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A new species of *Entomobrya* from Iraq (Collembola, Entomobryidae)

Rafael Jordana[1, 2] and Enrique Baquero[1]

[1] *Department of Zoology and Ecology, University of Navarra, Irunlarrea 1, 31080 Pamplona, Navarra, Spain*

[2] *Corresponding author: Rafael Jordana (email: rjordana@unav.es)*

Abstract

The systematic study of *Entomobrya* specimens from different museums in the Palaearctic region and material obtained from other collections allowed some new species of the genus to be revealed. *Entomobrya iraqensis* n. sp. is described from Mosul, Iraq. For the identification and description of the species, the set of characters proposed by Jordana and Baquero (2005) was used.

Key words: morphological characters, chaetotaxy, description

1. Introduction

The set of characters proposed by Jordana and Baquero (2005), based on a constant and relatively easily identifiable set of morphological characters including the dorsal macrochaetotaxy, is a simple and reliable system and has proven to be very useful in the identification of the species of the genus *Entomobrya*. This combination of characters has been used for the identification of specimens received on loan from different European museums, additional material from private collections and from samplings related with the projects for the publication of the Entomobryini volume as part of the 'Synopses on Palaearctic Collembola'. As a result, this new species has been found among other species in the Natural History Museum in London.

A specimen of *Entomobrya* appears among the slides of *Entomobrya quinquelineata* Börner, 1901, on loan from the NHM in London. Usually a potential new species is not described until several specimens have been found. However, on some occasions the new species can be descibed if it is possible to prepare a complete description, including the chaetotaxy, from a single specimen that is still stored and well preserved in a museum, and which is easily discernible from other species. The specimen described here as the holotype of a new species had originally been identified as *E. quinquelineata*, probably because of its similarity to the f. *'trilineata* Stach, 1922*'* pattern. It is in a good state of conservation and it was possible to observe all the characteristics considered to be important for its identification as species of the genus *Entomobrya*, including as species of the colour pattern. Although only a single specimen has been studied, we believe that the differences in morphological characters and in colour pattern validate its description as a new species.

Abbreviations: Abd = abdominal segment, Ant = antennal segment, Mc = macrochaeta, Th = thoracic segment

2. Results

***Entomobrya iraqensis* n. sp.**

Type locality. Iraq, Mosel (Mosul).

Type material. One specimen on a slide labeled as '*Entomobrya cf. quinquelineata* Börner, 1901 University campus Iraq Mosel College of Science T.M. 12.xi.1966'. Deposited in the Natural History Museum (NHM), London.

Description

Body length 1.6 mm excluding antennae. Body colour pattern see Fig. 1A. Further morphometric details are listed in Tab. 1.

Head: Eight eyes, GH smaller than EF (Fig. 2A). Antennae length 817 µm, 2.62 times the length of the head, antennal segment IV with simple apical vesicle (Fig. 1B). Relative length of antennal segments 1/2.25/2.1/2.82.

Body: Length ratio of Abd IV/ III > 4 (4.25). Claw with four internal teeth: first pair at 45 % of distance from base of claw; two unpaired teeth, first unpaired at 70 % of distance from base, and the most distal one minute; dorsal tooth basal. Empodium spike-like, with smooth inner edge on leg III (Fig. 1C). Length of manubrium and dens 625 µm. Manubrial plate with 4 chaetae and 2 pseudopores (Fig. 1D). Mucronal subapical tooth in size similar to terminal one, and mucronal spine present (Fig. 1E).

Chaetotaxy: Simplified formula of macrochaetae: 3-1-0-3-2/3-2/2-4/0-2-2/0-3-1$_0$4-1-3.

Head chaetotaxy see Fig. 2A. Thorax chaetotaxy: T1 area on Th II with 3 macrochaetae (m_1, m_2 and m_{2i} present); T2 area on Th II with 2 macrochaetae (Fig. 2B). Abdomen chaetotaxy (Fig. 2C–D): A1 area on Abd II with two macrochaetae and A2 area on Abd II with four macrochaetae. Abd III with two macrochaetae on areas A4 and A5.

Biology: Unknown.

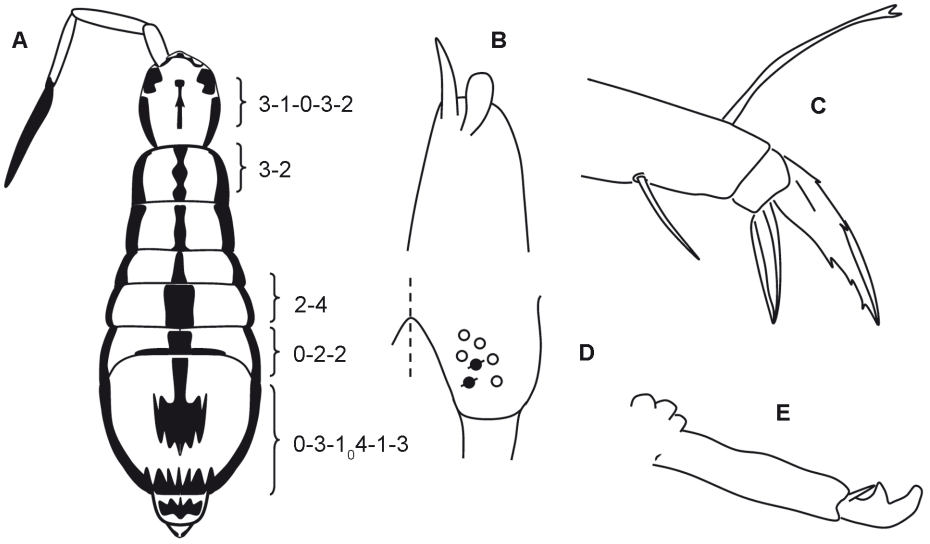

Fig. 1 *Entomobrya iraqensis* n. sp.; A: Colour pattern; B: apical vesicle of antenna; C: claw; D: manubrial plate; E: end of dens and mucro.

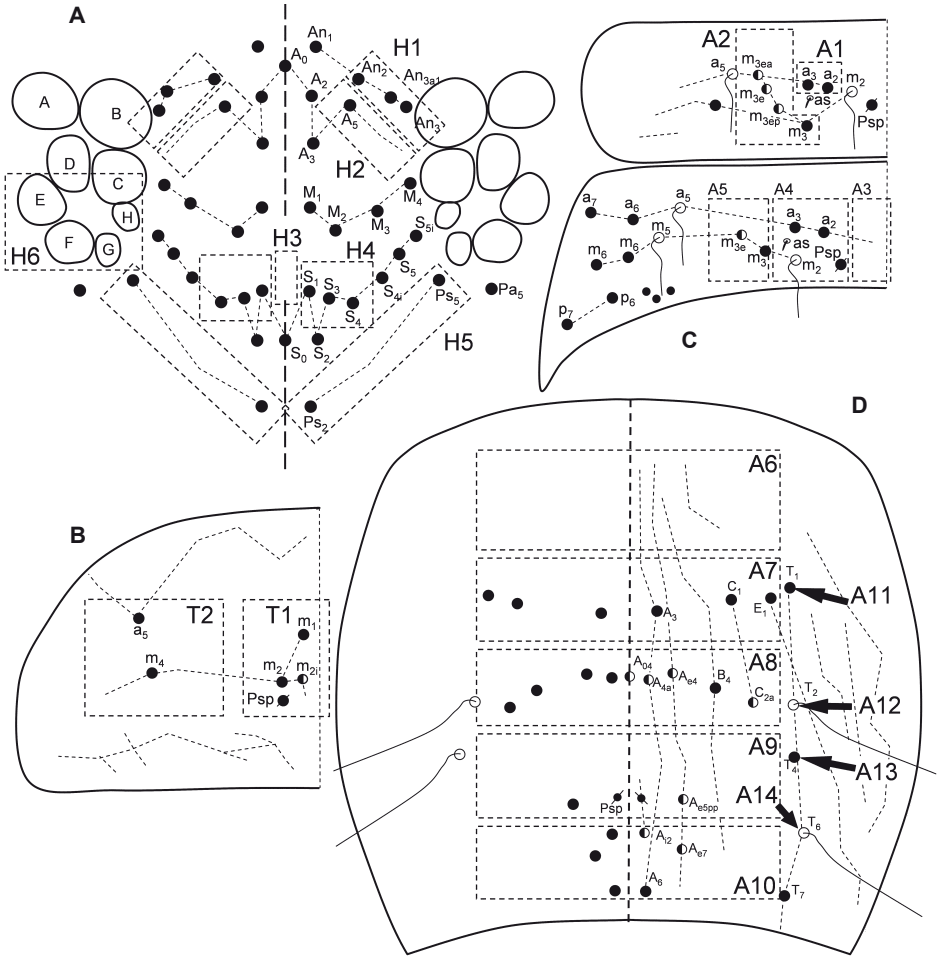

Fig. 2 *Entomobrya iraqensis* n. sp. macrochaetotaxy. A: Head; B: Th II; C: Abd II-III; D: Abd IV (the arrows point to the trichobothrium insertions).

Discussion. From Iraq only *E. mesopotamica* Rusek, 1981 was known; we examined a paratype from the garden of the University of Baghdad, sent to us by Rusek, but its colour and chaetotaxy were quite different.

Although *Entomobrya iraqensis* n. sp. was found included into a loan of *Entomobrya quinquelineata* (redescribed by Baquero & Jordana 2008) and its colour pattern is similar to *E. quinquelineata* f. *trilineata* Stach, 1922, chaetotaxy distinguishes this specimen from the former species (Tab. 1). In addition two *Entomobrya* from Easthern Palaearctic exhibit a colour pattern similar to the new species: *Entomobrya longisticta* Baijal, 1958 and *Entomobrya turcestanica* Stach, 1963. *E. longisticta* shows a different colour pattern, having five longitudinal dorsal bands, like *E. quinquelineata*, instead of three in the new species. No further characters for discrimination are currently known, as the types are lost and Baijal's description is too short (Baijal, 1958). *E. turcestanica* is very similar in its colour pattern but

Tab. 1 Set of characteristics of *Entomobrya iraqensis* n. sp. in comparison to *E. quinquelineata* and *E. turcestanica*. The differences are indicated in bold and with gray background.

Character	Location	Description	Range within the genus	*E. iraqensis n. sp.*	*E. quinquelineata*	*E. turcestanica*
Ch. 1	H1 (Head)	An_2–An_3	1–6	3	3	**4**
Ch. 2	H2	A_5–A_7	1–3	1	1	1
Ch. 3	H3	S'_0	0–1	0	0	0
Ch. 4	H4	S_1–S_3–S_4	0–3	3	**2**	3
Ch. 5	H5	P_{s2}–P_{s3}–P_{s5}	0–3	2	2	**1b**
Ch. 6	Labral papillae	simple and smooth papillae (1), wrinkled or with some projections (2), a projection chaetae like (3)	1–3	1	1	3
Ch. 7	Eyes G&H size	= E&F (1), <E&F (2)	1–2	2	2	2
Ch. 8	Apical antennal retractile bulb	no bulb (0), lobe simple (1), two lobe (2), three lobe (3)	0–3	1	1	1
Ch. 9	Ratio Ant/ Head	> or = 3 (1), > or = 2 < 3 (2), < 2 (3)	1–3	2	2	2
Ch.10	Anterior dorsal mane Th II Mc	with Mc type 1 (1), without Mc or type 2 (2)	1–2	1	1	1
Ch.11	T1	chaetae number m_1–m_{2i2} or >4 (5)	0–5	**3**	2	3
Ch.12	T2	chaetae number a_5, m_4–m_5 or >8 (9)	0–9	**2**	3	6
Ch.13	Smooth chaetae on tibiotarsi	not or 1 in tibiotarsi III = 0, double file = 1	0–1	0	0	0
Ch.14	Claw internal teeth	1(1), 2(2), 3(3), 4(4)	1–4	4	4	3
	Paired teeth of claw	distance from claw base, in %		46%	50%	53%
	First unpaired teeth of claw	distance from claw base, in %		70%	72%	74%
Ch.15	Claw dorsal tooth	basal = 1, internal teeth level = 2, intermediate = 3	1–2	3	3	**1**

Ch.16	Claw internal edge	without ciliation (0), with ciliation (1)	0–1	0	0	0
Ch.17	External empodium	smooth (0), serrate (1)	0–1	0	0	0
Ch.18	A1 Abd II	a_2–a_3	0–2	2	2	2
Ch.19	A2 Abd II	m_3 series chaetae number	0–7	4	**2**	**3**
Ch.20	A3 Abd III	a_1	0–1	0	**1**	**1**
Ch.21	A4 Abd III	above m_2 chaetae number	0–3	2	2	2
Ch.22	A5 Abd III	m_3–m_4 series chaetae number	0–4	2	**1**	**1**
Ch.23	A6 Abd IV	a_1–a_5 (A_1–D_1) chaetae number; >8 (9)	0–9	0	0	**3**
Ch.24	A7 unpaired chaeta	ma_0 (A_{03})	0–1	0	0	0
Ch.25	A7 Abd IV	ma_1–ma_4 (A_2–E_1) chaetae number; >9 (10)	0–10	3	3(4)	3
Ch.26	A8 unpaired chaeta	m_0 (A_{04})	0–1	1	**0**	**0**
Ch.27	A8 Abd IV	m_1–m_3 (A_{4a}–C_{2a}) chaetae number; >5 (6)	0–6	4	3(4-5)	3
Ch.28	A9 unpaired chaeta	mp_0 (A_{05})	0–1	0	0	0
Ch.29	A9 Abd IV	mp_1–mp_3 (A_5–B_5) chaetae number; >6 (7)	0–7	1	**2**	**2**
Ch.30	A10 Abd IV	p_{1a}–p_3 (A_6–B_6) chaetae number; >5 (6)	0–6	3	**2**	**2**
Ch.31	A11 Abd IV	T_1 (ma_{4e}) as trichbothrium	0–1	0	0	0
Ch.32	A12 Abd IV	T_2 (m_4) as trichobothrium	0–1	1	1	1
Ch.33	A13 Abd IV	T_4 (mp_4) as trichobothrium	0–1	0	**1**	**1**
Ch.34	A14 Abd IV	T_6 (p_4) as trichobothrium	0–1	1	**0**	**0**
Ch.35	Ratio Abd IV/Abd III	2 < R < 4 (1), R > 4 (2)	1–2	2	1	1
Ch.36	Manubrial plate	chaetae number; >10 (11)	0–11	4	4	?
Ch.37	Manubrial plate	pseudopores 1–2	1–2	2	2	?
Ch.38	Mucro	sub–apical tooth, without (0), normal (1), big (2), small (3)	0–1	1	1	1
Ch.39	Mucro	basal spine, absent (0), present (1)	0–1	1	1	1
		Number of differences			**11**	**15**

is quite different in its chaetotaxy given here for first time (Tab. 1: 4-1-0-3-1b/3-6/2-3/1-2-1/3-3-3-2-2) and in other morphological characters such as smooth labral papillae and claws with 4 teeth each in the new species, while *E. turcestanica* has a projecting chaeta as in each tubercle of the labral papilla and 3 teeth on each claw (Tab. 1).

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