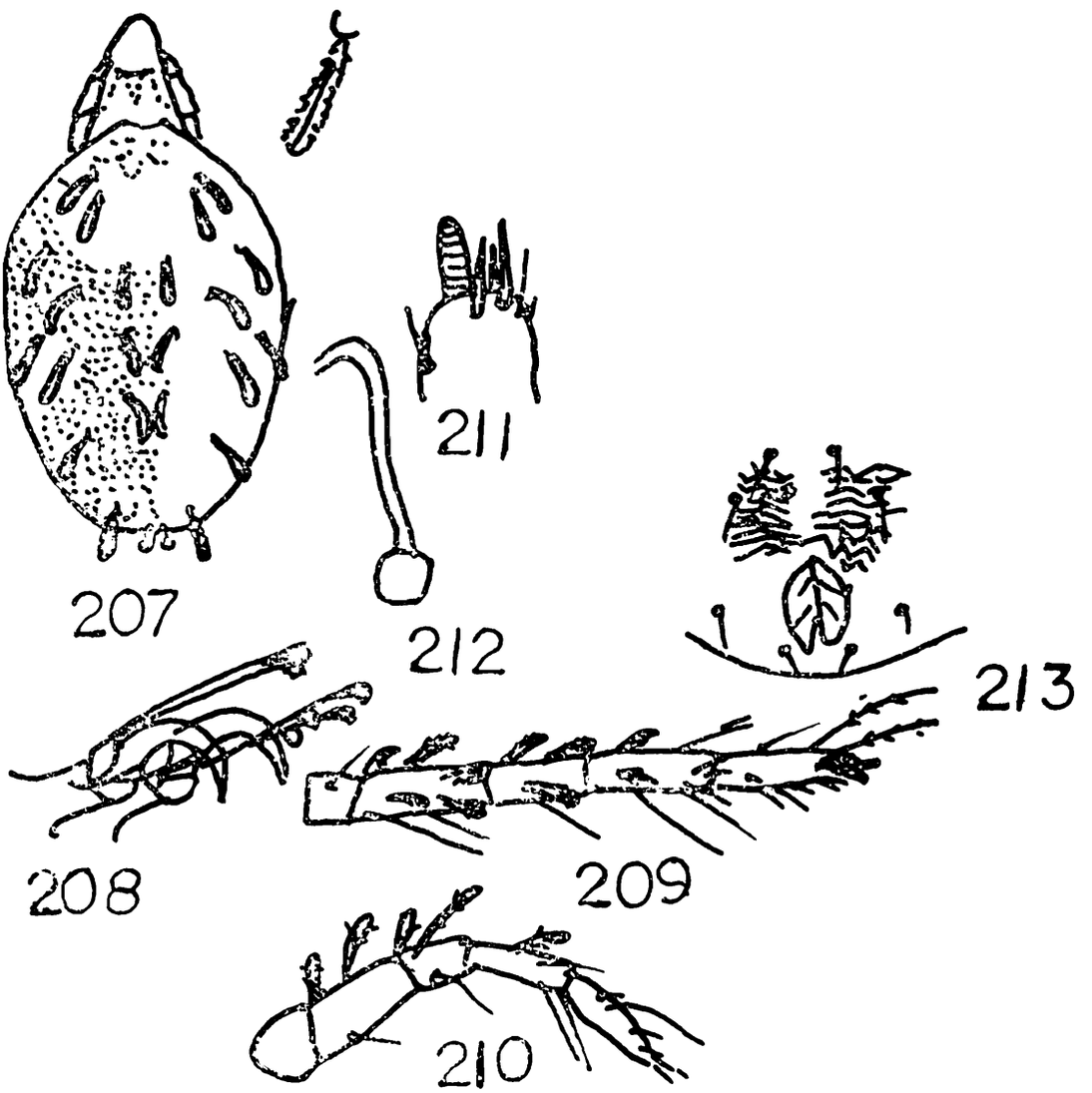
1. Dorsal idiosomal setae 12 pairs, setae leaf-like ... *orissaensis*
— Dorsal idiosomal setae 13 pairs, setae lanceolate ... *aculus*

27. Bakerina orissaensis Prasad
(Figs. 207-213)

Bakerina orissaensis Prasad, 1975c : 18-20 ; Gupta, 1985 : 70.

Male : Unknown.

Female : Body with rostrum 372 long, 257 wide. Stylophore narrow and rounded anteriorly. Peritreme ends more or less rectangular. Palpal thumb with a heavy rod-like



Figs. 207-213 : *Bakerina orissaensis* (after Prasad, 1975c) : 207- dorsum of female, 208- pretarsus of leg I, 209- leg I, 210- leg II, 211- distal segment of palp of female, 212- peritreme, 213- Ventral aspect of opisthosoma.

solenidion and tiny setae. Dorsal idiosomal setae 12 pairs with leaf-like serrate structure, borne on tubercles. Dorsal propodosomal I and II borne well posterior to anterior part

of propodosoma and placed very closed to each other. Latero-hysterosomals absent. Duplex setae on tarsus placed close to each other. Tibia I with 2 sensory setae, tarsus I and II with 2 sensory setae proximal to duplex setae.

Known host in India : *Artocarpus integrifolia* (jack fruit).

Distribution : India (Orissa).

28. **Bakerina aculus** Chaudhri

Bakerina aculus Chaudhri, 1971 : 197-199 ; Sadana, Chhabra & Kumari, 1981 : 325-326.

Male : Unknown.

Female : The species as re-described by Chaudhri *et al.* (1974) as : Body 337 long (without gnathosoma), 204 wide. Peritreme hooked. Dorsal setae 13 pairs, all being lanceolate and profusely barbed. Hysterosoma with irregular, simple, longitudinal striations along the margin and irregular, dimpled, transverse striations at the middle. Hysterosomal setae 10 pairs. Dorsocentral setae 3 pairs measuring 44, 52, 52. Three pairs of dorsolateral setae measuring 47, 49 and 49. Sacral setae 2 pairs measuring : inner sacral-52, outer sacral-47, clunal-49. Venter with simple striation. Anterior and posterior paraanals being both barbed. Setae on legs : Coxae : 2-2-1-1, trochanter : 1-1-1-1, femora : 8-6-4-4, genu : 5-5-3-3, tibia : 10-7-6-7, tarsi : 15-2-9-9. Tarsi I and II with 2 and 1 set of duplex setae, tarsi III and IV with a long solenidion each.

Known host in India : *Thuja orientalis.*

Known host outside India : *Salvadora oleoides.*

Distribution : India (Punjab), Pakistan.

Genus 15. **Panonychus** Yokoyama

Panonychus Yokoyama, 1929 : 531 ; Meyer & Ryke, 1959 : 350 ; Baker & Pritchard, 1960 : 471 : Tuttle & Baker, 1968 : 84 ; Meyer, 1974 : 186 ; Gupta, 1985 : 92 ; Smith-Meyer, 1987 : 97.

Metatetranychus Oudemans, 1931 : 199 ; Pritchard & Baker, 1955 : 127.

Type : *Panonychus mori* Yokoyama = *Panonychus citri* McGregor

Diagnosis : The genus may be recognised by the characters : dorsal body setae borne on strong tubercles, dorsal striae longitudinal on propodosoma and mostly transverse on opisthosoma ; empodium claw-like with 3 pairs of proximoventral hairs ; 2 pairs of paraanal setae on venter.

Key to the species of *Panonychus* known from India :

1. Fifth pair of dorsocentrals and 4th pair of dorsolateral equal in length ... *citri*
— Fifth pair of dorsocentrals about 1/3 length of 4th pair of dorsolateral ... *ulmi*

29. **Panonychus citri** (McGregor)
(Figs. 214-223)

Tetranychus citri McGregor, 1916 : 284.

Paratetranychus citri, McGregor, 1919 :

Metatetranychus citri Pritchard & Baker 1955 : 133 ; Gupta, 1970 : 98.

Panonychus citri Ehara, 1956 : 500 ; Meyer & Ryke, 1959 : 350-351 ; Baker & Pritchard, 1960 : 471-473 ; Wainstein, 1960 : 202 ; Bindra, 1966 : 111 ; Tuttle & Baker, 1968 : 85 ; Meyer, 1974 : 187 ; Prasad, 1974 : 119-120 ; Gupta, 1976 : 335 ; Gupta, 1985 : 92-93 ; Smith-Meyer, 1987 : 97-98.

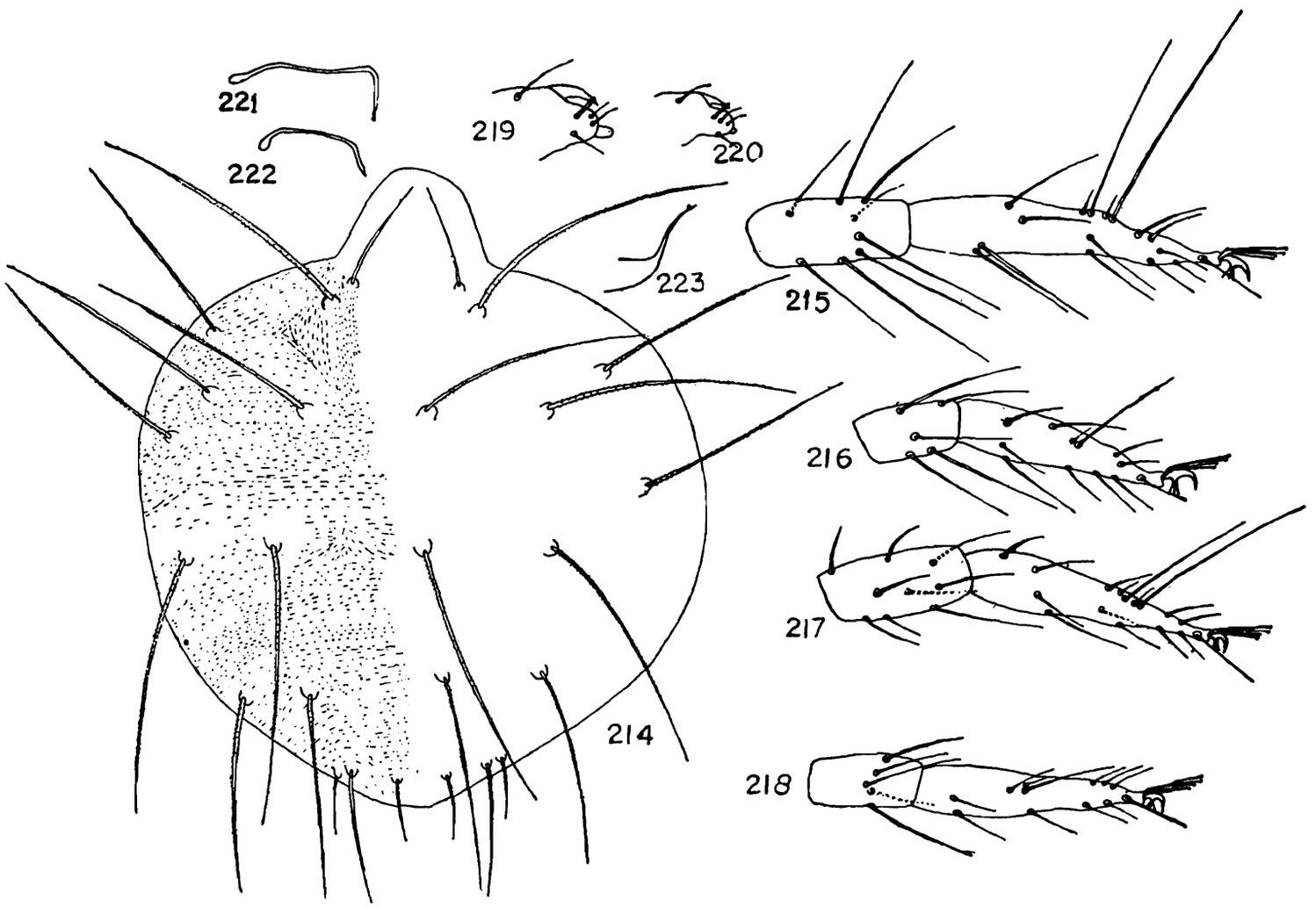
Male : Body including rostrum 331 long, 159 wide. Palpus with terminal sensillum minute, dorsal sensillum small and slender. Peritreme straight distally, ends into a simple bulb. Dorsal idiosomal setae borne on strong tubercles and similar to those of *P. ulmi* but longer. Tibia I with 3 sensory and 6 tactile setae ; tarsus I-2 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 5 tactile setae ; tarsus II with 3 tactile setae proximal to duplex setae. The aedeagus of this species bent dorsad gradually to form a narrow slender, sigmoid distal end.

Female : Body including rostrum 432 long, 159 wide. Palpus with terminal sensillum longer than broad, dorsal sensillum long and slender. Peritreme ends in simple bulb. Dorsal idiosomal setae much more longer, tibia I with 1 sensory and 7 tactile setae ; tarsus I with 1 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 5 tactile setae ; tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Outer and inner sacrals not of same length while inner and clunals same in length and 1/3 of outer sacrals. Genital flap with transverse striae. Medioventral setae of moderate size.

Known hosts in India : *Artocarpus integrifolia*, *Carica papaya* (papaya), *Chrysanthemum coronarium*, *Citrus* sp., *Citrus aurantium* (orange), *Crallia bracteata*, Mandarin, *Morus alba*, *Musa sapientum* (banana), *Prunus persica*, *Pyrus malus* (apple).

Known hosts outside India : *Areca catechu*, *Averrhoa* sp., Avocado, *Bochmeria* sp., *Carica papaya*, *Cedrella toona*, *Citrus* sp., *C. reticulata*, *C. sinensis*, *Cocoloba uvifora*, *Cocos nucifora*, *Coculus trilobus*, *Debergeesia leucophylla*, *Ficus* sp., *Glycine javanica*, *Jasminum* sp.,

Melia azadirachta, *Morus australis*, *Murraya paniculata*, *Osmanthus sp.*, *Pithecellobium dulce*, *Prunus persica*, *Pyrus pyrifolia*, *Rosa* sp., *Tetrachycarpus excelsa*, *Vitis vinifera*.



Figs. 214-223 : *Panonychus citri* : 214- dorsum of female, 215- tibia and tarsus I of female, 216- tibia and tarsus II of female, 217- tibia and tarsus I of male, 218- tibia and tarsus II of male, 219- distal segment of palpus of female, 220- distal segment of palpus of male, 221- peritreme of female, 222- peritreme of male, 223- aedeagus.

Distribution : India (Himachal Pradesh, Jammu & Kashmir, Manipur, Tripura, Uttar Pradesh, Meghalaya, West Bengal). Nepal, South America, U.S.A , Central America, China, Japan, Middle East, New Zealand, South Africa, Thailand, Taiwan, Hong Kong.

30. **Panonychus ulmi** (Koch)
(Figs. 224-231)

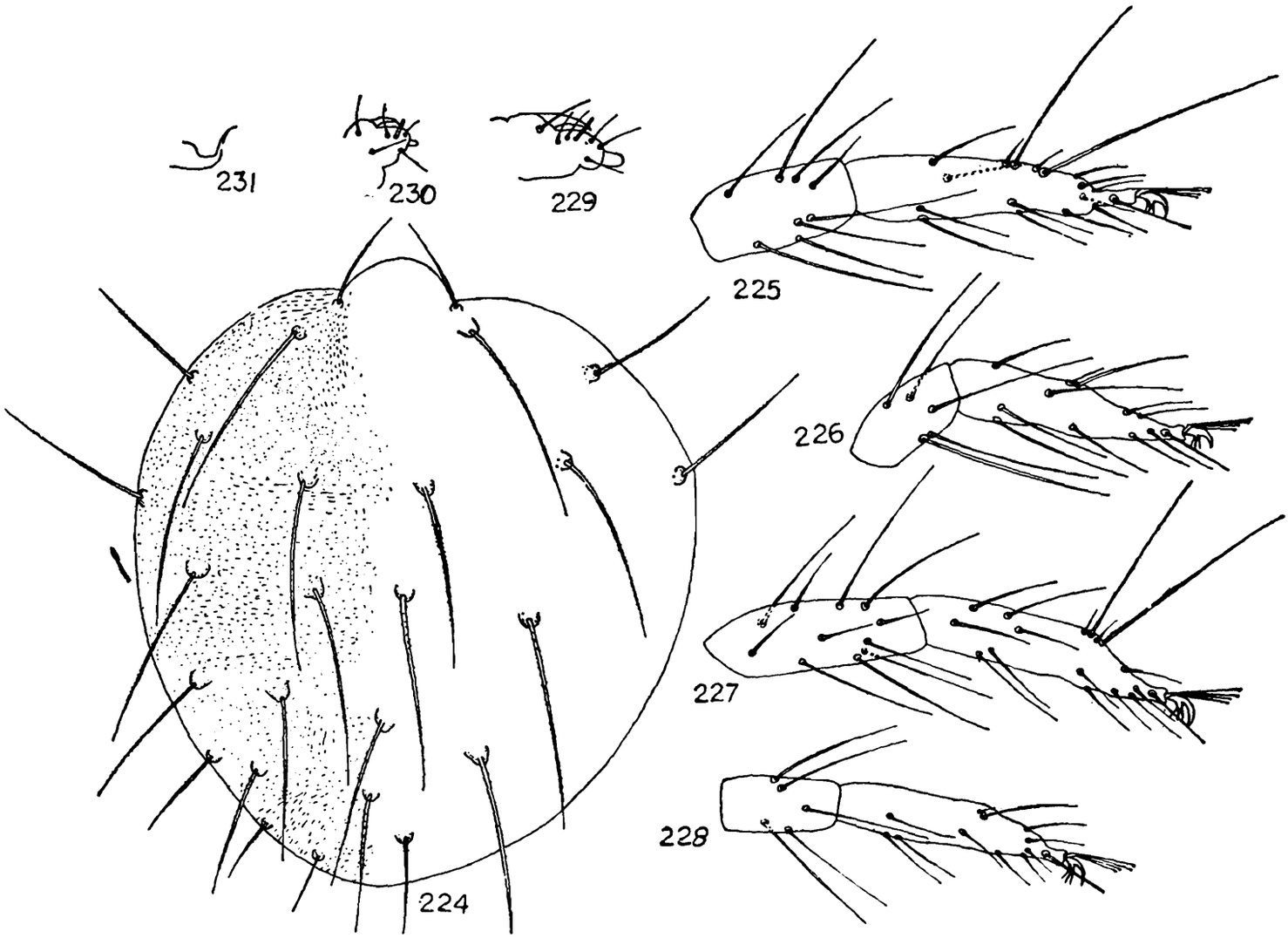
Tetranychus ulmi Koch, 1836 : 11.

Oligonychus ulmi, Hirst, 1920 :

Metatetranychus ulmi, Pritchard & Baker, 1955 : 128-132.

Panonychus ulmi Wainstein, 1960 : 202-203 ; Meyer, 1974 : 187 ; Prasad, 1975 : 22-24 ; Gupta, 1985 : 93 ; Smith-Meyer, 1987, : 97-98.

Male : Body including rostrum 285 long, 195 wide. Terminal sensillum of palpus twice as long as wide. Distal end of peritreme anastomosing. Dorsal idiosomal setae



Figs. 224-231 : *Panonychus ulmi* : 224- dorsum of female, 225- tibia and tarsus I of female, 226- tibia and tarsus II of female, 227- tibia and tarsus I of male, 228- tibia and tarsus II of male, 229- distal segment of palpus of female, 230- distal segment of palpus of male, 231- aedeagus.

borne on strong tubercles, serrate, tapering gradually and one and half times longer than the interval between their lohgitudinal bases. Tibia I with 3 sensory and 8 tactile setae ; tarsus I with 3 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 5 tactile setae, tarsus II with 2 tactile setae proximal to duplex setae. The male may be recognised by the aedeagus which is sharply bent dorsally, gradually becoming slender to form sigmoid distal end.

Female : Body including rostrum 534 long, 339 wide. Terminal sensillum of palpus much longer than wide, dorsal sensillum long and slender. Peritreme straight distally ending in a simple bulb. Dorsal idiosomal setae long, serrate, tapering gradually and one and half time longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 7 tactile setae, tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 5 tactile setae ; tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Outer sacrals longer than inner sacrals while clunals smaller than inner sacrals. Genital flap with transverse striae. Medioventral setae of moderate size.

Known hosts in India : *Artocarpus integrifolia*, *Chrysanthemum coronarium*, *Ficus carica*, *Hibiscus* sp., *Lycopersicum esculentum*, *Morus alba*, *Prunus armeniaca*, *P. communis*, *P. domestica*, *P. persica*. *Rosa indica*, *Triticum aestivum*, walnut.

Known hosts outside India : *Alnus glutinosa*, *Citrus* sp., Elm tree, Fungus, Gooseberry, *Lonicera japonica*, moss.

Distribution : India (Himachal Pradesh, Uttar Pradesh, West Bengal), worldwide,

Remarks : The infestation of this mite produces characteristic white specks on citrus leaves. Later, they assume grey hue, then yellowish brown and finally bronzy. The damaged leaves become rolled.

Genus 16. **Eotetranychus** Oudemans

Eotetranychus Oudemans, 1931 : 224 ; Pritchard & Baker, 1955 : 138 : Meyer & Ryke, 1959 : 348; Baker & Pritchard, 1960 : 473 ; Gutierrez, 1967 : 370-372 ; Meyer, 1974 : 189 ; Tuttle *et al.*, 1976 : 37 ; Gupta, 1985 : 70 ; Smith-Meyer, 1987 : 110.

Type : *Trombidium tiliarum* Hermann

Diagnosis : The members of this genus can be recognised by 2 pairs of anal and 2 pairs of paraanal setae in female ; opisthosomal striae transverse usually with small lobes ; tarsus I duplex setae distal and adjacent with 3-5 tactile setae proximal to duplex setae ; true claw pad-like with tenent hairs ; empodia (except in leg I and II of males) with 3 pairs of ventrally directed hairs ; dorsal body setae at least as long as distance between bases of consecutive setae.

Key to the species of *Eotetranychus* known from India :

1.	Dorsal idiosomal setae serrate	2
—	Dorsal idiosomal setae not serrate	9
2.	Dorsal idiosomal setae longer than distance between their longitudinal bases	3
—	Dorsal idiosomal setae as long as interval between their longitudinal bases	8
3.	Dorsal idiosomal setae one and half times as long as the interval between their longitudinal bases	4
—	Dorsal idiosomal setae about 2 times as long as interval between their longitudinal bases ...	*fremonti*
4.	Shaft of aedeagus short, board and curved dorsad not forming a knob	5
—	Shaft of aedeagus straight, turning slightly dorsad to form a knob	*rohilae*
5.	Aedeagus with proximal portion of shaft curved dorsad	6
—	Aedeagus with proximal portion of shaft not curved dorsad	7
6.	Distal portion of aedeagus sigmoid ...	*rajouriensis*
—	Distal portion of aedeagus not sigmoid ...	*communis*
7.	Aedeagus gradually tapering and forming a broad ventral bend ...	*kankitus*
—	Aedeagus gradually narrow distally and curves dorsad forming distal knob ...	*broodryki*
8.	Shaft of aedeagus bending dorsad to form slender sigmoid ...	*irregularis*
—	Shaft of aedeagus bending ventrad to form slender but not sigmoid ...	*syzygii*
9.	Distal portion of aedeagus sigmoid	10
—	Distal portion of aedeagus curved but not sigmoid	13
10.	Aedeagus bend dorsad	11
—	Aedeagus bend ventrad ...	*hicoriae*
11.	Distal portion of aedeagus strongly curved and hook-like	12
—	Distal portion of aedeagus strongly curved but not hooked ...	*hirsti*

12. Dorsal idiosomal setae twice as long as the interval between their longitudinal bases ... *frosti*

— Dorsal idiosomal setae not twice as long as the interval between their longitudinal bases ... *suginamensis*

13. Peritreme at the distal end forming irregular anastomose enlargement ... *populi*

— Peritreme not like above 14

14. Peritreme at the distal end bends 15

— Peritreme at the distal end not bend 18

15. Peritreme at distal end U-shaped ... *pruni*

— Peritreme at the distal end not U-shaped 16

16. Peritreme forms a short distal hook ... *asiaticus*

— Peritreme forms a simple long hook 17

17. Aedeagus bends dorsad forming an obtuse angle without knob ... *truncatus*

— Aedeaugus not as abovc ... *weldoni*

18. Genital flap with longitudinal striae ... *sexmaculatus*

— Genital flap with transverse striae 19

19. Terminal sensillum of palp absent ... *guajavae*

— Terminal sensillum of palp small 20

20. Peritreme at the distal end curved 22

— Peritreme at the distal end with small bulb 21

21. Aedeagus bent dorsad to form slender distal portion ... *pamelae*

— Aedeagus bent dorsad to form gradual tapering slender distal portion ... *mandensis*

22. Aedeagus narrow, rod forming, finger-like, distal end slender and rounded at the tip ... *ranikhetensis*

— Aedeagus narrowed, rod forming, pointed at the distal end ... *indicus*

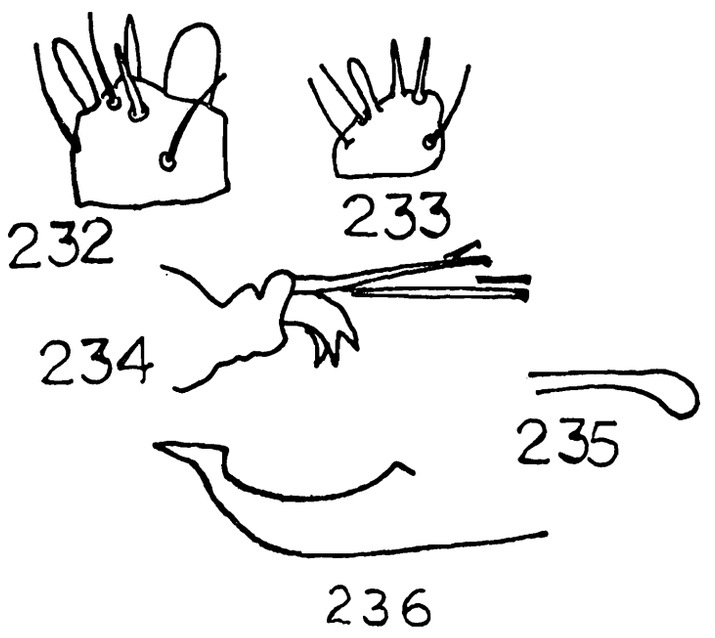
31. **Eotetranychus broodryki** Meyer

(Figs. 232-236)

Eotetranychus broodryki Meyer, 1974 : 201 ; Das & Naik, 1979 : 6 ; Gupta, 1985 : 71 ; Smith-Meyer, 1987 : 113.

Male : The terminal sensillum on the palp tarsus inconspicuous and rudimentary. The mediodorsal sensilla about as long as the proximodorsal sensillum. Tarsus I bears 3 tactile setae and one sensory seta proximal to duplex setae. Empodium I bifid. Aedeagus shaft gradually narrows distally and curves dorsad forming a distal knob. The dorsal margin of shaft convex and about one and half times as long as the width of the knob.

Female : Body including rostrum 500-559 long and 280-287 wide. The stylophore rounded distally. The terminal sensillum on the palp tarsus about one and half time as



Figs. 232-236 : *Eotetranychus broodryki* (after Meyer, 1974) : 232- distal segment of palpus of female, 233- distal segment of palpus of male, 234- tarsal claw of male, 235- peritreme of female, 236- aedeagus.

long as broad. Peritreme terminates in a simple bulb. Body setae linear, lanceolate, serrate and extend to the bases of setae next behind. The lobed striae on the propodosoma longitudinal and those on the hysterosoma mostly transverse. Tarsus I with 3 tactile setae and 1 sensory setae situated proximal to duplex setae.

Known host in India : *Cajanas cajan.*

Known host outside India : Unidentified wild tree.

Distribution : India (Orissa), Zimbabwe.

Remarks : Though this species has been reported to be infesting red gram in various parts of the country specially in the southern and western India but the authors

very much doubt the correctness of the identities *vis a vis* the occurrence of this species in India. In spite of best efforts, the identified specimens could not be made available to the authors and hence the correctness of the identities by the previous authors could not be re-checked.

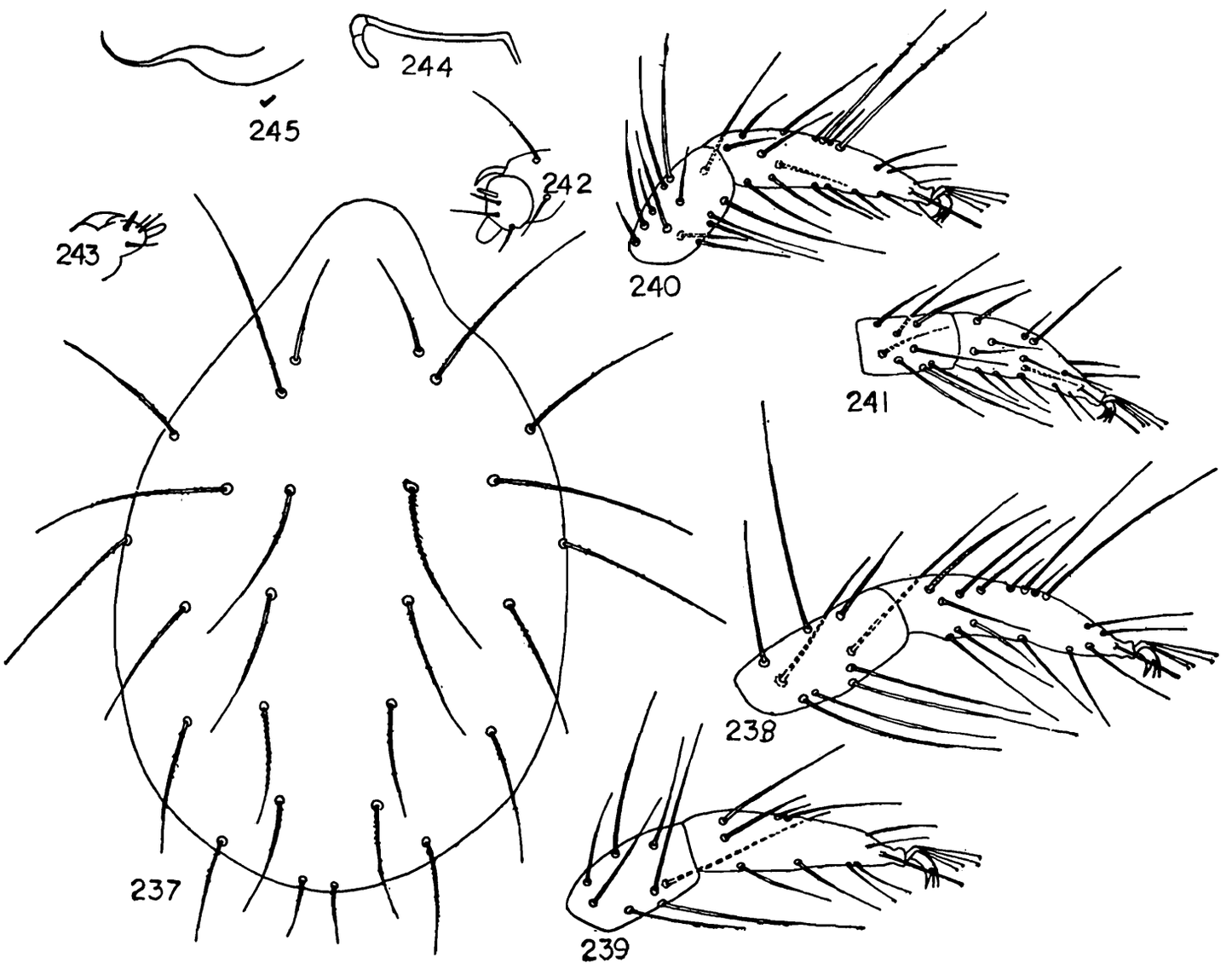
32. **Eotetranychus communis** sp. nov.
(Figs. 237-245)

Male : Body including rostrum 357 long, 177 wide. Terminal sensillum of palpus 3 times longer than wide, dorsal sensillum slender and tapering distally. Dorsal idiosomal setae long and serrate. Tibia I with 3 sensory and 10 tactile setae, tarsus I with 2 sensory and 5 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 7 tactile setae, tarsus II with 2 sensory and 2 tactile setae proximal to duplex setae. Aedeagus very similar to *E. smithi* Pritchard & Baker.

Female : Body including rostrum 498 long, 285 wide. Terminal sensillum of palpus one and half times as long as wide. Peritreme strongly hooked at distal end. Dorsal idiosomal setae serrate and one and half times as long as the interval between their longitudinal bases. Tibia I with 1 sensory and 5 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 7 tactile setae ; tarsus II with 1 sensory and 2 tactile setae proximal to duplex setae. Outer and inner sacral setae same in length. Clunals smaller. Genital flap with transverse striae.

Holotype male (Reg. No. 3189/17), India : Rajasthan, Udaipur Agril. University farm, on pear (Dt. of collection unknown), Coll. Y. D. Pande. Paratypes : 3 Females (Reg. No. 3190/17), data came as for holotype.

Remarks : Though the aedeagus of the new species is very similar to that of *E. smithi* Pritchard & Baker (1955) but the females of the two species differ distinctly as the dorsoidiosomal setae of the new species being serrate but it is smooth in *smithi* and these are of one and half times as long as the distance between their longitudinal bases while these are much shorter in *smithi*. Further, the chaetotactic pattern of the tibia and tarsus of leg I and II in both sexes differ.

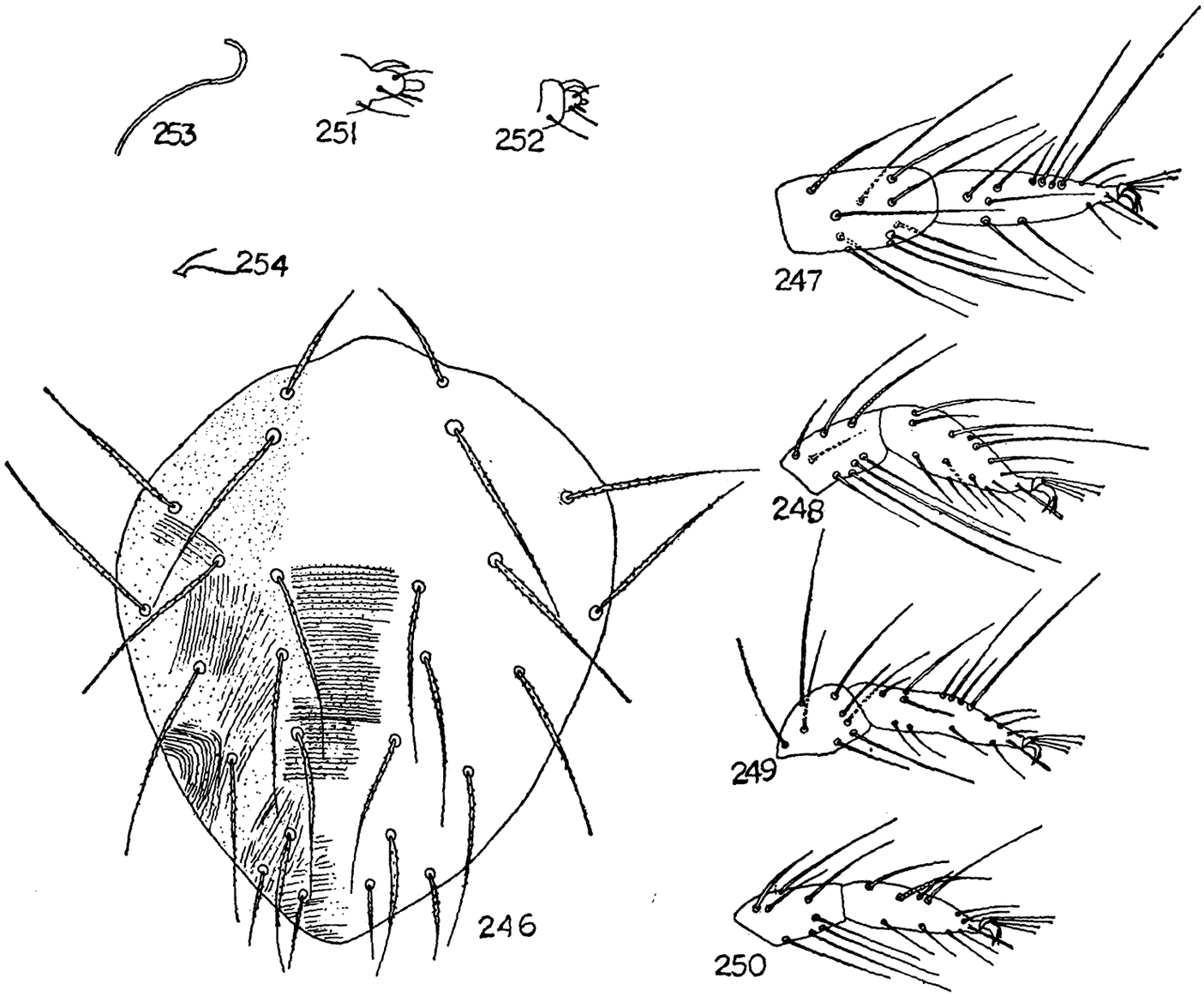


Figs. 237-245 : *Eotetranychus communis* sp. nov. : 237- dorsum of female, 238- tibia and tarsus I of female, 239- tibia and tarsus II of female, 240- tibia and tarsus I of male, 241- tibia and tarsus II of male, 242- distal segment of palpus of female, 243- distal segment of palpus of male, 244- peritreme of female, 245- aedeagus.

33. Eotetranychus fremonti Tuttle & Baker
(Figs. 246-254)

Eotetranychus fremonti Tuttle & Baker, 1964 : 260 ; 1968 : 90 ; Tuttle *et al.*, 1976 : 41 ; Gupta 1980 : 113 ; Gupta, 1985 : 73.

Male : Body including rostrum 270 long, 126 wide. Terminal sensillum of palpus minute and tapering, dorsal sensillum slender. Peritreme hooked shaped at the distal end.



Figs. 246-254 : *Eotetranychus fremonti* : 246- dorsum of female, 247- tibia and tarsus I of female, 248- tibia and tarsus II of female, 249- tibia and tarsus I of male, 250- tibia and tarsus II of male, 251- distal segment of palpus of female, 252- distal segment of palpus of male, 253- peritreme of female, 254- aedeages.

Dorsal setae of idiosoma long, fusiform, tapering from near the base, sharply serrate and nearly longer than the interval between their longitudinal bases. Tibia I with 2 sensory and 6 tactile setae, tarsus I with 2 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 7 tactile setae ; tarsus II with 1 sensory and 2 tactile setae proximal to duplex eetae. Body with fine, mostly transverse striae on propodosoma. Aedeagus bent ventrad with a short anterior and a much longer angulation.

Female : Body including rostrum 303 long, 166 wide. Terminal sensillum of palpus two and half times as long as wide, dorsal sensillum tapering. Peritreme at the distal end slightly anastomosing. Dorsal setae of idiosoma very long, fusiform, tapering from near the base, sharply serrate and nearly 2 times longer than the interval between their longitudinal bases. Tihia I with 1 sensory and 9 tactile setae ; tarsus I with 1 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 2 sensory and 6 tactile setae ; tarsus II with 1 sensory and 4 tactile setae proximal to duplex setae. Body with transverse striae. Inner sacrals longer than outer sacrals but equal to clunals. Genital flap with transverse striae. Postanal setae thin and small. Medioventral setae long.

Known host in India : *Ficus carica* (fig).

Known hosts outside India : *Acacia constricta, Morus alba, Poplus fremonti, P. tremuloides, Prosopis juliflora, Ruillia nudiflora, Zizyphus jujuba.*

Distribution : India (Andaman Nicobar Isls., Himachal Pradesh), U.S.A. (Arizona).

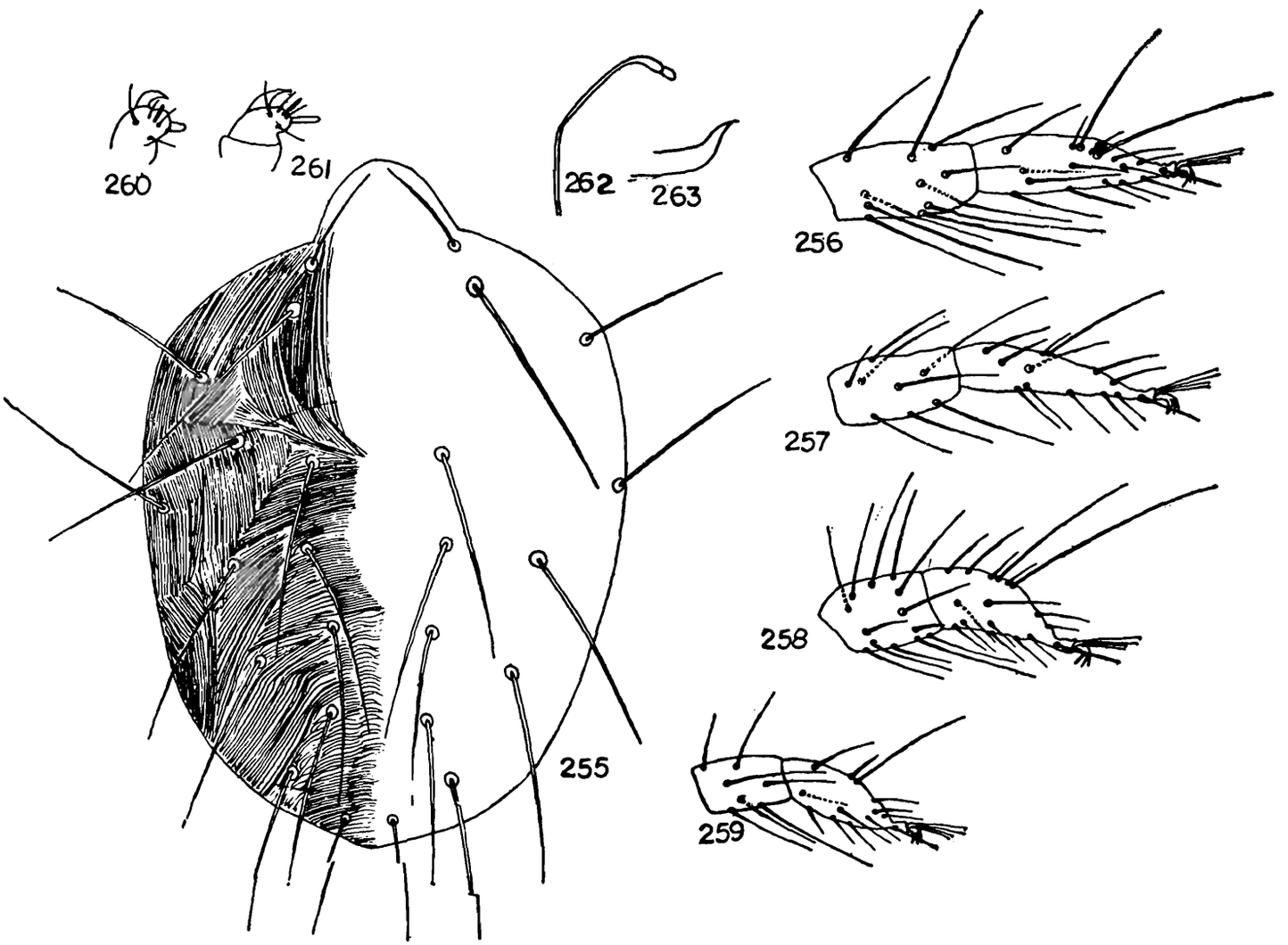
34. **Eotetranychus frosti** (McGregor)
(Figs. 255-263)

Tetranychus frosti McGregor, 1952 : 142 ;
Eotetranychus frosti, Pritchard & Baker, 1955 : 199 ; Gupta & Gupta, 1976 : 6-7 ; Gupta 1985 : 72-73.

Male : Body including rostrum 321 long, 151 wide. Palpus with terminal sensillum three and half times as long as wide; dorsal sensillum long and slender. Peritreme gradually bends at the distal end. Dorsal idiosomal setae long, gradually tapering posteriorly and twice as long as interval between their longitudinal bases. Tibia I with 4 sensory and 9 tactile setae ; tarsus I with 3 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 7 tactile setae ; tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Aedeagus slender, sharply bent dorsad to become slightly sigmoid at the distal end.

Female : Body including rostrum 432 long, 195 wide. Palpus with terminal sensillum twice as long as wide. Dorsal sensillum similar to that of male. Peritreme anastomosing at the distal end. Dorsal setae of idiosoma twice longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 9 tactile setae ; tarsus I with

1 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 8 tactile setae ; tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Striations on body very prominent. Outer and inner sacrals not of same length but clunals quite short. Genital flap with transverse striae. Medioventral setae of moderate size.



Figs. 255-263 : *Eotetranychus frosti* : 255- dorsum of female, 256- tibia and tarsus I of female, 257- tibia and tarsus II of female, 258- tibia and tarsus I of male, 259- tibia and tarsus II of male, 260- distal segment of palpus of female, 261- distal segment of palpus of male, 262- peritreme of female, 263- aedeagus.

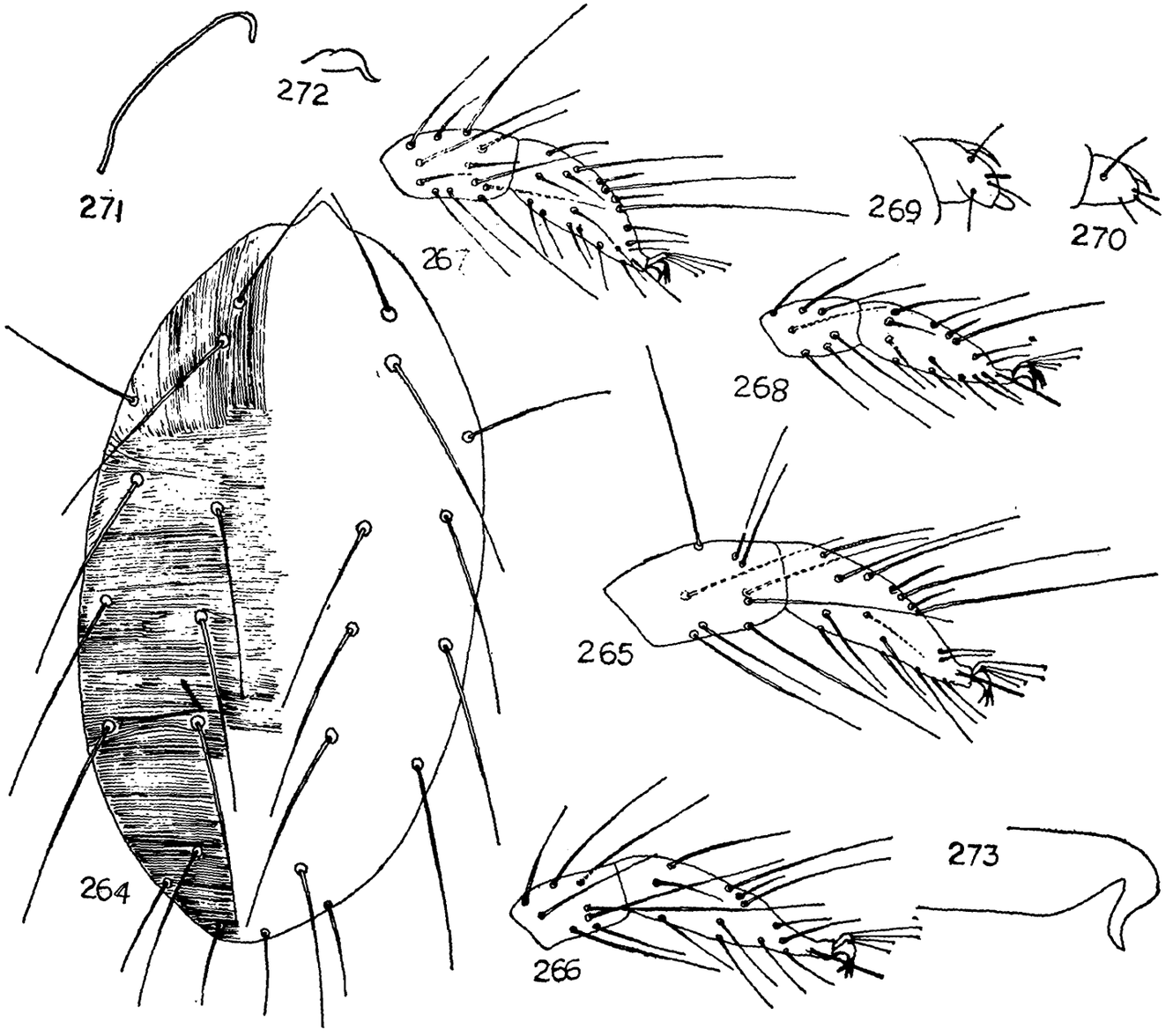
Known hosts in India : *Citrus* sp., *Pyrus malus* (apple).

Known hosts outside India : Raspberry, *Rosa indica, Syzygium jambolana.*

Distribution : India (Gujarat, Himachal Pradesh, Madhya Pradesh, Jammu & Kashmir), U. S.A.

35. **Eotetranychus guajavae** sp. nov.
(Figs. 264-272)

Male : Body including rostrum 292 long, 159 wide. Terminal sensillum of palpus absent ; dorsal sensillum small and slender. Peritreme simple. Dorsal setae of idiosoma longer than interval between their longitudinal bases. Tibia I with 3 sensory and 9 tactile



Figs. 264-272 : *Eotetranychus guajavae* sp. nov. : 264- dorsum of female, 265- tibia and tarsus I of female, 266- tibia and tarsus II of female, 267- tibia and tarsus I of male, 268- tibia and tarsus II of male, 269- distal segment of palpus of female, 270- distal segment of palpus of male, 271- peritreme of female, 272- aedeagus, 273- *Eotetranychus hicoriae* : aedeagus.

setae, tarsus I with 3 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae ; tarsus II with 2 sensory and 4 tactile setae proximal to duplex setae. Aedeagus with distal end ventrad, the ventral bent somewhat widened and the distal end caudally directed upward.

Female : Body including rostrum 357 long, 177 wide. Terminal sensillum of palpus twice as long as wide, dorsal sensillum slender. Peritreme at distal end a hook-like structure. Dorsal setae of idiosoma one and half times longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 8 tactile setae ; tarsus I with 1 sensory and 5 tactile setae proximal to duplex setae ; tibia II with 1 sensory and 7 tactile setae ; tarsus II with 1 sensory and 5 tactile setae proximal to duplex setae. Inner sacrals 2 times longer than outer sacrals. Genital flap with transverse striae. Medioventral setae of moderate size.

Holotype Male (Reg. No. 3187/17), India : West Bengal, 24 Parganas, Baruipur, 10.5.1978, on guava (*Psidium guajava*) (Coll. Y. N. Gupta). Paratypes 8 Females, 1 Male (Reg. No. 3188/17). Data same as for holotype.

Remarks : Aedeagus of this new species resembles *Eotetranychus cyphus* Baker & Pritchard (1960) but differs from it in relative number of tactile and sensory setae of tibia and tarsus.

36. **Eotetranychus hicoriae** (McGregor)
(Fig. 273)

Tetranychus hicoriae McGregor, 1950 :

Eotetranychus hicoriae, Pritchard & Baker, 1955 : 211 ; Lakkundi, 1973 : 1-62 ; Mallikarjunappa & Nageshchandra, 1989 : 47.

Diagnosis : The peritreme strongly hooked distally, the dorsal setae of the body much longer than the longitudinal interval between them. Aedeagus bent very sharply ventrad with bent portion strongly sigmoid. The shaft of the aedeagus gradually narrows to the bent. Genital flap with transverse striae.

Known host in India : *Psidium guajava* (guava).

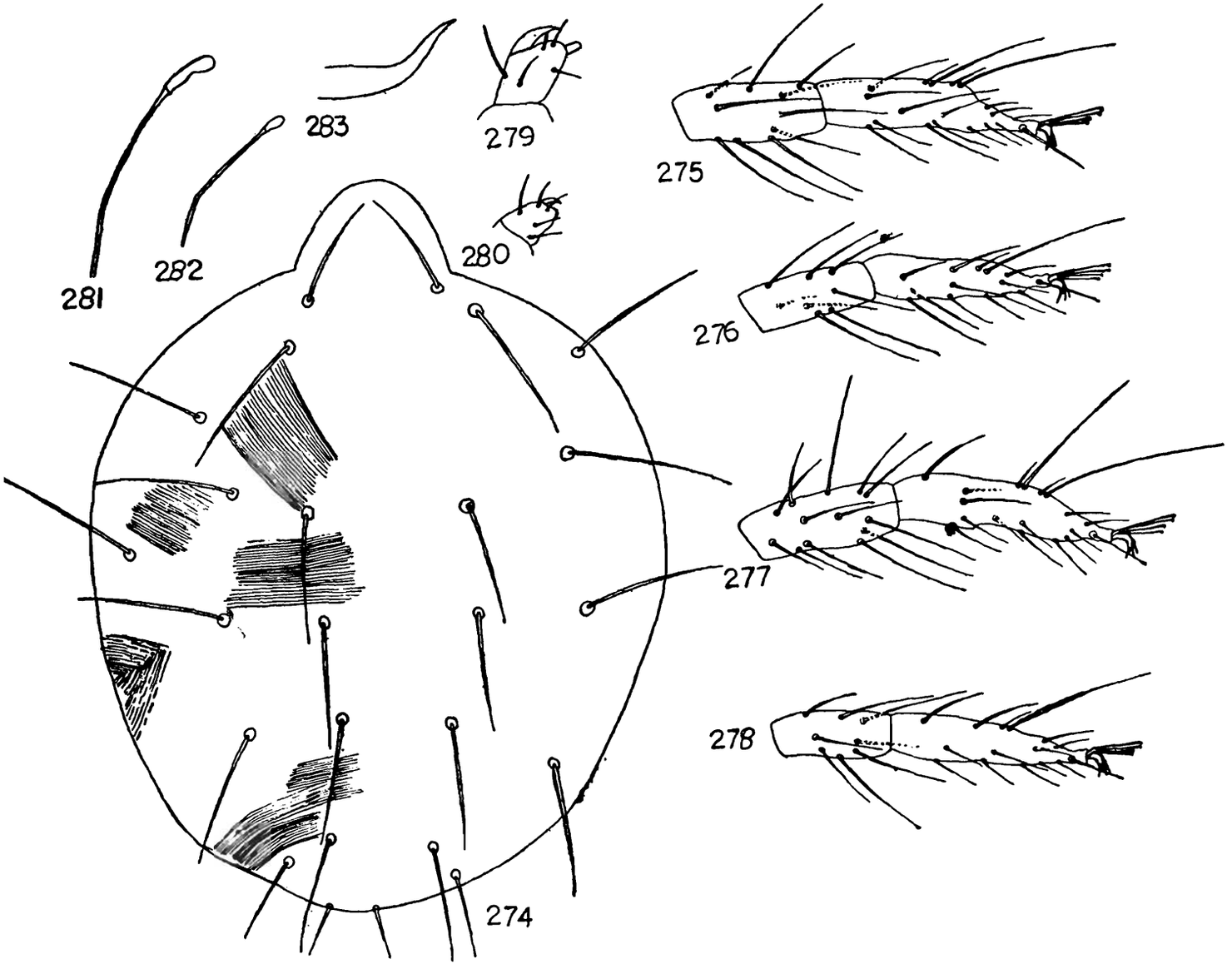
Known host outside India : *Artocarpus integrifolia*, chestnut, hicory, oak, peacan.

Distribution : India (Karnataka), U. S. A.

37. **Eotetranychus hirsti** Pritchard & Baker
(Figs. 274-283)

Tetranychus fici Hirst 1926 : 838 ; Rahman & Sapra, 1940 : 186.
Eotetranychus hirsti Pritchard & Baker, 1955 : 200 ; Gupta & Gupta, 1978 : 87-88 ; Gupta, 1985 : 73-74.

Male : Body including rostrum 339 long, 159 wide. Palpus with terminal sensillum absent. Peritreme forming bulb at the distal end. Dorsal idiosomal setae not on tubercles,



Figs. 274-283 : *Eotetranychus hirsti* : 274- dorsum of female, 275- tibia and tarsus I of female, 276- tibia and tarsus II of female, 277- tibia and tarsus I of male, 278- tibia and tarsus II of male, 279- distal segment of palpus of female, 280- distal segment of palpus of male, 281- peritreme of female, 282- peritreme of male, 283- aedeagus.

simple, gradually tapering and as long as interval between their longitudinal bases. Tibia I with 4 sensory and 9 tactile setae, tarsus I with 2 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 7 tactile setae ; tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Aedeagus is very distinctive by having aedeagal bend dorsal with the upturned portion slender, tapering and sigmoid.

Female : Body Including rostrum 375 long, 213 wide. Palpus with terminal sensillum stout and twice as long as broad, dorsal sensillum small and slender. Peritreme ends in simple bulb. Dorsal idiosomal setae simple, gradually tapering and slightly longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 7 tactile setae ; tarsus I with 1 sensory and 5 tactile setae proximal to duplex setae. Tibia II with 8 tactile setae ; tarsus II with 1 sensory and 4 tactile setae proximal to duplex setae. Striations as figured. Outer and inner sacrals not of same length.

Known hosts in India : *Bauhinia* spp., *Ficus carica*, (fig.) *Ficus cunea*, *Ficus racemosa.*

Distribution : India (throughout the country), Pakistan.

Remarks : This mite infests fig very seriously causing the appearence of transparent green patches on the under surface of leaves when viewed across light. The patches turn yellowish green and then brown with dry texture. The infested leaves and fruits drop off prematurely.

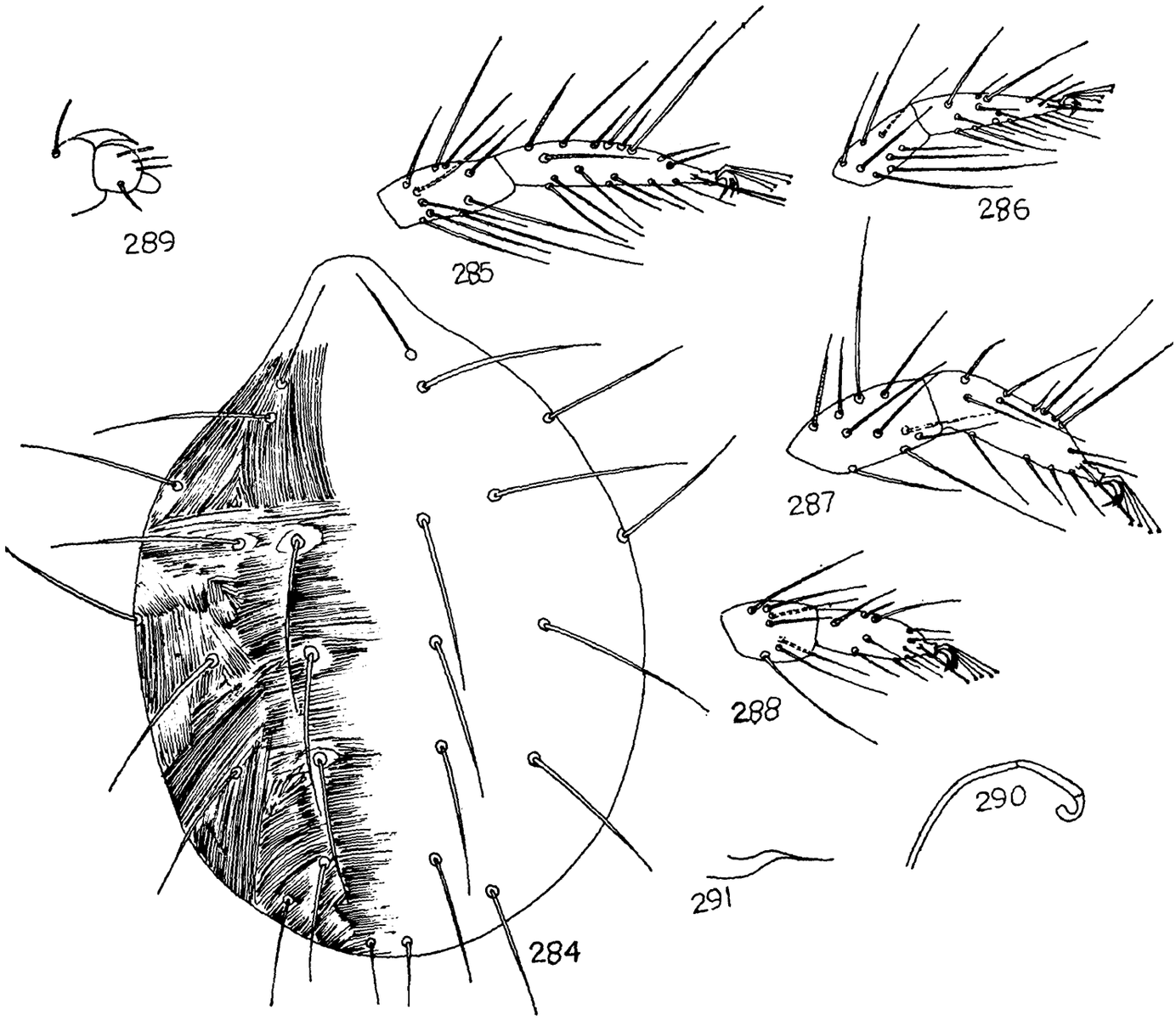
38. **Eotetranychus indicus** Gupta & Gupta
(Figs. 284-291)

Eotetranychus indicus Gupta & Gupta, 1990 : 20.

Male : Body including rostrum 375 long, 177 wide. Palpus with terminal sensillum 2 times as long as wide, dorsal sensillum much longer, fusiform. Dorsal setae of idiosoma longer than the interval between their bases. Tibia I with 3 sensory and 7 tactile setae ; tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 1 sensory and 2 tactile setae proximal to duplex setae. Aedeagus with proximal portion of shaft curved dorsal, the median portion of shaft curved abruptly and narrowed and the distal portion very slender and much similar to that of *Eotetranychus smithi* Pritchard & Baker (1955).

Female : Body including rostrum 432 long, 213 wide. Palpus with terminal sensillum slightly longer than wide, dorsal sensillum much longer. Peritreme ends in hook-like structure. Dorsal idiosomal setae slightly longer than the interval between their bases. Tibia I with 2 sensory and 8 tactile setae, tarsus I with 2 sensory and 4 tactile setae proximal

to duplex setae. Tibia II with 1 sensory and 7 tactile setae, tarsus II with 1 sensory and 4 tactile setae proximal to duplex setae. Outer and inner sacrals of same length. Dorsal



Figs. 284-291 : *Eotetranychus indicus*: 284- dorsum of female, 285- tibia and tarsus I of female, 286- tibia and tarsus II of female, 287- tibia and tarsus I of male, 288- tibia and tarsus II of male, 289- distal segment of palpus of female, 290- peritreme of female, 291- aedeagus.

striations as figured. Genital flap with transverse striae. Medioventral setae of moderate size.

Known host in India : *Pyrus communis* (Pear).

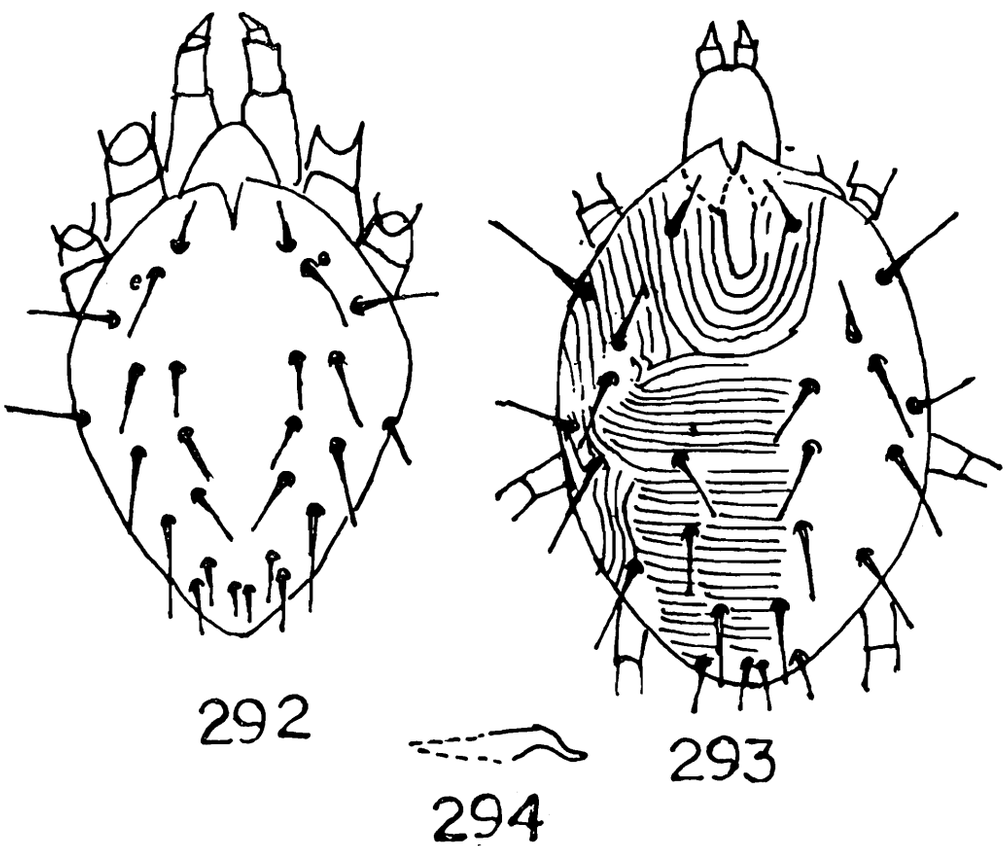
Distribution : India (Uttar Pradesh).

Remarks : The aedeagus of the species resembles *Eotetranychus smithi* Pritchard & Baker (1955) but differs from it in number of tactile and sensory setae of both tibia and tarsus in both the sexes.

39. **Eotetranychus irregularis** Nassar & Ghai
(Figs. 292-294)

Eotetranychus irregularis Nassar & Ghai, 1981 : 357-359 ; Gupta, 1985 : 74-75.

Male : Body including rostrum 355 long, 176 wide. Dorsal body setae shorter than those of female and reaching to the bases of setae next behind. Tarsus I with 4 tactile and 2



Figs. 292-294 : *Eotetranychus irregularis* (after Nassar & Ghai, 1981): 292- dorsum of female, 293- venter of female, 294- aedeagus.

sensory setae proximal to duplex setae. Shaft of aedeagus bending dorsad to form a slender, sigmoid distal end which is strongly tapered and directed straight dorso-caudally.

Female : Body including rostrum 400 long, 210 wide. Dorsal body setae 13 pairs including 1 pair of humeral setae. All setae without tubercles, linear-lanceolate, serrate and slightly longer than the longitudinal intervals between them. Propodosoma bearing longitudinal striae and those on hysterosoma mostly transverse. Stylophore notched anteriorly. Palpus provided with a terminal sensillum which is about twice as long as broad. Peritreme strongly hooked distally and becoming swollen before its distal end, striae on venter smooth and mostly transverse. Genital flap bearing transverse striae while the area immediately anterior to the flap with longitudinal striae.

Known hosts in india : *Ficus carica* (fig), *Zizyphus mauritiana*.

Distribution : India (Delhi).

Remarks : This species is similar to *P. rhusi* (Meyer) but differs in shape of distal portion of aedeagus.

40. **Eotetranychus kankitus** Ehara
(Figs. 295-303)

Eotetranychus kankitus Ehara, 1955 : 178 ; Manson, 1963 : 353 ; Gupta, 1985 : 75.

Male : Body including rostrum 321 long, 130 wide. Palpus with terminal sensillum very minute, dorsal sensillum slender. Peritreme ending as a simple bulb. Dorsal idiosomal setae serrate, gradually tapering and longer than the interval between their longitudinal bases. Tibia I with 4 sensory and 9 tactile setae, tarsus I with 3 sensory and 3 tactile setae proximal to duplex setae. Tarsus II with 1 sensory and 2 tactile setae proximal fo duplex setae, tibia II with 8 tactile setae. The aedeagus of *E. kankitus* is distinctive in having gradually tapering and forming a broad ventral bend.

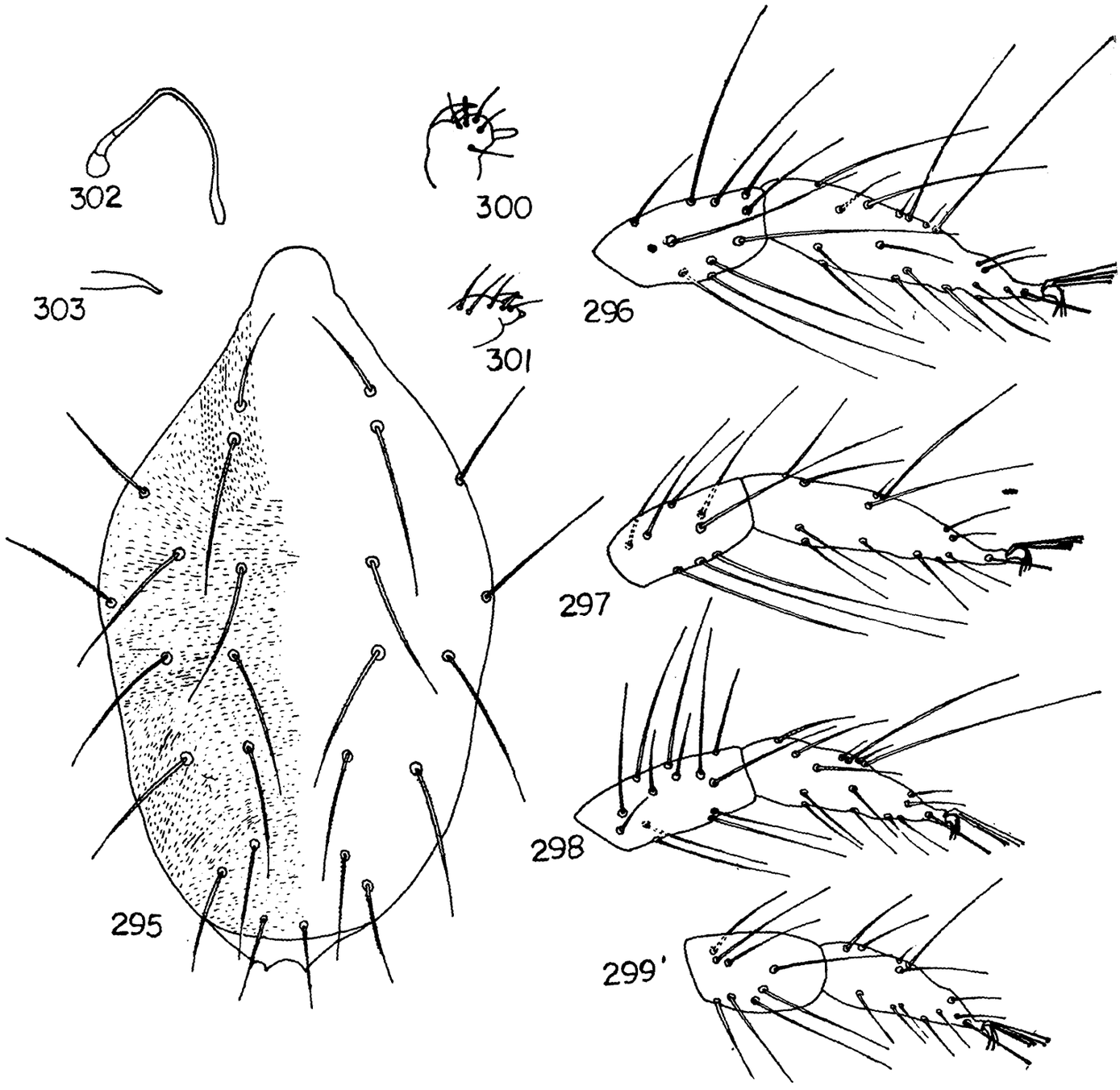
Female : Body including rostrum 393 long, 184 wide. Terminal sensillum of palpus three times longer than wide, dorsal sensillum slender. Peritreme at the distal end forming bulb-like structure. Dorsal idiosomal setae serrate, tapering and longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 9 tactile setae ; tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 8 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Outer and inner sacrals more or less similar in length. Clunals small. Genital flap with longitudinal striae on anterior part, with transverse striae on posterior part. Medioventral setae of moderate size.

Known hosts in India : Mandarin, apricot, china rose, rose, pear.

Known hosts outside India : *Rosa indica* (rose), *Citrus* sp. (Mandarin).

Distribution : India (Assam, Uttar Pradesh), Japan.

Remarks : This species resembles *Eotetranychus sexmaculatus* (Riley) but differs from it in idiosomal setae being apparently serrate and aedeagus not forming sigmoid arch.

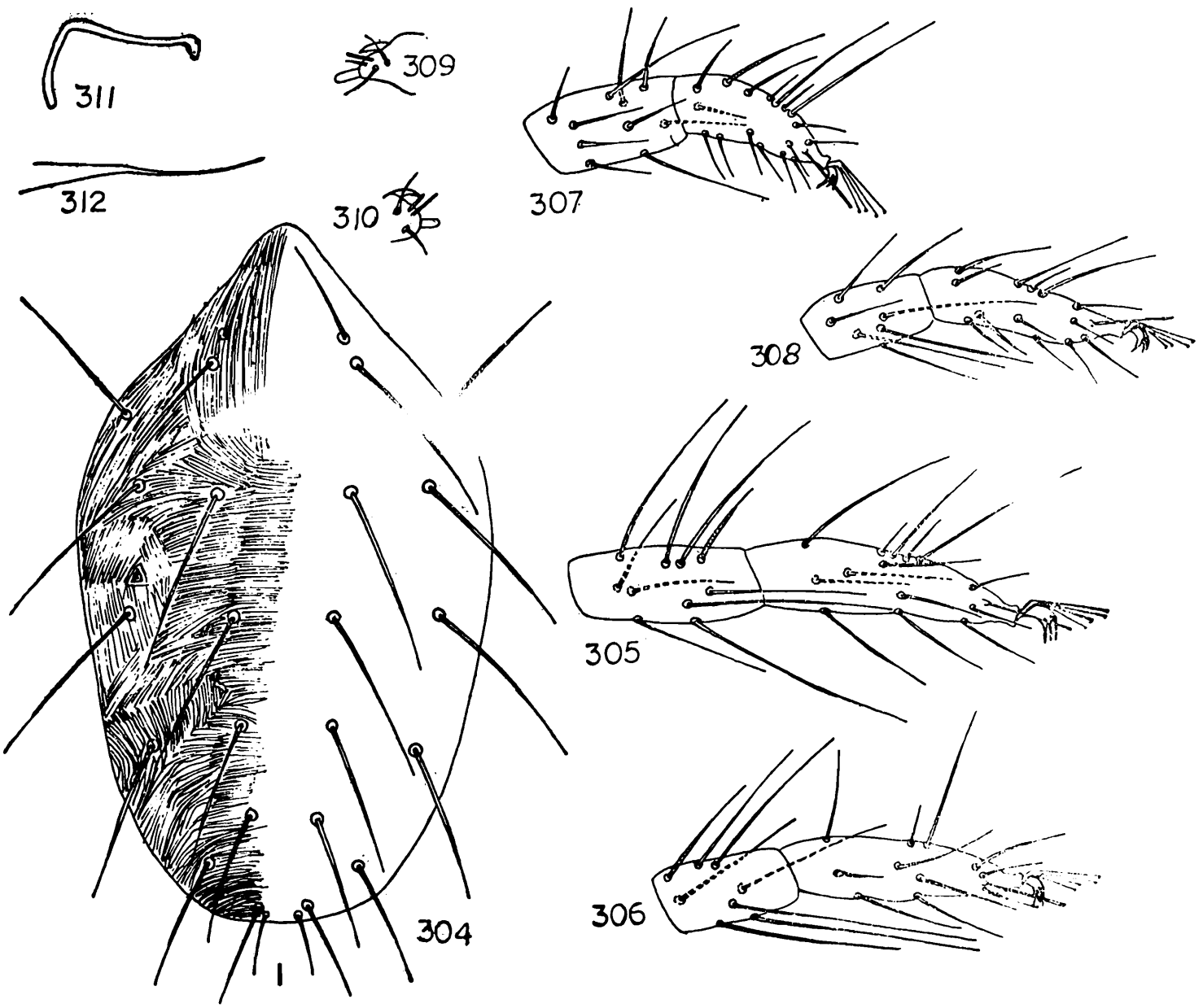


Figs. 295-303 : *Eotetranychus kankitus*: 295- dorsum of female, 296- tibia and tarsus I of female, 297- tibia and tarsus II of female, 298- tibia and tarsus I of male, 299- tibia and tarsus II of male, 300- distal segment of palpus of female, 301- distal segment of palpus of male, 302- peritreme of female, 303- aedeagus.

41. **Eotetranychus ladakhensis** Gupta
(Figs. 304-312)

Eotetranychus ladakhensis **Gupta,** 1978 : 236-237 ; **Gupta,** 1985 : 78.

Male **:** **Body including rostrum 408 long, 204 wide. Terminal sensillum of palpus as long as wide, dorsal sensillum slender. Dorsal setae of idiosoma longer than the interval**



Figs. 304-312 : *Eotetranychus ladakhensis*: **304- dorsum of female, 305- tibia and tarsus I of female 306- tibia and tarsus II of female, 307- tibia and tarsus I of male, 308- tibia and tarsus II of male, 309- distal segment of palpus of female, 310- distal segment of palpus of male, 311- peritreme, 312- aedeagus.**

between their longitudinal bases. Tibia I with 3 sensory and 7 tactile setae, tarsus I with 2 sensory and 5 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 1 sensory and 5 tactile setae proximal to duplex setae. The aedeagus very long, slender.

Female : Body including rostrum 510 long, 280 wide. Terminal sensillum of palpus 3 times as long as wide, dorsal sensillum slender. Peritreme ends in a simple bulb. Dorsal idiosomal setae much longer than interval between their longitudinal bases. Tibia I with 1 sensory and 9 tactile setae, tarsus I with 1 sensory and 5 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 7 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Outer and inner sacrals of same length. Genital flap with transverse striae. Medioventral setae of moderate size.

Known host in India : *Citrus* sp.

Distribution : India (Assam, Himachal Pradesh).

Remarks : This species was described from Himachal Pradesh infesting an unidentified plant. It differs from *E. kankitus* Ehara in shape of aedeagus.

42. **Eotetranychus mandensis** Manson
(Figs. 313-317)

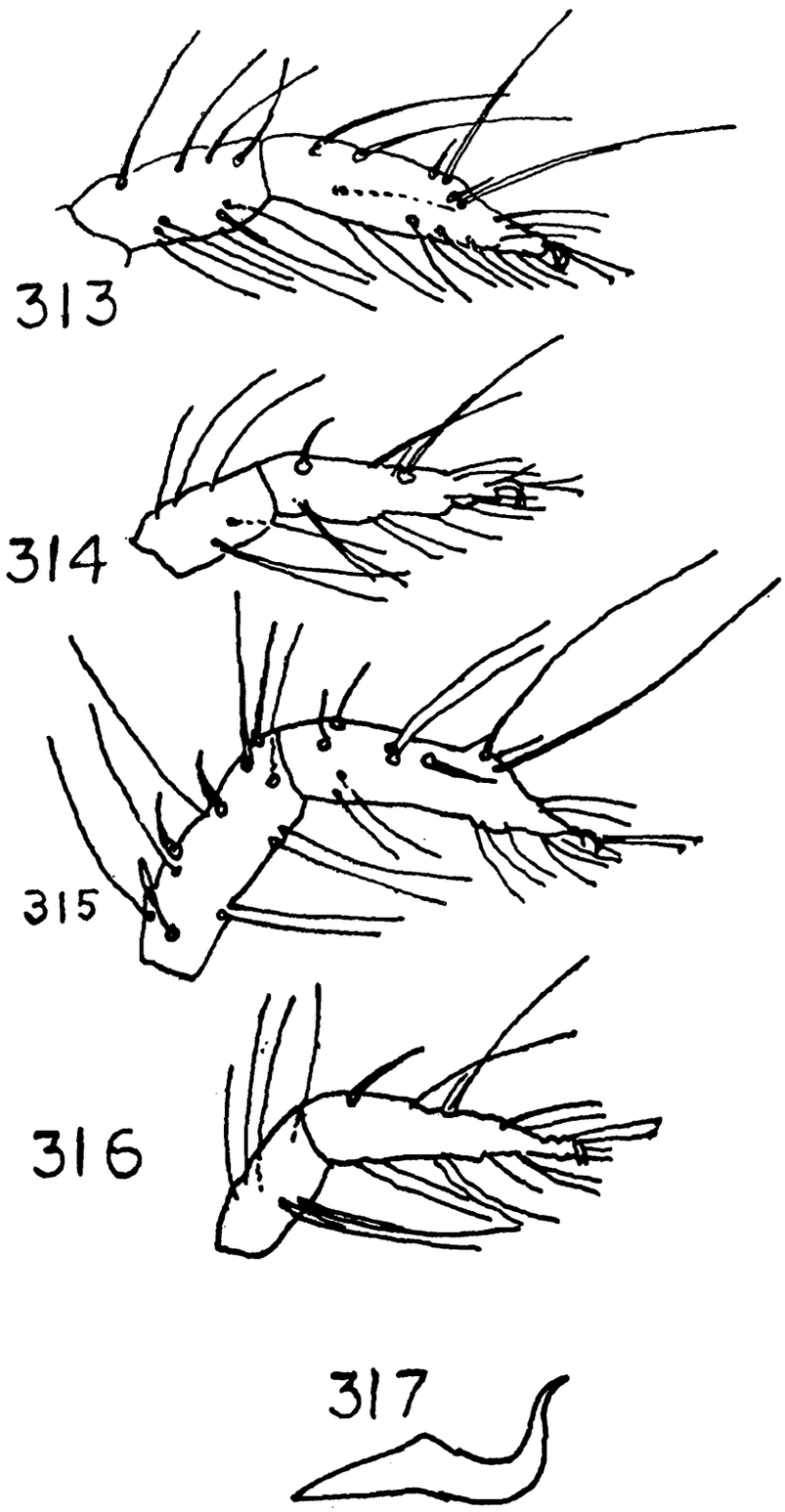
Eotetranychus mandensis **Manson**, 1963 : 358-360 ; **Prasad**, 1974 : 113 ; **Gupta**, 1985 : 75-76.

Male : Body including rostrum 205 long. Terminal sensillum of palpus absent. Terminal portion of peritreme ending as a simple bulb. Tibia I with 4 sensory and 9 tactile setae, tarsus I with 3 sensory and 13 tactile setae. Tarsus II with 1 sensory and 12 tactile setae. Aedeagus as figured, long, slender and tapering with distal portion directed posteriorly.

Female : Body including rostrum 269 long, 204 wide. Terminal sensillum of palpus large about twice as long as broad. Terminal portion of peritreme straight distally and ending as a simple bulb. Dorsal body setae slender and tapering. Dorsocentral hysterosomal setae about as long as or longer than longitudinal intervals between them. Dorsal striae longitudinal between the 3rd pair of dorsocentral hysterosomals. Tibia I with 1 sensory and 9 tactile setae ; tarsus I with 1 sensory and 13-14 tactile setae proximal to duplex setae. Tibia II normally with 6 tactile setae, tarsus II with 1 sensory and 12 tactile setae proximal to duplex setae. Striae on and anterior to genital flap transverse.

Known hosts in India : *Citrus* sp., *Zizyphus mauritiana.*

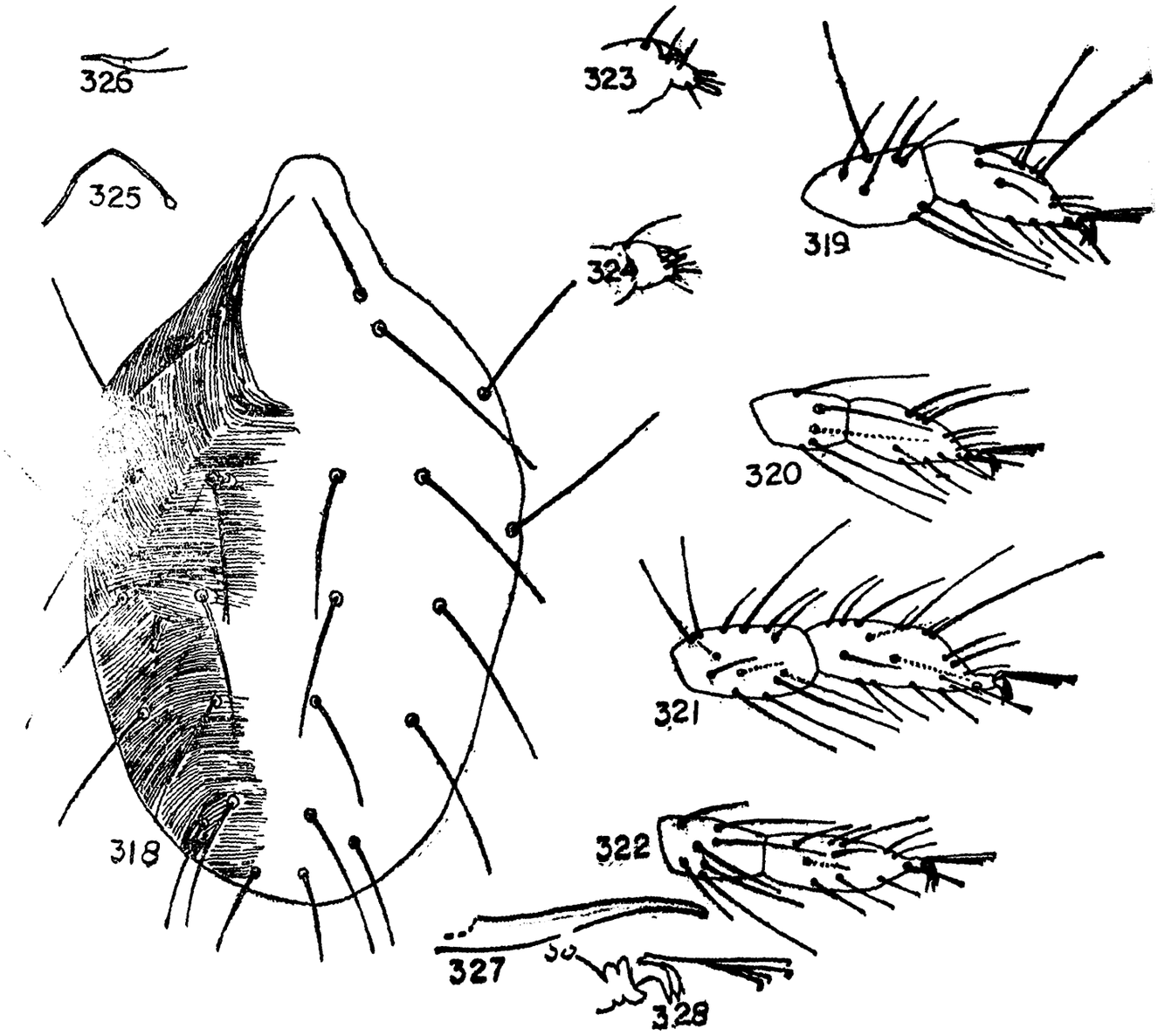
Distribution : India (Karnataka).



Figs. 313-317: *Eotetranychus mandensis*: 313- tibia and tarsus I of female, 314-tibia and tarsus II of female, 315- tibia and tarsus I of male, 316- libia and tarsus II of male, 317- aedeagus.

43. **Eotetranychus pamelae** Manson
(Figs. 318-326)

Eotetranychus pamelae **Manson, 1963 : 76 ; Prasad, 1974 : 114 ; Gupta, 1985 : 76.**



Figs. 318-326 : *Eotetranychus pamelae* **: 318- dorsum of female, 319- tibia and tarsus I of female, 320- tibia and tarsus II of female, 321- tibia and tarsus I of male, 322- tibia and tarsus II of male, 323- distal segment of palpus of female, 324- distal segment of palpus of male, 325- peritreme of female, 326- aedeagus.**

Figs. 327-328 : *Eotetranychus populi* **(after Pritchard & Baker, 1955) : 327- aedeagus, 328- tarsal appendage of leg I of male.**

Male : Body including rostrum 321 long, 141 wide. Terminal sensillum of palpus twice as long as broad and tapering at the distal end ; dorsal sensillum as figured. Terminal portion of peritreme somewhat variable, but usually sharply bent at right angle to shaft. Dorsal idiosomal setae tapering distally and longer than the interval between their longitudinal bases. Tibia I with 3 sensory and 10 tactile setae ; tarsus I with 1 sensory and 5 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae ; tarsus II with 1 sensory and 4 tactile setae proximal to duplex setae. Aedeagus short, directed posteriorly and ending bluntly.

Female : Body including rostrum 403 long, 213 wide. Terminal sensillum of palpus four times as long as wide, dorsal sensillum slender. Peritreme ending in a simple bulb. Dorsal body setae long and tapering, longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 6 tactile setae ; tarsus I with 1 sensory and 2 tactile setae proximal to duplex setae. Tibia II with 4 tactile setae ; tarsus II with 1 sensory and 1 tactile seta proximal to duplex setae. Outer and inner sacrals not of same length. Clunals small. Dorsal striae transverse in the middle. Genital flap with transverse striae and posterior portion of flap with longitudinal striae. Medioventral setae of moderate size.

Known host in India : *Citrus* sp.

Distribution : India (Assam, Himachal Pradesh).

44. Eotetranychus populi (Koch)
(Figs. 327-328)

Tetranychus populi Koch, 1838 : 14 ; Oudemans, 1937 : 1041 ; Oudemans, 1939 : 1041 ; McGregor, 1950 : 301.
Tetranychus salicicola Zacher, 1920 : 1 ;
Amphitetranychus salicicola Geljskes, 1939 : 41.
Eotetranychus populi, Pritchard & Baker, 1955 : 189 ; Rather, 1983 : 26

Diagnosis : Pritchard & Baker (1955) diagnosed this as : aedeagus very long and slender as in *E. tiliarum* and the *E. carpini* complex, but it is slightly undulate, less tapering with rounded at the tip. Both sexes of *E. populi* may be differentiated from other members of the genus by having the distal end of the peritreme forming an irregular anastomosing enlargement, together with having the dorsal setae of the body longer than intervals between them.

Known host in India : *Poplus* sp.

Known hosts outside India : Poplus, willow, aspen.

Distribution : India (Kashmir), England, Germany, U.S.A. (eastern part) Russia, Serbia.

45. **Eotetranychus rajouriensis** Nassar & Ghai
(Figs. 329-331)

Eotetranychus rajouriensis Nassar & Ghai, 1981 : 359-361 ; Gupta, 1985 : 77.

Male : Body including rostrum 370 long, 141 wide. Dorsal body setae shorter than those of female, at most longer than the interval between their bases. Tarsus I with 1 sensory and 5 tactile setae proximal to duplex setae. Empodium I bifid and each with 2 short teeth. Shaft of aedeagus short, relatively broad, strongly curved dorsad forming distal portion sigmoid, tapered and directed caudally.

Female : Body including rostrum 434 long, 206 wide. Stylophore rounded anteriorly, terminal sensillum of palpus about 2 times as long as broad. Peritreme hooked distally. Dorsal body setae 13 pairs including one pair of humeral setae, setae long, without tubercles. Dorsal setae much longer than the interval between their bases.

Known hosts in India : *Zizyphus* sp., Zizyphus *oenoplia*.

Distribution : India (Delhi).

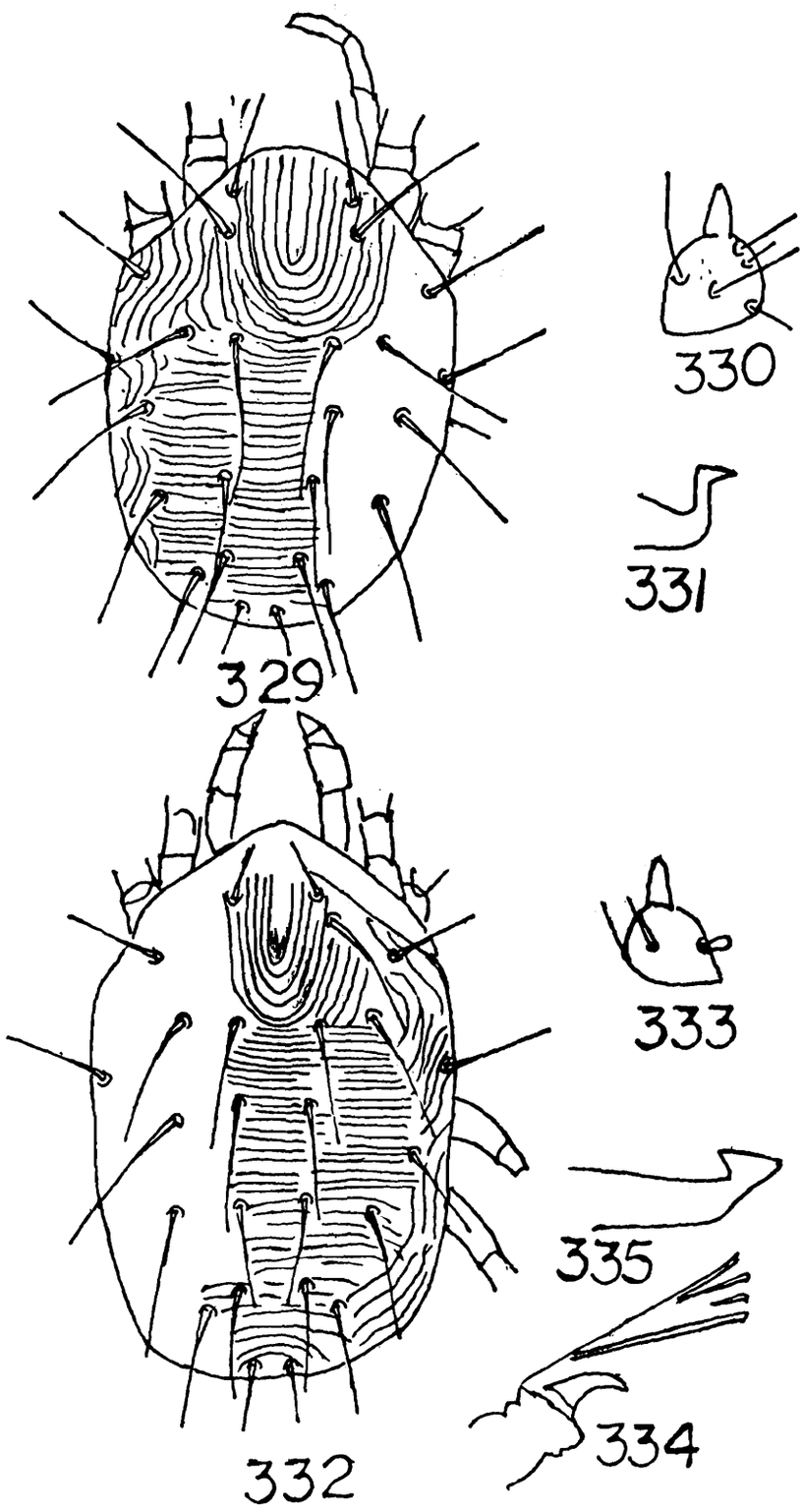
Remarks : This species is very close to *E. frosti* (McGregor) except the distal portion of aedeagus which is longer, broader and tapered.

46. **Eotetranychus rohilae** Nassar & Ghai
(Figs. 332-335)

Eotetranychus rohilae Nassar & Ghai, 1981 : 355-357 ; Gupta, 1985 : 76.

Male : Body including rostrum 244 long, 121 wide. Dorsal setae shorter than those of females and also longer than interval between their longitudinal bases. Genital area with 1 pair of pregenital and 4 pairs of genitoanal setae. Terminal sensillum of palpus about 1·5 times as long as broad. Slender shaft of aedeagus nearly straight, turning slightly to form a knob, the posterior projection rounded and about twice as long as posterior projection which is also rounded.

Female : Body including rostrum 424 long, 207 wide. Stylophore rounded distally. Terminal sensillum of palpus about 2 times as long as broad. Peritreme ending in a simple bulb. Dorsal body setae 13 pairs including 1 pair of humeral setae. All setae without tubercles, long, slender, serrate and pointed distally. Dorsal body setae extend beyond the



Figs. 329-331 : *Eotetranychus rajouriensis* (after Nassar & Ghai, 1981) : 329- dorsum of female, 330- distal segment of palpus of female, 331- aedeagus.

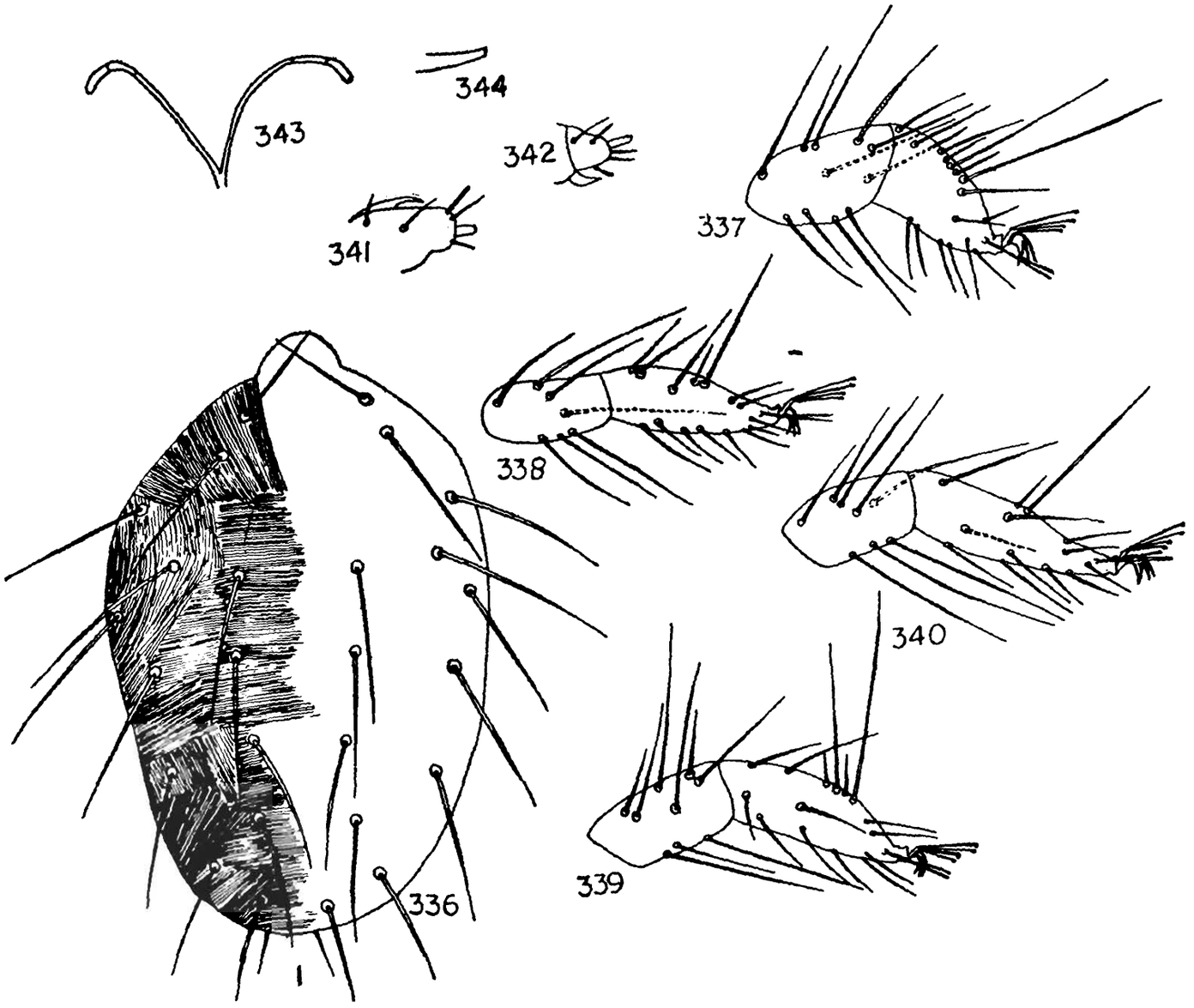
Figs. 332-335 : *Eotetranychus rohilae* (after Nassar & Ghai, 1981) : 332- dorsum of female, 333- distal segment of palpus of female, 334- tarsal appendage of leg I of male, 335- aedeagus.

bases of setae next behind. Tarsus I with 4 tactile setae and 1 sensory setae proximal to duplex setae. Striae on venter smooth and mostly transverse. Genital flap and the area anterior to it transversely striated.

Known host in India : *Morus* sp.

Distribution : India (Delhi).

47. **Eotetranychus ranikhetensis** sp. nov.
(Figs. 336-344)



Figs. 336-344 : *Eotetranychus ranikhetensis* sp. nov. : 336- dorsum of female, 337- tibia and tarsus I of female, 338- tibia and tarsus II of female, 339- tibia and tarsus I of male, 340- tibia and tarsus II of male, 341- distal segment of palpus of female, 342- distal segment of palpus of male, 343- peritreme of female, 344-aedeagus.

Male : Body including rostrum 357 long, 177 wide. Palpus with terminal sensillum 3 times as long as broad, dorsal sensillum slender. Dorsal setae of idiosoma smooth and one and half times longer than the interval between their longitudinal bases. Tibia I with 2 sensory and 7 tactile setae, tarsus I with 3 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 7 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Aedeagus is distinctive, consists of a simple rod, slightly narrowing distally and laterally emerginate at the tip.

Female : Body including rostrum 498 long, 249 wide. Terminal sensillum of palpus as long as wide, dorsal sensillnm slender. Peritreme ends into a slightly hook-like structure. Dorsal setae of idiosoma one and half times longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 10 tactile setae ; tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae. Striations at the propodosomal region longitudinal, transverse at the region of dorsocentral setae and irregular at the posterior region. Genital flap with transverse striae. Medioventral setae thin and small.

Holotype Male (Reg. No. 3193/17), India : Uttar Pradesh, Ranikhet, Misscot, 18.ii. 1977, on an undet. plant (Coll. S. K. Gupta & Y N. Cupta). Paratypes : 6 Females (Reg. No. 3194/17), data same as for holotype.

Remarks : Aedeagus of this species resembles *Eotetranychus libocardi* (McGregor, 1936) as described by Pritchard & Baker (1955) but differs from it in the relative length of idiosomal setae which are longer in the new species and also in the relative number of tactile and sensory setae on tibia and tarsus of leg I and II of both sexes.

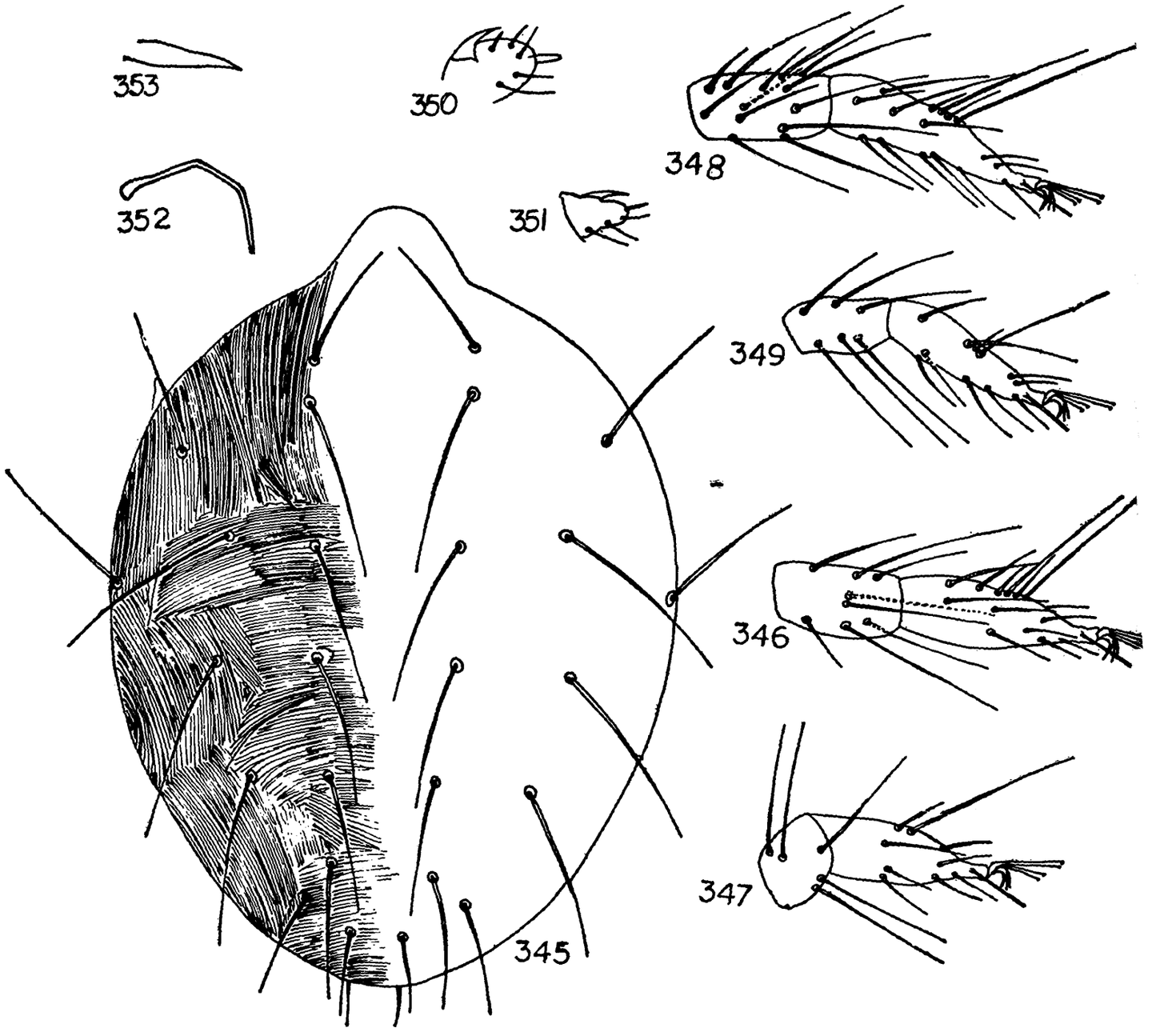
48. **Eotetranychus sexmaculatus** (Riley)

(Figs. 345-353)

Tetranychus 6-maculatus Riley, 1890 : 225-226.
Tetranychus sexmaculatus, Banks, 1900 : 75 ; McGregor, 1950 : 301.
Eotetranychus sexmaculatus Pritchard & Baker, 1955 : 202-205 ; Tuttle & Baker, 1964 : 21 ; 1968 : 87 ; Gupta & Gupta, 1977 : 27-29 ; Gupta, 1985 : 77.

Male : Body including rostrum 285 long, 141 wide. Terminal sensillum of palpus absent, dorsal sensillum pointed at the distal end. Dorsal idiosomal setae longer than the interval between their longitudinal bases. Tibia I with 3 sensory and 10 tactile setae, tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 5 tactile setae ; tarsus II with 2 sensory and 1 tactile setae proximal to duplex setae. Outer sacrals and inner sacrals not of same length. Clunal setae comparatively small. Aedeagus as figured.

Female : Body including rostrum 339 long, 195 wide. Terminal sensillum of palpus 3 times as long as wide, dorsal sensillum small and slender. Distal portion of peritreme blunt. Dorsal setae of idiosoma simple and longer than the interval between their longitu-



Figs. 345-353 : *Eotetranychus sexmaculatus* : 345- dorsum of female, 346- tibia and tarsus I of female, 347- tibia and tarsus II of female, 348- tibia and tarsus I of male, 349- tibia and tarsus II of male, 350- distal segment of palpus of female, 351- distal segment of palpus of male, 352- peritreme of female, 353- aedeagus.

dinal bases. Tibia I with 1 sensory and 7 tactile setae, tarsus I with 2 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 4 tactile setae, tarsus II with 3 tactile setae proximal to duplex setae. Outer sacrals smaller than inner sacrals. Clunals small. Genital flap with longitudinal striae. Medioventral setae thin and moderate in size.

Known hosts in India : *Citrus* sp., *Prunus persica* (peach),

Known hosts outside India : Avocado, *Azalea*, camphor, *Citrus* sp., *Elaeagmus* sp., lemon, maple, orange, *Pyracantha* sp., Royal paulonia.

Distribution : India (Assam, Uttar Pradesh, Meghalaya, Karnataka), U.S.A. (California, Florida, Arizona), Taiwan.

Remarks : Though this species has been reported as serious pest of citrus in many parts of the world but in India it never causes any serious damage although its occurrence has been reported from India.

49. **Eotetranychus suginamensis** (Yokoyama)

Tetranychus suginamensis Yokoyama, 1932 : 282.
Tetranychus mori Rahman & Sapra, 1940 : 184.
Eotetranychus suginamensis, Pritchard & Baker, 1955 : 200, Gupta *et al.*, 1971 : 299 ; Gupta, *et al.*, 1971 : 299 ; Gupta, 1976 : 334 ; Gupta, 1985 : 78.

Male : Chaetotaxy similar to that of female. Claw moderately developed but weakly curved. Aedeagus more or less triangular with apex curved.

Female : Dorsal idiosomal setae 14 pairs. Claw moderately developed and strongly curved.

Known host in India : *Morus alba* (mulberry).

Known hosts outside India : Mulberry, *Quercus* sp.

Distribution : India (Punjab, West Bengal), Japan.

Remarks : This mite infests mulberry causing crinkling and crumpling of leaves. The infested leaves turn yellowish and fall off prematurely.

50. **Eotetranychus uncatus** Garman

Eotetranychus uncatus Garman, 1952, 263 ; Pritchard & Baker, 1955 : 183 ; Tuttle, Baker & Abbatiello, 1976 : 45 ; Lal & Mukherjee, 1977 : 313-316.

Male : Body including rostrum 250 long, 130 wide. Palpus with terminal sensillum approximately 3 times as long as wide, dorsal sensillum very slender. Tibia I with 2 sensory and 9 tactile setae ; tarsus I with 3 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 8 tactile setae ; tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Aedeagus very slender with a strong undulation near the middle.

Female : Body including rostrum 360 long, 170 wide. Peritrème U-shaped at distal end. Palpus with terminal sensillum approximately twice as long as wide, dorsal sensillum fusiform. Tibia I with 1 sensory and 9 tactile setae ; tarsus I with 1 sensory and 5 tactile setae proximal to duplex setae. Tibia II with 8 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Genital flap with transverse striae.

Known host in india : *Bauhinia variegata.*

Known hosts outside India : *Juglans ailattifolia, Pyrus malus* (apple).

Distribution : India (Uttar Pradesh), U.S.A. (Uttah, South California), Southern Kazakhstan.

51. **Eotetranychus syzygii** Gupta & Gupta
(Figs. 354-361)

Eotetranychus syzygii Gupta & Gupta, 1978 : 88 ; Gupta, 1985 : 79.

Male : Body 288 long, 150 wide. Palpus with terminal sensillum absent, dorsal sensillum slender. Tarsus I with 3 sensory and 3 tactile setae proximal to duplex setae. Dorsal setae of idiosoma longer than interval between their bases. Aedeagus as figured.

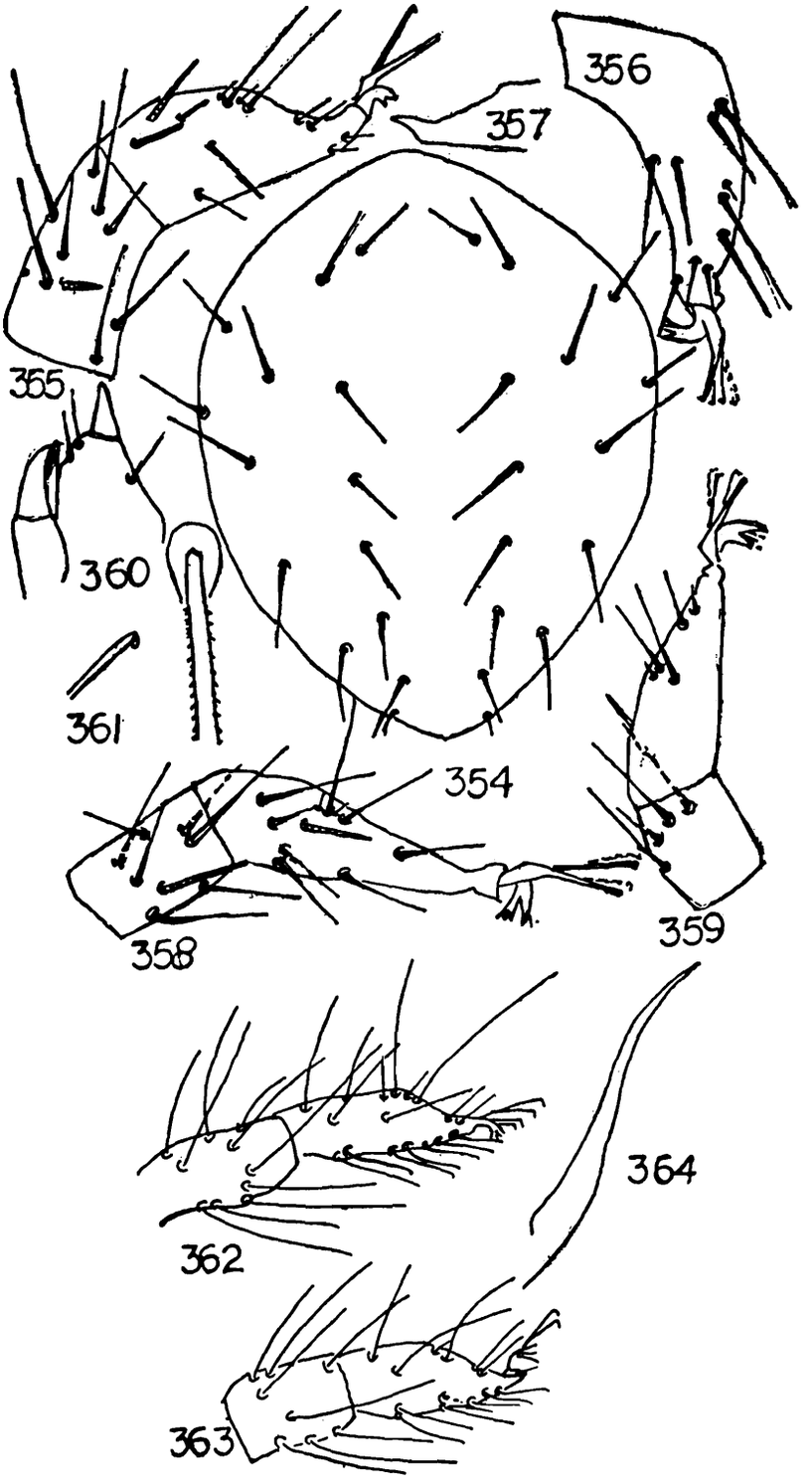
Female : Body 348 long, 220 wide. Terminal sensillum on palp as figured. Dorsal idiosomal setae slender, slightly enlarged at base, thickly pubescent. Dorsal striations of idiosoma as figured.

Known host in India : *Syzygium cumini* (black berry).

Distribution : India (Madhya Pradesh). The occurrence of this species outside India is unknown.

52. **Eotetranychus weldoni** (Ewing)
(Fig. 362-364)

Tetranychus weldoni Ewing, 1913 : 457 ; McGregor, 1919 : 660.
Tetranychus californicus McGregor, 1928 : 11 ; 1950 : 282.
Eotetranychus weldoni, Pritchard & Baker, 1955 : 191 ; Rather, 1983 : 26.



Figs. 354-361 : *Eotetranychus syzygii* : 354- dorsum of female, 355- tibia and tarsus I of male, 356- tibia and tarsus II of male, 357- aedeagus, 358- tibia and tarsus I of female, 359- tibia and tarsus II of female, 360- distal segment of palpus of female, 361- peritreme of female.

Figs. 362-364 : *Eotetranychus weldoni* (after Pritchard & Baker, 1955) : 362- tibia and tarsus I of female, 363- tibia and tarsus II of female, 364- aedeagus.

Diagnosis : This species differs from *E. populi* only in that the distal end of peritreme forms a simple small hook rather than being anastomosing. According to Pritchard & Baker (1955) these two names represent allopatric species or subspecies.

Known hosts : Poplar, willow.

Distribution : India (Kashmir), U. S. A.

Remarks : The occurrence of this species in India appears to be doubtful.

Genus 17. **Schizotetranychus** Tragardh

Schizotetranychus Tragardh, 1915 : 277 ; Pritchard & Baker, 1955 : 225-227 ; Baker & Pritchard, 1960 : 486 ; Gutierrez, 1968 : 22-23 ; Meyer, 1974 : 163 ; Tuttle *et al.*, 1976 : 64 ; Gutierrez, 1985 : 87 ; Gupta, 1985 : 95 ; Smith-Meyer, 1987 : 98.

Type : *Tetranychus schizopus* Zacher

Diagnosis : Duplex setae on tarsus I distal and adjacent to one another. Empodia strong, claw-like, split and appendent hairs may be present. Peritreme mostly simple distally but fingering, anastomosing or hooked. Striae anterior to female genitalia either transverse or longitudinal ; 2 pairs of paraanal setae present.

Key to the species of *Schizotetranychus* known from India

1.	Dorsal idiosomal setae longer than the interval between their longitudinal bases	2
—	Dorsal idiosomal setae as long as interval between their longitudinal bases	6
2.	Dorsal idiosomal setae serrate	3
—	Dorsal idiosomal setae not serrate	4
3.	Aedeagus shaft long, straight, curves dorsad, small anterior angulation with a longer dorsocaudally directed angulation ...	*tephrosiae*
—	Aedeagus shaft broad and long, gradually narrowing the distal part angulate with tip directed forward ...	*cajani*
4.	Dorsal body setae very minutely pubescent and lanceolate, broadened proximally and finally tapering distally ...	*andropogoni*
—	Dorsal body setae not pubescent but simple	5

5. Aedeagus turned dorsad distally without posterior angulation ... *hindustanicus*
— Aedeagus ventrally directed and sigmoid ... *undulatus*
6. Dorsal idiosomal setae less than half as long as the distance between their longitudinal bases ... *fluvialis*
— Dorsal idiosomal setae as long as the distance between their longitudinal bases 7
7. Peritreme at the distal end U-shaped 8
— Peritreme at the distal end bulb shaped 9
8. Dorsal idiosomal setae of two types, with broadened at basal third and taper rapidly and those with longer and taper more evenly ... *baltazari*
— Dorsal idiosomal setae of two types, those with small and those with more longer ... *meghalayensis*
9. Aedeagus dorsally directed and sigmoid ... *indicus*
— Aedeagus dorsally directed but not sigmoid ... *mansoni*

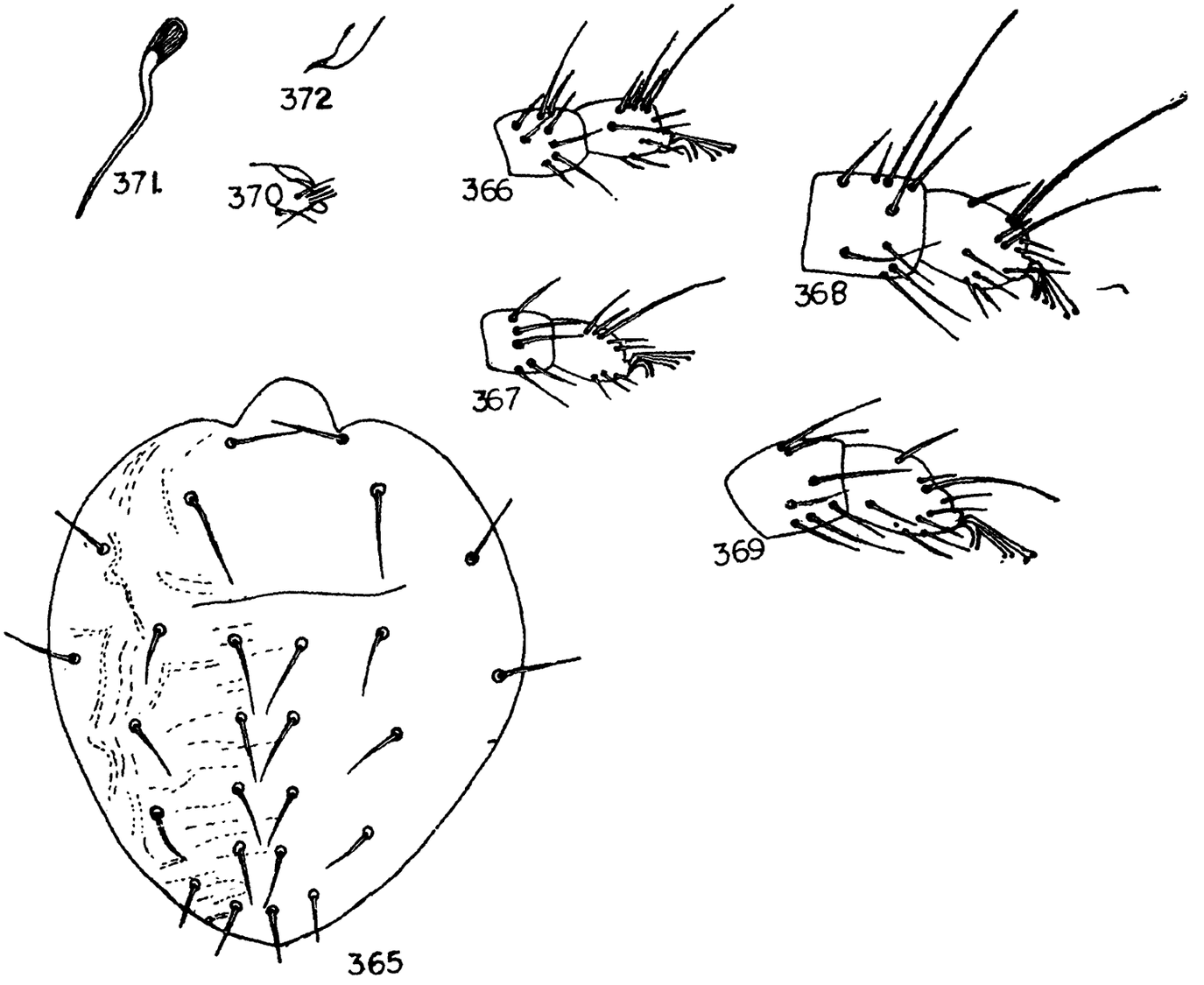
53. **Schizotetranychus andropogoni** (Hirst)
(Figs. 365-372)

Tetranychus (*Schizotetranychus*) *andropogoni* Hirst, 1926 : 829.
Schizotetranychus andropogoni, Narasimha, 1952 : 163 ; Pritchard & Baker, 1955 : 248-249 ; Prasad, 1974 : 121 ; Gupta, 1985 : 96-97.

Male : Body including rostrum 357 long, 169 wide. Palpus with terminal sensillum 3 times as long as broad, dorsal sensillum minutely pubescent, gradually tapering and lanceolate. Tibia I with 2 sensory and 7 tactile setae, tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 2 sensory and 5 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Aedeagus bent dorsad to form an abruptly tapering sigmoid distal part.

Female : Body including rostrum 432 long, 195 wide. Palpus with terminal sensillum slightly longer than wide, dorsal sensillum fusiform. Peritreme at the distal end forming bulb-like structure. Idiosoma with dorsal setae acutely tapering from the widened proximal portion, minutely pubescent. Dorsocentral setae as long as the interval between their longitudinal bases. Tibia I with 1 sensory and 7 tactile setae ; tarsus I with one sensory and 4 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 4 tactile setae, tarsus II with 2 tactile setae proximal to duplex setae. Outer, inner sacrals and clunals almost of same length. Genital flap with transverse striae. Medioventral setae of moderate size.

Known hosts in India : *Andropogon annulatus*, *Cajanus indicus*, *Chloris incomplata*, *Dicanthium annulatum*, *Oryza sativa* (paddy), *Saccharum officinarum* (sugarcane), *S. spontaneum* (sarkanda), *Zinia* sp.



Figs. 365-372 : *Schizotetranychus andropogoni* : 365- dorsum of female, 366- tibia and tarsus I of female, 367- tibia and tarsus II of female, 368- tibia and tarsus I of male, 369- tibia and tarsus II of male, 370- distal segment of palpus of female, 371- peritreme of female, 372- aedeagus.

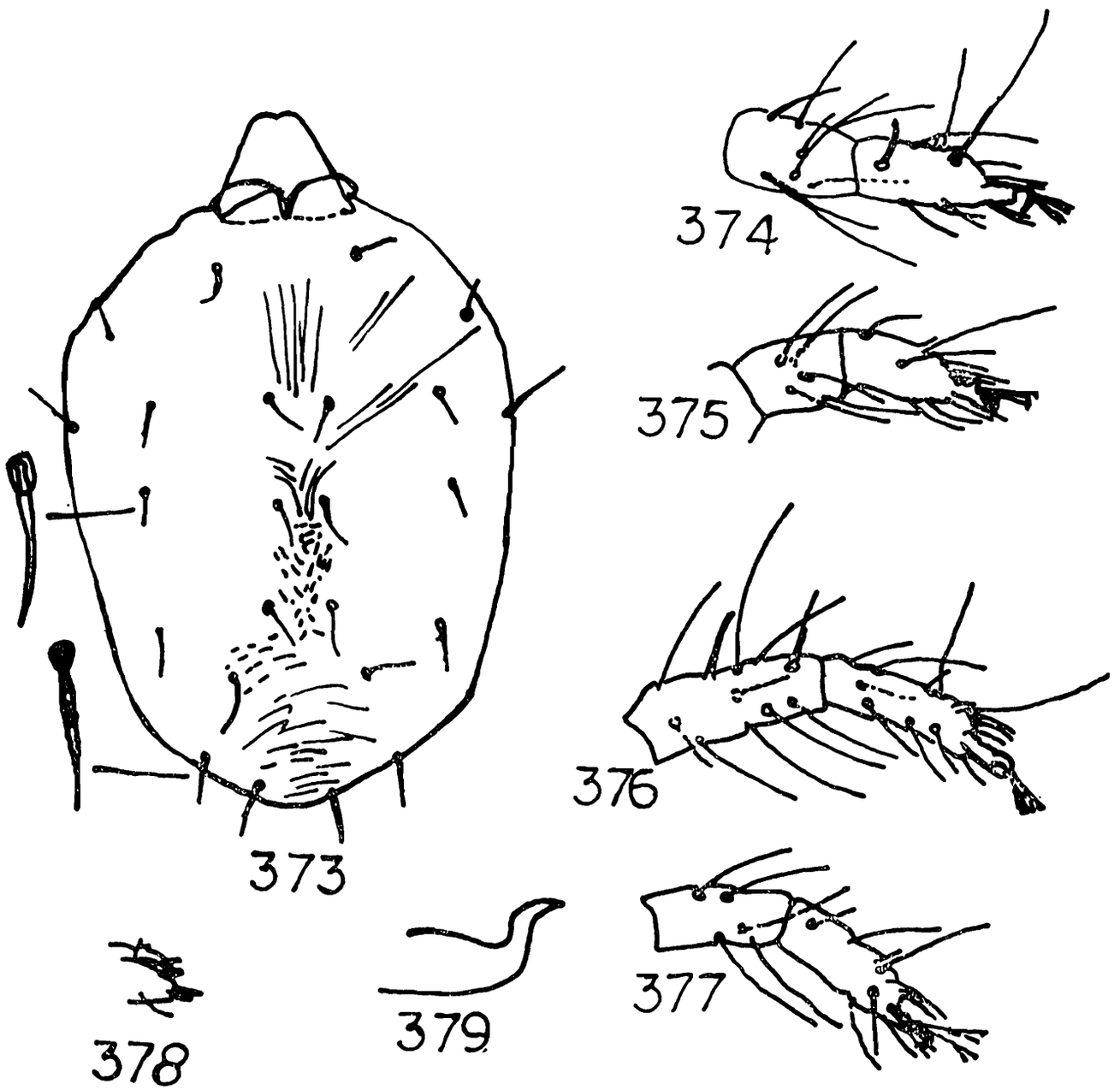
Known hosts outside India : *Andropogon annulatus*, *Saccharum officinarum* (sugarcane).

Distribution : India (Bihar, Delhi, Orissa, Punjab, Tamil Nadu, Karnataka, Kerala, Gujarat, Haryana, Uttar Pradesh, West Bengal), Pakistan, Thailand, Mexico.

Remarks : It is a sporadic postmonson pest of sugarcane throughout the country but occasionally attacks paddy also in eastern and northeastern India producing whitish patches in rows on either side of mid-rib.

54. **Schizotetranychus baltazari** Rimando
(Figs. 373-379)

Schizotetranychus baltazari Rimando, 1962 : 534-535 ; Manson, 1963 : 360-362 ; Manson, 1967b : 669 ; Prasad, 1974 : 122 ; Gupta, 1985 : 97-98.



Figs. 373-379 : *Schizotetranychus baltazari* : 373- dorsum of female, 374- tibia and tarsus I of female, 375- tibia and tarsus II of female, 376- tibia and tarsus I of male, 377- tibia and tarsus II of male, 378- distal segment of palpus of male, 379- aedeagus.

Male : Body including rostrum 261 long. Terminal sensillum of palpus absent. Peritreme hooked. Tibia I with 4 sensory and 7 tactile setae, tarsus I with 2 sensory and 10 tactile setae proximal to duplex setae. Tibia II with 5 tactile setae, tarsus II with 1 sensory and 9 tactile setae proximal to duplex setae. Aedeagus as figured. Dorsal surface of knob gently rounded pointed posteriorly, rounded anteriorly, axis of knob forming an angle with axis of shaft.

Female : Body including rostrum 308 long, 219 wide. Terminal sensillum of palpus large, about twice as long as broad. Anterior margin of stylophore slightly notched. Peritreme hooked. Dorsal body setae as figured. These are of two types, those which are broadened at the basal third and tapering rapidly and those which are longer, stiffer with a more even tapering. Tibia I with 7 tactile and 1 sensory setae ; tarsus I with 9 tactile setae proximal to duplex setae. Tibia II with 5 tactile setae, tarsus II with 1 sensory and 9 tactile setae proximal to duplex setae. Dorsal striae longitudinal between third pair of dorsocentral hysterosomal setae.

Known hosts in India : *Citrus sinensis*, *Murraya koenigii.*

Known hosts outside India : *Citrus aurantium* (orange), *Citrus nobilis.*

Distribution India (Assam, Karnataka), Myanmar, Thailand, Taiwan, Hong Kong, Philippines.

Remarks : Occasionally this species is known to infest citrus but causes no serious damage to the plants except producing stipplings on the leaves.

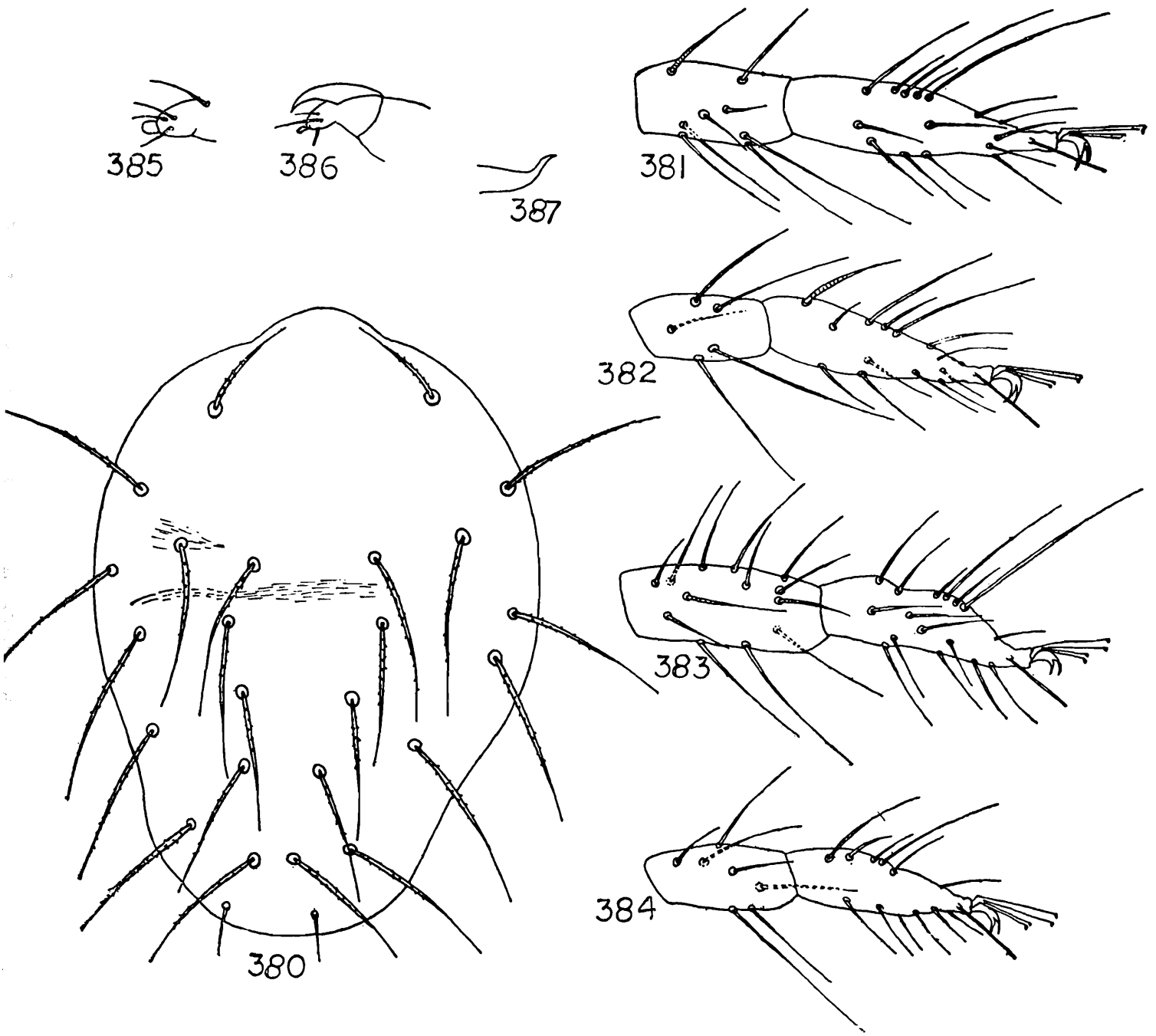
55. **Schizotetranychus cajani** Gupta
(Figs. 380-387)

Schizotetranychus spireafolia, Gupta & Dhooria, 1974 : 69.
Schizotetranychus cajani Gupta, 1976 : 336-337 ; Gupta, 1985 : 98.

Male : Body including rostrum 285 long, 141 wide. Terminal sensillum of palpus thin and minute, dorsal sensillum thin and slender. Peritreme anastomoses distally. Dorsal idiosomal setae serrate, fusiform, twice as long as interval between their longitudinal bases. Tibia I with 4 sensory and 9 tactile setae, tarsus I with 2 sensory and 5 tactile setae proximal to duplex setae. Striation transverse at the region of dorsocentral setae. Aedeagus with shaft broad and long, gradually narrowing distal part angulate with tip directed upward.

Female : Body including rostrum 371 long, 177 wide. Palpus with terminal sensillum twice as long as broad. Peritreme slightly anastomosing distally. Tibia I with 2 sensory and 6 tactile setae ; tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 4 tactile setae, tarsus II with 1 sensory and 4 tactile setae proxi-

mal to duplex setae. Outer and inner sacrals of same length. Genital flap with transverse striae. Medioventral setae of moderate size.



Figs. 380-387 : *Schizotetranychus cajani* : 380- dorsum of female, 381- tibia and tarsus I of female, 382- tibia and tarsus II of female, 383- tibia and tarsus I of male, 384- tibia and tarsus II of male, 385- distal segment of palpus of female, 386- distal segment of palpus of male, 387- aedeagus.

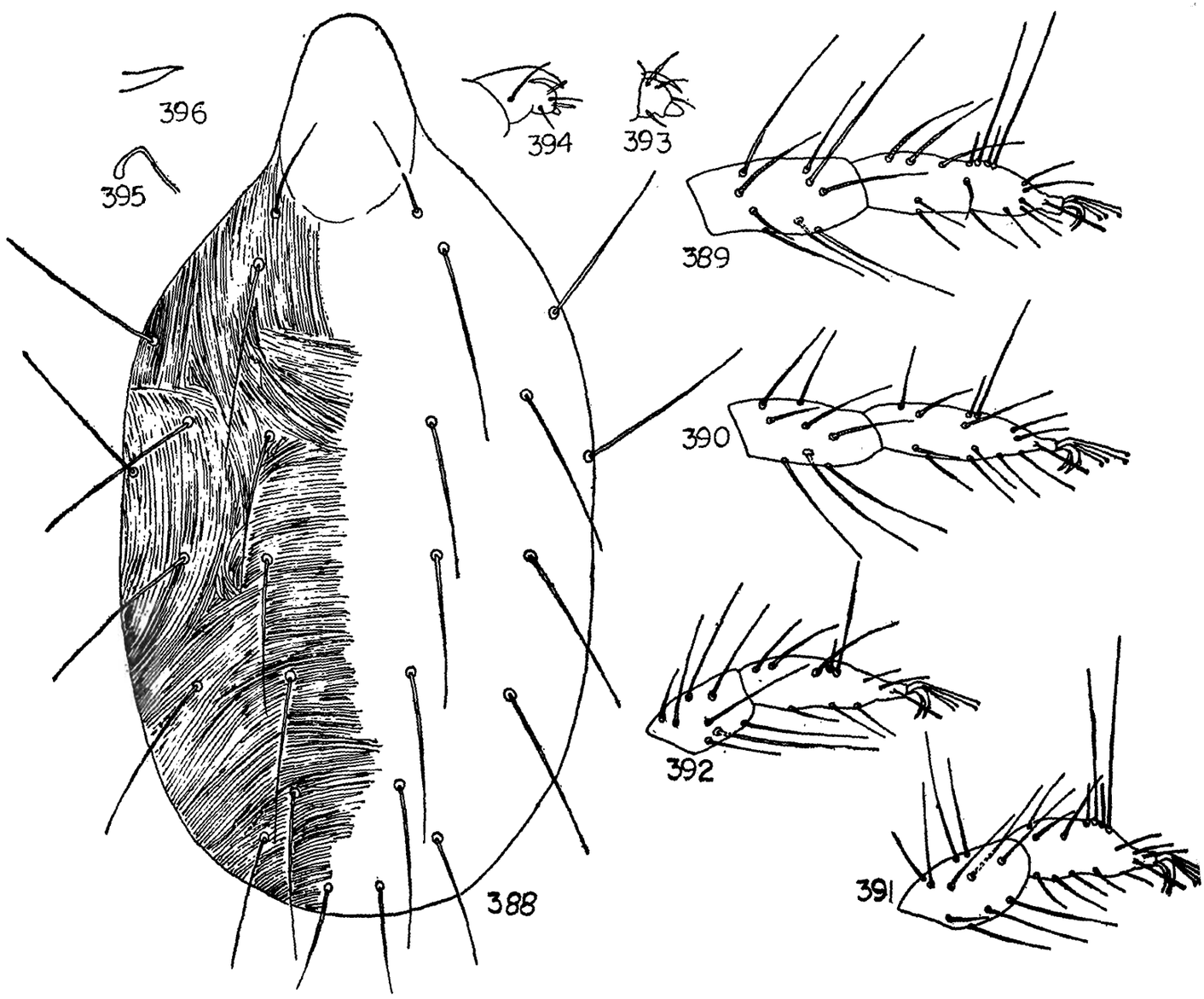
Known host in India : *Cajanus cajan* (pigeon pea).

Distribution : India (Andhra Pradesh, West Bengal, Gujarat, Punjab, Bihar).

Remarks : Often this yellowish mite infests pigeon-pea causing the appearance of yellow spots on the leaves. Such infested leaves dry up and fall off.

56. **Schizotetranychus indicus** sp. nov.

(Figs. 388-396)



Figs. 388-396 : *Schizotetranychus indicus* sp. nov. : 388- dorsum of female, 389- tibia and tarsus I of female, 390- tibia and tarsus II of female, 391- tibia and tarsus I of male, 392- tibia and tarsus II of male, 393- distal segment of palpus of female, 394- distal segment of palpus of male, 395- peritreme of female, 396- aedeagus.

Male: Body including rostrum 249 long, 126 wide. Terminal sensillum of palpus minute, dorsal sensillum slender and small. Dorsal setae of idiosoma longer than the interval between their longitudinal bases. Tibia I with 3 sensory and 8 tactile setae, tarsus I with 1 sensory and 5 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 2 tactile setae. Aedeagus slightly sigmoid at distal end.

Female : Body including rostrum 367 long, 130 wide. Terminal sensillum of palpus 2 times as long as wide and tapering distally, dorsal sensillum thin and slender. Peritreme distally hook-like. Dorsal setae of idiosoma longer than the interval between their longitudinal bases and tapering distally. Tibia I with 3 sensory and 6 tactile setae, tarsus I with 2 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 3 sensory and 5 tactile setae, tarsus II with 1 sensory and 4 tactile setae proximal to duplex setae. Outer and inner sacrals of same length. Clunals comparatively long and tapering. Genital flap with transverse striae. Medioventral setae of moderate size.

Holotype Male (Reg. No. 3195/17), India : Meghalaya, Mawphlong, 21.ix.1974, ex bamboo, (*Bambusa aurantium*) (Coll. S. K. Gupta). Paratypes: 6 Females (Reg. No. 3196/17), data same as for holotype.

Remarks : This species is close to *Schizotetranychus cajani* Gupta but differs from it in shape of aedeagus and in relative number of tactile and sensory setae on tibia and tarsus of leg I and II.

57. **Schizotetranychus fluvialis** McGregor
(Figs. 397-401)

Schizotetranychus fluvialis McGregor, 1928 : 13 ; Pritchard & Baker, 1955 : 254 ; Tuttle & Baker, 1968 : 98 ; Gupta, 1976 : 337 ; Gupta, 1985 : 98.

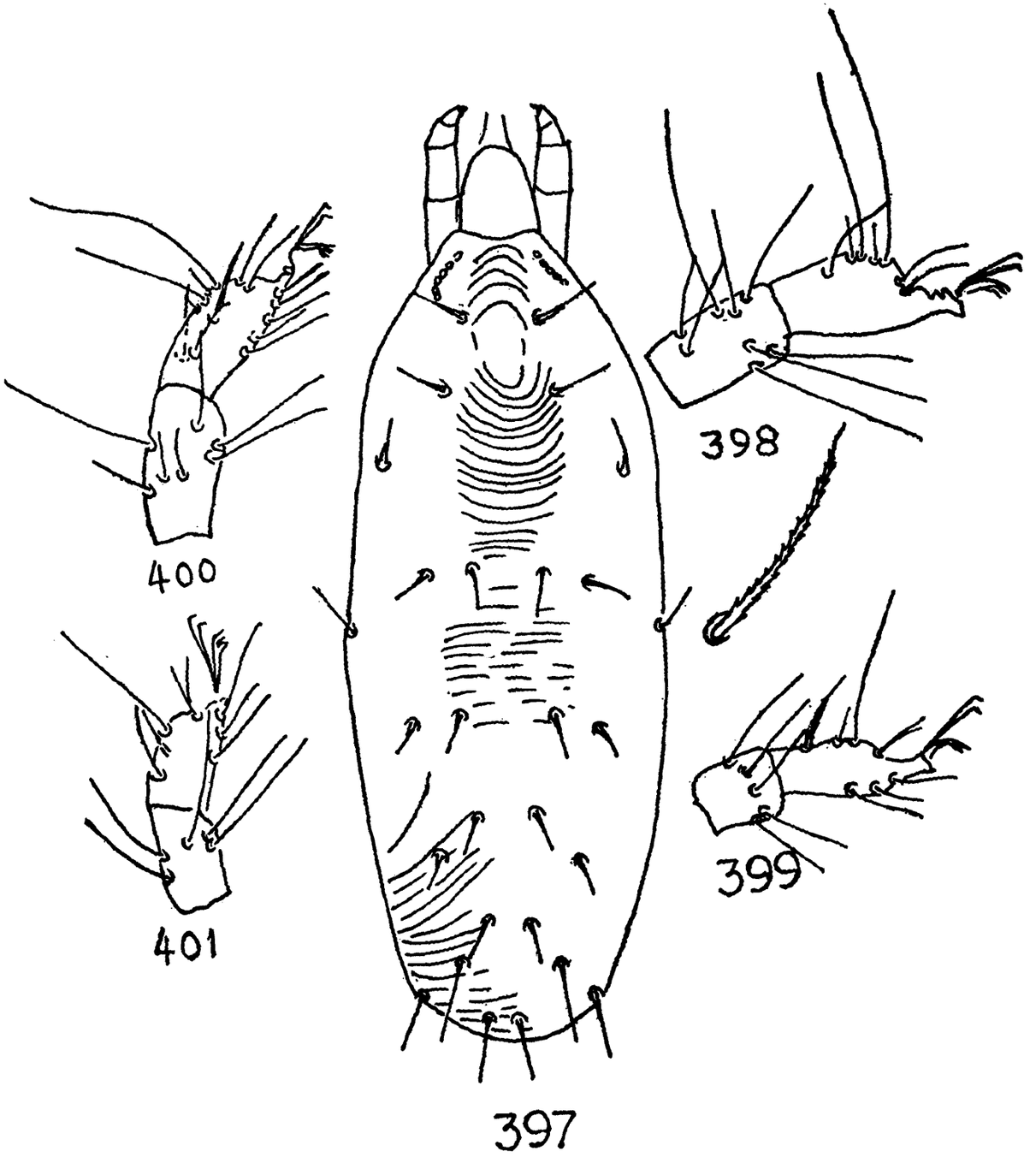
Diagnosis : This species is distinctive in having the dorsal setae all very short, much shorter than the interval between their bases. The striae of propodosoma longitudinal dorsally to a level with the second pair of propodosomal setae, the striae of hysterosoma transverse. The srriae of genital flap transverse, those of the area anterior to flap irregularly longitudinal. Aedeagus of male upturned and sigmoid. Tarsi blunt distally.

Known host in India : *Cajanus cajan* (pigeon-pea).

Known hosts outside India : *Aristida adscensionis*, *Muhlenbergia rigens*.

Distribution : India (Punjab), U.S.A. (California, Arizona).

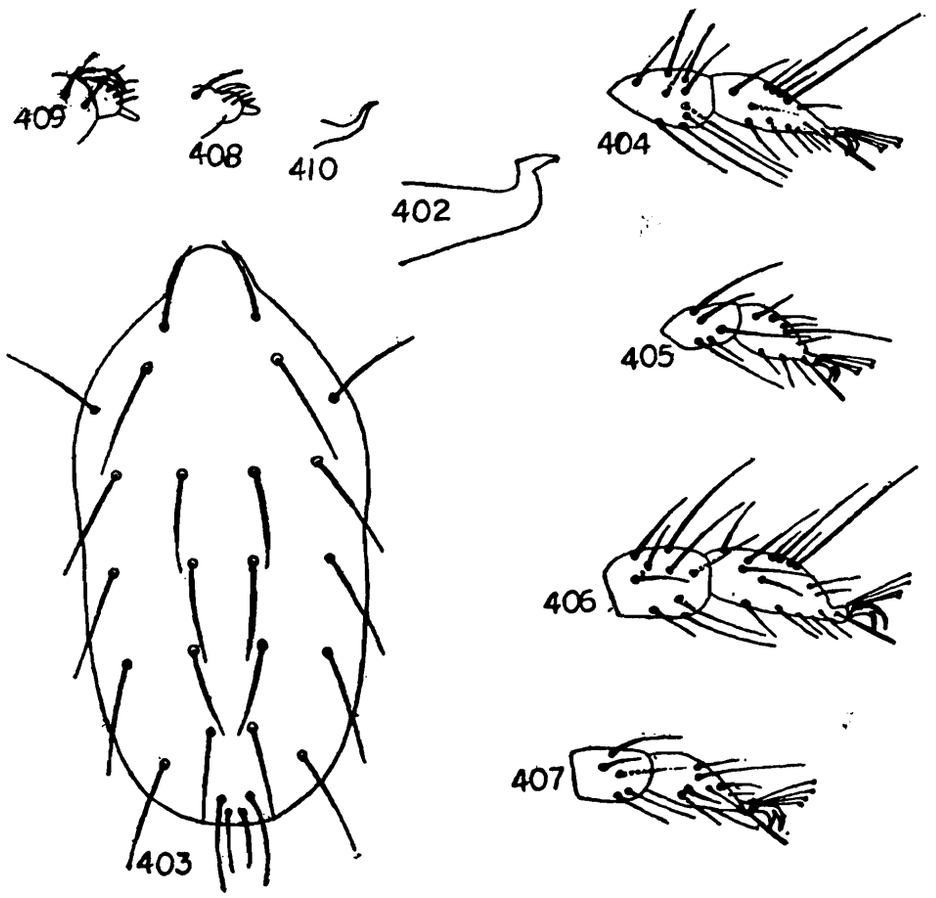
Remarks : This appears to be an incorrectly identified record from India. Material was not availahle for re-checking the identity.



Figs. 397-401 : *Schizotetranychus fluvialis* : 397- dorsum of female, 398- tibia and tarsus I of female, 399-tibia and tarsus II of female, 400- tibia and tarsus I of male, 401- tibia and tarsus II of male.

58. **Schizotetranychus hindustanicus** (Hirst)
(Fig. 402)

Tetranychus (*Schizotetranychus*) *hindustanicus* **Hirst, 1924 : 525.**
Schizotetranychus hindustanicus, **Pritchard & Baker, 1955 : 266-267 ; Bindra & Singh, 1970 : 17-24 ; Gupta, 1976 : 337 ; Gupta, 1985 : 99.**



Figs. 402 : *Schizotetranychus hindustanicus* **:** aedeagus.

Figs. 403-410 : *Schizotetranychus mansoni* **: 403- dorsum of female, 404- tibia and tarsus I of female, 405- tibia and tarsus II of female, 406- tibia and tarsus I of male, 407- tibia and tarsus II of male, 408- distal segment of palpus of female, 409- distal segment of palpus of male, 410- aedeagus.**

Male : Dorsal setae fine, set on triangular sockets, about 2/3rd as long as distance between their bases. Distal portion of aedeagus turns dorsal to form a sigmoid distal end, tip slightly hooked. Empodial claw simple.

Known hosts in India : *Acacia sp.*, *Azadirachta indica Citrus* sp., *Melia azadirachta*, *Sorghum vulgare.*

Distribution : India (Tamil Nadu, Kerala).

59. **Schizotetranychus mansoni** Gupta
(Figs. 403-410)

Schizotetranychus mansoni **Gupta, 1980 : 113-115.**

Male : Body including rostrum 298 long, 180 wide. Terminal sensillum of palpus three times as long as wide, dorsal sensillum slender. Dorsal setae of idiosoma slightly longer than the interval between their longitudinal bases. Tibia I with 2 sensory and 7 tactile setae, tarsus I with 1 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 5 tactile setae, tarsus II with 1 sensory and 2 tactile setae proximal to duplex setae. Aedeagus as figured.

Female : Body including rostrum 352 long, 130 wide. Terminal sensillum of palpus 2 times as long as wide. Dorsal setae of idiosoma tapering, minutely pubescent and longer than the interval between their longitudinal bases. Tibia I with 2 sensory and 8 tactile setae, tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 5 tactile setae, tarsus II with 1 sensory and 1 tactile setae proximal to duplex setae. Outer sacral longer than inner sacral. Post anal setae thin and small. Genital flap with transverse striae. Medioventral setae of moderate size.

Known host in India : *Oryza sativa* (paddy).

Distribution : India (Andaman & Nicobar Isls.).

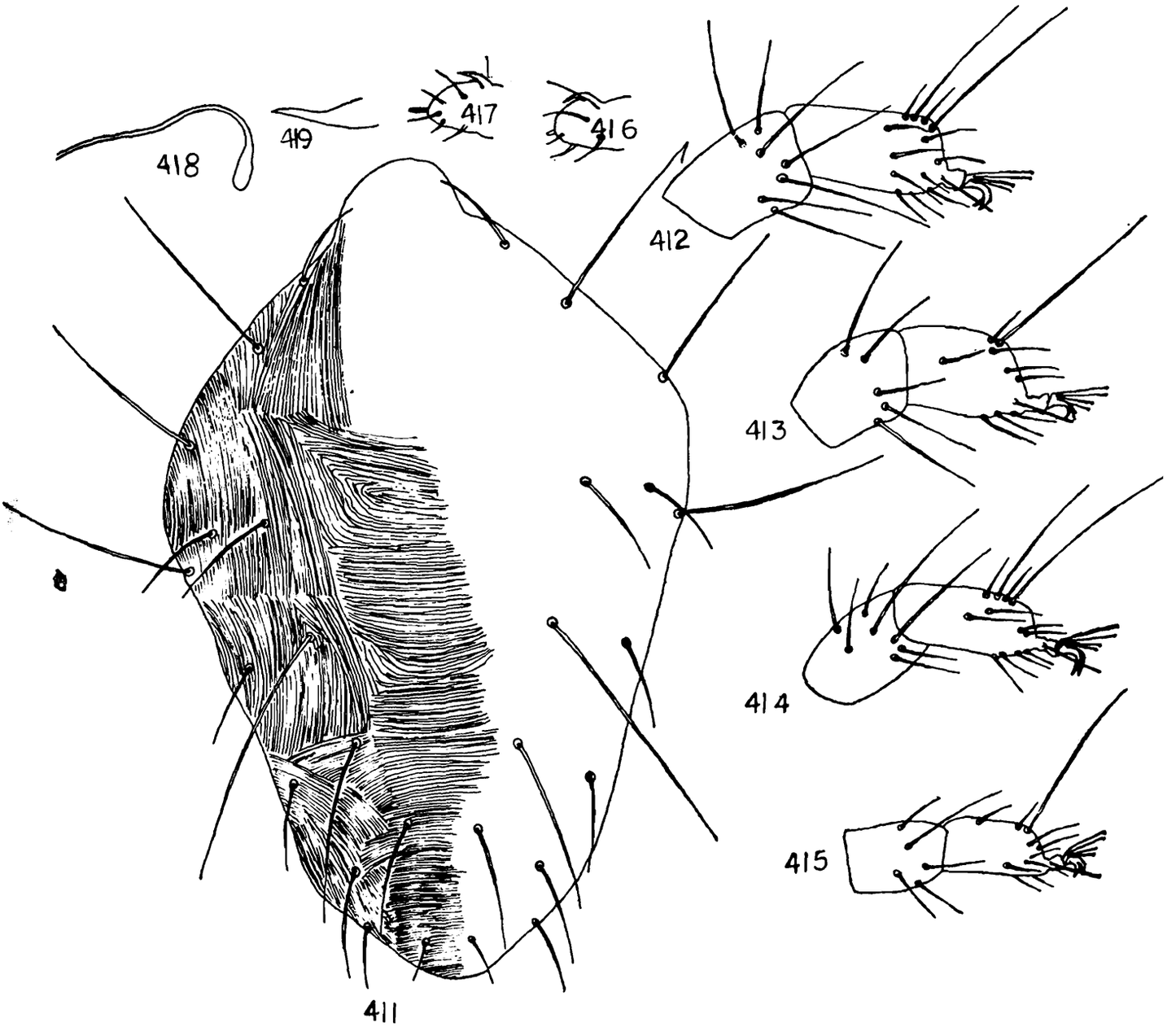
Remarks : This species resembles *S. andropogoni* (Hirst) but differs in shape of aedeagus.

60. **Schizotetranychus meghalayensis** sp. nov.
(Figs. 411-419)

Male : Body including rostrum 339 long, 159 wide. Terminal sensillum of palpus thin and long. Peritreme long and narrow and bulb-shaped distally. Dorsal idiosomal setae long, thin, simple, all are not of same length and longer than the interval between their longitudinal bases. Tibia I with 2 sensory and 5 tactile setae, tarsus I with 2 sensory setae proximal to duplex setae. Tibia II with 1 sensory and 4 tactile setae, tarsus II with 2 sensory and 1 tactile setae proximal to duplex setae. Outer and inner sacrals not of same length. Aedeagus bends up toward to form a semisigmoid distal end. Medioventral setae thin and of same length.

Female : Body including rostrum 414 long, 187 wide. Terminal sensillum of palpus very minute. Peritreme bulb-shaped distally. Dorsal setae of idiosoma thin, long, simple

and of different size. Tibia I with 2 sensory and 5 tactile setae, tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 2 sensory and 2 tactile setae. Inner sacrals longer than outer sacrals. Genital flap with transverse striae. Medioventral setae



Figs. 411-419 : *Schizotetranychus meghalayensis* sp. nov. : 411- dorsum of female, 412- tibia and tarsus I of female, 413- tibia and tarsus II of female. 414- tibia and tarsus I of male, 415- tibia and tarsus II of male, 416- distal segment of palpus of female, 417- distal segment of palpus of male, 418- peritreme, 419- aedeagus.

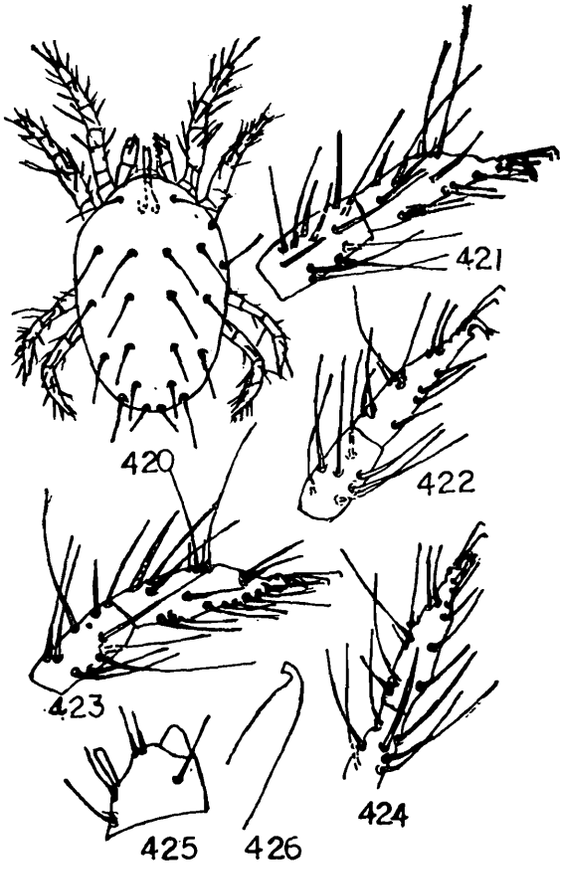
long, thin and normal in thickness. Holotype Male (Reg. No. 3197/17), India : Meghalaya, Tura, 15.10.1974, ex bamboo (*Bambusa vulgaris*) (Coll. S. K. Gupta). Paratypes : 6 Females, 1 Male (Reg. No. 3198/17), data same as for holotype.

Remarks : This species is very close to *Schizotetranychus celarius* Banks but differs in idiosomal setae being serrate in the new species, in shape of aedeagus and also in relative number of sensory and tactile setae on tibia and tarsus of leg I and II in both sexes.

61. Schizotetranychus tephrosiae Gutierrez
(Figs. 420-426)

Schizotetranychus tephrosiae Gutierrez, 1968 : 24-28 ; Meyer, 1974 : 170-171 ; Nassar & Ghai, 1981 : 353 ; Gupta, 1985 : 100.

Male : The palpus with terminal sensillum slightly longer than broad. Tibia I with 4 sensory and 9 tactile setae, tarsus I with 3 sensory and 13 tactile setae. Tibia II with 7



Figs. 420-426 : *Schizotetranychus tephrosiae* : 420- dorsum of female, 421- tibia and tarsus I of male, 422- tibia and tarsus II of male, 423- tibia and tarsus I of female, 424- tibia and tarsus II of female, 425- distal segment of palpus of female, 426- aedeagus.

tactile setae, tarsus II with 1 sensory and 12 tactile setae. Shaft of the aedeagus very long, straight and curves dorsad, the anterior projection relatively longer and directed dorsad. Aedeagal knob about one sixth the length of dorsal margin of shaft.

Female : Body including gnathosoma 600 long, 400 wide. Dorsal idiosomal setae linear, lanceolate, serrate and extend beyond the bases of setae next behind. Propodosoma with longitudinal striae and hysterosoma with transverse striae. Stylophore rounded. Terminal sensillum of palpus about one and one third times as long as broad. Distal end of peritreme varies from being strongly hooked and ends in a simple bulb. Genital flap with transverse striae.

Known host in India : *Eriobotrya japonica* (loquat).

Known hosts outside India : *Balanites pedicellaris*, *Mikania cordata*, *Mundulea sericea*, *Tephrosia striata*.

Distribution : India (Delhi), Madagascar, South Africa.

Genus 18. **Oligonychus** Berlese

Oligonychus Berlese, 1886 : 24 ; Pritchard & Baker, 1955 : 270 ; Wainstein, 1960 : 203 ; Tuttle & Baker, 1968 : 116 ; Meyer, 1974 : 248 ; Mitrofanov, 1977 : 1801-1802 ; Gupta, 1985 : 80 ; Smith-Meyer, 1987 : 142.

Type : *Heteronychus brevipodus* Targioni

Diagnosis : Single pair of preanal setae, well developed claw-like empodia with proximoventral hairs which are as long as proximoventral spurs. Duplex setae on tarsus I distal and adjacent ; Dorsal body setae with few exceptions not located on tubercles.

Key to the species of *Oligonychus* known from India :

1. Aedeagus bent ventrad, tarsus I with not more than a single tactile seta on venter just distad of duplex setae 2
— Aedeagus bent dorsad, although the distal end may be directed ventrad, tarsus I with 2 tactile setae on venter just distad of duplex setae 6
2. Aedeagus generally narrowing distally 3
— Aedeagus with distal end abruptly narrowed 5
3. Aedeagus bends ventrad, forms acute angle with axis of shaft 4
— Aedeagus bends ventrad at right angle ... ... *vitis*

4.	Bent portion of aedeagus forming an acute angle with shaft ...	*mangiferus*
—	Bent portion of aedeagus with tip directed ventrad ...	*coffeae*
5.	Aedeagus with bent portion forming a right angle with the shaft ...	*punicae*
—	Aedeagus with bent portion forming acute angle with shaft ...	*sapienticolus*
6.	Tarsus I with proximoventral appendages forming a pair of empodial spurs ; on monocots, mostly on grasses	7
—	Tarsus I with 3 pairs of proximoventral hairs on empodium, on other hosts ...	*biharensis*
7.	Aedeagus with distal end enlarged ...	*indicus*
—	Aedeagus with distal end not enlarged	8
8.	Bent portion of aedeagus longer ...	*iselleme*
—	Bent portion of aedeagus shorter	9
9.	Aedeagus with distal end strongly sigmoid ...	*sacchari*
—	Aedeagus with distal end not strongly sigmoid	10
10.	Aedeagus with bent dorsad, slender, s-shaped ...	*oryzae*
—	Aedeagus with dorsal bent tapering, small hook-shaped ...	*manishi*

62. **Oligonychus biharensis** (Hirst)
(Figs. 427-435)

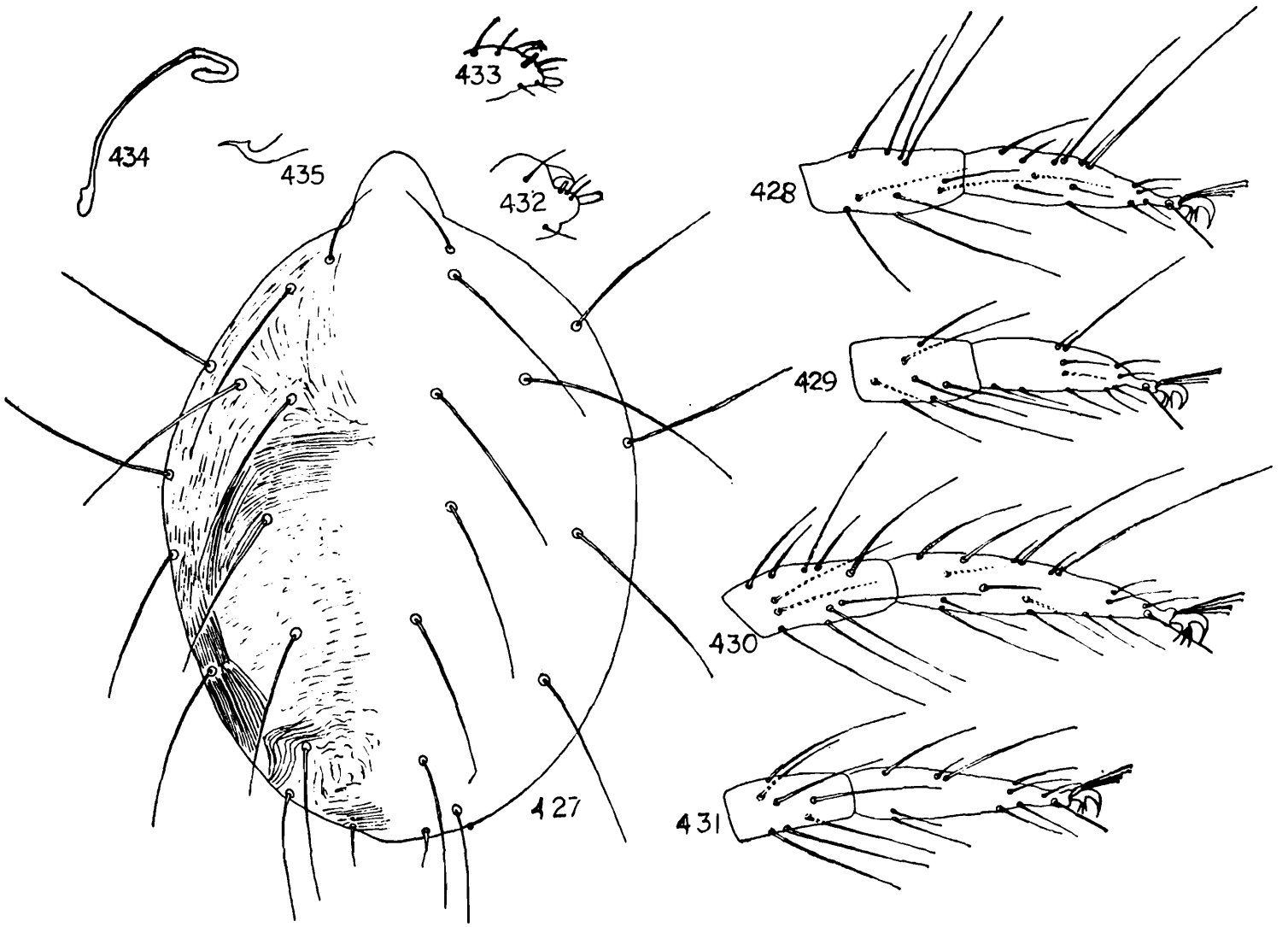
Paratetranychus biharensis Hirst, 1924 : 69.

Oligonychus biharensis, Pritchard & Baker, 1955 : 364-365 ; Baker & Pritchard, 1960 : 514-515 ; Ghai, 1964 : 392 ; Gupta, 1970 : 99 ; Prasad, 1974, 116 ; Gupta, 1976 : 339 ; Gupta, 1985 : 81-83 ; Smith-Meyer, 1987 : 149.

Male : Body including rostrum 357 long, 177 wide. Terminal sensillum of palpus slightly shorter than that of female ; dorsal sensillum long and slender. Peritreme retrose distally. Dorsal idiosomal setae thin, rather tapering at distal end and one and half times longer than the interval between their longitudinal bases. Tibia I with 3 sensory and 8 tactile setae, tarsus I with 2 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 7 tactile setae, tarsus II with 1 tactile seta proximal to duplex setae. Aedeagus with the axis parallel to that of the shaft. Dorsal margin of axis convex with tip bending downward.

Female : Body including rostrum 393 long, 288 wide. Palpus with terminal sensillum 3 times as long as wide, dorsal sensillum slender. The female can be distinguished from other members of this group by having the peritreme retrose distally. Dorsal idiosomal

setae thin, simple, slender and one and half times longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 9 tactile setae, tarsus I with 1 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 7 tactile setae ; tarsus II with 2 tactile



Figs. 427-435 : *Oligonychus biharensis* : **427- dorsum of female, 428- tibia and tarsus I of female, 429- tibia and tarsus II of female, 430- tibia and tarsus I of male, 431- tibia and tarsus II of male, 432- distal segment of palpus of female, 433- distal segment of palpus of male, 434- peritreme of female, 435- aedeagus.**

setae proximal to duplex setae. Outer and inner sacrals not of same length but clunals quite smaller than outer and inner sacrals. Genital flap with transverse striae. Medioventral setae of moderate size.

Known hosts in India : *Areca catechu, A. auriculiformes*, casava, cocoa, *Cocos nucifora, Dodonea viscosa, Eriobotrya japonica*, Ficus sp., *Grivellia robusta, Rosa indica, Shorea robusta*, Silver oak, *Solanum melongena*.

Known hosts outside India : *Acacia confusa*, *Achras zapota*, *Ampelopsis heterophylla*, *Artocarpus integer*, *Bauhinia purpurea*, *Bischofca javanica*, camphor, casava, *Cassia fistula*, *Citrus* sp., *Crotoneaster* sp., *Diaspyros* sp., *D. maritina*, *Durio zibethinus*, *Eriobotrya japonica*, *Eugenia javanica*, *Euphorbia longana*, *Goniothalmus undulatus*, *Hevea* sp., *Hibiscus tiliaceus*, *Lepisanthus bengalensis*, *Litchi chinensis*, loquat, *Macaranga bicolour*, *Mangifera indica*, *Musa* sp., *Perrea americana*, *Pleuropterus hypoleucus*, *Psidium guajava*, *Pyrus malus*, *P. pyrifolia*, *Rosa* sp., *R. indica*, *Sapindus mukorossi*, *Vitis vinifera*, *Zizyphus combodiana*.

Distribution : India (Andaman & Nicobar Isls., Bihar, Gujarat, Karnataka, Kerala, Tamil Nadu, West Bengal), Antigua, Brazil, Hawaii, Mauritius, Philippines, Thailand, Taiwan.

Remarks : This mite infests litchi, loquat and sometimes mango but never attains any serious form. A numerous white spots appear on the infested leaves.

63. **Oligonychus coffeae** Nietner
(Figs. 436-440)

Acarus coffeae **Nietner, 1861 : 19-20 ;**
Tetranychus bioculatus **Wood-Mason, 1884 : 1 ;**
Paratetranychus bioculatus, **Baker & Pritchard, 1953 : 213.**
Oligonychus merwei **Tucker, 1926 : 5-6.**
Oligonychus coffeae, **Pritchard & Baker, 1955 : 315 ; Das, 1959 : 265-274 ; Ghai, 1964 : 392 ; Gupta, 1970 : 99 ; Prasad, 1974 : 116 ; Gupta, 1985 : 83 ; Smith-Meyer, 1987 : 146.**

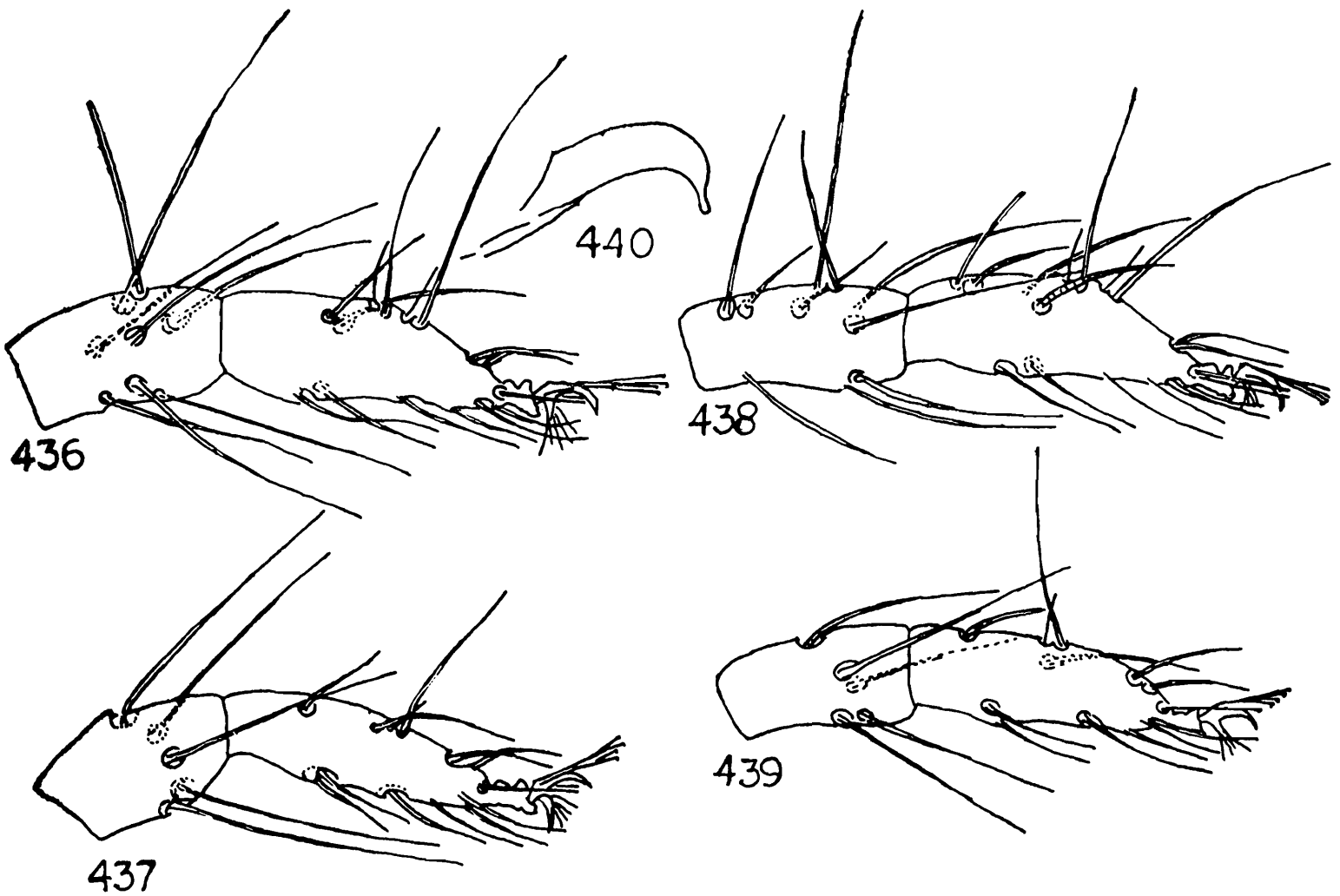
Male : The palp tarsus bears a tiny terminal sensillum. Tibia I with 3 sensory and 7 tactile setae. Tarsus I with 2 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 5 tactile setae, tarsus II with 1 sensory and 12 tactile setae. Aedeagus at distal end bends ventrad at a right angle to the axis of the shaft. It gradually narrows to a slender truncate tip.

Female : The terminal sensillum on the palp tarsus about as long as broad. Peritreme dialated into a simple bulb. Stylophore incised anteriorly. Dorsal idiosomal setae serrate and longer than the distance between consecutive setae. The striae on the hysterosoma mostly transverse but sometimes the striae between the 3rd pair of dorsocentrals are U—shaped to irregular. The striae are devoid of lobes. Genital flap bears transverse striae and the area immediately anterior to flap with longitudinal striae.

Known hosts in India : *Aristolochia* sp., *Camellia sinensis* (tea), *Coffea arabica* (coffee), *Corchorus capsularis* (jute), *C. olitorius* (jute), camphor, *Croton* sp., *Citrus* sp., *Grevillea* sp., *Gossypium herbaceum* (cotton), *Litsea lacifolia*, *Mangifera indica* (mango), *Melastoma malalia-*

thricum, *Moghanis macrophylla*, *Morus alba* (mulberry), *Prunus persica*, *Ricinus communis* (castor), *Syzygium cumini* (blackberry), *Urena lobata* (Bon okra).

Known hosts outside India: *Acacia* sp., *Alnus japonicus*, *Acacia confusa*, avocado, *Bequartio dendron*, *Camellia* sp., *C. sinensis*, *Coffea arabica* (coffee), *Citrus* sp., *Ceratopetalum gummiferum*, *Combretum quadrangulare*, *Crotalaris angyroides*, *Eucalyptus gomphocephalus*, *Hibiscus abelmoschus*, *H. ficulenus*, *H. panderiformа*, *Grevillea robusta*, *Indigofera* sp., *Juniperus*



Figs. 436-440 : *Oligonychus coffeae*: 436- tibia and tarsus I of female, 437- tibia and tarsus II of female, 438- tibia and tarsus I of male, 439- tibia and tarsus II of male, 440- aedeagus.

chinensis, *Magalis montanum*, *Mangifera indica*, *Melaleuca* sp., *Nephelium litchi*, *Nerium indicum*, *Parthenocissus quinquefolia*, *Persea americana*, *Prunus persica*, *Psidium cattleianum*, *Punica granatum*, *Quisqualis indica*, *Syzygium jambos*, *Tristana conferta*, *Trumphetta neglecta*, *Vitis vinifera*.

Distribution : India (Assam, West Bengal, Tamil Nadu, Himachal Pradesh, Meghalaya), Indonesia, Australia, Thailand, Hawaii, Japan, Philippines, Sri Lanka, Taiwan, U.S.A., South and East Africa, Russia, Mauritius, Middle East, Egypt.

Remarks : This mite is a serious pest of tea in both northeast and southern India causing copperish-bronzy appearance of leaves. The damage may be to the extent of 5-11%. The period of occurrence is during April-June. The life cycle is completed in 9-12 days.

64. **Oligonychus indicus** (Hirst)
(Figs. 441-449)

Paratetranychus indicus Hirst, 1923 : 990 ; Rahman & Sapra, 1940 : 201-212.
Oligonychus indicus, Pritchard & Baker, 1955 : 354-355 ; Gupta, 1970 : 96-99 ; Prasad, 1974 : 117-118 ; Gupta, 1976 : 340 ; Gupta, 1985 : 86.

Male : Body including rostrum 349 long, 202 wide. Palpus with terminal sensillum minute, tapering distally and as long as broad. Distal portion of peritreme ending into bulb. Dorsal body setae longer than the interval between their longitudinal bases. Tibia I with 2 sensory and 11 tactile setae ; tarsus I with 2 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae ; tarsus II with 2 sensory and 5 tactile setae proximal to duplex setae. Aedeagus is distinctive in having the distal knob very small. The bend of aedeagus forms an acute angle with axis of the shaft.

Female : Body including rostrum 393 long, 212 wide. Terminal sensillum of palpus two times as long as broad, dorsal sensillum slender. Dorsal body setae long, simple and longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 8 tactile setae, tarsus I with 2 sensory and 2 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Outer and inner sacrals of same length. Clunals of moderate size. Striations between hysterosomal region transverse and distance between them minutely broadened. Genital flap with transverse striae. Medioventral setae long and thin.

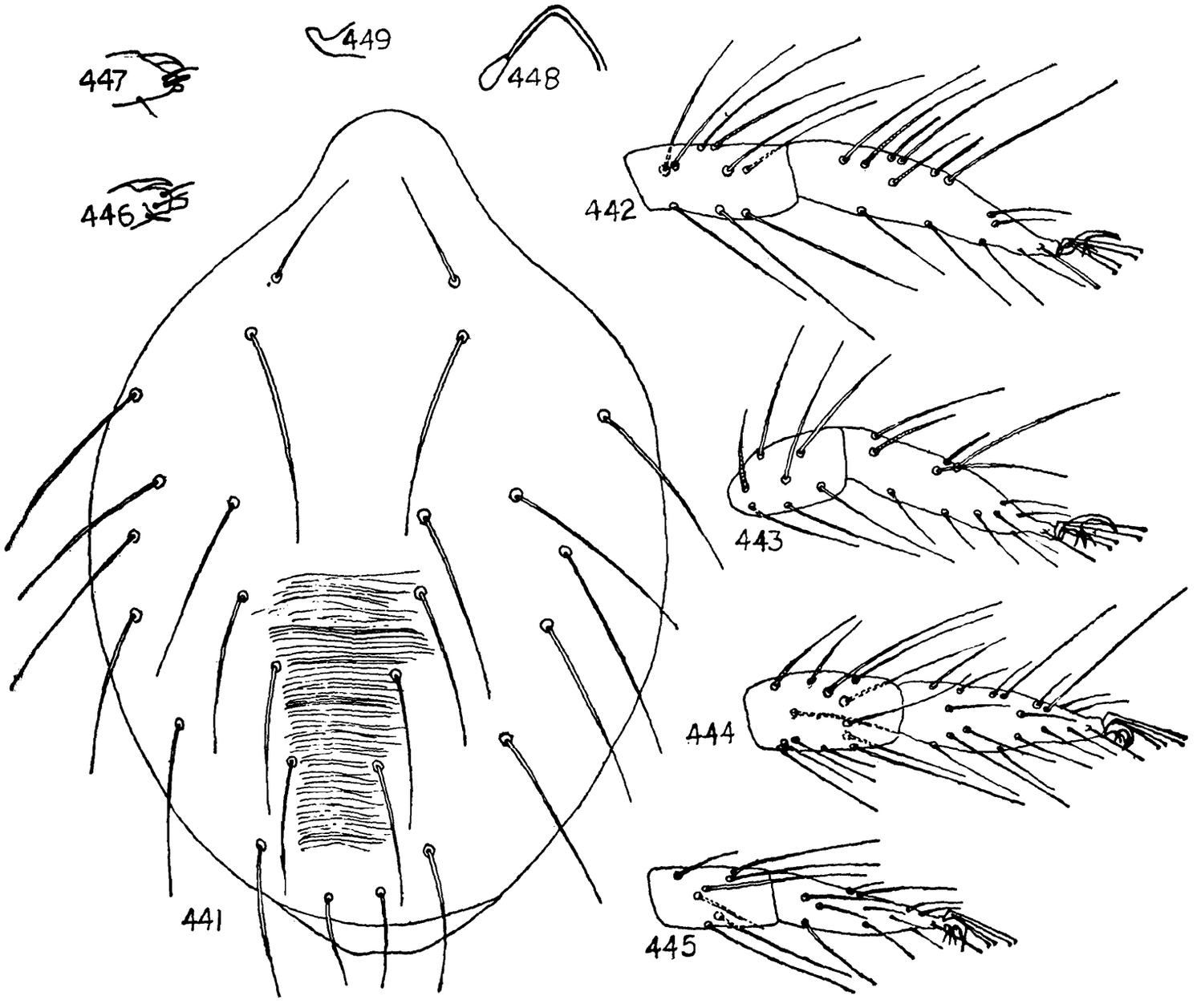
Known hosts in India : *Andropogon sorghum* (sorghum), *Areca catechu* (betel nut), *Cocos nucifora* (coconut), *Cynodon dactylon* (Doob grass), *Dicanthum annulatum*, *Lusine egypticum*, *Musa sapientum*, *Panichum distachyum*, *P. javanicum*, *Oryza sativa* (paddy), *Saccharum aurandinaceum*, *S. munja* (Sar), *S. officinarum* (sugarcane), *Sorghum helepense*, *S. vulgare*, *Zea mays* (maize).

Known hosts outside India : *Elusine aegyptica*, *Nelumbo nucifera*, *Sorghum vulgare*.

Distribution : India (Andhra Pradesh, Bihar, Delhi, Haryana, Karnataka, Orissa, Punjab, Tamil Nadu, Meghalaya, Uttar Pradesh, West Bengal), Pakistan.

Remarks : This is a serious pest of sugarcane causing reddening of leaves and the

extent of damage may be as high as 20-30%. This is mostly a pre-monsoon pest. Occasionally it attacks maize, sorghum and banana.

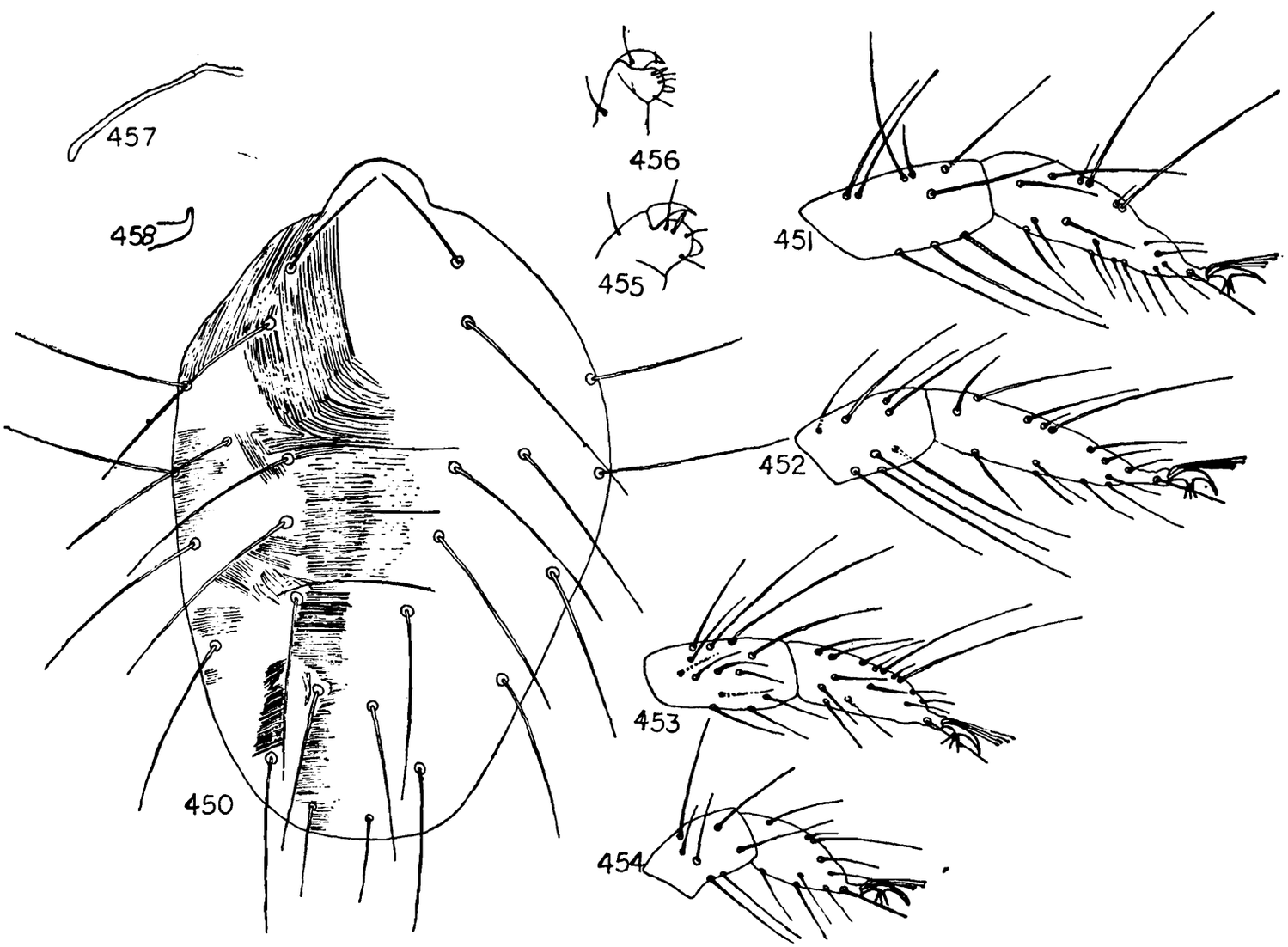


Figs. 441-449 : *Oligonychus indicus* : 441- dorsum of female, 442- tibia and tarsus I of female, 443- tibia and tarsus II of female, 444- tibia and tarsus I of male, 445- tibia and tarsus II of male, 446- distal segment of palpus of female, 447- distal segment of palpus of male, 448- peritreme of male, 449- aedeagus.

65. **Oligonychus iseilemae** (Hirst)
(Figs. 450-458)

Paratetranychus iseilemae Hirst, 1924 : 524.
Oligonychus iseilemae, Pritchard & Baker, 1955 : 358 ; Ghai, 1964 ; 392 ; Prasad, 1974 : 118 ; Gupta, 1976 : 340-341 ; Gupta, 1985 : 86-87.

Male : Body including rostrum 321 long, 141 wide. Palpus with terminal sensillum minute and slightly longer than wide. Peritreme at the distal end anastomosing. Dorsal



Figs. 450-458 : *Oligonychus iseilemae* : 450- dorsum of female, 451- tibia and tarsus I of female, 452- tibia and tarsus II of female, 453- tibia and tarsus I of male, 454- tibia and tarsus II of male, 455-distal segment of palpus of female, 456- distal segment of palpus of male, 457- peritreme of female. 458- aedeagus.

idiosomal setae not set on tubercles, simple, tapering gradually and twice longer than the interval between their longitudinal bases. Tibia I with 3 sensory and 10 tactile setae, tarsus I with 3 sensory and 4 tactile setae proximal to duplex setae. Aedeagus with small sigmoid tip, directed upward.

Female : Body including rostrum 393 long, 195 wide. Palpus with terminal sensillum much wider than long, dorsal sensillum slender. Peritreme at the distal end U-shaped and anastomosing at the distal end. Dorsal idiosomal setae not borne on tubercles, long, thin, gradually tapering and more than 2 times longer than the interval between their longitudinal bases. Tibia I with 2 sensory and 7 tactile setae, tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 8 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Outer and inner sacrals of same length while clunals smaller. Striations as figured. Genital flap with transverse striae. Medioventral setae of moderate size.

Known hosts in India : *Cajanus cajan* (pigeon pea), *Cocos nucifora* (coconut), some unidentified species of grass, *Iseilema laxum*.

Distribution : India (Andhra Pradesh, Tamil Nadu).

66. Oligonychus manishi Gupta
(Figs. 459-467)

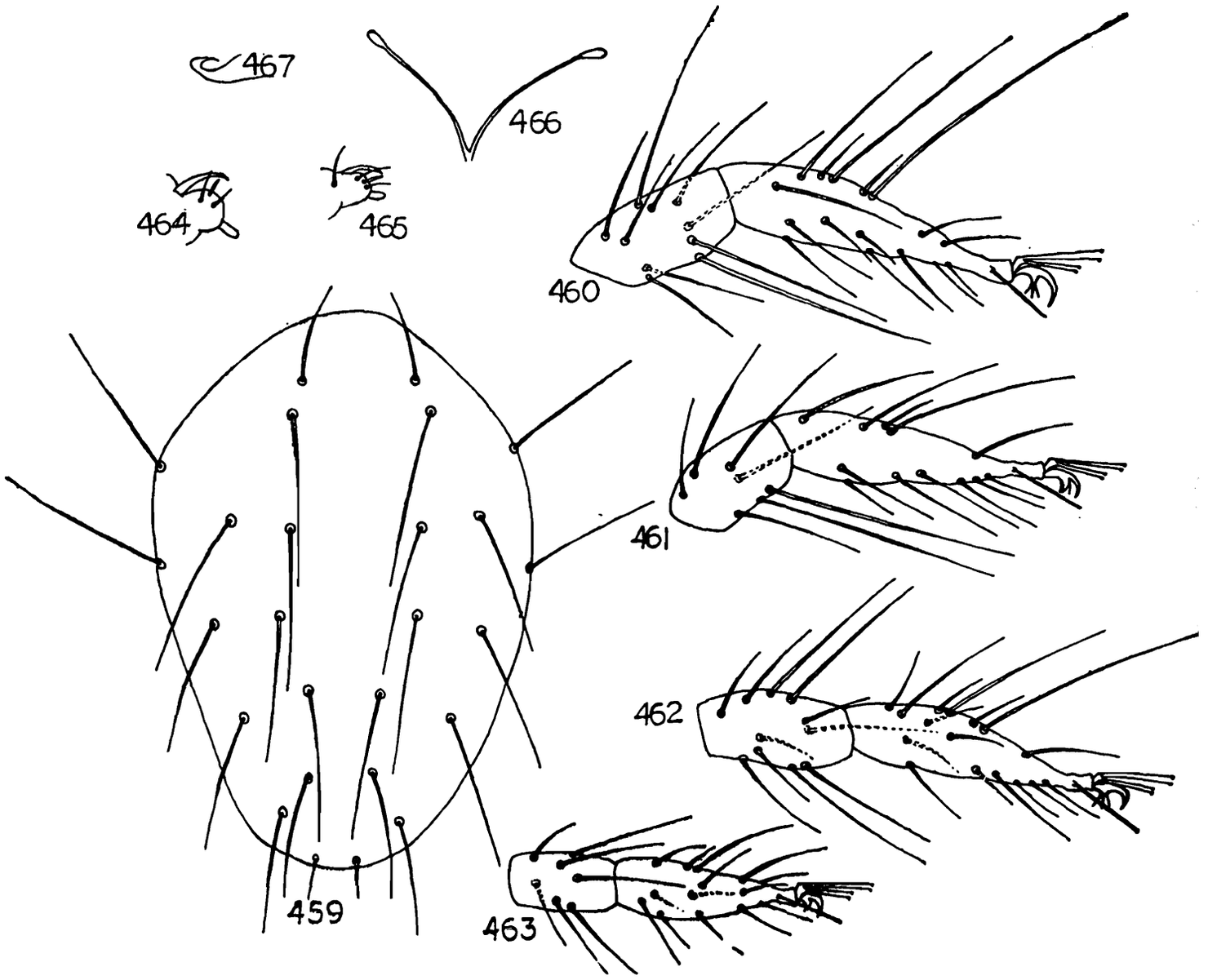
Oligonychus manishi Gupta, 1980 : 115-117.

Male : Body including rostrum 288 long, 144 wide. Terminal sensillum of palpus twice as long as broad. Peritreme at the distal end bulb-shaped. Dorsal body setae long and tapering, longer than the interval between their longitudinal bases. Tibia I with 2 sensory and 9 tactile setae, tarsus I with 2 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Aedeagus short, stout as figured.

Female : Body including rostrum 360 long, 216 wide. Terminal sensillum of palpus 3 times as long as wide, dorsal sensillum longer than terminal sensillum. Dorsal body setae same in length, slightly pubescent, acutely tapering, one and half times longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 9 tactile setae, tarsus I with 2 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 2 sensory and 5 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Outer sacrals and inner sacrals of same length, clunals thin and small. Genital flap with transverse striae. Medioventral setae of moderate size.

Known host in India : *Oryza sativa* (paddy).

Distribution : India (Andaman & Nicobar Isls.).



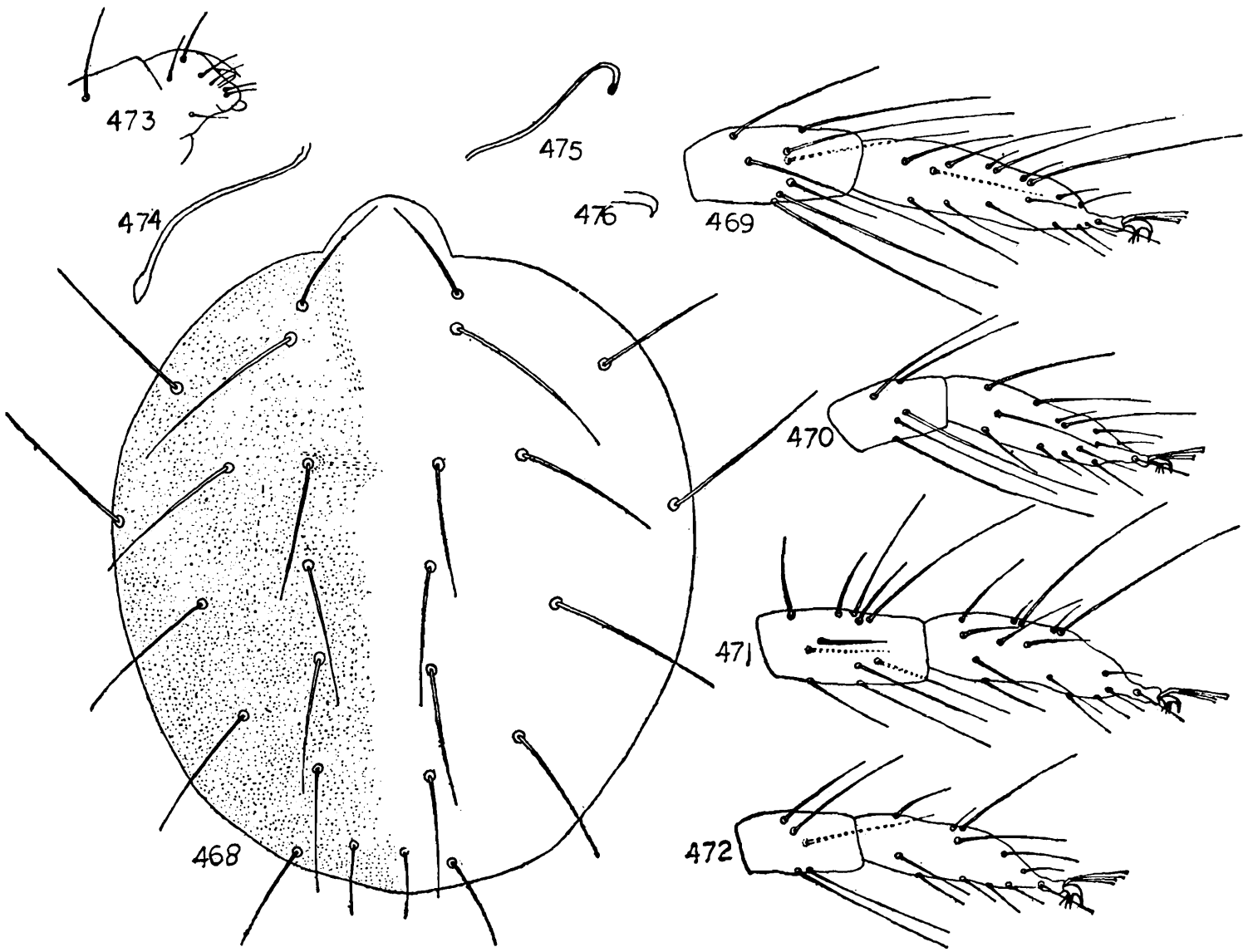
Figs. 459-467 : *Oligonychus manishi*: 459- dorsum of female, 460- tibia and tarsus I of female, 461- tibia and tarsus II of female, 462- tibia and tarsus I of male, 463- tibia and tarsus II of male, 464- distal segment of palpus of female, 465- distal segment of palpus of male, 467- aedeagus.

67. Oligonychus mangiferus (Rahman & Sapra)
(Figs. 468-476)

Paratetranychus mangiferus Rahman & Sapra, 1940 : 192.

Oligonychus mangiferus, Pritchard & Baker, 1955 : 330 ; Baker & Pritchard, 1960 : 506-507 ; Ghai, 1964 : 392 ; Gupta, 1970 : 99 ; Prasad, 1974 : 118-119 ; Gupta, 1976 : 341 ; Gupta, 1985 : 87-88 ; Smith-Meyer, 1987 : 147.

Male : Body including rostrum 393 long, 198 wide. Palpus with terminal sensillum very minute. Peritreme at the distal end appears to be anastomosing. Dorsal idiosomal setae simple and slightly longer than the interval between their longitudinal bases. Tibia I



Figs. 468-476 : *Oligonychus mangiferus*: 468- dorsum of female, 469- tibia and tarsus I of female, 470- tibia and tarsus II of female, 471- tibia and tarsus I of male, 472- tibia and tarsus II of male, 473- distal segment of palpus of female, 474- peritreme of female, 475- peritreme of male, 476- aedeagus.

with 4 sensory and 7 tactile setae, tarsus I with 5 tactile setae, tarsus II with 3 tactile setae proximal to duplex setae. Aedeagus bends ventrad but forms a more or less acute angle with the axis of the shaft.

Female : Body including rostrum 534 long, 350 wide. Palpus with terminal sensillum longer than broad and stout. Peritreme at the distal end anastomoising. Dorsal

idiosomal setae simple and slightly longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 5 tactile setae, tibia II with 5 tactile setae ; tarsus II with 1 sensory and 6 tactile setae proximal to duplex setae. Outer and inner sacrals not of same length. Clunals comparatively longer than outer sacrals. Genital flap with transverse striae. Medioventral setae slightly longer in size.

Known hosts in India : *Artocarpus integrifolia, Cassia fistula, Ficus carica, Gardenia florida, Lagestroemia indica. L. thorelli, Melia azadirachta, Musa paradisica, Mangifera indica, Pinus longifolia, Prunus persica, Psidium guajava, Ricinus communis, Rosa indica, Syzygium cumini, Vitis vinifera.*

Known hosts outside India : *Acacia cynophylla, Anacardium occidentale, Anona squamosa, Antigonon leptopus, Bauhinia acuminata, Bequartiodendron mgalismontanum, Butyrospermum paradoxum, Citrus* sp., *Combretum erythrophyllum, C. paniculatum, Crotoneaster* sp., *Delonix* sp., *Elaeis quineensis, Eucalyptus* sp., *E. gomphocephala, Eugenia jambolana, Euphorbia longana, Fragaria* sp., *Gossypium* sp., *Grevillea robusta, Hakea* sp., *Mangifera indica, Manihot esculenta, Musa* sp., *Parthenocissus quinquefolia, Persea americana, Platanus acerifolia, Plumeria* sp., *Protea compacta, P. exima, Prunus persica, Psidium guajava, Pyracentha* sp., *Quercus* sp., *Rhus* sp., *Rosa* sp., *Rubus avium, Scolopia mundii, Senecio angulatus, Syzygium cordatum, Terminalia catappa, Trichilia dregeama, Trichilia emetica, Vitis vinifera.*

Distribution : India (Haryana, Himachal Pradesh, Punjab, West Bengal, Meghalaya, Karnataka, Bihar, Gujarat), Mauritius, South Africa.

Remarks : This is an important pest of mango and grape vines in India and occasionally on litchi also. The infested parts become yellowish in mango and brownish in litchi. The peak infestation appears in October-December and the life cycle takes 8-9 days in summer and two and half times as long as during winter.

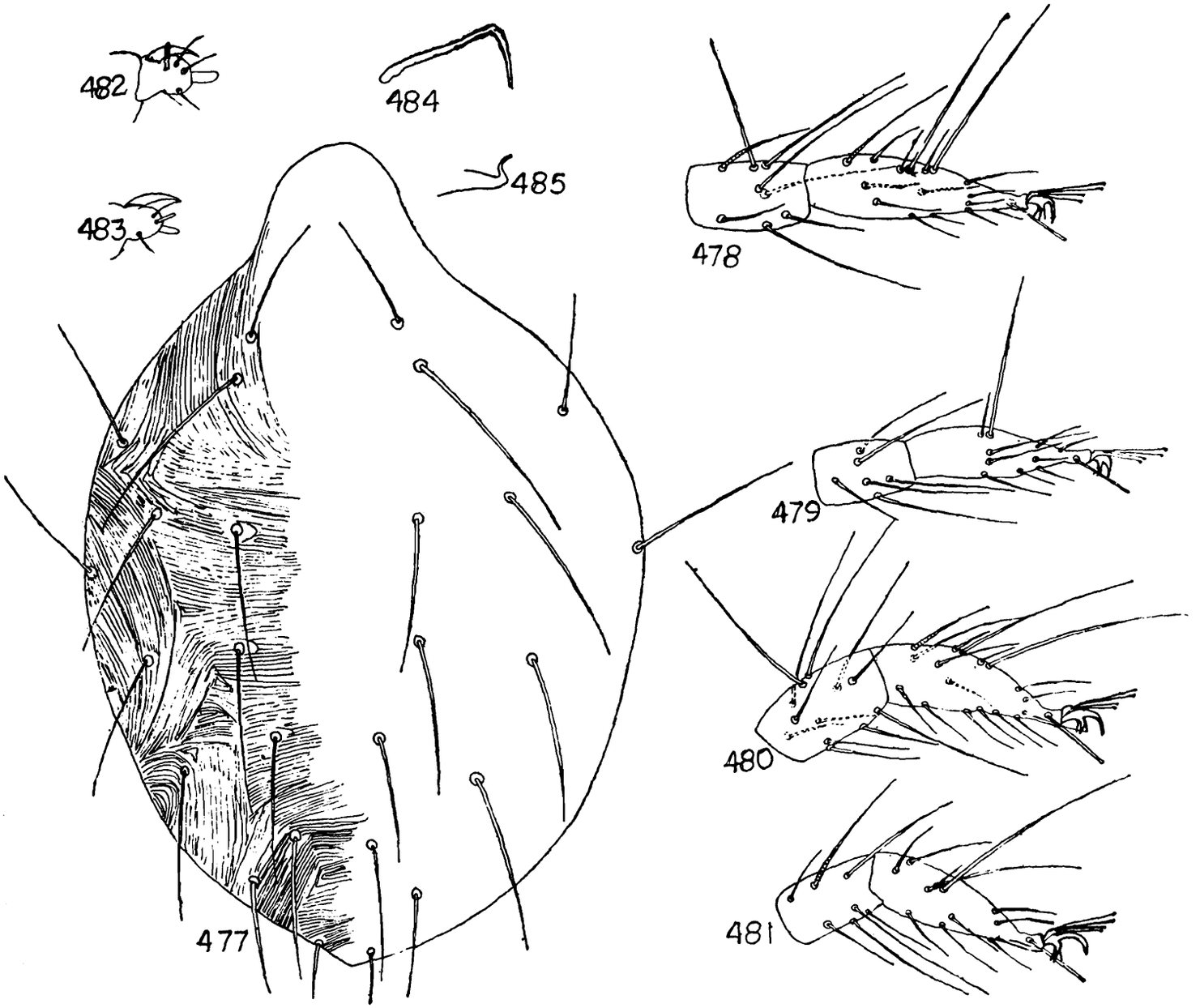
68. **Oligonychus oryzae** (Hirst)
(Figs. 477-485)

Paratetranychus oryzae **Hirst**, 1926 : 830.
Oligonychus oryzae **Pritchard & Baker**, 1955 : 337 ; Ghai, 1964 : 392 ; Gupta, 1976 : 145 ; Gupta, 1985 : 88-89.

Male : Body including rostrum 328 long, 148 wide. Palpus with terminal sensillum twice as long as broad. Dorsal sensillum similar to that of female. Dorsal idiosomal setae not on tubercles and slightly longer than interval between their longitudinal bases. Tibia I with 2 sensory and 10 tactile setae, tarsus I with 2 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 1 sensory and 3

tactile setae proximal to duplex setae. Aedeagus bent dorsal to form a slender sigmoid distal portion.

Female : Body including rostrum 239 long, 195 wide. Palpus with terminal sensillum 3 times as long as wide, dorsal sensillum slender. Peritreme as figured. Dorsal idiosomal



Figs. 477-485 : *Oligonychus oryzae* : 477- dorsum of female, 478- tibia and tarsus I of female, 479- tibia and tarsus II of female, 480- tibia and tarsus I of male, 481- tibia and tarsus II of male, 482- distal segment of palpus of female, 483- distal segment of palpus of male, 484- peritreme of female, 485- aedeagus.

setae slightly longer than the interval between their longitudinal bases. Tibia I with 2 sensory and 6 tactile setae, tarsus I with 1 sensory and 4 tactile setae proximal to duplex

setae. Tibia II with 6 tactile setae, tarsus II with 2 tactile setae proximal to duplex setae. Outer and inner sacrals not of same length. Clunals smaller than both outer and inner sacrals. Genital flap with transverse striae. Medioventral setae of moderate size.

Known hosts in India : *Cynodon dactylon*, *Hordeum vulgare* (barley), *Musa sapientum* (banana), *Oryza sativa*, *Setaria* sp. some unidentified species of grass.

Known hosts outside India : Avocado, *Eucalyptus* sp., *Fragaria* sp., *Musa* sp., *Persea americana*, *Punica granatum* (pomegranate), *Vitis vinifera*.

Distribution : India (Andaman & Nicobar Isls., Orissa, Punjab, Tamil Nadu), Thailand.

Remarks : This is a pre-monsoon pest of paddy in southern India. The feeding causes the production of whitish patches on leaves. The infested plants get stunted.

69. **Oligonychus punicae** (Hirst)
(Figs. 486-493)

Paratetranychus punicae Hirst, 1926 : 830.
Oligonychus punicae, Pritchard & Baker, 1955 : 335-336 ; Prasad, 1974 : 119 ; Gupta, 1976 : 341 ; Gupta, 1985 : 89-90 ; Smith-Meyer, 1987 : 147-148.

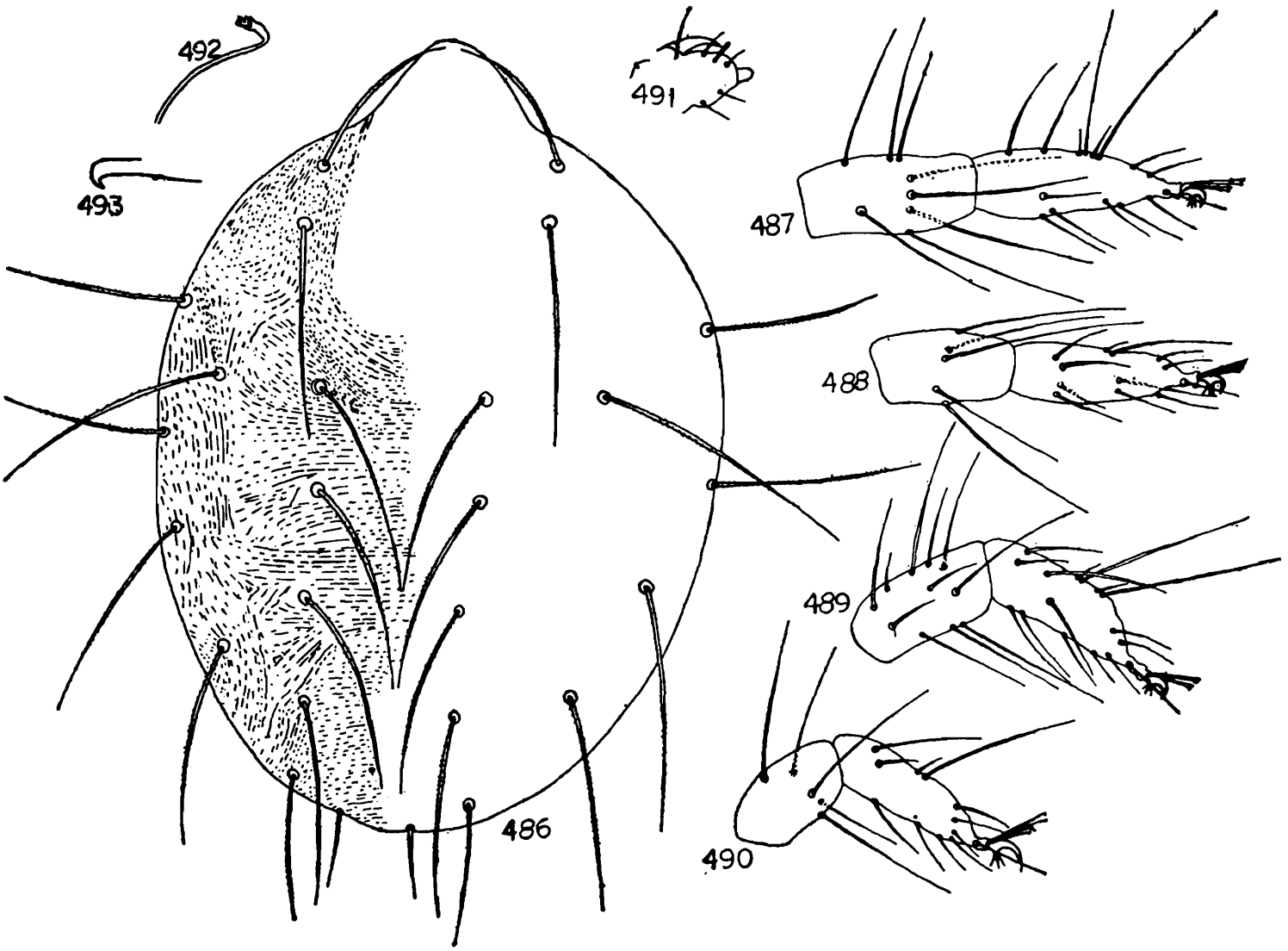
Male : Body including rostrum 393 long, 195 wide. Palpus with terminal sensillum small, dorsal sensillum small and slender. Peritreme at the distal end anastomosing. Dorsal idiosomal setae serrate, gradually tapering and twice as long as interval between their longitudinal bases. Tibia I with 3 sensory and 8 tactile setae, tarsus I with 2 sensory and 2 tactile setae proximal to duplex setae. Tibia II with 5 tactile setae, tarsus II with 1 sensory and 2 tactile setae proximal to duplex setae. The aedeagus is distinctive in having hook which is rather broad and the distal end narrowed to form a finger-like projection.

Female : Body including rostrum 432 long, 231 wide. Palpus with terminal sensillum twice as long as wide, dorsal sensillum long and slender. Peritreme ends into simple bulb. Dorsal idiosomal setae gradually tapering and about two times longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 7 tactile setae, tarsus I with 1 sensory and 2 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 4 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Striations on the body very distinctive as figured. Outer and inner sacrals not of same length. Clunals rather small. Genital flap with transverse striae.

Known hosts in India : *Eucalyptus* sp., *Litchi chinensis*, *Punica granatum*, *Vitis vinifera*.

Known hosts outside India : Avocado, *Eucalyptus* sp. *Fragaria* sp., *Persea americana.*

Distribution : India (Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh), Brazil, South America.



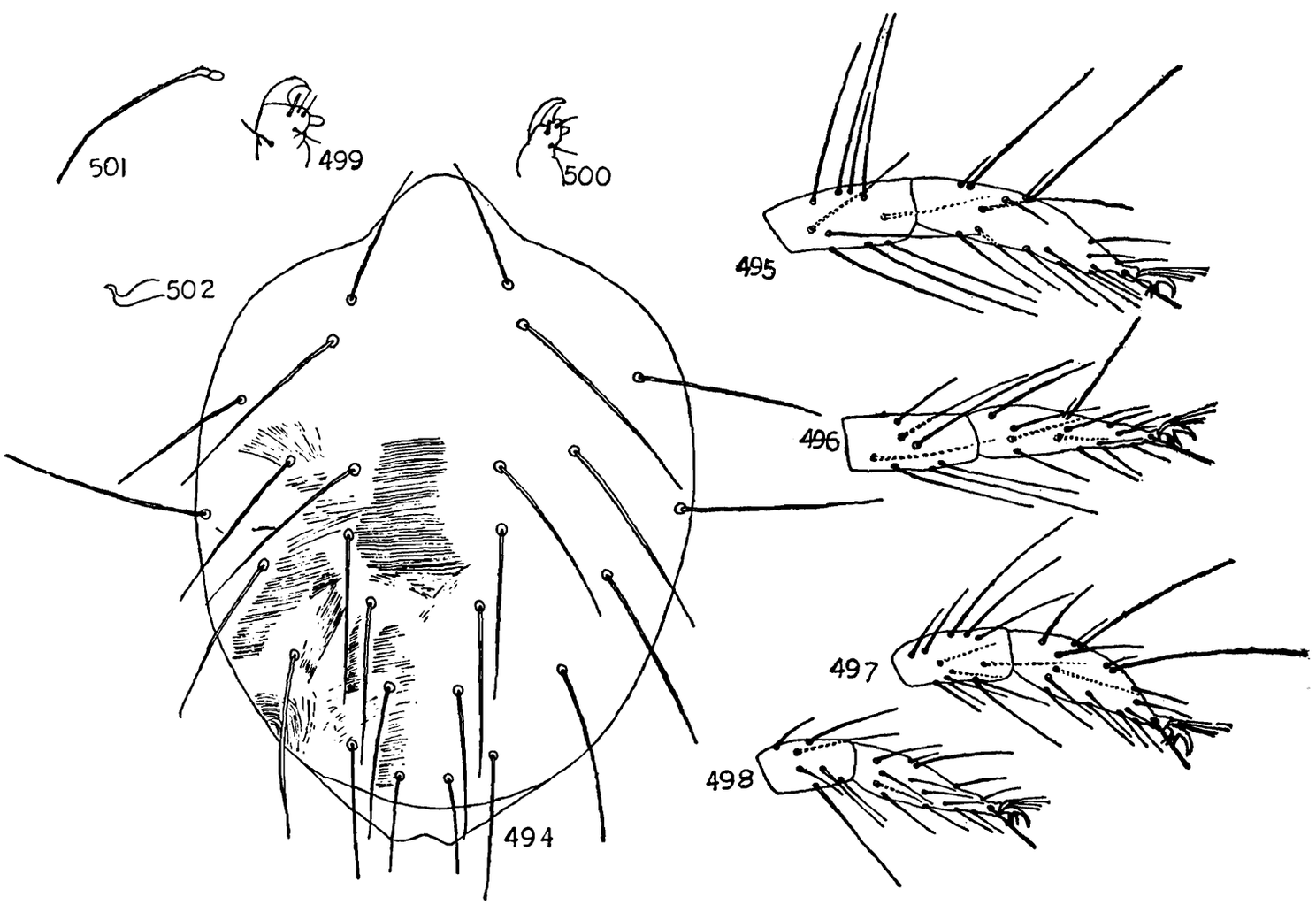
Figs. 486-493 : *Oligonychus punicae* : 486- dorsum of female, 487- tibia and tarsus I of female, 488- tibia and tarsus II of female, 489- tibia and tarsus I of male, 490- tibia and tarsus II of male, 491- distal segment of palpus of female, 492- peritreme of female, 493- aedeagus.

Remarks : This species sometimes infests grape vines and pomegranate in northern India causing the appearance of brownish spots.

70. **Oligonychus sacchari** (McGregor)
(Figs. 494-502)

Paratetranychus sacchari McGregor, 1942 : 91.
Oligonychus sacchari, Pritchard & Baker, 1955 : 355-357 ; Gupta, 1976 : 342 ; Gupta, 1985 : 90.

Male : Body including rostrum 321 long, 191 wide. Palpus with terminal sensillum one and half times as long as wide and tapering distally, dorsal sensillum small and slender.



Figs. 494-502 : *Oligonychus sacchari* : 494- dorsum of female, 495- tibia and tarsus I of female, 496- tibia and tarsus II of female, 497- tibia and tarsus I of male, 498- tibia and tarsus II of male, 499- distal segment of palpus of female, 500- distal segment of palpus of male, 501- peritreme of female, 502- aedeagus.

Peritreme at the distal end widened. Dorsal idiosomal setae twice as long as the interval between their longitudinal bases. Tibia I with 3 sensory and 10 tactile setae, tarsus I with

3 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 7 tactile setae, tarsus II with 1 sensory and 5 tactile setae proximal to duplex setae. Aedeagus strongly sigmoid at the distal end.

Female : Body including rostrum 325 long, 177 wide. Palpus with terminal sensillum two times as long as wide and slender, dorsal sensillum slender. Peritreme similar to that of male. Dorsal idiosomal setae set on tubercles and twice longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 9 tactile setae, tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 7 tactile setae, tarsus II with 1 sensory and 5 tactile setae proximal to duplex setae. Outer and inner sacrals of same length but clunals smaller than outer and inner sacrals. Genital flap with transverse striae. Medioventral setae of moderate size.

Known hosts in India : *Bambusa aurandinacea* (bamboo), *Saccharum officinarum* (sugarcane).

Known hosts outside India : *Saccharum officinarum*, some unidentified-species of orchid.

Distribution : India (Gujarat, Madhya Pradesh, Orissa, West Bengal), South America (Puerto Rico).

71. **Oligonychus sapienticolus** Gupta
(Figs. 503-512)

Oligonychus sapienticolus Gupta, 1976 : 342-343 ; Gupta, 1985 : 90.

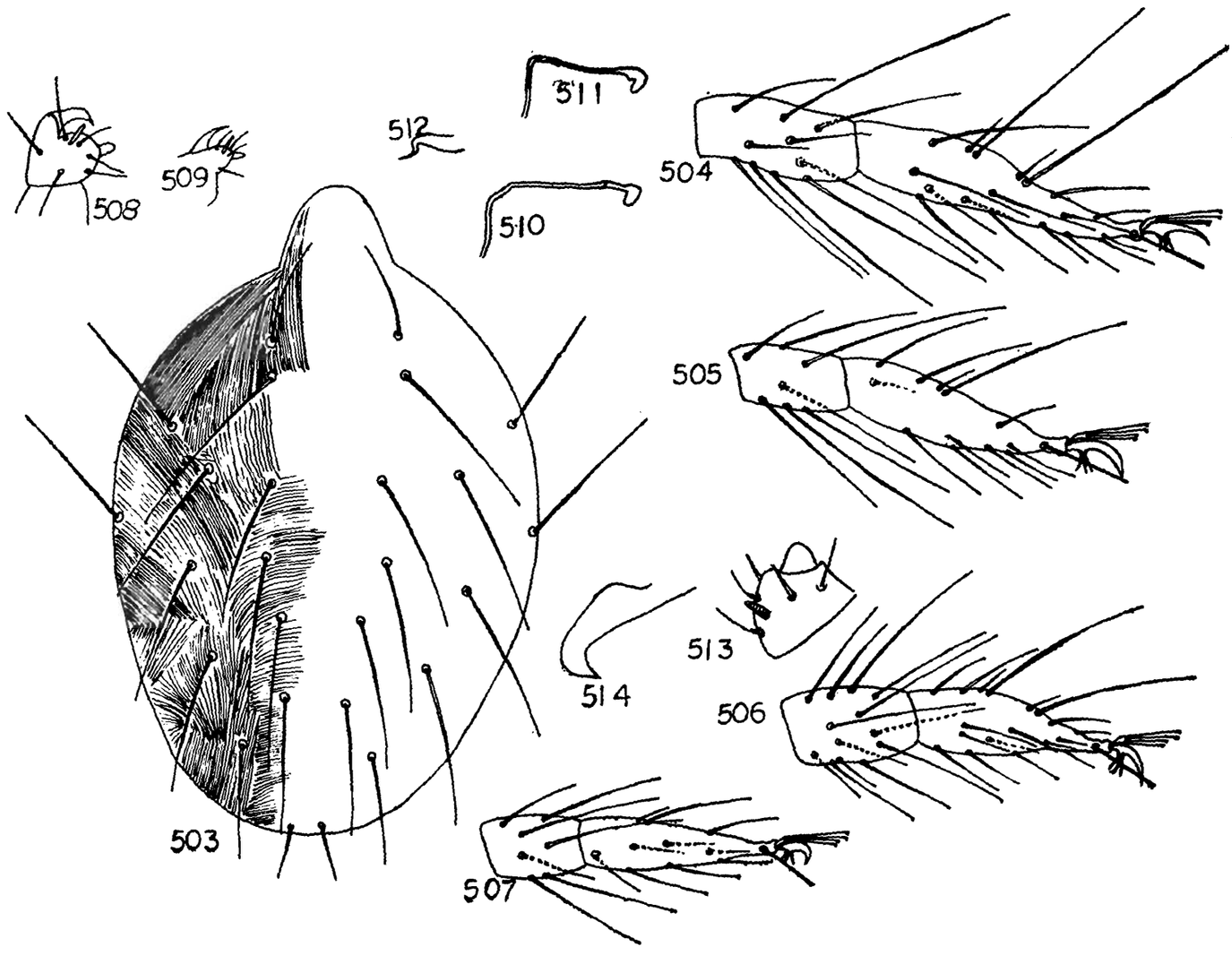
Male : Body including rostrum 328 long, 177 wide. Terminal sensillum of palpus gradually narrowed, longer than broad. Terminal portion of peritreme slightly elongated. Dorsal body setae elongated, simple, tapering, longer than the interval between their longitudinal bases. Tibia I with 3 sensory and 10 tactile setae, tarsus I with 1 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 3 tactile setae proximal to duplex setae. Aedeagus bends dorsad at right angle to shaft to form sigmoid distal end.

Female : Body including rostrum 393 long, 191 wide. Terminal sensillum of palpus longer than broad. Peritreme at the distal end hammer-shaped. Dorsal idiosomal setae thin, simple, not borne on tubercles and 2 times longer than the interval between their longitudinal bases. Tibia I with 3 sensory and 7 tactile setae, tarsus I with 1 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Empodial claws in both the sexes large and prominent. Outer and inner sacrals more or less similar in length. Clunals one

third the length of outer sacrals. Genital flap with transverse striae. Medioventral setae of moderate length.

Known host in India : *Musa sapientum* (banana).

Distribution ; India (West Bengal).



Figs. 503-512 : *Oligonychus sapienticolus* : 503- dorsum of female, 504- tibia and tarsus I of female, 505- tibia and tarsus II of female, 506- tibia and tarsus I of male, 507- tibia and tarsus II of male, 508- distal segment of palpus of female, 509- distal segment of palpus of male, 510- peritreme of female, 511- peritreme of male, 512- aedeagus.

Figs. 513-514 : *Oligonychus vitis* : 513- distal segment of palpus of female, 514- aedeagus.

72. **Oligonychus vitis** Zacher & Shehata
(Figs. 513-514)

Oligonychus vitis Zacher & Shehata, 1965 : 67-69 ; Meyer, 1974 : 252 ; Nassar & Ghai, 1981 : 364 ; Gupta, 1985 : 91 ; Smith-Meyer, 1987 : 147.

Male : As in *Oligonychus coffeae*, the aedeagus bends ventrad at a right angle to the axis of the shaft and it gradually narrows to a slender truncate tip. The terminal sensillum of palpus minute, about as long as broad. Tarsus I with 2 sensory and 3 tactile setae proximal to duplex setae. Empodia with 5 pairs of proximoventral hairs.

Female : Dorsal body setae serrate, longer than the interval between them. Striae on hysterosoma mostly transverse except for irregular striae between 3rd pair of dorsocentral hysterosomals. Lobes of striae rounded with basal spots. Ventrally with genital flap having transverse striae and the area immediately anterior to flap with longitudinal striae. Terminal sensillum on the palpus about as long as broad. Peritreme ends in simple bulb. Stylophore indented anteriorly.

Known host in India : *Vitis vinifera.*

Known hosts outside India : *Heteropyxis natalensis*, *Vitis vinifera.*

Distribution : India (Delhi), Egypt, South Africa.

Genus 19. **Tetranychus** Dufour

Tetranychus Dufour, 1832 : 276 ; Pritchard & Baker, 1955 : 373 ; Wainstein, 1960 : 149 ; Manson, 1967 : 582-585 ; Tuttle Baker, 1968 : 124 ; Attiah, 1969 : 735-736 ; Meyer, 1974 : 216 ; Tuttle *et al.*, 1976 : 89 ; Mitrofanov, 1977 : 1803 ; Zaher *et al.*, 1982 : 105-107 ; Gutierrez & Schicha, 1983 : 109-110 ; Gupta, 1985 : 101 ; Smith-Meyer, 1987 : 125-126.

Type : *Tetranychus lintearius* Dufour

Diagnosis : The members of this genus have a single pair of paraanal setae ; Empodia splits into 3 pairs of proximoventral hairs, empodia may have medioventral spurs shorter than proximoventral hairs. Male empodium I usually bearing tridigitate spur. Aedeagus bends dorsad and forms a key character for species determination. Shape of lobes of integumentary striae helps in species separation.

Key to the species of *Tetranychus* known from India :

1. Proximal duplex setae of tarsus I of female distal to tactile setae ... 2
— Proximal duplex setae on tarsus I of female more or less in line with tactile setae 3
2. Aedeagus with a knob distally 4
— Aedeagus very long, slender, tapering distally ... ... *fijiensis*
3. Aedeagal knob with very small anterior and posterior projections ; empodium II of male with proximoventral tridigitate spurs ... *macfarlanei*
— Aedeagal knob with anterior acute projection while posterior projection absent ; empodia II of male with 3 pairs of proximoventral hairs and small distinct mediodorsal spur ... ... *ludeni*
4. Aedeagus with tiny knob 5
— Aedeagus with distinct knob 6
5. Aedeagus bent dorsal, posterior angulation absent ... ... *hypogeae*
— Aedeagus knob with anterior and posterior angulations ... ... *udaipurensis*
6. Female with longitudinal to irregularly longitudinal striae between 3rd pair of dorsocentral hysterosomals and longitudinal between 4th pair of dorsocentrals 7
— Female with transverse to irregularly transverse striae between 3rd pair of dorsocentral hysterosomals and longitudinal between 4th pair of dorsocentrals ... ... *angloensis*
7. Female hysterosoma with longitudinal striae between 4th pair of dorsocentral hysterosomal forming a more or less diamond shaped figure between 3rd and 4th pair of dorsocentral hysterosomals 8
— Female hysterosoma with irregularly longitudinal striae between 4th pair of dorsocentral hysterosomal, not forming diamond shape ... ... *afrindicus*
8. Female hysterosoma with longitudinal striae between 3rd pair of dorsocentral 9
— Female hysterosoma with irregular longitudinal striae between 3rd pair of dorsocentral setae ... ... *sayedi*

9. Upper surface of aedeagal knob straight or rounded with some kind of projection 10

— Upper surface of aedeagal knob concave with anterior and posterior rounded projections, berry-like ... *neocaledonicus*

10. Aedeagal knob with anterior projection rounded 11

— Aedeagal knob with anterior projection acute 13

11. Terminal sensillum of male palpus about 3-4 times as long as broad, aedeagal knob absent, 0·2-0·25 the length of the dorsal margin of the shaft 12

— Terminal sensillum of male palpus about 3 times as long as broad, aedeagal knob about 0·33 the length of dorsal margin of shaft ... *hydrangeae*

12. Empodium I of male with strong mediodorsal spur, female carmine in colour ... ... *urticae*

— Empodium I of male with minute mediodorsal spur, female dark reddish ... *lombardin ii*

13. Anterior and posterior projection of aedeagal knob acuminate and similar ; axis of knob parallel with axis of shaft, upper surface of aedeagal knob rounded ... ... *zaheri*

— Anterior projection of aedeagal knob strongly acuminate and curved ventrad, axis of knob not parallel to axis of shaft ; upper surface of aedeagal knob straight ... ... *papayae*

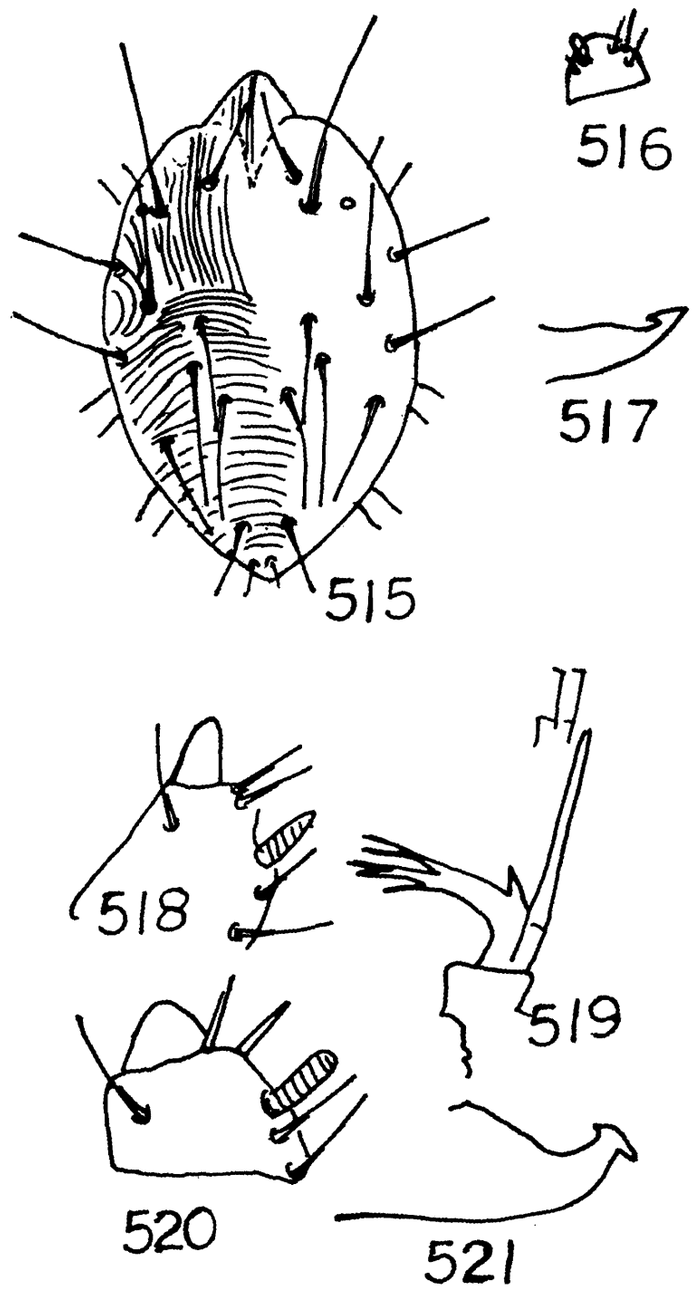
73. **Tetranychus afrindicus** Nassar & Ghai
(Figs. 515-517)

Tetranychus afrindicus Nassar & Ghai, 1981 : 367-369 ; Gupta, 1985 : 104.

Male : Body including rostrum 372 long, 172 wide. Dorsal setae shorter than those of females and also slender, serrate and pointed distally. Genital area with 1 pair of pregenital and 4 pairs of genitoanal setae. Terminal sensillum of palpus about 4 times as long as broad. Tarsus I with 1 sensory and 4 tactile setae proximal to duplex setae. Aedeagus shaft narrowed distally and turns slightly dorsad forming a knob with an acute anterior and posterior projections. Aedeagal knob without neck.

Female : Body including rostrum 417 long, 241 wide. Dorsal part of body with 13 pairs of setae being serrate and slender. All setae longer than distance between their

bases. Stylophore rounded anteriorly. Palpus with terminal sensillum about 3 times as long as broad. Peritreme hooked distally. Tarsus I bearing 4 tactile setae and 1 sensory



Figs. 515-517 : *Tetranychus afrindicus* (after Nassar & Ghai, 1981) : 515- dorsum of female, 516- distal segment of palpus, 517- aedeagus.

Figs. 518-521 : *Tetranychus angloensis* (after Meyer, 1974) : 518- distal segment of palpus of male, 519- tarsal appendages of leg I of male, 520- distal segment of palpus of female, 521- aedeagus.

setae proximal to duplex setae. Genital flap with transverse striations. Medioventral striae devoid of lobes.

Known host in India : *Phaseolus* sp.

Distribution : India (Delhi).

74. **Tetranychus angloensis** Meyer
(Figs. 518-521)

Tetranychus angloensis Meyer 1974 : 219 ; Nassar & Ghai, 1981 : 367 ; Gupta, 1985 : 103 ; Smith-Meyer, 1987 : 130.

Male : Palpus with a terminal sensillum about one and half times as long as broad. Tibia I with 1 sensory and 9 tactile setae, tarsus I with 4 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 13 tactile setae. Shaft of the aedeagus narrows distally and curves dorsad, forming a knob with an angulate anterior projection and a deflexed acute posterior projection, the axis of the knob forms an acute angle with the axis of the shaft, the dorsal margin of the shaft curved.

Female : Body including gnathosoma 467 long, 300 wide. Palpus with terminal sensillum broader than long. Peritreme slightly retrose distally. Dorsal idiosomal setae slender, serrate and longer than the distance between the bases of consecutive setae. Striae between 3rd pair of dorsocentral hysterosomals transverse to irregular while those between the 4th pair of dorsocentrals are longitudinal. Tibia I with 9 tactile setae and 1 sensory setae, tarsus I with 1 sensory and 13 tactile setae proximal to duplex setae. Tibia II with 7 tactile setae, tarsus II with 1 sensory and 13 tactile setae proximal to duplex setae.

Known host in India : *Cucurbita maxima* (sweet gourd).

Known host outside India : *Elaeis quineensis.*

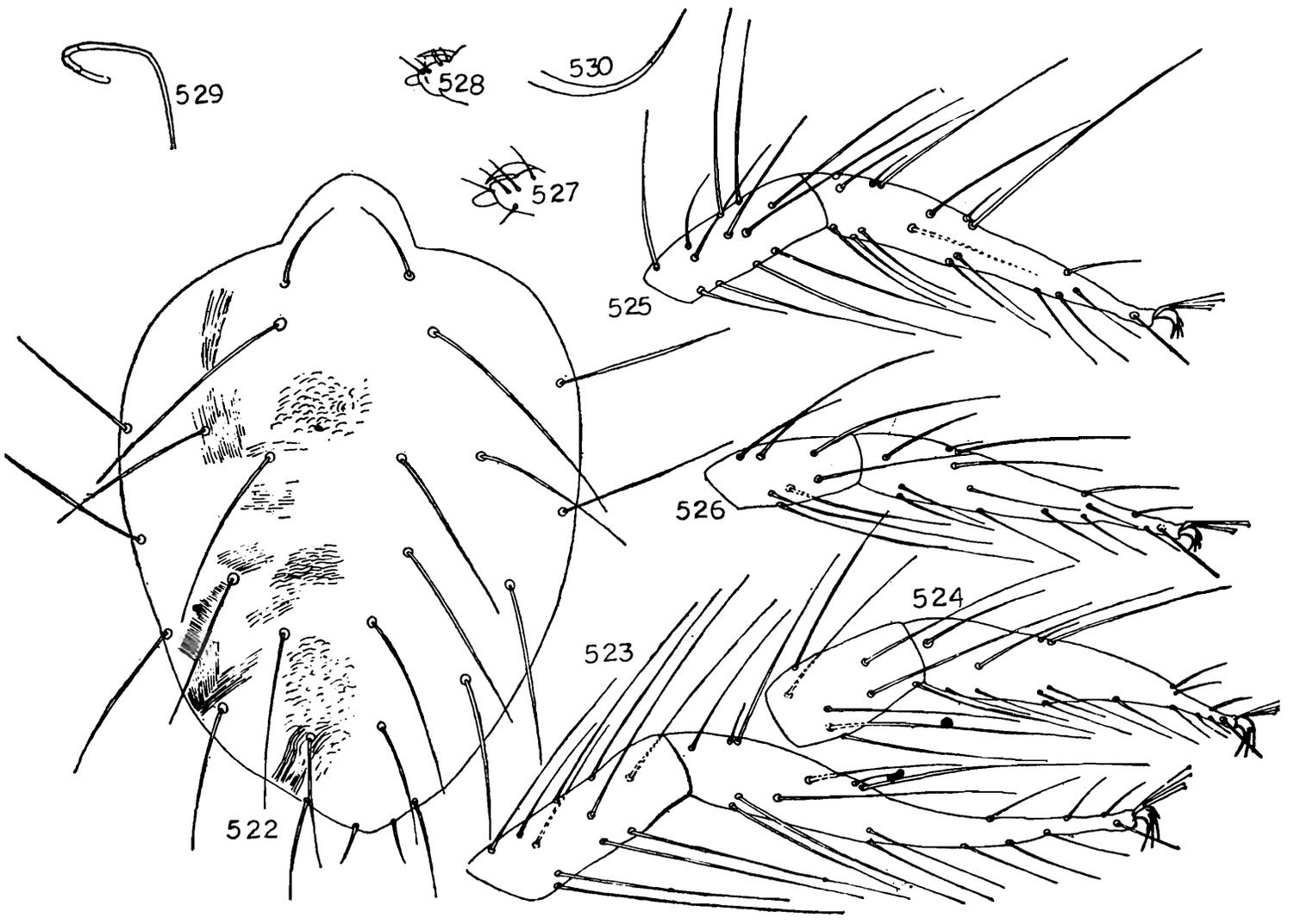
Distribution : India (Delhi), Angola.

75. **Tetranychus fijiensis** Hirst
(Figs. 522-530)

Tetranychus fijiensis Hirst, 1924 : 523 ; Manson, 1963 : 362 : Prasad, 1974 : 124 ; Gupta, 1976 : 345 ; Gupta, 1985 : 108 ; Smith-Meyer, 1987 : 139.

Male : Body including rostrum 357 long, 195 wide. Terminal sensillum of the palpus one and half times as long as broad, dorsal sensillum smaller and slender. Peritreme

hooked distally. Dorsal idiosomal setae simple tapering and longer than the interval between their longitudinal bases. Tibia I with 3 sensory and 9 tactile setae, tarsus I with 2 sensory



Figs. 522-530 : *Tetranychus fijiensis*: 522- dorsum of female, 523- tibia and tarsus I of female, 524- tibia and tarsus II of female, 525- tibia and tarsus I of male, 526- tibia and tarsus II of male, 527- distal segment of palpus of female, 528- distal segment of palpus of male, 529- peritreme of female, 530- aedeagus.

and 5 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 1 sensory and 4 tactile setae proximal to duplex setae. Aedeagus very distinctive as figured.

Female : Body including rostrum 480 long, 234 wide. Palpus with terminal sensillum twice as long as wide. Peritreme at the distal end hooked. Dorsal idiosomal setae thin, tapering gradually and longer than interval between their longitudinal bases. Tibia I

with 1 sensory and 10 tactile setae, tarsus I with 1 sensory and 4 tactile setae proximal to duplex setae. Duplex setae well apart. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Outer and inner sacrals not of same length. Clunals small. Genital flap with transverse striae. Medioventral setae of moderate size.

Known hosts in India : *Areca catechu* (arecanut), *Citrus aurantium* (orange), *Carica papaya* (papaya), *Cocos nucifora* (coconut), *Elettaria cardamomum* (cardamom).

Known hosts outside India : *Actinophloeus macarthuria*, *Citrus* sp., *Cocos nucifora*, *Cyrtosperma chamissonis*, *Dieffenbachia picta*, *Prunus persica*, *Ptychosperma macarthuri*, *Pummelo*, *Pyrus communis*, Sekarthia palm.

Remarks : This mite infests coconut in South India but the damage never appears to be of any serious nature.

76. **Tetranychus hypogeae** Gupta
(Figs. 531-540)

Tetranychus hypogeae Gupta, 1976 : 347-348 ; Gupta, 1985 : 112-113.

Male : Body including rostrum 339 long, 177 wide. Terminal sensillum of palpus small, as long as wide, dorsal sensillum long and slender. Peritreme at the distal end hooked but less bent. Dorsal idiosomal setae twice longer than the distance between their longitudinal bases. Tibia I with 4 sensory and 9 tactile setae, tarsus I with 1 sensory and 5 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Medioventral setae thin and moderate in size. Aedeagal bent dorsad without posterior angulation.

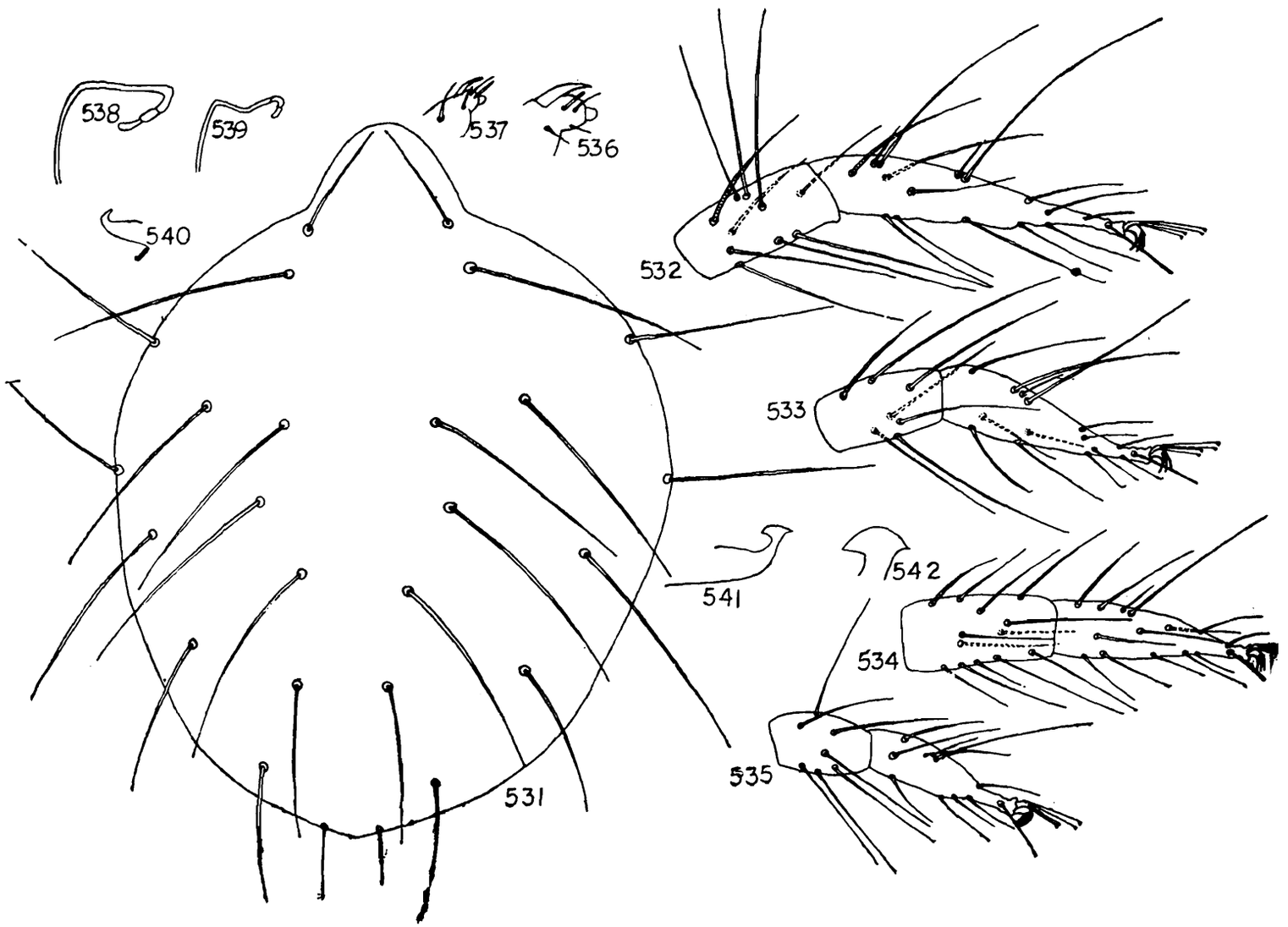
Female : Body including rostrum 480 long, 231 wide. Terminal sensillum of palpus one and half times as long as wide and tapering, dorsal sensillum normal in size and slender. Peritreme at the distal end more bent and forming hook-like structure. Dorsal idiosomal setae approximately twice longer than the interval between their longitudinal bases. Tibia I with 2 sensory and 9 tactile setae, tarsus I with 2 sensory and 2 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Outer and inner sacrals of same length. Clunals smaller in size. Genital flap with transverse striae. Medioventral setae of moderate size.

Known hosts in India : *Arachis hypogea*, *Chrysanthemum* sp.

Distribution : India (West Bengal).

Remarks : This mite was seen heavily infesting groundnut in West Bengal covering

the entire crop with webs. The infested leaves became yellowish and plants became sickly with stunted growth.



Figs. 531-540 : *Tetranychus hypogeae* : 531- dorsum of female, 532- tibia and tarsus I of female, 533- tibia and tarsus II of female, 534- tibia and tarsus I of male, 535- tibia and tarsus II of male, 536- distal segment of palpus of female, 537- distal segment of palpus of male, 538- peritreme of female, 539- peritreme of male, 540- aedeagus.

Figs. 541-542 : *Tetranychus hydrangeae* : aedeagi

77. **Tetranychus hydrangeae** Pritchard & Baker
(Figs. 541-542)

Tetranychus hydrangeae Pritchard & Baker, 1955 : 425 ; Ehara & Woongsiri, 1975 : 181-182 ; Smith-Meyer, 1987 : 132-133.

Tetranychus kanzawai Kishida, 1927 ; 105 ; Meyer, 1974 : 227-228 ; Nassar & Ghai, 1981 : 371 ; Gupta, 1985 : 104-105.

Male : Aedeagal knob one third length of dorsal margin of shaft, anterior rounded projection about as wide as base of acute posterior projection. Knob and shaft axis parallel.

Female : Dorsal body setae of female longer than the interval between their longitudinal bases. Hysterosoma provided with longitudinal striae between 3rd pair of dorsocentrals and between 4th pair of dorsocentrals, a diamond shaped figure between these two pairs of setae. Leg chaetotaxy similar to that of *T. lombardinii*. Dorsal lobes triangular, ventral striae between 2nd and 3rd pairs of ventral setae with low, rounded lobes, posterior to 3rd pairs of setae lobes become broader.

Known hosts in India : *Morus* sp., *Prunus armeniaca*, *P. persica*.

Known hosts outside India : *Arelia nudicaulis*, *Camellia sinensis*, *Carica papaya*, *Citrus* sp., clover, *Codiaeum variegatum*, corn, *Ehretia macrophylla*, *Ficus religiosa*, *Glycine* sp., *Glycine soja*, hop, *Hydrangea macrophylla*, *Manihot mauritiana*, *M. utilissima*, *Maranta* sp., *Melia azadirachta*, *Morus alba*, *Phaseolus* sp., *P. lunatus*, *Polyanthes* sp., *Polygonum multiflorum*, *Prunus mume*, *Prunus persica*, *Punica granatum*, *Pyrus communis*, *Rosa indica*, *Rubus* sp., *Rubus thunbergii*, *Sambucus* sp., *Solanum melongena*, *S. nigrum*, *Terminalia catappa*, *Trifolium* sp., *Verbena hortensis*, *V phlogiflora*, *Vitis vinifera*.

Distribution : India (Delhi), worldwide.

Remarks : Ehara & Wongiri (1975) considered *T kanzawai* as synonym of *T. hydrangeae* because of the similarities in aedeagus.

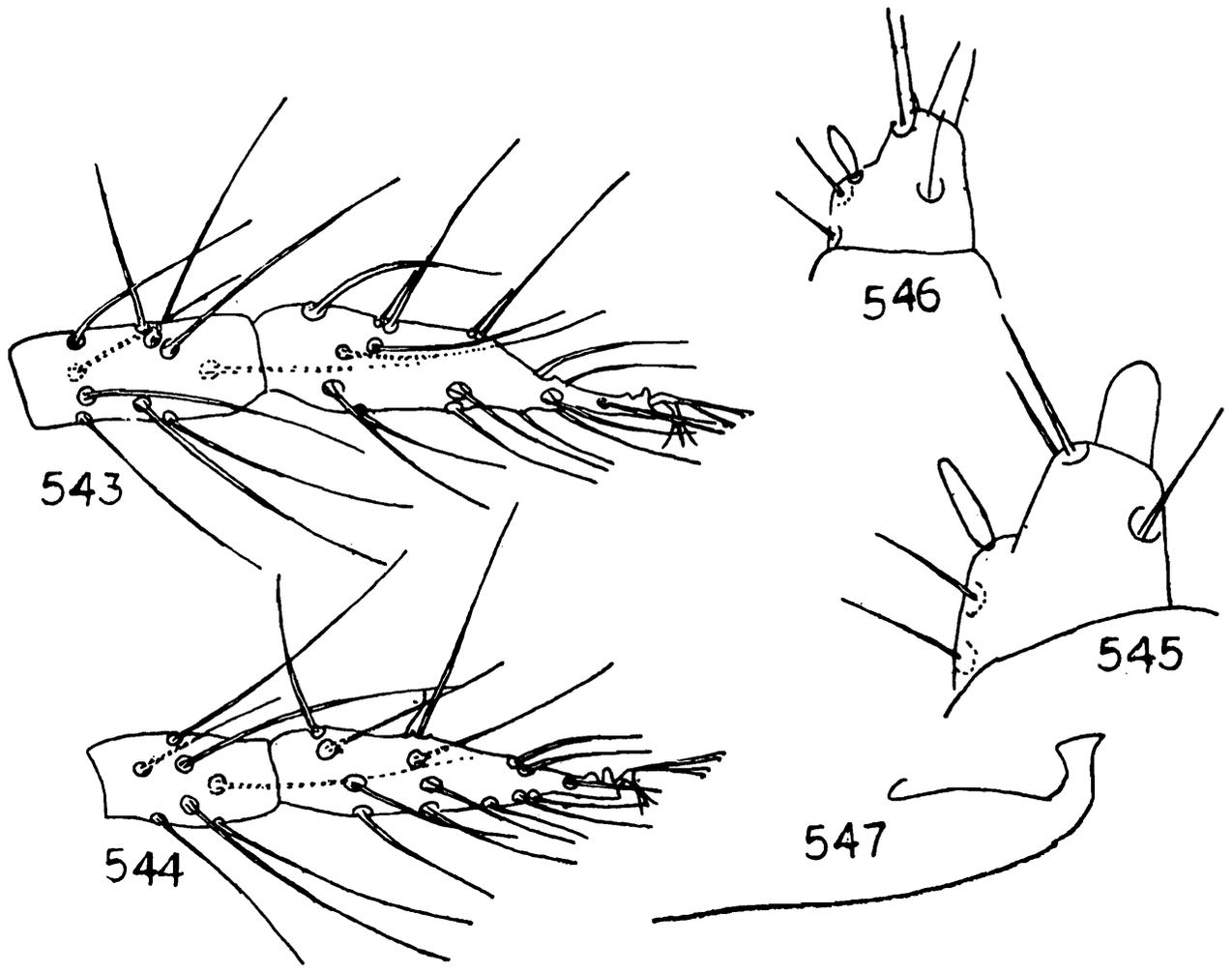
78. **Tetranychus lombardinii** Baker & Pritchard
(Figs. 543-547)

Tetranychus lombardinii Baker & Pritchard, 1960 : 553 ; Banerjee, 1965 : 4-7 ; Meyer, 1974 : 231-233, Gupta, 1985 : 109 ; Smith-Meyer, 1987 : 134.

Male : Body including rostrum 370 long, 298 wide. Palpus with terminal sensillum slender, four times as long as broad. Peritreme with distal end strongly hooked. Dorsal idiosomal setae smooth, longer than the interval between their longitudinal bases. Dorsal striae of idiosoma smaller, more widely spaced. Tibia I with 4 sensory and 9 tactile setae, tarsus I with 2 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 7 tactile setae. Aedeagus resembles that of *T urticae* except the anterior development of the terminal knob which is more broadly obtuse.

Female : Body including rostrum 517 long, 319 wide. Palpus with terminal sensillum stout, about twice as long as broad. Dorsal idiosomal setae twice longer than the interval between their longitudinal bases and gradually tapering at the distal end. Tibia I with 1 sensory and 9 tactile setae, tarsus I with 4 tactile setae proximal to duplex setae. Longitudi-

nal striae between 3rd pair of dorsocentrals and inner sacrals. Dorsal striae with tiny, widely spaced, semicircular to tringular lobes.



Figs. 543-547 : *Tetranychus lombardinii* : 543- tibia and tarsus I of female, 544- tibia and tarsus II of female, 545- distal segment of palpus of female, 546- distal segment of palpus of male, 547- aedeagus.

Known hosts in India : *Gossypium herbaceum*, *Indigofera intybus*.

Known hosts outside India : *Acalypha indica*, *A. segatalis*, *Achyranthes aspera*, *Amaranthus* sp., *Amaranthus hybridus*, *Arachis hypogaea*, *Argemone subfusiformes*, *Argemone triplexnuberecta*, *Atriplex*, *Azima*, *Blattota africana*, *Bidens biternata*, *B. pilosa*, *Boerhaavia* sp., *Cajanas cajan*, *Calpurnia aurea*, *Cardiospermum halicacabum*, *Carica papaya*, *Celtis africana*, *Chenopodium murale*, *Chrysanthemum* sp., *C. ellipticum*, *Citrullus lunatus*, *Cocculus hirsutus*, *Convolvulus ulosephalus*, *Corbichonia decumbens*, *Corchorus olitorius*, *Crinum* sp., *Crotalaria juncea*, *Croton* sp., *Cucumis metuliformes*, *Cucurbita* sp., *Datura* sp., *Datura shamonium*, *Dyospyros austroafricana*, *Erythrina* sp., *Exomis microphylla*, *Felicia erigeriodes*, *Ficus burkei*, *F. carica*, *Flagellaris quineensis*, *Galinsoga parviflora*, *Gerbena jamesoni*, *Glycine soja*,

Gossypium sp., *G. herbaceum* var. *africanum*, *Hebemtritra cordata*, *Helinus integrifolius*, *Heteromorpha trifoliata*, *Hostundia opposita*, *Ipomoea coscinosperma*, *I. purpurea*, *Ixia flexuosa*, *Jasminum nudiflorum*, *Lactuca sativa*, *Leucas martinicensis*, *Lycopersicum esculentum*, *Lyeium* sp., *Malva parviflora*, *Manihot esculenta*, *Maytenus cymosus*, *Melia azadirach*, *Merremia tuberosa*, *Morus* sp., *Musa sapientum*, *Nicotiana glauca*, *Nidorella auriculata*, *Passiflora* sp., *Passiflora edulis*, *Palargonium* sp., *Pharbitis hispida*, *Phaseolus* sp., *P. vulgaris*, *Pollichina compestris*, *Polygonum salcifolium*. *Poplus* sp., *Pynostachys urticifolia*, *Rhigozum brevispinosum*, *R. obovatum*, *R. trichotomum*, *Ricinus communis*, *Rupalia lappacea*, *Senecio* sp., *Sida cordifolia*, *Sparmannia africana*, *Spathodia* sp., *Spirostachys africana*, *Solanum* sp., *S. incanum*, *S. panduraeforme*, *S. retroflexum*, *S. rigencens*, *S. sodomaeum*, *S. tuberosum*, *S. caffrorum*, *Tynospora frugosum*, *Virnonia ampla*, *Wahlenbergea undulata*, *Withania somnifera*, *Xanthium stromarium*.

Distribution : India (Assam), Portugese East Africa, Kenya, South Africa, Zaire Zimbabwe.

79. **Tetranychus ludeni** Zacher
(Figs. 548-556)

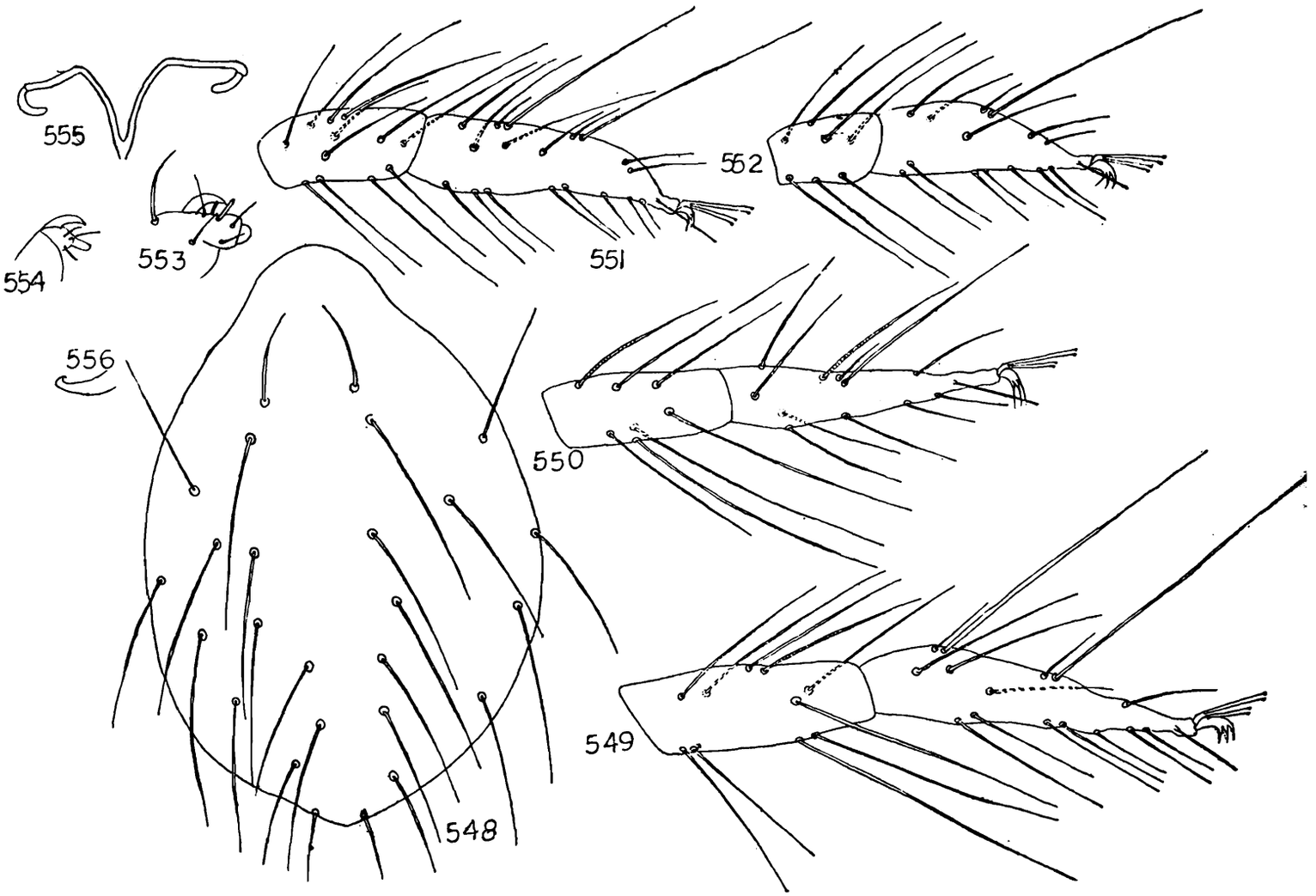
Tetranychus ludeni Zacher, 1913 : 40 ; Pritchard & Baker, 1955 : 405-407 ; Puttarndriah & Channa-Basavanna, 1959 : 530-439 ; Ghai, 1964 : 392 ; Prasad, 1974 : 125 ; Gupta, 1976 : 345 ; Gupta, 1985 : 110-112 ; Smith-Meyer, 1987 : 140-142.

Male : Body including rostrum 414 long, 162 wide. Terminal sensillum of palpus 3 times as long as wide, dorsal sensillum slender. Peritreme at the distal end, hooked. Dorsal idiosomal setae thin, slender, 2 times longer than the distance between their longitudinal bases. Tibia I with 2 sensory and 10 tactile setae, tarsus I with 2 sensory and 5 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 1 sensory and 4 tactile setae proximal to duplex setae. Aedeagus bends upward at right angle and terminates distally with a knob.

Female : Body including rostrum 534 long, 231 wide. Terminal sensillum of palpus one and half times as long as wide, dorsal sensillum long and slender. Peritreme hooked distally. Dorsal idiosomal setae longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 9 tactile setae, tarsus I with 1 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 2 sensory and 4 tactile setae, tarsus II with 2 sensory and 4 tactile setae proximal to duplex setae. Outer and inner sacrals not of same length while clunals small. Genital flap with transvers striae. Medioventral setae of moderate size.

Known hosts in India : *Abelmoschus esculentus* (bhendi), Bitter gourd, *Cajanas cajan*, *Citrullus lunatus*, *Citrus* sp., *Coccinea indica*, *Convolvulus* sp., *Cosmos* sp., *Cucumis sativus*,

Cucurbita maxima, *Dahlia* sp., *Dolichos biflorus*, *D. lablab*, French bean, *Glycine max*, *Gossypium herbaceum*, *G. hissutum*, *Jasminum sambac*, *Lablab niger* var. *lignosus*, *L. niger* var. *typicus*, *Lantana camara*, *Luffa acutangula*, *Lycopersicum esculentum*, *Ricinus communis*,



Figs. 548-556: *Tetranychus ludeni*: 548- dorsum of female, 549- tibia and tarsus II of female, 550- tibia and tarsus I of male, 552-tibia and tarsus II of male, 553-distal segment of palpus of female, 554- distal segment of plpus of male, 555- peritreme of male, 556- aedeagus.

Sechium edule, *Shorea robusta*. *Solanum melongena*, *Spinacea oleracea*, Tori, *Vigna radiata*, *V sinensis* (cow pea), *V. ungulata*.

Known hosts outside India : *Ageratum conyzoidea*, *Alocasia* sp., *Althea rosea*, *Anona*, *muricata*, *Arctotheca calendula*, *Aristolochia macrophylla*, *Armoracia rusticana*, *Artocarpus incisa*, *Aster* sp.. *Bidens pilosa*, *Buddleia*, *dysophylla*, *Cajanas cajan*, *Canavalia gladiata*, *Capsicum* sp., celery, *Chrysanthemum* sp., *Citrus* sp., *Cirsium arvense*, *Citrus limon*, *Citrullus vulgaris*, *Convolvulus* sp., *Corchorus tridens*, *Cosmos* sp., *Crotalaria* sp., *Cucnmis melo*, *Cucumis sativus*,

Cucurbita pepo, *Dahlia* sp., *Datura* sp., *Datura stramonium*, *Dianthus caryophyllus*, *Dryoptaris* sp., *Eichnoria crassipes*, *Erigeron floribundus*, *Euclea crispa*, *Ficus carica*, *Fragaria chilensis*, *Fragaria vesca*, *Fuchsia* sp., *Galinsoga parviflora*, *Geigeria passerinoides*, *Gerbera* sp., *Gerbera jamesoni*, *Glycine javanica*, *Gnaphalium undulatum*, *Gossypium* sp., *G. herbaceum*, *G. hirsutum*, *Helianthus annuus*, *Hibiscus* sp., *H. mutabilis*, *Hydrangea hortensia*, *Ipomoea arachnosperma*, *I. batatas*, *I. carica*, *I. purpurea*, *Lantana* sp., *L. camara*, *Leonotis leonotis* *Leucas martinicensis*, *Livistonia* sp., *Lupinus* sp., *Malva parviflora*, *Medicago sativa*, *Mina lobata*, *Momordica* sp., *Nicotiana* sp., *Passiflora edulis*, *Pastinaca sativa*, *Pelargonium* sp., *Pelargonium stelleriana*, *Phaseolus* sp., *P. minima*, *P. vulgaris*, *Physalis* sp., *P. peruviana*, *Plumeria* sp., *Prunus armeniaca*, *P. persica*, *Pyrethrum* sp., *Pyrus malus*, *Ricinus communis*, *Rubus* sp., *Salva* sp., *Sechium edule*, *Senecio inaeguidens*, *Sida rhombifolia*, *Solanum melongena*, *S. rosmaninifolius*, *S. tuberosum*, *Sparmannia africana*, *Tetrapanax papyriferum*, *Therperia* sp., *Tithonia rotundifolia*, *Trachonanthus camphoratus*, *Trifolium repens*, *Triumfetta rhomboidea*, *Ulmus procera*, *Verbena* sp., *V. bonariensis*, *V venosa*, *Vitis* sp., *V. vinifera*, Wonder bean, *Xanthium spinosum*, *Zantedeschia aethiopica*, *Zinia* sp.

Distribution : India (Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, West Bengal, Bihar, Assam, Orissa, Punjab, Gujarat, Haryana, Tripura, Uttar Pradesh), Australia, New Zealand, Hawaii, U. S. A. (Southern part), Mexico, South America, South Africa, Zimbabwe, Europe (France, Portugal).

Remarks : In India, this mite infests mainly vegetable crops causing stipplings on leaves. All such leaves dry up and fall off. The damage often assumes very serious nature.

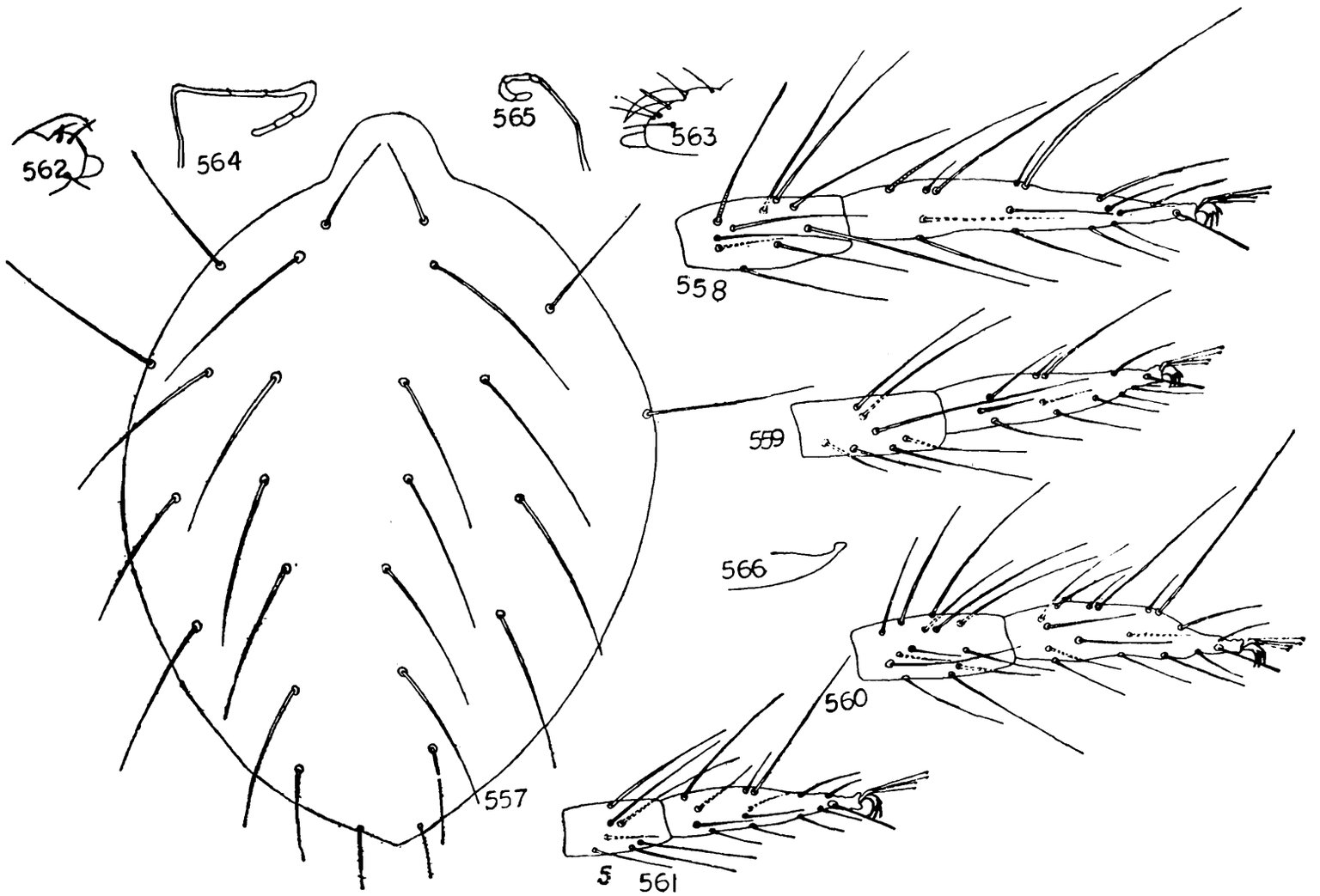
80. **Tetranychus macfarlanei** Baker & Pritchard
(Figs. 557-566)

Tetranychus macfarlanei Baker & Pritchard, 1960 : 537 ; Bindra & Kittur, 1961 : 71 ; Prasad, 1974 : 125 ; Gupta, 1976 : 345 ; Gupta, 1985 : 109-110 ; Smith-Meyer, 1987 : 140.

Male : Body including rostrum 339 long, 177 wide. Terminal sensillum of palpus one and half times as long as broad, dorsal sensillum long and slender. Peritreme hooked distally. Dorsal idiosomal setae tapering gradually and one and half times longer than the interval between their longitudinal bases. Tibia I with 3 sensory and 4 tactile setae, tibia II with 7 tactile setae, tarsus II with 1 sensory and 5 tactile setae proximal to duplex setae. Outer and inner sacrals not of same length. Clunals small. Aedeagal knob tiny with anterior and posterior angulations.

Female : Body including rostrum 534 long, 328 wide. Terminal sensillum of palpus short and more broad, dorsal sensillum slender. Peritreme hooked distally with more

bent. Dorsal idiosomal setae one and half times longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 9 tactile setae, tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II



Figs. 557-566 : *Tetranychus macfarlanei* : 557- dorsum of female, 558- tibia and tarsus I of female, 559- tibia and tarsus II of female, 560- tibia and tarsus I of male, 561- tibia and tarsus II of male, 562- distal segment of palpus of female, 563- distal segment of palpus of male, 564- peritreme of female, 565- peritreme of male, 566- aedeagus.

with 1 sensory and 4 tactile setae proximal to duplex setae. Outer and inner sacrals not of same length. Clunals small. Genital flap with transverse striae. Medioventral setae thin and long.

Known hosts in India : *Abelmoschus esculentus, Cajanas cajan, Chenopodium murale, Clerodendron inerme, Cucumis sativus, Cucurbita maxima, C. pepo, Dolichos lablab, Gossypium*

herbaceum, *G. hirsutum*, *Glycine soja*, *Ipomoea reptans*, *Lagenaria vulgaris*, *Operculina turpethum*, *Sechium edule*, *Solanum melongena*.

Known hosts outside India : *Abelmoschus esculentus*, *Citrullus lunatus*, *Cucumis sativus*, *Cucurbita maxima*, *C. pepo*, *Hibiscus* sp., *Ipomoea* sp., *Phaseolus lunatus*, *Puerraria javanica*, *Ricinus communis*.

Distribution : India (Andaman & Nicobar Isls., Madhya Pradesh, Rajasthan, Gujarat, Tamil Nadu, Karnataka, Uttar Pradesh, West Bengal), Mauritius.

Remarks : This is a sporadic pest of brinjal in south India producing yellowish patches. Such leaves dry up and fall off.

81. **Tetranychus neocaledonicus** Andre
(Figs. 567-576)

Tetranychus neocaledonicus Andre, 1933 : 302 ; Prasad, 1974 : 125-126 ; Gupta, 1976 : 344 ; Gupta, 1985 : 113-115 ; Smith-Meyer, 1987 : 137-138.

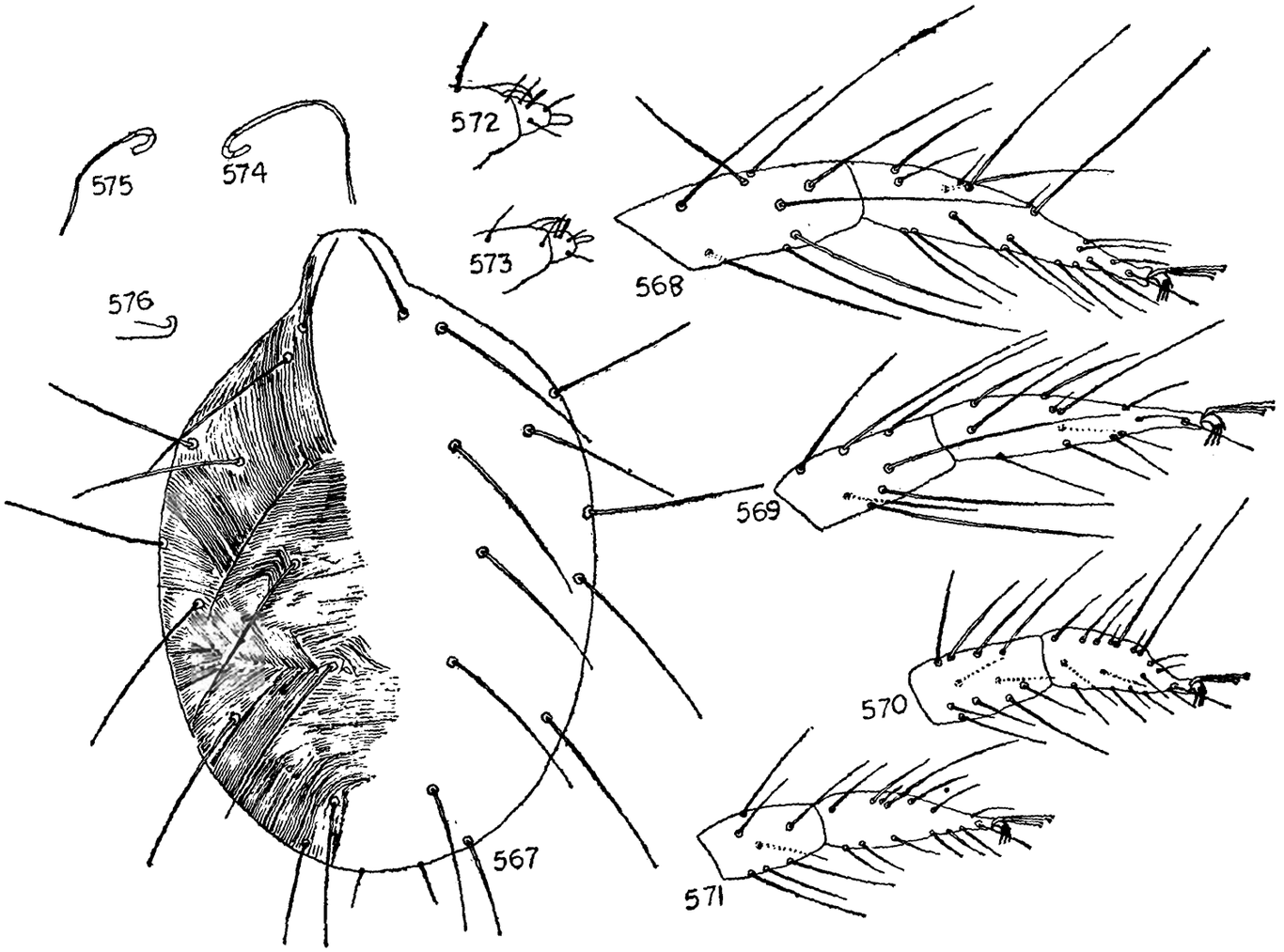
Tetranychus cucurbitae Rahman & Sapra, 1940 : 179 ; Ghai, 1964 : 392 ; Gupta, 1970 : 99.

Male : Body including rostrum 339 long, 177 wide. Palpus with terminal sensillum 4 times as long as broad. Peritreme at the distal end gradually bends downward to form hook. Dorsal idiosomal setae simple and tapering, longer than the interval between their longitudinal bases. Tibia I with 3 sensory and 8 tactile setae, tarsus I with 2 sensory and 4 tactile setae proximal to duplex setae. Tibia II with 7 tactile setae ; tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Aedeagus very distinct in having berry-like aedeagal knob.

Female : Body including rostrum 534 long, 263wide. Terminal sensillum of palpus 3 times as long as wide, dorsal sensillum slender. Peritreme similar to that of male. Dorsal idiosomal setae one and half times longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 7 tactile setae, tarsus I with 2 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 1 sensory and 3 tactile setae proximal to duplex setae. Striations as figured. Outer and inner sacrals of same length. Clunals small.

Known hosts in India : *Abelmoschus esculentus*, *Althea rosea* (hollyhock), *Amaranthus viridis*, *Andropogon sorghum* (sorghum), *Benincasa cerifera* (pumpkin), *Bidens pilosa*, *Brassica campestris* (mustard), *Brassica juncea* (Raya), *B. oleracea* (cabbage), *Carica papaya* (papaya), *Chrysanthemum* sp., *Cassia tora*, *Citrus limetta*, *Citrus limon*, *Commelina* sp., *Coriandrum sativum* (coriander), *Crotalaria juncea* (sunhemp), *Croton* sp., *Crossandra undu-*

laefolia, *Cucumis pepo* (petha), *Cucumis sativus* (cucumber), *Cucurbita maxima* (sweet gourd), *Cyperus* sp., *Dodonaea viscosa*, *Dolichos biflorus* (Kulthi), *D. lunatus*, *Elettaria cardamomum* (cardamom), *Eragrostris* sp., *Eruca sativa* (Taramira), *Euphorbia geniculata*, *Euphorbia hirta*, *Fan palm*, *Ficus carica* (fig), *Geranium* sp., *Gladiolus* sp., *Glycine soja* (soybean), *Gossypium herbaceum* (cotton), *G. hirsutum* (cotton), *Ipomoea* sp., *Jasminum* sp., *Lagenaria vulgaris*,



Figs. 567-576 : ***Tetranychus neocaledonicus*** **: 567- dorsum of female, 568- tibia and tarsus I of female, 569- tibia and tarsus II of female, 570- tibia and tarsus I of male, 571- tibia and tarsus II of male, 572- distal segment of palpus of female, 573- distal segment of palpus of male, 574- peritreme of female, 575- peritreme of male, 576- aedeagus.**

Livistonia chinensis, *Luffa acutangula* (ridge gourd), *Luffa aegyptica*, *Lycopersicum esculentum* (tomato), *Mangifera indica* (mango), *Melilotus parviflora*, *Medicago sativa* (lucern), *Morus alba* (mulberry), *Oscimum sanctum* (Tulsi), *Pennisetum typhoideum* (Bajra), *Phaseolus aconiti-*

folius (Moth bean), *P. aureus* (golden gram), *P. mungo* (black gram), *P. radiatus* (urid dal), *P. vulgaris* (french bean), *P. lunatus* (lima bean), *Pisum sativum* (pea), *Quamochit vulgaris*, *Quisqualis indica*, *Raphanus sativus* (radish), *Ricinus communis* (castor), *Rosa indica* (rose), *Santhalum album* (sandle wood), *Solanum melongena* (brinjal), *S. tuberosum* (potato), sugar beet, *Tegtes patula* (marigold), Tapioca, *Vigna sinensis* (cow pea), *Vitis vinifera*.

Known hosts from outside India : Jeppson *et. al.* (1975) mentioned that this mite was known from over 110 plants, some of those are : *Acalypha segetalis*, *A. stipulacea*, *A. urekeniana*, *Acaphylla giaprata*, *Ageratum conyzoides*, *Aleurites* sp., *Annona globra*, *A. murricata*, *A. squamosa*, *Arachis hypogaea*, *Artocarpus integrifolia*, *A. rigida*, *Averrhoa carambola*, *Boerhaavia erecta*, *Bridelia mollis*, *Buddleia paniculata*, *Carica papaya*, *Ceiba pentandra*, *Chloris gayana*, *Cinchona* sp., *Citrus* sp., *Colocasia esculenta*, *Corchorus olitorius*, *C. tridens*, *Croton megalobortys*, *Croton rivularis*, *Cyphostemma glandulosissionum*, *Felicia zeyheri*, *Feronia limonea*, *Gossypium* sp., *G. hirsutum*, *Gynura crepedioides*, *Hewittia sublobata*, *Hibiscus esculentus*, *H. physaloides*, *H. syriacum*, *H. vitifolius*, *Ipomoea* sp., *I. batatas*, *I. coscinosperm*, Iris, *Jatropha* sp., *Lepistemon africanum*, *Lippia javanica*, *Malus formossana*, *Manihot esculenta*, *Melothria* sp., *Merremia vitifolia*, *Moringa oleifera*, *Morus alba*, *Musa paradisaca*, *M. sapientum*, *Mussandra philippica*, *Nicotiana glauca*, *Nephrolepis exaltata*, *Nuxia congesta*, *Pachira macrocarpa*, *Passiflora edulis*, *Pyrus communis*, *Phaseolus vulgaris*, *Phyllanthus acid*, *Prunus mume*, *P. persica*, *Ricinus communis*, *Rueilla tuberosa*, *Solanum* spp., *Solanum indicum*, *S. melongena*, *S. nigrum*, *S. tervum*, *S. panduraeforme*, *S. verbascifolium*, *Tectona grandis*, *Thunbergia gibbsoni*, *Vanguria edulis*, *Veronia* sp., *Zea mays*.

Distribution : India (throught the country), worldwide.

Remarks : This species has been found to be a major pest of crops in India and infests mostly vegetables producing almost similar type of symptoms as by *T urticae*. The decreased vitality and leaf and fruit drop cause heavy loss to the farmers.

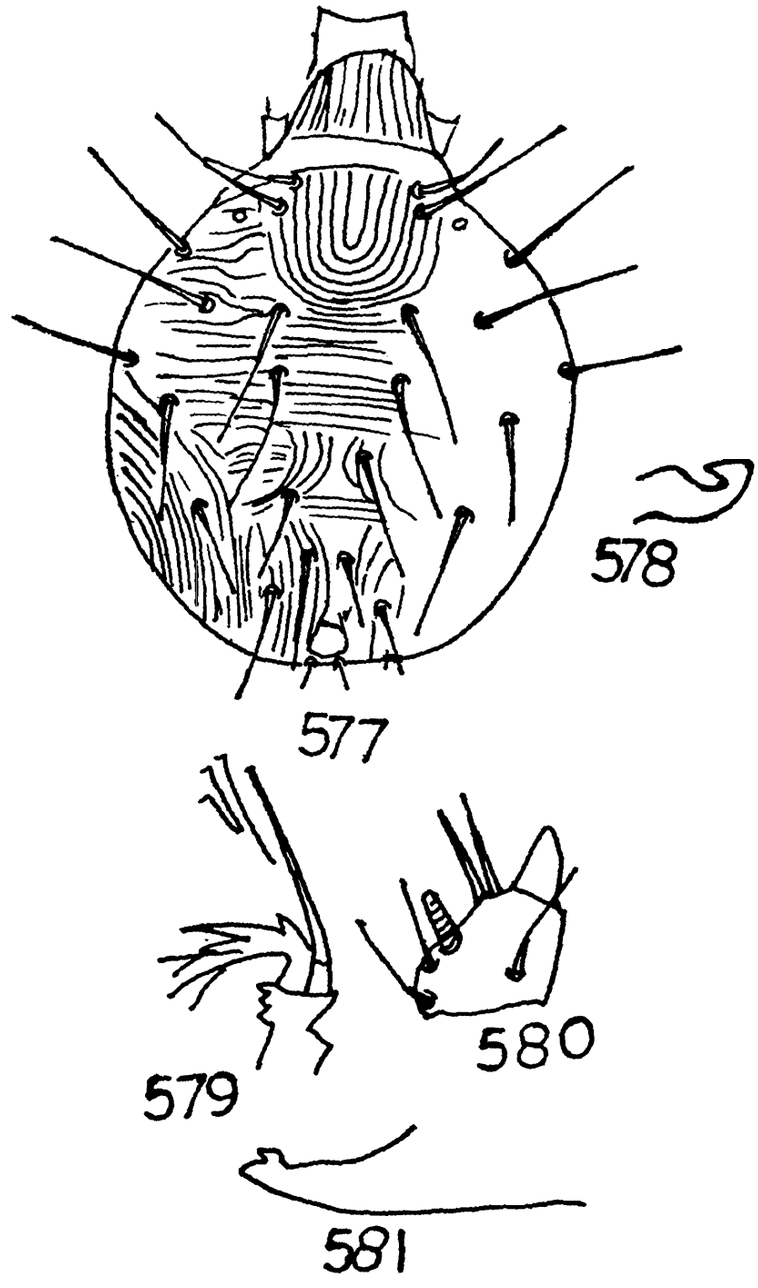
82. **Tetranychus papayae** Nassar & Ghai
(Figs. 577-578)

Tetranychus papayae Nassar & Ghai, 1981 : 375-377 ; Gupta, 1985 : 108.

Male : Body including rostrum 310 long, 169 wide. Dorsal setae shorter than those of females and also slender, pointed and longer than the interval between their bases. Genital area with 1 pair of pregenital and 4 pairs of genitoanal setae. Terminal sensillum of palpus about 3 times as long as broad. Tarsus I with 2 sensory and 4 tactile setae proximal to duplex setae, Empodium I with proximoventral spurs tridigitate and also provided with strong mediodorsal spur. Shaft of the aedeagus bent dorsad forming distal

knob. Aedeagal knob with strong acuminate anterior angulation curved ventrad. Upper surface of knob straight.

Female : Body including rostrum 579 long, 328 wide. Stylophore notched anteriorly. Terminal sensillum of palpus about as long as broad. Peritreme hooked distally. Dorsal



Figs. 577-578 : *Tetranychus papayae* (after Nassar & Ghai 1981) : 577- dorsum of female, 578- aedeagus.
Figs. 579-581 : *Tetranychus puschelii* (after Meyer, 1974) : 579- tarsal appendages of leg II of male, 580- distal segment of palpus of female, 581- aedeagus.

body setae 13 pairs, serrate, longer than the distance between their bases. Dorsal lobes of striae differing in shapes and sizes, mostly semicircular and with basal spots. Tarsus I with 4 tactile setae proximal to duplex setae. Striae on the venter mostly transverse. Genital flap with transverse striae.

Known host in India : *Carica papaya* (papaya).

Distribution : India (Delhi).

83. **Tetranychus puschelii** Meyer
(Figs. 579-581)

Tetranychus puschelii Meyer, 1974 : 239 ; Smith-Meyer, 1987 : 138.

Male : Terminal sensillum of palpus 3 times as long as wide. Empodium I with 2 slender proximoventral spurs. Empodium II provided with a small mediodorsal spur. Tibia I with 4 sensory and 9 tactile setae, tarsus I with 3 sensory and 13 tactile setae. Empodia without mediodorsal spurs. Tibia II with 7 tactile setae ; tarsus II with 1 sensory and 13 tactile setae. Aedeagus shaft gradually narrows, turns slightly dorsad at distal end forming a berry-shaped distinct knob.

Known host in India : Undetermined plant.

Known hosts outside India : *Cephalocroton puschelii*, *Lippia rehamannii*, *Plectranthus* sp., *Sida chrysantha*.

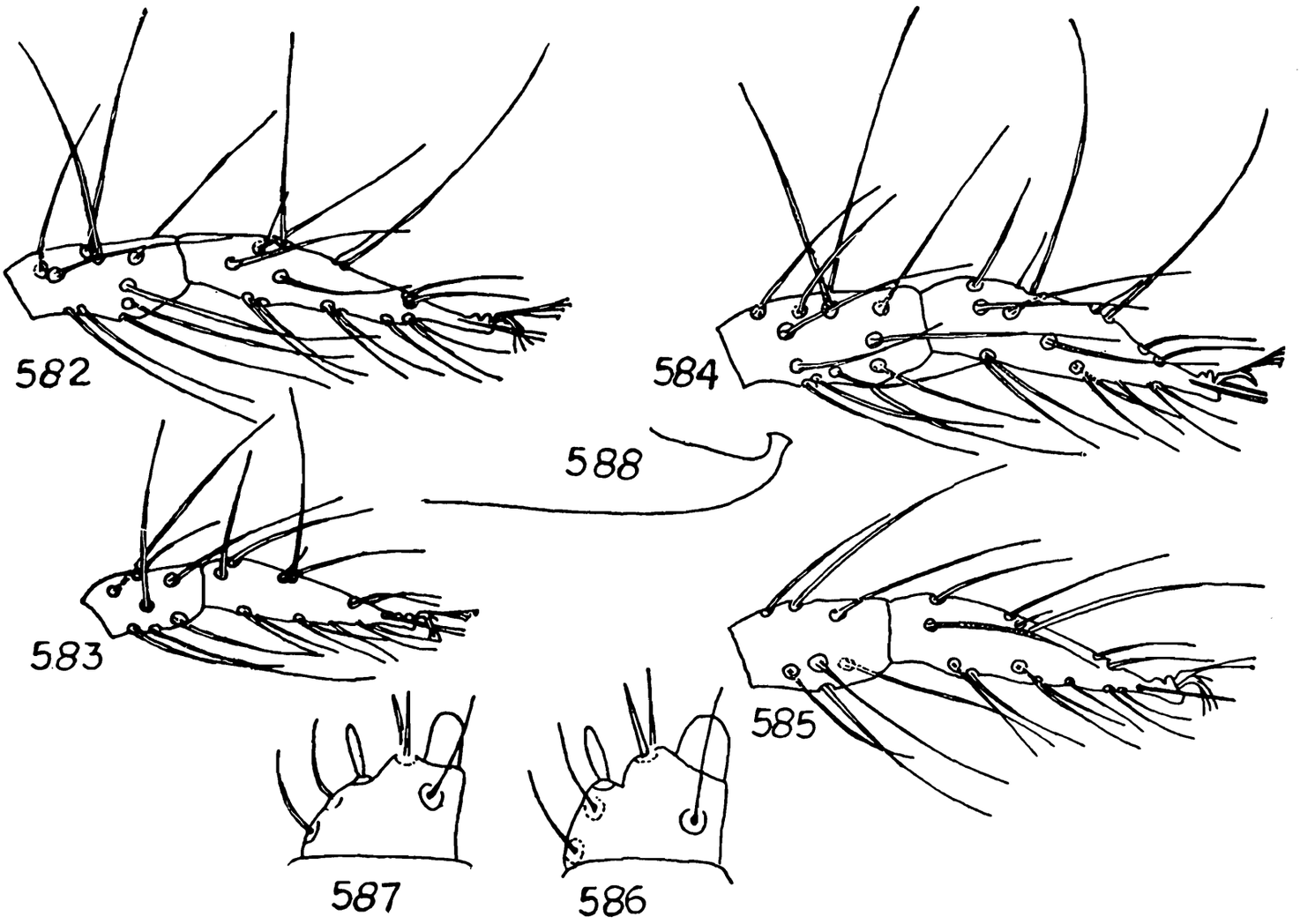
Distribution : India (Assam ?), Natal.

84. **Tetranychus sayedi** Baker & Pritchard
(Figs. 582-588)

Tetranychus sayedi Baker & Pritchard, 1960 : 543-545 ; Meyer, 1974 : 221-222 ; Nassar & Ghai, 1981 : 369 ; Gupta, 1985 : 104 ; Smith-Meyer, 1987 : 130-131.

Male : Body including rostrum 350 long, 172 wide. Palpus with terminal sensillum about twice as long as broad. Peritreme at the distal end retrose. Dorsal idiosomal setae long and slender, pubescent. Tibia I with 4 sensory and 9 tactile setae, tarsus I with 2 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 7 tactile setae ; tarsus II with 1 sensory and 13 tactile setae proximal to duplex setae. Axis of aedeagal knob parallel to that of shaft, rounded dorsally and bearing very small acute angulation anteriorly and posteriorly.

Female : Body including rostrum 440 long, 274 wide. Palpus with terminal sensillum as broad as long. Striae on dorsum bearing semicircular lobes. The striae irregular between 3rd pair of dorsocentral hysterosomals and longitudinal between inner sacrals. Tibia I with 1 sensory and 9 tactile setae, tarsus I with 3 tactile setae proximal to duplex setae. Dorsal



Figs. 582-588 : *Tetranychus sayedi* : 582- tibia and tarsus I of female, 583-tibia and tarsus II of female, 583- tibia and tarsus II of female, 584- tibia and tarsus I of male, 585- tibia and tarsus II of male, 586- distal segment of palpus of female, 587- distal segment of palpus of male, 588- aedeagus.

idiosomal striae bearing semicircular lobes, the striae irregular between 3rd pair of dorsocentral hysterosomals and longitudinal between inner sacrals.

Known host in India : *Solanum melongena* (bringal), *Morus alba* (mulberry).

Known host outside India : Manihot plant.

Distribution : India (Delhi), Zaire.

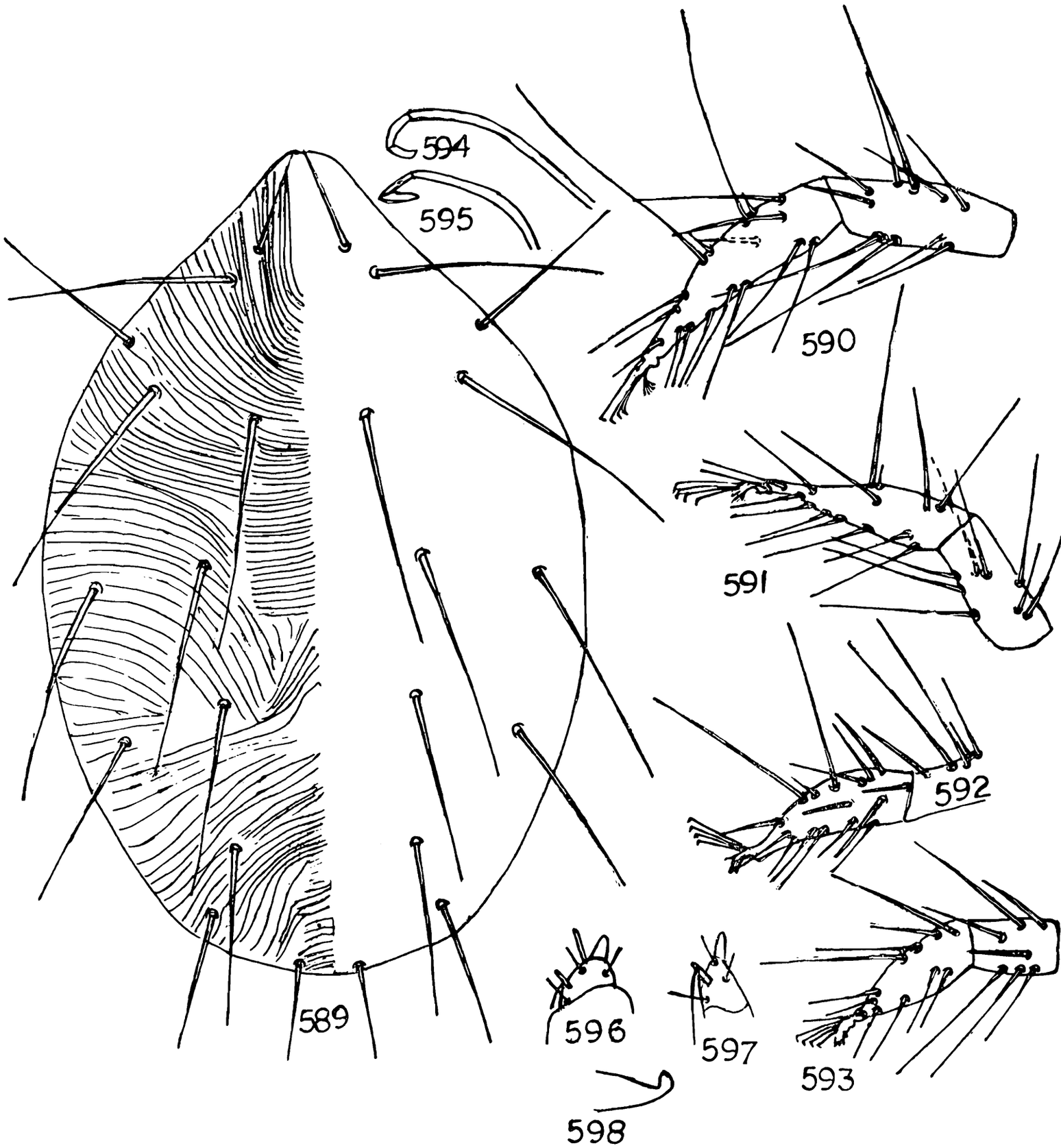
85. **Tetranychus udaipurensis** sp. nov.
(Figs. 589-598)

Male : Body including rostrum 330 long, 170 wide. Terminal sensillum of palpus 3 times as long as wide, dorsal sensillum broad, Peritreme hooked distally. Dorsal idiosomal setae simple, tapering gradually and one and half times longer than the interval between their longitudinal bases. Tibia I with 3 sensory and 8 tactile setae, tarsus I with 4 sensory and 1 tactile setae proximal to duplex setae. Tibia II with 1 sensory and 6 tactile setae, tarsus II with 1 sensory and 2 tactile setae proximal to duplex setae. Outer and inner sacrals not of same length. Clunals small. Aedeagal knob tiny with posterior angulation.

Female : Body including rostrum 520 long, 260 wide. Terminal sensillum of palpus one and half times as long as broad. Dorsal sensillum slender. Peritreme hooked distally with more bend. Dorsal idiosomal setae one and half times longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 9 tactile setae, tarsus I with 1 sensory and 2 tactile setae proximal to duplex setae. Tibia II with 7 tactile setae, tarsus II with 1 sensory and 2 tactile setae proximal to duplex setae. Outer and inner sacrals not of same length. Clunals small. Genital flap with transverse striae.

Holotype Male (Reg. No. 3438/17), India : Rajasthan. Udaipur Agril College campus, ex brinjal (*Solanum melongena*) 26.2.1981 (Coll. Y. N. Gupta). Paratypes : 4 females, data same as for holotype.

Remarks : This species is closely related to *Tetranychus neocaledonicus* Andre' but differs in having the dorsal margins of aedeagal knob being broadly angulate instead of being rounded.



Figs. 589- 598 : *Tetranychus udaipurensis* sp. nov. : 589- dorsum of female, 590- tibia and tarsus I of female, 591- tibia and tarsus II of female, 592- tibia and tarsus I of male, 593- tibia and tarsus II of male, 594- peritreme of female, 595- peritreme of male, 596- distal segments of palpus of female, 597- distal segments of palpus of male, 598-aedeagus.

86. **Tetranychus urticae** Koch
(Figs. 599-607)

Tetranychus urticae Koch, 1836 : 10 ; Boudreaux & Dosse, 1963 : 350 ; Manson, 1967a : 586-588 ; Tuttle & Baker, 1968 : 129 ; Meyer, 1974 : 234 ; Brandenburg & Kennedy, 1981 : 231-234 ; Gutierrez & Schicha, 1983 : 113-114 ; Gupta, 1985 : 115 ; Smith-Meyer, 1987 : 136-137.

Tetranychus telarius (Linn.), Baker & Pritchard, 1960 : 557-559 and several other authors.

Acarus cinnabarinus Boisduval, 1867 : 88.

Tetranychus cinnabarinus, Boudreaux, 1956 : 43-44 ; Meyer, 1974 : 235-238 ; Gupta, 1985 : 106-108 and many other authors.

Eotetranychus cucurbitacearum, Sayed, 1946 : 90-93.

Tetranychus aratica Basu, 1963 : 221-224 (*new synonymy*).

Tetranychus reetalius Basu, 1963 : 221-224 (*new synonymy*).

Tetranychus cucurbitacearum, Attiah, 1967 : 9 ; Meyer, 1974 : 234-235.

Tetranychus ricinus Saba, 1973 : 63-67.

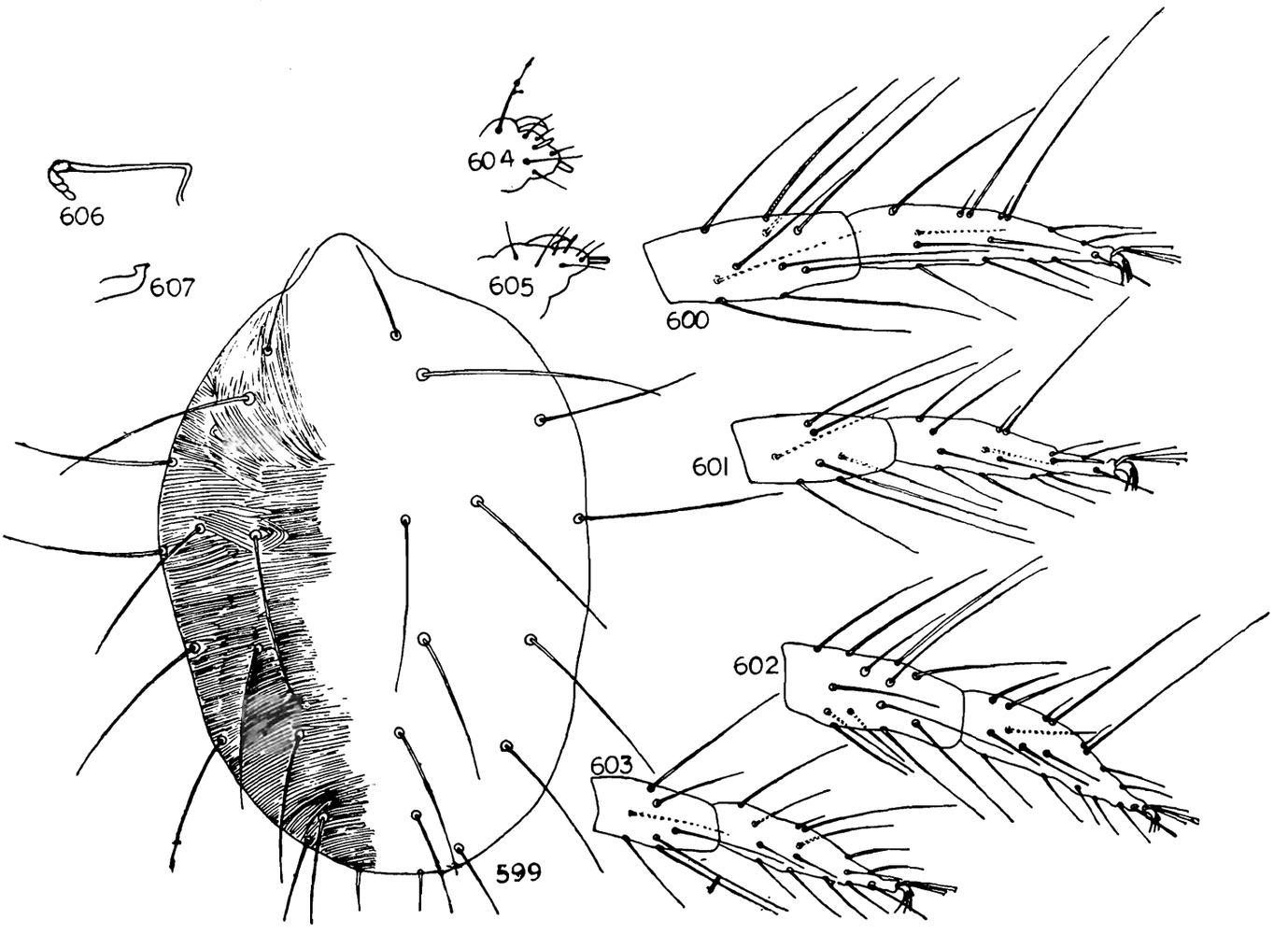
Platytetranychus multidigituli, Gupta & Gupta, 1976 : 6-7 (misidentification).

Male : Body including rostrum 435 long, 175 wide. Palpus with terminal sensillum 3 times longer than wide, dorsal sensillum fusiform. Peritreme at the distal end hooked. Dorsal idiosomal setae about twice longer than interval between their longitudinal bases and gradually tapering at distal end. Tibia I with 4 sensory and 9 tactile setae, tarsus I with 3 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 7 tactile setae, tarsus II with 1 sensory and 4 tactile setae proximal to duplex setae. Empodium with 3 pairs of proximoventral hairs which are very thin and similar in length, with a spur. Aedeagal knob small and its axis forms a small angle with axis of shaft.

Female : Body including rostrum 498 long, 241 wide. Palpus with terminal sensillum twice as long as broad, dorsal sensillum fusiform, thin and long. Peritreme at distal end hooked. Dorsal idiosomal setae much longer than the interval between their longitudinal bases. Tibia I with 1 sensory and 9 tactile setae, tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae. Tibia II with 7 tactile setae, tarsus II with 1 sensory and 4 tactile setae proximal to duplex setae. Striation as figured. Outer and inner sacrals not of same length. Clunals small. Genital flap with transverse striae.

Known hosts from India : *Abelmoschus esculentus*, *Ageratum conyzoides*, *Allium cepa*, *Althea rosea*, *Amaranthus* sp., *Amaranthus mangostans* (Chulai), *Amaranthus viridis*, *Andropogon sorghum*, *Apium graveolens* (celery), *Arachis hypogaea* (ground nut), *Beta vulgaris* (sugarbeet), *Benincasa cerifera* (pumpkin), *Brassica campestris* (mustard), *B. kaber*, *B. oleracea*, *B. oleracea* var. *capitata*, *Cajanas cajan* (pigeonpea), *Camellia sinensis*, *Canabis sativa*, *Carica papaya*, Carnation, *Chenopodium album*, *C. murale*, cherry, *Chrysanthemum* sp., *C. coronarium*, *Cichorium intybus*, *Citrullus vulgaris* (water melon), *C. vulgaris* var. *fistulosus* (round gourd), *Cleome viscosa* (Hulhul), *Citrus* sp., *C. sinensis*, *Corchorus capsularis*, *C.*

olitorius, *Coriandrum sativum* (coriander), *Crotalaria angyroides*, *C. juncea*, *Cucumis melo* (musk melon), *C. pepo* (pethaٰ), *C. sativus* (cucumber), *Dahlia* sp., *Dolichos lablab*, *Erigeron linifolius*, *Eruca sativa*, *Glycine soja*, *Gossypium herbaceum*, *G. hirsutum*, *Helianthus annuus*, *Heliotropium eichwaldi*, Holly hock, *Indigofera tinctoria*, *Irisine*, *Jasminum sambac*, Kanksi



Figs. 599-607: *Tetranychus urticae*: 599- dorsum of female, 600- tibia and tarsus I of female, 601- tibia and tarsus II of female, 602- tibia and tarsus I of male, 603- tibia and tarsus II of male, 604- distal segment of palpus of female, 605- distal segment of palpus of male, 606- peritreme of female, 607- aedeagus.

weed, *Lagenaria vulgaris*, *Lantana camara*, gourd, *Luffa aegyptica* (sponge gourd), *Luffa cylindrica* (bath sponge), *Lycopersicum esculentum*, Mandarin, *Medicago sativa*, *Melilothus indica*, *Mentha* sp., *Mentha arvensis*, *M. citrata*, *M. piperita*, *M. spicata*, *Momordica charantia*

(bitter gourd), *Morus alba*, Parthenium, *Petunia hybrida*, *Phaseolus aconitifolius* (moth bean), *P. aureus*, *P. lunatus*, *P. mungo*, *Pisum sativum*, *Prunis persica*, *Psidium guajava*, *Raphanus sativus*, *Rhyncosia capitata*, *R. communis*, *Rosa indica*, Rubber plant, Safflower, *Solanum melongena*, *S. nigrum*, *S. tuberosum*, *Sonchus arvensis*, *S. oleraceus*, *Spinacea oleracea* (spinach), *Tagetes erecta*, Tapioca, *Tridax procambens*, Turmeric, *Vigna sinensis*, *Vitis vinifera*, *Withania somnifera*, *Xanthium atromarium*.

Known hosts from outside India : *Aberia coffra*, *Abutilon tubulosum*, *Acacia robusta*, *Acalypha* sp., *Acer pseudoplatanus*, *Actinidea* sp., *Aegopodium podograria*, *Allium porrum*, *Alocasia* sp., *Althea rosea*, *Amaranthus* sp., *Amaranthus hybridus*, *Amygdalus persica*, *Arachis hypogaea*, *Argemone mexicana*, *Apium graveolens*, *Azalea* sp., *A. nudiflora*, *Bauhinia monandra*, *Beta vulgaris*, *Buddelia* sp., *Calathea* sp., *Cassytha* sp., cherry, *Chrysanthemum* sp., *Citrus* sp., *C. sinensis*, *Convolvulus* sp., *Conyza bonariensis*, *Cornus nuttali*, *Cosmos bipinnatus*, *Cucumis sativus*, *Cyclamen* sp., *Dacus carota*, *Dahlia* sp., *Delphinium* sp., *Dianthus armeria*, *Diecentre* sp., *Diervilla* sp., *Dolichos lablab*, *Nandiane domestica*, *Napeta catarea*, *Eichhornia crassipes*, *Erigeron canadensis*, *Eriodendron anafletuosum*, *Erythrina* sp., *Euphorbia* sp., *Fragaria* sp., *F. vesca*, *Fuchria* sp., *Galinsoga parviflora*, *Gardenia* sp., *Glycine soja*, *Gnaphalium lacteoalbum*, *Gossypium* sp., *G. herbaceum*, *G. hirsutum*, *Hevea braziliensis*, *Hibiscus* sp., *Hydrangea* sp., *Ipomoea* sp., *I. arachnosperma*, *I. batatas*, *I. plebeia*, *I. purpurea*, *Juglans* sp., *J. regia*, *Laminum purpureum*, *Leonotis leonotis*, *Lobelia* sp., *Lonicera* sp., *Lotus* sp., *Lupinus arborea*, *Lycopersicum esculentum*, *Magnolia stellata*, *Malus sylvastris*, *Malva parviflora*, *Mangifera indica*, *Manihot* sp., *Maranta* sp., *Medicago sativa*, *Mesembryanthemum crystallinum*, *Mina lobata*, *Morus japonica*, *Musa* sp., *M. acuminata*, *M. paradisica*, *Ornithogalum* sp., *Ornithopus* spp., *Oxalis* sp., *Phaseolus coccineus*, *Paspalum dilalatum*, *Passiflora* sp., *Pastinaca sativa*, *Pelargonium* sp., *Pennisetum clandestinum*, *Phaseolus* sp., *P. vulgaris*, *Phlox carolina*, *Physalis minima*, *Plumeria* sp., *Polyanthes* sp., *Populus nigra*, *Potentilla fruticosa*, *Postarparagus taricinus*, *Prunus domestica*, *P. persica*, *Punica granatum*, *Pyrus communis*, *P. malus*, *Raphionaeme* sp., *Rauwolfia serpentina*, *Rebes nigrum* (black currant), *Rosa* sp., *Rupex* sp., *Rubus lidaeu* (raspberry), *Sambucus nigra* (elder berry), *Solanum melongena*, *S. nigrum*, *Sonchus oleraceus*, *Sorghum* sp., *S. caffrorum*, *Stenotaphrum secundatum*, *Streculia diversiloba*, *Tagetes erecta*, *Trifolium* sp., *T. hybridum*, *T pralense* (red clover), *T repens* (white clover) *Tropaeolum mapus*, *Tynospora frugosum*, *Venda teres*, *Verbena* sp., *V officinalis*, *Viburnum* sp., *V opulis*, *Vicia* sp., *Viola* sp., *Vitis* sp., *Vitis vinifera*, *Wistaria* sp., *Zea mays*.

Distribution : India (throughout the country), worldwide.

Remarks : In spite of best efforts, the types of *T aratica* (Basu) and *T reetalius* Basu were not accessible to the authors for re-examination. However, from the available descriptions of these two species, it appears that they are same as *T. urticae* Koch with little variation. Hence, they are proposed here as new synonyms for *T. urticae*. Gupta (1976) placed

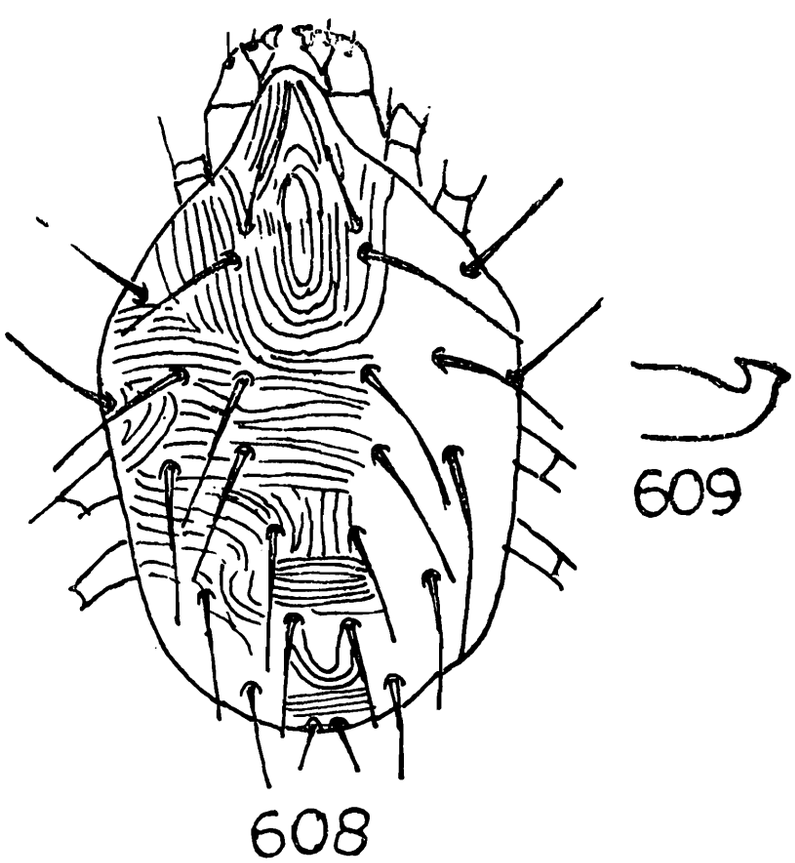
these two species as "*Species inquirenda*". The species earlier identified as *Platytetranychus multidigituli* (Ewing) (Gupta & Gupta, 1976) is indicated here as misidentification.

This is a pest of a large number of vegetables, fruit trees, ornamental plants, oilseeds, fibre crops, etc. in India. Feeding causes the appearance of yellow spots. The dens web often covers the plants where dust particles adhere which affect the physiological activity giving an unhealthy look. Sometimes the infested leaves become brown. More or less similar symptoms appear in most of the crops. All the affected plants gradually wither which causes yield loss.

87. **Tetranychus zaheri** Nassar & Ghai
(Figs. 608-609)

Tetranychus zaheri Nassar & Ghai, 1981 : 373-375 ; Gupta, 1985 : 105.

Male : Body including rostrum 379 long, 186 wide. Palpus with terminal sensillum about 2·5 times as long as broad. Dorsal setae shorter than those of females. Setae slender,



Figs. 608-609 : *Tetranychus zaheri* (after Nassar & Ghai, 1981) : 608- dorsum of female, 609- aedeagus.

serrate and longer than the interval between them. Genital area with 1 pair of pregenital and 4 pairs of genitoanal setae. Tarsus I with 2 sensory and 4 tactile setae proximal to duplex setae. Empodium I with proximoventral spurs slender and tridigitate while mediodorsal spur minute. Aedeagus short, broad and curving dorsad to form a large knob which is provided with an acute anterior and posterior projections.

Female : Body including rostrum 524 long, 299 wide. Stylophore rounded. Palpus provided with terminal sensillum which is about as long as broad. Peritreme strongly hooked distally. Dorsal body with 13 pairs of setae including one pair of humeral. All setae long, slender, serrate, longer than the interval between their longitudinal bases. Propodosoma with longitudinal striae. Hysterosoma striae mostly transverse. Tarsus I with 4 tactile setae proximal to duplex setae. Striae on venter mostly transverse. Genital flap with transverse striae. Medioventral striae on the propodosoma with lobes.

Known host in India : *Phaseolus vulgaris.*

Distribution : India (Delhi).

Dubious records from India

In addition to species under Sl. Nos. 1-87, there are also another 14 species reported from India. However, as those were not accessible to the authors for study and since some appear to be misidentified or their occurrences seem to be doubtful, those are listed here giving the relevant references, host records, distribution, comments, etc. omitting their detailed description, illustration and inclusion in keys. Further study is needed for confirming those records.

88. **Bryobia rubrioculus** (Scheuten)

Sannio rubrioculus Scheuten, 1857 : 104.
Bryobia rubrioculus, Tuttle & Baker, 1964 : 6 ; Rather, 1983 : 26.

Known hosts in India : *Pyrus amygdalus*, *P. malus* (apple).

Known hosts outside India : *Malvus sylvastris*, *Prunus* sp.

Distribution : India (Kashmir valley), worldwide.

Remarks : Though the material was not accessible to the authors for re-examination but previous survey results from that area by the present authors indicate that the species

may be the same as *B. praetiosa* which is quite common in Kashmir valley infesting stone fruits.

89. **Eutetranychus pantopus** (Berlese)

Tetranychus pantopus Berlese, 1910 : 242.
Eutetranychus pantopus, Baker & Pritchard, 1960 : 461 ; Meyer, 1974 : 152 ; Annonymous, 1989 : 104.

Known host in India : Undet. plant.

Known hosts outside India : *Albizzia lebbeck*, *Melia azadirach*, *Ricinus communis*.

Distribution : India (Karnataka), Egypt, Sudan.

Remarks : An allied species *Eutetranychus orientalis* shows wide range of variation and is known to infest a large number of plants. In all probability the present report pertains to *E. orientalis*.

90. **Eotetranychus asiaticus** (Ehara)

Eotetranychus asiaticus Ehara, 1966 : 8 ; Rather, 1983 : 26.

Known host in India : Rose.

Known hosts outside India : *Ficus* sp., *Psidium guajava*, *Vitis vinifera*.

Distribution : India (Kashmir valley), Japan.

Remarks : The identity needs re-checking.

91. **Eotetranychus neoperplexus** (McGregor)

Tetranychus perplexus McGregor, 1950 : 298.
Eotetranychus neoperplexus Estebanes & Baker, 1968 : 50 ; Sadana, & Chhabra, 1980 : 107.

Known host in India : *Bauhinia variegata*.

Known host outside India : *Cryptocarya* sp.

Distribution : India (Punjab), Mexico.

Remarks : This record is doubtful and needs re-examination.

92. **Eotetranychus pruni** (Oudemans)

Tetranychus pruni Oudemans, 1931 : 195.
Eotetranychus pruni, Geijskes, 1939 : 31 ; Pritchard & Baker, 1955 : 186 ; Rather, 1983 : 26.

Known hosts in India : *Prunus cerasus* (plum), *Prunus domestica.*

Distribution : India (Kashmir valley), England, U.S A.

Remarks : This record needs re-checking.

93. **Eotetranychus strychnosi** Meyer

Eotetranychus strychnosi Meyer, 1974 : 208-209 ; Smith-Meyer, 1987 : 118 ; Annonymous, 1989 : 104.

Known hosts in India : *Calotropis procera, Hollarhena antidyssentrica, Pergularia daemia.*

Known host outside India : *Strychnos spinosa.*

Distribution : India (Karnataka), South Africa.

Remarks : The record seems to be doubtful needing re-examination to confirm the validity.

94. **Eotetranychus truncatus** Estebanes & Baker

Eotetranychus truncatus Estebanes & Baker, 1966 : 81 ; Gupta & Dhooria, 1972 : 824-825.

Known host in India : *Vitis vinifera.*

Known host outside India : *Helicteres guazemaefolia.*

Distribution : India (Punjab), Mexico.

Remarks : This was a wrong identification and the species probably refers to *Tetranychus urticae.* The badly damaged condition of the specmen led to misidentification.

95. **Schizotetranychus undulatus** (Beer & Lang)

Neotetranychus undulatus Beer & Lang, 1958 : 1239.
Schizotetranychus undulatus, Tuttle, Baker & Abbatiello, 1976 : 69 ; Sadana, Chhabra & Kumar 1981 : 325-327.

Known hosts in India : *Acacia arabica*, *Jasminum grandiflorum.*

Distribution : India (Punjab), U. S. A.

Remarks : Its occurrence in India is doubtful and hence it needs confirmation.

96. **Oligonychus pratensis** (Banks)

Tetranychus pratensis Banks, 1912 : 97.
Oligonychus pratensis, Pritchard & Baker, 1955 : 349-354 ; Meyer, 1974 : 273 ; Smith-Meyer, 1987 : 157 ; Annonymous, 1990 : 139.

Known host in India : Grass (an undet. species).

Known hosts outside India : Coconut, date palm, grass, maize.

Remarks : The aedeagus of *O. pratensis* shows variation and often comes close to *O. indicus.* In view of this, the present record needs re-examination to confirm its identity.

97. **Oligonychus saccharinus** Baker & Pritchard

Oligonychus saccharinus Baker & Pritchard, 1960 : 525-526 ; Meyer, 1974 : 284-285 ; Smith-Meyer, 1987 : 160 ; Vishnupriya, Mohan & Mohansundaram, 1990 : 27-32.

Known host in India : *Saccharum officinarum.*

Known host outside India : *Saccharum officinarum.*

Distribution : India (Tamil Nadu), Mauritius, Mozambique.

Remarks : Most probably this record refers to *O. sacchari* which is quite common on sugarcane in Tamil Nadu. The aedeagei of both the species are so closed that it often becomes difficult to separate *saccharinus* from *sacchari.* However, the identity needs re-checking.

98. **Oligonychus thelytokous** Gutierrez

Oligonychus thelytokous Gutierrez, 1977 : 65-73 ; Smith-Meyer, 1987 : 146 ; Annonymous, 1990 : 197.

Known host in India : *Ichnocarpus* sp.

Known hosts outside India : *Hephelium litchi*. In addition, it is also known from 22 other hosts (Smith-Meyer, 1987).

Remarks : This record from India is interesting but needs re-checking.

99. **Oligonychus tylus** Baker & Pritchard

Oligonychus tylus Baker & Pritchard, 1960 : 525 ; Meyer, 1974 : 259 ; Smith-Meyer, 1987 : 156 ; Sirsikar & Nagabhusanam, 1989 : 27.

Known hosts in India : *Arundo donax*, sorghum.

Known hosts outside India : *Panicum maximum*.

Distribution : India (Maharashtra), Mauritius.

100. **Tetranychus truncatus** Eharai

Tetranychus truncatus Ehara, 1956 : 507 ; Rather, 1983 : 26.

Known host in India : *Dahlia* sp.

Known hosts outside India : *Beta vulgaris*, melon.

Distribution : India (Kashmir valley), Japan, Philippines.

Remarks : Most probably this record refers to *T urticae* which shows a good amount of variation in colouration and also is known to infest *Dahlia* often seriously. The identity needs re-checking.

101. **Tetranychus turkestani** (Ugarov & Nikolski)

Tetranychus turkestani Ugarov & Nikolski, 1937 : 28 ; Meyer, 1974 : 226 : Rather, 1983 : 26.

Known hosts in India : Apple, straw berry.

Known host outside India : *Medicago sativa.*

Remarks : The identity needs verification.

DISCUSSION

Zoogeographical distribution :

Among the 19 genera so far known from India, the distribution of only two, *viz. Tenuipalponychus* and *Stylophoronychus* are unknown beyond India while *Aponychus* is restricted to Oriental region only and *Bakerina* is known from Palaearctic region also in addition to the Oriental region. The cosmopolitan genera are : *Bryobia, Petrobia, Tetranychina, Panonychus, Eotetranychus, Schizotetranychus, Oligonychus* and *Tetranychus.* Among the remaining genera, *Bryobiella* and *Aplonobia* are known from Oriental, Ethiopian and Nearctic regions ; *Porcupinychus* from Oriental and Ethiopian regions, *Monoceronychus* from Oriental, Palaearctic and Nearctic regions and *Neopetrobia Mesobryobia* and *Eutetranychus* from Oriental, Ethiopian and Palaearctic regions.

Among the 87 valied species, a total of 38 species (including 6 new species described here) i. e., 43·67% are known only from India, of these, 10 belong to *Eotetranychus*, 6 to *Eutetranychus*, 5 each to *Schizotetranychus* and *Tetranychus*, 4 to *Aponychus*, 3 to *Oligonychus*, and 1 each to *Bryobiella, Neopetrobia, Stylophoronychus, Tenuipalponychus* and Bakerina. About 50% species are there the distribution of which beyond Oriental region is unknown signifying a high degree of endemism. There are 10 species (11·49%) which are cosmopolitan in distribution and those are : *Bryobia praetiosa, Petrobia latens, Tetranychina harti, Panonychus citri, P. ulmi. Oligonychus coffeae, Tetranychus neocaledonicus, T. urticae, T. hydrangeae* and *Eotetranychus sexmaculatus.* The occurrences of the species from other zoogeographical regions in India are approximately 5·7% from Palaearctic region, 6·9% from Nearctic region, 1·1% from Neotropical region, 11·4% from Ethiopian region and 1·1% from Australian region. The report of some of the Nearctic and Neotropical species in India is rather interesting and in all probability they might have been introduced through plant parts, fruits, etc. Of the 14 species listed at the end as "Dubious Records", excepting *Oligonychus tylus* and *Bryobia rubrioculus*, which may be valid records, the

occurrence of the others in India may be doubtful needing further re-checking to confirm their identities. Unfortunately, most of those were not accessible to the authors for re-examination and, therefore, those could not be verified. In view of these, their detailed descriptions, illustrations as well as their inclusion in keys in most of the cases are omitted pending further study of those materials.

Economic importance :

Out of 87 valid species reported here, 11 are very serious pests of a number of agricultural crops, fruit trees, vegetables, ornamental plants causing a considerable economic loss to the farmers. They are *Bryobia praetiosa* (on stone fruits in north India), *Petrobia latens* (on wheat and coriander in northwest and central India), *Eutetranychus orientalis* (on citrus, papaya, ornamental plants throughout India), *Schizotetranychus andropogoni* (on sugarcane and paddy in south, northeast India and Andaman Isls.), *Eotetranychus hirsti* (on fig in east and north India), *Oligonychus coffeae* (on tea throughout tea growing areas) *O. indicus* (on sugarcane throughout India), *O. mangiferus* (on mango, grape vines, black berry, litchi in north India), *Tetranychus neocaledonicus*, *T urticae* (both on vegetables throughout India). In view of these, a considerable amount of work has been done on most of these species on bioecology and control aspects. The species which rank as minor pests are *Oligonychus oryzae* (on paddy in south India), *Tetranychus hypogeae* (on groundnut in east India), *T macfarlanei* (on vegetables in south India), *Panonychus citri* (on mulberry in east India) and *Schizotetranychus baltazari* (on citrus in west India). Though these are minor pests for the present but the present day changes in cropping pattern and wide spread use of broad spectrum pesticides for killing the general pests which, in turn, eliminate the natural enemies of the mites, might in long run turn out to be major pests unless precautions are taken right now.

SUMMARY

This consolidated account of Indian spider mites (family Tetranychidae) deals with a total of 87 valid species under 19 genera, 6 tribes and 2 subfamilies. It includes descriptions of 6 species, *viz. Eotetranychus communis*, *Eotetranychus guajavae*, *Eotetranychus ranikhetensis*, *Schizotetranychus indicus*, *Schizotetranychus meghalayensis*, *Tetranychus udaipurensis*, as new to science and re-descriptions of all the remaining 81 species with adequate illustrations. In addition, synonymies, distribution in India and abroad and economic importance (wherever known) are also included. In addition, 14 species (Sl. Nos. 88-101) are listed at the end as "Dubious records" as from the available information, excepting 2, the other records in all probability are doubtful in India and most of those were not available to the authors for confirming their identities. Therefore, for those, only

relevant references, host records and distribution are given omitting their detailed descriptions, illustrations and inclusion in keys pending confirmation of their identities. In addition, a brief discussion is made regarding zoogepgraphical distribution of the species as well as economic importance of the pest species.

ACKNOWLEDGEMENTS

The authors are thankful to the Director, Zoological Survey of India, Calcutta for the facilities and constant encouragements. A large number of overseas scientists helped the authors with valuable literature otherwise unavailable to the authors in addition to offering fruitful suggestions as and when approached and the authors record their sincere thanks for this help and cooperation.

REFERENCES

Annonymous. 1989. Second Workshop on All India Coordinated Research Project on Agricultural Acarology (ICAR)—Annual Report. 1989. 1-184 pp.

Annonymous. 1990. All India Coordinated Research Project on Agriculeural Acarology (ICAR). Annual Report. 1990. 1-201 pp.

Andre', M. 1933. Note sur un Tetranyque nuisible au collonier en Nauvelle-Caledonie. *Bull. Mus. Natn. Hist. nat. Paris*, **5** : 302.

Anwarullah, M. 1966. *Porcupinychus abutiloni* (Acarina : Tetranychidae) a new mite from Pakistan. *Can. Ent.*, **98** : 71-75.

Attiah, H. H. 1967. *Eutetranychus* in U. A. R. with description of three new species (Acarina : Tetranychidae). *Bull. Soc. ent. Egypte*, **51** : 1-16.

Attiah, H. H. 1969. The tetranychini of the U. A. R. I. The genus *Tetranychus* Dufour (Acarina : Tetranychidae). *Acarologia*, **11** : 733-741.

Bagdasarian, A. T. 1957. New species of tetranychid mites in Armenia. *Dokl. Akad. Nauk. armyan.* S S R, **18** : 51-56.

Bagdasarian, A. T. 1959. Lectures of Armenian Akad. Sci. U. S. S. R., **28** : 139-142.

Baker, E. W. 1979. Spider mites revisited : a review. In : *Recent advances in Acarology*, Vol. 2 : 387-394 (Proc. V Internat. Congr. Acarology, August 6-12, 1978).

Baker, E. W. & Pritchard, A. E. 1953. A guide to the spider mites of cotton. *Hilgardia*, **22** : 203-234.

Baker, E. W. & Pritchard, A. E. 1960. The tetranychoid mites of Africa. *Hilgardia*, **29** : 455-574.

Baker, E. W. & Tuttle, D. M. 1972. New species and further notes on Tetranychoidea mostly from the south-western United States (Acariens : Tetranychidae, Tenuipalpidae). *Smithson, Contr. Zool.*, **116** : 1-37.

Banerjee, B. 1965. Mites of tea ancillary crops. *Two Bud*, **12** : 4-7.

Banks, N. 1900. The red spiders of the United States. (*Tetranychus* and *Stigmaeus*). *Bull. U. S. Dep. Agr.*, **8** : 65-77.

Basu, B. D. 1963. Studies on two new mites of the family Tetranychidae (Genus *Tetranychus*) *Proc. zool. Soc. (India)*, **16** : 221-224.

Banks, N. 1917. New mites, mostly economic. *Ent. News.*, **28** : 193-199.

Beer, R. E. & Lang, D. S. 1958. Tetranychidae of Mexico (Acarina). *Kans. Univ. Sci. Bull.*, **38** : 1231-1259.

Berlese, A. 1886. Acari dannosialle piante coltivati : **31.**

Berlese, A. 1910. Lista di nouve specie e nuovi generia acari. *Redia*, **6** : 242-271.

Berlese, A. 1913. Acarotheca Italica : 17.

Bindra, O. S. 1966. Role of insects and other animals in relation to citrus decline. *Punjab Hort. J.* **6** : 108-116.

Bindra, O. S. & Kittur, S. V. 1961. Two new records of tetranychid mites as crop pests in M. P. *Indian J. Ent.*, **23** : 71.

Bindra, O. S., Sidhu, A. S. & Singh, G. 1970. Control of *Tetranychus telarius* by soil application of systemic insecticides. *Indian J. agric. Sci.*, **40** : 917-920.

Bindra, O. S. & Singh, G. 1970. Mite pests of ornamental plants in India. *Pesticides*, June : 17-24.

Brandenburg, R. L. & Kennedy, G. G. 1981. Differences in dorsal integumentary lobe densities between *Tetranychus cinnabarinus* (Boisduval) (Acarina : Tetranychidae) from north-eastern North Carolina. *Internat. J. Acarol*, **7** : 231-234.

Boisduval, A. 1867. Essai Sur l' entomologie horticoli. 648.

Bourdeaux, H. B. 1956. Revision of the two-spotted spider (Acarina : Tetranychidae) complex, *Tetranychus telarius* (Linnaeus). *Ann. ent. Soc. Am.*, **49** : 43-48.

Bourdeaux, H. B. & Dosse, G. 1963. The usefulness of new taxonomic characters in females of the genus *Tetranychus* Dufour (Acari : Tetranychidae). *Acarologia*, **5** : 13-33.

ChannaBasavanna, G. P. 1971. The present status of our knowledge of Indian plant feeding mites. *Proc. 3rd. Internat. Congr. Acar., Prague* : 201-204.

ChannaBasavanna, G. P. & Banu, K. 1972. Plant feeding mites from India. Two spider mites of the subfamily Bryobiinae (Acarina : Tetranychidae). *Mysore J. agric Sci.*, **6** : 67-69.

ChannaBasavanna, G. P. & Lakkundi, N. H. 1977. A new genus of Tenuipalpodini (Acarina : Tetranychidae). *Indian J. Acar.*, **1** : 23-27.

Chaudhri, W. M. 1971. A new spider mite genus *Bakerina* (Acarina : Tenuipalpodini) with the description of four new species. *Pakistan J. Zool.*, 3 : 195-202.

Chaudhri, W. M. 1972. Three new species of mites of the genus *Aponychus* from Pakistan. *Pakistan J. Zool.*, **4** : 161-168.

Chaudhri, W. M., Akbar, S. & Rasool, A. 1974. Taxonomic studies of the mites belonging to the families Tenuipalpidae, Tetranychidae, Tuckerellidae, Caligonellidae, Stigmaeidae and Phytoseciidae. Univ. Agri. Lyallpur, 250 pp.

Das, G. M. 1959. Bionomics of the tea red spider (*Oligonychus coffeae* Nietner) *Bull. ent. Res.*, **50** : 265-274.

Das, G. M. & Naik, K. 1977. New record of the mite *Eotetranychus broodryki* Meyer as a pest of red gram (*Cajanas indicus*) at Bhubaneswar. *Acar. Newsl.*, **4** : 6.

Donnadieu, A. L. 1875. Recherches pour Servir a l hist Oire des Tetranyques. *Annls. Soc. Linn. Lyon*, **12** : 1-134.

Dufour, Leon 1832. Description et Figure du *Tetranychus lintericus* Arachnide nouvelle de la tribu des Acarides. *Annls. Sci. nat.*, **25** : 276.

Ehara, S. 1956. Tetranychoid mites of mulberry in Japan. *J. Fac. Sci. Hokkaido Univ. Ser. 6 (Zool.)*, **12** : 499-510.

Ehara, S. 1961. Notes on spider mites in the collection of the Zoological Survey of India,

Calcutta (Acarina : Tetranychidae). *Rec. Indian Mus.*, **59** : 143-148.

Ehara, S. 1966. The tetranychoid mites of Okinawa Island (Acarina : Prostigmata). *J. Fac. Sci. Hokkaido Univ.*, (6) **16** : 1-22.

Ehara, S. 1969. The tetranychoid mites of Taiwan (Acarina : Prostigmata). *J. Fac. Ed. Tottori Univ. Nat. Sci.*, **20** : 79-103.

Ehara, S. & Wongsiri, T. 1975. The spider mites of Thailand (Acarina : Tetranychidae). *Mushi*, **48** : 149-185.

Estebanes, G. M. L. & Baker, E. W. 1966 (1968) Aranas rojas de Mexico (Acarina : Tetranychidae). *An. Esc. nac. Cienc. biol. Mex*, **15** : 61-133.

Ewing, H. E. 1913. The taxonomic value of characters of the male genital aperture in the genus *Tetranychus* Dufour. *Ann. ent. Soc. Am..*, **6** : 453-460.

Eyndhoven, G. L. van. 1958. New ideas on the genus *Bryobia* (Acari : Tetranychidae). Notulae ad Tetranychidae. *Proc. 10th Internat. Congr. Ent.*, **1** : 927-929.

Flechtmann, C. H. W. & Baker, E. W. 1970. A preliminary report on the Tetranychidae (Acarina) of Brazil. *Ann. ent. Soc. Am.*, **63** : 156-163.

Flechtmann, C. H. W. & Baker, E. W. 1975. A report on the Tetranychidae (Acari) of Brazil. *Revta bras. Ent.*, **19** : 111-122.

Geijskes, D. C. 1939. Beitragi zur kenntnis der Europaischen Spinmilben (Acari : Tetranychidae) mit besonderer Beriicksichtigung der niederlandischen Arten. *Meded. Landb Hoogesch. Wageningen*, **42** : 1-68.

Ghai, S. 1964. Mites. In : *Entomology in India.* (Ed. N. C. Pant). *Ent. Soc. India*, 385-396.

Ghai, S. & Menon, M. G. R. 1971. New records of phytophagous mites from Delhi. *Entomologists' Newsl.* **1** : 37.

Gonzalez, R. H. 1977. The tetranychoid mites of Chile. I. The subfamily Bryobiinae (Acari : Tetranychidae). *Acarologia*, **19** : 633-653.

Gupta, S. K. 1970. Preliminary note on plant mites (Acarina) from West Bengal. *Sci. Cult.*, **36** : 98-99.

Gupta, S. K. 1976. Contribution to the knowledge of tetranychid mites (Acarina) with the descriptions of three new species from India. *Oriental Ins.*, **10** : 327-351.

Gupta, S. K. 1983. Taxonomy and distribution of plant associated mites of India—a review. *Abstr. II All India Symp. Acarology*, Pune, p. 1.

Gupta, S. K. 1985. *Handbook. Plant mites of India.* Zool. Surv. India Pub., 520 pp.

Gupta, S. K. 1991. Acari : Prostigmata, Astigmata & Mesostigmata. In : *Animal resources of India* (Ed. Director, Zoological Survey of India, Calcùtta) : 483-499.

Gupta, S. K. & Dhooria, M. S. 1972. Some new records of grape vine mite pests and their predators in India. *Curr. Sci.* **41** : 824-825.

Gupta, S. K. & Dhooria, M. S. 1974. Addition to the plant mite Fauna of Punjab and Himachal Pradesh. *Abstr. Indian Sci. Congr.*

Gupta, S. K., Sidhu, A. S., Dhooria, M. S. & Singh, G. 1971. Preliminary note on the phytophagous and predatory mite fauna of the Punjab and Himachal Pradesh. *Sci. Cult.*, **37** ; 296-298.

Gupta, S. K., Singh, G. & Sidhu, A. S. 1971. A note on predators of citrus mites in Punjab. *Sci. Cult.*, **37** : 484.

Gupta, Y N. 1980. Some spider mites (Acarina : Tetranychidae) from Andaman and Nicobar Islands with descriptions of three new species. *Rec. zool. Surv. India*, **77** ; 111-117.

Gupta, Y N. 1981. On a collection of tatranychid mites from Jammu and Kashmir with description of one new species of *Eotetranychus* (Acarina : Tetranychidae). *Bull. zool. Surv. India*, **3** : 235-238.

Gupta, Y. N. 1984. On a collection of tetranychoid mites from Tamil Nadu with description of a new species of *Aponychus* (Acari : Tetranychidae). *Bull. zool. Surv. India*, **6** : 237-245.

Gupta, Y N. & Gupta, S. K. 1976. Notes on some collection of Tetranychidae and Tenuipalpidae from Orissa (Acarina : Trombidiformes). *Newsl. zool. Surv. India*, **2** : 144-146.

Gupta, Y. N. & Gupta, S. K. 1977. Note on collection of tetranychoid mites from Meghalaya and Assam. *Newsl. zool. Surv. India*, **3** : 27-29.

Gupta, Y N. & Gupta, S. K. 1978. On a collection of tetranychoid mites from Madhya Pradesh, India with a description of a new *Eotetranychus* (Acari : Trombidiformes). *Indian J. Acar.*, **3** : 87-91.

Gupta, Y N. & Gupta, S. K. 1990. On a collection of tetranychid mites from Arunachal Pradesh, India with descriptions of two new species. *Rec. zool. Surv. India*, 88 : 15-22.

Gutierrez, J. 1967. Huit nouvelles especes du genre *Eotetranychus* Oudemans (Acariens : Tetranychidae) de Madagascar. *Acarologia*, 9 : 370-394.

Gutierrez, J. 1968. Tetranychidae nouveux de Madagascar (Quatrieme note). *Acarologia*, **10** : 13-28.

Gutierrez, J. 1977. Un tetranyque polyphage de la zone intertropicale *Oligonychus thelytokus* n. sp. cah. ORSTOM, Ser. Biol., **12** : 65-72.

Gutierrez, J. 1985. Division of the Tetranychidae into subfamilies, tribes and genera. In : *Spider mites : their biology, natural enemies and control.* (*Ed. W. Helle* & M. W. Sabelis), Elsevier Pub., Amsterdam. World Crop Pests 1A : 82-90.

Gutierrez, J. & Helle, W. 1971. Deux nouvelles especes due genre *Eutetranychus* Banks (Acariens : Tetranychidae) vivant sur plantes cultivess a Madagascar. *Ent. Ber. Amst.*, **31** : 45-60.

Gutierrez, J. & Schicha, E. 1983. The spider mite family Tetranychidae (Acari) in New South Wales. *Internat. J., Acarol.*, 9 : 99-116.

Hirst, S. 1920. Revision of the English species of Red spider (genre *Tetranychus* and *Oligonychus*). *Proc. zool. Soc. Lond.*, 49-60.

Hirst, S. 1923. On some new and little known species of Acari. *Proc. zool. Soc. Lond.*, Part 4 : 971-1000.

Hirst, S. 1924. On some new species of red spider. *Ann. Mag. nat. Hist., London*, 9 (14) : 522-527.

Hirst, S. 1926. Descriptions of new mites including four new species of red spider. *Proc. zool. Soc. Lond*, 825-841.

Jeppson, L. R., Keifer, H. H. & Baker, E. W. 1975. *Mites injurious to economic plants.* Univ. Calif. Press, 614 pp.

Kishida, K. 1927. Notes on *Tetranychus kanzawai* n. sp. a new tetranychid mite injurious to leaves of mulberry tree in Japan. *Zool. Mag.*, 39 : 105-107.

Klein, H. Z. 1936. Contributions to the knowledge of the red spiders in Palestine. *Bull. agric. Res. Stn. Rehovoth*, **21** : 163.

Koch, C. L. 1836. Deutsche Crustacea Myriapoda. Fasc. 1 : 11.

Lakkundi, N. H. 1973. Faunistic study of the phytophagous mites on fruit trees and vegetable crops arouud Bangalore. M. Sc. (Agri.) Thesis, University of Agricultural Sciences, Bangalore, 62 pp.

Lal, S. & Mukherjee, S. P. 1977. A contribution to the knowle Jge of phytophagous mites infesting medicinal plants. *Sci. Cult.*, 43 : 313-316.

Livshitz, I. S. & Mitrofanov, V. I. 1971. The mites of the genus *Bryobia* C. L. Koch, 1836 (Acaroformes, Bryobiidae). *Proc. Nikit. Botan. Gard.* 51 : 1-108 (In Russian).

McGregor, E. A. 1916. The citrus mite named and described for the first time. *Ann. ent. Soc. Am.*, 9 : 184-288.

McGregor, E. A. 1919. The red spiders of America and a few European species likely to be introduced in Washington D. C. *Smithsonian Inst. Proc. U. S. Nat. Mus.*, 56 : 641-679.

McGregor, E. A. 1928. Descriptions of two new species of spinning mites. *Proc. ent. Soc. Wash.*, 30 : 11-14.

McGregor, E. A. 1936. Two spinning mites attacking incense ceder in California. *Ann. ent. Soc. Am.*, 29 : 770-775.

McGregor, E. A. 1942. A new spinning mite attacking sugarcane in Puerto Rico. *J. Univ. Puerto Rico*, 26 : 91-94.

McGregor, E. A. 1945. A new genus and species of tetranychid mites from California. *Proc. ent. Soc. Wash.*, 47 : 100-102.

McGregor, E. A. 1950. Mites of the family Tetranychidae. *An. Midl. Nat.*, 44 : 257-420.

McGregor, E. A. 1952. A new spider mite (Acarina : Tetranychidae). *Proc. ent. Soc. Wash.*, 54 : 142-144.

Mallikarjunappa, S. & Nageshchandra, B. K. 1989. Biology of *Eotetranychus hicoriae* (Acari : Tetranychinae) on guava. *Indian J. Acar.*, 10 : 47-51.

Manson, D. C. M. 1963. Mites of the families Tetranychidae and Tenuipalpidae associated with citrus in Southeast Asia. *Acarologia*, 5 : 351-364.

Manson, D. C. M. 1965. The spider mite family Tetranychidae in New Zealand. II. The genus *Tetranychus*. *Acarologia*, 9 : 823-840.

Manson, D. C. M. 1967. The spider mite family Tetranychidae in New Zealand. I. The genus *Bryobia*. *Acarologia*, **9** : 76-123.

Manson, D. C. M. 1967a. The spider mite family Tetranychidae in New Zealand. II. The genus *Tetranychus*. *Acarologia*, **9** : 581-597.

Manson, D. C. M. 1967b. The spider mite family Tetranychidae in New Zealand. III. The genus *Schizotetranychus*. *Acarologia*, **9** : 823-840.

Manson, D. C. M. 1967c. The spider mite family Tetranychidae in New Zealand. IV. Two new species of *Tetranychus* and a revised key to the genus. *N Z. J. Sci.*, **10** : 1083-1091.

Manson, D. C. M. 1967d. Mites of the family Tenuipalpidae and Tetranychidae intrcepted entering New Zealand from overseas. *N. Z. J. Sci.*, **10** : 664-674.

Mathys, G. 1961. Notes sur I' espece *Bryobia praetiosa* Koch (Acarien : Tetranychidae). *Annu. agric. Suisse*, **62** : 295-304.

Menon, M. G. R. & Ghai, S. 1968. Further records of the distribution of *Petrobia latens* (Muller) (Acarina : Tetranychidae) a pest of wheat in India together with the description of a new species of predatory mite on the same. *Indian J. Ent.*, **30** : 77-79.

Menon, M. G. R. & Ghai, S. 1968a. Three new records of Bryobiinae from India (Acarina : Tetranychidae). *Indian J. Ent.*, 30 : 88-89.

Meyer, M. K. P. 1966. Acari associated with cotton in South Africa. *Garcea de Orto*, **13** : 1-33.

Meyer, M. K. P. 1974. A revision of the Tetranychidae of Africa (Acari) with a key to the genera of the world. *Rep. S. Afr. Dept. Agric. Tech. Ser., Ent. Mem.*, 36 : 1-292.

Meyer, M. K. P & Ryke, P. A. J. 1959. A revision of the spider mites (Acarina : Tetranychidae) of South Africa with descriptions of a new species. *J. ent. Soc. S. Afr.*, **22** : 330-366.

Mitrofanov, V. I. 1977. The taxonomy of the family Tetranychidae (Acariformes : Trombidiformes). *Zool. Zh.*, 56 : 1797-1803.

Mitrofanov, V. I., Bossenko, L. I. & Bitchevskis, M. J. 1 1975. A key for determination of tetranychoid mites of coniferous trees. Latvian Scientific Res. Inst. for Problems in Forestry. *Latvijas Entomologs Suppl.* 3 : 1-37 (In Russian).

Moutia, L. A. 1958. Contribution to the study of some phtyphagous Acarina and their predators in Mauritius. *Bull. ent. Res.*, **49** : 59-75.

Muller, O. F. 1776. *Zoologiae Danicae Prodromus.* Copenhagen. 282 pp.

Murray, A. 1877. *Economic entomology, Aptera.* Chapman & Hall. 433 pp.

Nassar, O. A. & Ghai, S. 1981. Taxonomic studies on tetranychoid mites infesting vegetables and fruit crops in Delhi and surrounding areas. *Oriental Ins.*, **15** : 333-396.

Nietner, J. 1861. Observations on the enemies of the coffee tree in Ceylon, 31 Suppl. Ceylon.

Oudemans, A. C. 1915. Notizen, uber Acari. *Arach. Naturg.*, **81** : 1-78.

Oudemans, A. C. 1929. Acarologische Aanteekeningen XCVIII. *Ent. Ber.*, **7** : 476-485.

Oudemans, A. C. 1929. Kritisch historisch overzicht der Acarologie. 2 Leiden. E. J. Brill : 1-1097.

Oudemans, A. C. 1931. Acarologische Aanteekeningen CVII. *Ent. Ber.*, **8** (178) : 221-236.

Oudemans, A. C. 1937. Kritisch historich overzicht der. *Acarologie*, **3** (C) : 1-1348.

Oudemans, A. C. 1939. Neue Funde auf dem Gebiete der Systematik und der Nomenklatur der Acari. VI. *Zool. Anz.*, **127** (3/4) : 75-80.

Prasad, V. 1974. *A catalogue of mites of India.* Indira Acarology Pub. House, Ludhiana, 320 pp.

Prasad, V. 1975. A new species of plant feeding mite from India (Acarina : Tetranychidae). *Internat. J. Acarol.*, **1** (1) : 1-5.

Prasad, V. 1975a. Plant feeding mites of India (Acarina : Tetranychidae). I. Genera *Tuckerella* and *Aponychus. Internat. J. Acarol.*, **1** (1) : 6-11.

Prasad, V. 1975b. Plant feeding mites of India (Acarina : Tetranychidae). II. Genera *Bryobia, Bryobiella, Neopetrobia* and *Petrobia. Internat. J. Acarol.*, **1** (1) : 12-20.

Prasad, V. 1975c. Plant feeding mites of India (Acarina : Tetranychidea). III. Genera *Bakerina, Mesobryobia Panonychus* and *Porcupinychus. Internat. J. Acarol.*, **1** (2) : 18-25.

Pritchard, A. E. & Baker, E. W. 1955. A revision of the spider mite family Tetranychidae. *Pacific Coast Ent. Soc. Mem. Ser.*, **2** : 1-472.

Pritchard, A. E. & Keifer H. H. 1958. Two new species of *Bryobia* with a revised key to the genus (Acarina : Tetranychidae). *Ann. ent. Soc. Am.*, **51** : 503-506.

Puttarudriah, M. & ChannaBasavanna, G. P. 1959. A preliminary account of phytophagous mites of Mysore. *Proc. 1st All India Congr. Zool.*, **2** : 530-539.

Rahman, K. A. & Sapra, A. N. 1940. Mites of the family Tetranychidae from Lyallpur with descriptions of new species. *Proc. Indian Acad. Sci.*, **11B** : 177-199.

Rather, A. Q. 1983. New records of five genera and eighteen species of phytophagous mites (Acarina) from India with notes on their host range, distribution and economic importance. Abstr. 2nd All India Symp. Acarology, Pune, p. 25-26.

Rajagopalan, K. 1974. First record of spider mite *Tetranychus ludeni* Zacher transmitting Dolichos Enation Mosaic Virus. *Curr. Sci.*, **43** : 488-489.

Reck, G. F. 1948. Rod *Schizotetranychus* (Tetranychidae : Acari) no inaterilan iz Gruzii. *Soohsch. Akad. Nauk. gruz. SSR.*, **9** : 369-376.

Reck, G. F. 1950. Materialik Faune Pautinnikh Kleshchei Gruzii (Tetranychidae : Acarina). *Trudy Inst. Zool. Akad. Nauk. gruz. SSR.*, **9** : 117-134.

Reck, G. F. 1952. O nekotorikh osmovakh kiassifikatsii tetranikovikh kleshekei. *Soobshch Akad. Nauk. gruz.* **13** : 420-425. (In Russian).

Reck, G. F. 1959. Identification of tetranychid mites. *Fauna Trans Caucasia Akad. Nauk. gruz. SSR Tbilisi* : 1-152.

Riley, C. V. 1890. The six spotted mite of the orange (*Tetranychus 6-maculatus* n. sp.). *Insect Life*, **2** : 225-226.

Rimando, L. C. 1962. The tetranychoid mites of the Philippines. *Tech. Bull. Coll. Agric. Univ.*, **11** : 52.

Rimando, L. C. 1966. A new subfamily of spider mites with the description of a new genus and two species. *Philip J. Agric.*, **50** : 105-113.

Saba, F. 1973. Les acariens nuisibles aux plantes cultivees au Maroc. *A. L. Awamia*, **49** : 69-97.

Sadana, G. L. 1985. *Plant feeding mites of India.* Kalyani Publisher, Daryaganj, New Delhi, 99 pp.

Sadana, G. L. & Chhabra, S. C. 1980. An addition to the tetranychoid mite fauna of the Punjab, India. *Sci. Cult.*, **46** : 369-376.

Sadana, G. L. & Chhabra, S. C. 1980a. Distribution and new records of tetranychid mites of the Punjab. *J. Adv. Zool.*, **1** : 104-109.

Sadana, G. L. & Chhabra, S. C. 1980b. New records of phytophagous mites (Acarina : Tetranychoidea) from India. *Sci. Cult.*, **46** : 399-401.

Sadana, G. L., Chhabra, S. C. & Gupta, B. K. 1982. Tetranychoid mites infesting fruit trees in the Punjab together with records of some new hosts and description of a new species. *Entomon*, **7** : 397-401.

Sadana, G. L., Chhabra, S. C. & Kumari, N. 1981. New records of tetranychoid mites of ornamental and medicinal plants and their hosts from the Punjab state. *Entomon*, **6** : 325-327.

Sadana, G. L., Gupta, B. K. & Chopra, R. 1983. Mites associated with crops and weeds in the Punjab, India. *Sci. Cult.*, **49** : 184-186.

Sadana, G. L., Gupta, B. K. & Goyal, M. 1985. Tetranychoid mites infesting vegetables in Punjab with description of two new species. *Annals of Biol.*, **1** : 157-164.

Sadana, G. L. & Kanta, V. 1972. Susceptibility of different varieties of citrus to the citrus mite, *Eutetranychus orientalis* (Klein). *Sci. Cult.*, **38** : 525-526.

Sayed, M. T. 1946. Contribution to the knowledge of the Acarina of Egypt. V Five new species of Tetranychidae. *Ler Ent. Bull. Soc. Fouad.*, **30** : 79-97.

Sayed, M. T. 1946a. The genus *Anychus* McGregor in Egypt and the Sudan. *ler Ent. Bull. Soc. Fouad.*, **30** : 143-148.

Scheuten, A. 1857. Einiges über Milben. Arch. Naturg., 23 (1) : 104-112.

Schulz, J. T. 1963. *Tetranychus telarius* (L.) new vector of virus-Y. *Plant Disease Reptr.*, **47** : 584-596.

Singh, J. & Putatunda, B. N. 1974. *Indian J. Pl. Prot.*, **1** : 51.

Sirskar, A. N. & Nagubhusanam, R. 1989. Biology of *Oligonychus tylus* Baker & Pritchard (Acari : Tetranychidae) : a potential mite pest of sorghum and other cereals, *Jour Acarology*. **11** : 95-99.

Smith-Meyer, M. K. P 1987. African Tetranychidae (Acari : Prostigmata) with reference to the world genera. *Ent. Mem. Dept. Agr. & Water Suppl. Repub. S. Africa*, No. 69 : 1-174.

Tragardh, I. 1915. Morphologische und Systematisch untersuchungen über die spinnmilben, *Tetranychus* Dufour. *Zts. Ang. Ent.*, **2** : 158-163.

Tucker, R. W. E. 1926. Some South African mites mainly Tetranychidae and Eriophyidae. *Union S. Afr. Dept. Agr. Div. Ent. Mem.*, **5** : 3-15.

Tuttle, D. M. & Baker, E. W. 1964. The spider mites of Arizona (Acarina : Tetranychidae). *Univ. Ariz. Tech. Bull.*, **158** : 1-41.

Tuttle, D. M. & Baker, E. W. 1968. Spider mites of South Western United States and a revision of the family Tetranychidae. *Tucson Ariz. Univ. Ariz.* Press, 1-143.

Tuttle, D. M., Baker, E. W. & Abbatiello, M. J. 1974. Spider mites from Northwestern and Northcentral Mexico (Acari : Tetranychidae). *Smithsonian Contr. Zool.*, **171** : 1-8.

Tuttle, D. M., Baker, E. W. & Abbatiello, M. J. 1976. Spider mites of Mexico (Acari : Tetranychidae). *Internat. J. Acarol.*, **2** : 1-108.

Vacante, V. 1984. Prima raccolta di Acari Tetranychidi in Sicilia (1). *Phytophaga* **1** : 41-114.

Vishnupriya, R., Mohan, R. & Mohanasundaram, M. 1990. Incidence of sugarcane mite, *Oligonychus saccharinus* on certain sugarcane clones. Abstr. IV Nat. Symp. Acarology, p. 38.

Wainstein, B. A. 1956. Material on the fauna of tetranychid mites of Kazakhstan. *Trudy Republik. Stentsii Zashch Rast. Kazfilial. Vaskhnil.*, **3** : 70-83.

Wainstein, B. A. 1956a. New findings of Tetranychoidea mites in southern Kazakhstan. *Zool. Zh.*, **35** : 1146-1151.

Wainstein, B. A. 1960. Tetranychoid mites of Kazakhstan (with revision of the family). *Kazakh. Akad. Selnk. Nauk. Nauch.—Issled. Inst. Zash. Rast, Trudy*, **5** : 1-276.

Womersley, H. 1940. Studies in Australian Acarina Tetranychidae and Trichadenidae. *Trans. R. Soc. S. Aust.*, **64** : 233-265.

Wood-Mason, J. 1884. Report on the tea mite and tea bug of Assam. 20. London.

Yokoyama, K. 1929. Nippon Sangyo Gaichu Zensho : 569 Tokyo (In Japanese).

Yokoyama, K. 1932. New tetranychid mites attacking the mulberry leaf. Contribution I. Bionomics and external structures of *Tetranychus suginamensis* n. sp. *Bull. Seric. Exp. Stn. Japan*, **8** : 229-287.

Zacher, F. 1913. Untersuchengen uber Spinnmilben. *Berlin Mitt. biol. Anst. H.*, **14** : 37-41.

Zaher, M. A. & Shehata, K. K. 1965. *Oligonychus vitis* n. sp. (Acarina : Tetranychidae). *Bull. Soc. Ent. Egypte*, **4** : 67-69.

PLANT HOST—MITE LIST

1. Mite species with single astericks indicate records from abroad.
2. Mite species with double astericks indicate doubtful records from India.

NAMES OF HOST PLANTS	NAMES OF MITE SPECIES
A	
Abelmoschus esculentus	*Tetranychus ludeni*, *T macfarlanei*, *T. neocaledonicus*, *T urticae.*
Aberia coffra	*T urticae**
Abies pindrow	*Bryobia praetiosa**
Abutilon indicum	*Porcupinychus abutiloni**
Abutilon tubulosum	*T urticae*
Acacia sp.	*Schizotetranychus hindustanicus*, *Oligonychus coffeae**
Acacia arabica	*Schizotetranychus undulatus**
Acacia confusa	*Oligonychus biharensis**, *O. coffeae**

Names of Host Plants	Names of Mite Species
Acacia constricta	*Eotetranychus fremonti**
Acacia cynophylla	*Oligonychus mangiferus**
Acacia erioloba	*Petrobia latens**
Acacia modesta	*Eutetranychus orientalis**
Acacia nilotica	*E. orientalis**
Acacia robusta	*T urticae**
Acalypha sp.	*T. urticae**
Acalypha indica	*T lombardinii**
Acalypha segetalis	*T lombardinii**, *T. neocaledonicus**
Acalypha stipilacea	*T neocaledonicus**
Acalypha urekaniana	*T neocaledonicus**
Acalypha giaprata	*T neocaledonicus**
Acer sp.	*Eutetranychus orientalis**
Acer pseudoplatanus	*T urticae**
Achras zapota	*O. biharensis**
Achyranthes aspera	*Bryobia praetiosa**, *T. lombardinii**
Actinidea sp.	*T. urticae**
Actinophloeus macarthuri	*T. fijiensis**
Adhatoda sp.	*Bryobia praetiosa**
Aegopodium podograria	*T. urticae**
Aesculus hippocastanum	*B. praetiosa**
Ageratum conyzoides	*Tetranychina harti**, *Tetranychus ludeni**, *T neocaledonicus**, *T urticae*
Agropyron desertorum	*B. praetiosa**
Agropyron smithi	*B. praetiosa**
Alanthus excelsa	*E. orientalis**
Albizzia lebbeck	*Eutetranychus pantopus***
Albizzia procera	*E. orientalis**
Aleurites sp.	*T neocaledonicus**
Alhagi camelorus	*Porcupinychus abutiloni**
Allium cepa	*Petrobia latens*, *T. urticae**
Allium porrum	*T urticae**

Names of Host Plants	Names of Mite Species
Alnus glutinosa	*Panonychus ulmi**
Alnus japonicus	*O. coffeae**
Alnus nitida	*B. praetiosa**
Alocasia sp.	*T ludeni**, *T urticae**
Alternanthera sp.	*B. praetiosa**
Althea rosea	*B. praetiosa**, *E. orientalis**, *T ludeni**, *T neocaledonicus*, *T. urticae**
Amaranthus sp.	*E. orientalis**, *T lombardinii**, *T urticae*
Amaranthus hybridus	*T lombardinii**, *T urticae**
Amaranthus mangostans	*T urticae*
Amaranthus viridis	*T neocaledonicus*, *T urticae*
Ampelopsis heterophylla	*O. biharensis**
Amygdalus persica	*T. urticae**
Anacardium occidentalis	*O. mangiferus**
Ananas comosus	*E. orientalis**
Andropogon annulatus	*Schizotetranychus andropogoni*
Andropogon sorghum	*O. indicus*, *T neocaledonicus*, *T urticae*
Anona sp.	*E. orientalis**
Anona globra	*T. neocaledonicus**
Anona muricata	*T. ludeni**, *T neocaledonicus**
Anona squamosa	*E. orientalis**, *O. mangiferus** *T. neocaledonicus**
Antigonon leptopus	*O. mangiferus**
Apium graveolens	*T urticae*
Apricot	*Eotetranychus kankitus*
Arachis hypogaea	*E. orientalis*, *T hypogeae*, *T. lombardinii**, *T neocaledonicus**, *T urticae*
Arctotheca calendula	*T. ludeni**
Areca auriculiformes	*O. biharensis*

Names of Host Plants	Names of Mite Species
Areca catechu	*Panonychus citri**, *O. biharensis*, *O. indicus*, *T fijiensis*
Arelia nudicolis	*T hydrangeae**
Argemone mexicana	*T urticae**
Argemone subfusiformes	*T lombardinii**
Argemone triplexnuberecta	*T lombardinii**
Aristida aedcensionis	*Schizotetranychus fluvialis**
Aristolochia sp.	*O. coffeae*
Aristolochia macrophylla	*T ludeni**
Armoracia rusticana	*T ludeni**
Artimisia nova	*B. praetiosa**
Artimisia tridantata	*B. praetiosa**
Artiplex cinera	*B. praetiosa**
Artiplex suberecta	*B. praetiosa**
Artocarpus calendula	*B. praetiosa**
Artocarpus incisa	*E. africana**, *T ludeni**
Artocarpus integra	*E. orientalis*, *O. biharensis**
Artocarpus integrifolia	*Tetranychina harti*, *E. africana**, *E. orientalis*, *Bakerina orissaensis*, *P. citri*, *P ulmi*, *Eotetranychus hicoriae**, *O. mangiferus*, *T neocaledonicus**
Artocarpus rigida	*T. neocaledonicus**
Arundo donax	*E. orientalis**, *O. tylus***, *Aponychus sulcatus**
Aspen	*Eotetranychus populi**
Aster sp.	*T. ludeni**
Artiplex nuelleri	*T lombardinii**
Avena sativa	*Petrobia latens**
Averrhoa carambola	*P. citri**, *T neocaledonicus**
Avocado	*P. citri**, *O. coffeae**, *O. oryzae**, *O. punicae**, *Eotetranychus sexmaculatus**

Names of Host Plants	Names of Mite Species
Azadirachta indica	*E. orientalis*, *S. hindustanicus*
Azalea sp.	*E. sexmaculatus**, *T urticae**
Azalea nudiflora	*T urticae**

B

Balanites pedicellaris	*Schizotetranychus tephrosiae**
Bauhinia acuminata	*O. mangiferus**
Bauhinia spp.	*Eotetranychus hirsti*
Bambusa aurandinacea	*Aponychus kodaikanalensis*, *A. bambusae*, *A. sarjui*, *Stylophoronychus baghensis*, *Schizotetranychus indicus*, *S. meghalayensis*, *O. sacchari*
Bambusa sp.	*Stylophoronychus lalii*
Bambusa stenostachya	*Aponychus corpuzae**
Bambusa tulda	*Aponychus corpuzae*
Bambusa vulgaris	*Neopetrobia simlaensis*, *A. corpuzae*
Bauhinia candida	*E. africana**
Bauhinia monandra	*T urticae**
Bauhinia purpurea	*E. orientalis**, *O. biharensis**
Bauhinia variegata	*E. orientalis**, *Eotetranychus uncatus*, *E. neoperplexus***
Benincasa cerifera	*T. neocaledonicus*, *T urticae*
Bequartiodendron sp.	*O. coffeae**, *O. mangiferus**
Bequartiodendron magalismontanum	*O. mangiferus**
Beta vulgaris	*T neocaledonicus*, *T urticae*, *T truncatus**
Bidens biternata	*T lombardinii**
Bidens pilosa	*T lombardinii**, *T ludeni**, *T neocaledonicus*

Names of Host Plants	Names of Mite Species
Bischofea javanica	*O. biharensis**
Bitter gourd	*T. ludeni*
Blattota africana	*T lombardinii**
Blumea membranacea	*E. orientalis**
Bochmeria sp.	*P. citri**
Boerhaavia sp.	*E. orientalis**, *T lombardinii**, *T neocaledonicus**
Boerhaavia diffusa	*Aponychus sulcatus**
Brassica campestris	*T neocaledonicus*, *T urticae*, *Bryobia praetiosa**
Brassica juncea	*T neocaledonicus*
Brassica kaber	*T urticae*
Brassica oleracea	*B. praetiosa**, *T neocaledonicus*, *T urticae*
Brassica oleracea capitata	*T urticae*
Brassica rapa	*B. praetiosa**
Brassica rapa var. *silvestris*	*B. praetiosa**
Bridelia mollis	*T neocaledonicus**
Bromus willdenowii	*B. praetiosa**, *Petrobia latens**
Buddelia sp.	*T urticae**
Buddleia dysophylla	*T ludeni**
Buddleia paniculata	*T neocaledonicus**
Butyrospermum paradoxum	*O. mangiferus**

C

Cajanus cajan	*Petrobia latens*, *E. orientalis*, *Eotetranychus broodryki*, *S. cajani*, *S. fluvialis*, *T lombardinii**, *T ludeni**, *T macfarlanei*, *T urticae*, *O. iseilemae*
Cajanus indicus	*Schizotetranychus andropogoni*
Calathea sp.	*T. urticae**

Names of Host Plants	Names of Mite Species
Calotropis gigantea	*E. orientalis**
Calotropis procera	*Eotetranychus strychnosi***
Calpurnia aurea	*T lombardinii**
Camellia sp.	*O. coffeae**
Camellia sinensis	*O. coffeae*, *T hydrangeae**, *T urticae*
Campenula medium	*B. praetiosa**
Camphor	*Eotetranychus sexmaculatus** *O. biharensis**, *O. coffeae*
Canabis sativa	*E. orientalis**, *T. urticae*
Canavalia gladiala	*T ludeni**
Capsicum sp.	*T ludeni**
Cardiospermum halicacabum	*T lombardinii**
Carica papaya	*E. orientalis*, *Aponychus sulcatus*, *P. citri*, *T. fijiensis*, *T. hydrangeae**, *T lombardinii**, *T neocaledonicus*, *T· papaya*, *T urticae*.
Carnation	*T. urticae*
Cassava	*O. biharensis*
Cassia sp.	*E. orientalis*
Cassia fistula	*E. orientalis*, *O. biharensis**, *O. mangiferus*
Cassia holosericea	*E. orientalis**, *P. abutiloni**
Cassia occidentalis	*E. orientalis**
Cassia tora	*T neocaledonicus*
Cassytha sp.	*T. urticae**
Cedrella toona	*P. citri**
Ceiba pentandra	*T neocaledonicus**
Celery	*T ludeni**
Celtis africana	*T lombardinii**
Cephalocroton puschelii	*T puschelii*
Ceratopetalum gummiferum	*O. coffeae**
Chaerophyllum sp.·	*B. praetiosa*

Names of Host Plants	Names of Mite Species
Chenopodium album	*P. latens*, *T. urticae*
Chenopodium murale	*T. lombardinii**, *T macfarlanei*, *T. urticae*
Cherry	*B. praetiosa**
Chestnut	*E. hicoriae**
Chloris gayana	*T neocaledonicus**
Chloris incomplata	*S. andropogoni*
Chrysanthemum sp.	*Bryobia eharai*, *B. praetiosa**, *T hypogeae*, *T lombardinii**, *T ludeni**, *T. neocaledonicus*, *T urticae*
Chrysanthemum coronaria	*P. citri*, *P. ulmi*, *T urticae*
Chrysanthemum ellipticum	*T lombardinii*
Chrysanthemum nauseosus	*B. praetiosa**
Chrysanthemum norifolium	*Bryobia eharai*, *E. orientalis**
Cichorium intybus	*E. orientalis**, *T urticae*
Cinchona sp.	*T. neocaledonicus**
Cinevaria lyrata	*P. latens**
Cirsium arvense	*T ludeni**
Citrullus lunatus	*T. lombardinii**, *T. ludeni* *T macfarlanei**
Citrullus vulgaris	*T. ludeni**, *T urticae*, *T truncatus***
Citrullus vulgaris var. *fistulosus*	*T urticae*
Citrus spp.	*Petrobia latens*, *E. africana*, *E. orientalis*, *E. citri*, *P. citri*, *P. ulmi**, *Eotetranychus frosti*, *E. ladakhensis*, *E. pamelae*, *E. mandensis*, *E. sexmaculatus*, *S. hindustanicus*, *O. biharensis**, *O. coffeae*, *O. mangiferus**, *T fijiensis**, *T. hydrangeae**, *T ludeni*, *T. neocaledonicus**, *T urticae*
Citrus aurantium	*E. africananus*, *E. orientalis*, *P citri*, *S. baltazari*, *T. fijiensis*

Names of Host Plants	Names of Mite Species
Citrus limetta	*T neocaledonicus*
Citrus limon	*E. orientalis*, *E. africanus**, *E. sexmaculatus**, *T ludeni**, *T neocaledonicus*
Citrus medica	*E. africanus*, *E. orientalis*
Citrus nobilis	*S. baltazari**
Citrus paradisica	*E. orientalis*
Citrus reticulata	*E. orientalis*, *P. citri**
Citrus sinensis	*E. orientalis*, *Tenuipalponychus citri*, *P. citri**, *E. sexmaculatus**, *T urticae**, *S. baltazari*
Cleome viscosa	*T urticae*
Clerodendron inerme	*T. macfarlanei*
Clover	*T hydrangeae*
Coccinea indica	*T. ludeni*
Cocculus hirsutus	*T lombardinii**
Cocoloba	*P. citri**
Cocos nucifora	*E. orientalis*, *P. citri**, *O. biharensis*, *O. indicus*, *T. fijiensis*, *O. pratensis***, *O. iseilemae*
Coculus trilobus	*P. citri**
Codiaeum variegatum	*T hydrangeae**
Coffea arabica	*O. coffeae*
Colocasia antiquorum	*B. eharai*
Colocasia esculenta	*T. neocaledonicus**
Combretum erythrophyllum	*O. mangiferus**
Combretum paniculatum	*O. mangiferus**
Combretum quadrangulare	*O. coffeae**
Commelina sp.	*T. neocaledonicus*
Commelina africana	*P. latens**
Convolvulus sp.	*T. ludeni*, *T urticae**
Convolvulus arvensis	*P latens*
Convolvulus ulosephalus	*T. lombardinii**

Names of Host Plants	Names of Mite Species
Conyza bonariensis	*T. urticae**
Corbichonia decumbens	*T lombardinii*
Corchorus capsularis	*O. coffeae, T. urticae*
Corchorus olitorius	*O. coffeae, T lombardinii** *T neocaledonicus**, *T urticae*
Corchorus tridens	*T. ludeni**, *T. neocaledonicus**
Cordia utilissima	*E. africanus**
Coriandrum sativum	*T neocaledonicus, T urticae*
Corn	*T hydrangeae**
Cornus sp.	*B. praetiosa**
Cornus nuttalli	*T urticae**
Cosmos sp.	*T ludeni*
Cosmos bipinnatus	*T urticae**
Crataegus monogyna	*B. praetiosa**
Crellia bracteata	*P. citri*
Crinum sp.	*T lombardinii**
Crossandra undulaefolia	*T neocaledonicus*
Crotalaria angyroides	*Tetranychina harti**, *O. coffeae**, *T. urticae*
Crotalaria juncea	*T lombardinii, T neocaledonicus,* *T urticae*
Croton sp.	*E. orientalis, O. coffeae, T lombardinii**, *T. ludeni**, *T. neocaledonicus*
Croton megalobortys	*T neocaledonicus**
Croton rivularis	*T neocaledonicus**
Crotoneaster sp.	*O. mangiferus**, *O. biharensis**
Crotoneaster bacillaris	*B. praetiosa**
Cryptocarya sp.	*E. neoperplexus***
Cryptosperma chamissonis	*T. fijiensis**
Cryptostegia madagascariensi	*E. africanus**
Cucumis melo	*T. ludeni**, *T urticae*
Cucumis metuliformes	*T lombaràinii**

Names of Host Plants	Names of Mite Species
Cucumis pepo	*T. neocaledonicus, T. urticae*
Cucumis sativus	*T ludeni, T. macfarlanei, T. neocaledonicus, T. urticae*
Cucurbita sp.	*T. lombardinii**
Cucurbita maxima	*E. maximae, T angloensis, T. ludeni, T macfarlanei, T. neocaledonicus, T. urticae*
Cucurbita pepo	*B. praetiosa**, *T. ludeni**, *T. macfarlanei*
Cupressus sempervirens	*B. praetiosa**, *P. abutiloni**, *E. orientalis**
Cyclamen sp.	*T. urticae**
Cynodon dactylon	*P. latens, O. indicus, O. oryzae*
Cyperus sp.	*T. neocaledonicus*
Cyphostemma glandulosissionum	*T neocaledonicus**

D

Dacus carota	*T. urticae**
Dahlia sp.	*E. orientalis**, *T. ludeni, T. urticae, T uncatus***
Dahlia pinnata	*E. orientalis**
Dalbergia sissoo	*E. orientalis**
Daphne papyoacea	*B. praetiosa**
Date palm	*O. pratensis***
Datura sp.	*T. lombardinii**, *T. ludeni**
Datura stramonium	*T lombardinii**, *T. ludeni**
Debergeesia hypoleuca	*B. praetiosa**
Debergeesia leucophylla	*P. citri**
Delonix sp.	*O. mangiferus*
Delphinium sp.	*T urticae**
Dianthus sp.	*B. praetiosa**

Names of Host Plants	Names of Mite Species
Dianthus armeria	*T urticae**
Dicanthus caryophyllus	*T ludeni**
Diaspyros sp.	*O. biharensis**
Diaspyros austroafricana	*T. lombardinii*
Diaspyros maritina	*O. biharensis**
Dicanthium annulatus	*S. andropogoni*, *O. indicus*
Dicliptera clinoodea	*B. praetiosa**
Dicentra sp.	*T urticae**
Dielfenchia picla	*T. fijiensis**
Diervilla sp.	*T. urticae**
Dodonaea viscosa	*O. biharensis*, *T neocaledonicus*
Dolichos biflorus	*T. ludeni*, *T. neocaledonicus*
Dolichos lablab	*E. orientalis*, *T. ludeni*, *T. macfarlanei*, *T urticae**
Dolichos lanulatus	*T. neocaledonicus*
Dryopteris sp.	*T. ludeni**
Durio zibethinus	*E. orientalis**, *O. biharensis**

E

Echinochiva crusgallii	*P. latens**
Ehretia macrophylla	*T. hydrangeae**
Eichornia sp.	*E. orientalis*
Eichornia crassipes	*T. ludeni**, *T urticae**
Elaeis guineensis	*O. mangiferus**, *T angloensis**
Elettaria cardamomum	*T. fijiensis*, *T neocaledonicus*
Elm tree	*P. ulmi**
Elusine aegyptica	*O. indicus**
Eragrostris sp.	*T neocaledonicus*

Names of Host Plants	Names of Mite Species
Eragrostris curvula	*P. latens**
Erigeron canadensis	*T urticae**
Erigeron floribundus	*T. ludeni**
Erigeron linifolius	*T. urticae*
Eriobotrya japonica	*E. africanus**, *E. nagai*, *S. tephrosiae*, *O. biharensis*
Eriodendron anfreetuosum	*T urticae**
Eruca sativa	*T. neocaledonicus*, *T. urticae*
Erythrina sp.	*T lombardinii**, *T urticae**
Erythrina indica	*E. orientalis*
Eucalyptus sp.	*O. mangiferus**, *O. oryzae*, *O. punicae*
Eucalyptus globulus	*E. orientalis**
Eucalyptus gomphocephala	*O. coffeae**, *O. mangiferus**
Euclea crispa	*T. ludeni**
Eugenia jambolana	*O. mangiferus**
Eugenia javanica	*O. biharensis**
Euphorbia sp.	*P. abutiloni**, *E. orientalis*, *T. urticae**
Euphorbia geniculata	*T neocaledonicus*
Euphorbia hirta	*T. neocaledonicus*
Euphorbia longana	*O. biharensis**, *O. mangiferus**
Exomis microphylla	*T. lombardinii**

F

Fan palm	*T. neocaledonicus*
Felicia erigeriodes	*T. lombardinii**
Felicia zeyheri	*T. neocaledonicus**
Feronia limonea	*T. neocaledonicus**
Ficus sp.	*P. citri**, *O. biharensis*, *E. africanus**
Ficus burkei	*T. lombardinii**

Names of Host Plants	Names of Mite Species
Ficus carica	*Eutetranychus caricae*, *P. ulmi*, *Eotetranychus fremonti*, *E. hirsti*, *E. irregularis*, *O. mangiferus*, *T. lombardinii**, *T. ludeni**, *T neocaledonicus*
Ficus cunea	*E. orientalis*, *E. hirsti*
Ficus palmata	*B. praetiosa**, *E. orientalis*
Ficus racemosa	*E. hirsti*
Ficus religiosa	*T. hydrangeae**
Flagellaris quineensis	*T. lombardinii**
Forskaolea candida	*B. praetiosa**
Fragaria sp.	*B. praetiosa**, *E. africanus**, *O. mangiferus**, *O. oryzae**, *O. punicae**, *T. urticae**
Fragaria chilensis	*T. ludeni**
Fragaria vesca	*B. praetiosa**, *P. latens**, *T ludeni**, *T. urticae**, *T. turkestani***
Frangipani	*E. orientalis**
Fuchria sp.	*T ludeni**, *T urticae**
Fumeria indica	*B. praetiosa**, *P. latens**,
Fungus	*P. ulmi**

G

Galinsaga parviflora	*T. lombardinii**, *T. ludeni**, *T. urticae**
Gardenia sp.	*T. urticae**
Gardenia florida	*O. mangiferus*
Geigeria passerinoides	*T. ludeni**
Geranium sp.	*T neocaledonicus*
Gerbera sp.	*T. ludeni**

Names of Host Plants	Names of Mite Species
Gerbera jamesoni	*T. lombardinii*, T. ludeni**
Gladiolus sp.	*P. latens*, T. neocaledonicus*
Glycine sp.	*T hydrangeae**
Glycine javanica	*P. citri*, T ludeni**
Glycine max	*T. ludeni*
Glycine soja	*T. hydrangeae, T. lombardinii*, T. macfarlanei, T. neocaledonicus, T urticae*
Glyricedia sp.	*E. orientalis**
Gnaphalium lacteoalbum	*T. urticae**
Gnaphalium pensylvanicum	*Tetranychina harti**
Gnaphalium undulatum	*T. ludeni**
Goniothalmus undulatus	*O. biharensis**
Gooseberry	*P. ulmi**
Gossypium sp.	*O. mangiferus*, T. lombardinii*, T. ludeni*, T. neocaledonicus*, T. urticae**
Gossypium herbaceum	*T lombardinii, T. ludeni*, T. macfarlanei, T. neocaledonicus, T. urticae*
Gossypium herbaceum var. *africanum*	*E. orientalis, O. coffeae, T. lombardinii*, T. ludeni,*
Gossypium hirsutum	*E. orientalis* T. ludeni, T. macfarlanei, T. neocaledonicus, T. urticae**
Grape fruit	*E. orientalis**
Grevillea sp.	*O. coffeae*
Grevillea robusta	*O. coffeae*, O. mangiferus**
Grewia populifolia	*E. orientalis**
Grewia villosa	*E. orientalis**
Grivellia robusta	*O. biharensis*
Gynandropsis gynandra	*E. orientalis**
Gynura crepedioides	*T. neocaledonicus**

Names of Host Plants	Names of Mite Species
H	
Hakea sp.	*O. mangiferus**
Hamelia patens	*E. orientalis**
Hebemtritra cordata	*T. lombardinii**
Hedera helex	*B. praetiosa**
Hedera japonica	*E. orientalis**
Helianthus annuus	*B. praetiosa**, *E. orientalis**, *T. ludeni**, *T. urticae*
Hibiscus guazemaefolia	*E. truncatus***
Helinus integrifolius	*T. lombardinii**
Heliophila deserticola	*P. latens**
Heliotropium carassivicum	*B. praetiosa**
Heliotropium eichwaldi	*T urticae**
Hephelium litchi	*O. thelytokus***
Heteromorpha trifoliata	*T lombardinii**
Hevea sp.	*O. biharensis**
Hevea braziliensis	*T. urticae**
Hewittia sublobata	*T. neocaledonicus**
Hibiscus sp.	*P. ulmi**, *T. ludeni**, *T. macfarlanei**, *T. urticae**
Hibiscus abelmoschus	*O. coffeae**
Hibiscus esculentus	*T. neocaledonicus**
Hibiscus ficulenus	*O. coffeae**
Hibiscus mutabilis	*T. ludeni**
Hibiscus pandaeriformes	*O. coffeae**
Hibiscus physaloides	*T. neocaledonicus**
Hibiscus rosa-sinensis	*E. kankitus*, *Eutetranychus maximae*
Hibiscus syriacum	*T. neocaledonicus**
Hibiscus tiliaceus	*O. biharensis**
Hibiscus vitifolius	*T neocaledonicus**

Names of Host Plants	Names of Mite Species
Hicori	*E. hicoriae**
Hollarhena antidyssentrica	*E. strychnosi***
Hollyhock	*T urticae*
Hop	*T hydrangeae**
Hordeum vulgare	*B. praetiosa**, *P. latens*, *O. oryzae*
Hostundia opposita	*T. lombardinii**
Hydrangea sp.	*T urticae**
Hydrangea hortensia	*T ludeni**
Hydrangea macrophylla	*T. hydrangeae**
Hyparhenia hirta	*P. latens**

I

Ibea creeper	*B. praetiosa**
Iberis amara	*B. praetiosa**
Imperata cylindrica	*P. latens**
Indigofera sp.	*O. coffeae**
Indigofera intybus	*T lombardinii*
Indigofera tinctoria	*B. praetiosa**, *T urticae*
Ipomoea sp.	*E. orientalis**, *T. macfarlanei**, *T. neocaledonicus*, *T. urticae**
Ipomoea arachnosperma	*T. ludeni**, *T. urticae**
Ipomoea batatas	*T. ludeni**, *T. neocaledonicus**, *T. urticae**
Ipomoea carica	*T ludeni**
Ipomoea coscinosperma	*T. lombardinii**, *T. neocaledonicus**
Ipomoea plebeia	*T urticae**
Ipomoea purpurea	*T lombardinii**, *T. ludeni**, *T urticae**
Ipomoea replans	*T macfarlanei*
Iris	*P. latens**, *T. neocaledonicus**

Names of Host Plants	Names of Mite Species
Irisine	*T. urticae*
Iseilema laxum	*O. iseilemae*
Ixia flexuosa	*T lombardinii**

J

Jasminum sp.	*P. citri**, *T. neocaledonicus*
Jasminum grandiflorum	*S. undulatus***
Jasminum nudiflorum	*T lombardinii**
Jasminum sambac	*T ludeni*, *T. urticae*
Jatropha sp.	*T. neocaledonicus**
Jatropha multifida	*E. orientalis**
Juglans sp.	*E. orientalis*, *T urticae**
Juglans ailattifolia	*Eotetranychus uncatus**
Juglans regia	*T. urticae**
Juniperus sp.	*B. praetiosa**
Juniperus chinensis	*O. coffeae**

K

Kanksi weed	*T. urticae*
Kochia indica	*E. orientalis**

L

Lablab niger var. *typicus*	*T ludeni*
Lactuca sp.	*B. praetiosa**
Lactuca sativa	*T. lombardinii**
Lagenaria vulgaris	*T. macfarlanei*, *T neocaledonicus*, *T. urticae*

Names of Host Plants	Names of Mite Species
Lagestroemia indica	*O. mangiferus*
Lagestroemia thorelli	*O. mangiferus*
Laminum purpureum	*T. urticae**
Lantana sp.	*B. praetiosa**, *T. ludeni**
Lantana camara	*E. orientalis**, *T ludeni*, *T. urticae*
Lathyrus odoratus	*E. orientalis**
Lentil	*B. praetiosa**
Leonotis leonotis	*T. ludeni**, *T urticae**
Lepisanthus bengalensis	*O. biharensis**
Lepistemon africanum	*T neocaledonicus**
Leucas martinicensis	*T. lombardinii**, *T. ludeni**
Liliaceae	*B. praetiosa**, *P. latens*
Lippia javanica	*T neocaledonicus**
Lippia rehamannii	*T. puschelii**
Litchi chinensis	*B. praetiosa**, *O. biharensis**, *O. mangiferus*, *O. punicae*
Litsea lacifolia	*O. coffeae*
Livistonia sp.	*T ludeni**
Livistonia chinensis	*T neocaledonicus*
Lobelia sp.	*T. urticae**
Lonicera sp.	*B. praetiosa**, *T. urticae**
Lonicera japonica	*P. ulmi**
Loquat	*B. praetiosa**
Lotus sp.	*T. urticae**
Lucine egypticum	*O. indicus*
Luffa acutangula	*E. orientalis*, *T. ludeni*, *T. neocaledonicus*
Luffa aegyptica	*T. neocaledonicus*, *T. urticae*
Luffa cylindrica	*T. urticae*
Lupinus sp.	*T. ludeni**
Lupinus arborea	*T. urticae**
Lycium europaeum	*B. praetiosa**

Names of Host Plants	Names of Mite Species
Lycopersicum esculentum	*P. ulmi*, *T lombardinii*, *T. ludeni*, *T neocaledonicus*, *T urticae*
Lycium sp.	*T lombardinii*

M

Macaranga bicolour	*O. biharensis**
Macrophylla sp.	*O. coffeae*
Magalis montanum	*O. coffeae**
Magnolia stellata	*T urticae**
Malastoma malaliathricum	*O. coffeae*
Malus formosana	*T. neocaledonicus**
Malus sylvastris	*T urticae**, *B. rubrioculus***
Malva parviflora	*B. praetiosa**, *T. lombardinii* *T. ludeni**, *T urticae**
Malvastrum tricuspidatum	*E. orientalis**
Malyastrume sp.	*P abutiloni**
Mandarin	*P. citri*, *E. kankitus*, *T urticae*
Mangifera indica	*O. biharensis**, *O. coffeae*, *O. mangiferus*, *T. neocaledonicus*, *T. urticae**
Manihot sp.	*E. orientalis**, *T hydrangeae**, *T sayedi**, *T. urticae**
Manihot esculenta	*O. mangiferus**, *T. lombardinii*, *T. neocaledonicus**
Manihot utilissima	*T hydrangeae**
Maple	*E. sexmaculatus**
Maranta sp.	*T hydrangeae**, *T. urticae**
Maytenus cymosus	*T lombardinii*
Medicago sativa	*B. praetiosa**, *P. latens**, *Tetranychina harti**, *T. ludeni**, *T. neocaledonicus*, *T urticae*, *T. turkestani***

Names of Host Plants	Names of Mite Species
Melaleuca sp.	*O. coffeae**
Melia azadirachta	*E. orientalis*, *P. citri**, *O. mangiferus*, *T. hydrangeae**, *T. lombardinii**, *Eutetranychus pantopus***, *S. hindustanicus*
Melilothus indica	*T. urticae*
Melilothus parviflora	*T. neocaledonicus*
Melothria sp.	*T. neocaledonicus**
Mentha sp.	*T. urticae*
Mentha arvensis	*T. urticae*
Mentha citrata	*T. urticae*
Mentha incana	*P. latens**
Mentha piperita	*E. orientalis**, *T. urticae*
Mentha spicata	*T. urticae*
Merrenia tuberosa	*T. lombardinii**
Merrenia vitifolia	*T neocaledonicus**
Mesembryanthemum crystallinum	*T urticae**
Mina lobata	*T. ludeni**, *T. urticae**
Mikania cordata	*S. tephrosiae**
Moghanis sp.	*O. coffeae*
Momordica sp.	*T. ludeni**
Momordica charantia	*T. urticae*
Moringa oleifera	*E. orientalis**, *T. neocaledonicus**
Morus sp.	*E. orientalis**, *E. rohilae*, *T. hydrangeae*, *T. lombardinii**
Morus alba	*E. orientalis*, *P. citri*, *P. ulmi*, *E. suginamensis*, *O. coffeae*, *T. hydrangeae**, *T. neocaledonicus*, *T. urticae*, *E. fremonti*, *T. sayedi*
Morus australis	*P. citri**
Morus jpponica	*P. latens**, *T. urticae**
Moss	*P. ulmi**

Names of Host Plants	Names of Mite Species
Muhlenbergia regins	*S. fluvialis**
Mullongo hirto	*E. orientalis**
Mundulea sericea	*S. tephrosiae**
Muntingia alabura	*E. orientalis**
Murraya koenigii	*S. baltazari*
Murraya paniculata	*E. orientalis**, *P. citri**
Musa sp.	*O. biharensis**, *O. mangiferus**, *T urticae**, *O. oryzae**
Musa acuminata	*T urticae**
Musa paradisica	*O. mangiferus*, *T. urticae*, *T. neocaledonicus**
Musa sapientum	*E. orientalis**, *P. citri*, *O. indicus*, *O. oryzae*, *O. sacchari*, *T. lombardinii**, *T. neocaledonicus**
Mussandra philippica	*T. neocaledonicus**

N

Napier grass	*Mesobryobia jobneri*
Nectarine	*B. praetiosa**
Nelumbo nucifera	*O. indicus**
Nephelium litchi	*O. coffeae**
Nephrolepis exaltata	*T. neocaledonicus**
Nerium indicum	*B. praetiosa**, *P. abutiloni**, *E. orientalis*, *O. coffeae**
Nicotiana sp.	*T. ludeni**
Nicotiana glauca	*T· lombardinii**, *T. neocaledonicus**
Nidorella auriculata	*T lombardinii**
Nuxia congesta	*T. neocaledonicus**

Names of Host Plants	Names of Mite Species
O	
Oak	*E. hicoriae**
Operculina turpethum	*T. macfarlanei*
Ornithogalum sp.	*T urticae**
Ornithopus spp.	*T urticae**
Oryza sativa	*S. andropogoni*, *S. mansoni*, *O. indicus*, *O. manishi*, *O. oryzae*
Oscimum sanctum	*T. neocaledonicus*
Osmanthus sp.	*P. citri**
Oxalis sp.	*P. latens**, *T. urticae**
Oxalis corniculata	*Tetranychina harti*
Oxalis corymbosa	*T harti**
Oxalis iatifolia	*T harti**
Oxalis pilosa	*T. harti**
P	
Pachira macrocarpa	*E. orientalis**, *T neocaledonicus**
Pachalia pinnata	*E. orientalis**
Panichum distachym	*O. indicus*
Panichum javanicum	*O. indicus*
Panichum maximum	*O. tylus***
Parijath	*E. orientalis*
Parrea americana	*E. orientalis**, *O. mangiferus**
Parthenium	*T urticae*
Parthenocissus quinquefolia	*O. coffeae**, *O. mangiferus**
Paspalum dilalatum	*P. latens**, *T. urticae**
Passiflora sp.	*T. lombardinii**, *T urticae**
Passiflora edulis	*B. praetiosa**, *T. lombardinii** *T. ludeni**, *T. neocaledonicus**

Names of Host Plants	Names of Mite Species
Pastinacea sativa	*T ludeni*, T. urticae**
Pecan	*E. hicoriae**
Pelargonium sp.	*B. praetiosa*, T. harti*, T. lombardinii*, T. ludeni*, T urticae**
Pelargonium stelleriana	*T. ludeni**
Pennisetum clandestinum	*T. urticae**
Pennisetum typhoideum	*T. neocaledonicus*
Pentzia suffruticosa	*B. praetiosa* P. latens**
Persea americana	*O. coffeae*, O. oryzae*, O. punicae**
Pergularia daemia	*E. strychnosi***
Peristrophe sp.	*B. praetiosa**
Peristrophe bicalyculata	*B. praetiosa**
Perrea americana	*O. biharensis**
Petunia alba	*P. abutiloni**
Petunia hybrida	*T harti, T. urticae*
Pharbitis hispida	*T. lombardinii**
Phaseolus sp.	*T. afrindicus, T lombardinii*, T hydrangeae*, T ludeni*, T. urticae**
Phaseolus aconitifolius	*T neocaledonicus, T. urticae*
Phaseolus aureus	*T neocaledonicus, T. urticae*
Phaseolus coccineus	*T. urticae**
phaseolus lunatus	*T hydrangeae*, T macfarlanei, T. neocaledonicus, T. urticae*
Phaseolus minima	*T ludeni**
Phaseolus mungo	*T neocaledonicus, T. urticae*
Phaseolus radiatus	*T. neocaledonicus*
Phaseolus vulgaris	*E. phaseoli, T. lombardinii*, T. ludeni*, T neocaledonicus, T. urticae*, T. zaheri*

Names of Host Plants	Names of Mite Species
Phlox carolina	*T. urticae**
Phosphocarpus tetragonolobus	*E. orientalis**
Phyllanthus acid	*T neocaledonicus**
Physalis sp.	*T ludeni**
Physalis minima	*T. urticae**
Physalis peruviana	*T ludeni**
Pinus sp.	*B. praetiosa**
Pinus longifolia	*O. mangiferus*
Pinus wallichiana	*B. praetiosa**
Pisum sativum	*T. neocaledonicus*, *T. urticae*
Pithecellobium dulce	*P citri**, *Porcupinychus abutiloni**
Plantago lanceolata	*T. harti**
Platanus acerifolia	*O. mangiferus**
Plectanthus sp.	*T. puschelii**
Pleuropterus hypoleucus	*O. biharensis**
Plumeria sp.	*O. mangiferus**, *T ludeni** *T. urticae**
Plumeria alba	*E africanus**
Pollichina campestris	*T. lombardinii**
Polyanthea longifolia	*E. orientalis*
Polyanthes sp.	*T. hydrangeae**, *T. urticae**
Polygonum multiflorum	*T. hydrangeae**
Polygonum salicifolium	*T lombardinii**
Pogamia excelsa	*E. orientalis**
Pongamia pinnata	*E. orientalis**
Poplus fremonti	*E. fremonti**
Poplus tremuloides	*E. fremonti**
Postarparagus taricinus	*T. urticae**
Potentilla fruticosa	*T. urticae**
Presosis juliflora	*E. fremonti**
Prosopis spicigera	*P. abutiloni**

Names of Host Plants	Names of Mite Species
Protea compacta	*O. mangiferus**
Protea eximia	*O. mangiferus**
Prunus sp.	*B. praetiosa**, *B. rubrioculus**
Prunus amygdalus	*E. orientalis*
Prunus armeniaca	*P. ulmi*, *T. hydrangeae*, *T ludeni**
Prunus cerasus	*B. praetiosa**, *T. urticae*, *Eotetranychus punicae***
Prunus communis	*B. praetiosa*, *E, orientalis*
Prunus domestica	*B. praetiosa**, *P. ulmi*, *T urticae**, *E. pruni***
Prunus mume	*T. hydrangeae**, *T. neocaledonicus**
Prunus persica	*B. praetiosa**, *E. africanus**, *E. orientalis*, *P. citri*, *P. ulmi*, *E. sexmaculatus*, *O. coffeae*, *O. mangiferus*, *T. fijiensis**, *T hydrangeae*, *T ludeni**, *T neocaledonicus**, *T. urticae*
Prunus triloba	*B. praetiosa**
Pschscholizia california	*B. praetiosa**
Psidium cattleianum	*O. coffeae**
Psidium guajava	*E. orientalis*, *Eotetranychus guajavae*, *E. hicoriae*, *E. asiaticus***, *O. biharensis** *O. mangiferus*, *T. urticae*
Pterocarpus macrocarpus	*E. orientalis**
Pterospermum semisagitatum	*E. africanus**
Ptychosperma macarthuri	*T. fijiensis**
Puerraria javanica	*T. macfarlanei**
Pummelo	*T. fijiensis**
Punica granatum	*E. orientalis**, *O. coffeae**, *O. oryzae**, *O. punicae*, *T. hydrangeae**, *T urticae**

Names of Host Plants	Names of Mite Species
Pynostachys articifolia	*T. lombardinii*
Pyracantha sp.	*E. sexmaculatus*, O. mangiferus*,*
Pyrethrum sp.	*T. ludeni**
Pyrus anygdalus	*B. rubrioculus***
Pyrus communis	*B. praetiosa, E. orientalis, Aponychus corpuzae, P. ulmi, E. communis, E. indicus, E. kankitus, T. fijiensis*, T hydrangeae*, T neocaledonicus*, T urticae**
Pyrus malus	*B. praetiosa*, T. harti*, P citri, E. frosti, E. uncatus*, O. biharensis*, T ludeni*, T. urticae* B. rubrioculus, T. turkestani***
Pyrus pyrifolia	*E. orientalis*, P. citri*, O. biharensis**

Q

Quamochit vulgaris	*T. neocaledonicus*
Quisqualis indica	*O. coffeae*, T. neocaledonicus*
Quercus sp.	*O. mangiferus**

R

Ramphal	*E. orientalis*
Ranunculus sp.	*Aplonobia sphaeralceae*
Ranunculus lactus	*B. praetiosa**
Ranvolfia serrientina	*E. orientalis*
Raphanus sativus	*B. praetiosa*, T. harti*, T. neocaledonicus*, T. urticae*
Raphionaeme sp.	*T. urticae**

Names of Host Plants	Names of Mite Species
Rauwolfia serpentina	*T urticae**
Rebes nigrum	*T. urticae**
Rhamnus virgata	*B. praetiosa**
Rhigozum brevispinosum	*T. lombardinii**
Rhigozum obovatum	*T. lombardinii**
Rhigozum trichotomum	*T lombardinii**
Rhus sp.	*O. mangiferus**
Rhyncosia capitata	*T urticae*
Ribis inerme	*B. praetiosa*
Ricinus communis	*E. africanus**, *E. orientalis*, *O. coffeae*, *O. mangiferus*, *T. lombardinii**, *T. ludeni*, *T macfarlanei*, *T neocaledonicus*, *T urticae*, *Eotetranychus pantopus***
Rosa sp.	*P citri**, *O. biharensis**, *O. mangiferus**, *T urticae**, *E. asiaticus***
Rosa indica	*B. praetiosa*, *E. orientalis*, *P. ulmi*, *E. frosti**, *E. kankitus**, *O. biharensis**, *O. mangiferus*, *T hydrangeae**, *T neocaledonicus*, *T. urticae*
Royal paulonia	*E. sexmaculatus*
Rubber plant	*T. urticae*
Rubus sp.	*T. hydrangeae**, *T ludeni**
Rubus avium	*O. mangiferus**
Rubus lidaeu	*T. urticae**, *E. frosti**
Rubus thunbergii	*T hydrangeae**
Rueilla tuberosa	*T. neocaledonicus**
Ruillia nudiflora	*E. fremonti**
Rumex sp.	*P. letens**, *T. urticae**
Rupalia lappacea	*T lombardinii**

Names of Host Plants	Names of Mite Species
S	
Saccharum aurandinaceum	*O. indicus*
Saccharum munja	*O. indicus*
Saccharum officinarum	*Aponychus bambusae*, *S. andropogoni*, *O. indicus*, *O. sacchari*, *O. saccharinus***
Saccharum spontaneum	*S. andropogoni*
Safflower	*T. urticae**
Salvadora oleoides	*E. orientalis**, *Bakerina aculus**
Salvia sp.	*T. ludeni**
Sambucus sp.	*T. hydrangeae**, *T. urticae**
Santhalum album	*T. neocaledonicus*
Sapindus mukorossi	*O. biharensis**
Sapota	*E. orientalis*
Sarcobatus vermiculatus	*B. praetiosa**
Sarcossa sp.	*B. praetiosa**
Sarkanda	*T. harti*
Schismatoglottis sp.	*E. orientalis**
Schizostachyum lima	*A. corpuzae**
Scolopia mundii	*O. mangiferus**
Sechium	*T. ludeni*, *T. macfarlanei*
Sekarthia palm	*T. fijiensis**
Senebiera didyna	*B. praetiosa**
Senecio sp.	*T. lombardinii**
Senecio angulatus	*O. mangiferus**
Senecio brachellii	*B. praetiosa**
Senecio cineraria	*B. praetiosa**
Senecio inaequidens	*T. ludeni**
Sesamum indicum	*E. orientalis*

Names of Host Plants	Names of Mite Species
Setaria sp.	*O. oryzae*
Shaddock	*E. orientalis*
Shorea robusta	*O. biharensis. T ludeni*
Sida sp.	*P. abutiloni*
Sida chrysantha	*T. puschelii**
Sida cordifolia	*T lombardinii**
Sida rhombifolia	*T ludeni**
Silver oak	*O. biharensis*
Solanum spp.	*T lombardinii**, *T neocaledonicus**
Solanum cafforum	*T lombardinii**
Solanum dulcamara	*B. praetiosa**
Solanum incanum	*T lombardinii**
Solanum indicum	*T neocaledonicus**
Solanum melongena	*T. harti**, *E. africanus*, *E. orientalis**, *O. biharensis*, *T hydrangeae**, *T ludeni*, *T macfarlanei*, *T. neocaledonicus*, *T. sayedi*, *T udaipurensis*, *T. urticae*
Solanum nigrum	*E. orientalis**, *T. hydrangeae**, *T. neocaledonicus**, *T. urticae*
Solanum panduraeforme	*T lombardinii**, *T. neocaledonicus**
Solanum rigencens	*T lombardinii**
Solanum retroflexum	*T. lombardinii**
Solanum rosmarinifolius	*T ludeni**
Solanum sodomaeum	*T. lombardinii**
Solanum tervum	*T neocaledonicus**
Solanum tuberosum	*B. praetiosa**, *T lombardinii** *T. ludeni**, *T. neocaledonicus*, *T. urticae*
Solanum verbascifolium	*T. neocaledonicus**
Sonchus arvensis	*T urticae*
Sonchus oleraceus	*T urticae*

Names of Host Plants	Names of Mite Species
Sorbus domesticus	*E. orientalis**
Sorghum sp.	*T urticae**
Sorghum cafforum	*T urticae**
Sorghum helepense	*O. indicus*
Sorghum vulgare	*P. latens**, *O. indicus*, *O. tylus***, *S. hindustanicus*
Sparmannia africana	*T. lombardinii**, *T ludeni**
Spathodea sp.	*T. lombardinii*
Sphaeralcea ambiqua	*Aplonobia sphaeralceae**
Spheneclea seylanica	*B. praetiosa**,
Spinacea oleracea	*B. praetiosa**, *T ludeni*, *T urticae*
Spirostachys africana	*T. lombardinii**
Squash	*E. orientalis**
Stenotaphrum secundatum	*T. urticae**
Streculia diversiloba	*T urticae**
Strychnos spinosa	*E. strychnosi**
Syzygium cordatum	*O. mangiferus**
Syzygium cumini	*T harti**, *E. syzygii*, *O. coffeae*, *O. mangiferus*
Syzygium jambolana	*E. frosti**
Syzygium jambos	*O. coffeae**

T

Tabernaemontana coronaria	*E. orientalis*
Tagetes erecta	*T. urticae*
Tagetes patula	*T neocaledonicus*
Tagetes tenuifolia	*B. praetiosa**, *E. orientalis**
Tamaryx aphylla	*E. orientalis**
Tapioca	*T neocaledonicus**, *T. urticae*
Taxus baccata	*B. praetiosa**

Names of Host Plants	Names of Mite Species
Technocarpus sp.	*O. thelytokus***
Tectonia grandis	*E. africanus**, *T. neocaledonicus**
Tephrosia striata	*S. tephrosiae**
Terminalia arjuna	*E. orientalis*
Terminalia catappa	*E. orientalis**, *O. mangiferus**, *T hydrangeae**
Tetrachycarpus excelsa	*P. citri**
Tetrapanax papyriforme	*T. ludeni**
Theobroma cacao	*E orientalis**, *O. biharensis*
Therperia sp.	*T ludeni**
Thevetia peruviana	*E. orientalis**
Thuja orientalis	*Bakerina aculus*
Thunbergia gibbsoni	*T neocaledonicus**
Tilia platyphyllos	*E. citri**
Tithonia rotundifolia	*T ludeni**
Tori	*T. ludeni*
Trachonanthus camphoratus	*T ludeni**
Trianthema monogyne	*E. orientalis**
Trichilia olregeama	*O. mangiferus**
Trichilia emetica	*O. mangiferus**
Tridax procambens	*T urticae*
Trifolium sp.	*B. praeti osa**, *P. lateus*, *T hydrangeae **, *T urticae**
Trifolium hybridum	*T urticae**
Trifolium pralense	*T urticae**
Trifolium repe ns	*T ludeni**, *T urticae**
Trislana conferta	*O. coffeae **
Triticum aestivum	*B. praetiosa**, *P. latens*, *P. ulmi*
Triumfetta mhomboidea	*T ludeni**
Tropaeolum mapus	*T urticae**
Trumphetta neglecta	*O. coffeae**

Names of Host Plants	Names of Mite Species
Turmeric	*T. urticae*
Tynospora frugosum	*T. lombardinii**, *T urticae**

U

Ulnus procera	*T ludeni**
Undet. spp. of grass	*B. praetiosa**, *Monocernonychus terpoghossiani*, *Neopetrobia simlaensis*, *P. latens**, *E. orientalis**, *O. pratensis***, *O. iseilemae*, *O. oryzae*,
Undet. spp. of orchid	*O. sacchari**
Undet. plant	*T. puschelii*, *Eotetranychus ranikhetensis*, *Eutetranychus pantopus*
Urena lobata	*O. coffeae*

V

Vangueria edulis	*T. neocaledonicus**
Venda teres	*T. urticae**
Verbascum thapsus	*B. praetiosa**
Verbena sp.	*T. ludeni**, *T urticae**
Verbena bonariensis	*E. orientalis**, *T ludeni**
Verbena hortensis	*T. hydrangeae**
Verbena officinalis	*T urticae**
Verbena phlogiflora	*T hydrangeae**
Verbena venosa	*T ludeni**
Vernonia sp.	*T. neocaledonicus**
Viburnum sp.	*T urticae**

Names of Host Plants	Names of Mite Species
Viburnum opulis	*T urticae**
Vicia sp.	*T urticae**
Vigna cylindrica	*E. orientalis**
Vigna radiata	*T ludeni*
Vigna sinensis	*T ludeni, T neocaledonicus, T. urticae*
Vigna ungulata	*T. ludeni*
Viola sp.	*T. urticae**, *Tetranychina harti*
Vicia hirsuta	*P. latens*
Virnonia ampla	*T lombardinii**
Vitis sp.	*T ludeni**, *T urticae**
Vitis labrasca	*E. africanus**
Vitis vinifera	*B. praetiosa**, *E. orientalis**, *P. citri**, *O. biharensis**, *O. coffeae**, *O. mangiferus*, *O. oryzae**, *O. punicae*, *O. vitis*, *E. asiaticus***, *E. truncatus***, *T hydrangeae**, *T. ludeni**, *T. neocaledonicus*, *T urticae*

W

Wahlenbergea undulata	*T lombardinii**
Walnut	*P. ulmi*
Willow	*E. populi**, *E weldoni***
Wistaria sp.	*T. urticae**
Withania somnifera	*E. orientalis**, *T lombardinii**, *T urticae*
Wonder bean	*T. ludeni**

X

Xanthium spinosum	*T. ludeni**
Xanthium strumarium	*T. lombardinii**, *T. urticae*

Z

Zantedeschia aethiopica	*B. praetiosa**
Zea mays	*P. latens*, *E. orientalis*, *O. indicus**, *T neocaledonicus** *T urticae**, *O. pratensis***
Zinia sp.	*S. andropogoni*, *T. ludeni**
Zizyphus sp.	*Eotetranychus bilobatus*, *Eotetranychus rajouriensis*
Zizyphus combodiana	*O. biharensis**
Zizyphus mauritiana	*E. maximae*, *B. praetiosa** *E. orientalis*, *E. mandensis*, *E. irregularis*
Zizyphus jujuba	*E. fremonti**
Zizyphus oenoplia	*E. rajouriensis*