

**Biting midges (Diptera: Ceratopogonidae)  
from the Lower Cretaceous amber of Jordan**

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**ABSTRACT.** Two female Ceratopogonidae from Lower Cretaceous Jordanian amber are recorded. A new genus and species *Jordanoconops weitschati* gen. n. et sp. n., based on one female, is described and illustrated. The second female is a member of the Lower Cretaceous genus *Archiaustroconops* SZADZIEWSKI, but is not named. Both recorded genera belong to the subfamily Austroconopinae, which predominated ceratopogonid diversity during the Lower Cretaceous.

**KEY WORDS:** Diptera, Ceratopogonidae, Lower Cretaceous, amber, Jordan.

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INTRODUCTION

Lower Cretaceous Jordanian amber is found in deposits of the Kurnub Series, located in the area of Wadi Zerka, north of Amman. Recent studies on Jordanian amber indicate that it is of Albian age and of araucarian origin (BANDEL et al. 1997). This amber has few insect inclusions with only a few Diptera recorded (loc. cit.), all in the families Chironomidae and Ceratopogonidae. The family Sciaridae is excluded from the list of fossils reported from Jordanian amber as the specimen reported by BANDEL et al. (1997) is actually a biting midge determined below as *Archiaustroconops* SZADZIEWSKI.

The oldest biting midges are reported from Lower Cretaceous Lebanese amber (SZADZIEWSKI 1996), Austrian amber (BORKENT 1997) and Spanish amber (SZADZIEWSKI & ARILLO 1998). The two specimens of biting midges described here belong in the subfamily Austroconopinae, which predominated the Ceratopogonidae diversity during the Lower Cretaceous period. The subfamily during that period was represented by three extinct (*Archiaustroconops* SZADZIEWSKI - Lower Cretaceous, *Lebanoconops* SZADZIEWSKI - Lower Cretaceous, *Minyohelea* BORKENT- Lower to Upper Cretaceous) and

one extant genus (*Austroconops* WIRTH et LEE).

### Acknowledgments

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## SYSTEMATICS

### Subfamily Austroconopinae

#### *Jordanocops* gen. n.

Figs. 1, 2

Type-species *Jordanoconops weitschati* sp. n. Present designation.

### Diagnosis

The new genus can be readily distinguished among the Austroconopinae by having a single, long first radial cell (Fig. 2C). Male unknown. Lower Cretaceous.

### Discussion

The wing venation of the new genus is similar to that of *Austroconops* (Fig. 2B), with the transverse vein r-m parallel to R1. However, vein R2 is absent, and as a result the radial cell is single. The costal vein is prolonged to the wing apex as in *Austroconops* and *Archiaustroconops* (Fig. 2A). Other Lower Cretaceous genera of the subfamily (*Minyohelea* and *Lebanocnops*) have a greatly reduced wing venation.

The character states - single and long first radial cell (r1+r2, vein R2 reduced) or both first radial cells separated, is often used for distinguishing genera of biting midges. Within most genera the character states are stable (for example *Bezzia* KIEFFER with only one first cell r1 and *Palpomyia* KIEFFER with two).

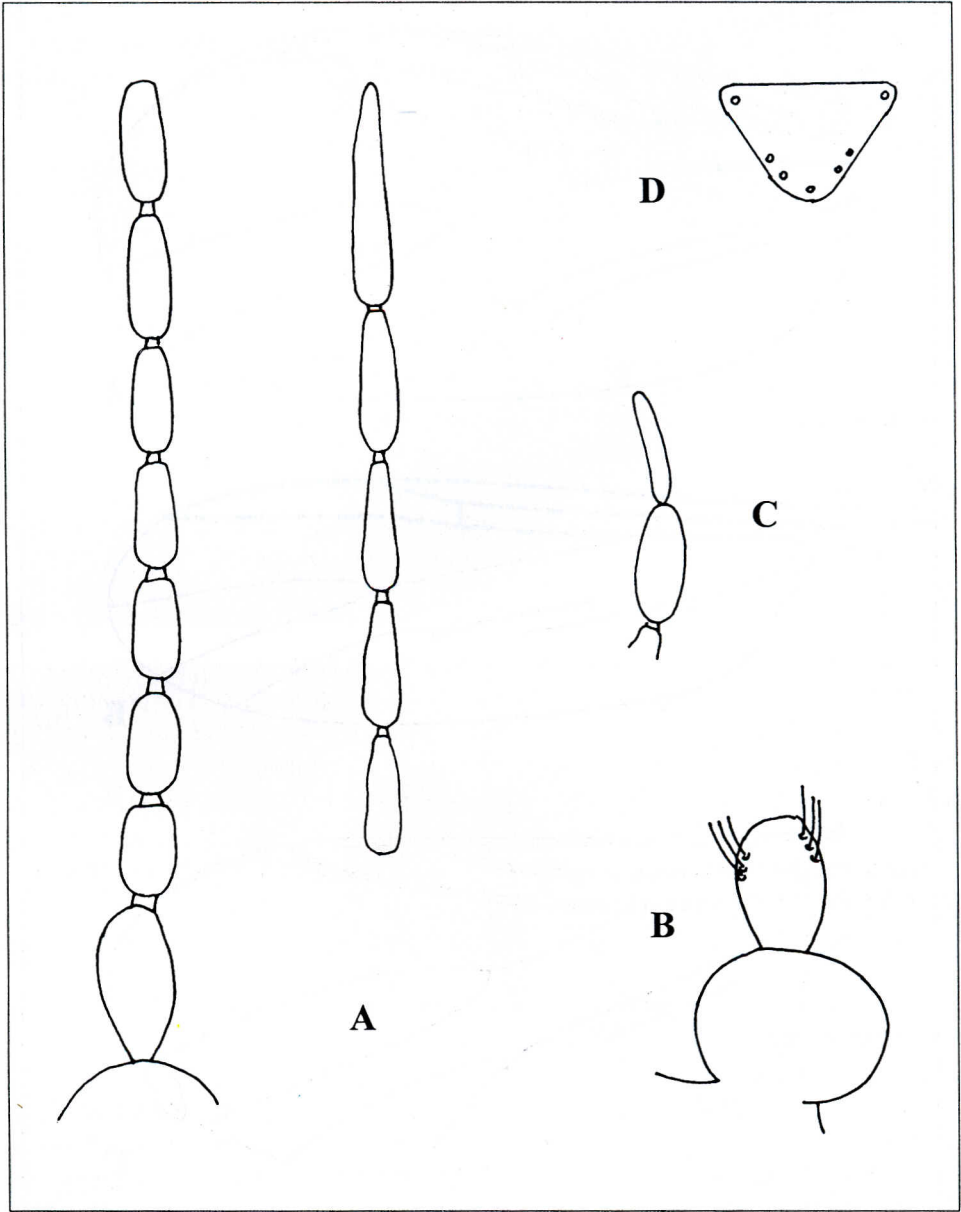
#### *Jordanoconops weitschati* sp. n.

### Description

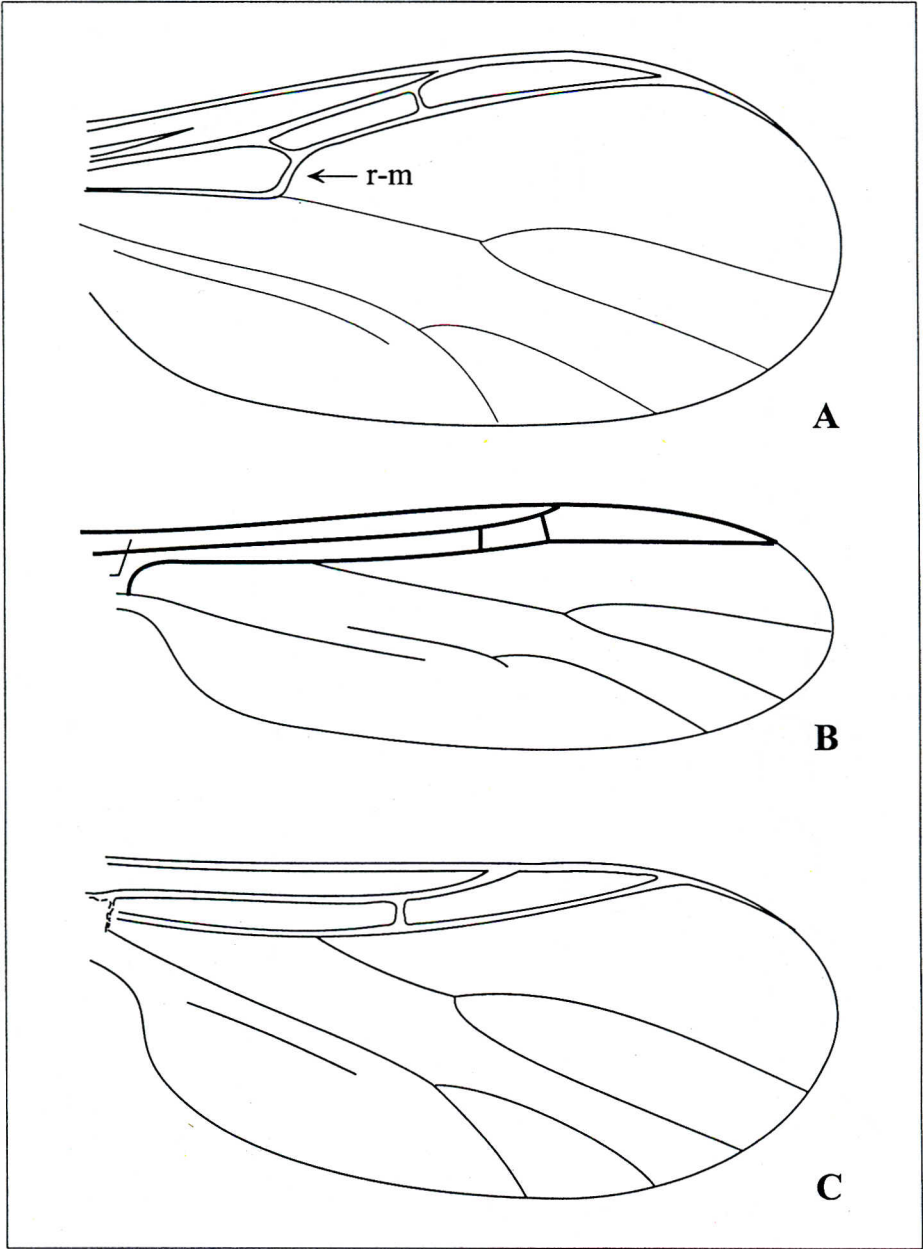
Male. Unknown.

Female. Well preserved. Total habitus as in Fig. 3A,B. Body length 0.8 mm. Eyes closely approximated over antennae. Proboscis very short, slightly bent forward. Clypeus strongly convex. Palpus 4-segmented; third palpal segment stout, length 40  $\mu$ m; fourth one slender, length 28  $\mu$ m (Fig. 1C). Flagellum with 13 cylindrical flagellomeres (Fig. 1A); lengths of flagellomeres from 2 to 13 as follows (in  $\mu$ m): 48-28-28-30-32-32-36-36-40-40-44-68; first flagellomere with two groups of subapical trichoid setae (Fig. 1B).

Thorax robust. Basisternite of prothorax small, triangular. Lateral cervical sclerite rather



**Fig. 1.** *Jordanoconops weitschati* gen. et sp. n., holotype female. A - proximal and distal flagellomeres, B - pedicel and first flagellomere, C - palpus, D - dorsal aspect of scutellum.



**Fig. 2.** Wing venation of *Archiaustroconops ceratiformis* SZADZIEWSKI (A, female), *Austroconops sibiricus* SZADZIEWSKI (B, male) and *Jordanoconops weitschati* gen. et sp. n. (C, female).



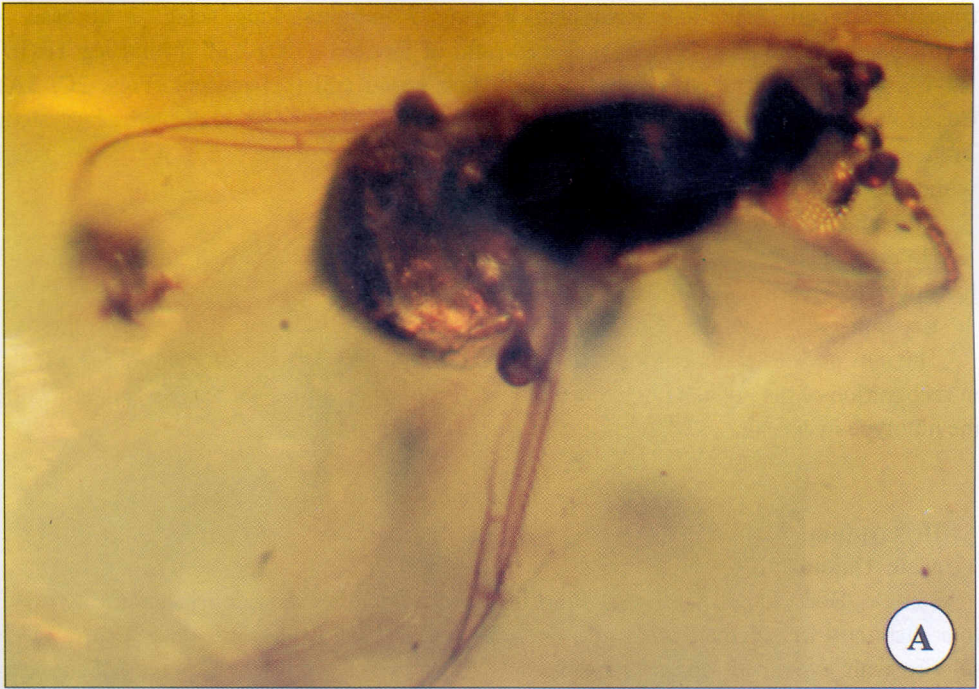


Fig. 3. *Jordanoconops weitschati* gen. et sp. n., holotype female. A - dorsal aspect, B - lateral aspect.

triangular, broad. Scutellum triangular, bearing 7 marginal long setae: 2 at base, 4 submedian and 1 median (Fig. 3D). Tarsal ratio of fore leg TR(I) 2.8, of hind leg TR(III) 1.4-1.5. Wing length about 0.57 mm. Only first radial cell (r1) present (Figs. 2C, 3A). Costal vein prolonged beyond R3 almost to wing apex. Media petiolate with short stem. Transverse vein r-m parallel to R1, forming straight line with vein R3. Wing membrane without macrotrichia.

#### **Material examined**

Holotype female, Amber of Jordan, coll. GPIMH 4226 (Geologisch-Paläontologisches Institute und Museum der Universität, Bundesstrasse 55, 20146 Hamburg).

#### **Etymology**

The new species is named in honour of Dr. Wolfgang Weitschat of Hamburg (GPIMH) in recognition of his outstanding contributions to studies on amber inclusions and collecting the holotype in Jordan.

### *Archiaustroconops* undet.

#### **Description**

Male. Unknown.

Female. Body length 0.95 mm. Flagellomeres gradually increasing in length; terminal four distinctly longer than preceding ones. Proboscis slightly bent forward. Ventral neck sclerite with expanded lateral arms. Sternite (basisternite) of prothorax small. Scutellum bearing 2 submedian and 1 median strong marginal setae. Wing length about 0.6 mm. Venation with oblique transverse vein r-m as in *Archiaustroconops ceratiformis* SZADZIEWSKI, 1996 from Lebanese amber.

#### **Material examined**

1 female, Jordanisher Bernstein, Jordan, Wadi Zerka, coll. GPIMH 3789.

#### **Discussion**

The female described above is very similar to *Archiaustroconops ceratiformis* described from Lower Cretaceous Lebanese amber (SZADZIEWSKI 1996). This specimen was previously determined as a sciarid and photographed by BANDEL et al. (1997).

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