

**Tardigrades from Iztaccíhuatl volcano (Trans-Mexican Volcanic Belt),  
with the description of *Minibiotus citlalium* sp. nov.  
(Eutardigrada: Macrobiotidae)**

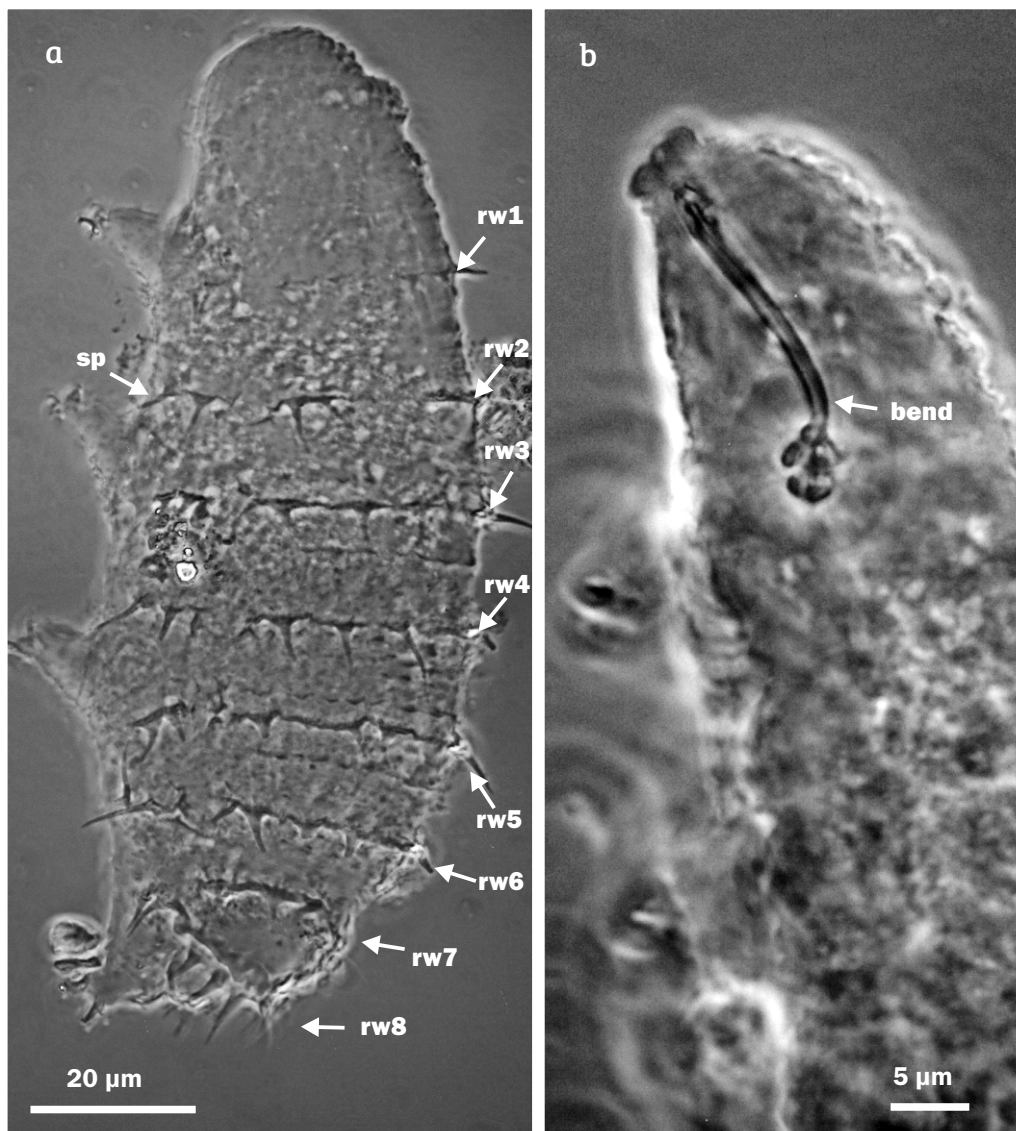
Alba Dueñas-Cedillo<sup>1</sup>, Evelyn Martínez-Méndez<sup>1</sup>, Jazmín García-Román<sup>1</sup>,  
Francisco Armendáriz-Toledano<sup>2\*</sup> and Enrico Alejandro Ruiz<sup>1,\*</sup>

<sup>1</sup>Laboratorio de Ecología, Departamento de Zoología, Escuela Nacional de Ciencias Biológicas, Instituto Politécnico Nacional. Prolongación de Carpio y Plan de Ayala s/n. C.P. 11340. Ciudad de México, México; albaduenas@live.com.mx, lageneal@gmail.com, lgarciar0706@alumno.ipn.mx@ipn.com

<sup>2</sup>Colección Nacional de Insectos, Departamento de Zoología, Instituto de Biología, Universidad Nacional Autónoma de México, Cto. Zona Deportiva S/N, C.U., C. P. 04510, Ciudad de México, México.

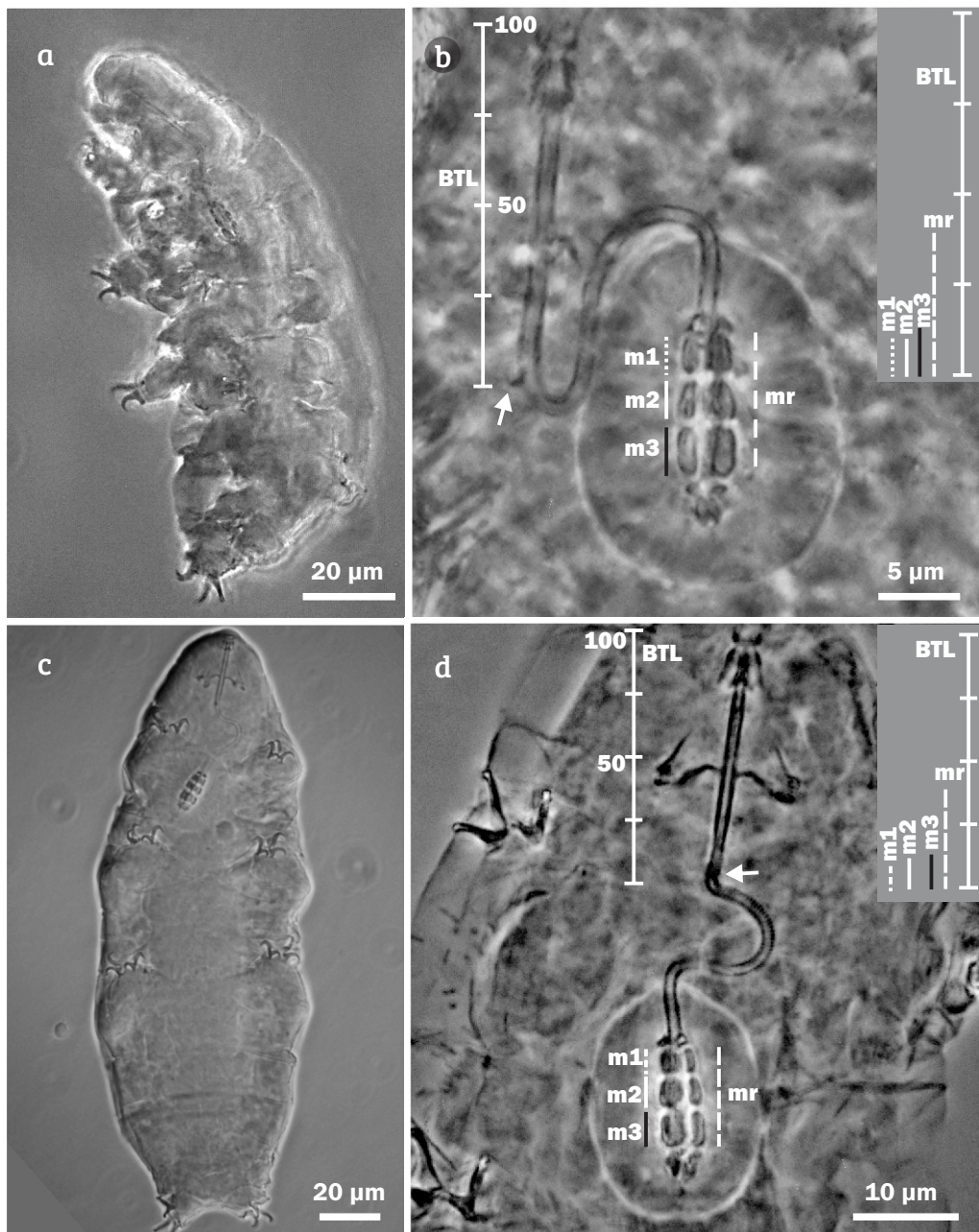
\* Correspondence: F.A.T. farmendariztoledano@ib.unam.mx, E.A.R. enrico\_ruiz@yahoo.com

Received: date; Accepted: date; Published: date



**Figure S1.** *Calohypsibius* cf. *ornatus*. a—habitus (latero-dorsal view), showing eight transversal parallel rows of cuticular spines (sp spines, rw row), b—buccal apparatus of the *Calohypsibius* type, with one bend in the posterior portion.

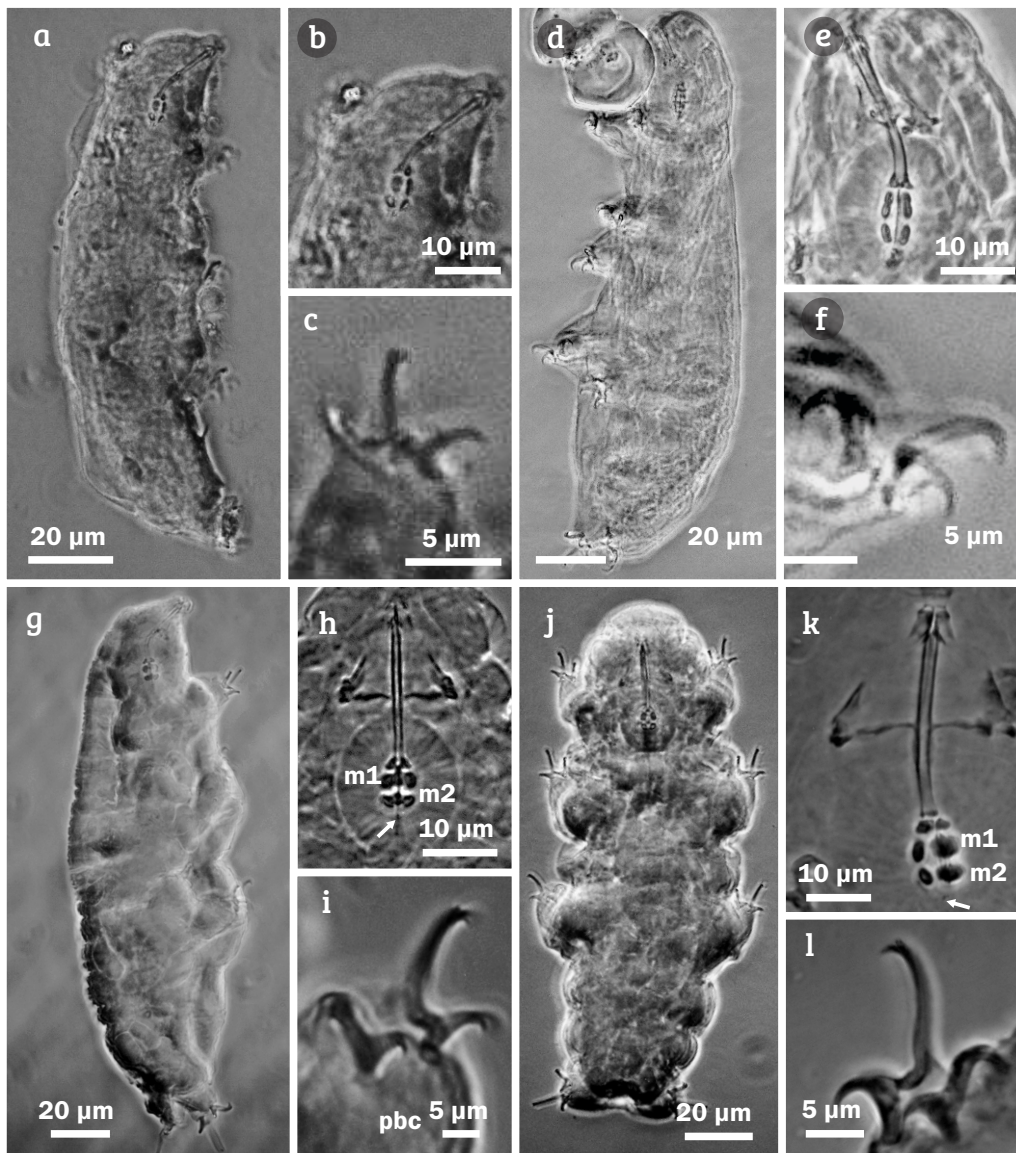
## Supplementary material



**Figure S2.** *Diphascon mitrense* and *Dip. pingue*. a—*Dip. mitrense* habitus, b—bucco-pharyngeal apparatus; c—*Dip. pingue* habitus, d—bucco-pharyngeal apparatus. (BTL buccal tube length, mr macroplacoid row, m1 first macroplacoid, m2 second macroplacoid, m3 third macroplacoid, white arrow indicates thickening drop shape). The length of the buccal tube is expressed as a percentage on a vertical line. It also stands for length comparison to other structures.

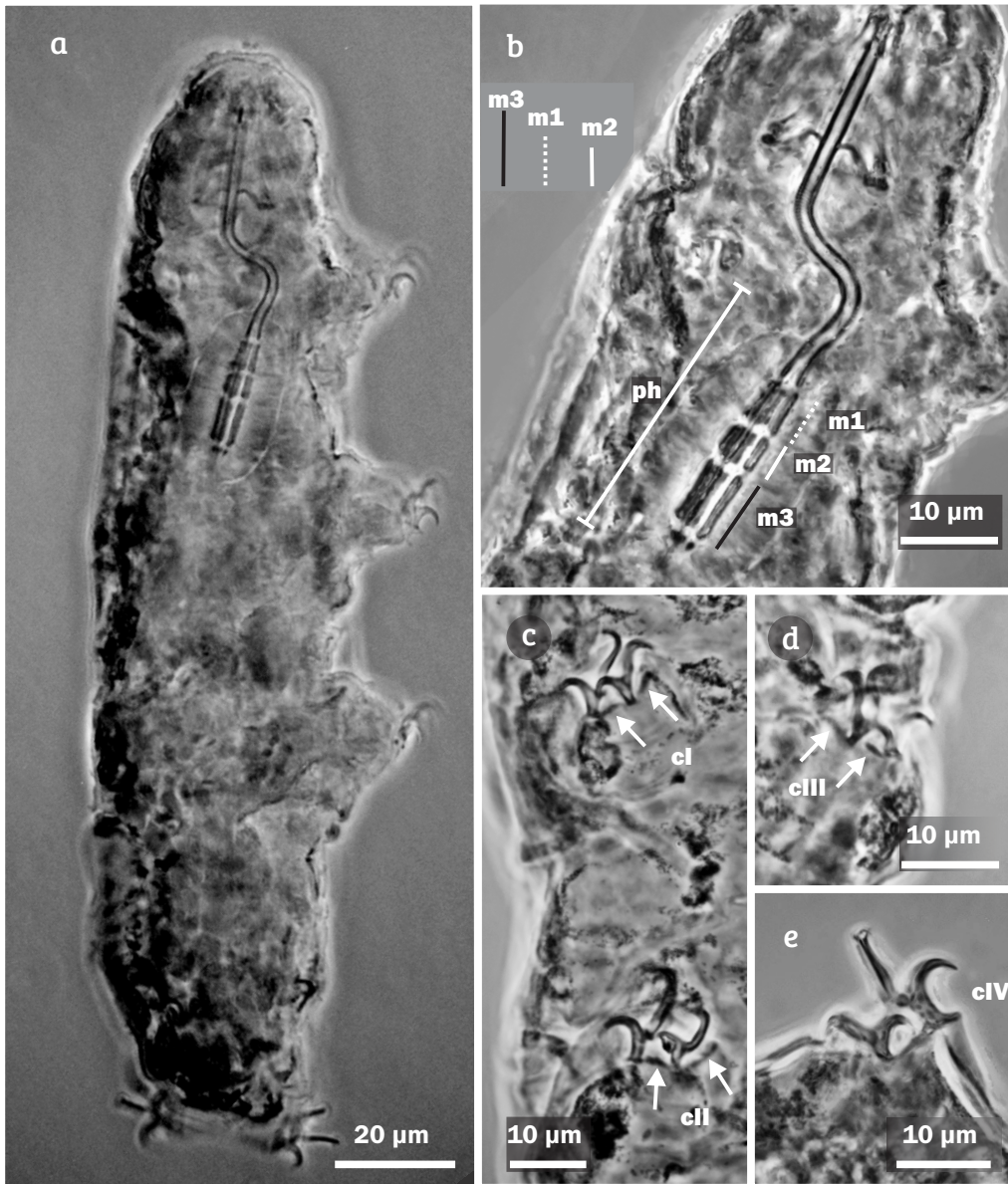


Supplementary material



**Figure S3.** *Hypsibius* cf. *dujardini*, *Hys.* cf. *exemplaris*, *Hys.* cf. *microps* and *Hys.* cf. *pallidus*. a—*Hys.* cf. *dujardini* habitus, b—buccal apparatus, c—claws IV; d—*Hys.* cf. *exemplaris* habitus, e—buccal apparatus, f—claws III; g—*Hys.* cf. *microps* habitus, h—buccal apparatus, i—claws IV; j—*Hys.* cf. *pallidus* habitus, k—buccal apparatus, l—claws IV. The white arrow indicates the minute dot-like septula at the end of the placoids row.

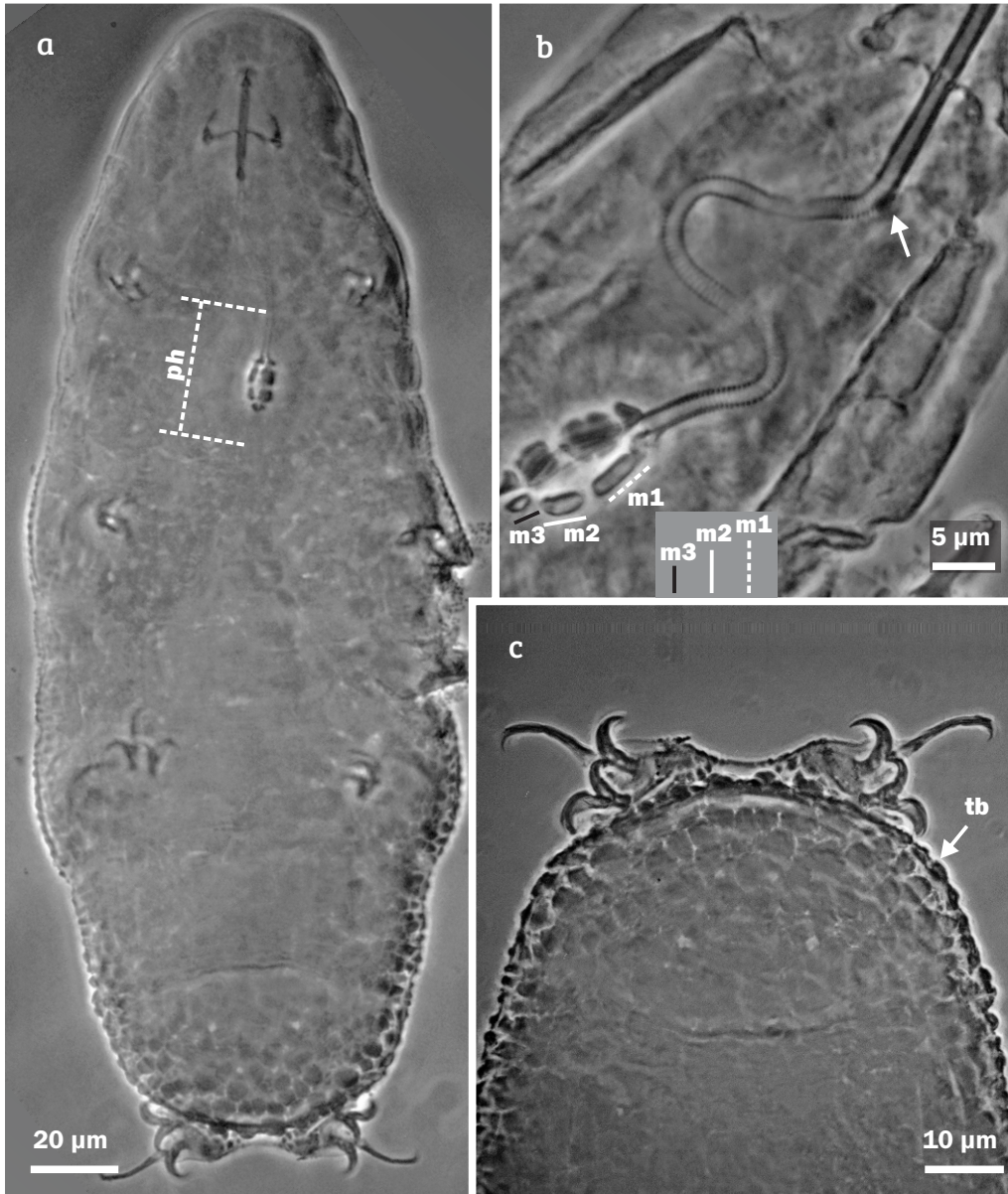
Supplementary material



**Figure S4.** *Adropion scoticum*. a—habitus, b—bucco-pharyngeal apparatus, c—claws I-II; d—claws III, e—claws IV. (ph pharynx length, m1 first macroplacoid, m2 second macroplacoid, m3 third macroplacoid, cI claws I, cII claws II, cIII claws III, cIV claws IV, white arrow indicates cuticular bars on legs I-III).

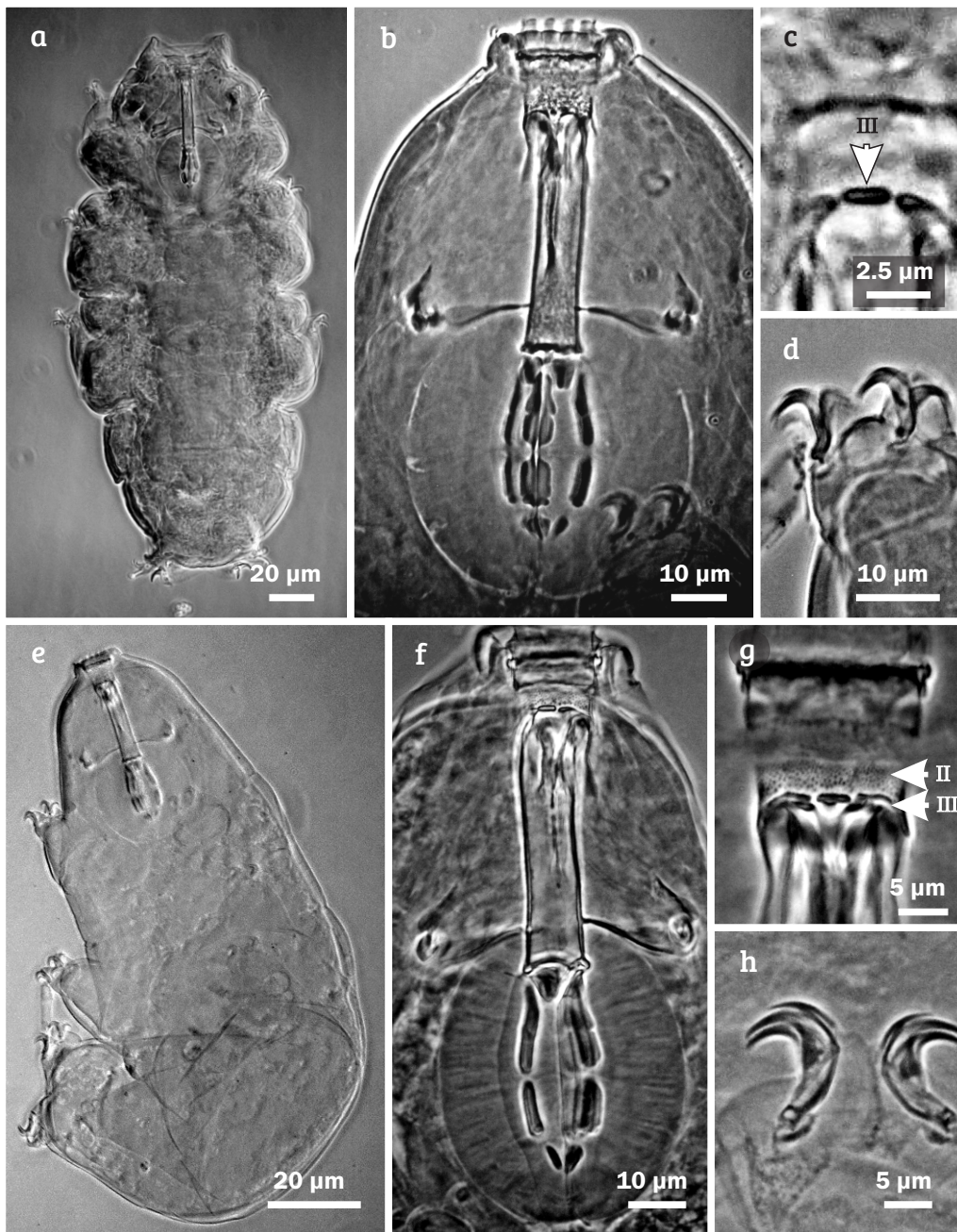


Supplementary material



**Figure S5.** *Pilatobius nodulosus*. a—habitus, b—bucco-pharyngeal apparatus, c—posterior part of the body. (**ph** pharynx length, **m1** first macroplacoid, **m2** second macroplacoid, **m3** third macroplacoid, **tb** tubercles, white arrow indicates thickening drop shape).

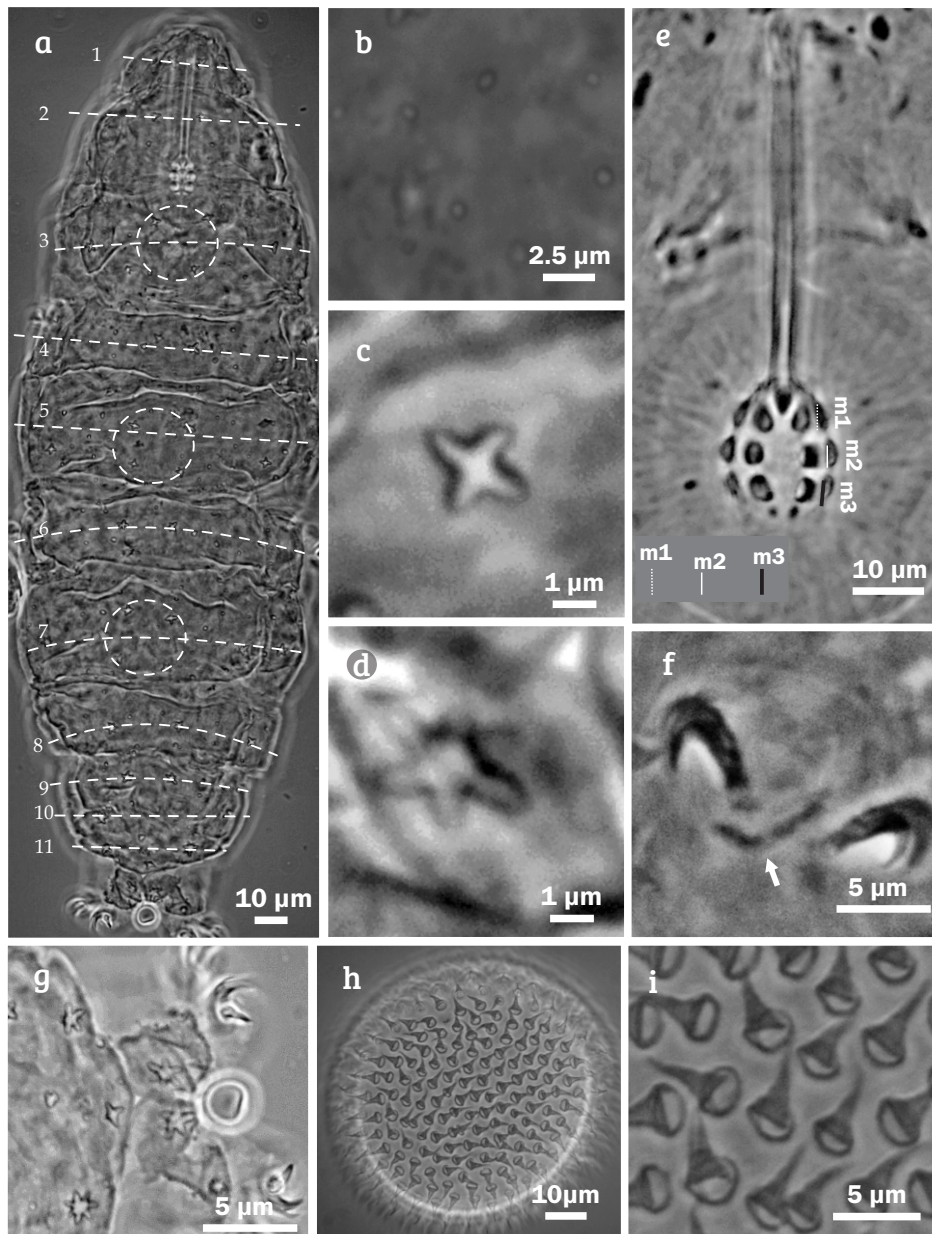
Supplementary material



**Figure S6.** *Macrobotus* sp. a—habitus, b—buccal apparatus, c—oral cavity armature *maculatus* type, d—claws IV of *hufelandi* type; *Macrobotus* sp. e—habitus, f—buccal apparatus, g—oral cavity armature *patagonicus* type, h— claws IV of *hufelandi* type. White arrow indicates II and III band of teeth.



Supplementary material



**Figure S7.** *Minibiotus sidereus*. a – habitus (dorsal view), b – cuticular small circular pores, c – large star-shaped pores with 3–8 arms (4–5 most common), d – big star-shaped pore in each leg of fourth pair, e – buccal apparatus of *Minibiotus* type, macroplacoid length sequence  $1 > 2 < 3$ , f – cuticular bar on leg III, g – legs IV, h – egg, i – egg processes. (m1 first macroplacoid, m2 second macroplacoid, m3 third macroplacoid, white arrow indicates cuticular bar).

## Supplementary material

Table S1. Results of linear regressions of morphometric characters measured in relation to buccal tube length in *Minibiotus citlalium* sp. nov. Data log–log transformed.  $N$  = sample size;  $b$  = slope;  $a^*$  = Y intercept;  $r^2$  = coefficient of correlation;  $p(r^2)$  = probability associated to “ $r^2$ ”;  $t$  = Student’s T test for slopes,  $p(t)$  = probability that  $b$  differs from slope of 1, traits with  $p < 0.05$  are allometric and are indicated in bold.

Trait	$N$	$b$	$a^*$	$r^2$	$p(r^2)$	$t$	$p(t)$
Stylet support insertion point	16	0.9878	-0.2054	0.9631	<b>0.0000</b>	-0.2354	0.815
Buccal tube external width	16	0.9045	-0.9901	0.4551	<b>0.0042</b>	-0.3611	0.721
Buccal tube internal width	16	1.6502	-2.3186	0.3894	<b>0.0098</b>	1.1773	0.248
Ventral lamina length	15	1.0577	-0.4167	0.9364	<b>0.0000</b>	0.7546	0.457
Placoid lengths							
Macroplacoid 1	15	0.4857	-0.3940	0.0495	0.4255	-0.8711	0.391
Macroplacoid 2	15	0.2900	-0.1829	0.0228	0.5911	-1.3485	0.188
Macroplacoid 3	15	0.5330	-0.5230	0.1229	0.2002	-1.1826	0.247
Microplacoid	15	0.6307	-1.0368	0.0861	0.2886	-0.6479	0.522
Macroplacoid row	15	-0.0052	0.8037	0.0000	0.9883	-2.8584	<b>0.008</b>
Placoid row	15	0.1081	0.7255	0.0114	0.7051	-3.1933	0.916
Claw 1 heights							
				0.0000			
External primary branch	15	1.3290	-1.2296	0.3897	<b>0.0129</b>	0.7132	0.482
External secondary branch	15	1.3081	-1.3276	0.2429	<b>0.0620</b>	0.4810	0.634
Internal primary branch	15	1.2658	-1.1229	0.4546	<b>0.0058</b>	0.6912	0.495
Internal secondary branch	14	1.1971	-1.1120	0.3672	<b>0.0216</b>	0.4344	0.668
Claw 2 heights							
				0.0000			
External primary branch	13	1.1939	-0.9710	0.8431	<b>0.0000</b>	1.2487	0.224
External secondary branch	12	1.9706	-2.1884	0.7727	<b>0.0002</b>	2.87151	<b>0.009</b>
Internal primary branch	13	1.6503	-1.6475	0.7786	<b>0.0001</b>	2.45091	<b>0.022</b>
Internal secondary branch	12	2.1359	-2.4402	0.8108	<b>0.0001</b>	3.4809	<b>0.002</b>
Claw 3 heights							
				0.0000			
External primary branch	14	0.7703	-0.4019	0.5315	<b>0.0031</b>	-1.1005	0.281
External secondary branch	13	1.0097	-0.8535	0.6482	<b>0.0009</b>	0.0432	0.966
Internal primary branch	14	1.1334	-0.9089	0.6427	<b>0.0006</b>	0.5468	0.589
Internal secondary branch	13	1.7654	-1.9003	0.8095	<b>0.0000</b>	2.9637	<b>0.007</b>
Claw 4 lengths							
				0.0000			
Anterior primary branch	13	1.8009	-1.8124	0.6425	<b>0.0010</b>	1.9774	0.06
Anterior secondary branch	12	2.1424	-2.4058	0.6450	<b>0.0017</b>	2.2729	<b>0.033</b>
Posterior primary branch	11	1.9279	-1.9889	0.5900	<b>0.0058</b>	1.7322	0.099
Posterior secondary branch	11	2.4482	-2.8772	0.7906	<b>0.0003</b>	3.4481	<b>0.003</b>