

Megalothorax sanctistephani sp.n.

(Insecta: Collembola: Neelidae)

from the catacombs of St. Stephen's Cathedral, Vienna

E. Christian*

Abstract

Megalothorax sanctistephani sp.n. (Collembola: Neelidae) is described from the gravelly bottom substrate of St. Stephen's catacombs in the centre of Vienna, Austria. The new species of the *M. minimus*-group is readily identified by an oval tegumentary structure dorsally on the head.

Key words: Collembola, Neelidae, *Megalothorax sanctistephani*, new species, subterranean, urban fauna, Austria.

Zusammenfassung

Megalothorax sanctistephani sp.n. (Collembola: Neelidae) wird aus dem kiesigen Bodensubstrat der Stephanskatakomben im Zentrum Wiens beschrieben. Die neue Art aus der *M. minimus*-Gruppe ist durch eine ovale Integument-Struktur, dorsal auf dem Kopf, leicht zu identifizieren.

Introduction

The faunistic investigation of the catacombs of St. Stephen's Cathedral, Vienna, yielded a total of 34 invertebrate species (CHRISTIAN 1998a, 1998b), among them the palpi-grade *Eukoenia austriaca* (HANSEN, 1926) and the collembolan *Pseudosinella bidenticulata* BARRA, 1967, *Arrhopalites pygmaeus* (WANKEL, 1860) and *Disparrhopalites patrizii* (CASSAGNAU & DELAMARE DEBOUTTEVILLE, 1953). These underground arthropods were chiefly encountered in the air-filled pore system of the gravelly bottom substrate, along with the new species described below and its cosmopolitan congeneric *Megalothorax incertus* BÖRNER, 1903 (Collembola: Neelidae).

Megalothorax sanctistephani sp.n.

Holotype ♀, mounted in Marc André II medium, labelled "Wien, Stephansdom, Katakomben, leg. E. Christian, 30.9.96", and 4 paratypes (sex not determined, mounted, same label, but leg. 30.9.96 [2], 13.11.96, 12.1.97), deposited at the Naturhistorisches Museum Wien.

Etymology: Named in honour of St. Stephanus, patron saint of the locus typicus. The protomartyr's iconographic attribute – a handful of pebbles – alludes to his lapidation, but may symbolize the habitat of the new species as well.

* Dr. Erhard Christian, Institute of Zoology, University of Agricultural Sciences, Gregor-Mendel-Straße 33, A-1180 Wien, Austria.

Diagnosis: *Megalothorax* with smooth mucronal lamellae (*M. minimus*-group) and non-trogomorphic habitus. Antennae with a long sensillum Sy, without seta X. Dorsally on the head, in front of the antennal bases, the median seta a_0 is replaced by an oval tegumentary structure.

Description: Body length c. 390 μm . Shape typical of the genus *Megalothorax*; without troglomorphic elongation of any appendage. No pigment visible in fixed specimens. Integument uniformly fine-grained. Cuticular canal system well-developed on the head, symmetrical. Ordinary dorsal setae of head and trunk smooth and pointed.

Length and proportion of antennal joints as in *M. minimus* WILLEM, 1900. Ant. I with 1 seta, Ant. II with 4 setae. Ant. III fused to Ant. IV. Ant. III organ with long, soft, transparent sensory hairs S1 and S4 originating at the same level; S2 and S3 subequal, short and transparent, with undulating surface. Ant. IV with 10 long, blunt, cylindric sensory hairs S; the strongly curved Sy is of similar length, but of double diameter; seta X absent; Ant. IV organ minute (Fig. 1).

Forehead chaetotaxy (clypeo-labral formula sensu DEHARVENG 1978): a_0 absent; 2, 2, 5, 4, 5/5, 4. Setae r and m smooth, m inserted more apically (Fig. 2); apical setae R1 and R2 stronger, curved, with 1-2 external denticles (Fig. 3). In position of a_0 there is a sharply confined oval field, c. 7 μm long. Inside this structure, the normal skin grains are replaced by a very fine and dense, hardly discernible granulation. A faint, straight or slightly S-shaped line along the median axis evokes the illusion of a coffee-bean (Figs. 2 and 4). Mandible, maxilla and maxillary outer lobe (Fig. 5) as in *M. minimus*. 3+3 pre-labial setae.

Setae and sensory fields of head and trunk distributed as in *M. minimus* and *M. tuberculatus* DEHARVENG & BERUETE, 1993 (best illustrated in the original description of the latter species). Differentiation of setae as in *M. minimus*: one longer and somewhat spini-form seta rostro-lateral of the anterior sensory field of the head; similar setae in the occipital region (Fig. 2) and around the sensory fields of thorax and abdomen (Fig. 6). Short, blunt lateral seta s of mesothorax present.

Legs short. Tibiotarsi I-II-III with 12-12-11 setae. Claw and empodium short and stout; teeth as in *M. minimus* (Fig. 7). Ventral tube with 2+2 apical setae. Tenaculum without seta, rami with 3 teeth. Two short, flat, apically fringed setae on either side of the furcal base. Manubrium with 2+2 proximal and 2+2 distal setae. Manubrium ventro-apically with 2 strong articular pegs, corresponding with acetabula on the dentes. Dens subsegmented: proximal part with 1 dorsal seta; distal part with 2 dorsal spines arranged transversally, 1 dorsal seta, and 5 apical spines. Mucro somewhat longer than the distal subsegment of the dens, the apical 40% being slightly bent and narrowed. Two smooth mucronal lamellae (Fig. 8). Female genital plate with 3+3 setae (Fig. 9).

Affinities: *Megalothorax sanctistephani* sp.n. belongs to the *M. minimus*-group, characterized by smooth mucronal lamellae. The new species differs from the cosmopolitan *M. minimus* by the absence of seta X on the antenna and, in front of the antennal bases, the replacement of the median seta a_0 by an oval tegumentary structure. The latter character (unique in the genus), the long antennal sensillum Sy, and the lack of troglomorphic features separate *M. sanctistephani* from *M. tuberculatus*.

Ecology: All individuals of *M. sanctistephani* were extracted (floatation and Macfadyen) from the bottom substrate of the "new tombs", a baroque necropolis beneath the former



Figs. 1 - 9: *Megalothorax sanctistephani* sp.n., (1) Antenna III and IV, (2) head, dorsal aspect (0,5x): chaetotaxy, sensory fields, canal system and oval tegumentary structure in position a_0 , (3) labrum, ventral aspect, setae R1 and R2, (4) oval tegumentary structure of another specimen; granulation partly omitted, (5) maxillary outer palp, (6) abdominal sensory field, (7) tibiotarsus, claw and empodium of leg III, (8) tenaculum, dens and mucro, dorsal aspect, (9) female genital plate.

St. Stephen's churchyard in the centre of Vienna. The gravelly substrate, a Pleistocene sediment of the Danube River, is mixed with fragments of human bones (for a description of the habitat and the accompanying fauna see CHRISTIAN 1998a, 1998b). No specimen was caught in neighbouring pitfall traps. This suggests, along with the absence of troglomorphic characters, an edaphic or interstitial rather than a cavernicolous mode of life.

References

- CHRISTIAN, E. 1998a: *Eukoenia austriaca* from the catacombs of St. Stephen's Cathedral in the centre of Vienna and the distribution of palpigrades in Austria (Arachnida: Palpigrada: Eukoeniidae). – *Senckenbergiana biologica*, 77: 241-245.
- CHRISTIAN, E. 1998b: Die Fauna der Katakomben des Wiener Stephansdomes. – *Verhandlungen der Zoologisch-Botanischen Gesellschaft in Österreich* 135: in press.
- DEHARVENG, L. 1978: Collemboles cavernicoles 1. – Grottes de l'Aguzou (France: Aude). – *Bulletin de la Société d'Histoire naturelle de Toulouse* 114: 393-403.
- DEHARVENG, L. & BERUETE, E. 1993: *Megalothorax tuberculatus* n.sp., nouveau troglobie des Pyrénées-Atlantiques (France) et de Navarre (Espagne) (Collembola, Neelidae). – *Bulletin de la Société entomologique de France* 98: 15-18.