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## **ADAMYSTIS FONSI (PROSTIGMATA, ADAMYSTIDAE) EXTERNAL MORPHOLOGY PECULIARITIES — NEW FOR UKRAINE FAMILY OF PROSTIGMATID MITES**

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***Adamystis fonsi* (Prostigmata, Adamystidae) External Morphology Peculiarities — New for Ukraine Family of Prostigmatid Mites.** Pogrebnyak S. — The mites of Adamystidae family, new for Ukraine, have found in materials collected in the Black Sea Biosphere Reserve. The comprehensive description and external morphology figures are resulted.

Key words: *Adamystis fonsi*, Adamystidae, mites, external morphology.

**Особливості зовнішньої морфології *Adamystis fonsi* (Prostigmata, Adamystidae) — представника нової для України родини простиجماتичних кліщів.** Погребняк С. Г. — У матеріалах з Чорноморського біосферного заповідника виявлені кліщі нової для України родини. Наведено розширений опис та малюнки деталей зовнішньої морфології цих кліщів.

Ключові слова: *Adamystis fonsi*, Adamystidae, кліщі, зовнішня морфологія.

### **Introduction**

F. Cunliffe (1957) entered the genus *Adamystis* in Anystidae family based on prodorsum chaetotaxy, some other parts, and, probably, because of fast-moving predator mites. Later, Y. Coineau (1974 a, 1974 b) establish a new family for that mites, finally named Adamystidae with a specific features that close to Prostigmata and Endeostigmata. Having a common similarity the species of Adamistidae are with varied base peculiar features. Dorsum is with or without shield. Eyes present, one or two pairs. Leg femora are entire or divided. Idiosoma is constricted at the level of coxae IV (*Saxidromus* genus) or not. All of them have a naso, simple palpi without claws on palptibia and 2 pair of acetabularia (genital papillae). Only in the middle of 90th two more species of *Saxidromus* have been described (Palacios-Vargas, Prieto, 1995, Lopes-Campos, 1996). As opposed to that the revision of E. Ueckermann, (1989) adopted species of *Adamystis* also described before by P. Hunter and D. Crossley, (1968), J. Rafalski (1982), B. McDaniel and E. Bolen (1983), A. Barilo (1986), as like as six new, described by him.

As for now there are 17 species of Adamystidae known in the world. Thirteen (13) are of genus *Adamystis*: *Adamystis donnae* Cunliffe, 1957, was collected from the litter of pine cones near the Tahoe City, California, USA; *A. sarae* Hunter, Crossley, 1968, was collected from the corn litter in Savannah River Plant Reservation near Aiken, South Carolina, USA; *A. fonsi* Coineau, 1974, was collected from the wall of Science Center in Banyuls-sur-Mer, Eastern Pyrenees, France; *A. doumengei* Coineau, 1974, was collected along the road to Ermelo, Transvaal, South Africa; *A. coineaui* Rafalski, 1982, was collected in lichens and under stones, Valley of Mandaras and Valley of Darum, High Hindu-Kush mountains, Pakistan; *A. beckyanneae* McDaniel, Bolen, 1983, was collected on the surface of sandy soil near Olton town, Lamb Country, Texas, USA; *A. sartorum* Barilo, 1986, was collected on the surface of clay ground of three different points near Samarkand and Bukhara, Uzbekistan, and one more in Tajikistan; *A. buchelis* Ueckermann, 1989, was collected from soil, Edenville, Orange Free State, South Africa; *A. monomaculata* Ueckermann, 1989, was collected from soil, Edenville, Orange Free State, and from litter, University of Potchefstroom, Transvaal, South Africa; *A. nudis* Ueckermann, 1989, was collected from soil, Edenville, Orange Free State, South Africa; *A. oculensis* Ueckermann, 1989, was collected from soil, Edenville, Orange Free State, South Africa; *A. trimaculata* Ueckermann, 1989, was collected from soil, Edenville, Orange Free State, South Africa; *A. yvesi* Ueckermann, 1989, was collected from soil surface, Pongola, Transvaal, South Africa. Also there are 4 species of *Saxidromus* Coineau, 1974: *Saxidromus knoefferi* Coineau, 1974, was collected along the road to Ermelo, Transvaal, South Africa; *S. delamarei* Coineau, 1974, was collected from the wall along the left bank of Baillaurie river, Banyuls-sur-Mer, Eastern Pyrenees, France; *S. caribeus* Palacios-Vargas, Prieto,

1995, was collected from litter and soil of sugar cane, Santiago de las Vegas, Habana region, Cuba; *S. annahoffmannae* Lopes-Campos, 1996 was collected from the wall of old catholic chapel, Veracruz, Mexico.

Working with materials collected in Black See Biosphere Reserve (Southern Ukraine) the specimens of *Adamystis fonsi* have been determined, and some parts of body, legs and appendages were examined to extend original description and now are presented in this publication.

### Materials and methods

All samples were collected in the Black See Biosphere Reserve (Southern Ukraine), Gulf of Yegorlyk of Black Sea, at the coast line, in the zone of pure grasses (preferably with cereals) direct joined to the splash line. Latitude: 46°26'52.57"N, longitude: 31°55'53.71"E. Such zone is densely populated with terrestrial prostigmatic and parasitengonic predator mites. 27 specimens of *Adamystis fonsi* have been determined from 4 samples. The lot includes 9 females and 18 males. Four slides marked as c289b, c338c, c340, c341a, consist of 1M, 2F, 5F5M, 2F12M exemplars properly. The materials are deposited in the mite collection of Schmalhausen Institute of Zoology, National Academy of Science of Ukraine.

Terminology and nomenclature of external morphology are followed on A. Baker (1990). All measurements are in mkm.

### Results and discussion

The original description (Coineau, 1974) points to the posterior shield tapes, bigger than eyes postocular bodies, two setae on chelicera, body length 455 mkm and width 215 mkm. This description has filled up by E. Ueckermann (1989) in next: setae *e1* and *f1* located on the integument; postocular bodies twice as large as the eyes; dorsal body setae short and simple; setae *h1*, *h2* and *ps1*, *ps2*, *ps3* on platelets; endopodal shields absent.

*Description.* Male and female have very similar external morphology. Males differ by internal genitalia, length of genital flaps and some sets of genital setae that will be discussed in description.

*Body* ellipsoid, 490–530 mkm length varies around 510, 320–360 mkm width of 340. Gnathosoma adds 70–80 mkm to the general length in 580.

*Dorsum* (fig. 1) is covered by smooth and soft shield, which cone-shaped posteriorly. Bothridial sensillae *iv* on naso, smooth, 43–45 mkm in length, another one *T* smooth, on prodorsum, 50–53 mkm in length. Eyes and postocular bodies do not clearly define. Estimated diameter of eye (on the dorsal shield plication) — 12–14 mkm. Naso spheroid with cellular pattern near botridial sensillae and linear ribbed pattern ventrally and terminally. A pair of lens-like structures nears the naso frontal-laterally. Prodorsal setae *ev* slightly serrated (30–33), all other dorsal setae serrated: *sc* (20–22), *c1*, *c2*, *d1* (18–20) on shield, *e1* (20–23), *f1*, *h1*, *h2*, *ps1*, *ps2*, *ps3* (18–20) on platelets. Two pairs of big lyrifissures (*im*, *ip*) posterior to *d1*.

*Venter* (fig. 2) striated, reinforced only by coxae. Subcapitulum (fig. 18) with 4 pair of smooth setae on the ventral part: one little medially (7–10) and 3 others — 16–17, 10–12, 15–17. Ventral podosomal setae partially belong to coxae, partially to the proper epimerite by the scheme: coxa I — 1+2, coxae II–IV — 3+2 setae. Two pairs of setae out of this scheme, one near the coxa III between *3a* and *3b* marked as *v1* (28–30), one other posterior to coxa IV medially marked as *v2*. Setae *1a* (28–30), *1b* (26–28), *2a* (27–28), *2b* (28–30), *3a*, *3b* (28–30), *4a* (25–28), *4b* (20–23). Four pairs of aggenital setae *ag1*, *ag2*, *ag3*, *ag4* (23–25, 28–32, 23–25, 17–19) surround the genital opening. Two mites from 17 (1F1M) have 3 aggenital setae asymmetrically in front of genital opening. Genital flaps 130–135 mkm in length with central and paracentral rows of setae. Seven setae are in central row and 2 of them visibly longer (2<sup>nd</sup> and 3<sup>rd</sup>) with thin end, 7 setae are in paracentral row. One case of female with 8 and 8 setae on genital flap, one additional longer seta between 3<sup>rd</sup> and typical 4<sup>th</sup> in central row, one additional seta between 4<sup>th</sup> and 5<sup>th</sup> in paracentral row; one case of 6 setae in paracentral row and one more of 9 setae in central row asymmetrically. Central row of setae is 50–52 mkm. Setae length *g1–g7* (anterior first) — 12–15, 25–27, 20–22, 17–22, 15–17,



Fig. 1. Dorsal view of female.

Рис. 1. Дорсальная сторона тела самки.

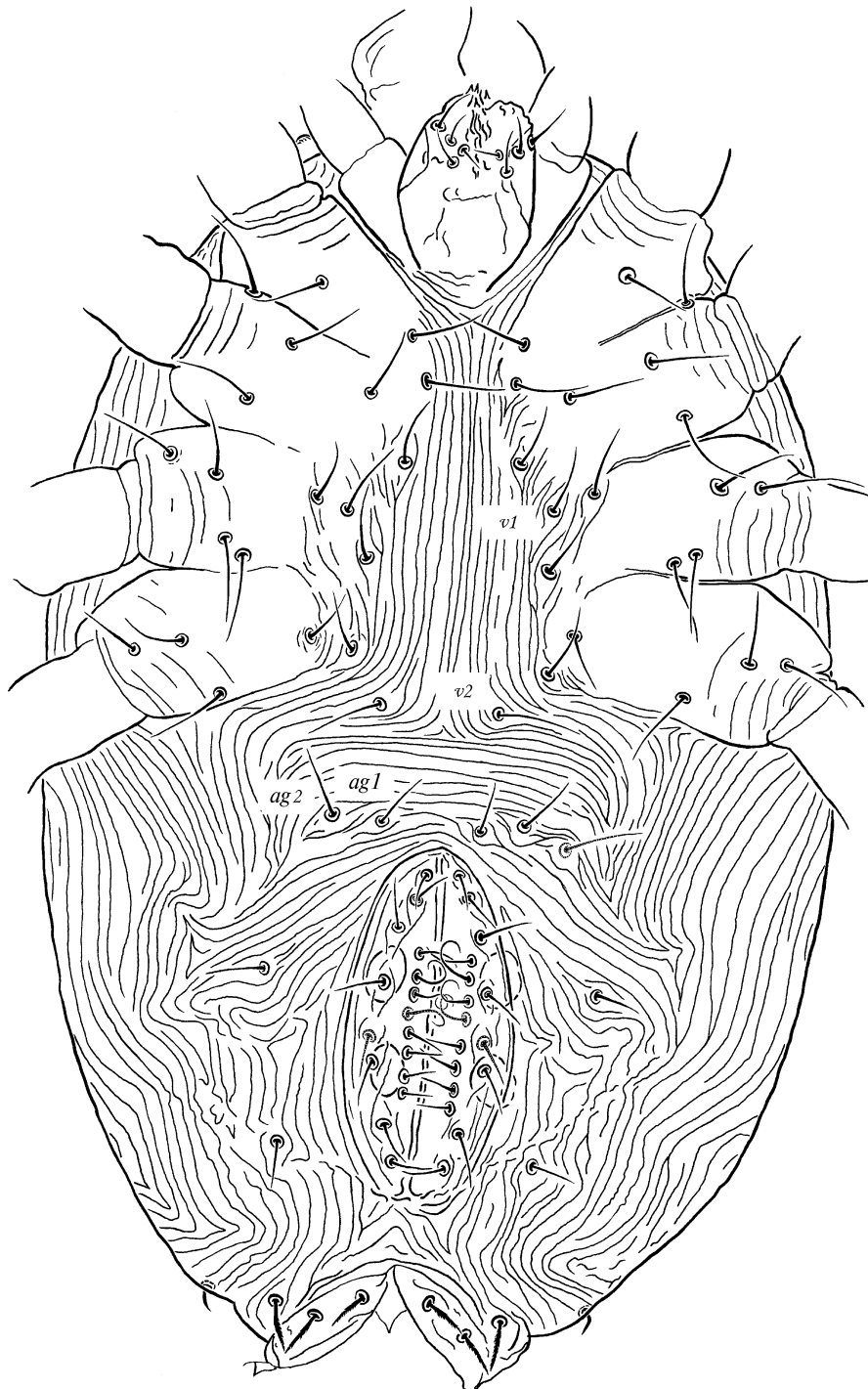


Fig. 2. Ventral view of female.

Рис. 2. Вентральная сторона тела самки.

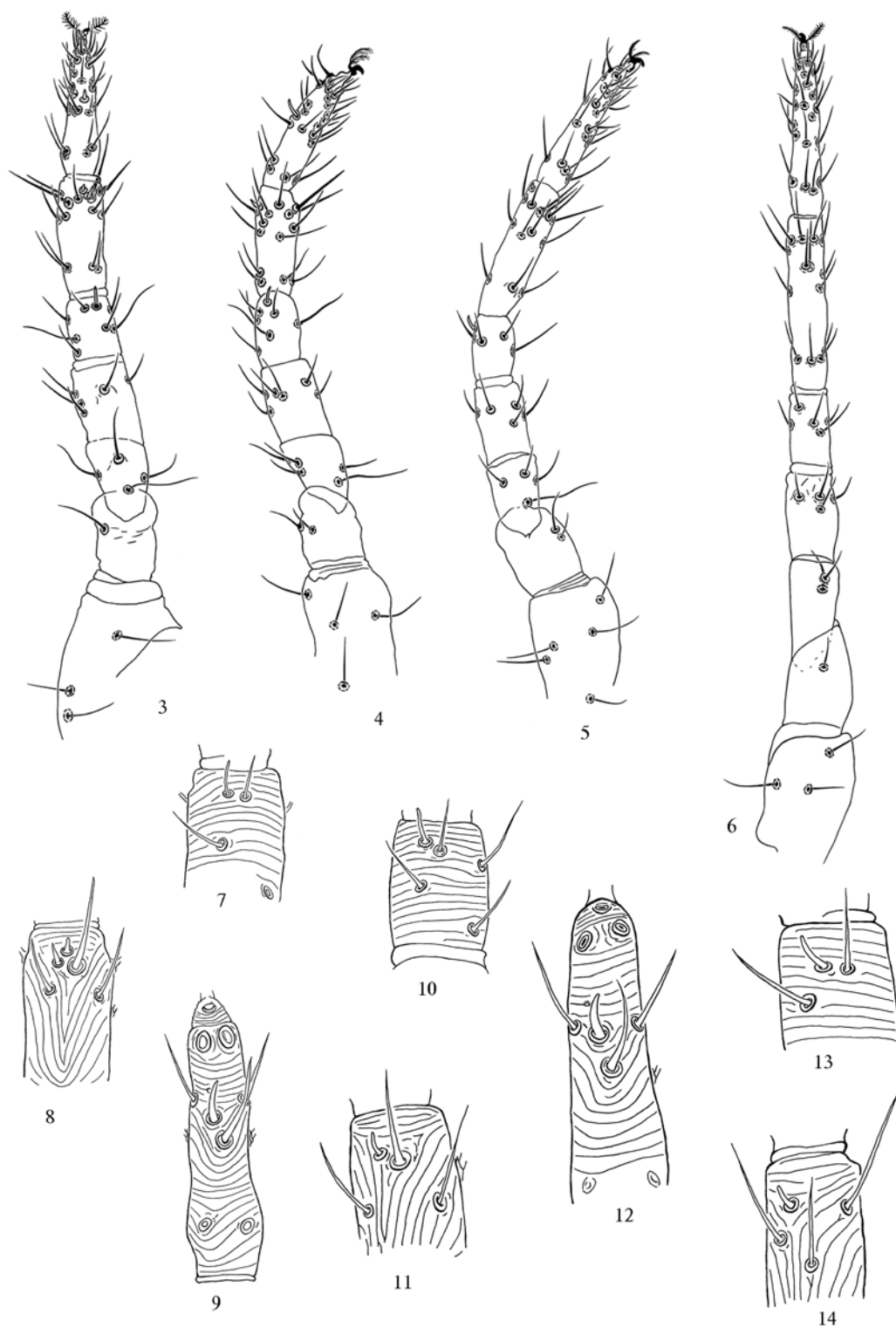


Fig. 3–14. Legs of female: 3 – Leg I; 4 – Leg II; 5 – Leg III; 6 – Leg IV; 7 – Genu I; 8 – Tibia I; 9 – Tarsus I; 10 –Genu II; 11 – Tibia II; 12 – Tarsus II; 13 – Genu III; 14 – Tibia III.

Рис 3–14. Ноги самки: 3 – нога I; 4 – нога II; 5 – нога III; 6 – нога IV; 7 – колено I; 8 – голень I; 9 – лапка I; 10 – колено II; 11 – голень II; 12 – лапка II; 13 – колено III; 14 – голень III.



Fig. 15–19. Different parts of female and male: 15 – Palp; 16 – Palptarsus; 17 – Chelicera; 18 – Subcapitulum; 19 – Genital flaps of male.

Рис. 15–19. Некоторые детали строения самок и самцов: 15 – пальпа; 16 – лапка пальпы; 17 – хелицера; 18 – субкапитулюм; 19 – генитальный клапан самца.

12–13, 11–12. Paracentral row setae length *gp1–gp7* (anterior first) — 14–16, 15–17, 20–22, 15–17, 13–17, 13–17, 12–13. Striation density between *Ia* setae — 20 lines, between *4a* — 40 lines. Striation is transverse posterior to *v2*, number of striae appr. 30. Striation is inclined from the frontal part of genital flaps to the region of *ag3* seta. Inclined striation of males differs a bit in front of genital opening and in the region of *ag3* seta. Males also differ from females in length of genital flaps (100–105), form and length of central row genital setae (fig. 19). Central row of setae is 44–46 mkm. Setae length *g1–g7* (anterior first) — 10–12, 17–20, 12–15, 12–15, 14–15, 15–17, 11–12. Paracentral row setae length *gp1–gp7* (anterior first) — 10–12, 14–15, 17–20, 17–20, 15–17, 16–17, 10–12.

All four *legs* have femora divided into basifemur and telofemur. Tarsal appendages are similar, with little hook-like empodium, and ambulacral claws (14–15 mkm) feather-like with thin hairs. Tarsal claws III–IV more finely haired, but I–II more distinct as feather. Commonly legs chaetotaxy as follows (solenidia in parentheses): coxae 1–3–3–3, trochanters 2–2–2–1, basifemora 5–5–4–2, telofemora 5–6–5–4, genua 7(1)–7(1)–5(1)–5, tibiae 13(2)–13(1)–13(1)–14, tarsi 25(1)–23(1)–23–21.

*Leg I* (fig. 3). Visible length (without coxa, with tarsal claws) is 335–340 mkm. Terminal part of coxa (70–75) with 1 seta *Ic* (31–33 mkm). Trochanter (43–45) with 2 setae (dorsal 26–28, lateral 15–17). Basifemur (48–53) with 5 setae, one of them is long, smooth and thin macrochaeta (43–47) placed on basal part and directed ventrally. Telofemur (48–50) with 5 setae; there is 6 setae sometimes, but it looks like addition untypical seta. Genu (43–45) with 7 setae and one solenidium (fig. 7), 3 setae and

dorsal solenidion form a terminal tuft, two ventro-lateral of other four are thin macrochaetae (30–35, 32–37); solenidion — 10–11, attendant seta — 12–13. Tibia (72–75) with 13 setae and two little solenidia (fig. 8); four ordinary setae forms basal tuft, and 5 setae and dorsal solenidia form terminal tuft in which 2 ventral coarse and slightly serrated macrochaetae (35–43); solenidia almost equal, 2–3 mkm, attendant seta — 20–22. Tarsus (77–80) bears 25 setae and a little solenidion (5–6 mkm) (fig. 9) placed in the middle part dorsally; 4 setae form basal tuft, a half of tarsus for other setae, preferably in ventral position. Cluster of 3 dorso-terminal setae (20–22) and attendant on solenidion seta (22–23) are up-directed.

*Leg II* (fig. 4). Visible length (without coxa, with tarsal claws) is 335–340 mkm. Terminal part of coxa (55–60) with 3 seta *2c*, *2d*, *2e* (28–30 mkm). Trochanter (43–45) with 2 setae (dorsal 25–27, lateral 15–18). Basifemur (48–50) with 5 setae, one of them is long, smooth and thin macrochaeta (43–45) on basal part ventrally directed. Telofemur (45–48) with 6 setae; there is 5 setae sometimes, but it looks like lack of seta. Genu (43–45) with 6 setae and a solenidion (fig. 10), 3 setae and dorsal solenidion form a terminal tuft, two ventro-lateral thin macrochaetae (28–30, 28–30) are in the middle part of genu; solenidion — 9–10, attendant seta — 14–15. Tibia (70–75) with 13 setae and one solenidion (fig. 11); four ordinary setae form basal tuft, 2 coarse and slightly serrated ventro-terminal macrochaetae (32–35, 30–32); solenidion — 5–6 mkm, attendant seta — 20–22. Tarsus (72–80) with 23 setae and a solenidion (7–8 mkm) (fig. 12) in dorsal position of the middle part; 4 setae form basal tuft, a half of tarsus bears other setae, mostly in ventral position. Cluster of 3 dorso-terminal setae (20–22) and attendant on solenidion seta (22–25) are up-directed.

*Leg III* (fig. 5). Visible length (without coxa, with tarsal claws) is 353–357 mkm. Terminal part of coxa (70–75) with 3 seta *3c*, *3d*, *3e* (30–32 mkm). Trochanter (40–42) with 2 seta (dorsal 17–20, lateral 16–18). Basifemur (36–38) with 4 seta, one of them is long, smooth and thin macrochaeta (43–45) on the ventral side of basal part. Telofemur (48–50) with 5 setae. Genu (38–40) with a solenidion (fig. 13) and 4 setae, one of them is a bit longer (33–35); solenidion — 5–6 mkm, attendant seta — 22–25. Tibia (82–85) with 13 setae and a minute solenidion (fig. 14) dorsally and terminal; solenidion — 6–8 mkm, attendant seta — 20–22; four ordinary setae form basal tuft, 6 setae placed in terminal position, 2 of them a bit longer and stronger than others (33–35, 30–32). Tarsus (82–85) with 23 setae; 4 setae form basal tuft, more than half of tarsus bears other setae, mostly in ventral position.

*Leg IV* (fig. 6). Visible length (without coxa, with tarsal claws) is 415–422 mkm. Terminal part of coxa (85–90) with 3 seta *4c* (30–32 mkm), *4d* (25–28), *4e* (25–30). Trochanter (40–42) with 1 lateral seta (22–25). Basifemur (43–45) with 2 seta. Telofemur (50–53) with 4 setae. Genu (45–48) with 5 simple setae. Tibia (110–113) with 14 setae; four ordinary setae form basal tuft; 5 setae placed in terminal position and a bit longer than others, 2 of them ventrally are 33–35 mkm in length, 2 others — 28–30. Tarsus (102–105) with 21 setae; 4 setae form basal tuft; one dorso-terminal seta longer than others (35–38).

*Palp* (fig. 15). Visible length (without coxa, without terminal strong seta) is 105–108 mkm. Palpcoxa with no setae; palp trochanter short and do not clearly defined; palpgenu (32–35) with 2 setae (25–27, 20–22); palptibia (19–20) with 3 setae appr. equal in length (22–25); palptarsus (45–48) with 9 setae and a solenidion (5–6 mkm) (fig. 16), two terminal setae stronger than others (15–17, 19–20). *Chelicera* (fig. 17) 70–73 mkm in length with 2 smooth setae (17–20).

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