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Further observations on the Cheyletidae (Acari), with a key to the genera of the Cheyletinae and a list of all known species in the family

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Summary

A revised key to separate the subfamilies of the family Cheyletidae is provided and the subfamily Chelonotinae is newly defined. The genera of the Cheyletidae are defined, their habitats noted, and all known species are listed. A key to separate the genera of the Cheyletinae is presented. Problems relating to some of the genera are discussed but no new taxa are proposed.

Introduction

The family Cheyletidae LEACH, 1815, may roughly be separated into two assemblages, the free living predators and the animal associates, of which many are parasites. Although the dividing line between these groups is indeterminate, the obviously parasitic taxa can be recognized by bizarre modifications to their mouthparts and legs and by their reduced, or enhanced, setation (hypotrichy or neotrichy). Animal-associated species occur on birds, mammals or arthropods, and may damage birds, cats and dogs. Further, some induce allergies and papular dermatitis in humans (BRONSWIJK and DE KREEK, 1976; KEH *et al.*, 1987). Most parasitic, highly-derived forms have been assigned to seven subfamilies (FAIN *et al.*, 1997). The predatory forms possess a more generalized body. They occur on plants, in the soil, in stored products and vertebrate nests, feeding on many mites and small insects. A few cheyletids are considered to be biological control agents, and one, *Cheyletus eruditus* (SCHRANK), is being used in commerce (GERSON and SMILEY, 1990). The Cheyletidae are cosmopolitan in distribution.

The modern taxonomic edifice of the Cheyletidae has been erected by BAKER (1949), VOLGIN (1969; English translation, 1987), and by SUMMERS and PRICE (1970). This robust construct, broadened and deepened during the intervening years, has remained vigorous to this day. SUMMERS and PRICE (1970) counted ca 50 genera and close to 190 species in the family; the total has since risen to about 75 genera and to more than 400 species. Of special note are the dozen vertebrate-associated genera described by FAIN (for their revision, see FAIN *et al.*, 1997). Several regional treatments [TSENG (1977) for Formosa; CORPUZ-RAROS (1988 and former papers) for the Philippines; GERSON (1994) for Australia] were published. However, no recent revisions or summations of the family are at hand, nor is a key to all described genera available to interested students. Furthermore, the relevant literature is scattered in many, sometimes hard-to-get periodicals, placing yet another onus on the students. In a previous paper (FAIN *et al.*, 1997) we studied the solenidiotaxy and chaetotaxy of the Cheyletidae and provided a key to its eight subfamilies. We also revised seven of these subfamilies and included keys to all their genera. The present paper deals with the largest subfamily, the Cheyletinae, includes brief diagnoses of all genera and provides a key for them. We also list all species in the family.

SUMMERS and PRICE (1970) remarked on the large number of monospecific genera in the family, believing that this may reflect on the small sample of the world cheyletid fauna which had been collected. Their hypothesis is strongly supported by two developments. Additional species in many of those genera are now known, and most of the genera described in the intervening period are monospecific. Many of those genera were collected off vertebrates, suggesting that their unique body forms may represent specific adaptations. Most radiation, however, seems to have taken place in the less specialized genera, e.g. *Cheyletus* with over 65 named species, *Hemicheyletia* with ca 35.

The Cheyletidae are best recognized by their fused chelicerae and the robust gnathosoma with a palpal thumb-claw complex (Fig 1a). The palpal tarsus often carries two comb-like (Fig 1b) and/or two sickle-like setae as well as a minute solenidion (Fig 1c). The palptibial claws (with or without teeth) are usually oriented horizontally. The palpfemur is the largest segment and is elbowed in midsection. The segmented peritremes are located on the stylophore; their individual segments are called links. SUMMERS and PRICE (1970) named the region behind the peritremes "tegmen" and the area in front of them "protegmen" (Figs 1a and 35). The dorsum of the Cheyletidae may, or may not, carry a pair of anterior eyes (Figs 27a; 31; 45b). The dorsum is usually covered by one or more plates or shields (Fig 1a), which bear setae showing a bewildering diversity of form. Some are sim-

ple, slender (Fig 16b; 17; 21; 23), others are lanceolate or spatulate (Fig 1a); sometimes they occur in the shape of fans (fan-like or shell-like, Figs 12; 14; 28; 51), some appear squamiform (Figs 26 and 55), and there may also be setae which look like the horns of stags (Figs 15, 49 and 53). In most cases the shape of the dorsal setae is relatively uniform for each species, although they may be heteromorphic or dissimilar (Figs 15; 26; 48). Tarsus I carries a solenidion (ωI) which is often accompanied by a guard seta (Fig 1e). Solenidia (without guard setae and much reduced in size) also occur on tarsus II; tibiae I and II (φ), and at least on genu I (σ). In some genera of Cheyletinae the males carry an additional large solenidion (ω) on tarsi III and IV. Most species bear claws and/or empodia on their tarsi (Fig 1a); exceptions to this rule are of major taxonomic importance (Figs 51 and 52). The aedeagus is usually posteroventral, sometimes dorsal in parasitic species. As noted, the vertebrate-associated genera may show considerable divergence from this generalized scheme.

Many problems remain for future students. SUMMERS and PRICE (1970) noted the difficulties of assigning appropriate signatures to the dorsal setae. This stems from the considerable neotrichy prevalent in many species. GERSON (1994), SMILEY (1996) and CORPUZ-RAROS (1998) tried to apply the segmentally-based setal system proposed by KETHLEY (1990). However, it is not fully satisfactory (especially with neotrichous taxa) and was abandoned in favor of the former system developed by FAIN (1979d); The reader is referred to FAIN *et al.* (1997) for details of the system's application to the cheyletid subfamilies. Although this system of signatures is used in the present contribution, we believe that a thorough study of the cheyletid setal homology, as it developes through the immature stages, should be conducted. Another confounding problem is the occurrence of two forms of males in several cheyletids, especially in the genus *Cheyletus*. These are the homeomorph, similar to the female, and the heteromorph, which may be dissimilar. The latter possesses strongly elongated palpi within its greatly expanded mouthparts and seems to have a more sclerotized body. REGEV (1974) argued that the aspect of the heteromorphic male in *Cheyletus malaccensis* OUDEMANS resulted from a post-ecdysis developmental anomaly, manifested as variable palpfemur expansion. One of us (A.F.) has observed heteromorphic males of different sizes in the same habitat, suggesting continuous elongation and growth after ecdysis, including modifications of the gnathosoma. The matter becomes of systematic interest because several species (e.g. *Cheyletus intrepidus* OUDEMANS; *C. truculentus* VOLGIN and others) are known only as heteromorphic males. A different variation occurs in the male of *Chelacaropsis moorei* BAKER, which bears a hysteronotal shield, that is absent in the female (Fig. 22c) (LEKPRAYOON and SMILEY, 1986).

One of us (A.F.) recently obtained and examined the type specimens of *Dubininiola polylepis* VOLGIN, formerly known only from VOLGIN's brief 1969 description, and of *Thewkachela ratufi* IDE and KETHLEY. This enables us to present the first-ever figure of *D. polylepis* (Fig. 45) and to provide additional data on both genera. *Dubininiola* has well-developed eyes. The peritremes are slightly arched, with four links on each side. All tarsi carry a unique, large and setulose, branched seta and two claws, those on leg I are minute. There are five pairs of delicately-setose genital setae, two pairs of similar anal setae, and two extra pairs of apparently-neotrichous, post-anal, squamate setae. *Thewkachela* (formerly placed in the subfamily Chelonotinae, along with *Chelonotus, Muricheyla* and *Promuricheyla*) is similar to the latter two genera , but differs from both by lacking strong dorsal triangular processes on tarsi III-IV. This examination lead us to restrict the Chelonotinae to *Chelonotus* and to place the other three genera, temporarily, in the Cheyletinae. Additional problematic genera (*Atarsacheylus, Cheletoides* and *Metacheletoides*) are also keyed out with the Cheyletinae. Other problems, restricted to specific genera, will be discussed in their appropriate context.

We begin by providing a key to the subfamilies of the Cheyletidae, slightly revised from FAIN *et al.* (1997). Only females are considered in these keys, because males are relatively rare and due to the dimorphism noted above. The importance of character-states like the shape of the dorsal setae and the presence/absence of dorsal shields for female systematics thus detracts from their application to the males.

Each genus and its habitat are then briefly characterized in standard terms and figured, and a list of all its named species is added. Genera and their species are arranged in alphabetical order. It must be emphasized that the present contribution is not intended to be a revision of the family, and we have abstained from making any formal changes (although pertinent suggestions were added). This paper is intended to be a "stocktaking" of the family Cheyletidae, as currently known. We deem this contribution to be a scaffold, compiled in order to encourage future work.

Key to the subfamilies of the family Cheyletidae (*)

1. Body with four pairs of well-developed legs . . . 2
   - Body with three pairs of well-developed legs; legs IV vestigial or absent . . . . . Metacheyletiinae FAIN; only one genus, *Metacheyletia* FAIN (Fig. 65)
2. (1) Tarsi II with paired claws and rayed empodia; tarsi III and IV either with claws and rayed empodia or with empodia only; tarsus I with or without paired claws and empodia; tibia I with solenidion φ (except *Apodicheles*, which lacks this seta) 3
   - Tarsi I-IV without claws but with feather-like empodia; tibia I without solenidion φ . . . . . Cheyletiellinae VOLGIN (Figs 76-78)
3. (2) Tarsi IV with paired claws and rayed empodia; dorsum with or without one or two median shields; idiosoma distally without lobe-like projections . . 4

- Tarsi IV with empodia but without claws; dorsum with three median shields; idiosoma distally with lobe-like projections ..... Teinocheylinae FAIN; only one genus, *Teinocheylus* FAIN (Fig. 63)

4. (3) Idiosoma without contiguous dorsal shields covering or overlapping part of the ventral hysterosoma 5
- Idiosoma with very large contiguous dorsal shields covering or overlapping part of the ventral hysterosoma ..... Chelonotinae VOLGIN; only one genus, *Chelonotus* BERLESE (Fig. 64)

5. (4) Gnathosoma modified, with ventral basal hooks and/or lateral hooks on palpal segments, or palpal segments reduced; solenidion σI on genu I replaced by a stellate seta 6
- Gnathosoma unmodified; without basal hooks (except in *Apodicheles*, Ornithocheyletiinae, which has ventral hooks at the base of the gnathosoma); palpal segments normal, never reduced; genu I with solenidion σl 7

6. (5) Gnathosoma with very large lateral hook-like processes; palpi small, narrow, their tibiae and tarsi fused, forming a short segment with a thick comb-like seta; idiosoma and legs without processes; dorsum without neotrichial setae .... Criokerontinae SMILEY; only one genus, *Criokeron* VOLGIN (Fig. 79)
- Gnathosoma not as above; palpal tibial claw strongly hooked; without comb-like setae; palpi, idiosoma and legs with processes; dorsum may bear neotrichial setae ..... Niheliinae SMILEY (Figs 72-75)

7. (5) Gnathosoma poorly developed, but palpal claw strongly curved; no comb-like setae and/or eyes ..... Ornithocheyletiinae SMILEY (Figs 66-71)
- Gnathosoma well developed; palpal claw at most moderately curved, often with comb-like setae and/or eyes ..... Cheyletinae VOLGIN

(*) The genera *Alliea* YUNKER (Fig. 19) and *Thryonomycheyla* FAIN were excluded from the above and the following keys. The former because only a male (for both *A. laruei* YUNKER and *A. prasadi* CORPUZ-RAROS) and an incomplete female (without gnathosoma, for *A. laruei*) were available, the latter because the female is unknown.

Subfamily Cheyletinae FAIN

The Cheyletinae is the largest subfamily in the family Cheyletidae. Its members occur on plants, in the soil, in bee hives, in the nests of rodents and birds, on the bodies of arthropods and commonly occur in stored food. The following key was constructed only to facilitate the separation of the genera, and does not reflect any perceived relationships.

1. With one pair of eyes 18
- Without eyes 2

2. (1) Palpal tarsus with 1-2 comb-like setae 5
- Palpal tarsus without comblike setae 3

3. (2) Palpal claw with teeth; body ovoid; dorsum with one dorsal median shield and several ultralong setae 4
- Palpal claw edentate; body fusiform; without dorsal median shields, without ultralong setae ..... *Atarsacheylus* THEWKE (Fig. 17)

4. (3) Palpal claw with a single tooth; palpal tarsus with a single stiff seta bearing vestigial teeth ..... *Cheletoides* OUDEMANS (Figs 3-4)
- Palpal claw with 2-7 basal teeth; stiff seta on palpal tarsus without vestigial teeth ..... *Metacheletoides* FAIN (Fig. 2)

5. (2) Tarsi III-IV without strong dorsal triangular processes 7
- Tarsi III-IV with strong dorsal triangular processes 6

6. Palpal tarsus with 1 comb-like seta ..... *Muricheyla* FAIN (Fig. 10)
- Palpal tarsus with 2 comb-like setae ..... *Promuricheyla* FAIN (Fig. 9)

7. (5) Palpal tarsus with 2 comb-like setae 13
- Palpal tarsus with 1 comb-like seta 8

8. (7) Coxae I-II without lateral or posterior lobes . 9
- Coxae I-II with lateral or posterior lobes ..... *Thewkachela* IDE and KETHLEY (Fig. 8)

9. (8) Dorsum with a propodosomal and a hysterosomal shield 11
- Dorsum with only with a propodosomal shield 10

10. (9) Coxae III and IV separated; solenidion ω1 lacking ..... *Eucheletopsis* VOLGIN (Fig. 5)
- Coxae III and IV contiguous; solenidion ω1 present ..... *Cheletopsis* OUDEMANS (Fig. 6)

11. (9) Hysteronotal shield large, on entire hysteronotum, bearing regular and neotrichous setae ... 12
- Hysteronotal shield small, restricted to suranal area, bearing only 2 pairs of slender setae ..... *Cheletosoma* OUDEMANS (Fig. 7)

12. (11) Lateral and median dorsal setae dissimilar; anus ventral; inner comb-like seta of palpal tarsus replaced by a small spiculate seta ..... *Camincheyletus* SMILEY and WHITAKER (Fig. 13)
- All dorsal setae similar; anus on a caudal lobe; inner comb-like seta of palpal tarsus replaced by a small smooth seta ..... *Caudacheles* GERSON (Fig. 14)

13. (7) Body ovoid, peritremes arched forward or with short transverse arms, curving and descending backwards 14
- Body elongated, peritremes M-shaped ..... *Bak* YUNKER (Fig. 18)

14. (13) Dorsum with 2 shields, one on propodosoma, other on hysterosoma, peritremes arched or with short transverse links 15
- Dorsum with only 1 shield, on propodosoma; peritremes not arched but with short transverse links ..... *Cheletonella* WOMERSLEY (Fig. 11)

15. (14) Tarsus I with claws; palpal claw with at least 1 tooth, peritremes not arched forward, with short transverse links, descending backwards 16
- Tarsus I without claws; palpal claws toothless; peritremes arched forward, curving backwards ... . *Eutogenes* BAKER (Fig. 12)
16. (15) Peritremes M-shaped or forming an inverted U; lateral dorsal setae slender to narrowly-spatulate 17
- Peritremes usually with 3 short transverse links; lateral dorsal setae fan-like .... *Eucheyletia* BAKER (Fig. 15)
17. (16) Posterior peritremal link abruply bent inwards; tibial claw with 4-7 teeth .... *Hylopecheyla* FAIN (Fig. 16)
- Posterior peritremal link not abruply bent turned inwards; tibial claw with 1-4 teeth .... *Cheyletus* LATREILLE (Fig. 1)
18. (1) Palpal tarsus with 2 comb-like setae 29
- Palpal tarsus with 1 comb-like seta 19
19. (18) Dorsum with at least 1 shield 21
- Dorsum without shields, entirely striated ... 20
20. (19) Body ovoid, coxae II and III separated by less than body width .... *Chelachecaropsis* ATTIAH (Fig. 20)
- Body fusiform, coxae II and III separated by about body width .... *Chelacheles* BAKER (*) (Fig. 21)
21. (19) Dorsum with propodosomal and hysteronotal shields 22
- Dorsum only with a propodosomal shield .... *Chelacaropsis* BAKER (Fig. 22)
22. (21) Median hysteronotal shield large, bears several setae 24
- Median hysteronotal shield small, without setae 23
23. (22) Dorsal setae spatulate to fan-like; humerals similar to other dorsal setae .... *Cheletonata* WOMERSLEY (Fig. 25)
- Dorsal setae slender; humeral setae ultralong ... . *Paracaropsis* VOLGIN (Fig. 23)
24. (22) All tarsi with empodia and claws 25
- All tarsi with empodia but without claws .... *Paramicrocheyla* OLIVIER and THERON (Fig. 28)
25. (24) Body ovoid, coxae II and III separated by less than body width 26
- Body fusiform, coxae II and III separated by more than body width .... *Neochelacheles* SMILEY and WILLIAMS (Fig. 27)
26. (25) Claws on legs II-IV with smooth hooks .. 27
- Claws on legs II-IV with a basal process .... *Neoacaropsis* VOLGIN (Fig. 24)
27. (26) Claws on all tarsi of regular size; dorsal lateral and median setae similar 28
- Claws on all tarsi minute or absent; dorsal and lateral setae dissimilar .... *Microcheyla* VOLGIN (Fig. 26)
28. (27) Humeral setae similar to dorsal setae .... *Acaropsella* VOLGIN (Fig. 30)
- Humeral setae ultralong .... *Acaropsellina* SUMMERS (Fig. 29)
29. (18) Dorsum with at least one shield 30
- Dorsum without shields .... *Chelacheles* BAKER (*) (Fig. 21)
30. (29) Dorsum with 2 or 3 shields 32
- Dorsum with 1 shield 31
31. (30) Palpal claw toothed only along basal half; dorsal setae mostly rodlike .... *Philippicheyla* CORPUZ-RAROS (Fig. 31)
- Palpal claw toothed along entire inner margin; dorsal setae mostly fanlike .... *Cheletacarus* VOLGIN (Fig. 32)
32. (30) Dorsum with 2 shields 36
- Dorsum with 3 shields 33
33. (32) Palpal claw toothed 34
- Palpal claw edentate .... *Aegyptocheyla* YOUSEF (Fig. 33)
34. (33) Each hysteronotal shield with 1-2 setae .. 35
- Each hysteronotal shield with 5-7 setae .... *Oudemansicheyla* VOLGIN (Fig. 34)
35. (34) All tarsi with long solenidia (subequal in length to segment) .... *Paracheyletiella* KUZNETZOV (Fig. 36)
- Only tarsi I-II with solenidia; if solenidia present on tarsi II-IV, then shorter than width of segment . ..... *Cheletomimus* OUDEMANS (Fig. 35)
36. (32) Palpal claw with 1 or more teeth 40
- Palpal claw edentate 37
37. (36) With sickle-like setae; median dorsal setae similar to lateral setae 38
- Without sickle-like setae; median dorsal setae dissimilar to lateral setae .... *Columbicheyla* THEWKE and ENNS (Fig. 37)
38. (37) Leg I with claws 39
- Leg I without claws .... *Chiapacheylus* DE LEON (Fig. 38)
39. (38) Dorsal body and tegmen with coarse reticulation ..... *Ker* MUMA (Fig. 40)
- Dorsal body and tegmen without reticulation ... . *Pavlovskicheyla* VOLGIN (Fig. 39)
40. (36) Palpal claw with more than 3 teeth 46
- Palpal claw with 1-3 teeth 41
41. (40) Leg I shorter (ca 70%) than idiosoma ... 43
- Leg I as long as idiosoma or longer 42
42. (41) Dorsal shields separated; claws on leg I minute or absent .... *Cheletomorpha* OUDEMANS (Fig. 41)
- Dorsal shields indeterminately separated; claws on leg I normal ..... *Nodele* MUMA (Fig. 42)
43. (41) Hysteronotal shield covers most of hysterosoma; peritremes forming an inverted U 44
- Hysteronotal shield confined to opisthosomal region; peritremes M-shaped .... *Cheletophyes* OUDEMANS (Fig. 43)
44. (43) With a single large basal tooth on palpal claw 45
- With 2 basal teeth on palpal claw .... *Polycheyletus* VAIVANIJKUL (Fig. 44)

45. (44) Dorsum with up to 21 pairs of setae; median dorsal and lateral setae dissimilar ..... *Hoffmannita* PELAEZ (Fig. 48)
- Dorsum with more than 30 pairs of setae; dorsal median and lateral setae similar ..... *Dubininiola* VOLGIN (Fig. 45)

46. (40) Gnathosoma not overhung by propodosoma 47
- Gnathosoma partly covered by overhanging propodosoma ..... *Samsinakia* VOLGIN (Fig. 46)

47. (46) Inner sickle-like seta on palpal tarsus normal, seta-like 49
- Inner sickle-like seta on palpal tarsus inflated 48

48. (47) Posterior links of peritremes straight, devoid of vesicular chamber ..... *Neoeucheyla* RADFORD (Fig. 52)
- Posterior links of peritremes straight or looped, terminating at vesicular chambers ..... *Cunliffella* VOLGIN (Fig. 47)

49. (47) Claws on leg I normal, similar to claws on other legs 53
- Claws on leg I either minute, smaller than other claws, or absent 50

50. (49) Claws on leg I minute 52
- Claws on leg I absent 51

51. (50) Tarsus I with 2 conspicuous terminal setae ..... *Cheletogenes* OUDEMANS (Fig. 51)
- Tarsus I with 4 conspicuous terminal setae ..... *Prosocheyla* VOLGIN (Fig. 50)

52. (50) Leg I shorter (ca 70%) than idiosoma ..... *Paracheyletia* VOLGIN (Fig. 49)
- Leg I as long as idiosoma or longer ..... *Mexecheles* DE LEON (Fig. 53)

53. (49) All anterior prodorsal setae similar 54
- Anterior prodorsal setae dissimilar ..... *Grallacheles* DE LEON (Fig. 54)

54. (53) Dorsal lateral setae similar to dorsal median setae 56
- Dorsal lateral setae dissimilar to dorsal median setae 55

55. (54) Palpal claw toothed only along basal half ..... *Hypopicheyla* VOLGIN (Fig. 55)
- Palpal claw toothed along entire length ..... *Cheyletia* HALLER (Fig. 56)

56. (54) Leg I shorter than idiosoma (ca 70%); no concentric striae around dorsal setae 57
- Leg I as long as idiosoma; some dorsal setae surrounded by concentric striae ..... *Cheletophanes* OUDEMANS (Fig. 57)

57. (56) Hysterosoma rounded posteriorly 58
- Hysterosoma tapering posteriorly ..... *Lepidocheyla* VOLGIN (Fig. 58)

58. (57) Anus not placed on a caudal lobe 59
- Anus placed on a caudal lobe ..... *Anthribicheyla* THEWKE (Fig. 59)

59. (58) Peritremes forming an inverted U 60
- Peritremes M-shaped ..... *Tutacheyla* CORPUZ-RAROS (Fig. 60)

60. (59) Dorsal setae mostly fan-like; humeral setae on dorsum ..... *Hemicheyletia* VOLGIN (Fig. 61)
- Dorsal setae rod-like; humeral setae on pleuroventrally displaced platelets ..... *Laeliocheyletia* SUMMERS and PRICE (Fig. 62)

(*) Due to different definitions of *Chelacheles*, the genus is keyed out twice; see remarks to this genus.

The genera and species of the Cheyletidae (*species of uncertain standing; subspecies not listed)

Genus *Acaropsella* VOLGIN 1962

Type species: *Neoacaropsis rohdendorfi* VOLGIN 1962

Diagnosis: Eyes present; palpal tarsus with 1 comb-like seta and 2 sickle-like setae; palpal claw with more than 3 teeth; peritremes with at least 3 links; body ovoid; dorsum with a propodosomal and a hysteronotal shield, both with lanceolate setae; humerals similar; legs II and III separated by less than body width; all legs shorter than body; all tarsi with smooth claws and empodia.

Other species
A. aegyptiaca (WAFA and SOLIMAN) 1968
A. filipina CORPUZ-RAROS 1988
A. kinshasensis FAIN 1972
A. konoi TSENG 1977
A. kulagini (RHODENDORF) 1940
A. nobilis RASOOL *et al.*, 1980
A. schmidtmanni PRICE 1972
A. volgini (GERSON) 1967

Habitat: Stored products, bird nests, soil. Cosmopolitan.

Genus *Acaropsellina* SUMMERS 1976 (= *Acaropsis* MOQUIN-TANDON 1862)

Type species: *Acaropsis* sollers RHODENDORF 1940

Diagnosis: Eyes present; palpal tarsus with 1 comb-like seta and 2 sickle-like setae; palpal claw with more than 3 teeth; peritremes with more than 3 links; body ovoid; dorsum with a propodosomal and a hysteronotal shield, both with slender to spatulate setae; humeral setae ultralong, slender; legs II and III separated by less than body width; all legs shorter than body; all tarsi with smooth claws and empodia.

Other species
A. anarsia SUMMERS 1976
A. clamo QAYYUM and CHAUDHRI* 1979
A. docta (BERLESE) 1886

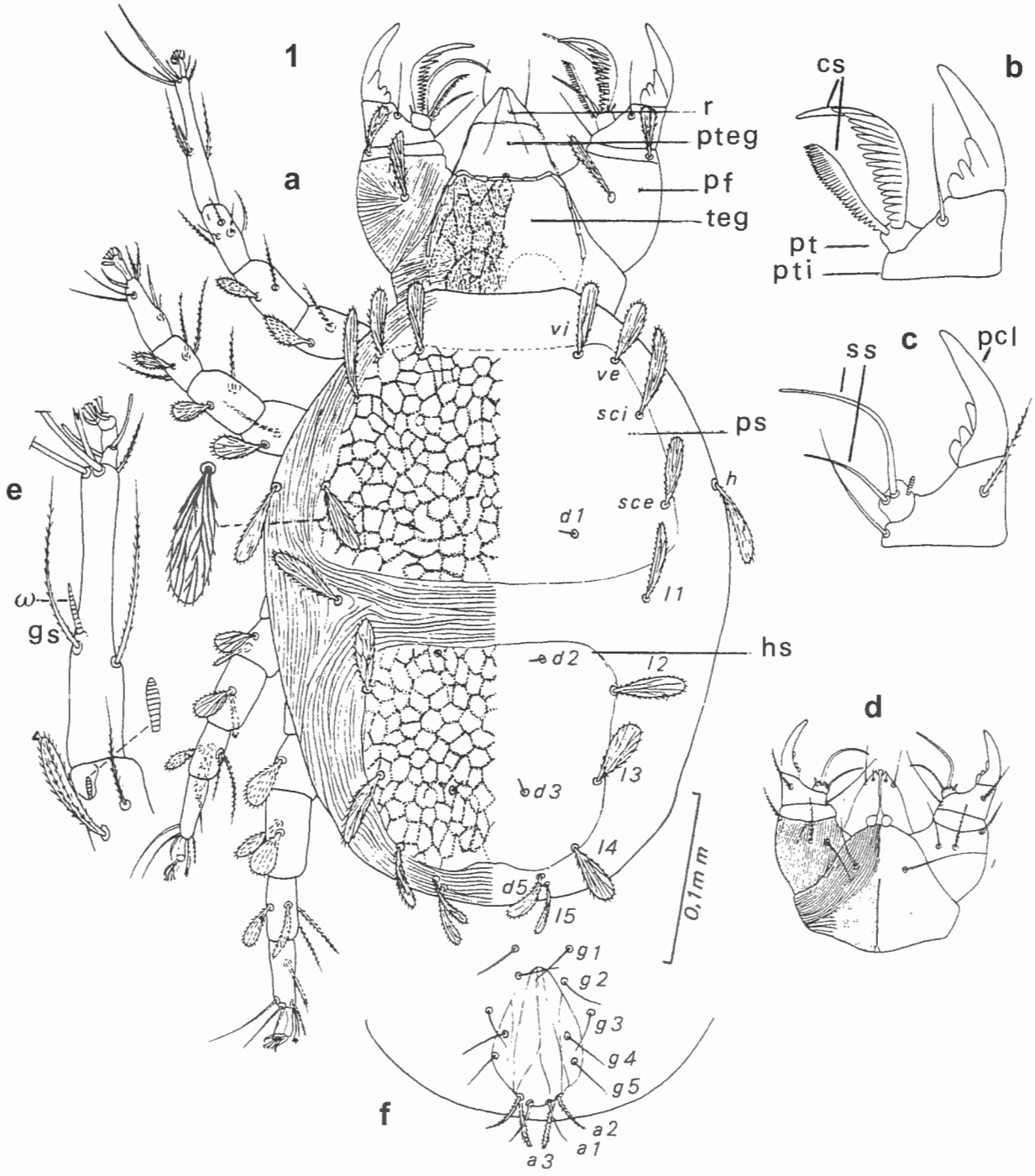


Fig. 1 — *Cheyletus misonnei* FAIN and LUKOSCHUS. Female, dorsum (a); palpal tarsus and tibia, dorsal (b) and ventral (c); gnathosoma, ventral (d); tarsus I, dorso-lateral (e); genito-anal region (f). Abbreviations: proponotal shield (ps); hysteronotal shield (hs); palpal tarsus (pt); palpal tibia (pti); comb-like setae (cs); palpal claw (pcl); sickle-like setae (ss); tegmen (teg); protegmen (pteg); palpal femur (pf); rostrum (r); solenidion *omega* of tarsus I: (ω); guard seta (gs) (from FAIN and LUKOSCHUS, 1981a).

A. opsis RASOOL *et al.*,* 1980
A. orbis QAYYUM and CHAUDHRI* 1979
A. philippinensis (CORPUZ-RAROS and SOTTO) 1977
A. platessa AHEER *et al.*,* 1991
A. porta QAYYUM and CHAUDHRI* 1979
A. shorkotiensis AKBAR, *et al.** 1988
A. summersi SMILEY and WHITAKER 1981
A. tyrophagus ELBADRY* 1969
A. vitrus AHEER, AKBAR and CHAUDHRI* 1991

Habitat: Stored products, plants, flying squirrels (*Glaucomys*). Cosmopolitan.

Genus *Aegyptocheyla* YOUSEF 1978

Type species: *Aegyptocheyla summersi* YOUSEF 1978

Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw edentate; peritremes with more than 3 links; body ovoid; dorsum with a single propodosomal shield and a pair of hysteronotal shields, placed side-by-side, all with fan-like setae; humerals alike; legs II and III separated by less than body width; all legs shorter than body; all tarsi with smooth claws and empodia.

Habitat: Plant. Egypt.

Genus *Alliea* YUNKER 1960

Type species: *Alliea laruei* YUNKER 1960

Diagnosis: Eyes absent; gnathosoma not seen; body ovoid, dorsum with large propodosomal and hysteronotal shields, each bearing 16 pairs of squamatiform or fan-like setae; humerals similar; legs II and III separated by less than body width; all legs shorter than body; all tarsi with smooth claws and empodia, claws on tarsus I slightly smaller.

Habitat: Rats, stored food. U.S.A., The Philippines.

Other species
A. prasadi CORPUZ-RAROS 1998

Remarks: The above diagnosis is based only on a single damaged female specimen, and the lack of the gnathosoma did not allow us to place this genus in the key. Nevertheless, there are sufficient characters to separate *Alliea* from two other cheletine genera, namely *Eutogenes* and *Caudacheles*, which also lack eyes and bear numerous fan-like setae on their extensive dorsal shields. Tarsus I of *Eutogenes* is devoid of claws and bears four long setae, whereas the anus of *Caudacheles* is borne on a projecting caudal lobe. The only other named species, *A. prasadi,* is likewise known only as a male, and like *A. laruei,* it bears an inflated seta on the palpal tarsus.

Genus *Anthribicheyla* THEWKE 1980

Type species: *Anthribicheyla bocki* THEWKE 1980

Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw with more than 3 teeth; peritremes with more than 3 links; body ovoid, dorsum with a propodosomal and a hysteronotal shield, both with spatulate, barbed setae; humerals similar; anus on stalked caudal lobe; legs II and III separated by less than body width; all legs shorter than body; all tarsi with smooth claws and empodia.

Habitat: Anthribid beetles. USA.

Genus *Apodicheles* FAIN 1979

Type species: *Apodicheles cypsiurus* FAIN 1979

Diagnosis: Eyes absent; without comb-like setae but with 1-2 sickle-like setae; tibial claw edentate; each palpal femur bears 2 pairs of retrorse, ventral processes; peritremes M-shaped, with more than 3 broad links; body ovoid, dorsum with an ill-defined, finely striated shield which extends from legs II to beyond legs IV; dorsal setae slender, barbed; some, including humerals, ultralong; anal setae reduced to one pair or missing; legs II and III separated by less than body width; all legs shorter than body; coxae III and IV with 1 seta; all tarsi with smooth claws and empodia; tibia I without solenidion; coxae III and IV with 1 seta.

Other species
A. apus FAIN 1979
A. heteropalpus MÉGNIN* 1878

Habitat: Birds (swifts). Africa.

Genus *Atarsacheylus* THEWKE 1980

Type species: *Atarsacheylus vichii* THEWKE 1980

Diagnosis: Eyes absent; palpal tarsus absent (thus lacking comb-like and sickle-like setae); palpal claw edentate; peritremes with more than 3 links; body fusiform, legs II and III separated by more than body width; dorsum devoid of shields, all dorsal setae slender, barbed; humerals alike; all legs shorter than body; all tarsi with smooth claws and empodia.

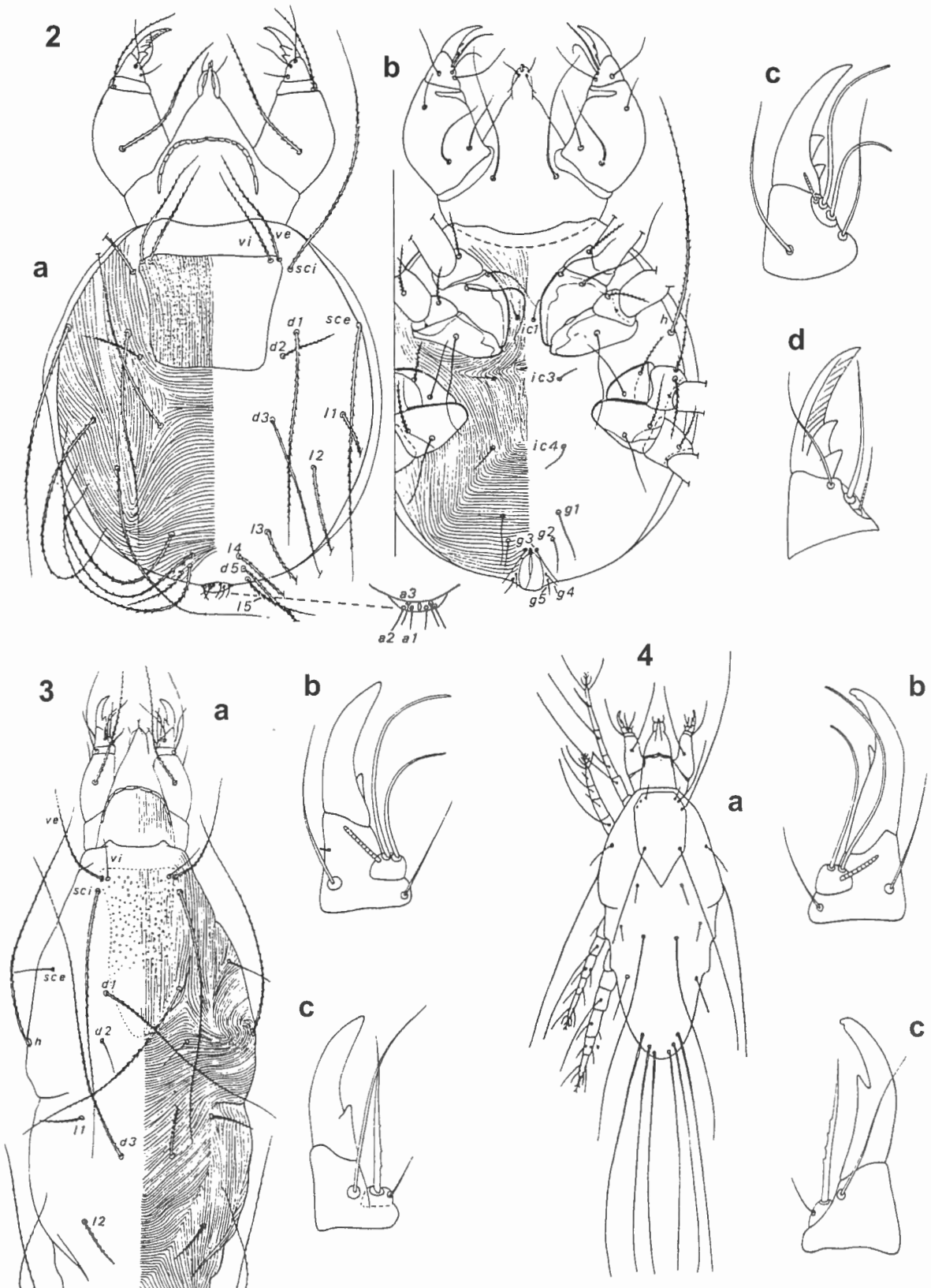
Habitat: Tree bark. USA.

Genus *Bak* YUNKER 1961

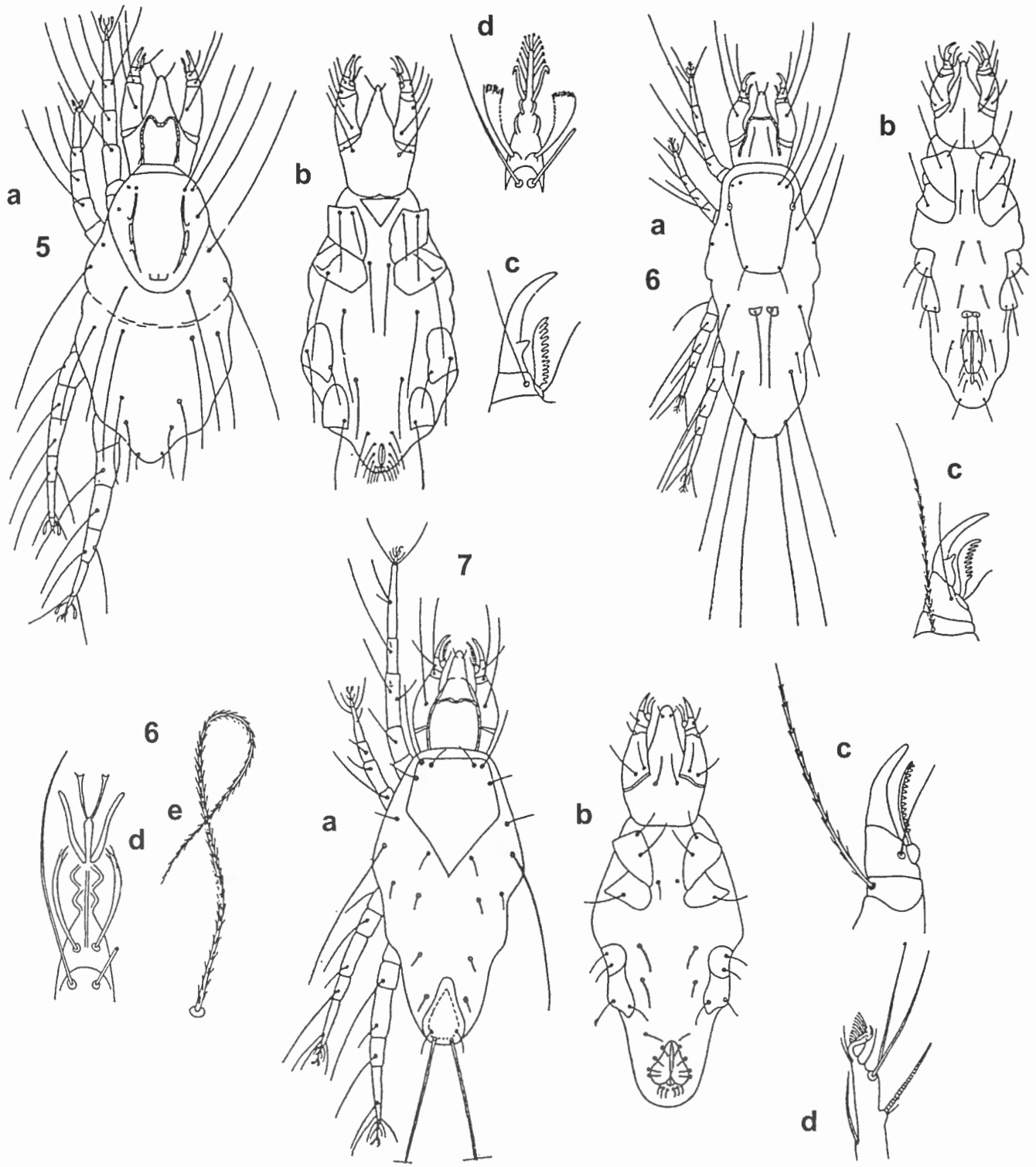
Type species: *Bak sanctaehelenae* YUNKER 1961

Diagnosis: Eyes absent; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw with 1-3 teeth; peritremes M-shaped, with more than 3 links; body fusiform, legs II and III separated by more than body width; dorsum with one propodosomal shield, hysteronotum with several platelets; all dorsal setae slender or barbed; humerals similar; all legs shorter than body; all tarsi with smooth claws and empodia.

Other species
B. deleoni YUNKER 1961
B. elongatus PATXOT and GOFF 1985
B. furcatus GERSON and FAIN 1991



Figs 2-4 — Fig. 2. *Metacheletoides numidae* FAIN. Female, dorsum (a) and venter (b); palpal tarsus and tibia, ventral (c) and dorsal (d) (this and the next Fig. from FAIN, 1979e). Fig. 3. *Cheletoides chirunduensis* FAIN. Female, dorsum (a); palpal tarsus and tibia, ventral (b) and dorsal (c). Fig. 4. *Cheletoides uncinatus* (Heller). Female, dorsum (a) (from OUDEMANS, 1906) (a); palpal tarsus and tibia, ventral (b) and dorsal (c) (from FAIN, 1979e).

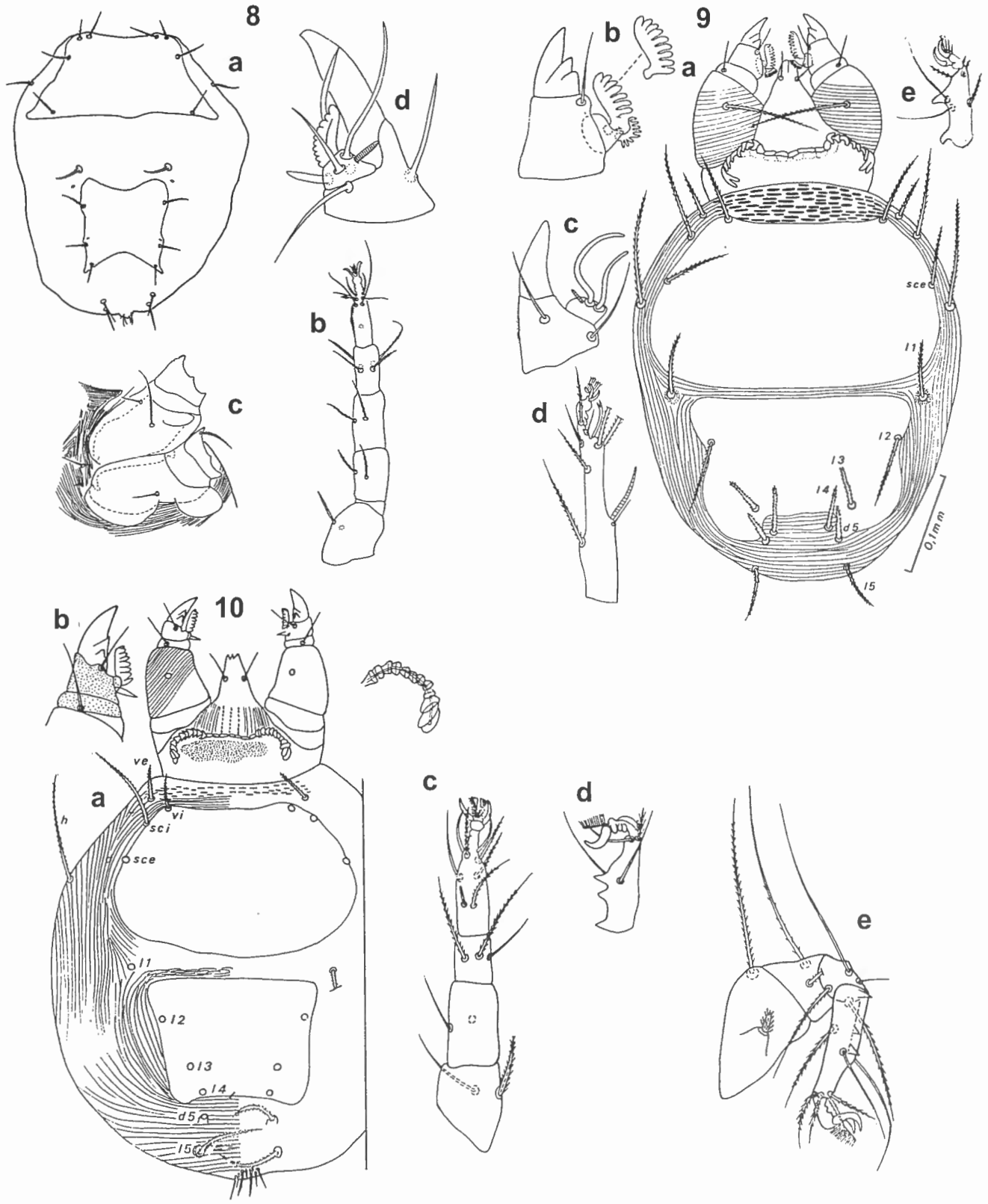


Figs 5-7 — Fig. 5. *Eucheletopsis major* (TROUESSART). Female, dorsum (a) and venter (b); palpal tarsus and tibia, dorsal (c); apex of tarsus I (d) (this and the next two Figs from OUDEMANS, 1906). Fig. 6. *Cheletopsis norneri* (Poppe). Female, dorsum (a) and venter (b); palpal tarsus and tibia, dorsal (c); apex of tarsus I (d); a dorsal seta (e). Fig. 7. *Cheletosoma tyrannus* OUDEMANS. Female, dorsum (a) and venter (b); palpal tarsus and tibia, dorsal (c); apex of tarsus I (d).

B. ligyscutatus FLECHTMANN 1979(**)
B. micidus SUMMERS and PRICE 1970
B. ozarkensis THEWKE and ENNS 1974
B. payatus CORPUZ-RAROS and SOTTO 1977
B. truncatus CORPUZ-RAROS and SOTTO 1977

(**) May be an illegal name because published only in a thesis.

Habitats: Decomposing plants, soil, bee hive debris; cosmopolitan.



Figs 8-10 — Fig. 8. *Thewkachela ratufi* IDE and KETHLEY. Female, dorsum (a); leg I (b); coxae I-II (c); palpal tarsus and tibia, venter (d) (from IDE and KETHLEY, 1977). Fig. 9. *Promuricheyla lukoschusi* FAIN. Female, dorsum (a); palpal tarsus and tibia, dorsal (b); ventral (c); tarsus I (d); tarsus IV in lateral view (e) (this and the next Fig. from FAIN, 1979f). Fig. 10. *Muricheyla sicista* FAIN. Female, dorsum (a); palpal tarsus and tibia, dorsal (b); leg I, dorsal (c); tarsus III, lateral (d); leg IV, lateral (e).

Genus *Bakericheyla* VOLGIN 1966

Type species: *Cheyletiella chanayi* BERLESE and TROUESSART 1889

Diagnosis: Eyes absent; palpal tarsus devoid of comb-like setae but with 1-2 sickle-like setae; tibial claw edentate; no retrorse processes on palpal femora; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a delicate propodosomal shield which may be discernible only by more delicate striae; dorsal setae slender, some, including humerals, ultralong; all legs shorter than body; coxae III and IV contiguous, coxa IV with 2 setae; tibia I with solenidion; all tarsi with smooth claws and empodia.

Other species
B. africana FAIN 1979
B. benoiti FAIN 1980
B. faini (LAWRENCE) 1959
B. subquadrata (LAWRENCE) 1959
B. transvaalica (LAWRENCE) 1959

Habitat: Birds. Cosmopolitan.

Genus *Bicheyletiella* FAIN 1972

Type species: *Bicheyletiella romerolagi* FAIN 1972

Diagnosis: Eyes absent; palpal tarsus without comb-like setae but with 2 rodlike setae, one forked terminally, other rod-like; palpal claw edentate; peritremes with more than 3 links; body ovoid; legs II and III separated by less than body width; dorsum with a propodosomal and a wider than long hysteronotal shield; all dorsal setae slender, nude or barbed; humerals alike; all tarsi without claws but bear feather-like empodia; tibia I lacks solenidion φ.

Habitat: On *Romerolagus diazi*. Mexico.

Genus *Camincheyletus* SMILEY and WHITAKER 1981

Type species: *Camincheyletus glaucomys* SMILEY and WHITAKER 1981

Diagnosis: Eyes absent; palpal tarsus with 1 comb-like seta, other seta short, spiculate, and 2 sickle-like setae; palpal claw with 1 tooth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; with a propodosomal and a hysteronotal shield that cover most of dorsum, with dissimilar setae: laterals spatulate, medians squamate; more than 10 pairs of neotrichous setae on hysteronotum; humerals like lateral setae, on separate pleuroventral platelets; all legs shorter than body; all tarsi with smooth claws and empodia.

Habitat: Nest of flying squirrels, *Glaucomys*. USA.

Genus *Caudacheles* GERSON 1968

Type species: *Caudacheles khayae* GERSON 1968

Diagnosis: Eyes absent; palpal tarsus with 1 comb-like seta, other seta short, smooth, and 2 sickle-like setae; palpal claw edentate; peritremes with 2-5 links; body ovoid, legs II and III separated by less than body width; dorsum carries a propodosomal and a hysteronotal shield, both neotrichous; all dorsal setae similar, fan-like; humerals alike; anus on caudal lobe; all legs shorter than body; all tarsi with smooth claws and empodia.

Other species
C. lieni TSENG 1977

Habitat: Plants. Israel, Taiwan.

Genus *Chelacaropsis* BAKER 1949

Type species: *Chelacaropsis moorei* BAKER 1949

Diagnosis: Eyes present; palpal tarsus with 1 comb-like seta, other seta similar to the 2 sickle-like setae; palpal claw with 3 teeth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; idiosoma carries only a propodosomal shield; all dorsal setae spatulate-barbed, humerals similar or slightly longer; all legs shorter than body, all tarsi with smooth claws and empodia.

Other species
C. apus FAIN 1972
C. reticulata SOLIMAN 1975
C. rwandana FAIN 1972
C. terrestris CORPUZ-RAROS and SOTTO 1977

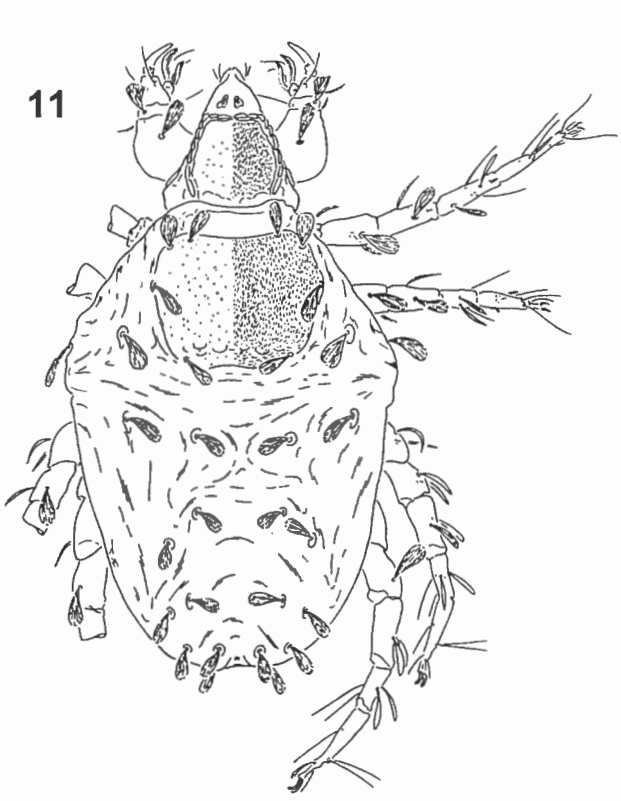
Habitat: *Glaucomys*; nests of rodents and birds; food stores; soil. USA, Asia, Africa.

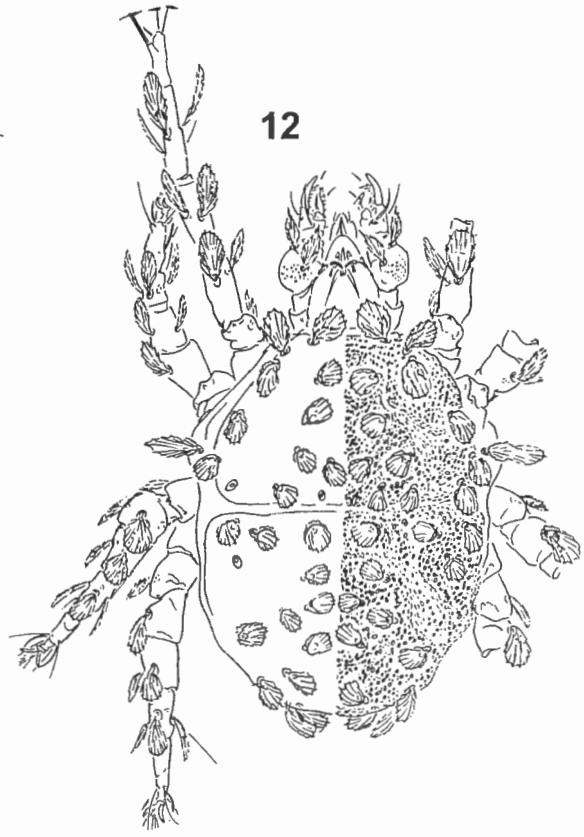
Remarks: The concept of this genus was changed by LEKPRAYOON and SMILEY (1986), who examined the types of *Chelacaropsis moorei* and noted that, contrary to the original description (BAKER, 1949), the female bears a propodosomal shield. This suggests that the four other species presently placed in *Chelacaropsis* should be accommodated elsewhere.

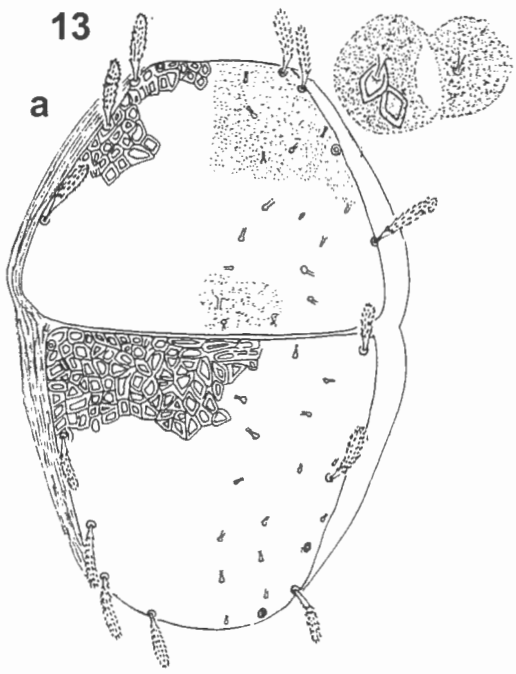
Genus *Chelachecaropsis* ATTIAH 1973

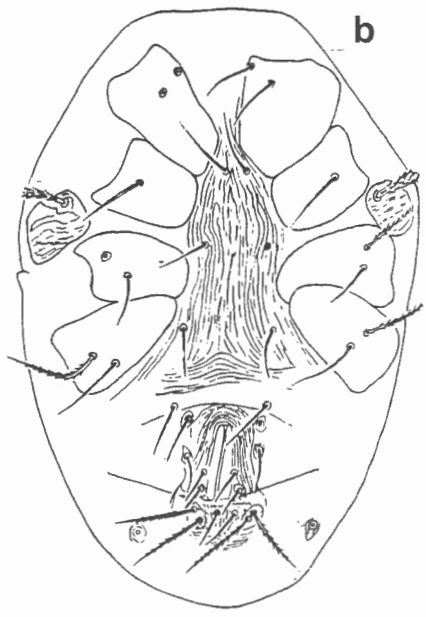
Type species: *Chelachecaropsis bakeri* ATTIAH 1973.

Diagnosis: Eyes present; palpal tarsus with 1 comb-like seta, other seta similar to the 2 sickle-like setae; palpal claw with more than 3 teeth; peritremes with more than 3 links; body ovoid, legs II and III separated by less









Figs 11-13 — Fig. 11. *Cheletonella vespertilionis* WOMERSLEY. Female, dorsum (this and the next Fig. from SUMMERS and PRICE, 1970). Fig. 12. *Eutogenes foxi* BAKER. Female, dorsum. Fig. 13. *Camincheyletus glaucomys* SMILEY and WHITAKER. Female, dorsum (a) and venter (b) (from SMILEY and WHITAKER, 1981).

than body width; idiosoma striated, without shields; all dorsal setae slender to barbed, humerals ultralong; all legs shorter than body; all tarsi with smooth claws and empodia.

Other species
C. stigmaeoides BARILO 1989

Habitat: Rice mill, soil. Egypt; Uzbekistan.

Genus *Chelacheles* BAKER 1958

Type species: *Chelacheles strabismus* BAKER 1958.

Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae; one of the comb-like setae may be similar to the 2 sickle-like setae; palpal claw with 3 or more teeth; peritremes with more than 3 links; body fusiform, legs II and III separated by about body width; dorsum striated, without shields; all dorsal setae slender, may be barbed, humerals same shape but ultralong; all legs shorter than body; all tarsi with smooth claws and empodia.

Other species
C. alexandrinus HASSAN and GOMAA 1981
C. bacchusi BOCHKOV, HAUSTOV and KUZNETZOV, 1999
C. baiwanganae CORPUZ-RAROS and SOTTO 1977
C. bipanus SUMMERS and PRICE 1970
C. humilis RASOOL *et al.*, 1980
C. lanceolatus TSENG 1977
C. michalskii SAMSINAK 1962
C. peritremaculatus THEWKE 1974
C. robustus CORPUZ-RAROS 1998

Habitat: Stored products, bark beetle galleries, chicken feathers. Europe, USA, Asia.

Remarks: The genus was defined (BAKER, 1958) as having 2 comb-like setae, a practice followed by CORPUZ-RAROS (1998). But SUMMERS and PRICE (1970) stated that the inner comb-like seta may be ''comblike or plain'', and the relevant seta of their *bipanus* has only ''several exceedingly fine barbs on its convext curvature''. TSENG (1977) defined *Chelacheles* as having only 1 comb-like seta. The significance of this character remains unresolved.

Genus *Cheletacarus* VOLGIN 1961

Type species: *Cheletacarus raptor* VOLGIN 1961

Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw with more than 3 teeth, placed along most of palpal claw; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal but no hysteronotal shield a single propodosomal shield bearing spatulate or lanceolate setae; humerals similar; all legs shorter than body; all tarsi with smooth claws and empodia.

Other species
C. gryphus SUMMERS and PRICE 1970
C. novemdentis MEYER 1988
C. ploceus GUPTA and PAUL 1985
C. rugosus (WOMERSLEY) 1941

Habitat: Trees, associated with scale insects (Homoptera: Cocoidea) or beetles; birds' nests. Cosmopolitan.

Remarks: SUMMERS and PRICE (1970) considered the placement of *C. rugosus* in *Cheletacarus* as provisional, because part of the type specimen was damaged. Another reason for reconsidering the status of this species is the form of the two anterior propodosomal setae, which are dissimilar to other dorsals and much longer.

Genus *Cheletogenes* OUDEMANS 1905

Type species: *Cheylus ornatus* CANESTRINI and FANZAGO 1876.

Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw with more than 3 teeth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, both with similar fan-like setae; humerals alike; all legs shorter than body; tarsus I without claws and empodia, bearing 2 conspicuous terminal setae; tarsi II-IV with smooth claws and empodia.

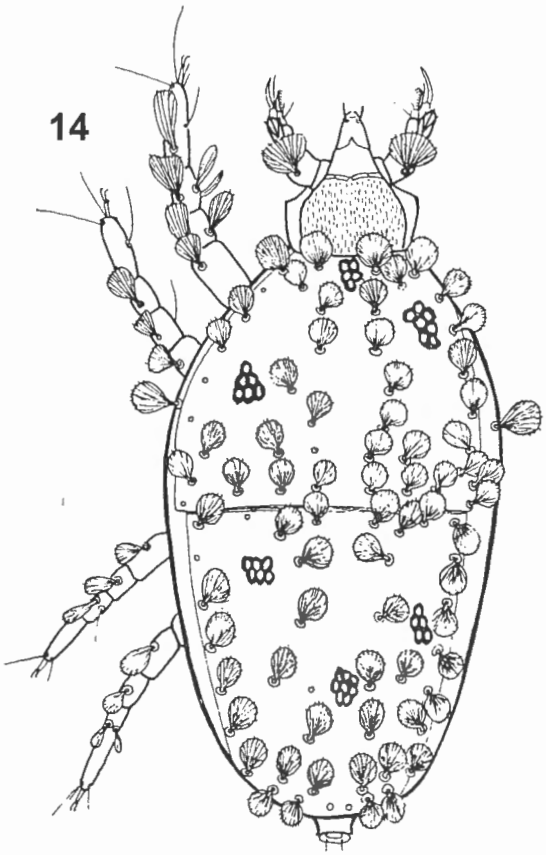
Other species
C. aceriai KHAN* 1970
C. carinatus AHEER *et al.*, 1992
C. dissitus AKBAR *et al.*, 1988
C. iconis AHEER *et al.*, 1992
C. meihuashanense IN and LIU 1994
C. monosetosus TSENG 1977
C. petiginis QAYYUM and CHAUDHRI 1977
C. sagacis AHEER *et al.*, 1992
C. scaber QAYYUM and CHAUDHRI 1977
C. vulgatus RASOOL and CHAUDHRI 1979
C. waitei GERSON 1994

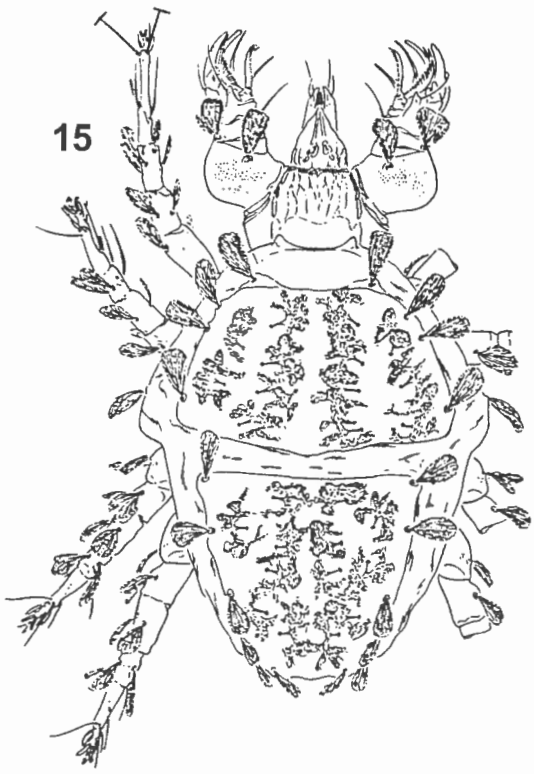
Habitat: Plants. Cosmopolitan.

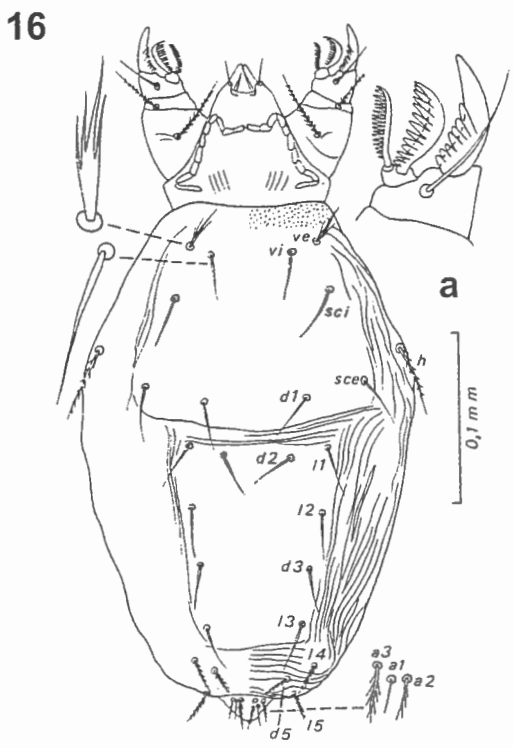
Genus *Cheletoides* OUDEMANS 1904

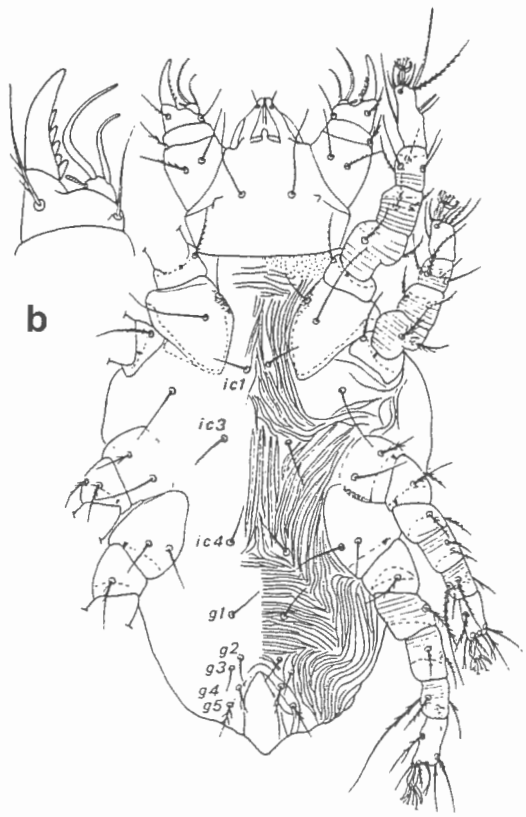
Type species: *Syringophilus uncinatus* Heller 1880

Diagnosis: Eyes absent; palpal tarsus without comb-like setae, but bearing a stiff seta carrying vestigial teeth and 2

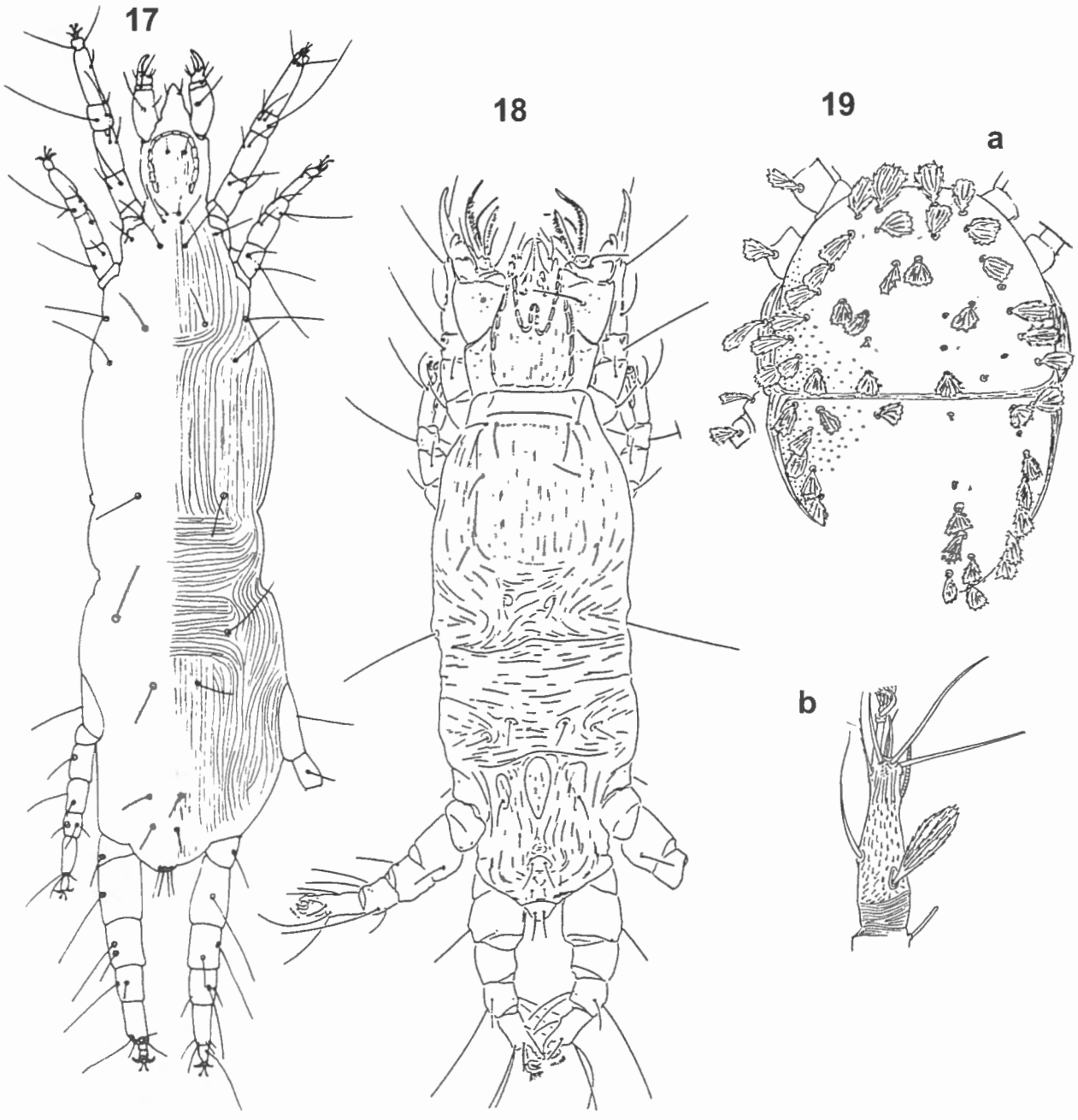








Figs 14-16 — Fig. 14. *Caudacheles khayae* GERSON. Female, dorsum (from GERSON, 1968). Fig. 15. *Eucheyletia bishoppi* BAKER. Female, dorsum (from SUMMERS and PRICE, 1970). Fig. 16. *Hylopecheyla malayi* FAIN and NADCHATRAM. Female, dorsum (a); venter (b) (from FAIN and NADCHATRAM, 1980).



Figs 17-19 — Fig. 17. *Atarsacheylus vichii* THEWKE. Female, dorsum (redrawn by A.F. from THEWKE, 1980). Fig. 18. *Bak sanctaehelenae* YUNKER. Female, dorsum (from SUMMERS and PRICE, 1970). Fig. 19. *Alliea laruei* YUNKER. Female, dorsum without gnathosoma (a); tarsus I (b) (from YUNKER, 1960).

sickle-like setae; palpal claw with a single tooth; peritremes with more than 3 links; body ovoid, legs II and III separated by about body width; dorsum only with a propodosomal shield, dorsal setae slender, barbed; several, including humerals, ultralong; all legs shorter than body; all tarsi with smooth claws and empodia.

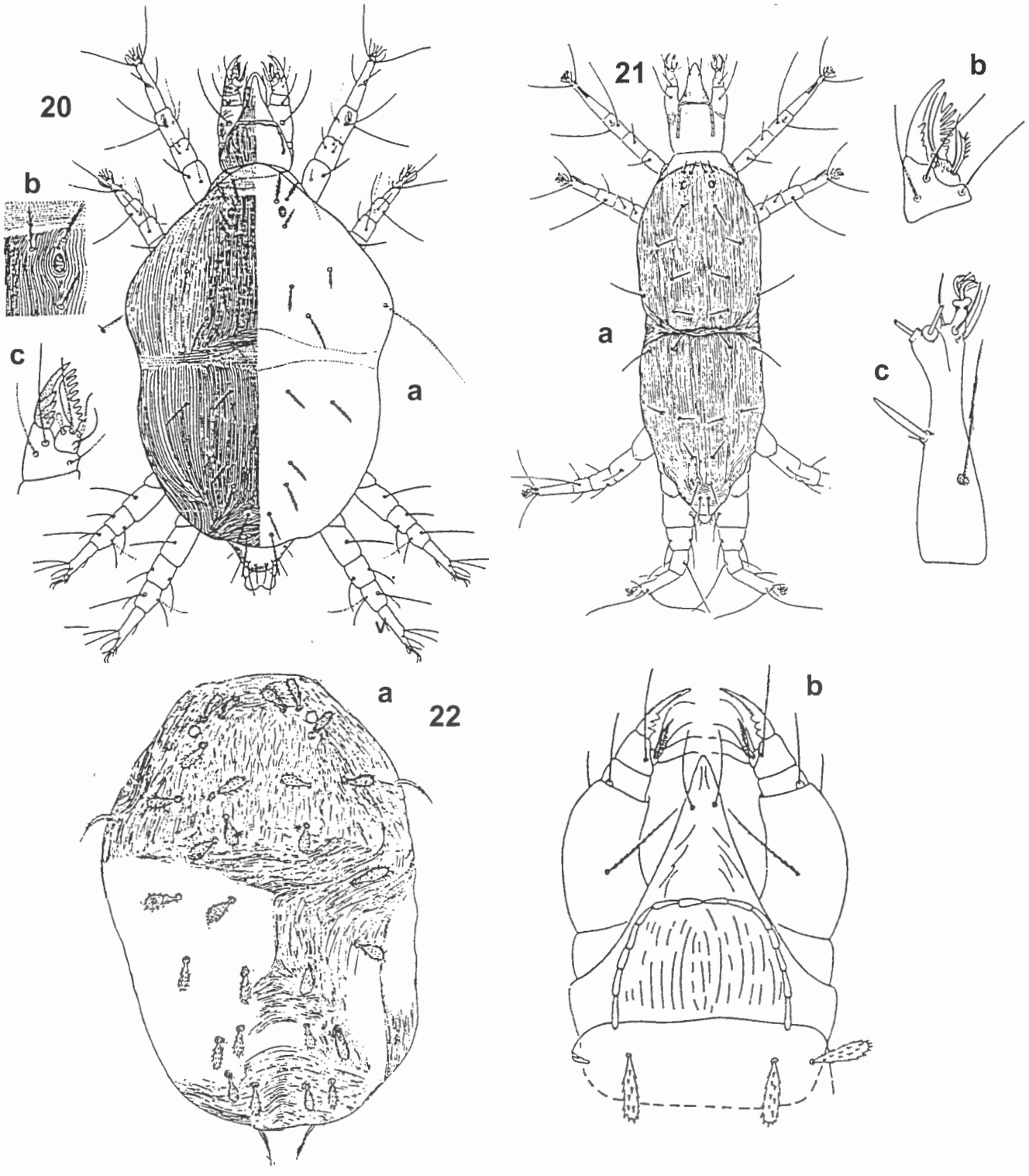
Other species
Cheletoides chirunduensis FAIN 1979.

Habitat: Birds. Europe, Africa.

Genus *Cheletomimus* OUDEMANS 1904

Type species: *Cheletes berlesei* OUDEMANS 1904

Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw with more than 3 teeth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and 2 hysteronotal shields, placed side-by-side, all bearing similar, lanceolate to narrowly fan-like dorsal setae; each hysteronotal shield with 1-2 setae;



Figs 20-22 — Fig. 20. *Chelachecaropsis bakeri* ATTIAH. Female, dorsum (a); left eye (b); palpal tarsus and tibia (c) (from ATTIAH, 1973). Fig. 21. *Chelacheles strabismus* BAKER. Female, dorsum (a); palpal tarsus and tibia (b) and tarsus I (from BAKER, 1958). Fig. 22. *Chelacaropsis moorei* BAKER. Female, dorsum (a) (from LEKPRAYOON and SMILEY, 1986); gnathosoma, dorsal (b) (from BAKER, 1949).

humerals alike; all legs shorter than body, all tarsi with smooth claws and empodia.

Other species
C. binus TSENG 1973
C. bisetosus TSENG 1977
C. cambio AHEER, AKBAR and CHAUDHRI 1994
C. cantor RASOOL, CHAUDHRI and AKBAR 1980
C. citrosinensis PATXOT and GOFF 1985
C. daltoniensis CORPUZ-RAROS 1998

C. duosetosus MUMA 1964
C. heredis QAYYUM and CHAUDHRI 1979
C. larmae AHEER *et al.*, 1994
C. minutus SOLIMAN 1977
C. zamia AHEER *et al.*, 1994

Habitat: Plants, soil. Cosmopolitan.

Genus *Cheletomorpha* OUDEMANS 1904 (= *Acheletomorpha* VOLGIN 1969)

Type species: *Acarus lepidopterorum* SHAW 1794

Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw with 1 large basal tooth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield; lateral and humerals setae rod-like, barbed, medians dissimilar, staghorn-like; legs I longer than body, their tarsi with empodia, with or without minute claws; other legs shorter; their tarsi with smooth claws and empodia.

Other species
C. bakeri LAWRENCE 1954
C. dolosus AHEER *et al.*, 1997
C. obrutus QAYYUM and CHAUDHRI 1977
C. opacus QAYYUM and CHAUDHRI 1977
C. orientalis OUDEMANS 1928
C. tenerum QAYYUM and CHAUDHRI 1977

Habitat: Moths, stored products, plants. Cosmopolitan.

Remarks: VOLGIN (1969) created *Acheletomorpha* gen. nov. for *C. bakeri*, because its median dorsal and lateral setae are similar. SUMMERS and PRICE (1970) considered this difference to be specific rather than generic, thereby returning *C. bakeri* to *Cheletomorpha*. Three species, namely *C. dolosus, C. obrutus*, and *C. opacus,* bear paired hysteronotal shields, which suggests that they should be placed elsewhere. Alternatively, one or more of the examined specimens of these taxa were not adults, because the nymphs of many cheyletids bear 2 hysteronotal shields. We suggest that the position of some of the described species of *Cheletomorpha* should be reconsidered.

Genus *Cheletonata* WOMERSLEY 1955

Type species: *Cheletonata milesi* WOMERSLEY 1955

Diagnosis: Eyes present; palpal tarsus with 1 comb-like seta and 2 sickle-like setae; palpal claw with 4 basal teeth; peritremes forming an inverted U, with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, latter only a nude, small median platelet; dorsal setae spatulate to fan-like, humerals alike; all legs shorter than body, with smooth claws and empodia, claws on tarsus I minute.

Habitat: Bird's nest. Australia.

Genus *Cheletonella* WOMERSLEY 1941

Type species: *Cheletonella vespertilionis* WOMERSLEY 1941

Diagnosis: Eyes absent; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw with 2-4 teeth; peritremes forming an inverted U or M-shaped, with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal but no hysteronotal shield, dorsal setae lanceolate or fan-like; humerals similar or dissimilar to other dorsal setae; all legs shorter than body, all tarsi with smooth claws and empodia.

Other species
C. caucasica VOLGIN 1955
C. hoffmannae SMILEY 1996
C. juglandis XIA *et al.*, 1999
C. pilosa TSENG 1977

Habitat: Bat guano, bird nests, soil. Australia, Russia, China.

Remarks: An application of our criteria for separating genera in the family Cheyletidae suggests that *C. pilosa* and *C. juglandis* should be placed elsewhere. The peritremes of both are M-shaped, their dorsal setae are lanceolate-barbed and the humerals are ultralong, dissimilar to the dorsals; these characters are in contrast to the inverted U-shaped peritremes, fan-like dorsals and similar humerals in the type species.

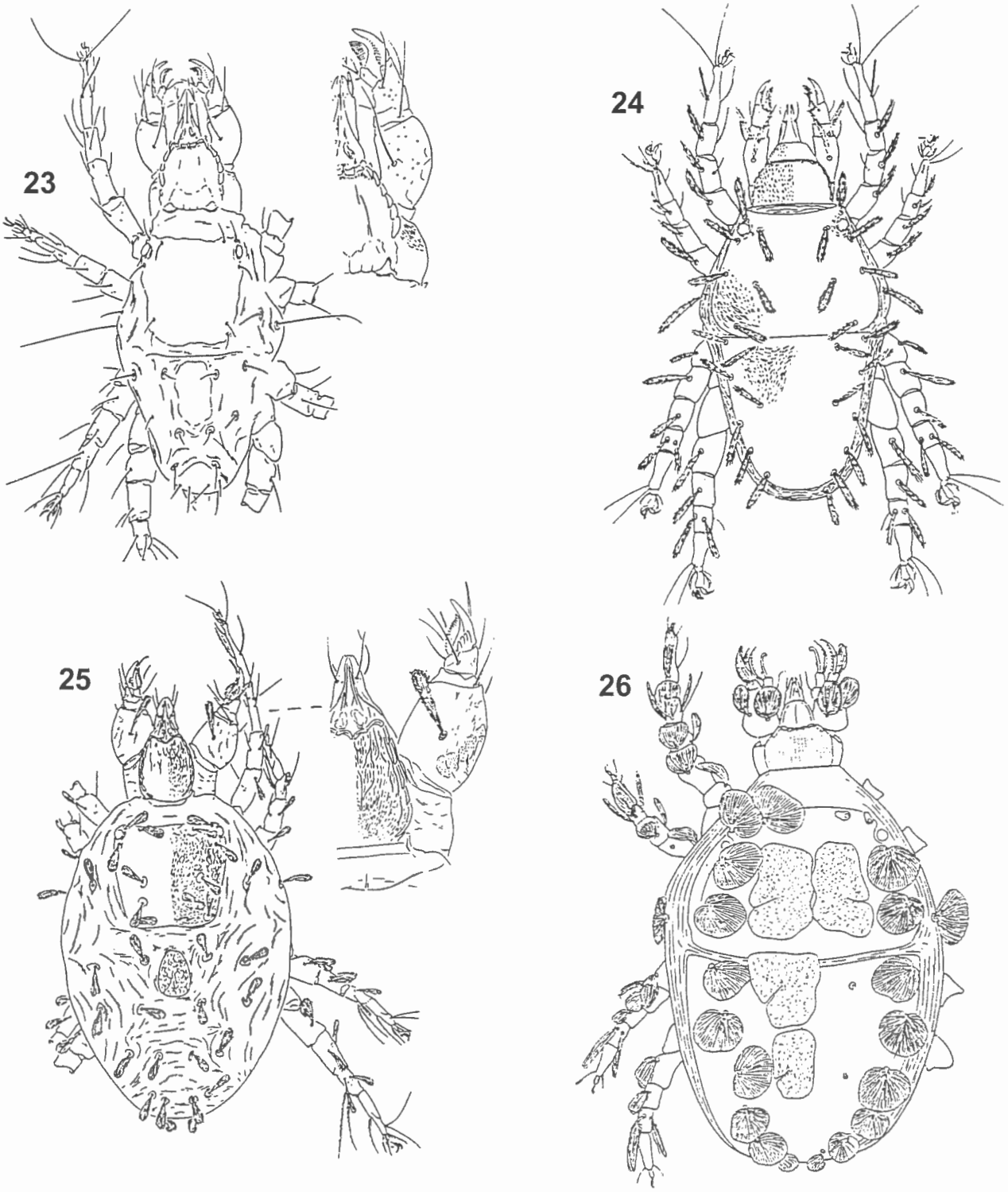
Genus *Cheletophanes* OUDEMANS 1904

Type species: *Cheyletus montandoni* BERLESE and TROUESSART 1889

Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw with more than 3 teeth; peritremes M-shaped, with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a contiguous hysteronotal shield; both shields bear similar spatulate setae surrounded by concentric striae, humeral setae alike, displaced pleuroventrally; leg I subequal in length to idiosoma; all tarsi with smooth claws and empodia.

Other species:
C. peregrinus BERLESE* 1921

Habitat: Bugs. Eastern Europe.



Figs 23-26 — Fig. 23. *Paracaropsis travisi* (BAKER). Female, dorsum (from SUMMERS and PRICE, 1970). Fig. 24. *Neoacaropsis granulatus* VOLGIN. Female, dorsum (from VOLGIN, 1969). Fig. 25. *Cheletonata milesi* WOMERSLEY. Female, dorsum (from SUMMERS and PRICE, 1970). Fig. 26. *Microcheyla parvula* VOLGIN. Female, dorsum (from VOLGIN, 1969).

Genus *Cheletophyes* OUDEMANS 1914

Type species: *Cheletophyes vitzthumi* OUDEMANS 1914

Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw with 2-3 teeth; peritremes M-shaped, with more than 3 bulbous links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, latter restricted to opisthosomal region; both with similar, rod-like, barbed setae; humerals similar; all legs shorter than body, all tarsi with smooth claws and empodia.

Other species
C. apicola FAIN, LUKOSCHUS and NADCHATRAM 1980
C. clavipilis FAIN, LUKOSCHUS and NADCHATRAM 1980
C. deodikari PUTATUNDA and KAPIL 1988
C. eckerti SUMMERS and PRICE 1970
C. harnaji PUTATUNDA and KAPIL 1988
C. haryanaensis PUTATUNDA and KAPIL 1988
C. indiacus SMILEY and WHITAKER 1981
C. newtoni PUTATUNDA and KAPIL 1988
C. orientalis PUTATUNDA and KAPIL 1988
C. panamensis KLOMPEN *et al.*, 1984
C. ruttneri PUTATUNDA and KAPIL 1988
C. shendei PUTATUNDA and KAPIL 1988
C. xylocopae RAMARAJU and MOHANASUNDARAM 1999

Habitat: On carpenter bees (Xylocopinae). South-east Asia.

Genus *Cheletopsis* OUDEMANS 1904

Type species: *Cheyletus nörneri* Poppe 1888

Diagnosis: Eyes absent; palpal tarsus with 1 comb-like seta and 2 sickle-like setae; palpal claw with 1-2 teeth; peritreme with more than 3 links; body fusiform, legs II and III separated by less than body width; dorsum with a single, propodosomal shield; all setae slender, finely barbed, several, usually including humerals, ultralong; all legs shorter than body, coxae III and IV contiguous; all tarsi with smooth claws and empodia; tarsus I with solenidion.

Other species
C. animosa OUDEMANS 1904
C. anax OUDEMANS 1904
C. basilica OUDEMANS 1904
C. charadrii MIRONOV *et al.*, 1991
C. daberti KIVGANOV and BOCHKOV 1994
C. impavida OUDEMANS 1904
C. magnanima OUDEMANS 1904
C. mariae MIRONOV *et al.*, 1991

Habitat: Birds. Europe, South America.

Genus *Cheletosoma* OUDEMANS 1905

Type species: *Cheletosoma tyrannus* OUDEMANS 1905

Diagnosis: Eyes absent; palpal tarsus with 1 comb-like seta and 2 sickle-like setae; palpal claw edentate (but nymph II with one tooth); peritremes forming an inverted U with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a small suranal hysteronotal shield bearing 2 pairs of slender setae unequal in length; other dorsals slender, humerals ultralong; all legs shorter than body, all tarsi with smooth claws and empodia.

Habitat: Bird, from shaft of wing feathers. Tropical America

Genus *Chelonotus* BERLESE 1893

Type species: *Chelonotus selenirhynchus* BERLESE 1893

Diagnosis: Eyes absent; palpal tarsus with 1 comb-like seta and a conic spine and 2 sickle-like setae; palpal claw with 1 large tooth; peritremes with more than 3 links; palpal femur very large, wider than long; body ovoid; legs II and III separated by less than body width; dorsum with contiguous propodosomal and hysteronotal shields which cover the entire idiosoma and extend pleurally; dorsal setae mostly slender, none ultralong, medians apparently missing; humerals similar, displaced pleuroventrally; all legs shorter than body; coxae II and III almost adjoining; all tarsi with smooth claws and empodia.

Habitat: Squirrels and a tree shrew (*Tupaia*). South-east Asia.

Genus *Cheyletia* HALLER 1884

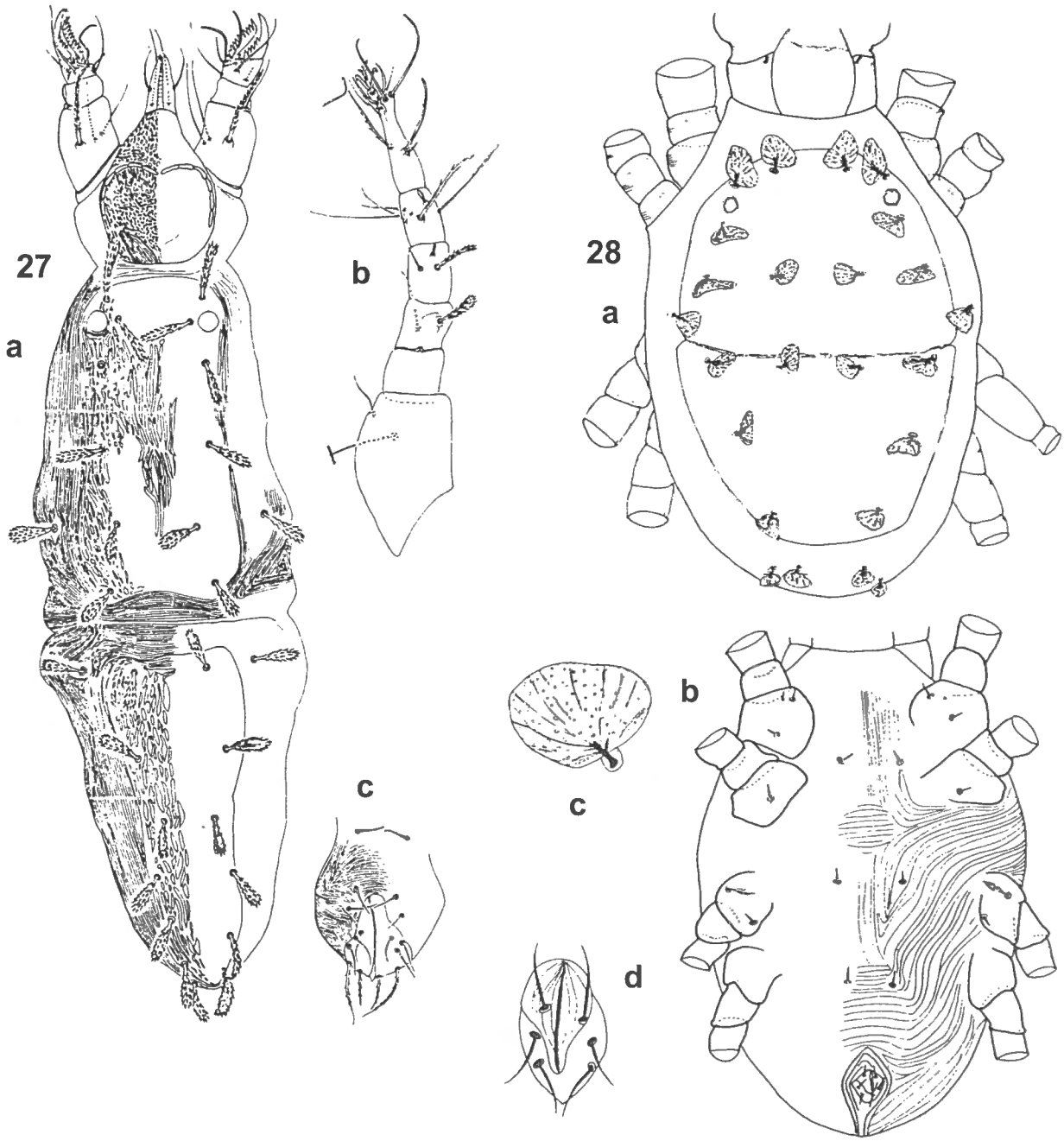
Type species: *Acarus squamosus* DE GEER 1776

Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw with more than 3 teeth, restricted to its basal part; peritremes with more than 3 links, posteriorly straight; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield; both bear dissimilar setae, laterals fan-like, medians squamate; humerals resemble lateral setae, pleuroventrally displaced; all tarsi with smooth claws and empodia.

Other species:
C. americana VOLGIN* 1969
C. aradiphila VOLGIN 1966
C. laureata HALLER* 1884
C. papillifera VOLGIN 1955

Habitat: Bugs, scale insects, birds. Europe, USA.

Remarks: We follow SUMMERS and PRICE (1970) in considering *squamosa* to be the type species of *Cheyletia*, and agree with them that the concept of this genus "remains nebulous". Three different species, from three different habitats, seem to have been described under *squamosa*. One (off a bug) has remained with the specific name, and a second (from a bird) was renamed *papillifera* VOLGIN. The third (described by BAKER, 1949, from scale insects) was renamed *americana* by VOLGIN (1969), a decision challenged by SUMMERS and PRICE (1970). VOLGIN (1969) considered *laureata* to be the type species, thereby negating BAKER's (1949) decision to



Figs 27-28 — Fig. 27. *Neochelacheles messersmithi* SMILEY and WILLIAMS. Female, dorsum (a); leg I (b); genito-anal region (c) (from SMILEY and WILLIAMS, 1972). Fig. 28. *Paramicrocheyla spinula* OLIVIER and THERON. Female, dorsum (a); venter (b); a dorsal seta (c); genito-anal region (d) (from OLIVIER and THERON, 1989).

synonymize it with *squamosa.* A better understanding of *Cheyletia* is thus hindered by our deficient concept of the type species.

Genus *Cheyletiella* CANESTRINI 1886

Type species: *Cheyletus parasitivorax* MÉGNIN 1878

Diagnosis: Eyes absent; palpal tarsus without comb-like and sickle-like setae; palpal claw edentate; peritremes with more than 3 broad links; body ovoid; legs II and III separated by less than body width; dorsum bears a single wide propodosomal shield, with 4-5 pairs of setae; dorsal setae slender, nude or barbed; humerals alike; all tarsi without claws but with feather-like empodia; tibia I without solenidion φ.

Other species
C. blakei SMILEY 1970
C. dengi HU and HOU 1992
C. furmani SMILEY 1970

C. katangae FAIN 1972
C. strandtmanni SMILEY 1970
C. yasguri SMILEY 1965

Habitat: Cats, dogs, rabbits. Cosmopolitan.

Genus *Cheyletus* LATREILLE 1796

Type species: *Acarus eruditus* SCHRANK 1781

Diagnosis: Eyes absent; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw with 1-4 teeth; peritremes M-shaped, with more than 3 links, posterior link straight; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, both with slender to spatulate barbed lateral setae; humerals may be longer; median setae, if present, usually small or dissimilar; all legs shorter than body, all tarsi bear smooth claws and empodia.

Other species
C. acarophagus ZAHER and SOLIMAN 1967
C. acer OUDEMANS 1904
C. alacer OUDEMANS 1904
C. allactaga FAIN and LUKOSCHUS 1981
C. attiahi YOUSEF and ISSA 1972
C. audax OUDEMANS 1904
C. aversor RHODENDORF 1940
C. avidus QAYYUM and CHAUDHRI 1977
C. ayyazi AKBAR *et al.*, 1993
C. baloghi VOLGIN 1969
C. baridos AKBAR *et al.*, 1988
C. bidentatus FAIN and NADCHATRAM 1980
C. burmiticus COCKERELL* 1917
C. cacahuamilpensis BAKER 1949
C. carnifex ZACHVATKIN 1935
*C. clavispinus** BANKS 1902
C. crassus QAYYUM and CHAUDHRI 1977
C. desitus QAYYUM and CHAUDHRI 1977
C. digitarsus SUGIMOTO* 1942
C. egypticus ELBADRY 1969
C. ferox TROUESSART 1885
C. fortis OUDEMANS 1904
C. furibundus RHODENDORF 1940
C. gerbillicola FAIN and LUKOSCHUS 1981
C. hendersoni BAKER 1949
C. infensus AKBAR *et al.*, 1993
C. intrepidus OUDEMANS 1903
C. kuznetzovi BOCHKOV and KHAUSTOV, 1999
C. legendrei FAIN 1982
C. linsdalei BAKER 1949
C. mafekingensis FAIN 1982
C. malaccensis OUDEMANS 1903
C. malayensis CUNLIFFE 1962
C. misonnei FAIN and LUKOSCHUS 1981
C. mortelmansi FAIN 1972
C. nidicolus FAIN 1972
C. nigripes MOLA* 1907
C. parumsetosus KARPELLES 1884
*C. patagiatus** NORDENSKIOLD 1900
C. phantosis AKBAR and AHEER 1994
C. philippinensis CORPUZ-RAROS 1988
C. pluridens FAIN and NADCHATRAM 1980
C. polymorphus VOLGIN 1949
C. praedibundus RHODENDORF 1940
C. promptus OUDEMANS 1904
C. pseudomalaccensis FAIN 1982
C. punctulatus FAIN and LUKOSCHUS 1981
C. pyriformis BANKS 1904
C. rapax OUDEMANS 1903
C. rohdendorfi ZACHVATKIN 1949
C. rwandae FAIN 1972
C. saevus OUDEMANS* 1904
C. schneideri OUDEMANS 1904
C. spatiosus QAYYUM and CHAUDHRI 1977
C. strenuus OUDEMANS 1904
C. tenuipilis FAIN *et al.*, 1980
C. trouessarti OUDEMANS 1903
C. truculentus VOLGIN 1949
C. trux RHODENDORF 1940
C. tutela QAYYUM and CHAUDHRI *1977*
C. ugandanus LAWRENCE 1954
C. venator VITZTHUM 1920
C. vivatus QAYYUM and CHAUDHRI 1977
C. vorax OUDEMANS 1903
C. wahndoensis AKBAR and AHEER 1994
C. woodroffei JEFFREY 1979
C. zumpti FAIN 1972

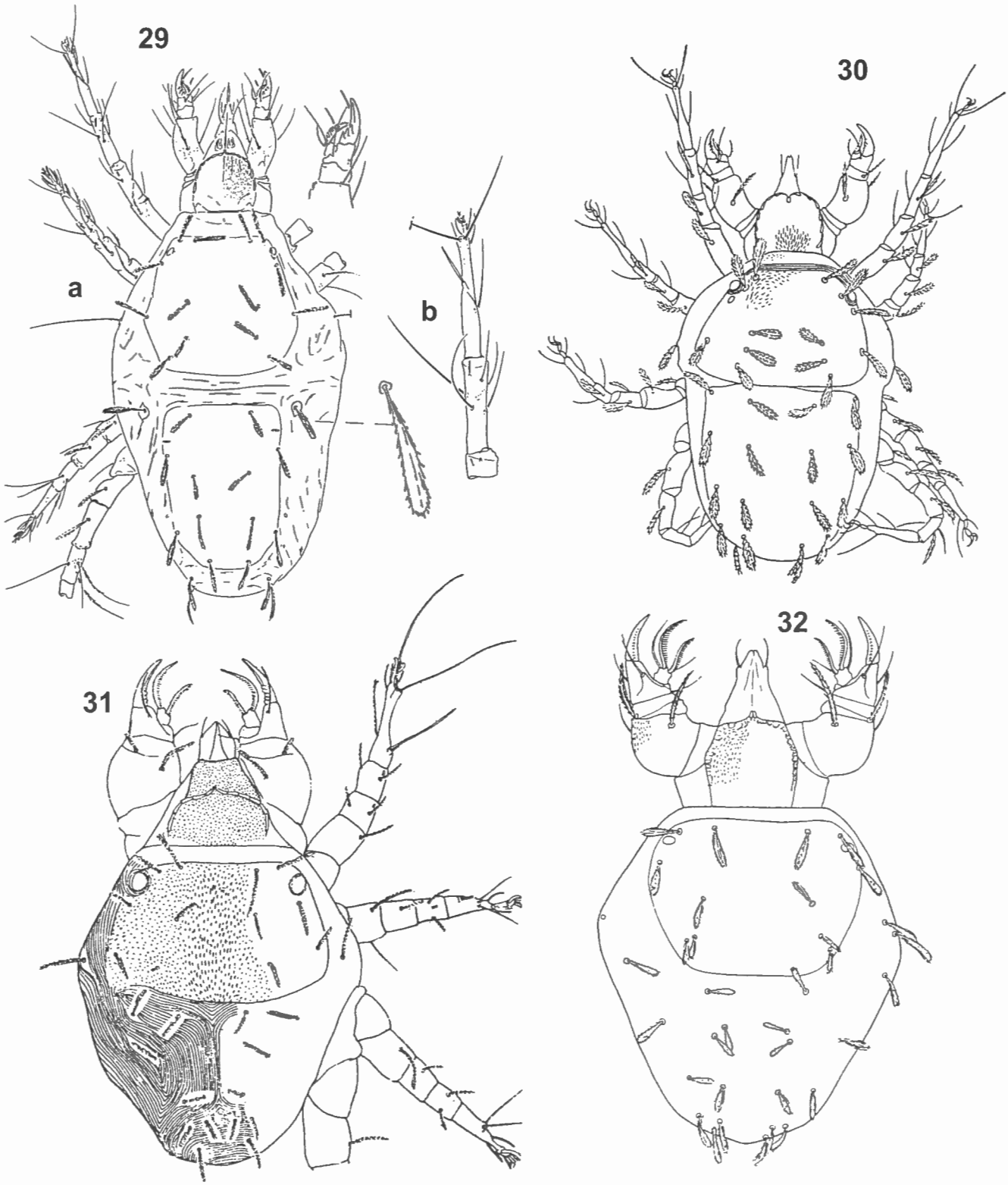
Habitat: Stored food, soil, plants, nests. Cosmopolitan.

Remarks. This is the largest and most problematic genus in the family. VOLGIN (1969) keyed out 29 species, of which 13 were known only as males (some heteromorphic), 8 only as females and both genders were described for the remaining 8 species. SUMMERS and PRICE (1970) listed 36 species but provided keys for 9 only. Problems in species determination include loss of type material, inadequate descriptions, the need to match up males and females, some variation in shape and length of various setae and a sometimes broad definition of the genus. Thus we agree with SUMMERS and PRICE (1970) that a complete revision of *Cheyletus* may require the combined efforts of acarologists from different parts of the world. A preliminary effort towards understanding the extent of variation within 5 common species of *Cheyletus* was made by SUMMERS *et al.* (1972).

Genus *Chiapacheylus* DE LEON 1962

Type species: *Chiapacheylus edentatus* DE LEON 1962

Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw edentate; peri-



Figs 29-32 — Fig. 29. *Acaropsellina sollers* (RHODENDORF). Female, dorsum (a); leg I (b) (from SUMMERS and PRICE, 1970). Fig. 30. *Acaropsella rohdendorfi* (VOLGIN). Female, dorsum (from VOLGIN, 1969). Fig. 31. *Philippicheyla filipina* Corpus-RAROS. Female, dorsum (from Corpus-RAROS, 1972). Fig. 32. *Cheletacarus raptor* VOLGIN. Female, dorsum (from VOLGIN, 1969).

tremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, with similar fan-like setae, some neotrichous; humerals similar to lateral setae; all legs shorter than body; all tarsi with empodia; tarsus I without claws but tarsi II-IV with smooth claws.

Other species
C. desertorum ZAHER and SOLIMAN* 1967
C. macrocorneus ZAHER and SOLIMAN* 1967

Habitat: Plants. Mexico.

Remarks: In their definition of *Chiapacheylus,* ZAHER and SOLIMAN (1967) stated that this genus had all legs with claws and ''pulvillus''. This incorrect definition suggests that *C. desertorum* and *C. macrocorneus* may belong elsewhere.

Genus *Columbicheyla* THEWKE and ENNS 1972

Type species: *Columbicheyla macroflabellata* THEWKE and ENNS 1972

Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae, no sickle-like setae; palpal claw edentate; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, dorsal setae dissimilar, laterals and humerals fan-like, medians squamate; all tarsi with smooth claws and empodia.

Habitat: Tree bark, North America.

Genus *Criokeron* VOLGIN 1966

Type species: *Nihelia quintus* DOMROW and BAKER 1963

Diagnosis: Eyes absent; gnathosoma with large lateral hook-like processes; palpal tarsus fused with palpal tibia, with 1 comb-like seta and 1-2 sickle-like setae; peritreme with more than 3 broad links, posteriorly convulated; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal shield and a hysteronotal shield; all setae slender, humerals on pleuroventral platelets, similar to lateral setae; all legs shorter than body; solenidion σ on genu I replaced by a stellate seta; all tarsi with smooth claws and empodia.

Other species
C. thailandicus FAIN and LUKOSCHUS 1985.

Habitat:*Tupaia glis*. Africa, South-east Asia.

Genus *Cunliffella* VOLGIN 1969 (= *Bothrocheyla* VOLGIN 1964)

Type species: *Neoeucheyla tuberculicoxa* VOLGIN 1964.

Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae, 1 sickle-like seta and an inflated seta; palpal claw with more than 3 teeth; peritremes with more than 3 links, posteriorly straight or looped around a vesicular chamber; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, both covered by fan-like to squamate setae; laterals usually differ from medians, and latter may differ amongst themselves; humerals displaced to pleuroventral position, similar to lateral setae; all tarsi with smooth claws and empodia.

Other species:
C. panamensis (BAKER) 1949
C. variegata BARILO 1985
C. whartoni (BAKER) 1949

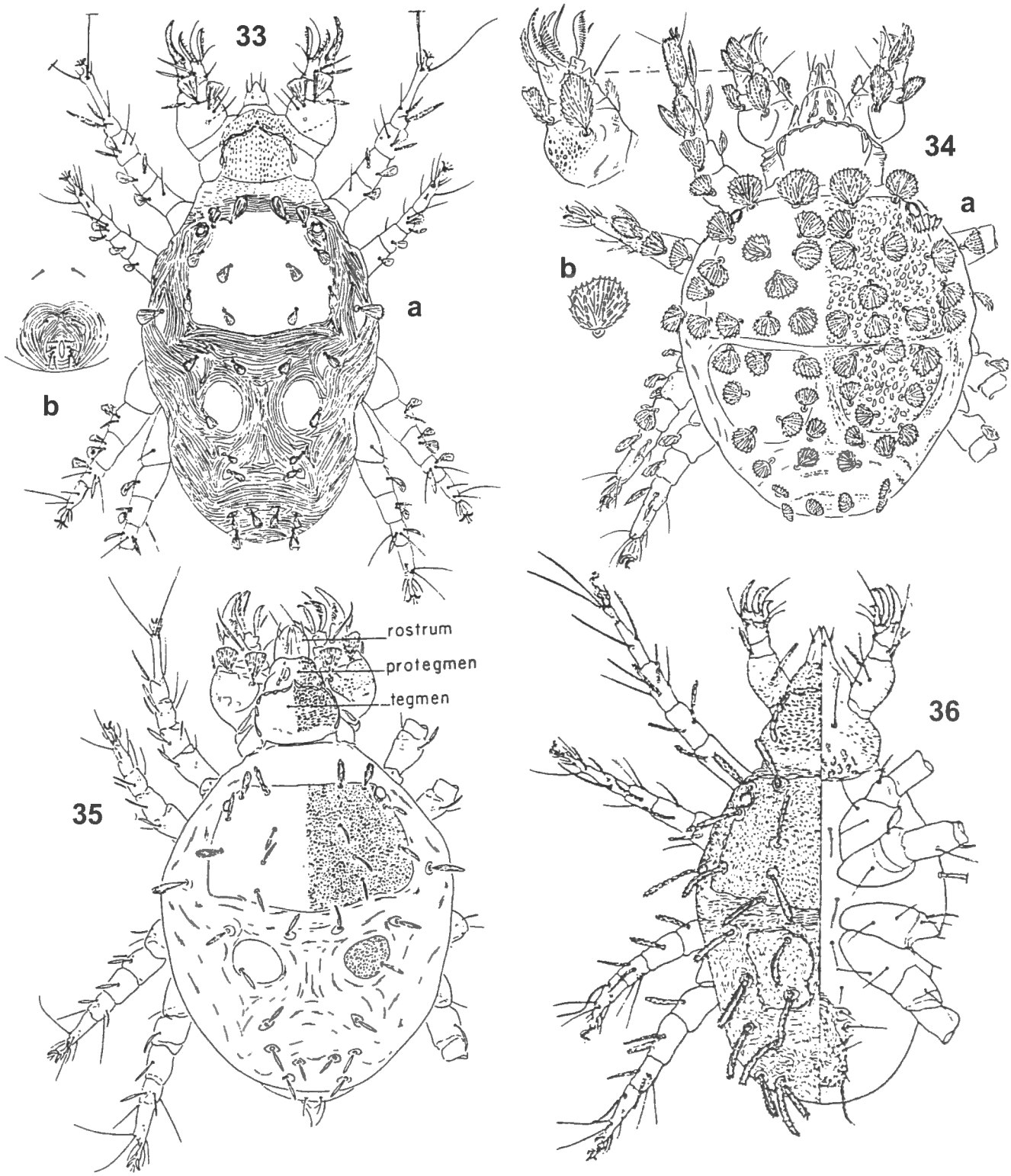
Habitat: Soil. Eastern Europe, USA.

Remarks: The definition of the genus is based on the inflated tarsal seta along with the vesicular chamber at the posterior part of the peritremes. BOCHKOV and MIRONOV (1997) made an effort to elucidate the relationships of *Cunliffella,* and the closely related *Neoeucheyla,* by applying cladistic methods. As a result they resurrected *Bothrocheyla* VOLGIN 1964 and re-assigned species currently referable to *Cunliffella* and to *Neoeucheyla.* However, these authors used characters that are variable within genera, a practice that detracts from their use for intergeneric analysis. Further, the 2 most distinctive characters separating *Cunliffella* and *Neoeucheyla,* namely the inflated inner tarsal seta and the presence/absence of the vesicular chambers, are inconsistent in the BOCHKOV and MIRONOV (1997) arrangement. The status of these genera should be re-evaluated.

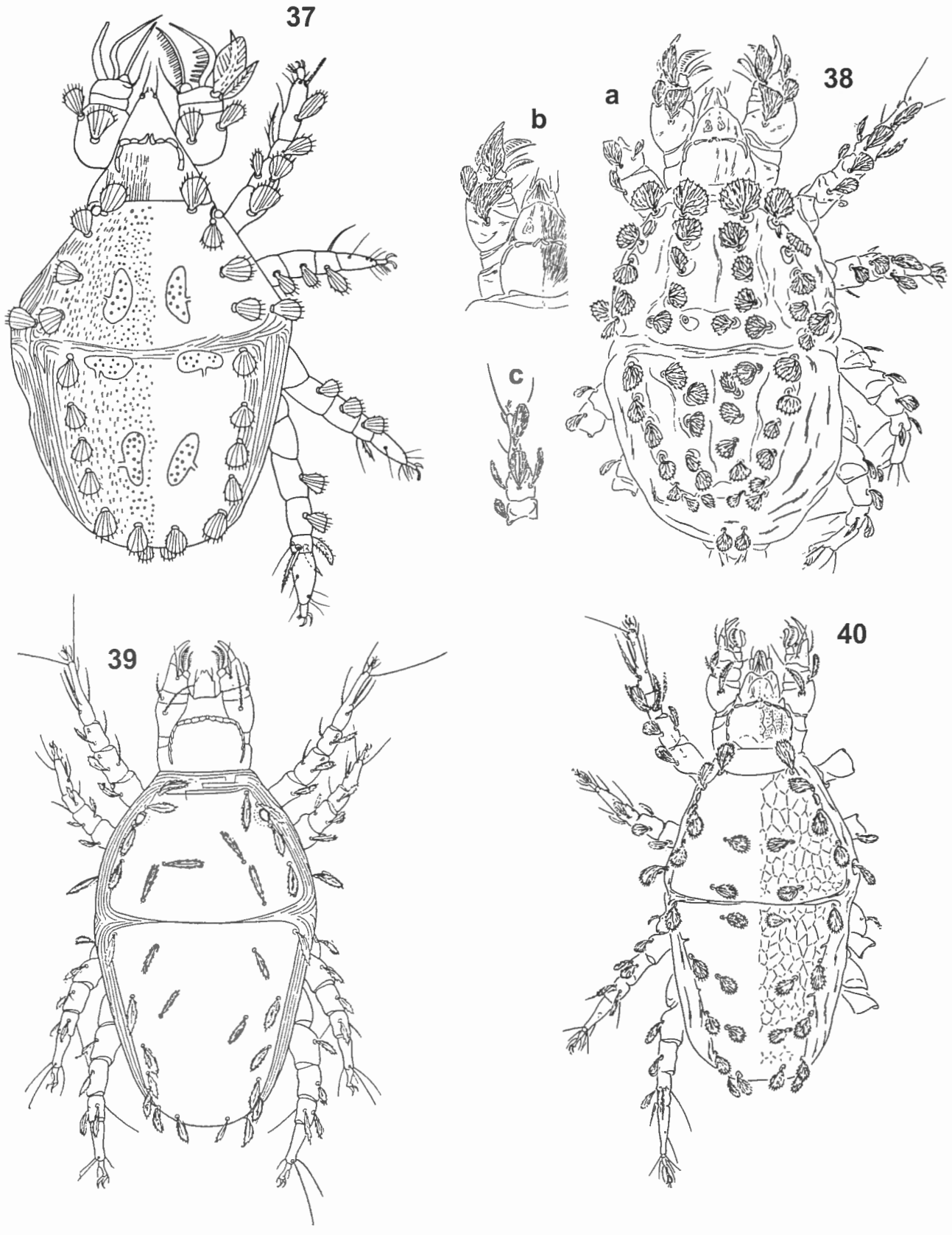
Genus *Dubininiola* VOLGIN 1969

Type species: *Dubininiola polylepis* VOLGIN 1969

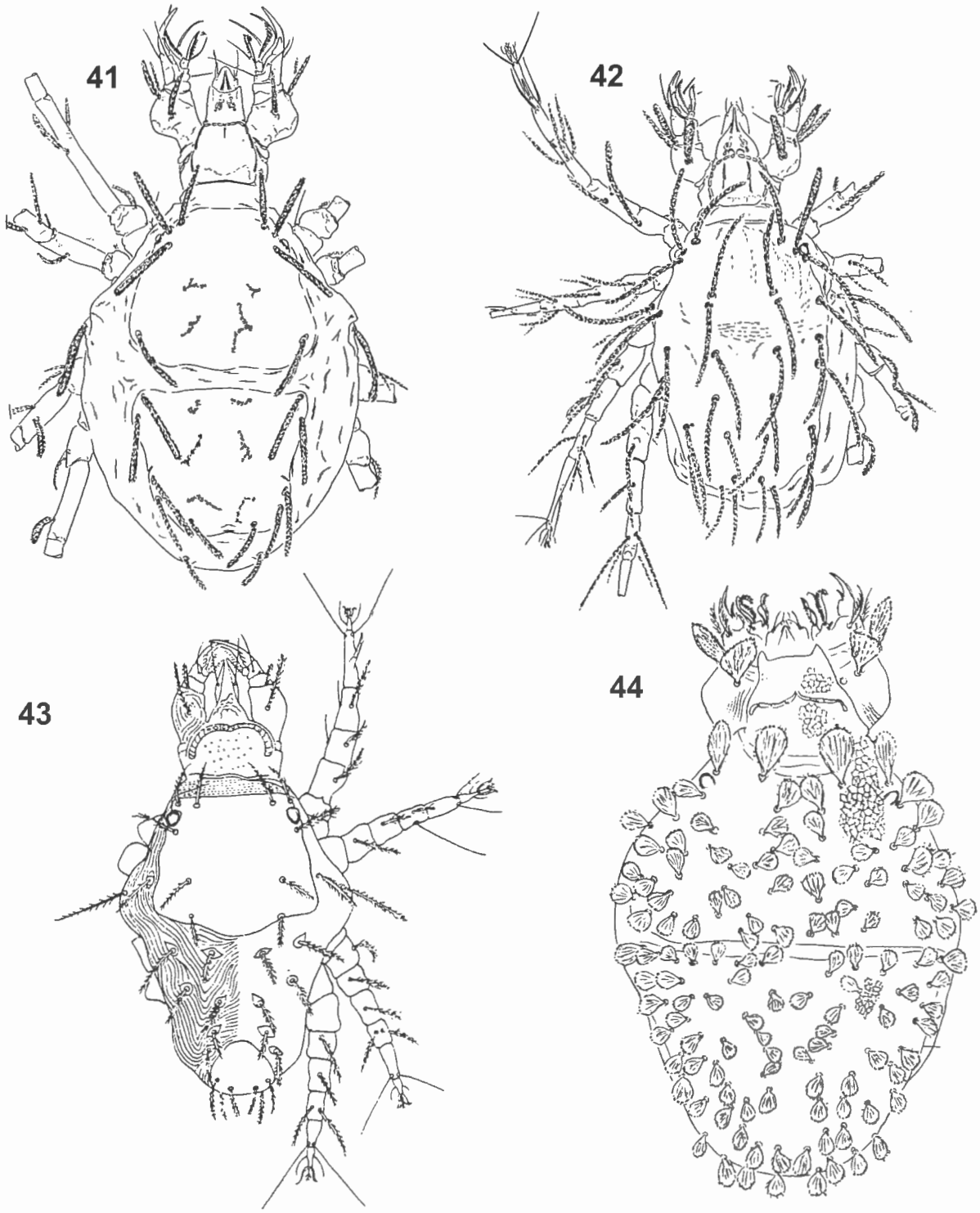
Diagnosis: Eyes present; palpal tarsus with 2 comb-like setae and 2 sickle-like setae; palpal claw with 1 large tooth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, each with many (17 pairs together) neotrichous squamiform setae; venter with 2 pairs of apparently neotrichous squamiform setae, placed beyond the anals; humerals similar to lateral setae; all legs shorter than body, all tarsi with a large branched ventral seta, and smooth claws and empodia; claws on tarsus I minute.



Figs 33-36 — Fig. 33. *Aegyptocheyla summersi* YOUSEF. Female, dorsum (a); genito-anal region (b); (from YOUSEF, 1978). Fig. 34. *Oudemansicheyla denmarki* (YUNKER). Female, dorsum (a); antero-dorsal seta (b) (this and the next Fig. from SUMMERS and PRICE, 1970). Fig. 35. *Cheletomimus berlesei* (OUDEMANS). Female, dorsum. Fig. 36. *Paracheyletiella volgini* KUZNETZOV. Female, dorsum (from KUZNETZOV, 1977).



Figs 37-40 — Fig. 37. *Columbicheyla macroflabellata* THEWKE and ENNS. Female, dorsum (redrawn by A.F. from a paratype). Fig. 38. *Chiapacheylus edentatus* DE LEON. Female, dorsum (a); palpus (b); leg I (c) (from SUMMERS and PRICE, 1970). Fig. 39. *Pavlovskicheyla semenovi* (RHODENDORF). Female, dorsum (from VOLGIN, 1969). Fig. 40. *Ker palmatus* MUMA. Female, dorsum (from SUMMERS and PRICE, 1970).



Figs 41-44 — Fig. 41. *Cheletomorpha lepidopterorum* (SHAW). Female, dorsum (this and the next Fig. from SUMMERS and PRICE, 1970). Fig. 42. *Nodele calamondin* MUMA. Female, dorsum. Fig. 43. *Cheletophyes vitzthumi* (OUDEMANS). Female, dorsum (from OUDEMANS, 1914). Fig. 44. *Polycheyletus boonkongae* VAIVANIJKUL. Female, dorsum (from VAIVANIJKUL, 1979).

Habitat: Rodents. Turkemenistan.

Remarks: Some salient features of this genus were noted above. We formerly (FAIN *et al.*, 1997) believed *Dubininiola* to be very close to *Alliea* YUNKER, a genus we could not treat herein (see above). The examination of *D. polylepis* indicated that the 2 genera are very different. In contrast to *Alliea, Dubininiola* has eyes, a large setulose and branched ventral seta on all tarsi, and 2 pairs of squamate setae beyond the anal setae.

Genus *Eucheletopsis* VOLGIN 1969

Type species: *Cheletopsis major* OUDEMANS 1904

Diagnosis: Eyes absent; palpal tarsus with one comb-like seta and two sickle-like setae; palpal claw with a single tooth; peritreme with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum only with a propodosomal shield; all setae, including humerals, slender, ultralong; all legs shorter than body, coxae III and IV clearly separated; all tarsi with smooth claws and empodia; tarsus I without solenidion ω.

Habitat: Bird, New Guinea.

Genus *Eucheyletia* BAKER 1949 (= *Zachvatkiniola* VOLGIN 1969)

Type species: *Eucheyletia bishoppi* BAKER 1949.

Diagnosis: Eyes absent; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with 2-4 teeth; peritremes forming an inverted U, with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, both with dissimilar dorsal setae, laterals and humerals fan-like, medians staghorn-like or squamate; all legs shorter than body, all tarsi with smooth claws and empodia.

Other species
E. asiatica VOLGIN 1955
E. bakeri VOLGIN 1963
E. bothrophilia VOLGIN 1963
E. eoa VOLGIN 1963
E. flabellifera (MICHAEL) 1878
E. funisciuri FAIN 1972
E. hardyi BAKER 1949
E. harpyia (RHODENDORF) 1940
E. kivuensis FAIN 1972
E. nidicola DEFINADO and KHAING-FIELDS 1976
E. nintoda CORPUZ-RAROS* 1988
E. oregonensis SMILEY and WHITAKER 1981
E. pavlovskyi VOLGIN 1963
E. reticulata CUNLIFFE 1962
E. sibirica VOLGIN 1963
E. sinensis VOLGIN 1963
E. tanzaniensis FAIN 1972
E. taurica VOLGIN 1963
E. womersleyi VOLGIN 1963

Habitat: Soil, stored food, nests of small mammals. Cosmopolitan.

Remarks: VOLGIN (1969) erected *Zachvatkiniola* gen. nov. for *E. reticulata,* due to its strong dorsal reticulation and similar lateral and median setae. SUMMERS and PRICE (1970) returned *reticulata* to *Eucheyletia,* arguing that the taxonomy of the genus will thus be simplified. The issue requires re-evaluation.

Genus *Eucheyletiella* VOLGIN 1969

Type species: *Cheyletiella ochotonae* VOLGIN 1960

Diagnosis: Eyes absent; palpal tarsus without comb-like and sickle-like setae; palpal claw edentate; peritremes with more than 3 broad links; body ovoid; legs II and III separated by less than body width; female dorsum bears only a propodosomal shield, as long or longer than wide; dorsal setae slender, mostly barbed; humerals similar; all tarsi without claws but with feather-like empodia; tibia I without solenidion φ.

Other species
E. faini BOCHKOV and MALIKOV 1996
E. johnstoni (SMILEY) 1965
E. takahashii (SASA and KONO) 1951

Habitat: Rabbits (Lagomorpha), field mice. Cosmopolitan.

Genus *Eutogenes* BAKER 1949

Type species: *Eutogenes foxi* BAKER 1949.

Diagnosis: Eyes absent; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw edentate; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width, leg I almost as long as body, other legs shorter; dorsum with a propodosomal and a hysteronotal shield, both with similar dorsal fan-like setae; humerals alike; leg I without claws and empodia, bearing four conspicuous terminal setae; tarsi II-IV with smooth claws and empodia.

Other species
E. africanus WAFA and SOLIMAN 1968
E. bakeri CORPUZ-RAROS 1998
E. citri GERSON 1967
E. cornutus CORPUZ-RAROS 1998
E. frater VOLGIN 1958
E. makilingiensis CORPUZ-RAROS 1998
E. narashinoensis HARA and HANADA 1960
E. onoi (SHIBA) 1976
E. pinicola THEWKE and ENNS 1972
E. punctata ZAHER and SOLIMAN 1965
E. quadrisetatus (BERLESE) 1913
E. reticularis OLIVIER and THERON 1988
E. vicinus SUMMERS and PRICE 1970

Habitat: Plants, soil. Cosmopolitan.

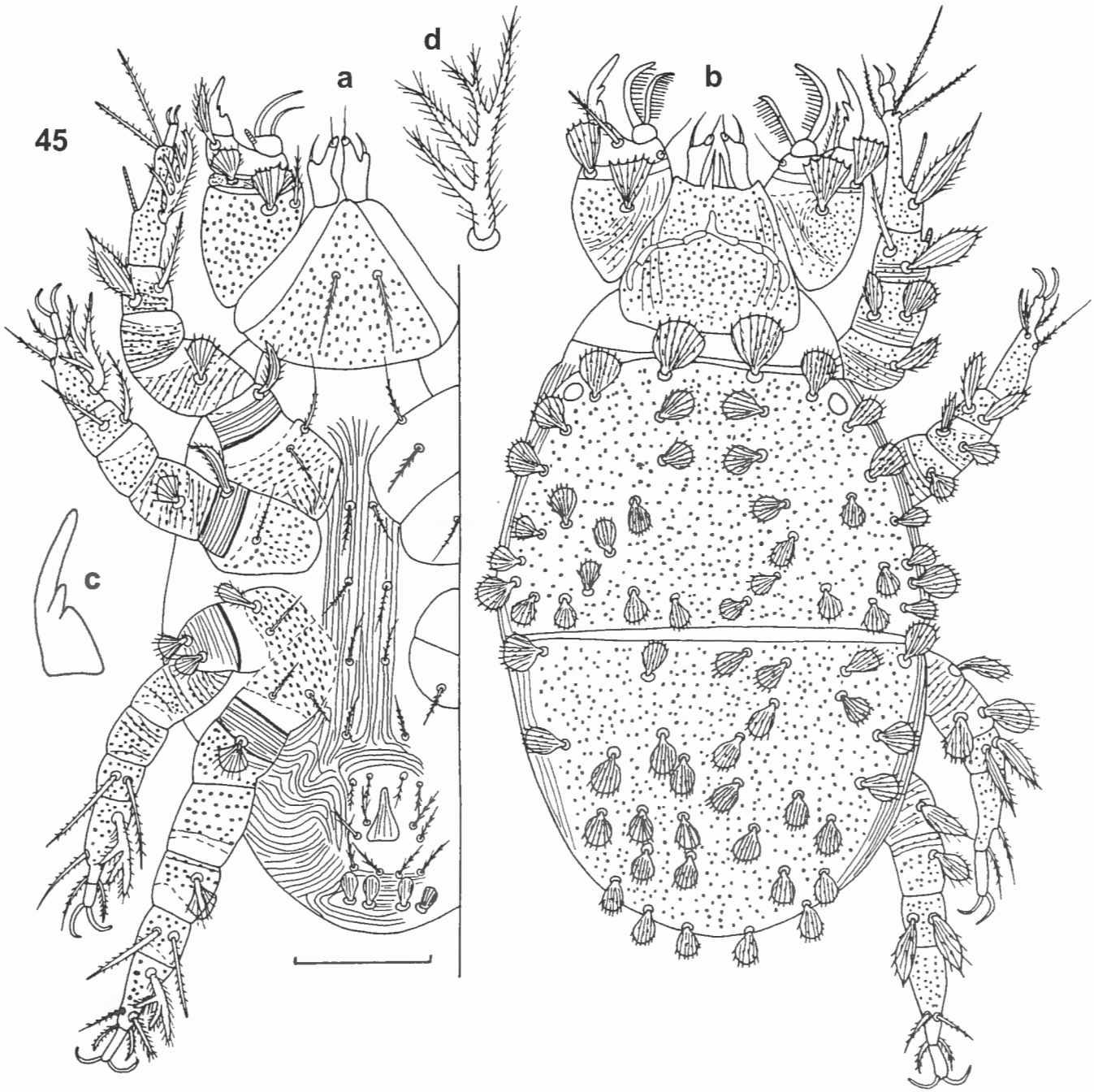


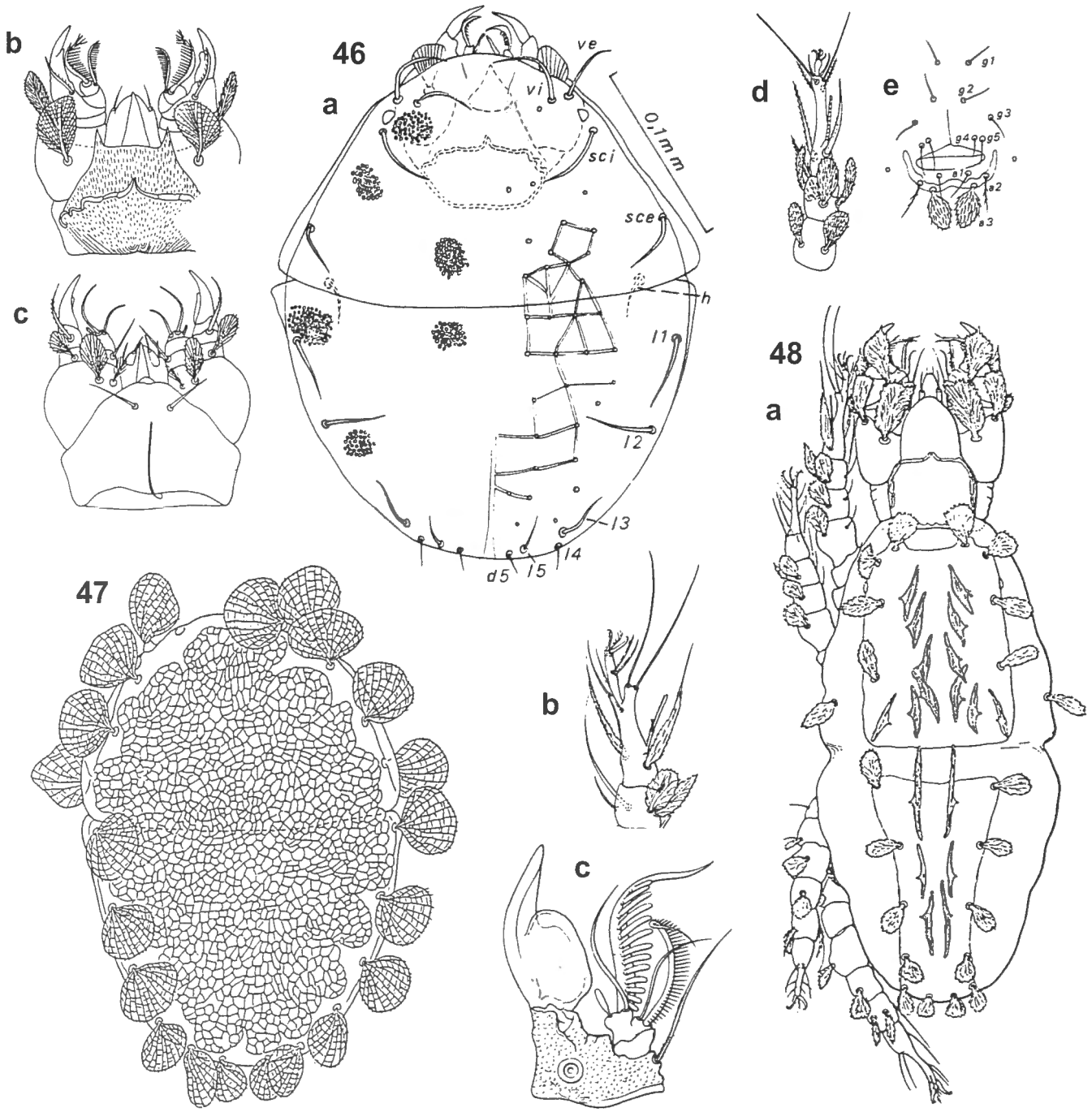
Fig. 45 — *Dubininiola polylepis* VOLGIN, 1969. Holotype female, venter (a) and dorsum (b); tarsal claw (c); branched seta on tarsus I (drawn by A.F.; scale line 50μm).

Genus *Galagocheles* FAIN 1979

Type species: *Cheletiella lemuricola* LAWRENCE 1948

Diagnosis: Eyes absent; palpal tarsus with several uneven rod-like setae but no comb-like and sickle-like setae; palpal claw edentate, hooked; palpal femur with lateral and ventral processes; base of gnathosoma with a pair of retrose processes; peritreme with more than 3 broad links, much expanded anteriorly; body ovoid, legs II and III separated by less than body width; idiosoma with retrorse lateral processes between legs II and III; dorsum with a propodosomal shield and a hysteronotal shield; all setae, including humerals, slender to spine-like; all legs shorter than body; coxa I with a lateral process; legs I-II with retrorse ventral processes on tarsi, genua and femora; solenidion σI on genu I replaced by a stellate seta; all tarsi with smooth claws and empodia.

Habitat: Lemurs. Africa.



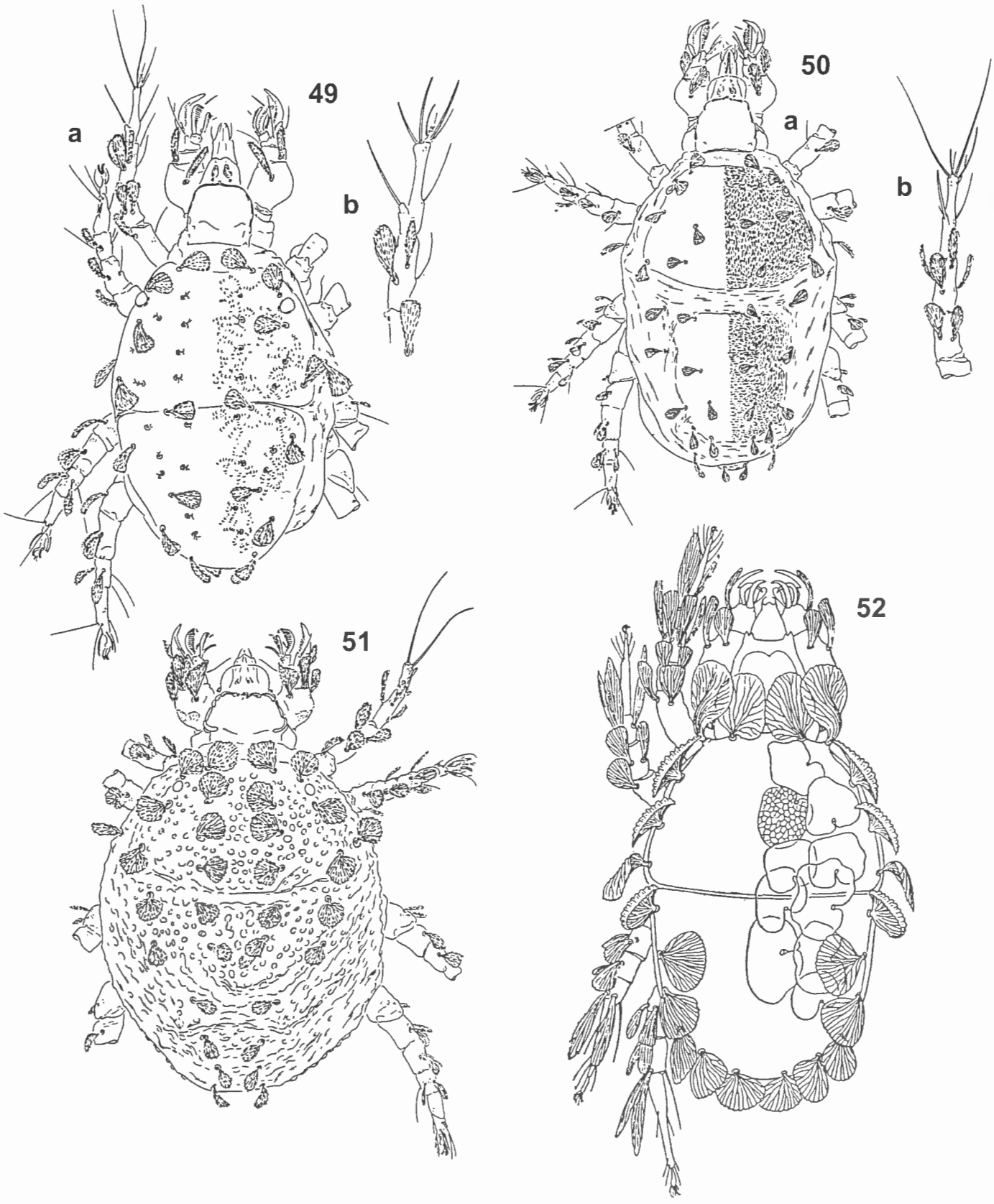
Figs 46-48 — Fig. 46. *Samsinakia volgini* (FAIN). Female, dorsum (a); gnathosoma dorsal (b) and ventral (c); leg I (d); genito-anal region (e) (from FAIN 1980c). Fig. 47. *Cunliffella tuberculicoxa* VOLGIN. Female, dorsum (from VOLGIN, 1969). Fig. 48. *Hoffmannita mexicana* PELAEZ. Female, dorsum (a); leg I (tarsus and tibia) (b); palpal tarsus and tibia, ventral (c) (from PELAEZ, 1962).

Genus *Grallacheles* DE LEON 1962

Type species: *Grallacheles bakeri* DE LEON 1962

Diagnosis: Eyes present; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with more than 3 teeth; peritremes with more then 3 links; body ovoid, legs II and III separated by less than body width; dorsum bears a propodosomal and a hysteronotal shield; anterior propodosomal setae fan-like, second pair and posterior setae narrowly fan-like, all other dorsals rod-like, barbed; humerals alike; all legs shorter than body, all tarsi with smooth claws and empodia.

Other species
G. nanfengensis XIA *et al.*, 1997.



Figs 49-52 — Fig. 49. *Paracheyletia pyriformis* (BANKS). Female, dorsum (a); leg I (b) (this and the next two Figs are from SUMMERS and PRICE, 1970). Fig. 50. *Prosocheyla oaklandia* (BAKER). Female, dorsum (a); leg I (b). Fig. 51. *Cheletogenes ornatus* (CANESTRINI and FANZAGO). Female, dorsum. Fig. 52. *Neoeucheyla loricata* (BERLESE). Female, dorsum (from BERLESE, 1913).

Habitat: Plants; stored food. USA, Pacific Islands, East Asia, Israel.

Genus *Hemicheyletia* VOLGIN 1969 (= *Dendrocheyla* VOLGIN 1969; = *Andrecheyla* VOLGIN 1969)

Type species: *Paracheyletia bakeri* EHARA 1962

Diagnosis: Eyes present; palpal tarsus with a two comb-like setae and two sickle-like setae; palpal claw with more than 3 teeth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield; lateral and humeral setae spatulate to fan-like, medians similar or dissimilar, in latter cases staghorn-like; all legs shorter than body, all tarsi with smooth claws and empodia.

Other species
H. anarbora (DE LEON) 1967
H. arecana TJYING 1972
H. asiatica VOLGIN 1978
H. athenae CORPUZ-RAROS 1988
H. bregetovae (VOLGIN) 1969
H. chui TSENG 1977
H. congensis (CUNLIFFE) 1962
H. cordovensis (DE LEON) 1962
H. darwinia SUMMERS and PRICE 1970
H. granula SUMMERS and PRICE 1970
H. hissariensis MATHUR and MATHUR 1981
H. indica GUPTA 1991
H. kureatollensis GOFF 1982
H. kysenyiensis THEWKE and ENNS 1979
H. lacinia RASOOL and CHAUDHRI 1979
H. laguncula RASOOL and CHAUDHRI 1979
H. lanceolata CORPUZ-RAROS 1998
H. leytensis CORPUZ-RAROS 1988
H. makilingensis CORPUZ-RAROS 1972
H. mexicana THEWKE and ENNS 1979
H. morii EHARA and GHANI IBRAHIM 1988
H. newyorkensis DEFINADO and KHAING-FIELDS 1976
H. omissa TSENG 1977
H. pusillifolium LIN, PEN and CHEN 1994
H. reticulata JEFFREY and CAMPBELL 1975
H. rostella SUMMERS and PRICE 1970
H. scitula CORPUZ-RAROS 1972
H. scutellata (DE LEON) 1962
H. serrula SUMMERS and PRICE 1970
H. transversa CORPUZ-RAROS 1972
H. tropica (SHIBA) 1976
H. tumidus QAYYUM and CHAUDHRI
H. uichancoi CORPUZ-RAROS 1972
H. vescus QAYYUM and CHAUDHRI
H. volgini (CUNLIFFE) 1962
H. wellsi (BAKER) 1949
H. lindquisti THEWKE and ENNS 1979
H. wellsina (DE LEON) 1967

Habitat. Plants, soil. Cosmopolitan.

Remarks: The present concept of *Hemicheyletia,* the second largest genus in the family, is unsatisfactory. It contains one group whose median and lateral dorsal setae are similar and another with dissimilar setae. The hysteronotal shield may be reduced in members of both groups (*H. volgini*, with dissimilar dorsal setae, has an almost obsolete, nude hysteronotal shield). VOLGIN (1969) tried to address the problem by restricting *Hemicheyletia* to species with similar dorsal setae, creating *Dendrocheyla* gen. nov. for taxa with dissimilar dorsals, and adding *Andrecheyla* gen. nov. for *H. scutellata,* which bears a small hysteronotal shield. SUMMERS and PRICE (1970) did not accept this arrangement and rejected *Dendrocheyla* and *Andrecheyla*, a decision followed by most subsequent authors. However, as the number of species assigned to *Hemicheyletia* has almost trebled since then, it is time for a new effort, utilizing more characters.

Genus *Hoffmannita* PELAEZ 1962 (= *Myrmicocheyla* VOLGIN 1963)

Type species: *Hoffmannita mexicana* PELAEZ 1962

Diagnosis: Eyes present; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with a single large tooth; peritremes forming an inverted U, with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, both with fan-like lateral and humerals setae and boatlike median setae; all legs shorter than body, all tarsi with smooth claws and empodia.

Other species
H. clavipes (VOLGIN) 1963
H. rimandoi CORPUZ-RAROS 1972

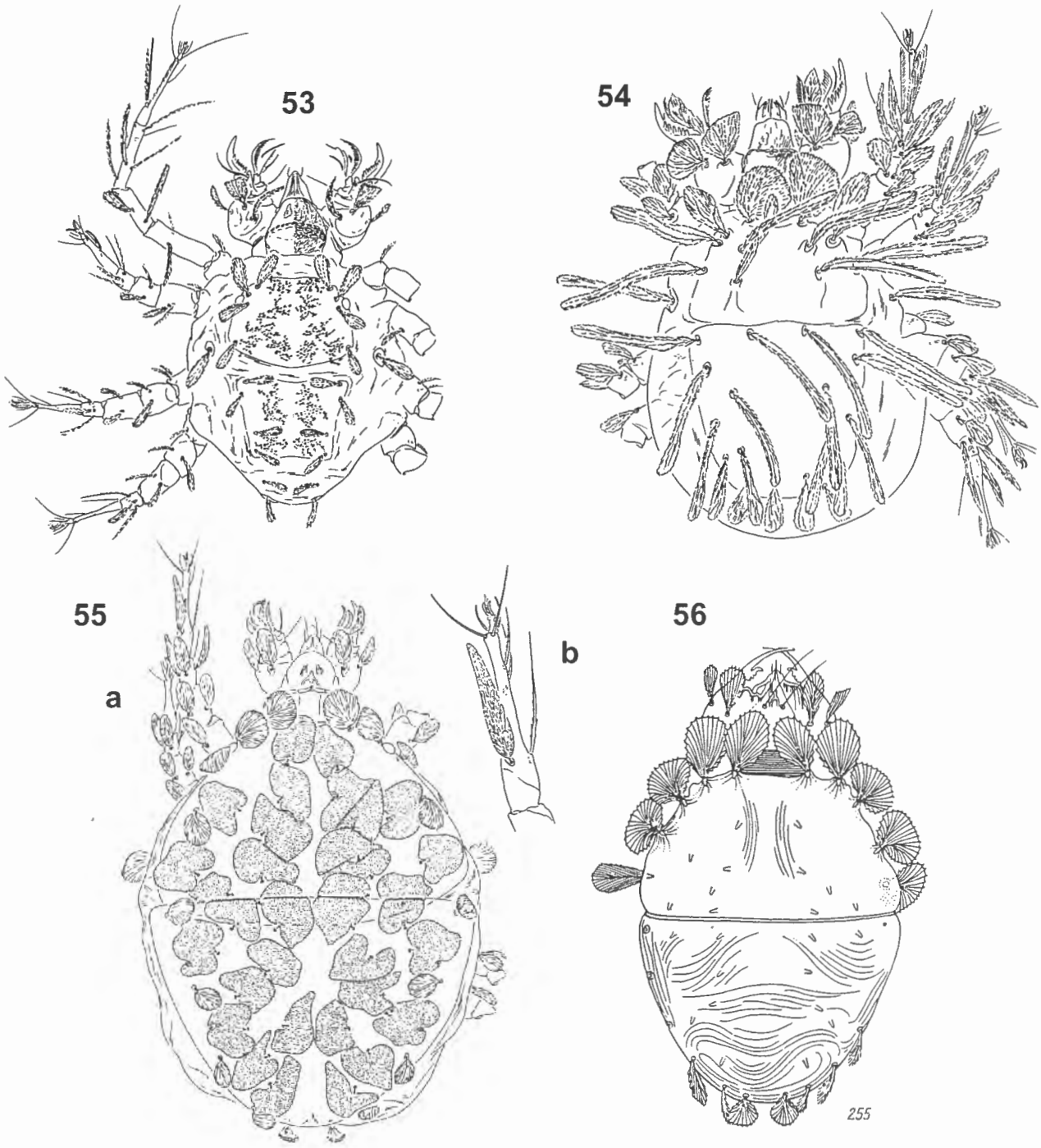
Habitat: Invertebrates: scorpion, millipede, tree bugs. Mexico, Eastern Europe, The Philippines.

Remarks: Although the three species assigned to *Hoffmannita* appear to be very similar, they actually make up two groups. The type species bears a pair of eyes whereas the other two taxa lack this character. An examination of the types and an evaluation of additional characters would be needed to decide the issue

Genus *Hylopecheyla* FAIN 1972

Type species: *Hylopecheyla bunguranensis* FAIN 1972

Diagnosis: Eyes absent; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with more than 3 teeth; peritremes M-shaped, with more than 3 links, posterior link abruptly bent inwards; body ovoid, legs II and III separated by less than body width; dorsum with a



Figs 53-56 — Fig. 53. *Mexecheles cunliffei* DE LEON. Female, dorsum (this and the following two Figs from SUMMERS and PRICE, 1970). Fig. 54. *Grallacheles bakeri* DE LEON. Female, dorsum. Fig. 55. *Hypopicheyla elongata* VOLGIN. Female, dorsum (a); Tarsus I (b). Fig. 56. *Cheyletia papillifera* VOLGIN. Female, dorsum (from VOLGIN, 1969).

propodosomal and a hysteronotal shield, both with slender, barbed dorsal setae; humerals similar; all legs shorter than body, all tarsi with smooth claws and empodia.

Other species

Hylopecheyla malayi FAIN and NADCHATRAM 1980

Habitat: Squirrels (Sciuridae). South Asia.

Genus *Hypopicheyla* VOLGIN 1969

Type species: *Hypopicheyla elongata* VOLGIN 1969

Diagnosis: Eyes present; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with more than 3 teeth, placed along its entire length; peritremes with 3-4 links, posteriorly straight; body ovoid, legs II and III separated by less than body width; dorsum with a

propodosomal and a hysteronotal shield, contiguous; both shields bear dissimilar setae, laterals fan-like, medians squamate; humerals like lateral setae, pleuroventrally displaced; all tarsi with smooth claws and empodia.

Other species:
H. mirabilis (VOLGIN) 1955

Habitat: Bugs, beetles, soil. Eastern Europe, Asia, USA.

Genus *Ker* MUMA 1964

Type species: *Ker palmatus* MUMA 1964

Diagnosis: Eyes present; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw edentate; peritremes with 3-4 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, both coarsely reticulated and with similar, spatulate to fan-like setae, humerals alike; all legs shorter than body, all tarsi with smooth claws and empodia.

Other species
K. acidalia AHEER *et al.*, 1997
K. bakeri ZAHER and SOLIMAN 1967
K. caeterus BARILO 1986
K. mercedesae CORPUZ-RAROS 1998
K. pintoriensis CORPUZ-RAROS 1998

Habitat: Soil, food stores, bird's nest. USA, Asia.

Genus *Laeliocheyletia* SUMMERS and PRICE 1970

Type species: *Laeliocheyletia teretis* SUMMERS and PRICE 1970

Diagnosis: Eyes present; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with more than 3 teeth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with propodosomal and hysteronotal shields, both with similar, rod-like, barbed setae; humerals alike but displaced onto ventral platelets; all legs shorter than body, all tarsi with smooth claws and empodia.

Habitat: Tenebrionidae (Coleoptera). Central America.

Genus *Lepidocheyla* VOLGIN 1963

Type species: *Lepidocheyla gracilis* VOLGIN 1963

Diagnosis: Eyes present; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with more than 3 teeth; peritremes with 3-4 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a contiguous hysteronotal shield; both bearing fan-like setae, humerals similar; hysteronotal shield tapering posteriorly; all legs shorter than idiosoma; all tarsi with smooth claws and empodia.

Habitat: Old manure. Eastern Europe.

Genus *Metacheletoides* FAIN 1972

Type species: *Metacheletoides numidae* FAIN 1972

Diagnosis: Eyes absent; palpal tarsus without comb-like setae, bearing a smooth stiff seta and two sickle-like setae; palpal claw with more than one tooth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum only with a propodosomal shield, dorsal setae slender, barbed; several, including humerals, ultralong; claws on tarsus I minute, other tarsi with smooth claws and empodia.

Other species
M. akanyaruensis (FAIN) 1972
M. crinifer FAIN 1979
M. gisagarensis FAIN 1979

Habitat: Birds. Africa.

Genus Metacheyletia FAIN 1972

Type species: *Metacheyletia obesa* FAIN 1972

Diagnosis: Eyes absent; palpal tarsus with two sickle-like setae and two setae that lack dentitions; palpal claw with a single basal tooth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum only with a small propodosomal shield; all setae slender; humerals similar; all legs shorter than body; tarsi I-III with smooth claws and empodia; leg IV vestigial or absent.

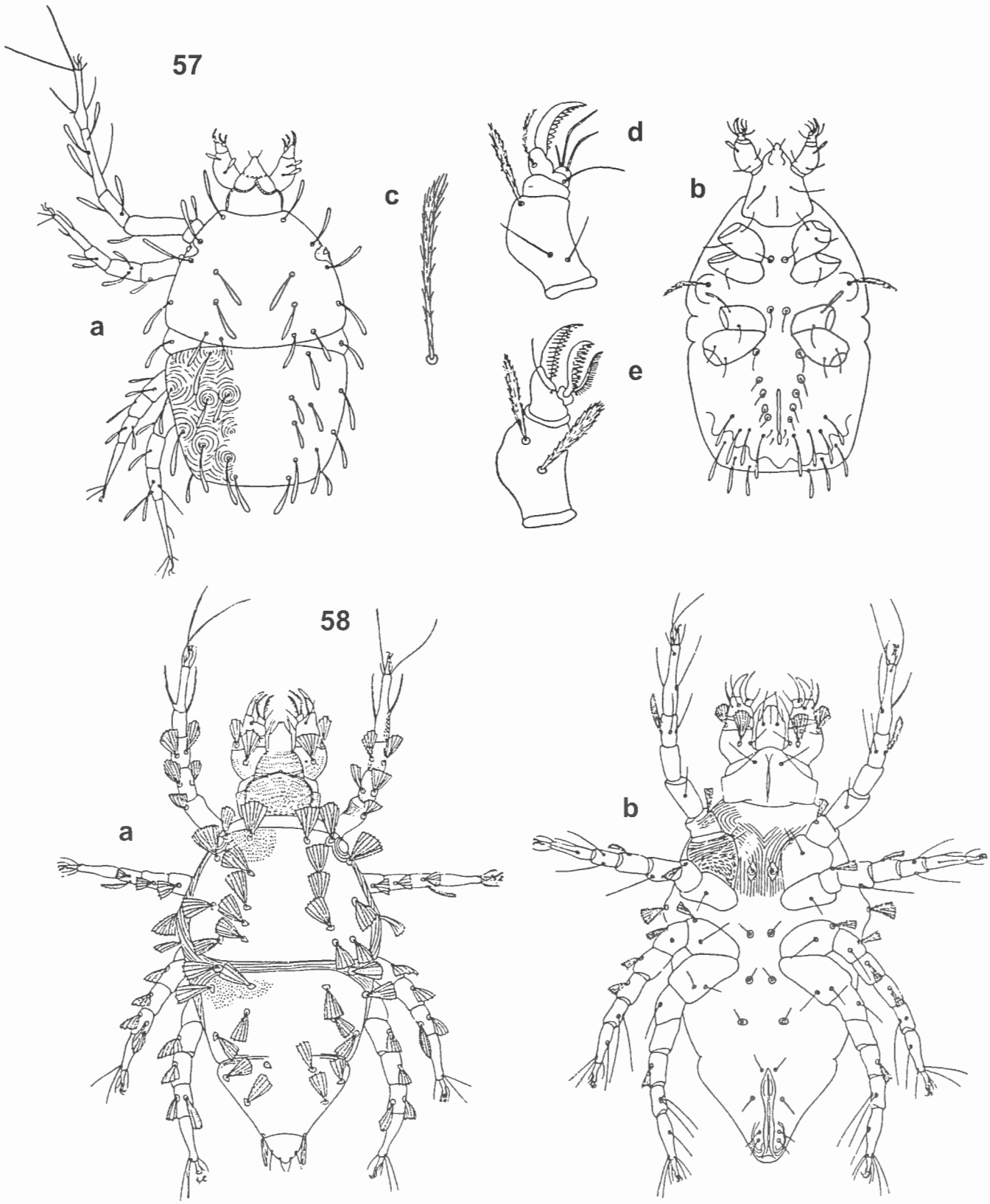
Other species
Metacheyletia longisetosa ATYEO *et al.*, 1984

Habitat: Parrots. Africa, South-East Asia, Mexico.

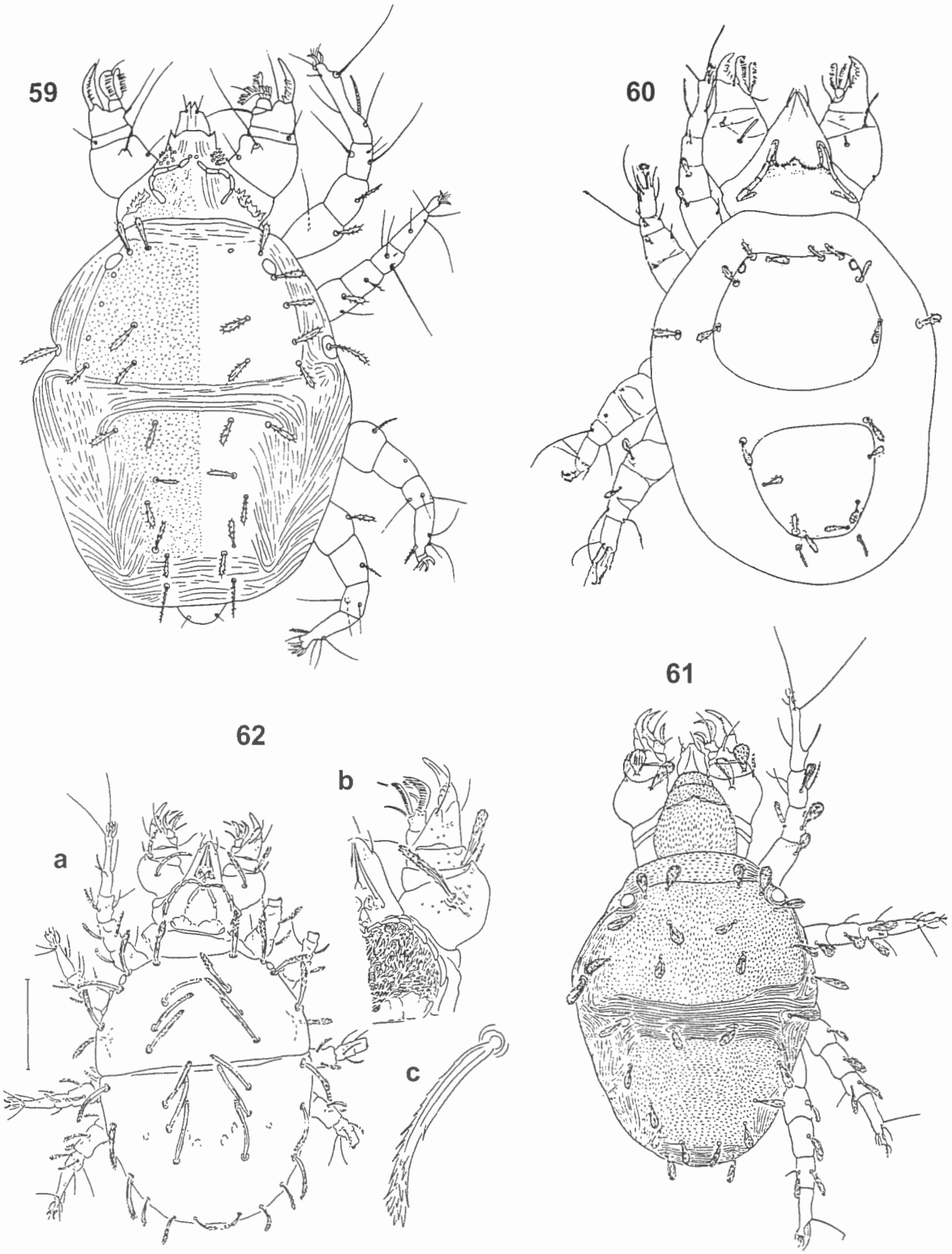
Genus *Mexecheles* DE LEON 1962 (= *Acarocheyla* VOLGIN 1965)

Type species: *Mexecheles cunliffei* DE LEON 1962

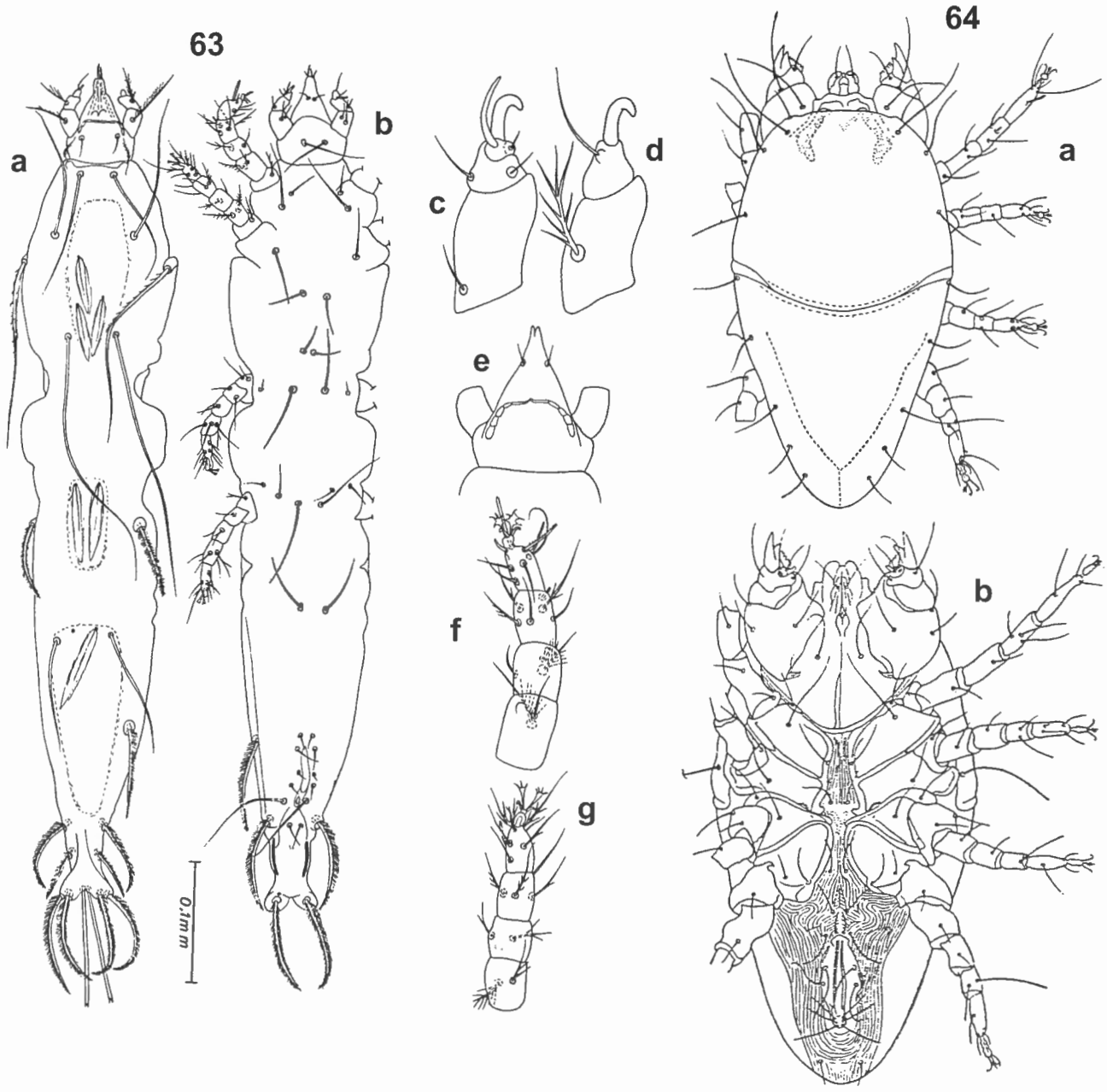
Diagnosis: Eyes present; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with more than 3 teeth; peritremes with more than 3 links; body ovoid; legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, both with dissimilar dorsal setae: laterals and humerals



Figs 57-58 — Fig. 57. *Cheletophanes montandoni* (BERLESE and TROUESSART). Female, dorsum (a) and venter (b); a dorsal seta (c); palpus venter (d) and dorsal (e) (from OUDEMANS, 1906). Fig. 58. *Lepidocheyla gracilis* VOLGIN. Female, dorsum (a) and venter (b) (from VOLGIN, 1969).



Figs 59-62 — Fig. 59. *Anthribicheyla bocki* THEWKE. Female, dorsum (redrawn by A.F. from the holotype). Fig. 60. *Tutacheyla robusta* CORPUZ-RAROS. Female, dorsum (from CORPUZ-RAROS, 1972). Fig. 61. *Hemicheyletia bakeri* (EHARA). Female, dorsum (from EHARA, 1962). Fig. 62. *Laeliocheyletia teretis* SUMMERS and PRICE. Female, dorsum (a); gnathosoma (b); a dorsal seta (c) (from SUMMERS and PRICE, 1970).



Figs 63-64 — Fig. 63. *Teinocheylus longissimus* FAIN. Female, dorsum (a) and venter (b); palpus venter (c) and dorsal (d); gnathosoma dorsal (e); leg I (f) and II (g) (from FAIN, 1974). Fig. 64. *Chelonotus selenirhynchus* BERLESE. Female, dorsum (a) and venter (b) (from DOMROW, 1960).

lanceolate to strap-like, medians staghorn-like; leg I with minute claws and empodia, subequal in length to body or longer; other legs shorter than body; tarsi II-IV with smooth claws and empodia.

Other species
M. aztecorum DE LEON 1962
M. hawaiiensis (BAKER) 1949
M. impolitus (SMILEY and MOSER) 1970
M. marshalli (BAKER) 1949
M. panneus SUMMERS and PRICE 1970
M. virginiensis BAKER 1949
M. votandinii JEFFREY 1975

Habitat: Plants, house dust, nests. USA, England, Australia.

Genus *Microcheyla* VOLGIN 1966

Type species: *Microcheyla parvula* VOLGIN 1966

Eyes present; with a single comb-like seta, other seta scimitar-like, and two sickle-like setae; palpal claw with more than 3 teeth; peritremes with 3-4 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield; lateral

setae fan-like, medians dissimilar, squamate; humeral setae displaced to a pleuroventral platelet, similar to laterals; all legs shorter than body, all tarsi with minute claws and empodia (see FAIN *et. al.* 1997).

Other species
M. bengalensis GUPTA and PAUL 1992
M. granifera KUZNETZOV 1977
M. ozkani KOÇ and AYYILDIZ 1995

Habitat: Plants, soil. Tadzhekistan, Russia, Turkey, USA.

Remarks: VOLGIN (1969) described the type species as bearing minute claws, whereas SUMMERS and PRICE (1970) emphasized the lack of claws on all tarsi. However, the figures provided by KUZNETZOV (1977) and by KOÇ and AYYILDIZ (1995) indicate that their species carry claws on all legs. Claws also seem to be present on leg I of *M. bengalensis* according to the figure provided by GUPTA and PAUL (1992). These authors also wrote that *M. bengalensis* has two comb-like setae, a feature not shared by the type species.

Genus *Muricheyla* FAIN 1972

Type species: *Muricheyla sicista* FAIN 1972

Diagnosis: Eyes absent; palpal tarsus with one comb-like seta and two sickle-like setae; palpal claw with 1-2 teeth; peritremes with more than 3 links; body ovoid; legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield; dorsal setae slender, barbed; humerals similar; all legs shorter than body; all tarsi with smooth claws and empodia; tarsi III and IV with 3 dorsal conical processes each.

Habitat: On *Sicista subtilis.* Caucasia.

Genus *Neoacaropsis* VOLGIN 1962

Type species: *Neoacaropsis granulatus* VOLGIN 1962

Diagnosis: Eyes present; palpal tarsus with a single comb-like seta; palpal claw with more than 3 teeth; peritremes with more than 3 links; body ovoid; dorsum with propodosomal and hysteronotal shields, both with spatulate setae; humerals similar; legs II and III separated by less than body width; claws on all tarsi on swollen stalks and with basal processes.

Other species:
N. levis CORPUZ-RAROS 1972

Habitat: Soil, Russia.

Remarks: CORPUZ-RAROS (1972) described *N. levis* as having "claws of legs II-IV smooth, without basal processes". This suggests that the species should be placed elsewhere.

Genus *Neochelacheles* SMILEY and WILLIAMS 1972

Type species: *Neochelacheles messersmithi* SMILEY and WILLIAMS 1972

Diagnosis: Eyes present; palpal tarsus with one comb-like seta and two sickle-like setae; palpal claw with more than 3 teeth; peritremes with more than 3 links; body fusiform, legs II and III separated by more than body width; dorsum with a propodosomal and a hysteronotal shield; all dorsal setae spatulate-barbed, humerals likewise; all legs shorter than body; all tarsi with smooth claws and empodia.

Habitat: Tenebrionidae (Coleoptera), USA.

Genus *Neocheyletiella* BAKER 1949 (= *Ornithocheyla* LAWRENCE 1959)

Type species: *Neocheyletiella rohweri* BAKER 1949

Diagnosis: Eyes absent; palpal tarsus devoid of comb-like setae but with 1-2 sickle-like setae; tibial claw edentate; no retrorse processes on palpal femora; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal shield which may be distinguished only by delicate striae; dorsal setae slender, a few, including humerals, may be ultralong; setae *ic*4 missing; all legs shorter than body; all tarsi with basally-inflated claws and empodia; coxae III and IV widely separated, coxa IV with one seta; tibia I with solenidion φ.

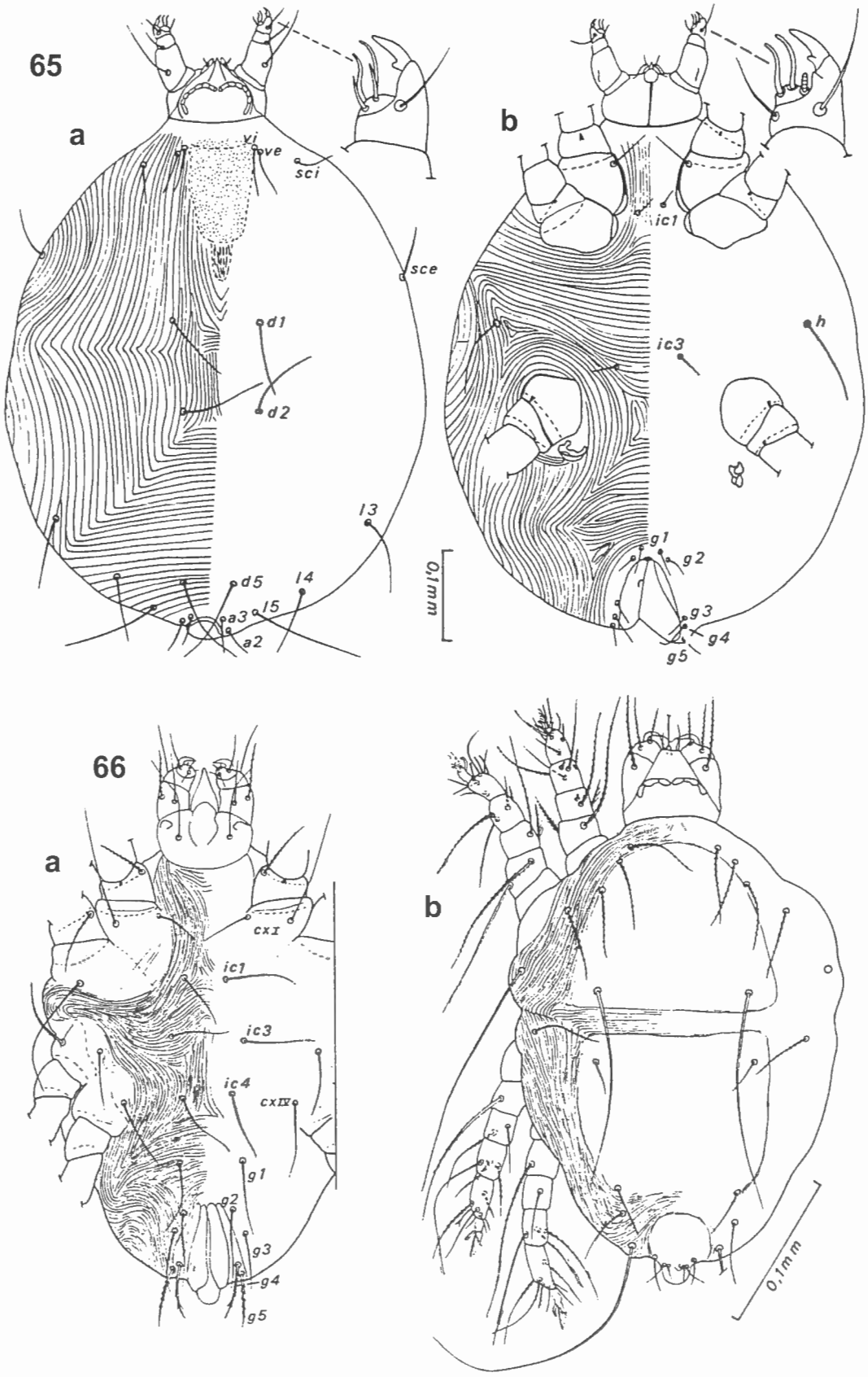
Other species
N. amandavae FAIN 1972
N. artami DOMROW 1965
N. avicola FAIN 1972
N. macronycha MÉGNIN* 1878
N. media FAIN 1972
N. megaphallos (LAWRENCE) 1959
N. microrhyncha (BERLESE and TROUESSART) 1889
N. pittae FAIN 1972
N. rohweri BAKER 1949
N. smallwoodae BAKER 1949
N. siva FAIN 1972
N. vestergaardi SMILEY* 1977

Habitat: Birds. Cosmopolitan.

Genus *Neoeucheyla* RADFORD 1950

Type species: *Cheyletia loricata* BERLESE 1913.

Diagnosis: Eyes present; palpal tarsus with two comb-like



Figs 65-66 — Fig. 65. *Metacheyletia obesa* FAIN. Female, dorsum (a) and venter (b) (from FAIN, 1972, 1980c). Fig. 66. *Ornithocheyletia aitkeni* FAIN. Female, venter (a) and dorsum (b) (from FAIN, 1981).

setae, a single sickle-like seta and an inflated seta; palpal claw with a single to more than 3 teeth; peritremes with more than 3 links, none paired, without posterior vesicular chamber; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, both covered by fan-like to squamate setae; laterals usually differ from medians, and latter may differ among themselves; humerals similar to other lateral setae; all tarsi with smooth claws and empodia.

Other species
N. beeri THEWKE and ENNS 1972
N. bulgarica (VOLGIN) 1955
N. dua CORPUZ-RAROS 1998
N. macrocorneus SOLIMAN 1975
N. maysa CORPUZ-RAROS 1998
N. minuta BARILO 1986
N. mumai VOLGIN 1969
N. ornata WAFA and SOLIMAN 1969
N. pavlovskyi VOLGIN 1964
N. ploceus GUPTA and PAUL* 1992
N. typhosa SUMMERS and PRICE 1970

Habitat: Soil, moss, plants. Europe, USA.

Remarks: The definition of *Neoeucheyla* is based on the inflated tibial seta along with the presence of a vesicular chamber at the posterior part of the peritremes; see also under *Cunliffella*. The presence or absence of eyes in *N. ploceus* could be determined neither from its description (GUPTA and PAUL, 1987) nor from the accompanying figure. The status of this species remains unclear.

Genus *Nihelia* DOMROW and BAKER 1960 (= *Hemicheyletus* LAWRENCE 1954)

Type species: *Nihelia calcarata* DOMROW and BAKER 1960

Diagnosis: Eyes absent; gnathosoma with lateral and dorsal hook-like processes; palpal tarsus minute, without comb-like or sickle-like setae; palpal tibia bears large, hooked edentate claw; palpal femur with a lateral process; peritreme with more than 3 broad links, posteriorly paired and convulated; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal shield and a hysteronotal shield; all setae, including humerals, slender; humerals on separate platelet; all legs shorter than body; solenidion σI on genu I replaced by a stellate seta; all tarsi with smooth claws and empodia.

Habitat: Mongoose. Africa, South-east Asia.

Other species
N. curvidens (LAWRENCE) 1948
N. cynictis FAIN 1979

Habitat: Mongooses. Thailand, Angola, South Africa.

Genus *Nodele* MUMA 1964 (= *Neocheletophyes* VOLGIN 1965)

Type species: *Nodele calamondin* MUMA 1964

Diagnosis: Eyes present; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with a single basal tooth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsal propodosomal and hysteronotal shields indeterminately separated, with similar rod-like barbed setae; humerals alike; leg I as long as body, other legs shorter; all tarsi with smooth claws and empodia.

Other species
N. coccineae THEWKE and ENNS 1968
N. mu HAINES 1988
N. philippinensis (BAKER) 1949
N. simplex WAFA and SOLIMAN 1968
N. superba KUZNETZOV 1977

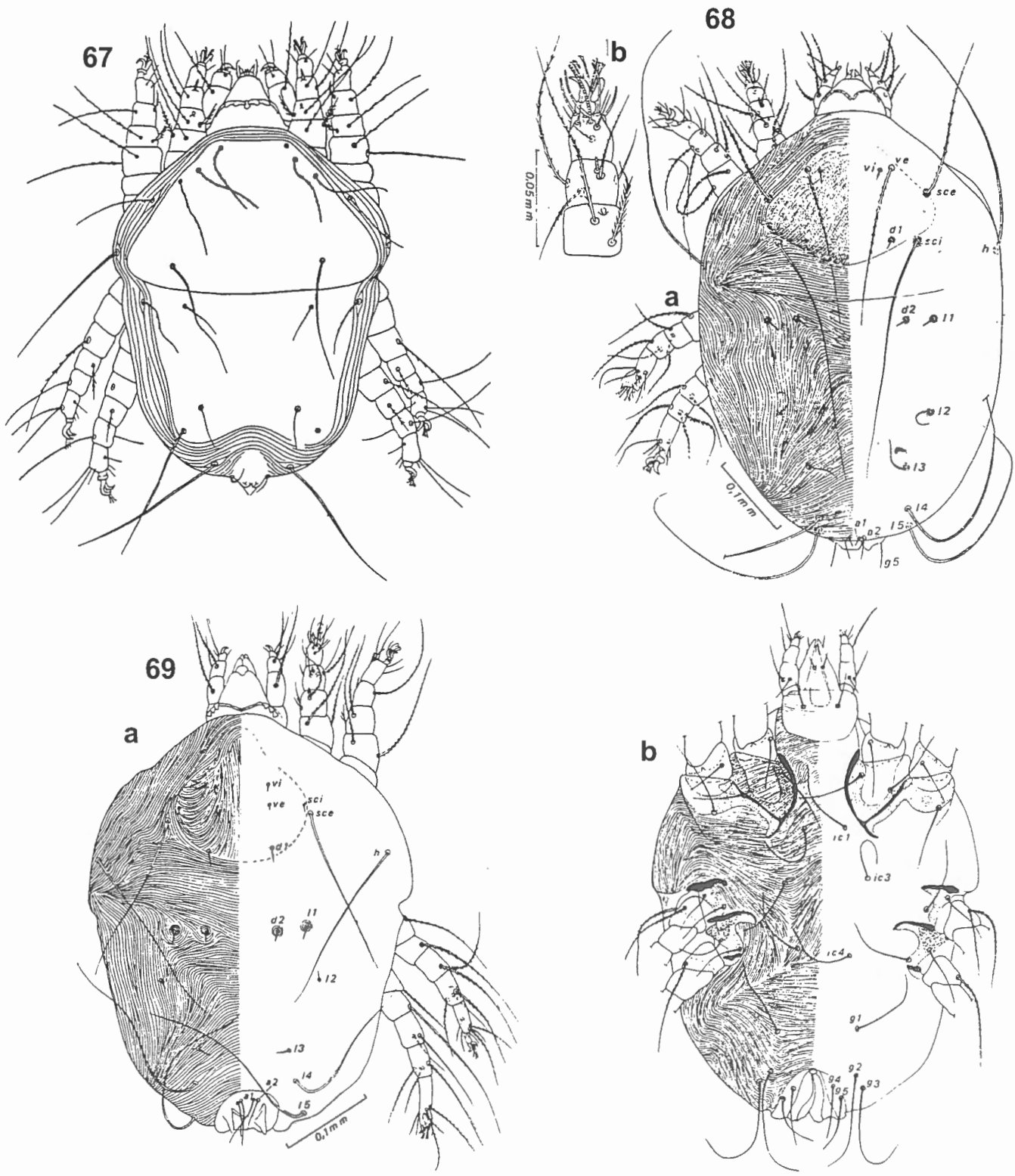
Habitat: Soil, galleries of bark beetles. USA, Russia, Asia.

Genus *Ornithocheyletia* VOLGIN 1964

Type species: *Ornithocheyletia dubinini* VOLGIN 1964

Diagnosis: Eyes absent; palpal tarsus devoid of comb-like setae but with 1-2 sickle-like setae; tibial claw edentate; no retrose processes on palpal femora; peritremes with 3-4 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and two hysteronotal shields: one large, covers hysteronotum, other suranal; dorsal setae slender, barbed; some, including humerals, ultralong; all legs shorter than body; all tarsi with smooth claws and empodia; coxa IV with 1 seta; tibia I with solenidion φ.

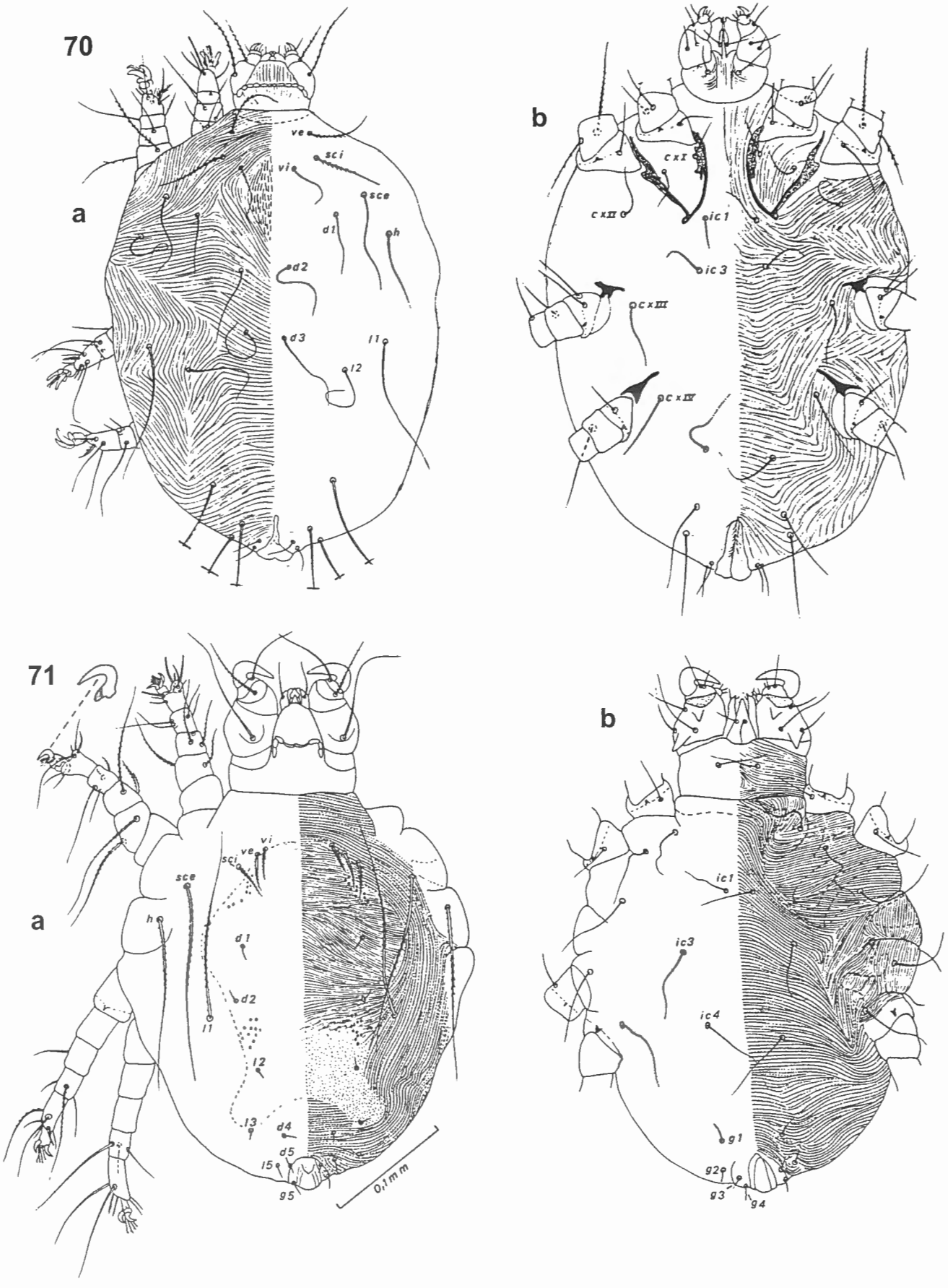
Other species
O. aitkeni FAIN 1972
O. argentinensis FAIN 1972
O. barri SMILEY 1977
O. canadensis (BANKS) 1909
O. eulabes FAIN 1981
O. francolini FAIN 1972
O. garrulax FAIN 1972
O. geopeliae FAIN 1981
O. gersoni SMILEY 1970
O. granatina FAIN 1972
O. hallae SMILEY 1970
O. lamprocolius FAIN 1972
O. lawrenceae SMILEY 1970
O. leiothrix FAIN 1972
O. lepidus FAIN 1981
O. lichmerae SMILEY 1984
O. lonchurae SMILEY 1984
O. lukoschusi FAIN 1970
O. mironovi BOCHKOV and CHIROV, 1998



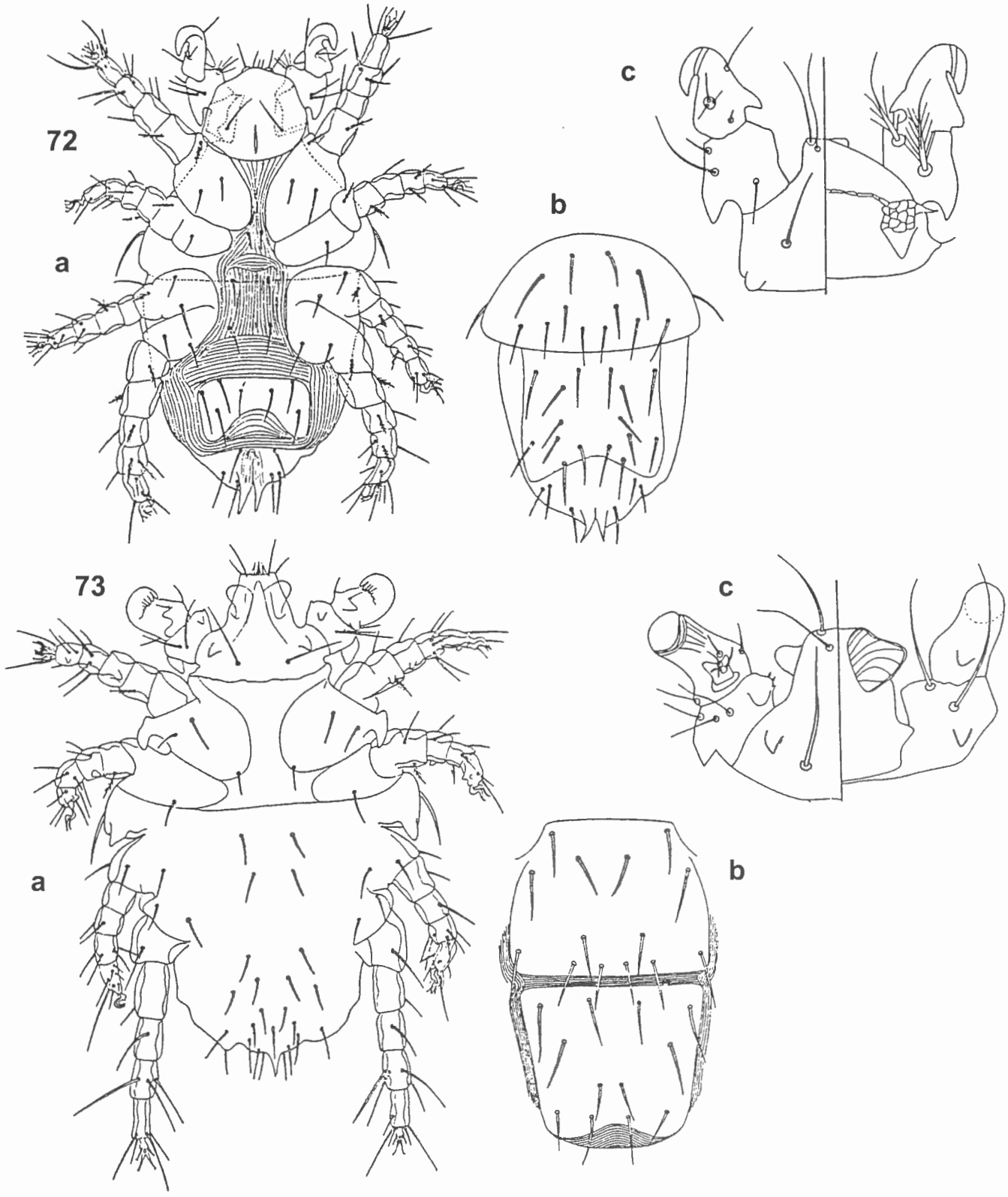
Figs 67-69 — Fig. 67. *Ornithocheyletia dubinini* VOLGIN. Female, dorsum (from VOLGIN, 1969). Fig. 68. *Bakericheyla benoiti* FAIN. Female, dorsum (a); leg I (b) (from FAIN, 1980b). Fig. 69. *Bakericheyla* (*Apodicheyla*) *africana* FAIN. Female, dorsum (a) and venter (b) (from FAIN, 1979b).

O. phylloscopi BOCHKOV *et al.*, 1994
O. pinguis (BERLESE) 1889
O. psittaci FAIN 1972
O. psittaculae FAIN 1972
O. smileyi FAIN 1972
O. volgini SMILEY 1970

Habitat: Birds; cosmopolitan.



Figs 70-71 — Fig. 70. *Neocheyletiella media* FAIN. Female, dorsum (a) and venter (b) (from FAIN, 1980a). Fig. 71. *Apodicheles cypsiurus* FAIN. Female, dorsum (a) and venter (b) (from FAIN, 1979b).



Figs 72-73 — Fig. 72. *Nihelia curvidens* (LAWRENCE). Female, venter (a) and dorsum (b); gnathosoma: venter, left; dorsum, right (c) (from LAWRENCE, 1948). Fig. 73. *Galagocheles lemuricola* (LAWRENCE). Female, venter (a) and dorsum (b); gnathosoma: venter, left; dorsum, right (c) (from LAWRENCE, 1948 and FAIN, 1979a).

Genus *Oudemansicheyla* Volgin 1969

Type species: *Cheletomimus denmarki* Yunker 1961

Diagnosis: Eyes present; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with more than 3 teeth; peritremes with at least 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and two hysteronotal shields, placed side-by-side; all with similar dorsal fan-like setae; each hysteronotal shield with 5-7 setae; humerals alike; all legs shorter than body; all tarsi with smooth claws and empodia.

Other species
O. coprosomae Thewke and Enns 1976

Habitat: Soil, plants. USA, Australasia.

Genus *Paracaropsis* Volgin 1969

Type species: *Acaropsis travisi* Baker 1949

Diagnosis: Eyes present; palpal tarsus with a single comb-like seta and two sickle-like setae; palpal claw with more than 3 teeth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and 2 minute hysteronotal shields, placed in tandem, median, devoid of setae; dorsal setae slender, humerals similar but ultralong; all tarsi with smooth claws and empodia, claws on tarsus I minute.

Habitat: Lizard, flies, moss. USA, Europe.

Genus *Paracheyletia* Volgin 1955

Type species: *Cheyletus pyriformis* Banks 1904

Diagnosis: Eyes present; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with more than 3 teeth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, both with dissimilar setae, lateral and humerals fan-like, medians staghorn-like; all legs shorter than body, all tarsi with smooth claws and empodia; claws on tarsus I minute.

Other species
P. hortensis Volgin 1969
P. recki Volgin 1966
P. samsinaki Volgin 1966

Habitat: Plants, insects. Eastern Europe, USA.

Remarks: The present concept of *Paracheyletia* is based on Summers and Price (1970). The female of the type species has dissimilar lateral and median dorsal setae, whereas all those of the male are similar. Only the males of the other species are known, and they bear similar dorsal setae. A clearer definition of the genus will thus have to await the description of additional species or of the females of named taxa.

Genus *Paracheyletiella* Kuznetzov 1977

Type species: *Paracheyletiella volgini* Kuznetzov 1977

Diagnosis: Eyes present; palpal tarsus with two comb-ike setae and two sickle-like setae; palpal claw with more than 3 teeth; peritremes with at least 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and two hysteronotal shields, placed side-by-side; with rod-like, barbed dorsal setae; each hysteronotal shield with 2 setae; humerals similar to other dorsal setae; all tarsi with smooth claws and empodia, solenidia on all tarsi subequal to segment in length.

Habitat: Tree holes, Russia.

Remarks: The type of this genus is very similar to several species of *Cheletomimus*, the only consistent difference being the length of the solenidia on tarsi II-IV. A further evaluation of this character is warranted.

Genus *Paramicrocheyla* Olivier and Theron 1989

Type species: *Paramicrocheyla spinula* Olivier and Theron 1989

Diagnosis: Eyes present; palpal tarsus with a single comb-like seta; palpal claw with more than 3 teeth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, both with fan-like setae, humerals similar; all tarsi with empodia but lack claws.

Other species
Paramicrocheyla ungulina Olivier and Theron 1989.

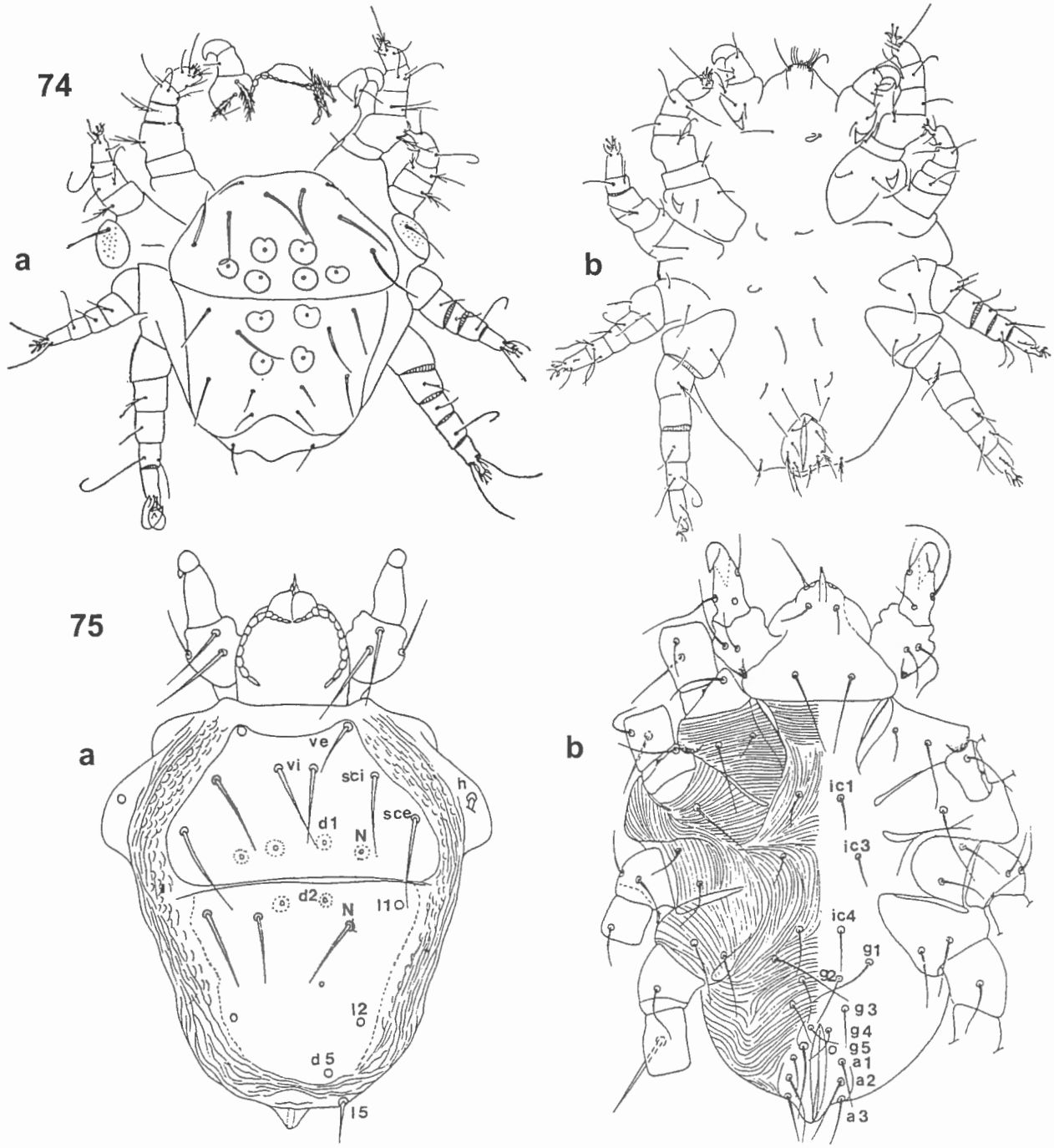
Habitat: Soil, South Africa.

Remarks: The description of this genus presents two separate problems. First, the figure of *P. spinula* (herein reproduced as Fig. 28) suggests that the specimen examined by Olivier and Theron may have been a nymph. Second, *P. spinula* lacks claws on all legs, whereas the second species, P. *ungulina,* has tarsal claws.

Genus *Pavlovskicheyla* Volgin 1965

Type species: *Cheletophyes semenovi* Rhodendorf 1940

Diagnosis: Eyes present; palpal tarsus with two comb-like seta and two sickle-like setae; palpal claw edentate;



Figs 74-75 — Fig. 74. *Sciurocheyla squamosa* (DOMROW and BAKER). Female dorsum, (a) and venter (b) (from DOMROW and BAKER, 1963). Fig. 75. *Smileycheles camerounensis* FAIN. Female dorsum, (a) and venter (b) (from FAIN, 1979a).

peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, both smooth or punctated and with similar, lanceolate to fan-like dorsal setae; humerals similar; all legs shorter than body, all tarsi with smooth claws and empodia.

Other species
P. philippicana CORPUZ-RAROS 1998
P. platydemae THEWKE and ENNS 1975

Habitat: Stored products, manure, Tenebrionidae (Coleoptera). Uzbekistan, USA.

Genus *Philippicheyla* CORPUZ-RAROS 1972

Type species: *Philippicheyla filipina* CORPUZ-RAROS 1972

Diagnosis: Eyes present; palpal tarsus with two comb-

like setae and two sickle-like setae; palpal claw with more than 3 teeth, located only along basal half; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a single propodosomal shield bearing rod-like setae; humeral setae alike; all tarsi with smooth claws and empodia.

Other species
P. notelaeae GERSON 1994

Habitat: Plants. The Philippines; Australia.

Genus *Polycheyletus* VAIVANIJKUL 1979

Type species: *Polycheyletus boonkongae* VAIVANIJKUL 1979

Diagnosis: Eyes present; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with 2 basal teeth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, both bearing many neotrichous, similar fan-like setae; humerals similar; all tarsi with smooth claws and empodia.

Other species:
P. batangenius (CORPUZ-RAROS and SOTTO) 1977

Habitat: Soil; Thailand, The Philippines.

Remarks: CORPUZ-RAROS (1980) redescribed *P. batangenius* (originally placed in *Oudemansicheyla*). She noted that it differed from the type species by having only a single comb-like seta (among other characters), the appropriate seta being present but lacking dentitions. At present it is difficult to evaluate the significance of this variation.

Genus *Promuricheyla* FAIN 1979

Type species: *Promuricheyla lukoschusi* FAIN 1979

Diagnosis: Eyes absent; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with 1-2 teeth; peritremes with more than 3 links; body ovoid; legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield; dorsal setae slender, barbed, humerals similar; all tarsi bear smooth claws and empodia; tarsi III and IV with 2 dorsal conical processes each.

Habitat: On *Nannosciurus surrutilus*, The Philippines.

Genus *Prosocheyla* VOLGIN 1969

Type species: *Cheletogenes oaklandia* BAKER 1949.

Diagnosis: Eyes present; palpal tarsus with two comb-like setae and two sickle-like setae; palpal claw with more than 3 teeth; peritremes with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield, both with similar or dissimilar fan-like or staghorn-like setae; humerals similar to lateral setae; leg I without claws and empodia, bearing four to six conspicuous terminal setae; tarsi II-IV with smooth claws and empodia.

Other species
P. acantha (SMILEY and MOSER) 1970
P. buckneri (BAKER) 1949
P. hepburni (LAWRENCE) 1954
P. traubi (BAKER) 1949
P. villosa BOCHKOV and HAUSTOV, 1999

Habitat: Plants. Cosmopolitan.

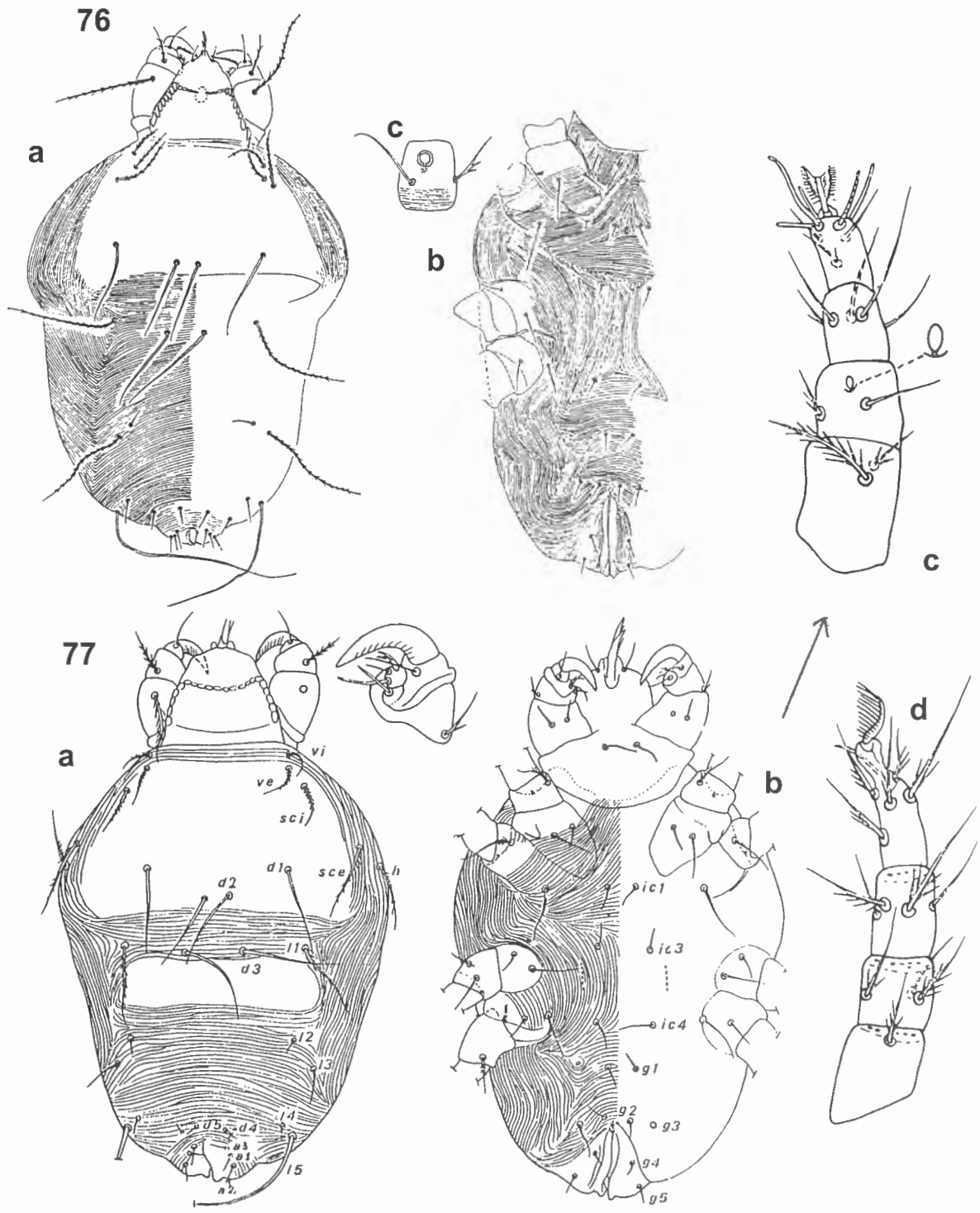
Remarks: VOLGIN (1969) as well as SUMMERS and PRICE (1970) noted that *Prosocheyla* is a heterogenous assemblage. VOLGIN (1969) split *Prosocheyla* into two subgenera, *Prosocheyla* and *Reckiana;* the former characterized by a large shield which covers most of its hysteronotum, whereas the latter bears only an indeterminate, centrally-located hysteronotal shield. SUMMERS and PRICE (1970) generally agreed with VOLGIN, but did not accept his subgenera. Upon applying the generic concepts used in the present summation, we conclude that the genus may have to be split even further. All dorsal setae of the type species, *P. oaklandia,* are similar, whereas they are quite dissimilar on the dorsum of another member of that group, *P. traubi.* The same disparity may be seen in regard to the dorsal setae of *P. hepburni* and *P. buckneri,* both placed in the *Reckiana* group. Finally, *P. acantha,* which has a longitudinally-separated hysteronotal shield, clearly deserves separate status. However, were we to formalize these concepts, *Prosochyla* would be split into five genera, a step which appears to be premature.

Genus *Samsinakia* VOLGIN 1965 (= *Cryptocheyla* FAIN, 1972)

Type species: *Cheletophyes theodoridis* Saminák 1959

Diagnosis: Eyes present; palpal tarsus with two comb-like seta and two sickle-like setae; palpal claw with 1-12 teeth; peritremes with more than 3 links; gnathosoma partly covered by anterior margin of propodosoma; body ovoid; legs II and III separated by less than body width; dorsum with strongly-appressed propodosomal and hysteronotal shields; dorsal setae slender, lanceolate or fan-like, humerals alike; all tarsi with smooth claws and empodia.

Other species:
S. carabae RAMARAJU and MOHANASUNDARAM 1999



Figs 76-77 — Fig. 76. *Cheyletiella parasitivorax* (ÉGNIN). Female dorsum, (a) and venter (b); genu I, dorsal (c) (from SMILEY, 1970). Fig. 77. *Bicheyletiella romerolagi* FAIN. Female dorsum, (a) and venter (b); leg I (c); leg IV (d) (from FAIN, 1979f).

S. gonocephalum FAIN 1984
S. pagongae CORPUZ-RAROS and SOTTO 1977
S. trilobitus BOCHKOV and MIRONOV 1998
S. volgini (FAIN) 1972

Habitat: Tenebrionidae (Coleoptera). Africa, Australia, The Philippines.

Remarks: The variable number of teeth located on the tibial claw of species consigned to this genus, as well as the diverse shape of their dorsal setae, would indicate that *Samsinakia,* as presently understood, consists of more than a single genus. CORPUZ-RAROS and SOTTO (1977) were aware of these difficulties and only reluctantly placed *pagongae* (collected from soil, an unusual habitat

Figs 78-79 — Fig. 78. *Eucheyletiella ochotonae* (VOLGIN). Female, dorsum (from VOLGIN, 1969). Fig. 79. *Criokeron quintus* (DOMROW and BAKER). Female, dorsum (from DOMROW and BAKER, 1963).

for *Samsinakia*) in this genus. Most species of *Samsinakia* were collected off tenebrionid beetles, and the variations noted may reflect adaptations to specific hosts. A further evaluation of the characters defining *Samsinakia* awaits the description of additional species.

Genus *Sciurocheyla* VOLGIN 1969

Type species: *Nihelia squamosa* DOMROW and BAKER 1963

Diagnosis: Eyes absent; palpal tarsus minute, without comb-like or sickle-like setae; palpal claw edentate, hooked; palpal femur and coxa I each with a retrose ventral process; peritreme with more than 3 beadlike links; body ovoid, legs II and III separated by less than body width; dorsum with two contiguous, propodosomal and hysteronotal shields; dorsal setae dissimilar, medians squamate, laterals and humerals slender; humeral setae on a separate platelet; all legs shorter than body; solenidion σI on genu I replaced by a stellate seta; all tarsi with smooth claws and empodia in the shape of two diverging, distally-expanded rods.

Habitat: Squirrel (Sciuridae). Thailand.

Genus *Smileycheles* FAIN 1979

Type species: *Smileycheles camerounensis* FAIN 1979

Diagnosis: Eyes absent; palpal tarsus absent, thus without comb-like or sickle-like setae; palpal claw edentate, hooked; palpal femur with a ventral process; peritreme with more than 3 beadlike links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield; all setae, including humerals similar, slender; all legs shorter than body; solenidion σI on genu I replaced by a stellate seta; all tarsi with smooth claws and empodia.

Habitat: Rodents. Africa.

Genus *Teinocheylus* FAIN 1974

Type species: *Teinocheylus longissimus* FAIN 1974

Diagnosis: Eyes absent; palpal tarsus without comb-like setae and a single sickle-like seta; palpal claw edentate; peritreme with more than 3 links; body fusiform, legs II and III separated by more than body width; dorsum with a single propodosomal shield and two hysteronotal shields placed in tandem; all shields bear foliate setae; other anterior dorsal setae, including humerals, slender or barbed, posterior setae feathered; idiosoma with two setiferous lobes caudally; all legs shorter than body, coxae III and IV clearly separated; tarsi I-III bear smooth claws and empodia; tarsus IV only with empodium.

Other species
Teinocheylus gundii FAIN *et al.*, 1982.

Habitat: Rodents. Africa.

Genus *Thewkachela* IDE and KETHLEY 1977

Type species: *Thewkachela ratufi* IDE and KETHLEY 1977

Diagnosis: Eyes absent; palpal tarsus with one comb-like seta and two sickle-like setae, other comb-like seta modified to a thick spine; palpal claw edentate; peritremes with more than 3 links; base of gnathosoma with strong hooks; body ovoid; legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield; dorsal setae short, barbed; humerals similar, on separate platelets; all legs shorter than body; coxae I-II with lobes; all tarsi with smooth claws and empodia.

Habitat: Squirrels. South-east Asia.

Genus *Tutacheyla* CORPUZ-RAROS 1972 (= *Indonesicheyla* THEWKE 1980)

Type species: *Tutacheyla robusta* CORPUZ-RAROS 1972

Diagnosis: Eyes present; palpal tarsus with two comb-like seta and two sickle-like setae; palpal claw with more than 3 teeth; peritremes strongly M-shaped, with more than 3 links; body ovoid, legs II and III separated by less than body width; dorsum with a propodosomal and a hysteronotal shield which carry similar spatulate setae; humerals similar; all tarsi with smooth claws and empodia.

Other species
T. buruensis (THEWKE) 1980

Habitat: Plants. The Philippines; USA.

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