

Description of the Nymphs and Eggs of *Acentrella almohades* sp. n. from Morocco and Southern Spain (Ephemeroptera: Baetidae)

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ABSTRACT

The nymph and egg of *Acentrella almohades* sp. n. are described and illustrated on the basis of material collected in southern Spain (in the upper reaches of the Guadalquivir River Basin) and Morocco (Rif Mountains and Atlas Mountains). Features distinguishing the new species from other European species are discussed and keyed.

KEYWORDS: Nymph, egg, key, Ephemeroptera, *Acentrella almohades* sp. n.

INTRODUCTION

During a study of Ephemeroptera nymphs from Morocco and southern Spain, an undescribed new species close to *A. sinaica* was found, which we name *Acentrella almohades* sp. n.

DESCRIPTION

Acentrella almohades sp. n. (Figs. 1–18)

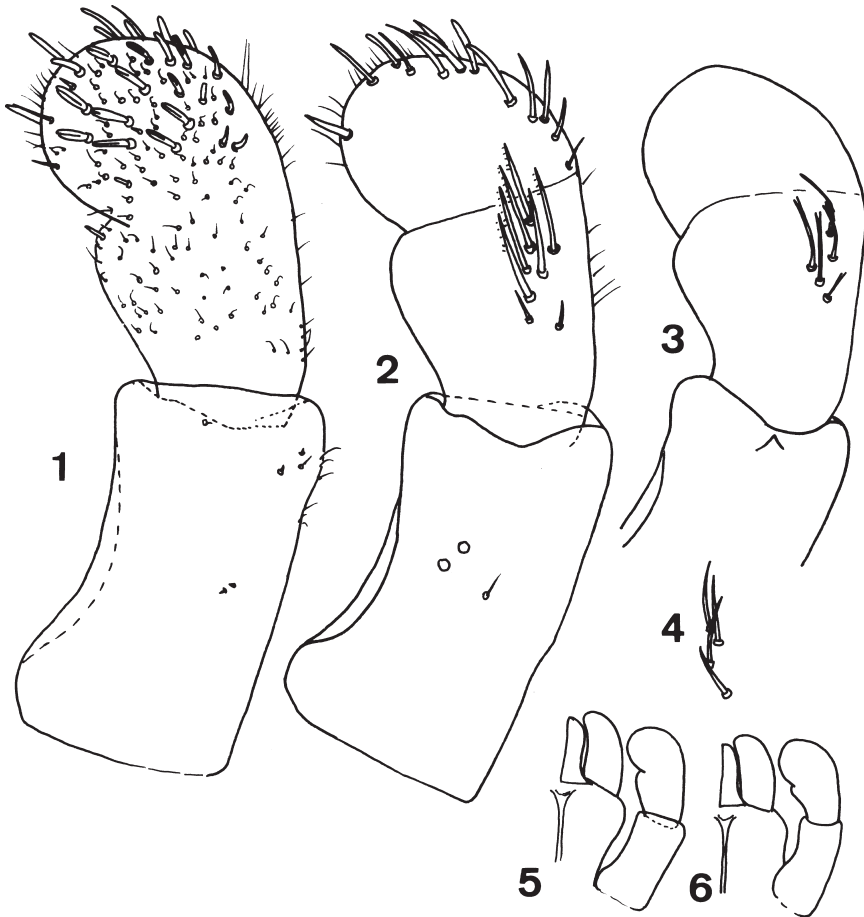
Material: Holotype: ♀ nymph (on slide no. 292), Oued Ksar Essghir, bridge of Ketama, 90 m. a.s.l., Tetouan, Rif Mountains (Morocco), 35° 46' 97" N, 5° 31' 33" W, 23–III–1997, M. El Alami leg. (in microscopic preparation No. 292). *Paratypes:* 1 ♂ nymph (on slide no. 294), 26 nymphs (8 ♂ and 18 ♀) from the same locality and date as the holotype. the same locality; 33 nymphs (11 ♂ and 23 ♀ – one on slide no. 296–), Arroyo Salado, Martos, prov. Jaen (Spain), U.T.M.: 30SVG0572, 2–IV–1983, M. López Pulido leg.; 1 ♂ nymph (partially on slide no. 297), Río Colomera, prov. Granada (Spain), 4–III–83, U.T.M.: 30SVG3525, J.C. Rodríguez-Nuñez leg.; 4 nymphs (1 ♂, 3 ♀), Río Colomera, Caparacena, 670 m., prov. Granada (Spain), 26–II–1983, U.T.M.: 30SVG388262, J.C. Rodríguez leg. Other material: 24 nymphs (8 ♂, 16 ♀), Oued Laou, bridge Afertane, 55 m., Chefchaouen, Rif. Mountains (Morocco), 35° 46' 9" N, 5° 10' 48" W, 24–III–1988, M. El Alami leg.; 26 nymphs (8 ♂ 18

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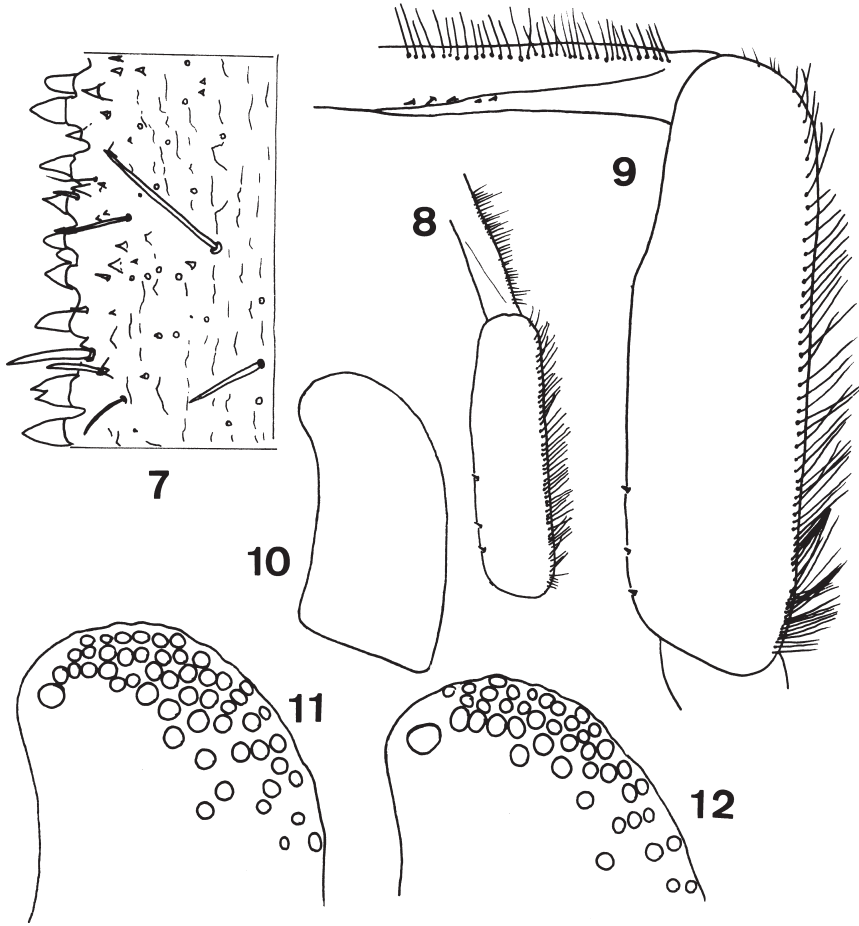
♀), Ain Bouzemmour, confluence road Tamghiti/Immouzer-Mermoucha, 1870 m., Middle Atlas (Morocco), 1-VI-1994, M. Dakki leg. The material is in the senior author's collection in the Department of Animal Biology and Ecology (Zoology), University of Granada, Spain.

Etymology: the new species is named after the 'Almohades', a North African people that invaded the Iberian Peninsula during the Middle Ages.

Mature nymph. Body length: 5.0–7.5 mm, cerci: 6–7 mm. General body colour and pattern very similar to that of *A. sinaica* (see Müller-Liebenau, 1969: fig. 44), in general females darker and with a more conspicuous pattern than males

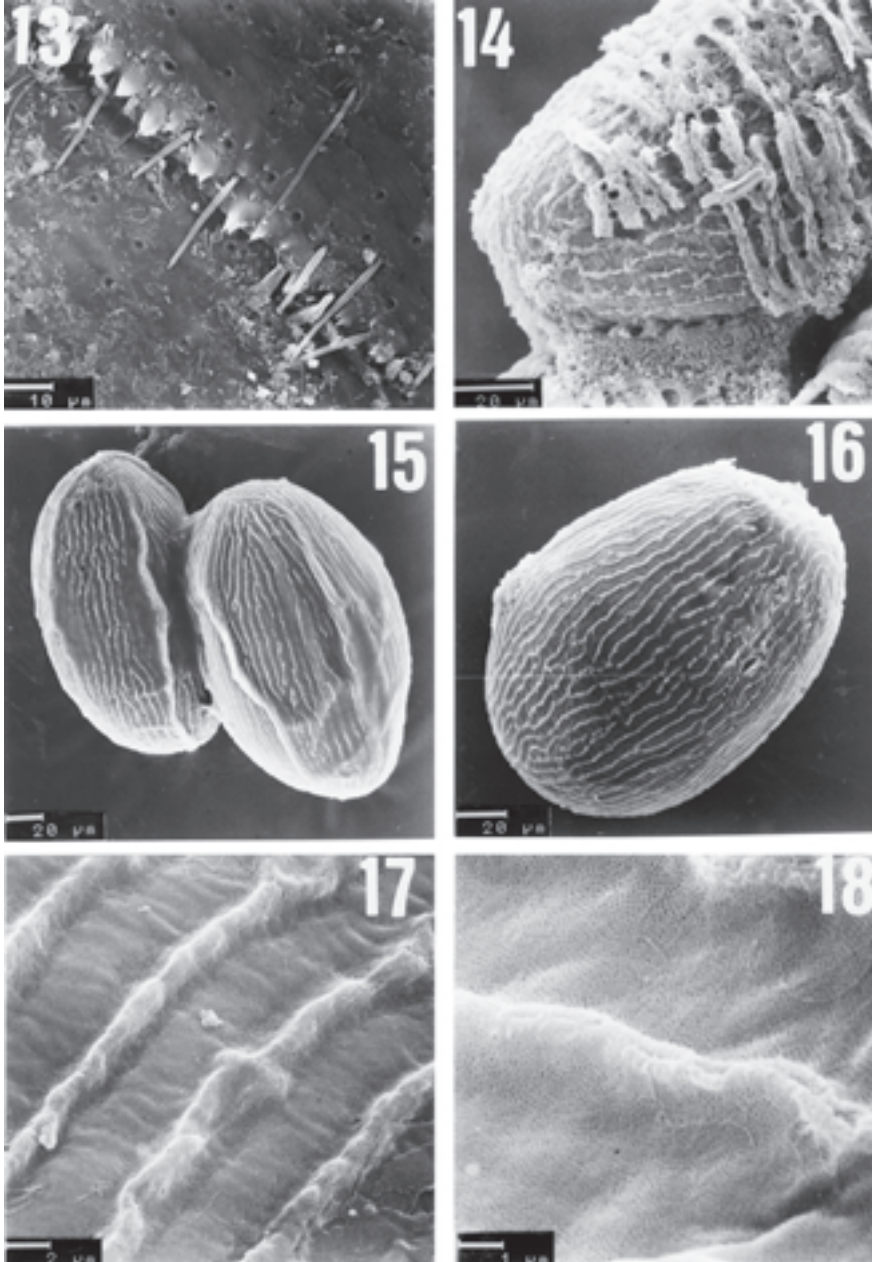


Figs. 1–6. *Acentrella almohades* sp.n., nymph: Ventral (1) and dorsal views (2,3) of labial palp. Setae on 2nd segment of left labial palp (4) of same labium as shown in Fig. 3. General view of labium (5, 6). (1, 2 and 5: nymphs from southern Spain. 3, 4 and 6: from Rif Mountains in Morocco).



Figs. 7–12. *Acentrella almohades* sp.n. , nymph: Dorsal surface and hind margin of an abdominal tergite (7). Legs (8, 9). Outline of a paraglossa (10). Apices of paraglossae in ventral view (11, 12). (7, 8 and 12: nymphs from southern Spain. 9–11: from Rif Mountains in Morocco).

Mouthparts (Figs. 1-6 and 10-12) very similar to those of *A. sinaica* (see Müller-Liebenau, 1969: fig. 49, and Grandi, 1960: figs. 144, 145). Labium roughly twice wider than long with 1 + 6–9 submarginal setae. Labium (Figs. 5, 6); labial palpi as in Figures 1–3, dorsal side of 2nd segment with 2–7 long setae; sometimes, left and right body sides differ in number and arrangement (Figs. 3, 4). Setae of the distal part on the ventral surface of paraglossae very numerous and arranged in irregular rows (Figs. 11, 12).



Figs. 13–18. *Acentrella almohades* sp.n., SEM micrographs: dorsal surface and hind margin of an abdominal tergite (13). Eggs from a nymph, with protective exochorionic cover (14). General aspect of egg (15, 16). Details of chorionic surface of egg (17, 18). (13, 16 and 17: from Atlas Mountains in Morocco. 16: from Rif Mountains in Morocco. 15, 18: from southern Spain).

Pronotal surface with short bristles and sparse pores. Legs with a row of long fine setae on femora and tibiae (Figs. 8, 9); femoral setae shorter or length similar to half the femoral width; inner edge of tibiae and tarsi with some small spines; outer edges of tarsi without spines, only short and delicate setae; claws with 7–10 denticles and lacking distal subapical setae.

Abdominal tergites (Figs. 7, 13): hind margins with sharp denticles and additional smaller ones more basally; surface with long pointed bristles and small pores. Gills oval, roughly one and a half times longer than corresponding abdominal segment. Paraprocts denticulated along the distal internal third; surface, with short bristles and scarce pores, sculptured as in *A. sinaica* (see Müller–Liebenau, 1969: fig. 5).

Egg (Figs. 14–18): Length: 0.15–0.18 mm. ($\bar{x} = 0.17$, $n = 20$); chorion with longitudinal ribs giving general appearance of a finger print, surface with small pores. In mature nymphs egg are covered by an exochorionic cover with general transversal ribs (Fig. 14), similar to those observed by Kopelke and Müller–Liebenau (1981) in subimaginal eggs of *Baetis alpinus* and *Acentrella lapponica* (ibid., figs. 6, 39).

DISCUSSION

Acentrella (with the species *A. sinaica*) has been recently recorded from North Africa, in Tunisia, by Boumaiza and Thomas (1995). This paper represents the first record of the genus in Morocco. Considering the similarities between *A. almohades* sp. n. and *A. sinaica*, it would be necessary to review the records of *A. sinaica* in the Iberian Peninsula and in North Africa to confirm the identification.

Until now, two species of the genus were known in Europe: *A. lapponica* Bengtsson, 1912 and *A. sinaica* Bogoescu, 1931. Descriptions and/or differential characteristics were published by Grandi (1960), Müller–Liebenau (1969) and Jacob (1991).

Based on the variability observed in the shape of labial palpi, the new species occupies an intermediate position between *A. lapponica* and *A. sinaica* (compare Figs. 5, 6 with Müller–Liebenau, 1969: figs. 46d, 49b, and Jacob, 1991: figs. 3a, b). However, these two species have three rows of submarginal setae on the distal part of the dorsal surface of the paraglossae, while the new species has more numerous bristles arranged in more than three rows (Figs. 11, 12). The length of setae on the femora and tibiae of the new species roughly resembles those of *A. lapponica*, but the two species can be easily distinguished as *A. almohades* sp. n. lacks subapical setae on the claws and the long setae of femora are not dilated in the middle (as shown by Müller–Liebenau, 1969: fig. 46f). Moreover, the new species differs from *A. sinaica* by lacking conspicuous tube-shaped bristles (see Müller–Liebenau, 1969: figs. 48, 49e, referred to by Waltz & McCafferty, 1987,

as tube scales) on the surface of pronotum, abdominal tergites, and distal margin of femora.

The chorionic ornamentation of the egg is close to that of *A. sinaica*, (compare Figs. 14–18 with Kopelke & Müller–Liebenau, 1982: figs. 41–46). However, *A. sinaica* has secondary small ribs between the principal longitudinal ones, which are absent in the new species; additional differences can be observed in the ornamentation of the rib crests (compare Figs. 17, 18 with *ibid.*, figs. 42, 43).

KEY TO THE NYMPHS AND EGGS OF THE EUROPEAN AND NORTH AFRICAN SPECIES OF *ACENTRELLA* BENGTSSON, 1912.

1. Nymphal claws with two subapical bristles (Müller–Liebenau, 1969: fig. 46h). Chorion without longitudinal ribs (Kopelke & Müller–Liebenau, 1982: figs.:33–40). *A. lapponica*
- Nymphal claws without distal subapical bristles. Chorionic ornamentation of eggs with longitudinal ribs (Figs. 15–18). 2
2. Nymphs with femoral setae roughly similar in length to femoral width (slightly shorter or longer) (i.e., see Grandi, 1960, fig. 141, 2; Müller–Liebenau, 1969: fig. 49e, Belfiore, 1983: fig. 5a; Studemann et al., 1992, fig. 22), submarginal setae on distal part of dorsal surface of paraglossae arranged in three regular rows (Müller–Liebenau, 1969: fig. 49d). Chorionic surface of egg with secondary small ribs between principal longitudinal ones (Kopelke & Müller–Liebenau, 1982: fig. 42) *A. sinaica*
- Nymphs with femoral setae roughly one half femoral length (Figs. 8, 9), submarginal setae on distal part of dorsal surface of paraglossae arranged in more than three (generally four) irregular rows (Figs. 11, 12). Chorionic surface of egg without secondary ribs. *A. almohades*

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