

A DESCRIPTION OF A NEW GENUS, *UMAKEFEQ* GEN. N., INCLUDING THREE NEW SPECIES OF MYCETOPHAGOUS ACARID MITES (ACARIFORMES, ACARIDAE) FROM EASTERN PALAEARCTIC

ОПИСАНИЕ НОВОГО РОДА, *УМАКЕФЕК* GEN. N., СОДЕРЖАЩЕГО ТРИ НОВЫХ ВИДА МИКОФИЛЬНЫХ АКАРИДНЫХ КЛЕЩЕЙ (ACARIFORMES, ACARIDAE) ИЗ ВОСТОЧНОЙ ПАЛЕАРКТИКИ

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ABSTRACT

A new genus of mycetophagous acarid mites (Acariformes, Acaridae) including three new species is described from the Russian Far East and Japan. *Umakefeq macroophthalmus* gen. et sp. n. is described from both adults and hypopi, *U. mesoophthalmus* sp. n. and *U. microophthalmus* sp. n. from hypopi only. The new genus is closely related to the genus *Calvoliella* Samšičák.

РЕЗЮМЕ

Из Дальнего Востока России и Японии описан новый род микофильных акаридных клещей (Acariformes, Acaridae), содержащий 3 новых вида. *Umakefeq macroophthalmus* gen. et sp. n. описан по взрослым и гипопусам, *U. mesoophthalmus* sp. n. и *U. microophthalmus* sp. n. — по гипопусам. Новый род близок к роду *Calvoliella* Samšičák.

A new genus of acarid mites including three new species was found in the fauna of the Eastern Palaearctic region. A description of new taxa is given below. The designation of gnathosoma parts follows that of Akimov [1985]. Nomenclature of leg and idiosomal chaetotaxy follows that of Griffiths [1970] and Griffiths et al. [1990]. The names of beetles of the family Erotylidae are given according to Jablókoff-Knnzorian [1975], classification of fungi after Hawksworth et al. [1995]. All measurements are given in micrometers (μm). Statistical data are presented as range, mean \pm standard deviation. Holotypes, paratypes, additional material, and hosts are deposited in the collections of the Institute of Biology and Pedology, Vladivostok, Russia. Unless otherwise noted, all the material has been collected by the author himself.

Genus *Umakefeq* Klimov, gen. n.

Type species *Umakefeq macroophthalmus* Klimov, sp. n.

Adults. Chelicera with 1 short seta; fore cheliceral spine sharp, hind one not divided; movable

digit with 2 low and long teeth; fixed digit with 3 teeth (2 hind teeth considerably larger than fore one). Subcapitulum massive, length approximately equal to width; fore edge of hypostome weakly incised, without crista (fore protuberance of hypostome) and sublingual projection (projection of ventral surface of hypostome placed in its median incision, under crista); ventral setae near bases of free palpomeres represented by alveoli, dorsolateral ones of basal part of subcapitulum probably absent; base of subcapitulum ventrally with 2 pairs of "windows". Labrum comparatively short, not reaching fore edge of hypostome, thin, very weakly costate. Idiosoma elongated (especially in female). Grandjean's organ smooth, flattened, bifurcate. Hind part of propodosomal shield with cellular sculpture (some cells with longitudinal striae). Setae smooth. *vi* short, setiform, shifted posteriorly from fore edge of propodosomal shield. *se* and *si* positioned posteriorly to the hind edge of propodosomal shield; *si* of medium length, much shorter than *se*. *scx* long, setiform. *c*₁, *c*₂, *f*₂, *c*₃, *3a*, and *g* absent. *d*₁ and *e*₁ placed noticeable far from each other. Sejugal furrow developed, with small dorsolateral sclerites. Openings of latero-abdominal glands shifted posteriorly, located between bases of *e*₁ and *e*₂. Cupuli developed, comparatively large; *ia* placed between *cp* and *d*₁; *im* ventrally, between *d*₂ and *e*₂; *ip* between *e*₂ and *h*₂. Coxal fields II and III located far from each other (distance between them larger than their length). Medial ends of epimeres III and IV not touching each other. Sclerotization near epimeres weak. Genital papillae rounded at tips, with wide and low basal parts. Spines on all podomeres (beside tarsi) absent. *hT*, σ III, *aa*, *u*, and *v* absent. σ' I longer than $\sigma\sigma''$ I. ω ₁ and ξ placed in common cuticular field on tarsus I; *ba* setiform, placed paramedially far from ω ₁; *e*, *s*, *p*, and *q* short, spiniform. Pretarsus as long as 2/3 of claw length. Formula of legs I-IV: 1-1-2+(2)-1+(1)+10+(3+1), 1-1-2+(1)-1+(1)+10+(1), 1-0-1-1+(1)-8, 0-1-0-1+(1)+8.

DIFFERENTIAL DIAGNOSIS

Female. Epigynium present but weakly developed. Anus shifted to hind edge of idiosoma. External opening of spermatheca channel is very small. Channel of spermatheca approximately as long as the anus length; having a small diameter all along its length; there is comparatively long part of the channel in spermatheca, these part supplied with small accessory sclerite. Ratio of σ'/σ'' more than in male; ω_3 shorter than in male.

Male. Anus and genital apparatus remote from each other. Anal suckers weakly convex, without sclerotized peripheral ring. ps_3 located anteriorly to anal suckers. ϕ IV long, setiform. Tarsal suckers placed near corresponding ends of tarsus. Penis short, shorter than basal part of genital apparatus.

Hypopus. Gnathosoma with almost parallel sides and one-segmented, separated distal palpomeres; arista longer than gnathosoma; only 1 pair of setae of distal palpomeres developed; dorsal alveoli of basal palpomeres fused or separated. Idiosoma dorsally smooth, finely porous, or with regularly oriented short striae. Rostrum conspicuous or not separated from propodosoma. There are pigmented spots (retinae) on sides of rostrum. Eye lens absent. Propodosomal shield narrowed toward region of retinae and somewhat widened anteriorly. Lateral bounds of the shield inconspicuous, accompanied by a number of very small sclerites. vi comparatively long, placed ventrally near top of rostrum; se anteriorly si , at edge of propodosomal shield. scx long, setiform. ve and c_1 absent. Cupuli ip placed between f_2 and e_2 . Coxal fields I–II conspicuously not closed, coxal fields III closed, touching each other at middle line of body; coxal fields IV closed or, if sclerotization of ventrum weak, look like being opened. Sternum and epimerites II not reaching hind edge of sternal shield. Ia , $3b$, and represented by conoids; $4a$ conoid or short, stick-like; sometimes peripheral bodies of conoids shifted from their bases. Bound between genital and ventral shields almost transverse, indistinct; genital shield better sclerotized than ventral one, region of sclerotization not correspond to anterior boundaries of genital shield. Anal disk transverse, all its elements developed. ps_2 at level of ad_1+ad_2 , with more or less developed sclerites. Internal sclerites of ps_1 with medial, directed anteriorly process (*U. microphthalmus*, *U. mesoophthalmus*), or without it (*U. macrophthalmus*). Elements of legs setiform or needle-like; massive spines absent. Genua-tibiae with needle-like setae. hT I–II absent. ω_1 long, stick-like, not widened on tip; ξ setiform, longer than 1/4 of ω_1 length, placed in common field with ω_1 (tarsus I); ω_2 short, sometimes weakly visible; ω_3 approximately equal to ω_1 , shifted distally from ω_1 ; aa absent; wa near middle of tarsus, proximally la and ra ; e I–II with dilatation on tips; d shorter than e , setiform; distinctly widened setae (beside e) absent. Formula of leg I–IV: 1–1–2+(1)–1+(1)–8+(3+1); 1–1–2+(1)–1+(1)–9+(1); 1–0–1–1+(1)–8; 0–1–0–1+(1)–8.

Hypopi of a new genus are closely related to hypopi of the genus *Calvoliella* Samšičák, 1961 but differ by the following features (characters of *Calvoliella* are given in parentheses): retinae are remote from each other, with clear boundaries, placed at sides of rostrum (retinae are almost fused, boundaries of retinae indistinct, retinae form unpaired eye which placed on tip of rostrum); dorso-lateral setae of basal gnathosomal palpomer not developed, represented by alveoli (developed); scx comparatively long, longer than length of genu I (short, shorter than genu I); c_1 absent (present); Ia , $3b$, and $4a$ are sucker-like conoids (rudimentary); hT I–II are absent (present); ξ is comparatively long, needle-like (short, spiniform).

ETYMOLOGY

Umakefeq is an arbitrary combination of letters, which is considered as a noun of masculine gender.

NOTES

A new genus consists of three species distributed in Eastern Palearctic. One species, *Umakefeq macrophthalmus*, is known from both adults and hypopi, two other species are known only from hypopi only. Adults of *U. macrophthalmus* inhabit decaying polypore fungi. Hypopi of *Umakefeq* are phoretic on mycetophagous arthropods (ciid and erotyloid beetles and oribatid mites).

Key to species of the genus *Umakefeq*

Hypopi (adults of *Umakefeq mesoophthalmus* and *U. microphthalmus* are unknown)

1(4) Retinae large, approximately equal or longer than width of genu I. Ventrum sclerotized, well-developed. Dorsal alveoli of basal palpomer fused or touching each other. Cupuli ip nearest to e_2 than to f_2 . Hind marginal sclerite of anal disk absent. Sternum not reaching Ia level or slightly protruding this level. Anterior edge of ventro-genital shield with more or less developed middle incision. Idiosoma dorsally smooth or with multiple weakly visible and short striae. Legs I–II distinctly longer than half of maximal idiosomal width. Rostrum well-developed, conspicuous. Internal sclerite of ps_1 without projection posteriorly to ps_1 .

2(3) Retinae are closely positioned, distance between them shorter than width of retinae. Lateral sides of retinae and lateral sclerites of scx form distinct bend. Gnathosoma elongate (width approximately 3 times shorter than length), protruding from edge of idiosoma by distal half. Idiosoma dorsally smooth. Bases of vi touching each other. Orifices of latero-abdominal glands placed anteriorly to somewhat posteriorly of transverse level of c_3 . Bases and bodies of conoids Ia and $3b$ placed anteriorly to corresponding epimeres; epimeres II without "denticles". Internal sclerite of ps_1 without anteromedial process. Bases of wa , ra , and la

remote from each other. *d* III–IV shorter than length of tarsus

..... *U. macrophthalmus* Klimov, **sp. n.**

3(2) Retinae remote from each other, distance between them longer than width of retinae. Lateral sides of retinae and lateral sclerites of *scx* form an arc. Gnathosoma shorter (width shorter than length approximately 2 times), protruding from edge of idiosoma by free palpomeres. Idiosoma dorsally with weakly visible ornament consisting of short striae which sometimes regularly directed. Bases of *vi* remote from each other. Orifices of latero-abdominal glands placed posteriad to transverse level of *c₃*. Bodies of conoids *1a* and *3b* placed on corresponding epimeres, their base touching anterior edges of epimeres and form characteristic indentation. Internal sclerite of *ps₁* with stick-like, medial, longitudinal, directed anteriorly process. Bases of *wa*, *ra*, and *la* are closely located (distance between them shorter or slightly longer than diameter of bases). *d* III longer than tarsus III, *d* IV more than 2 times longer than length of tarsus IV

..... *U. mesoophthalmus* Klimov, **sp. n.**

4(1) Retinae small, shorter than width of genu I. Ventrum not sclerotized, weakly visible. Dorsal alveoli of basal palpomer remote from each other. Cupuli *ip* nearest to *f₂* than to *e₂*. Hind marginal sclerite of anal disk developed. Sternum crossing *1a* level. Anterior edge of ventro-genital shield without middle incision. Idiosoma dorsally granular. Legs I–II shorter or slightly longer than half of maximal idiosomal width. Rostrum not separated or weakly separated from propodosoma, almost triangular, with rounded apex or trapeziform, with almost straight fore edge. Form of internal sclerite of *ps₁* variable, often the sclerite with more or less developed projection(s) posteriad to *ps₁*

..... *U. microphthalmus* Klimov, **sp. n.**

Umakefeq macrophthalmus Klimov, **sp. n.**

Figs. 1–4.

Adults. Tarsi I longer than length of genua+tibiae I. Tibiae I–II with 1 seta (*gT*), genu III with *nG* only. Tips of σ'' and σ II rounded; σ'' 2 times shorter than σ' on tarsus I; σ'' I and σ II distinctly thicker than σ' I. Tarsus I: ω_1 stick-like, comparatively short, slightly widened and rounded at tip; ξ spiniform, longer than 1/3 of ω_1 , placed distally ω_1 ; ω_2 stick-like, approximately as long as half of ω_1 ; *ba* setiform, placed paramedially, remote from ω_1 – ξ group; *wa* and *la* needle-like, *ra* setiform; *e* short, setiform; *d* and *f* setiform; ω_3 not protruding claw tip; *s*, *p*, and *q* short, spiniform.

Female (holotype). Total body length 391.6. Subcapitulum 45.3×55.0. Chelicera 63.0. Idiosoma 357.3×158.2 (319.0×144.8–460.1×225.8, 419.4±44.3×189.4±26.3; 1/w 2.0–2.6, 2.2±0.2, n=11). *vi* 21.1, *se* 133.2, *si* 29.1, *scx* 17.0, *cp* 99.3, *d₁* 48.4, *d₂* 49.7, *e₁* 88.2, *e₂* 65.4, *h₁* 99.3, *h₂* 109.0, *h₃* 64.2. *ip* placed ventrally; *ih* approximately at level of first 1/3 of anus length. Genital opening posi-

tioned between coxae III and IV. Basal part of epigynium slightly arched; tips of arc form thin processes directed to ends of epimerites II. *ps₁*–*ps₃* and *ad₁*–*ad₃* absent. Spermatheca ovoid (length 36.3). Channel of spermatheca long (approximately equal to anus length), its diameter comparatively small (0.5, in spermatheca 1.2–1.5); in spermatheca channel passes through internal sclerite (5.1×4.8); length of channel in spermatheca before internal sclerite 14.5, after sclerite 8.5; channel ends having small, weakly visible, ovoid dilatation with granular contents. There are low transverse sclerite (length 5.1) and Y-forming sclerites of oviduct (6.1×1.9) at place of channel and spermatheca junction. σ' 19.4–20.8; σ'' 9.7–11.6. Length of legs I–IV (without and with claw): 131.5–134.7, 119.4–123.5, 102.9–104.1, 115.0–116.3. ω_3 (6.1–7.0) not reaching half of pretarsus length.

Male (paratype). Total body length 291.9. Chelicera 41.2. Idiosoma 271.3×160.8 (245.4×147.2–285.9×174.2, 266.4±12.8×159.2±9.1; 1/w 1.5–1.8, 1.7±0.1, n=8). *se* 90.8, *si* >24.9, *cp* 60.6, *d₁* 32.5, *d₂* 31.5, *e₁* 75.1, *e₂* 67.8, *h₁* 121.1, *h₂* 104.1, *h₃* 65.4. *ip* placed dorsally; *ih* outerly *ps₂*, posteriorly anal suckers. Genital apparatus located between trochanters IV. Anal suckers weakly convex, small (diameter 10.9). *ps₁*–*ps₃* with comparatively large alveoli, represented by microsetae. *ps₁* placed between *h₃*, posteriad to anal suckers; *ps₂* at level of hind edge of suckers, form with *ps₁* a trapezium (with its tip directed posteriad); *ps₃* located considerably anterior to fore edge of suckers, at transverse level of half of anus length and at longitudinal level of outer edge of anal suckers. σ' 15.5–17.0; σ'' 10.8–11.6. Length of leg I–IV (without and with claw): 104.9–109.0, 95.7–99.3, 80.7–82.3, 91.3–92.0. ω_3 (9.7–14.5) reaching tip of pretarsus. ϕ IV longer than corresponding tarsus, setiform.

Hypopus (paratype). Gnathosoma 21.8×9.7, elongated, with almost parallel sides; arista 33.9, approximately 1.5 times longer than gnathosoma; setae at bases of free palpomeres developed, setiform; setae of basal palpomer (23.0) absent. Idiosoma dorsally smooth, ovoid, 203.0×142.9 (188.9×138.1–212.4×163.5, n=29; 201.0±8.9×145.3±9.6; 1/w 1.3–1.4, 1.4±0.0, n=7). Propodosoma 49.7; hysterosoma 153.3; (43.4–50.9, 46.4±3.1; 145.3–164.7, 154.6±6.5; h/p=3.1–3.5, 3.3±0.2, n=7). Rostrum well-developed, 21.8×31.5 (width measured at base), with large pigmented spots (retinae) at sides. Retinae 17.0×8.5, placed near each other (maximal end minimal distance between them 8.5 and 20.6). *vi* placed at tip of rostrum, they bases touching each other. *ve* absent. *scx* long (19.4), setiform. *se* placed anterior to *si*. Distance between some setae is as follows: *si*–*si* 35.8, *se*–*se* 66.1, *d₁*–*d₁* 55.7, *e₁*–*e₁* 38.8, *h₁*–*h₁* 47.0. Alveoli *h₁* and *f₂* duplicate. *e₂* long, longer than other hysterosomal setae. *c₁* absent. *ia* large; *ih* not observed. Coxal skeleton well-developed. Sternal shield 70.2×107.8. Sternum (22.3) and epimeres II (26.6) short, not reaching posterior edge of

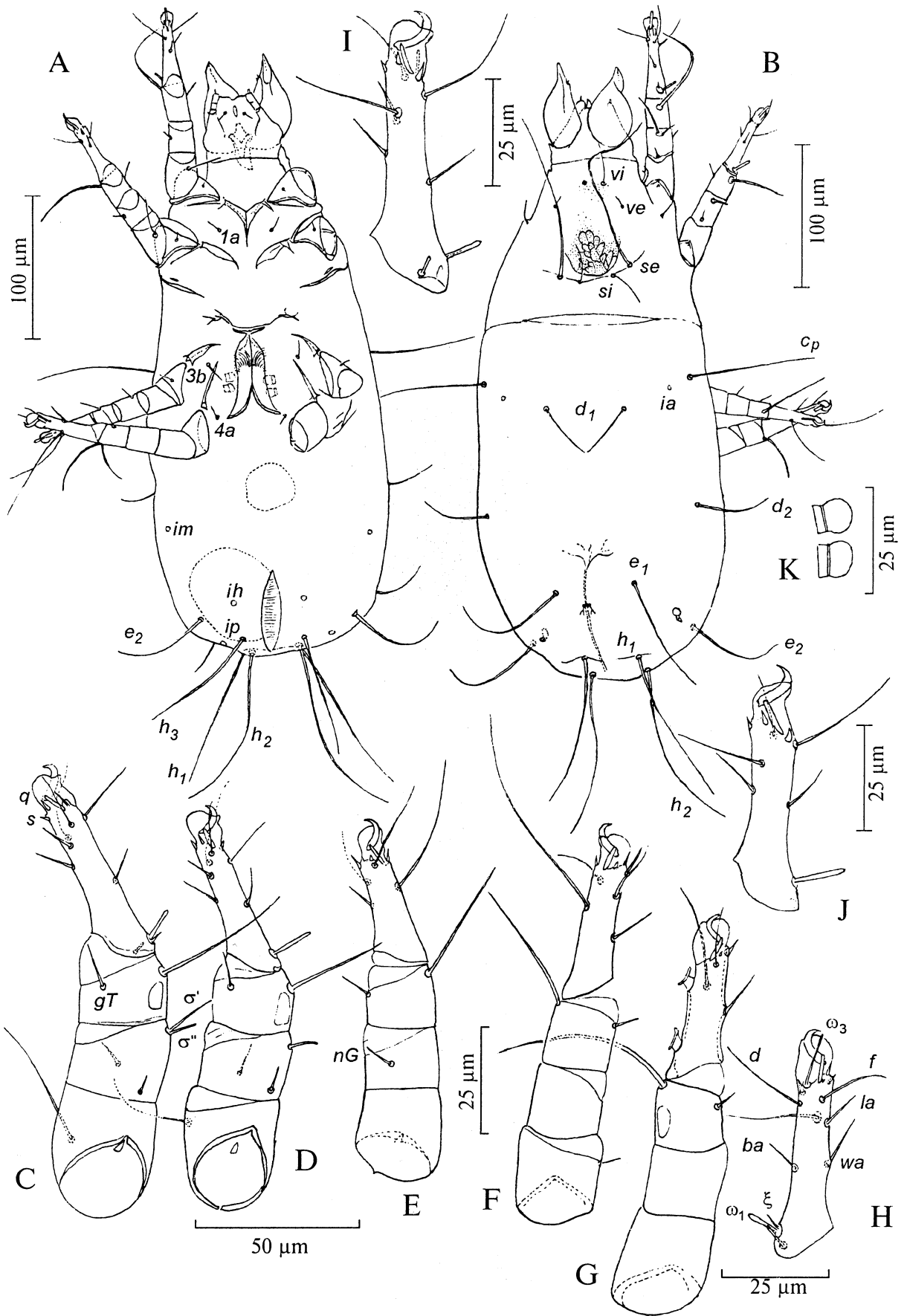


Fig. 1. *Umakefeq macrophthalmus* Klimov, gen. et sp. n. (A–H, I, J – female; H, K – male): A – ventral view, B – dorsal view, C–E – legs I–III, respectively, F–G – Leg IV, H–I – tarsus I, J – tarsus II, K – genital papillae. A–B – holotype, C–K – paratypes. Scale bars: A–B – 100 μ m; C–F – 50 μ m; G–K – 25 μ m.

Рис. 1. *Umakefeq macrophthalmus* Klimov, gen. et sp. n. (A–H, I, J – самка; H, K – самец): A – вентрально, B – дорсально, C–E – ноги I–III, соответственно, F–G – Нога IV, H–I – лапка I, J – лапка II, K – генитальные папиллы. A–B – голотип, C–K – паратипы. Масштаб: A–B – 100 μ m; C–F – 50 μ m; G–K – 25 μ m.

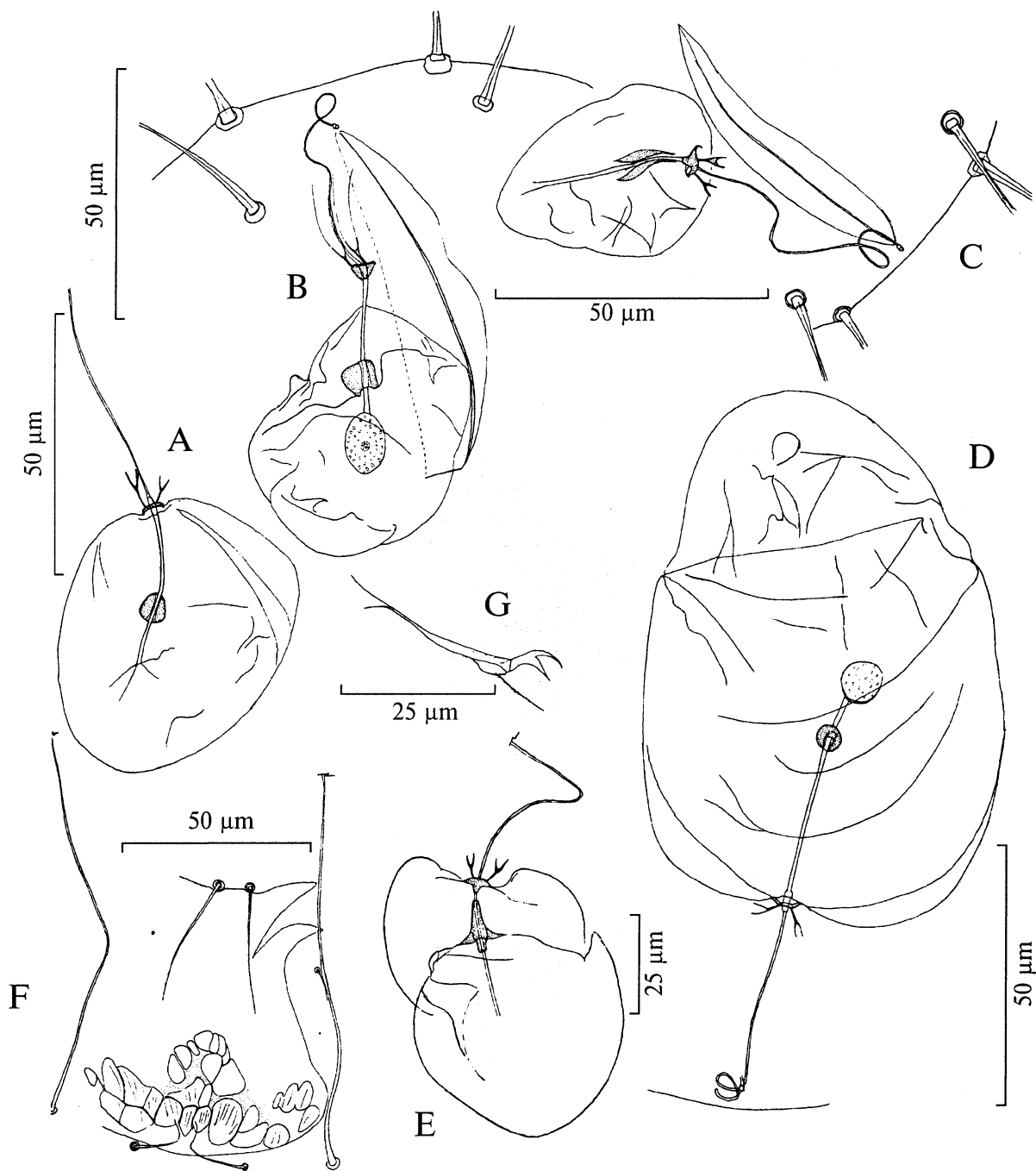


Fig. 2. *Umakefeq macrophthalmus* Klimov, gen. et sp. n. (female): A-E — spermatheca; F — propodosomal shield; G — Grandjean's organ. Scale bars: A-D, F — 50 μ m; E, G — 25 μ m.

Рис. 2. *Umakefeq macrophthalmus* Klimov, gen. et sp. n. (самка): A-E — сперматека; F — проподосомальный щит; G — орган Гранжана. Масштаб: A-D, F — 50 μ m; E, G — 25 μ m.

sternal shield, distance between them and the shield longer than length of sternum and epimeres II (39.7 and 26.6, respectively); coxal fields II opened; epimerites II 19.5. Lateral edges of sternal shield meet approximately at angle 45° to middle line of body; hind edge of shield touching ventro-genital one. Ventro-genital shield 79.4×24.2 (at level of fore end of genital opening) — 45.5 (at level of epimeres IV); fore edge of shield incised; epimeres III meet at obtuse angle to middle line of body; coxal field III closed, touching each other at distance 12.1; ventrum 29.1, free, almost reaching genital opening; coxal fields IV touching each

other. Genital shield not separated distinctly from ventral one. Ventro-genital shield narrowed at bound between shields. Genital opening 21.8. *1a*, *3b*, and *4a* conoids; *3a* and *g* setiform; *g* placed anteriorly *4a*. Anal disk transverse (32.7×43.8); *ad*₃ 6.1; anterior edge of *ps*₂ (6.1) located at level of anterior edge of *ad*₁+*ad*₂ (9.7×6.3); cupuli of *ad*₁+*ad*₂ touching each other, placed on large sclerites which occupy greater part of *ad*₁+*ad*₂; *ps*₁ 5.3; fore cuticular suckers (8.5×7.3) well-developed; hind and lateral suckers almost fused with disk shields; disk shields almost fused together, with cellular sculpture. Legs comparatively long. Length of legs I-IV

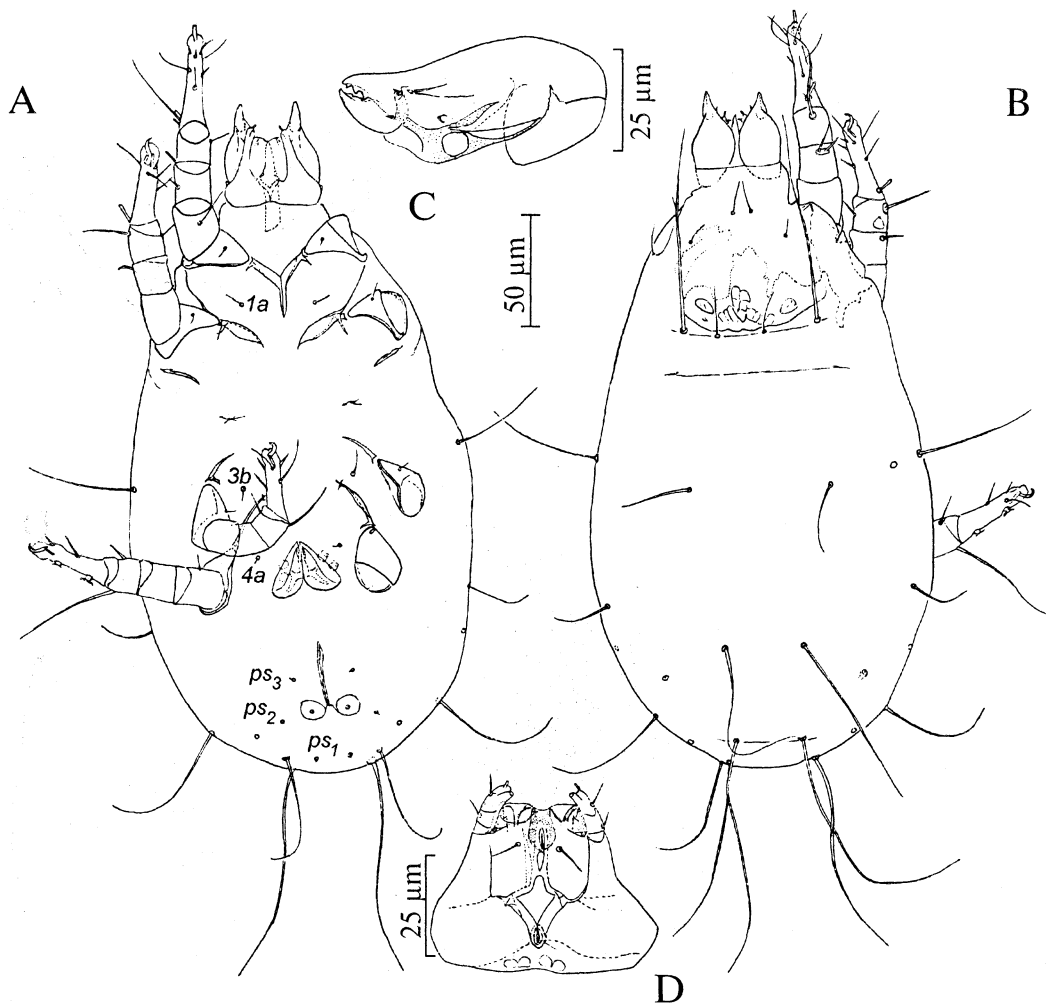


Fig. 3. *Umakefeq macrophthalmus* Klimov, gen. et sp. n. (A–C — paratype male, D — holotype female): A — ventral view, B — dorsal view, C — chelicera, D — subcapitulum. Scale bars: A–B — 50 μ m; C–D — 25 μ m.

Рис. 3. *Umakefeq macrophthalmus* Klimov, gen. et sp. n. (A–C — самец, паратип, D — самка, голотип): A — вентралью, B — дорсально, C — хелицера, D — субкапитулюм. Масштаб: A–B — 50 μ m; C–D — 25 μ m.

(without and with claw): 102.7–109.0, 82.3–90.3, 55.7–65.4, 60.6–70.2. Spines absent. Genua-tibiae with needle-like setae. Tarsus I long, longer than genu+tibia I; ω_1 long, stick-like, not widened at tip; ξ setiform, longer than 1/4 of ω_1 length, placed in same field and proximally ω_1 ; ω_2 shifted posteriad to ω_1 , slightly shorter than half of ω_1 ; ω_3 somewhat longer than ω_1 , shifted distally ω_1 at distance equal distance ω_1 -base of tarsus; *aa* absent; *wa* placed paramedially on tarsus, proximally *la* and *ra*; *e* with dilatation at tip (as on tarsus II); *d* shorter than *e*, setiform; *p* and *q* not reaching tip of claw; *ra*, *f*, *p*, *q*, and, probably, other setae, with small falcate or lanceolate terminal dilatation. *d* and *e* III–IV remote. Leg formula: 1–1–2+(1)–1+(1)–8+(3+1); 1–1–2+(1)–1+(1)–9+(1); 1–0–1–1+(1)–8; 0–1–0–1+(1)–8.

Morphological variation. Female (n=11): σ' 18.2–21.8 (19.9 \pm 1.2); σ'' 9.7–11.6 (10.2 \pm 0.8); $\sigma'/\sigma''=1.8$ –2.1 (1.9 \pm 0.1); ω , 4.1–8.5 (6.0 \pm 1.2); form of internal sclerite of spermatheca considerably varies (Fig. 2, A–E). Male: σ' 15.3–18.6 (17.3 \pm 1.1,

n=7); σ'' 12.1–14.5 (13.1 \pm 1.0, n=5); $\sigma'/\sigma''=1.3$ –1.4 (1.3 \pm 0.1, n=5); ω , 7.9–12.1 (10.5 \pm 1.4, n=7).

Type material. Holotype (marked by ink arrow): ♀ Russia: Primorye, Ussuriyskii district, Kaymanovka, bank of Barsukovka river, stem of fallen deciduous tree, resupinate form of unidentified polypore fungi, 15.06.1998. Paratypes: 29 ♀♀, 10 ♂♂, 33 hypopi — same data as for holotype (4 slides); 2 hypopi — same locality, *Lycoperdon* sp. (Lycoperdales, Lycoperdaceae), ex Galumnoidea (Acariformes), 5.06.1998. Holotype and paratypes are deposited in the collections of the Institute of Biology and Pedology.

DIFFERENTIAL DIAGNOSIS

Differential characters are given in the key above.

ETYMOLOGY

Specific name is derived from Greek adjective μακροσ (long, large) and noun οφθαλμος (eye) referring to comparatively large retinac.

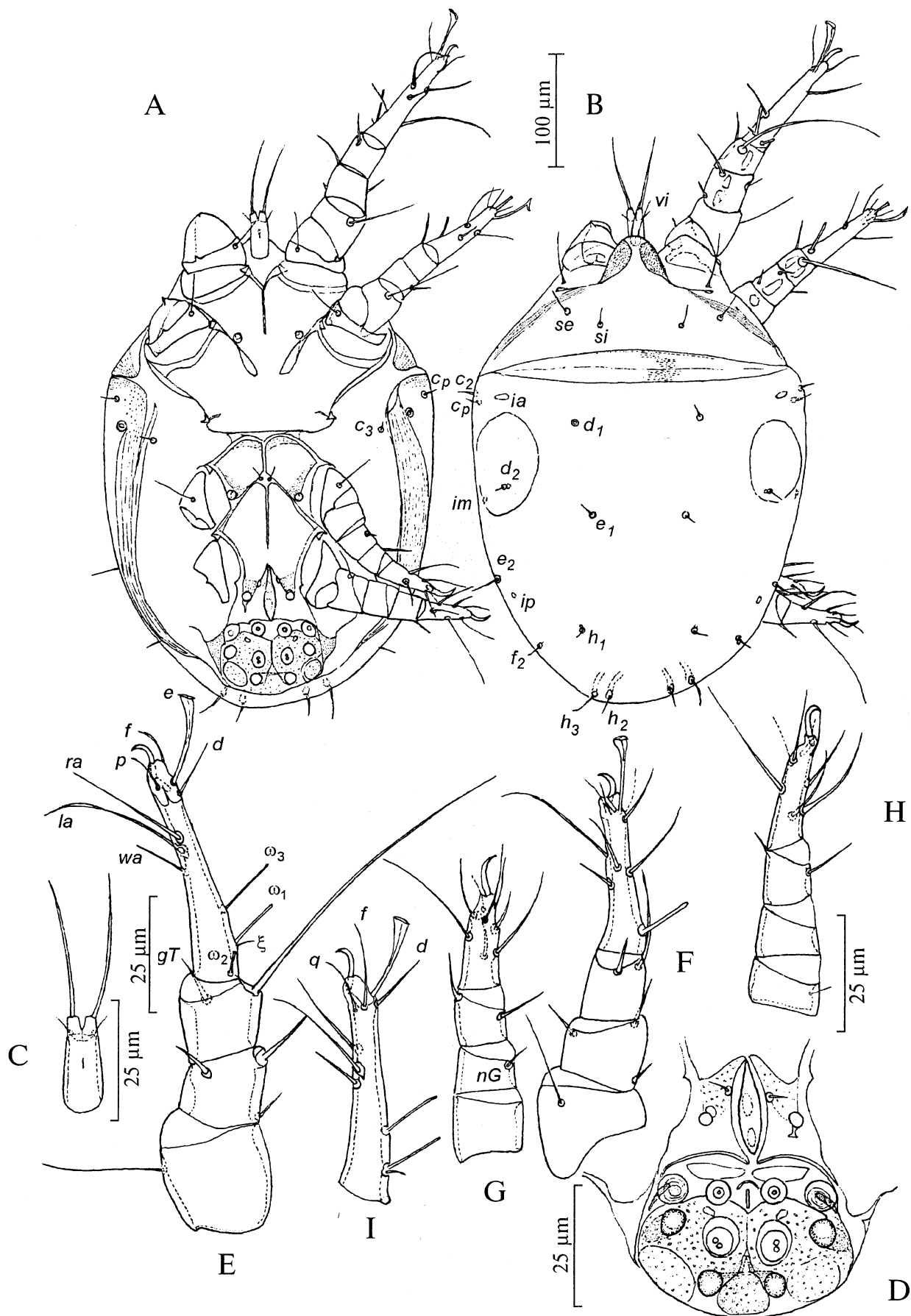


Fig. 4. *Umakefeq macrophthalmus* Klimov, **gen. et sp. n.** (hypopus, paratype): A — ventral view, B — dorsal view, C — gnathosoma, D — anal disk, E–H — legs I–IV, respectively, I–J — tarsus I. Scale bars: A–B — 100 µm; C–J — 25 µm.

Рис. 4. *Umakefeq macrophthalmus* Klimov, **gen. et sp. n.** (гипопус, паратип): А — вентрально, В — дорсально, С — гнатосома, D — анальный диск, E–H — ноги I–IV, соответственно, I — лапка I. Масштаб: А–В — 100 µm; С–J — 25 µm.

DISTRIBUTION

Russia: Primorye, Ussuriyskii district (type locality).

BIOLOGY

Mycetophagous species. Homeomorphic instars have been found in tubular hymenium of resupinate form of unidentified polypore fungi, while numerous hypopi collected out of limits of the fungi. Crawled out from fungi adults move considerably fast (one female overcome 6 mm during 15 seconds on comparatively smooth surface of wood). Feeding by *Lycoperdon* is problematic. Hypopi have been collected from oribatid mite superfamily Galumnoidea.

NOTE

Anterior 3/4 of propodosomal shield covered by dense layer of guanine crystals in all homeomorphic instars, therefore it is difficult to observe propodosomal shield configuration. Probably, anterior and anteriolateral edges of propodosomal shield have no incisions which is typical for the genus *Thyreophagus* Rondani, 1874.

Umakefeq mesoophthalmus Klimov, sp. n.

Fig. 5.

Hypopus (holotype). Gnathosoma 14.5×8.2, elongate, sides almost parallel, with 1 pair of dorsal setae at bases of free palpomeres; these setae reaching tip of gnathosoma; basal palpomer 10.4, with dorsal sclerite (fused alveoli); length of arista 33.8. Idiosoma 176.8×114.6 (176.8×114.6–201.0×135.6, n=21, 188.3±7.7×123.9±7.2; l/w 1.5–1.6, 1.5±0.0, n=8). Propodosoma 60.6; hysterosoma 116.3; h/p=1.9 (58.1–70.2, 63.5±4.2; 116.3–130.8, 124.8±5.2; 1.8–2.2, 2.0±0.1, respectively, n=8). Idiosoma dorsally with fine striae which form longitudinal and transverse bands. Propodosoma with well-developed rostrum (21.8×54.5) bearing a pair of retinae. Retinae 12.1×5.6, well-pigmented, striated, remote from each other (distance between them 12.1 at middle and 26.6 at hind edge of retinae), not reaching tip of rostrum (distance 6.1). Propodosomal shield narrowed towards its tip, in a region where retinae widened. Its posterolateral sides supplied with numerous small sclerites (boundaries of shield not distinct here); with *vi* (length 13.8, placed ventrally at tip of rostrum, bases remote), *se* (at edges of shield), and *si* (posteriorly *se*). *scx* setiform (19.4), comparatively long. *ve* and *c₁* absent. All idiosomal setae short (*scx*, *vi*, and *h₃* longer). Distance between some setae is as follows: *se-se* 58.1, *si-si* 37.1, *d₁-d₁* 36.3, *d₂-d₂* 81.1, *e₁-e₁* 33.9, *h₁-h₁* 36.3. Cupuli *ia* placed at transverse level of *d₁*; *im* at level of *d₂*; *ip* between *e₂* and *f₂* (nearest to former); *ih* placed at hind angles of anal disk. Sternal shield 60.6×78.4. Sternum short (17.7), not reaching ventro-genital shield (distance 36.3). Epimeres II (22.5) not reaching ventro-genital shield (distance 24.5). Coxal fields I–II opened.

Epimerites II 36.3. Hind edge of sternal shield weakly sclerotized. Ventro-genital shield 63.0 (at middle) – 65.4 (laterally) × 21.8 (at level of fore edge of genital shield) – 49.7 (at level of trochanters IV). Coxal fields III closed, touching each other at distance 10.9; ventrum (17.7) free posteriad. Genital opening 17.0, anal slit 6.5. Genital papillae ovoid. Genital shield distinctly not separated from ventral one; fore edge with strongly sclerotized cuticle sharpened, triangular. *Ia* and *3b* conoids, placed under corresponding epimeres, while their bases located anteriorly (there are characteristic “denticles” on epimeres here; “denticles” better developed on epimeres II). *g* placed near bases of *4a* or remote; *4a* (conoids) shifted posterolaterally from *g* bases. Anal disk 29.1×38.8, transverse. *ad₃* 7.3; fore cuticular suckers 4.8×8.0, with well-developed internal stick-like sclerite (5.6); *ad₁+ad₂* (7.3×8.0) with alveoli touching each others; *ps₂* 5.4; *ps₁* 6.1; internal sclerite of *ps₁* well-pigmented, dark, forms small process (5.8) which directed anteriorly and has a small hole. Legs I–II comparatively long (longer than half of maximal idiosomal width). Length of leg I–IV (without and with claw): 72.7–80.7, 65.4–72.7, 43.6–51.6, 47.2–55.7. Leg elements setiform or needle-like, massive spines absent. *vFI*–II long. *hTI*–II absent. Leg I: *cG*, *mG*, and *gT* needle-like; σ reaching tarsus base; ϕ approximately 1.5 times longer than tarsus+claw; ω_1 long, stick-like, reaching transverse level of *wa*; ξ approximately 3 times shorter than ω_1 , comparatively long, setiform; ω_2 shorter than ξ , placed closest to tarsal base than ω_1 ; ω_3 remote from ω_1 (approximately at length of ξ); *wa*, *ra*, and *la* near each other, they bases form a “triangle” (*wa* placed proximally, *ra* distally), *wa* needle-like, short, *ra* and *la* long, setiform, slightly falcate at tips; *e* with developed “saucer”; *d* comparatively short, slightly protruding tip of claw; *p* longer than *q*, both slightly falcate terminally. *nG* developed, weakly visible. *d* III and IV longer than corresponding leg 0.7 and 1.5 times, respectively. Formula of legs: 1–1–2+(1)–1+(1)–8+(3+1); 1–1–2+(1)–1+(1)–9+(1); 1–0–1+1+(1)–8; 0–1–0+1+(1)–8.

Type material. Holotype (marked by ink arrow): hypopus — Russia: Primorye, Ussuriyskii district, Kaymanovka, unidentified woody bracket fungi on *Quercus mongolica* Fischer ex Turczaninow, 1838 (Fagales, Fagaceae), ex *Mycetophagus* sp. (Coleoptera, Mycetophagidae), 21.06.1998. Paratypes: 20 hypopi — on the same as holotype; 4 hypopi — same data, ex *Dacne maculata* Chûjô, 1940 (Coleoptera, Erotylidae), 21.06.1998, with *Schwiebea nova* (Oudemans, 1906) (Acariformes: Acaridae); 1 hypopus — Russia, Vladivostok, env. Botanical garden, ex *Sericania fuscolineata* Motschulsky, 1860 (Coleoptera, Scarabaeidae) in web on *Filipendula palmata* (Pallas, 1776) Maximowicz, 1879 (Rosales, Rosaceae), 23.07.1995. Holotype and paratypes are deposited in the collections of the Institute of Biology and Pedology.

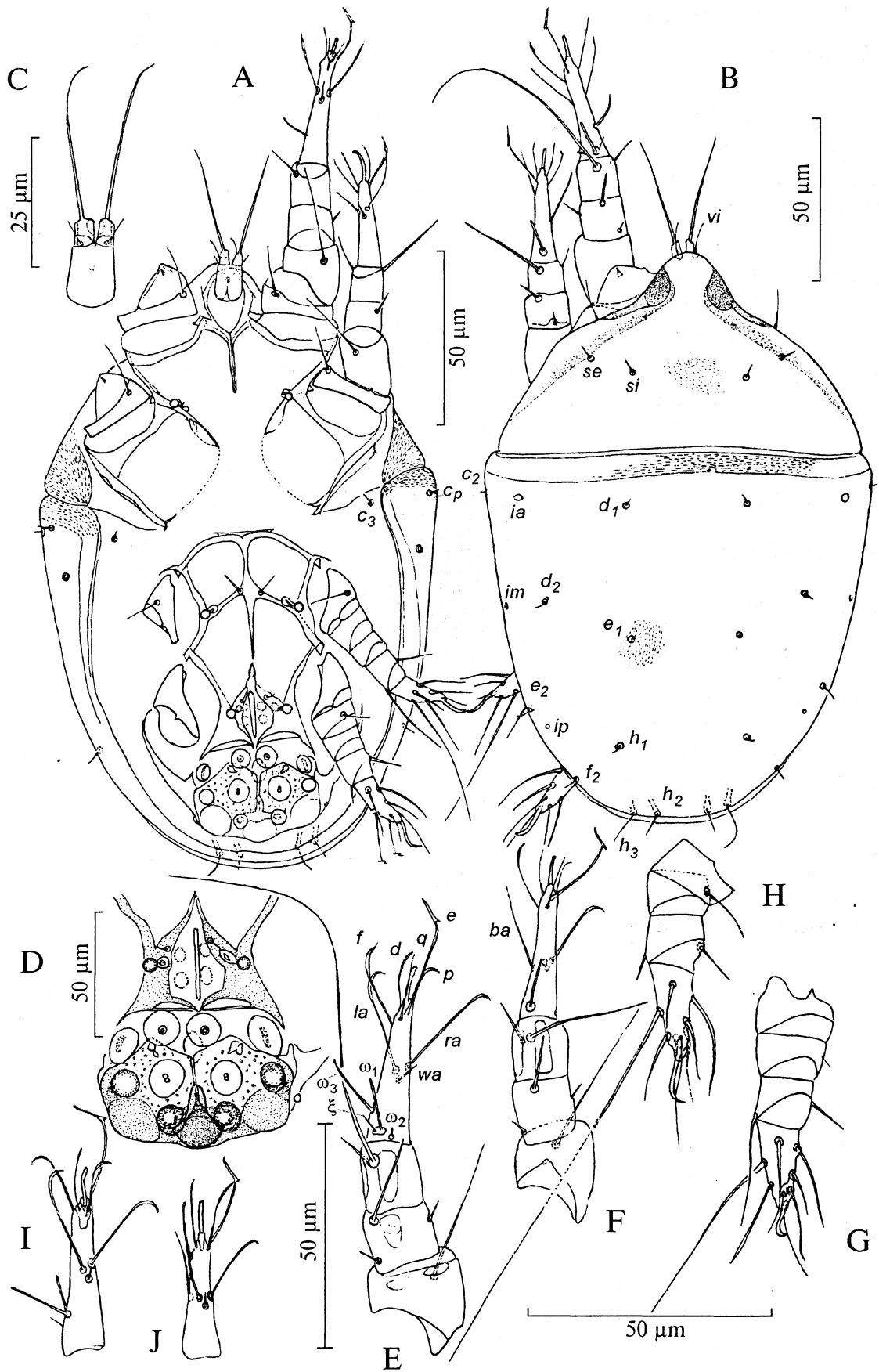


Fig. 5. *Umakefeq mesoophthalmus* Klimov, sp. n. (hypopus, holotype): A — ventral view, B — dorsal view, C — gnathosoma, D — anal disk, E–H — legs I–IV, respectively, I–J — tarsus I, dorsally and ventrally. Scale bars: A–B, D–J — 50 μ m; C — 25 μ m.
 Рис. 5. *Umakefeq mesoophthalmus* Klimov, sp. n. (гипопус, голотип): А — вентрально, В — дорсально, С — гнатосома, D — анальный диск, E–H — ноги I–IV, соответственно, I–J — лапка I, дорсально и вентрально. Масштаб: А–В, D–J — 50 μ m; C — 25 μ m.

DIAGNOSIS

Differential characters are given in the key above.

ETYMOLOGY

The species name is derived from Greek adjective μέσος (middle) and noun οφθαλμος (eye) referring to the size of retinae in a new species.

DISTRIBUTION

Russia: Primorye, Ussuriyskii district (type locality), env. of Vladivostok.

BIOLOGY

Hypopi were collected from mycetophagous beetles *Mycetophagus* sp. (Mycetophagidae) obtained from woody bracket fungi and *Dacne maculata* (Erotylidae). One specimen has been found under the elytra of *Sericania fuscolineata* (?occasionally). Probably, adults inhabit polypore fungi.

Umakefeq microphthalmus Klimov, sp. n.

Figs. 6–8.

Hypopus (holotype). Gnathosoma 14.5×7.3 (at tip)–9.7 (at base), comparatively short; basal palpomer 11.4, with a pair of alveoli remoted from each other; arista (37.5) more than 2 times longer than gnathosoma; free palpomeres resemble ones being segmented; only 1 pair of setae developed near bases of free palpomeres. Gnathosoma surrounded by camerostome which develops from fore edge of epimerae I (Figs. 6, A; 7, A). Idiosoma 206.1×150.9, dorsally granular. Propodosoma 69.8; hysterosoma 136.4; h/p 2.0. Propodosoma triangular rounded; rostrum not separated distinctly from propodosoma. Lateral edges of propodosomal shield arched, convex, anteriorly with a projection reaching tip of idiosoma; there is a pair of small, located out of shield retinae at the base of projection. Retinae remote from each other (distance between them approximately 5 times longer than width of retinae), not reaching idiosomal tip (distance more than length of retinae). *vi* 18.2, placed ventrally, near tip of idiosoma; *se* laterally, touching lateral sides of propodosomal shield; *si* located somewhat anteriorly to *se*. *scx* 15.3, setiform. All hysterosomal setae excluding *c*₁ well-developed. Distance between some setae is as follows: *se-se* 81.1, *si-si* 36.3, *d*₁-*d*₁ 63.0, *d*₂-*d*₂ 113.8, *h*₁-*h*₁ 53.3. *ia* placed posteriorly *c*₂; *ip* between *e*₂ and *f*₂ (nearest to latter); *im* and *ih* not observed. Sternal shield 67.8×109.0. Sternum (26.6) and epimeres II (33.9) not reaching ventral shield (distance 33.4 and 19.4, respectively). Epimerites II 43.6. Hind edge of sternal shield finely separated, touching ventro-genital shield. Ventro-genital shield 60.6 (medially)–67.8 (laterally)×31.5 (at level of fore edge of genital shield)–55.7 (at level of trochanters IV). Bound between shields almost transverse, indistinct. Genital shield better sclerotized than ventral one, region

of sclerotization does not correspond to anterior boundaries of genital shield. Coxal fields III closed, touching each other at middle line of body. Typical ventrum absent, median edges of coxal fields IV weakly sclerotized, parallel. *1a*, *3b*, and *4a* represented by conoids; bodies *1a* and *4a* shifted from their bases anteriorly and posteriorly, respectively. *3a* and *g* represented by setae. Anal disk 39.5×46.0, transverse. *ad*₃ 7.3, *ad*₁+*ad*₂ 8.5, with remote from each other alveoli; *ps*₂ 7.3, placed at level of *ad*₁+*ad*₂, bases of *ps*₂ supplied with internal elongate sclerite; *ps*₁ 7.3; internal sclerite of *ps*₁ triangular (apex directed posteriad), comparatively large, forms long stick-like process which reaching transverse level of *ad*₁+*ad*₂; fore cuticular suckers 4.8×6.1, semitransparent. Laterally and posteriorly anal disk surrounded by well-developed sclerites (Fig. 6, D; 7, D).

Legs I–II comparatively short (shorter than half of maximal idiosomal width). Length of legs I–IV (without and with claw): 63.9–70.2, 58.1–66.1, 38.8–50.4, 45.5–55.7. Arrangement and morphology of leg elements typical for genus. ω_2 very short; bases of *wa*, *ra*, and *la* near each other (almost on same transverse level). *nG* short, hardly visible. *d* IV slightly longer than length of leg IV; *d* III distinctly shorter. Formula of legs I–IV: 1–1–2+(1)–1+(1)–8+(3+1); 1–1–2+(1)–1+(1)–9+(1); 1–0–1+1+(1)–8; 0–1–0+1+(1)–8.

Morphological variation. Gnathosoma (n=43): length×width 10.9×7.8–17.7×10.9, 15.2±1.5×9.4±0.8; length/width ratio 1.3–2.0, 1.6±0.1. Dorsal alveoli of gnathosoma are remote or, rarely, touching each other. Length of idiosoma (n=57) is 164.0×109.0–211.4×155.0, 195.2±9.2×140.4±9.3; l/w 1.3–1.6, 1.4±0.1, n=57; propodosoma (n=57) 52.6–75.1, 64.1±5.2; hysterosoma (n=57) 111.4–142.9 131.1±6.4; h/p 1.7–2.5, 2.1±0.2, n=57. Form of rostrum varies from almost triangle, with rounded fore edge (Fig. 6, A) to trapeziform, with almost straight fore edge (Fig. 7, A). Placement of retinae depends on form of rostrum; in case of almost triangle rostrum retinae considerably are shifted from apex of idiosoma and, if rostrum trapeziform, retinae placed near apex of idiosoma. Free end of sternum is bifurcate (Japanese mites), simply, or very slightly bifurcate (mites from the Russian Far East). *4a* are sucker-like conoids or short, stick-like ones. Alveoli of *ad*₂ and *ad*₃ touching each other or remote. Internal sclerite of *ps*₁; form varies from almost triangle (Fig. 8, C) to trapeziform (Fig. 8, B), or split and represented by 2 wedge-shaped sclerites which moving away from *ps*₁ (Fig. 8, A); hind edge reaching (Fig. 8, C) or not reaching (Figs. 7, A, C) posterior edge of hind marginal sclerite, straight or with 2 rounded protuberances; medial process reaching or not reaching hind edge of anus; length (without process) 9.9–19.4, 14.6±2.4; width 5.3–20.1, 16.9±2.7; length/width 0.5–3.1, 0.9±0.4 (n=57). Distance ω_3 –apex of tarsus (1) is 10.9–18.9, 14.8±2.1; ω_3 –base of tarsus (2) 8.7–13.6,

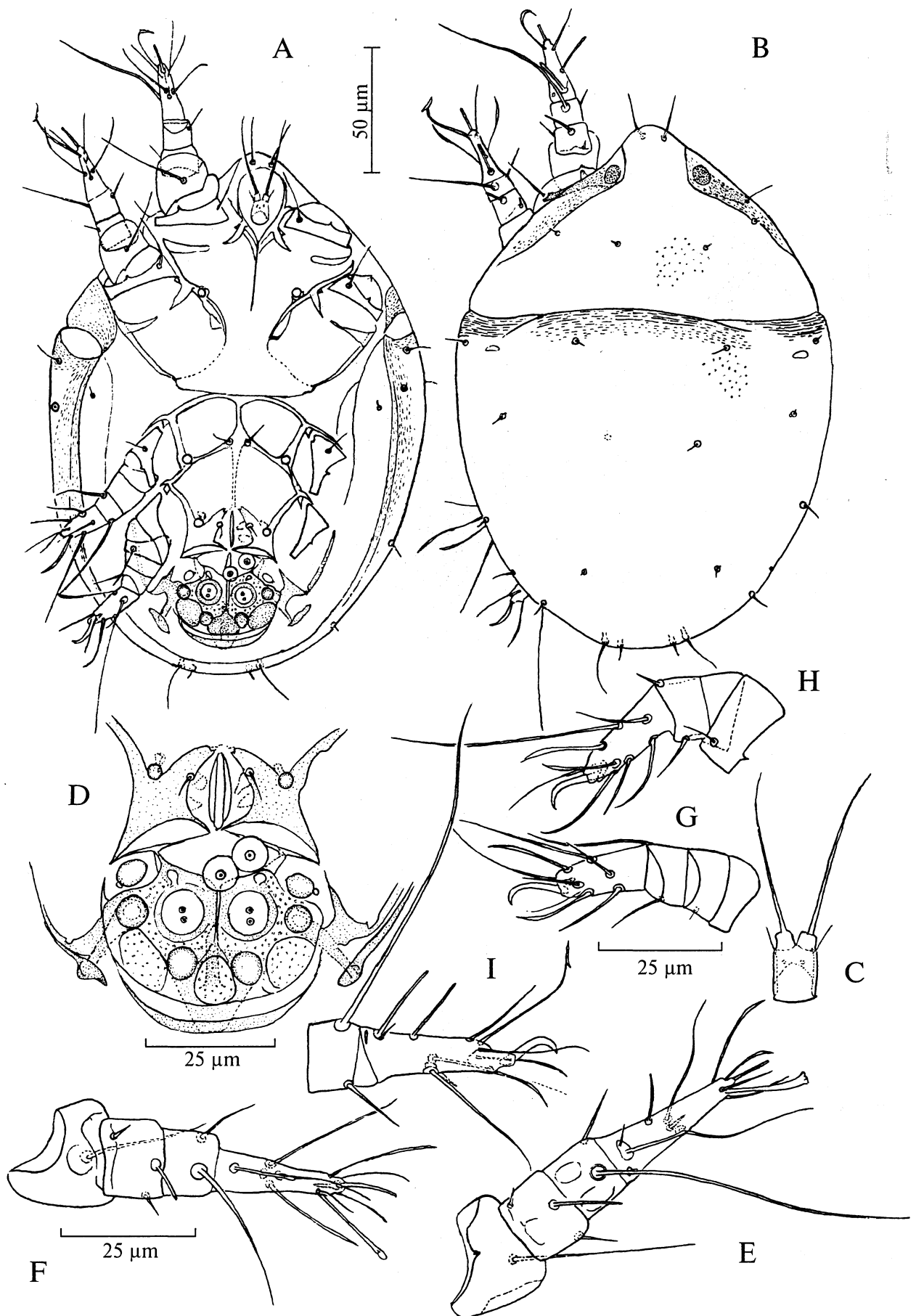


Fig. 6. *Umakefeq microphthalmus* Klimov, sp. n. (hypopus, holotype): A – ventral view, B – dorsal view, C – gnathosoma, D – anal disk, E-H – legs I-IV, respectively, I – tarsus I

Рис. 6. *Umakefeq microphthalmus* Klimov, sp. n. (гипопус, голотип): А – вентрально, В – дорсально, С – гнатосома, D – анальный диск, E-H – ноги I-IV, соответственно, I – лапка I.

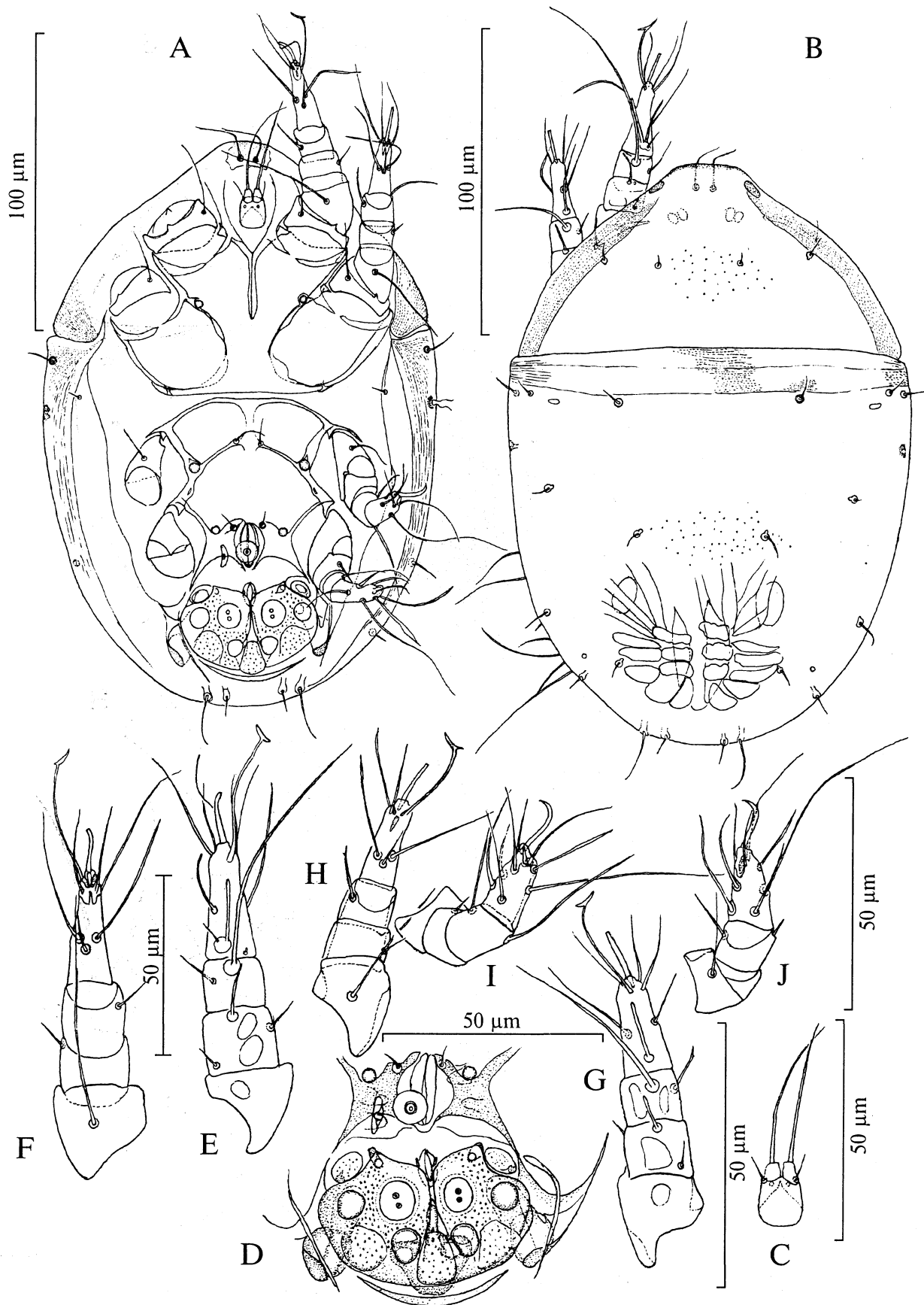


Fig. 7. *Umakefeq microophthalmus* (hypopus): A — ventral view, B — dorsal view, C — gnathosoma, D — anal disk, E–F — leg I, dorsal and ventral view, respectively, G–H — leg II, dorsal and ventral view, respectively, I–G — legs III–IV, respectively. Scale bars: A–B — 100 µm; C–J — 50 µm.

Рис. 7. *Umakefeq microophthalmus* (гипопус): А — вентрально, В — дорсально, С — гнатосома, D — анальный диск, E–F — нога I, дорсально и вентрально, G–H — нога II, дорсально и вентрально, I–G — ноги III–IV, соответственно. Масштаб: А–В — 100 µm; С–J — 50 µm.

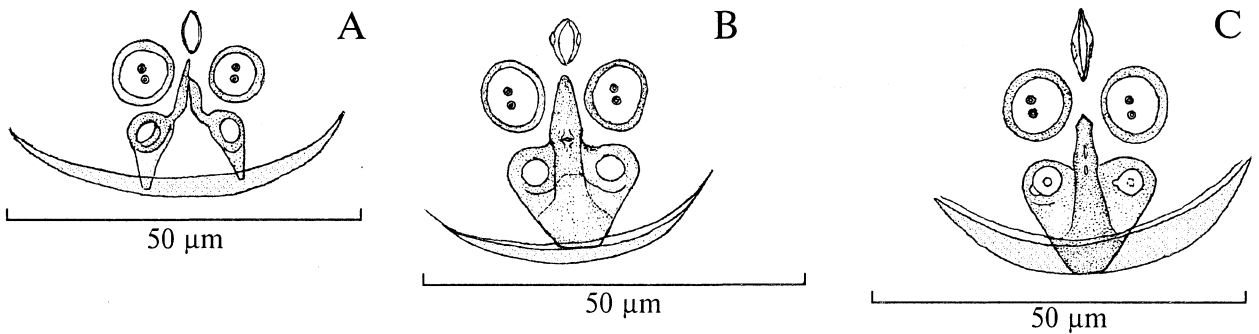


Fig. 8. *Umakefeq microophtalmus* (hypopus): A–C — internal sclerites of *ps*₁.
Рис. 8. *Umakefeq microophtalmus* (гипопус): А–С — внутренний склерит *ps*₁.

11.0 ± 1.5 ; $(1)/(2) = 0.9-2.0$, 1.4 ± 0.4 , $n=31$. ω_3 is placed paramedially, near ω_1 (distance between them slightly longer than diameter of base of ω_3), or in common cuticular field with ω_1 (observed on one tarsus in single specimen). Length of *p* and *q* I is as shown on Fig. 6, E or as on Fig. 7, F. *d* IV are longer or shorter than legs IV.

Form of rostrum and placement of retinae vary in mites collected from one host, while form of internal sclerite of *ps*₁ and placement of its posterior edge relative to marginal sclerite is often constant in samples from one host. Holotype and all paratypes have internal sclerite of *ps*₁ as shown on Fig. 8, C; mites from Partizanskiy district (Chandalaza, ex Ciidae № 2) as on Fig. 8, B; mites from Pogranichniy district as on Fig. 8, A. Form of internal sclerite of *ps*₁ is intermediate between Figs. 8, C and B in some mites from Shkotovskiy district.

There are well visible muscles of anal disk and places of their attachment to hysterosomal shield in posterior part of hysterosoma in some specimens: 3 pairs of band-form, short, transverse, central muscles; they surrounded posterolaterally by 6 pairs of more longer peripheral muscles and anteriorly by 3–4 pairs of long muscles directed antieriad. 2 pairs of small places of muscle attachment present near the base of rostrum; muscles, probably, directed dorsoventrally.

Type material. Holotype (marked by ink arrow): hypopus — Russia: Primorye, Partizanskiy district, top of Chandalaza, ex Ciidae, 7.06.1981, N.Moroz. Paratypes: 8 hypopi — same slide as holotype; 9 hypopi — same data, ex Ciidae № 1, 3–4 (3 slides); 7 hypopi — Primorye, Dal'nerechenskiy district, env. Lyubitovka, ex *Aulacochilus japonicus* Crotch, 1873 (Coleoptera, Erotylidae) № 9, 10–30.08.1975, G.Krivotluskaya. Holotype and paratypes are deposited in the collections of the Institute of Biology and Pedology.

Additional material. Russia, Primorye: 19 hypopi — Shkotovskiy district, Anisimovka and its env., ex *Tritoma niponensis* (Lewis, 1874) (Coleoptera, Erotylidae), 5.07.1975, G.Krivotluskaya; 6 hypopi — Partizanskiy district, summit of Chandalaza, ex Ciidae № 2, 7.06.1981, N.Moroz; hypopus — Pogranichniy district, Barabash-Levada,

flood-lands forest, fungi grown on willow (*Salix*), ex Ciidae, 26.05.1981, G.Krivotluskaya; 10 hypopi — Japan, Tokyo, Setagaya district, Kinuta [now Kinuta-park], ex *Tritoma lewisi* (Crotch, 1870) (Coleoptera, Erotylidae) № 1, 25.05.1932, A. Ashahina.

DIFFERENTIAL DIAGNOSIS

Differential characters are given in a key presented hereabove.

ETYMOLOGY

The species name is derived from the Greek adjective μικρος (small) and noun οφθαλμος (eye) referring to comparatively small retinae in a new species.

DISTRIBUTION

Russia: Primorye, Partizanskiy (type locality), Dal'nerechenskiy, Shkotovskiy, and Pogranichniy districts; Japan.

BIOLOGY

Hypopi of a new species are associated with ciid and erotyloid beetles (Ciidae, Erotylidae).

NOTE

Right seta *e*₁ in holotype is absent.

ACKNOWLEDGEMENTS

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