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A new species of *Weiseronyssus* Samsinak 1962 (Acari: Mesostigmata: Diplogyniidae) from Iran, with a key for genera

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Abstract

A new species of *Weiseronyssus* (Mesostigmata: Diplogyniidae) is described from adult females and males taken from *Oryctes nasicornis* (L.) (Coleoptera: Scarabaeidae) in northern Iran. The genus was previously known from a single species associated with an undetermined dynastine scarab from southern China. The generic diagnosis is updated and a key to the genera of Diplogyniidae is presented.

Key words: Acari, Mesostigmata, Diplogyniidae, *Weiseronyssus*, *Oryctes nasicornis*, Iran

Introduction

Adults of the mesostigmatid mite family Diplogyniidae are usually found on host specimens, most commonly beetles of the superfamily Scarabaeoidea (e.g., Passalidae, Scarabaeidae) (Elsen 1975, 1981; Hunter 1993; Trägårdh 1950; Womersley 1958). However, their overall host range is in fact quite extensive, including Curculionidae (Hicks 1958), Tenebrionidae (Elsen 1981; Samsinak 1957), Histeridae (Banks 1905; Hicks 1957; Ishikawa 1968; Masán & Kaluz 1998), Hymenoptera (Elsen 1975; Hunter 1993), Isoptera (Krantz 1958), Blattodea (Womersley 1958), Dermaptera (Seeman 2007), Myriapoda (Canestrini 1888; Womersley 1958) and even Squamata (Johnston & Fain 1964). Off-host records of adults (Bhattacharyya 1969; Datta 1984; Elsen 1974; Trägårdh 1950) include sites under tree bark or in manure, all sites assumed to be high in organic matter. Only adults of these mites have been found on their hosts and immature stages are presumably free living predators in their host's habitat.

We provide the first record of Diplogyniidae from Iran. The combination of holotrichy / hypotrichy of the dorsal shield, a large rounded ventrianal shield, absence of ventrimarginal shields, and fused metasternal shields, assign this species to *Weiseronyssus* Samsinak 1962, a genus previously known only from a single species from Southern China. Adult males and females of a new species were removed from *Oryctes nasicornis* (L.) (Coleoptera: Scarabaeidae) collected in two different areas with similar climatic characteristics in northern Iran near the Caspian Sea. Several species of *Oryctes* Illiger have been recorded from Iran; *O. nasicornis* is a big (23-42 mm long) oaken reddish beetle with large horned males and short horned females. It has been reported from central and northern Iran, near the Caspian Sea to north-eastern Iran (Behdad 1996). The beetle's larvae feed on stems and roots of some Rosaceae and sometimes grape but the species is not consid-

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ered an important pest species (Behdad 1996). Adult beetles are nocturnal and they are attracted to light.

Currently, 39 genera of the family Diplogyniidae have been named (Hallan 2000). Unfortunately, the literature on this family is quite dispersed. The last comprehensive revision (Trägårdh 1950) is now more than 50 years old, and the last key to the genera (Elsen 1975) listed only 22. The goal of this study is to describe the new species of *Weiseronyssus*, update the generic diagnosis, and to provide an updated generic key for the family.

Material and methods

Mites were removed from *O. nasicornis* (L.) (Coleoptera: Scarabaeidae) from two areas in northern Iran near the Caspian Sea, specifically the Galugah region in the east of Mazandaran province (July 2005) and the Shast-kola region in the west of Golestan province (June 2007). These two areas are near to each other and have similar climates. The beetles were captured with a light trap and killed in 75% ethanol. Mites were taken from under each beetle's elytra, cleared in Nesbitt's solution and mounted on permanent slides in Hoyer's medium.

Morphological observations, measurements (given in micrometers, in the format mean $\pm$ SD, range or in a single average value) and illustrations were made using compound microscopes equipped with differential interference contrast and phase contrast optical systems and a drawing tube. Idiosomal setal notation follows Lindquist and Evans (1965), leg chaetotaxy follows Evans (1963, 1965). Distinction between pore like structures of the idiosoma is based on the morphological observations of Athias-Henriot (1969a, 1969b); notation for these structures, as adenotoxy and poroidotoxy, respectively, follows Johnston and Moraza (1991).

Weiseronyssus Samsinak 1962

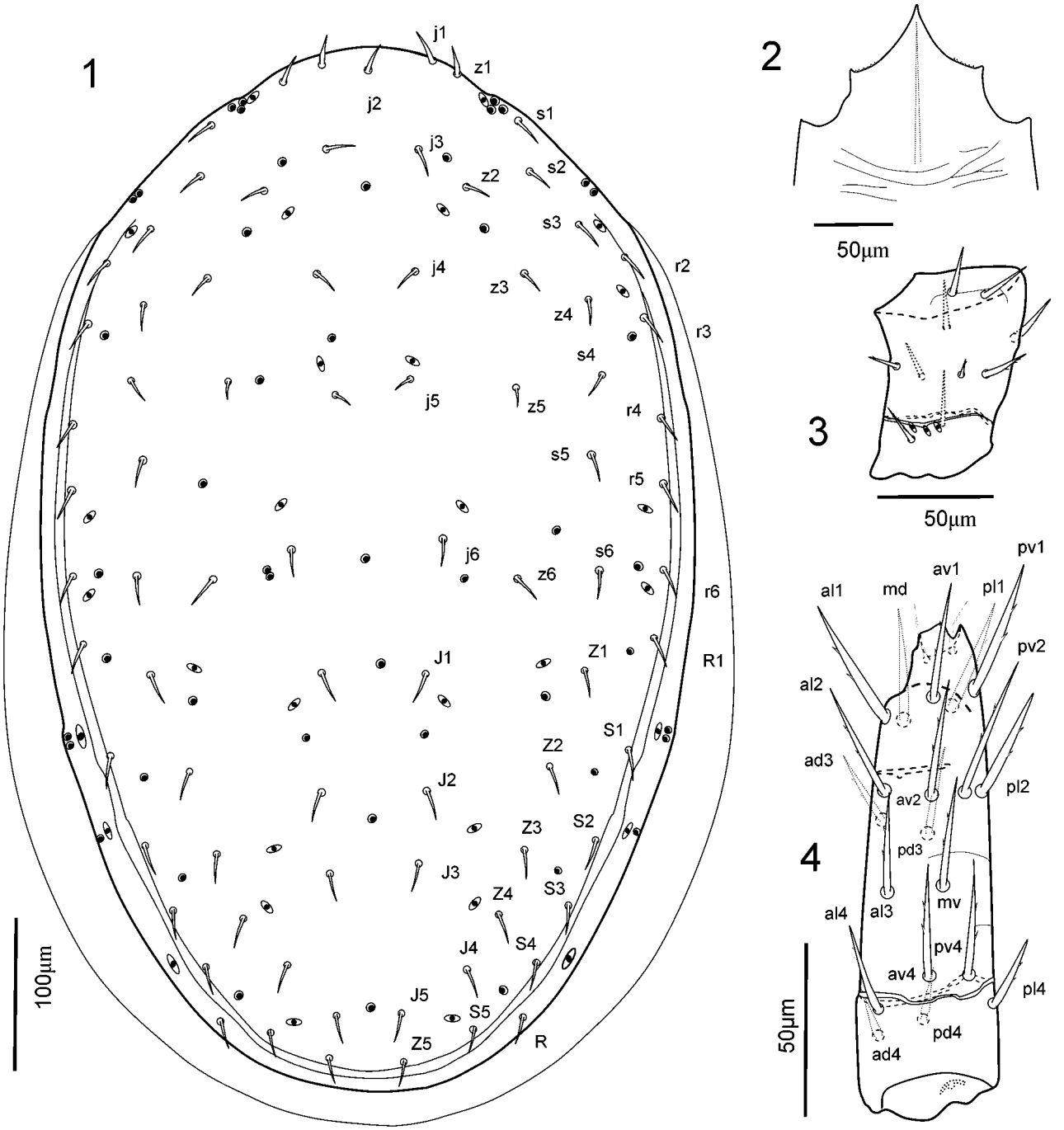
Weiseronyssus Samsinak 1962: 192

Diagnosis. Dorsal shield not completely covering the dorsum; unsclerotized cuticle between marginal and dorsal shield or between marginal and ventrianal shield without setae. Three pairs of glands on opisthosomal soft cuticle between the marginal and ventrianal shields. Marginal dorsal shield present, bearing one pair of setae (*R*). Marginal dorsal shield fused anteriorly with dorsal shield at level of setae *s3*, free lateral, fused or free posteriorly. Dorsal shield in podonotal region holotrichous with 22 pairs of setae and one unpaired medial setae; all relatively short; opisthonotum hypotrichous with 16 pairs of setae. Sternal shield with three pairs of setae, *st3* setae set close together at the posterior margin of the shield; two pairs of sternal lyrifissures and a pair of glands. Metasternal shields free from sternal shield but fused together, with short setae *st4* and lyrifissures *iv3*. Female genital shields include two triangular latigynial shields, each with two setae and a nearly rectangular small mesogynial shield; anterolateral margins of mesogynial shield overlapped by latigynial shields. Vaginal sclerites club-like, well sclerotized; with distinct lateral projections. Ventrianal shield hypotrichous, with six pairs of setae, four pairs of lyrifissures and a pair of glands (*gv2*). Ventrianal shield expansive, continuously united with peritrematal, exopodal and metapodal shields anterolaterally; posterior margin rounded, not extending to posterior margin of idiosoma. Ventrimarginal shields absent. Stigmata between coxae III and IV; peritremes extending no further than the middle region of coxae II. Movable digit of chelicerae in males with one brushy excrescence and a basal thumb like structure as long as movable digit; movable cheliceral digit in females with three brushy excrescences and a comb-like structure. Legs I without claws; tarsus IV without a distinct ventral sclerite.

Type species. *Weiseronyssus mirus* Samsinak 1962: 193.

***Weiseronyssus persicus* n.sp.**
Figs. 1–14

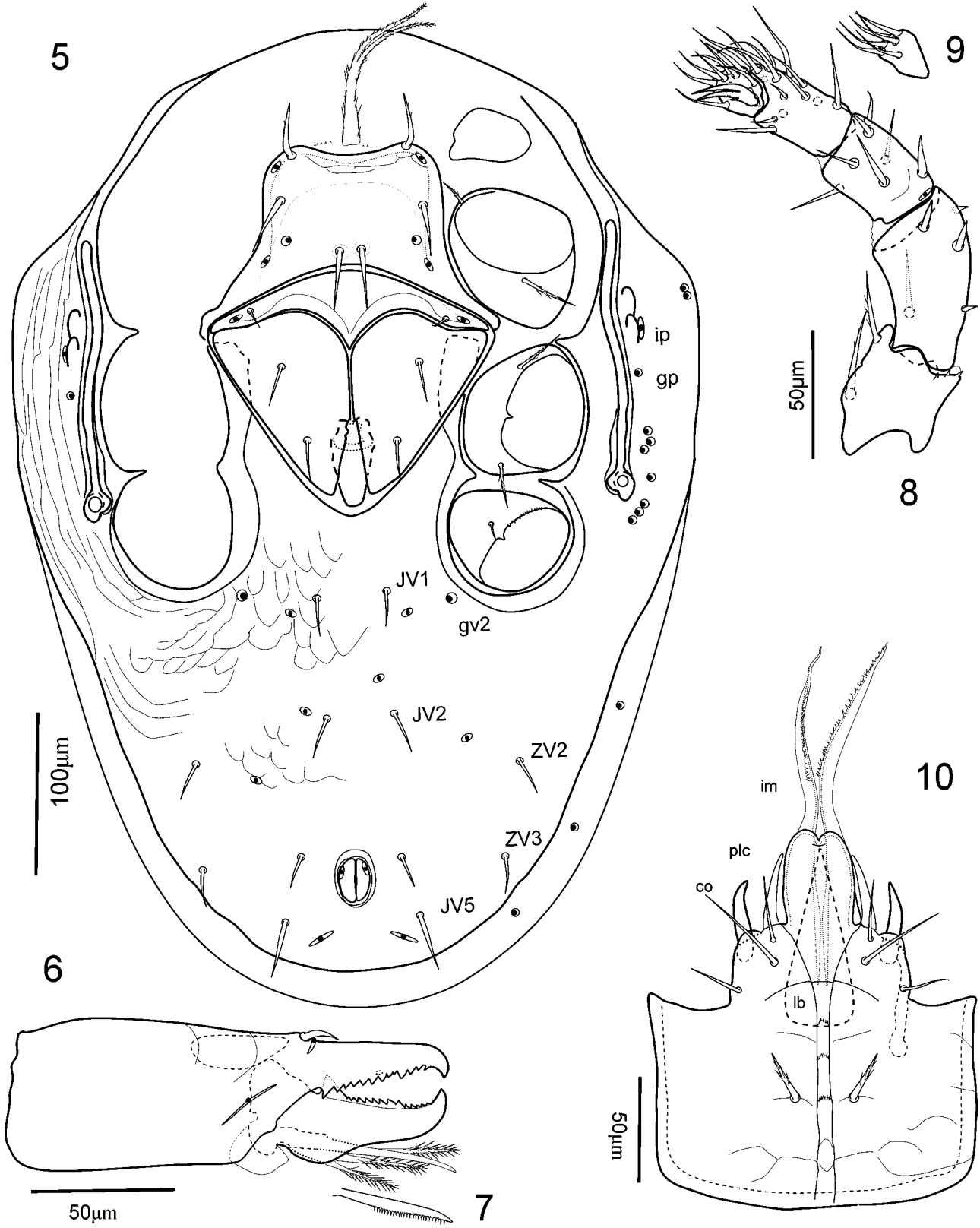
Diagnosis. With the characteristics of the genus. Marginal dorsal shield free in posterior region. Sternal setae *st2* and *st3* in the male distinctly shorter than *st1*. Mesogynial shield not fused to ventrianal shield. Gnathotectum with an anterior projection, triangular, with small denticles at each side of base and striation on dorsal basal surface, with a poorly developed median keel. Subcapitular setae denticulate in both adults.



FIGURES 1–4. *Weiseronyssus persicus* **n. sp.**, female: 1, idiosoma, dorsal aspect; 2, gnathotectum, anterolateral aspect; 3, genua II, dorsal aspect; 4, tarsus IV, ventral aspect.

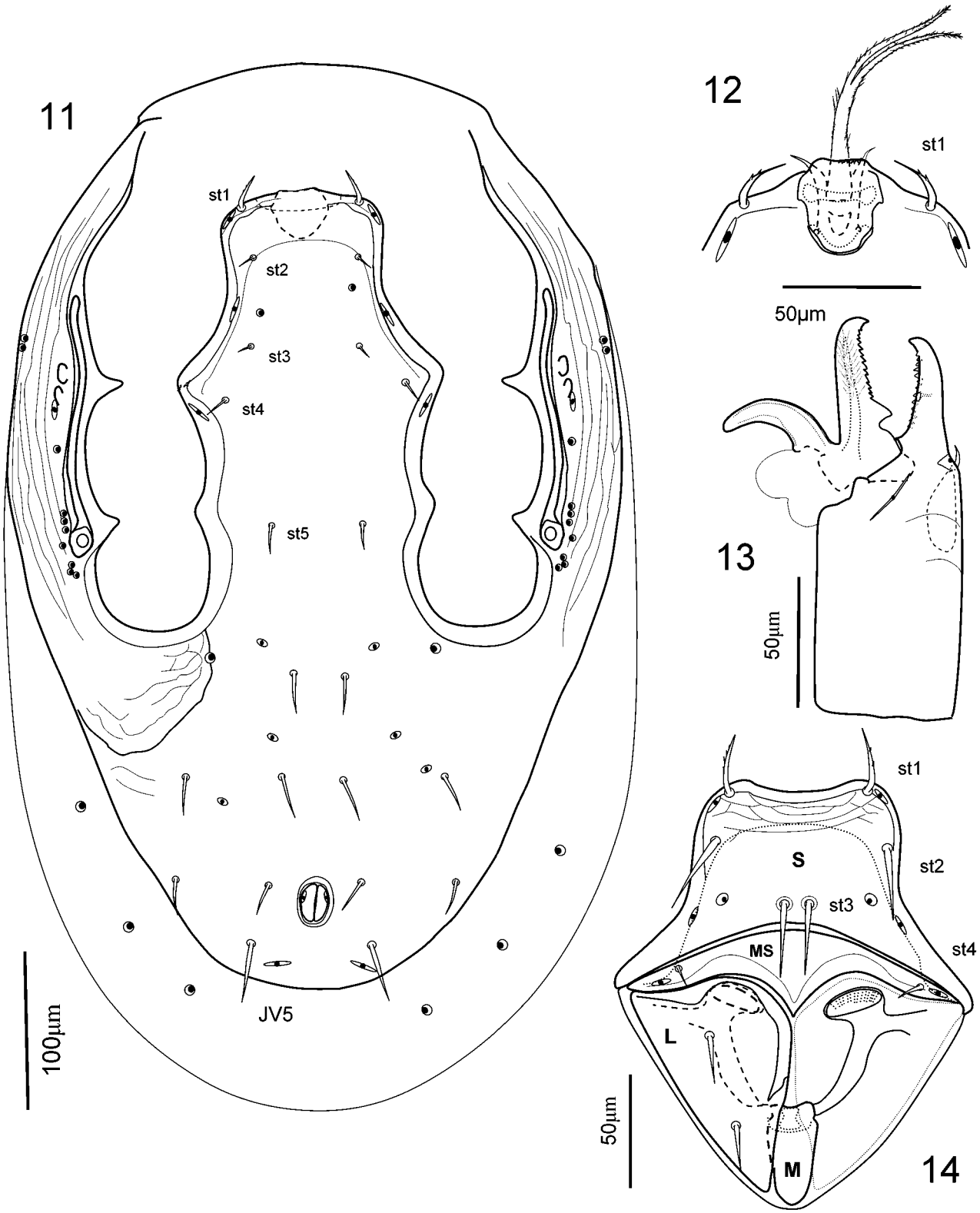
Taxonomic remarks. The above character states differ from those in *W. mirus* as follows: in *W. mirus* the dorsolateral shield is fused to the dorsal shield in the posterior region, setae *st2* and *st3* in the male are sub-

equal in length to *st1*, the mesogynial shield is fused to the ventrianal shield, and the subcapitular setae are smooth in the female. All state determinations for *W. mirus* are based on data listed in the original description (Samsinak 1962).



FIGURES 5–10. *Weiseronyssus persicus* **n. sp.**, female: 5, idiosoma, ventral aspect; 6, chelicera, antiaxial aspect; 7, details of the comb-like structure; 8, palp, anterolateral aspect; 9, palp-tarsus, posterolateral aspect; 10, subcapitulum.

The only other Diplogyniidae described from *Oryctes* spp., *Diplogynium oryctae* Vishnupriya & Mohanasundaram 1988, differs by the apparent fusion of the metasternal and latigynial shields, a smaller number of dorsal setae and, possibly, a different structure of the opisthogastral shields. Exact states are difficult to discern, as the description is inadequate by modern standards.



FIGURES 11–14. *Weiseronyssus persicus* **n. sp.**, 11, male, idiosoma, ventral aspect; 12, male, genital opening; 13, male, chelicera, antiaxial aspect; 14, female, sternal and genital shields. Abbreviations: L= latigynial shields; M= mesogynial shield, MS= metasternal shield; S= sternal shield.

Description. FEMALE. Idiosoma. Length: 642±25 (630–670), maximum width: 410±10 (395–415) (N=5). *Idiosoma, dorsum* (Fig. 1): Cuticle with reticulate ornamentation and a dense and distinctive punctation. Dorsal shield fused to dorsomarginal shields at level of setae *s3*. Podonotum with 22 setal pairs (*j1, j3-j6, z1-z6, s1-s6, r2-r6*) and one unpaired (*j2*) seta; opisthosoma with 17 pairs of setae (*J1-J5, Z1-Z5, S1-S5, R1, R*) one of them located on a distinctive marginal shield (*R*); all dorsal setae short and slightly denticulate, 12-20 long. Poroidotaxy and adenotaxy on dorsal shield as in Fig. 1, with six unpaired glands located along the midline: three podonotal (position *gdj3*, *gdj5*, *gdj6*) and three opisthonotal (position *gdJ1*, *gdJ2*, *gdJ5*); two pairs of podonotal glandular complexes (two or three glands associated) at positions *gdz1* and *gds2* and 13 pairs of isolated glands (seven pairs podonotal and six opisthonotal); 13 pairs of dorsal lyrifissures, eight podonotal and five opisthonotal); marginal shield with three additional pairs of opisthonotal lyrifissures, one pairs of complex glands (*gdS*1) and one pairs of simple glands (*gdS2*).

Idiosoma, venter (Fig. 5): Tritosternal base narrow and as long as laciniae; laciniae free and pilose. Sternal shield (Fig. 14: S) wider than long; 184 at the widest point (width at level of *st2* setae 100), length from median anterolateral to median posterolateral corners 60; concave posteriorly; smooth striation restricted to anterior part of sternal shield; with three pairs of setae, *st1* (33) barbed, *st2* (37) and *st*3 (37) smooth; *st3* set close together at posterior margin; with two pairs of lyrifissures and one pair of glands. Metasternal shields (Fig. 14: MS) fused together but free from sternal shield, with one pair of smooth *st4* setae (13) and lyrifissures *iv3*; combined shield is 178 wide and 40 long (measured at the body midline). Latigynial shields (Fig. 14: L) triangular in shape, with smooth surface and rounded anterior paraxial corners; 108 long and 85 wide, with two pairs of smooth setae (23); anterior and median margins thickened. Mesogynial shield small and narrow (50 long). Vaginal sclerites club-like, with moderate well developed lateral projections. Spermathecal apparatus without distinctly sclerotized structures. Ventrianal shield fused with peritrematal and parapodal shields, with reticulate ornamentation; ventrianal region with five pairs of ventral and one pair of paranal setae, unpaired postanal seta absent. Length of setae *JV1*, *JV2*, *JV5*, *ZV2*, *ZV3* and *PA* respectively: 25, 26, 36, 23, 18, 21; setae *JV1*, *JV2*, *JV5*, *ZV2*, *ZV3* and paranal setae with one to three fine denticles; four pairs of lyrifissures (*iv5* very conspicuous) and *gv2*; anal glands *gv3* absent. Anal valves with euanal lyrifissures but without anal setae. Peritrematal shields with longitudinal, parallel striae; peritremes 158 long, extending from stigmata to the middle region of coxae II; *ip1* associated with peritrematal sigillae; *gp1* is a complex of two glands, *gp2* is isolated; *gp3* positioned anterior to stigmata with three glands, *gp4* positioned at the stigmata level and *gp5* posterior to the stigmata with two or three glands.

Gnathosoma (Figs. 2, 6–10): Gnathotectum triangular, dorsal side with some small denticles at both basal lateral sides and fine striations on base (Fig. 2). Palptarsal apotele 3-tined, third tine small; palpi with standard setation for the family (2, 5, 7, 15, 14), palpgenual seta *al-2* longer than *al-1*, setae of trochanter pilose, the others simple (Figs. 8, 9). Chelicerae (Figs. 6–7): length 139, dorsal seta small and smooth, near dorsal lyrifissure; antiaxial lyrifissure long; unsclerotized area at base fixed digit; fixed digit with several (12–14) minute teeth and a large basal tooth; pilus dentilis vestigial, only alveolus present; movable digit with 15 small teeth, the five most distal ones minute, and a large basal tooth; three brushy excrescences and a comb-like structure with short denticles (Fig. 7) arising from proximolateral surface. Subcapitulum (Fig. 10) with smooth hypostomal setae (*hp1*= 28, *hp2*= 34, *hp3*= 18); subcapitular setae thicker and denticulate (21); deutosternum with five transversal rows, the two basal rows smooth, other rows with narrow denticles; all rows connected. Corniculi (*co*) narrow, spoon-like; internal malae (*im*) long and slender, pointed, finely fringed, and extending beyond the proximal margin of the palp tibia; paralaciniae (*plc*) as long as corniculi; labrum (*lb*) blade-like, not projecting beyond the apex of the subcapitulum, with plumose lateral margins.

Legs (Figs. 3–4): Legs II to IV with paired claws and rounded pulvilli well developed, leg I without pretarsus but with a small acrotarsus. Legs of moderate length (respectively, 445, 380, 355, 453); legs I and IV not longer than the dorsal shield. Ventral surface of coxae with serrated ridges. Tarsi II–IV with apical setal processes *ad-1*, *pd-1* conspicuous (Fig. 4). Complement of setae of genua of legs I-II-III-IV, respectively, 9-9-8-9; that of tibia 13-7-8-7.

MALE. Idiosoma. Length: 633±27 (605– 670), maximum width: 390±3 (388– 393) (N=5).

Idiosoma, dorsum: Dorsal shielding, chaetotaxy, adenotaxy and poroidotaxy similar to female.

Idiosoma, venter (Figs. 11–12): Males with a holoventral shield (genito-ventrianal fused to peritrematal shield and podal elements) (Fig. 11). Genital opening (Fig. 12) totally covered by sternal shield, 22 long, 30 wide. Ventral region of the shield with reticulate ornamentation and peritrematal region with longitudinal parallel striae similar to female. Sternal setae *st1* (23) thick and dentate; setae *st2* (9), *st3* (8), *st4* (13) and *st5* (19) thinner and smooth. Ventral idiosomal adenotaxy and poroidotaxy as in the female. Setae *JV5* (38) longest ventral setae; four pairs of ventral lyrifissures and *gv2* as in female. Anal valves as in the female.

Gnathosoma (Fig. 13): Subcapitulum as in female. Chelicera 145 long, 40 wide; movable digit multidentate, 13 minute teeth and a large basal tooth, with one brushy excrescence and a thumb like structure as long as movable digit; fixed digit multidentate and with vestigial pilus dentilis; unsclerotized area at the base of the fixed digit.

TABLE 1. Leg chaetotaxy of *Wiseronyssus persicus* **n. sp.**

Leg	Coxa	Trochanter	Femur	Genu	Tibia	Tarsus
I	2	5	10	1,3/1,2/1,1	2,3/2,2/2,2	
II	2	5	10	1,3/1,2/1,1	1,2/1,1/1,1	(18) 3,3/2,1/1,3/2,3
III	2	5	7	1,2/1,2/1,1	1,2/1,2/1,1	(18) 3,3/2,1/1,3/2,3
IV	1	6	8	1,3/1,2/1,1	1,2/1,1/1,1	(21) 4,3/3,1/1 3/3,3

Legs: Leg chaetotaxy as in the female. Length of legs I–IV respectively: 420, 360, 345, 439.

Type material. Holotype female: Iran, eastern part of Mazandaran province, Galugah region, latitude 36º 41´ 55", longitude 53º 50´ 24", taken from *Oryctes nasicornis*, 10 July 2005, H. Hajiqanbar coll. (deposited in Acarological Collection, Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran (AETMU)); same locality and collection data: seven paratype females and 11 paratype males (deposited in AETMU); two paratype females and one paratype male (deposited in Acarology Laboratory, Ohio State University, Columbus, Ohio (OSAL006592-006594)); Iran, western part of Golestan province, Shast-kola region, latitude 36º 48´ 5˝, longitude 54º 23´ 42˝, taken from *Oryctes nasicornis*, 21 June 2007, Sh. Kazemi coll., 15 paratype females and 18 paratype males (deposited in AETMU); two paratype female and two paratype male (deposited in Museum of Zoology, Navarra University, Pamplona, Spain (MZUNAV)). Host deposited in 75% ethanol in Entomological Collection, Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran.

Etymology. The specific name of the new species is derived from the country of origin.

Biology. Females of *W. persicus* often contained eggs. The number of eggs in this species ranges from 4–6. This mite may be quite host specific: in the three years in which the area has been investigated we did not find this mite on any other beetle species.

Generic key to females of the family Diplogyniidae (adapted from Elsen (1975))

Note: Generic concepts in the family Diplogyniidae are not always well defined, and some genera are separated based on quite minor characters. Clearly a generic level revision of the family is indicated. As such a project extends well beyond the goals of the current study, we included in this key all currently recognized genera for which information could be assembled by either direct examination of specimens, or by literature data. The latter restriction unfortunately excluded the type genus *Diplogynium* Canestrini, described from specimens found on a millipede from Brazil and never recollected. Specimens for the latter genus were not

available, and the original description of *Diplogynium* is very brief, listing no unique characters. Also excluded is *Eboriella* Elsen 1981 known from the male only.

1 Anal shield separated from ventral shield ..... Neodiplogyniinae Trägårdh 1950, *Neodiplogynium* Trägårdh 1950
- Anal shield fused to ventral shield 2
2 Thin, strap-like marginal shield separating dorsal and ventrimarginal shields; two porose areas near peritreme ..... Heterodiplogyniinae Trägårdh 1950 3
- Those specific characters absent 4
3 Marginal shield with numerous small spines. Width latigynial shields subequal to length, with indistinct anterior lobe ..... *Heterodiplogynium* Trägårdh 1950
- Marginal shield without spines, carrying marginal setae near posterior section. Latigynial shields twice as long as wide ..... *Cingularus* Elsen 1975
4 (2) Ventrianal shield and ventrimarginal shields fused, delineation limited to line posterior to anus. Body size small (400–450 long, 280–305 wide). Marginal dorsal setae short, one posterior pair three times as long as other marginal setae ..... *Microdiplogynium* Trägårdh 1950
- Ventrimarginal shields absent or quite distinct, not fused to ventrianal shield. Body size generally greater 5
5 Ventrimarginal shields extremely reduced or absent; ventrianal shield rounded posteriorly, covering almost entire ventral opisthosoma 6
- Ventrimarginal shields distinct; ventrianal shield pointed posteriorly, covering medial opisthosoma only 8
6 Metasternal setae present ..... *Weiseronyssus* Samsinak 1962
- Metasternal setae absent 7
7 Dorsum holotrichous, with no more than 42 pairs of setae; ventrianal shield not reaching posterior margin of the idiosoma; with 2 latigynial setae ..... *Bingervillia* Elsen 1981
- Dorsum hypertrichous; with 1–3 latigynial setae ..... Trichodiplogyniinae Trägårdh 1950, *Trichodiplogynium* Trägårdh 1950
8 (5) Metasternal setae present 9
- Metasternal setae absent 25
9 Metasternal shield not fused to the sternal shield 10
- Metasternal shield fused to the sternal shield; if fusion appears incomplete, peritremes not extending beyond anterior margin of coxae II 19
10 Peritremes elongate, extending distinctly anterior of coxae I 11
- Peritreme relatively short, not extending beyond anterior margin of coxae II 17
11 Ventrianal shield extending to posterior margin of idiosoma 12
- Ventrianal shield not extending to posterior margin, cut off by ventrimarginal shields 14
12 Only 5 pairs of dorsal setae elongate. Dorsal shield with crenulate margin ..... *Cryptometasternum* Trägårdh 1950
- More than 5 pairs of dorsal setae elongate, Dorsal shield margin not crenulate 13
13 Latigynial shield width subequal to length; anterior border almost transverse relative to body axis. Anus enveloped by shields ..... *Passalacarus* Pearse & Wharton 1936
- Latigynial shields much longer than wide; with a distinct anterior lobe. Anus surrounded by a membranous region ..... *Paradiplogynium* Womersley 1958
14 (11) With prominent scale-like processes on trochanter IV (less developed on trochanters II–III). Anus surrounded by branched integumentary canals. Latigynial shields elongate and triangular ..... *Ophiocelaeno* Johnston & Fain 1964

- Trochanteral processes and anal structures absent. Latigynial shields shaped differently 15

15 Anterior margin of sternal shield distinctly concave. Sternal seta *st1* twice as long as *st2* or *st3*. Most dorsal setae of similar size, medium long ..... *Brachylobogynium* Bhattacharyya, 1969

- Anterior margin sternal shield straight or only lightly concave. Sternal setae *st1*-*st3* of similar size. Dorsal setae variable in relative size 16

16 Anterior margin of latigynial shields distinctly bilobate. Dorsum with four pairs of long submarginal setae..... *Lobogynium* Trägårdh 1950

- Latigynial shields with a large anterior lobe and a small, truncate lateral lobe. Dorsum with two long submarginal setae on posterior border ..... *Bilongicauda* Elsen 1975

17 (10) With one seta on each latigynial shield..... *Monodiplogynium* Womersley 1958

- With two setae on each latigynial shield 18

18 Ventrianal shield extending to posterior margin of the idiosoma .....*Discretoseta* Elsen 1981

- Ventrianal shield ending anterior to posterior margin of idiosoma; cut off by ventrimarginal shields... ..... *Lobogyniella* Krantz 1958

19 (9) With only one setae on each latigynial shield ..... *Crassoseta* Hunter 1993

- With two setae on each latigynial shield 20

20 Peritremes elongate, extending distinctly anterior of coxae I. Sternal and metasternal shields completely fused 21

- Peritreme reduced, usually not extending beyond anterior margin of coxae II. Fusion metasternal and sternal shields incomplete 24

21 Vaginal sclerites with distinct lateral projections; dorsum with four pairs of very long submarginal setae, other dorsal setae short..... *Forkosclerite* Datta 1985

- Vaginal sclerites without distinct lateral projections; dorsal setae different 22

22 Latigynial shields without a distinct anterior lobe, antero-lateral margin nearly straight; anterior latigynial seta positioned near median of shields. Sternal setae *st2*-*st4* arranged in a single line 23

- Latigynial shields with a distinct rounded anterior lobe; anterior latigynial seta positioned lateral on shields. Sternal setae *st2*-*st4* not arranged in a single line ..... *Crenemargo* Hicks 1958

23 Dorsal setae less numerous (~39); central dorsal setae distinctly shorter than marginal ones; dorsal shield covering entire dorsal .....*Brachysternum* Trägårdh 1950

- Dorsal setae more numerous (~47); all dorsal setae of similar length; dorsal shield not covering all of dorsum, some setae inserted on unsclerotized cuticle posterior to shield..... .....*Brachysternopsis* Hunter 1993

24 (20) Latigynial shields with a distinct anterior lobe: antero-lateral margin not straight; anterior latigynial seta positioned lateral to midline of each latigynial shield ..... *Diplogyniella* Trägårdh 1950

- Latigynial shields without distinct anterior lobe: antero-lateral margin more or less straight; anterior latigynial seta positioned near mid-line of each latigynial shields ..... *Pseudofusio* Elsen 1981

25 (8) Metasternal shield not fused to sternal shield 26

- Metasternal shield fused to sternal shield 35

26 Peritremes often short, extending to level of coxae II–III, rarely elongate. Ventrianal shield extending to posterior edge of the idiosoma.....27

- Peritremes long, always extending beyond level of coxa I. Ventrianal shield may or may not not reach posterior edge of idiosoma 28

27 With two pairs of sternal setae .....*Quadristernoseta* Elsen 1975

- With three pairs of sternal setae ..... *Lobogynioides* Trägårdh 1950

28 With three setae on each latigynial shield..... *Tridiplogynium* Trägårdh 1950

- With two setae on each latigynial shield.....29

29 With one pair of sternal setae. Ventrianal shield reaching posterior edge of the idiosoma.....30

- With three pairs of sternal setae. Ventrianal shield separated form posterior edge of idiosoma by ventrimarginal shields 31

30 Dorsum with three pairs of posterior median setae distinctly longer than remaining setae. Movable digit of chelicerae with at least 18 teeth.....*Diplogyniopsis* Trägårdh 1950

- All dorsal setae of similar size: posterior median setae not distinctly elongate. Movable digit of chelicerae with 9–10 teeth ..... *Pseudodiplogyniopsis* Elsen 1981

31 (29) With a large number (>20) of filiform elongate setae on the dorsum; all dorsal setae of similar shape 32

- Dorsal setae short, or if long setae present, only 4–6 pairs elongate, and of different shape than remaining dorsal setae (typically bottle-brush).....33

32 All dorsal setae long. Sternal shield medio-posteriorly with a rounded invagination; shield length at midline of body distinctly less than half of overall length. Latigynial shields elongate and triangular .....*Schizodiplogynium* Trägårdh 1950

- Median dorsal setae short. Sternal shield length at midline of body more than half of overall length. Latigynial shields not elongate.....*Hirsutocapillus* Elsen 1981

33 (31) Marginal dorsal setae short but spine-like, all of similar shape; median setae short, setiform..... .....*Heveacarus* Elsen 1974

- Marginal dorsal setae never spine-like; 4–5 pairs of very long, brush-like submarginal setae 34

34 Peritreme with a distinct inward bend at level of coxae II–III. Setae of the legs short, spine-like. External lobe of latigynial shields truncate..... *Burgeonium* Elsen 1975

- Peritreme without distinct inward bend at level of coxae II–III. Leg setation normal. External lobe of latigynial shields not truncate ..... *Neolobogynium* Hicks 1957

35 (25) Postero-lateral margin of latigynial shields transverse ..... *Pyramidogynium* Elsen 1974

- Postero-lateral margin of latigynial shields not transverse .....*Spatulosternum* Elsen 1974

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