Genus	Vol. 11 (4): 511-520	Wrocław, 26 XII 2000

New data on European *Hymenaphorura* (BAGNALL, 1948) (*Collembola*: *Onychiuridae*)

ROMUALD J. POMORSKI
Zoological Institute, Wrocław University, Sienkiewicza 21, PL-50-335 Wrocław, Poland
E-mail: onychus@biol.uni.wroc.pl

ABSTRACT. *Hymenaphorura creatricis* POMORSKI 1990 is a junior synonym of *Hymenaphorura dentifera* (STACH, 1934). *Hymenaphorura strasseri* (STACH, 1934), *Hymenaphorura pseudosibirica* (STACH, 1954) and *Hymenaphorura valdegranulata* (STACH, 1954) are redescribed based on original and new materials. Lectotype of *H. pseudosibirica* is designated.

Key words: entomology, taxonomy, redescriptions, new synonymy, *Collembola*, *Onychiuridae*.

STACH (1934, 1954) described three species and one form of onychiurids, which are currently classified as *Hymenaphorura* BAGNALL, 1948. Thanks to the kindness of Dr. W. WEINER (Kraków), Prof. E. CHRISTIAN (Vienna) and Dr. I. KAPRUS' (Lviv) I have had an opportunity to examine the original and new materials of all the species. I have ascertained that all of them belong to the genus *Hymenaphorura*, but they needed a comment and a modern redescription.

The study was supported by the University of Wrocław (project number 2020/W/IZ/99).

Hymenaphorura dentifera (STACH, 1934)

Onychiurus sibiricus f. *dentifera* STACH, 1934, Ann. Mus. Zool. Pol.: 144
Hymenaphorura sibirica dentifera (STACH, 1934) nov. comb.: SALMON, 1964, Roy. Soc. of New Zel.: 161
Hymenaphorura creatricis POMORSKI, 1990, Mitt. Der Schwei. Ent. Ges., 63: 216, **syn. nov.**

STACH (1934) described *Onychiurus sibiricus* f. *dentifera*, as a new form from the Tatra Mts. ("auf der Świnica-Spitze, 2306 m. H., VIII 1909") and the Polish part of Silesia ("in Bystra"). The form is characterized by the presence of a denticle on the claw. In his 1964 catalogue, SALMON transferred the form to the genus *Hymenaphorura* BAGNAL, 1948 and elevated it to subspecific rank – *Hymenaphorura sibirica dentifera* (STACH, 1934). According to the International Code of Zoological Nomenclature, SALMON'S act made the name "*dentifera*" available.

In STACH'S collection, kept at the Institute of Systematic and Evolution of Animals PAS (Kraków) there are no materials from any of the localities mentioned. Two species with denticulate claws are known from Poland – *Hymenaphorura creatricis* POMORSKI, 1990 and *Hymenaphorura nova* POMORSKI, 1990 which makes "*dentifera*" nomen dubium.

In order to solve the problem, I propose to regard *H. creatricis* as a junior synonym of *H. dentifera. H.creatricis* is the most frequent at higher altitudes in the Carpathians and Sudetes (POMORSKI, 1998) and most probably STACH dealt with specimens of this species. I propose to designate the holotype of *H. creatricis* as the neotype of *H. dentifera*.

Hymenaphorura strasseri (STACH, 1934)

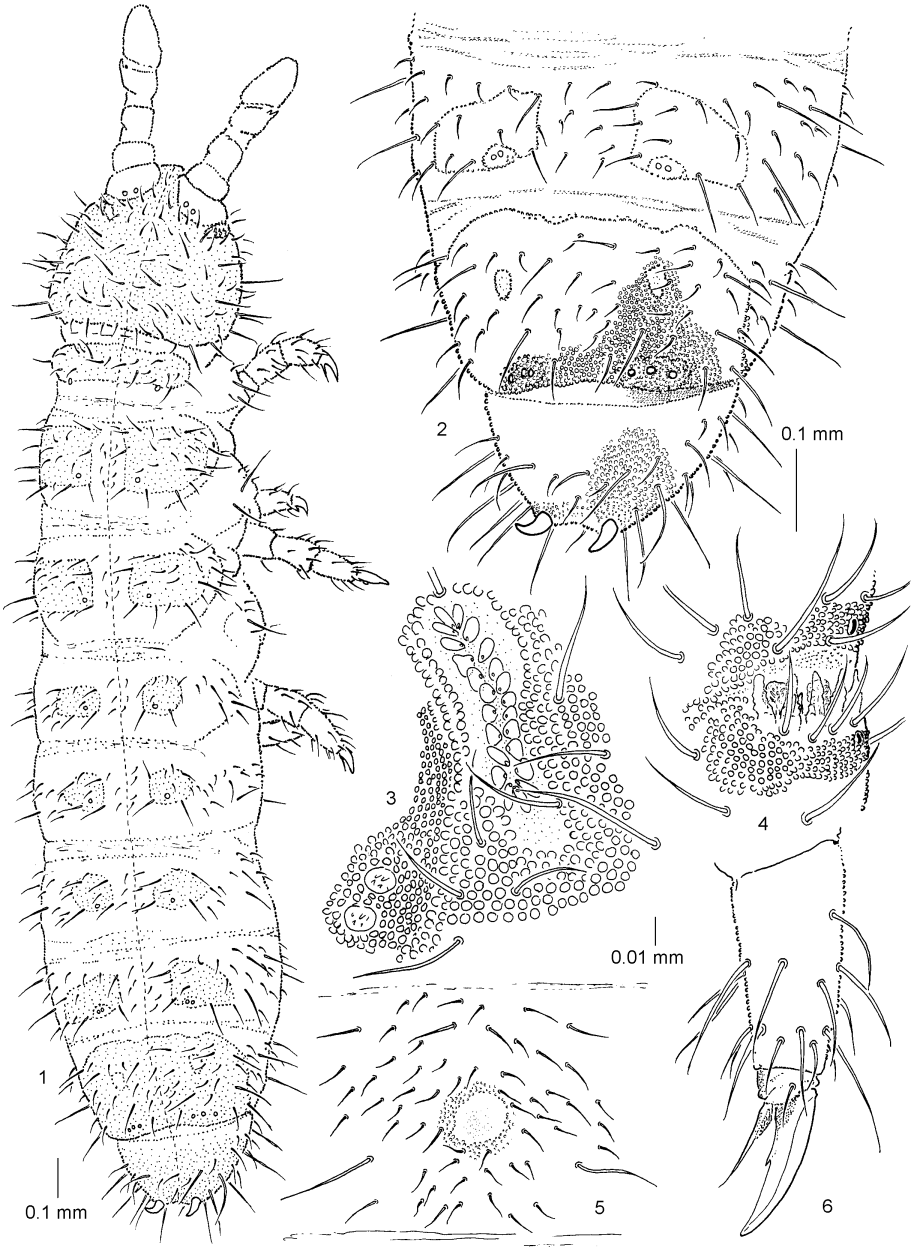
Onychiurus strasseri STACH, 1934, Ann. Mus. Zool. Pol.: 147.

TYPE MATERIAL

Holotype (original designation) 1 female on slide, 8 paratypes on 7 slides (2 males, 6 females) and 4 paratypes in alcohol (2 vials) originally labelled: "*Onychiurus strasseri* Stach. Typus. Italia, Idria, Golebeja Jama b. Schwarzenberg, Tarnovaner Wald, Seeh. 670 m., 15 tiefer Schacht mitkleiner Höhle. Am Grunde Schneekegel, Temp. 2,5 °C; ziemlich helles Licht. Auf Hölcer. 26 V 1929, Leg. KARL STRASSER (Triest)" (kept in Institute of Systematic and Evolution of Animals PAS, Kraków).

DIAGNOSIS

H. strasseri belongs to the Palaearctic group of *Hymenaphorura* species with 11 setae in the distal whorl on tibiotarsi, equal setae p_2 and p_3 on abdominal terga I-III and 1 border seta at PAO groove. Among known members of the genus it is characterized by an exceptionally high number of pseudocelli (pseudocellar formula – 20/111/111(2)23). The presence of a distinct denticle on the claw and 1+1 pseudocelli on thoracic tergum I place this species near *Hymenaphorura valdegranulata* (STACH, 1954).



1-6. *H. strasseri*: 1 – habitus and dorsal chaetotaxy, 2 – chaetotaxy of abdominal terga IV-VI, 3 – postantennal organ and pseudocelli at base of antenna, 4 – antennal III sense organ, 5 – remnant of furca, 6 – tibiotarsus and claw of legs II

REDESCRIPTION

Color in alcohol white. Size without antennae, males 2.1 mm, females 2.2-2.5 mm. Shape of body cylindrical, elongated with rounded abdominal tergum VI as in Figs. 1 and 2. Antennae as long as head. Trace of reduced furca in shape of small depression with fine granulation and with 2-3 small setae posteriorly. Granulation of dorsal side of the body distinct, regular, rather fine with well visible granular areas - usually 11-13 grains around each pseudocellus.

AIIIO consists of 5 tuberculately wrinkled, simple papillae; 2 sensory rods; 2 finely granulated, spherical sensory clubs; 4 guard setae (Fig. 4).

Antennal segment IV with subapical organite and microsensillum in latero-external position, at the level of first row of setae. On III antennal segment microsensillum located laterally, slightly below AIIIO (Fig. 2).

PAO relatively long in a narrow and short cuticular groove, with one border seta with 22-23 simple and bilobed vesicles (Fig. 3).

Pseudocellar formula (pso) 20/111/111(2)23, ventral pso absent. 2+2 pseudocelli (when present) on abdominal tergum III located closely together, like on abdominal tergum IV. Parapseudocellar formula typical for the genus.

Dorsal chaetotaxy symmetrical, excluding medial part of abdominal tergum V. Macrochaetae distinct, on abdominal terga I-III setae p_2 and p_3, located on each side of the pseudocelli, roughly equal in length, as in Fig. 1. Thorax II-III with lateral microsensilla. Granular area on abdominal tergum V with 6(7)+6(7) more or less developed macrochaetae (Fig. 2). Subcoxae with 5, 6, 6 setae. Between legs on meso- and metathorax 1+1 and 2+2(3+3) setae respectively. Tubus ventralis usually with 11+11 setae. Male ventral organ absent.

Claw of adults elongated, always with denticle, without lateral teeth. Empodial appendage with narrow basal lamella, appendage length equals 5/6 inner edge of claw. Distal veriticil on tibiotarsi with 11 setae; tenant setae visible but not distinct (Fig. 6).

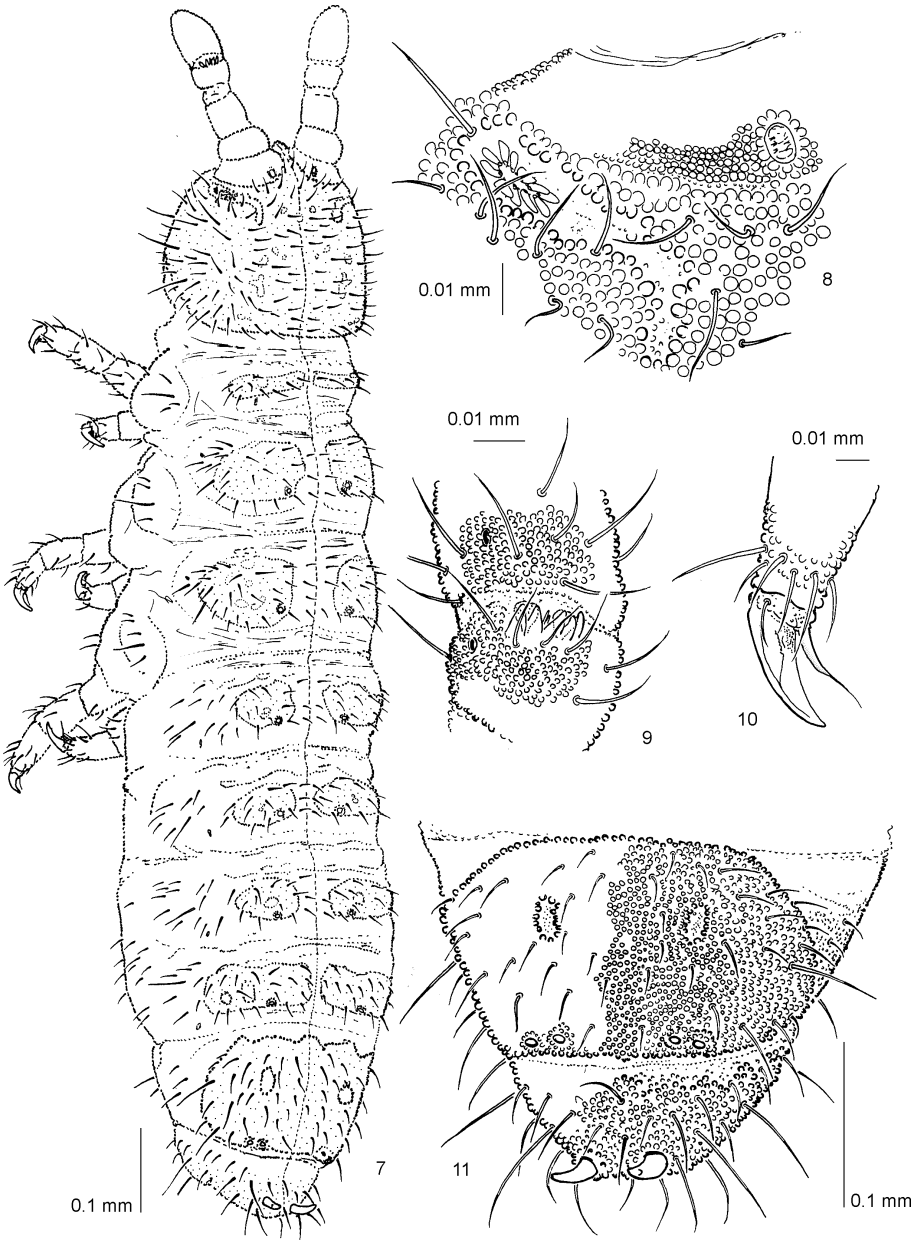
Anal spines rather fine, curved, pointed, with small basal papillae, shorter than claw.

Hymenaphorura pseudosibirica (STACH, 1954)

Onychiurus psudosibiricus STACH, 1954, Pol. Akad. Nauk. Inst. Zool.: 31.

TYPE MATERIAL

Lectotype (present designation), male on slide, 6 paralectotypes (3 males, 3 females) on 4 slides and 46 paralectotypes in alcohol (2 vials); originally labelled: "*Onychiurus pseudosibiricus* Stach. N. 223 Hùngaria, Antrùm Aggtálek, 29. VII. 1929. Leg. DUDICH" (kept in Institute of Systematic and Evolution of Animals PAS, Kraków).



7-11. *H. pseudosibirica*: 7 – habitus and dorsal chaetotaxy, 8 – postantennal organ and pseudocellus at base of antenna, 9 – antennal III sense organ, 10 – claw of legs II, 11 – chaetotaxy and granulation of abdominal terga V-VI

DIAGNOSIS

Among known members of the genus, only *H. pseudosibirica* males have ventral organ. The remaining morphological characters place this species near *Hymenaphorura polonica* POMORSKI, 1990. Both species have similar, relatively short and equal dorsal macrochaetae (p_2 and p_3), strong granulation, one border seta at postantennal groove, claws without denticle and general shape of body. Subadults and females of *H. pseudosibirica* can be easily recognized, because of their unique long abdominal tergum V (ca. 2 times longer than abdominal tergum VI), very long empodial appendage (as long as claw) and 10-11 setae on granular area of abdominal terga I-III (*H. polonica* - 7 setae).

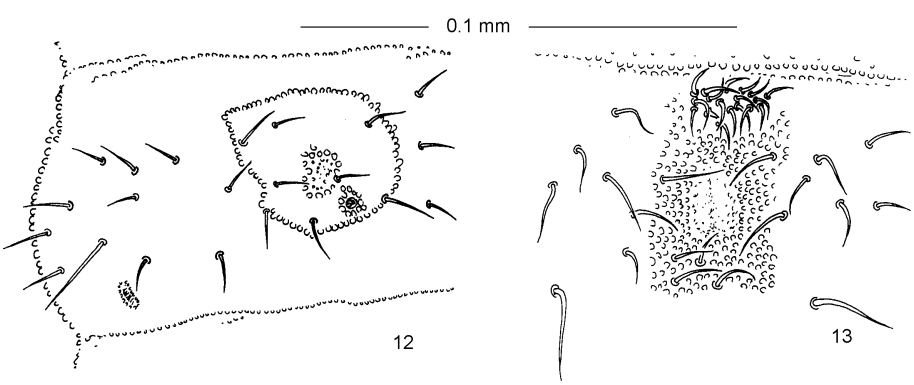
REDESCRIPTION

Color in alcohol white. Size without antennae: males 1.6-1.9 (holotype 1.9 mm), females 1.8-2.0. Shape of body cylindrical, robust with relatively long abdominal segment V (2 times longer than abdominal segment VI) as in Fig. 7. Antennae as long as head or somewhat shorter. Trace of reduced furca in shape of 2 symmetrical small patches of fine granulation with 2-3 small setae posteriorly (Fig. 13). Granulation of dorsal side of the body coarse, with well visible granular areas - usually 9-11 grains around each pseudocellus; granular area of abdominal tergum V with poorly marked cauliflower-like areas.

Antennal III sense organ consists of 5 simple rather short papillae; 2 sensory rods; 2 finely granulated, spherical sensory clubs; 4 guard setae (Fig. 9).

Antennal segment IV with subapical organite and microsensillum in latero-external position, at level of second row of setae. On antennal segment III microsensillum relatively small, located laterally slightly below antennal III sense organ (Fig. 9).

Postantennal organ in a narrow and very long cuticular groove (distinctly prolonged on dorsal side of head), with one border seta and 9-11 simple and bilobed vesicles (Fig. 8).



12-13. *H. pseudosibirica*: 12 – chaetotaxy of abdominal tergum I, 13 – male ventral organ and

Pseudocellar formula (pso) 10/011/11112, ventral pso absent. Parapseudocellar formula typical for the genus.

Dorsal chaetotaxy relatively short with poorly marked macrochaetae, as in Fig. 7. Thorax II-III with lateral microsensilla. On abdominal terga I-III granular area with 10-11 setae; setae p_2 and p_3, located on each side of pseudocelli, roughly equal in length (Fig. 12). Chaetotaxy of granular area on abdominal tergum V usually asymmetrical with 1(2)+1(2) more or less developed lateral macrochaetae (Fig. 11). Subcoxae with 4, 5, 5 setae. Between legs on meso- and metathorax 1+1 setae. Tubus ventralis usually with 9+9 setae. Male ventral organ situated on abdominal sternum III, above trace of reduced furca, consists of group of ca. 15 thickened setae located together (Fig. 13).

Claw of adults always without denticle. Empodial appendage as long as claw, with narrow and long basal lamella and distal filament. Distal whorl on tibiotarsi with 11 setae; tenant setae invisible (Fig. 10).

Anal spines strong, curved, pointed, with small basal papillae, as long as the claw.

Hymenaphorura valdegranulata (STACH, 1954)

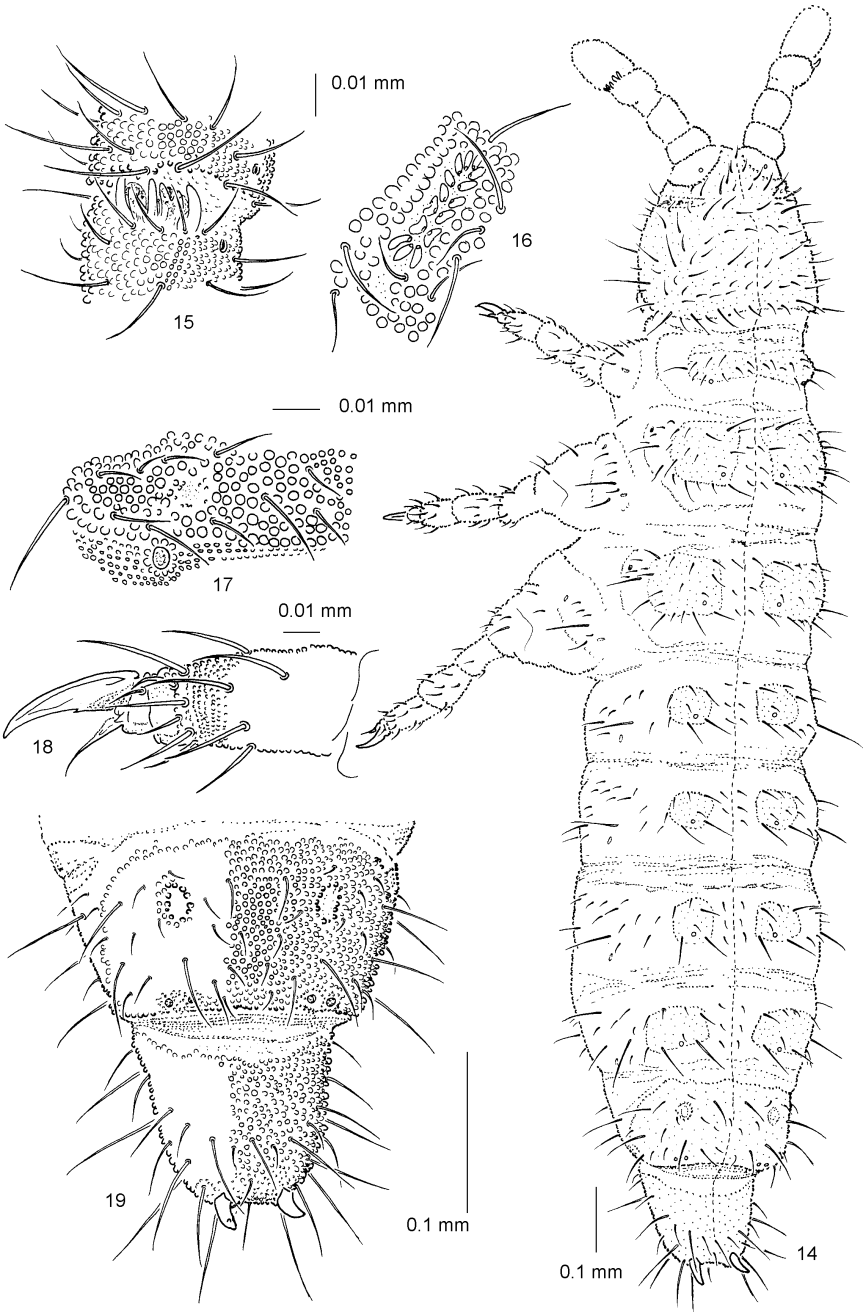
Onychiurus valdegranulatus STACH, 1954, Pol. Akad. Nauk. Inst. Zool.: 103.

TYPE MATERIAL

Holotype (original designation), 1 spp. (sex unknown) on slide, 2 paratypes (sex unknown) on 1 slide; originally labelled: "*Onychiurus valdegranulatus*. Typ. Polonia, Czarnohora, 22. VII. 1934. Leg. J. STACH" (kept in Institute of Systematic and Evolution of Animals PAS, Kraków).

OTHER MATERIAL

7 spp. on 2 slides; Ukraine, East Carphatians, Carnohora, Bukowye Krivolisya, Vidrog "Zelemin" (ca. 1000 m. a.s.l.); 25 X 1989; litter in beech forest. Leg. I. KAPRUS'. 4 spp. on 1 slide; Ukraine, East Carphatians, Carnohora, Bukowye Krivolisya, Vidrog "Zelemin" (ca. 1000 m. a.s.l.); 24 V 1990; litter and moss in beech forest. Leg. I. KAPRUS'. 3 spp. on 1 slide; Ukraine, East Carphatians, Carnohora, Smerecnik; 27 VI 1991; litter in beech forest. Leg. I. KAPRUS'. 8 spp. on 2 slides Ukraine, East Carphatians, Carnohora, Smerecnik "Veliky Kamin"; 1 VIII 1991; litter in beech forest. Leg. I. KAPRUS'. 9 spp. on 2 slides; Ukraine, East Carphatians, Carnohora, Smerecnik; 24 VIII 1993; litter in beech forest. Leg. I. KAPRUS'. 1 spp. (juv) on slide; Austria, Karawanken mountains, Carinthia; 10 X 1987; Quelle bei der Klagenfurter Hütte (= spring near Klagenfurt refuge) 1650 m a. s. l. Leg. H. MIXANIG.



14-19. *H. valdegranulata*: 14 – habitus and dorsal chaetotaxy, 15 – antennal III sense organ, 16 – postantennal organ, 17 – thoracic tergum I, 18 – tibiotarsus and claw of legs III, 19 – chaetotaxy of abdominal terga V-VI

DIAGNOSIS

H. valdegranulata belongs to the Palearctic group of *Hymenaphorura* species with 1 border seta at PAO groove, with denticulate claw and forked second lateral papilla of antennal III sense organ. It is related to *H. nova* POMORSKI, 1990, from which it clearly differs in the presence of 1+1 pseudocelli on thoracic tergum I and size and number of macrochaetae on abdominal tergum V (*H. nova* - 3+3 poorly marked macrochaetae, *H. valdegranulata* – 6+6 distinct macrochaetae).

REDESCRIPTION

Color in alcohol white. Size without antennae, 2.0-2.1 mm males, 2.3-2.5 mm females (holotype – 2.4 mm). Shape of body cylindrical, elongated and slender (abdominal terga V and VI relatively long and narrow) as in Figs 14 and 19. Antennae as long as head. Trace of reduced furca in shape of 2 symmetrical small patches of fine granulation with 2-3 small setae posteriorly. Granulation of dorsal side of the body distinct, irregular, with well visible granular areas **-** usually 9-10 grains around each pseudocellus.

AIIIO consists of 5 simple papillae of which the second external is forked; 2 sensory rods; 2 finely granulated, spherical sensory clubs; 4 guard setae (Fig. 15).

Antennal segment IV with subapical organite and microsensillum in latero-external position, slightly above first row of setae. On III antennal segment microsensillum located laterally, slightly below AIIIO (Fig. 15).

PAO in a relatively broad and short cuticular groove, with one border seta, with 14-15 simple and bilobed vesicles (Fig. 16).

Pseudocellar formula (pso) 10/111/11112, ventral pso absent. Thoracic tergum I with 1+1 pseudocellus (Fig. 17). Excluding thoracic tergum I parapseudocellar formula typical for the genus.

Dorsal chaetotaxy symmetrical, with distinct and relatively long macrochaetae, as in Fig. 14. Thorax II-III with lateral microsensilla. On abdominal terga I-III setae p_2 and p_3, located on each side of pseudocelli, roughly equal in length. Granular area on abdominal tergum V with 6+6 more or less developed macrochaetae (Fig. 19). Subcoxae with 4(5), 6, 6 setae. Between legs on meso- and metathorax 1+1 setae. Tubus ventralis usually with 9+9 setae. Male ventral organ absent.

Claw of adults always with denticle and two lateral teeth (claws of juvenile specimens usually without denticle). Empodial appendage with narrow basal lamella, appendage length equals 6/7 inner edge of the claw. Distal veriticil on tibiotarsi with 11 setae; tenant setae visible but not distinct (Fig. 18).

Anal spines strong, curved, pointed, with little basal papillae, distinctly longer than the claw.

REMARKS

In STACH'S collection only two slides with 3 spp. of *H. valdegranulata* were found. All the specimens are in very bad condition, but morphological details,

which are still visible, have enabled me to ascertain that they were the base for the description. The thoracic tergum I with distinct pseudocellus and claws is visible. One specimen is juvenile and reason the claw has no denticle as in figure in STACH'S monography (1954; plate VII, fig. 4).

ACKNOWLEDGEMENTS

I am greatly indepted to Dr. WANDA WEINER, Prof. ERHARD CHRISTIAN and Dr. IGOR KAPRUS' for the loan and gift of the materials of *Hymenaphorura*.

REFERENCES

POMORSKI, R. J., 1998. *Onychiurinae* of Poland (*Collembola*: *Onychiuridae*). Genus, supplement: 201 pp.

SALMON, J. T., 1964. An idex to the *Collembola*. Vol. **1-2**, Society Victoria University of Wellington, Wellington: 144 pp.

STACH, J., 1934. Die in den Höhlen Europeas vorkommenden Arten der Gattung *Onychiurus* Gervais. Annales Musei Zoologici Polonici, **10**, 11: 111-222.

—, 1954. The Apterygotan fauna of Poland in relation to the world-fauna of this group of insects. *Onychiuridae*. PAN, Kraków PWN: 219 pp.