STEINERNEMA KRAUSSEI (STEINER, 1923) (NEMATODA: RHABDITOVIDA): REDISCOVERY OF ITS TYPE LOCALITY IN GERMANY

In a study of an outbreak of sawfly, Cephaeleia abietis (Pamphilidae, Hymenoptera) in South Bohemia, Czechoslovakia, Weiser (1976: Proc. Inst. Int. Coll. Invertebr. Pathol. Kingston: 245–249) described an entomophilic nematode that was within the diapausing stage of this insect in the soil. This nematode infection was associated with a large decrease in the insect population. The comparison of this nematode material with that from three other sawfly outbreak sites in Northwest Bohemia and North Moravia showed this nematode to be present in each locality and that the nematode is a member of the genus Steinernema Travassos.

The only other report of a nematode parasite of the C. abietis is that of Steinernema kraussei (Steiner, 1923) from Germany. After considering the morphological characteristics of the nematode described by Steiner (1923: Centrbl. Bakt., II, 59: 14–18) and comparing them with those from Bohemia and Moravia, and considering the continuity of a sawfly outbreak in areas throughout Central Europe during the last two centuries, Mráček (1977: J. Invertebr. Pathol. 30: 87–94) redescribed the new South Bohemian isolate of S. kraussei and completed Steiner’s old description.

The generic name, Steinernema, was proposed by Travassos (1927: Boll. Biologico, 19: 87–94). Based on scanning electron microscopy of S. kraussei from South Bohemia, the genus Neoplectana Steiner, 1929 was replaced by the older synonym, Steinernema Travassos, 1927 in Wouts et al. (1982: Syst. Parasitol. 4: 147–154).

After publication of this synonymy, some authors, e.g. Poinar (1986: in Samson R. A. et al., Fund. appl. aspects of Invertebr. Pathol., Veldhoven: 281–284), were critical of the proposed change and claimed that the specimens from South Bohemia in Mráček (op. cit.) were not identical with the species described by Steiner (op. cit.). Mráček (1986: in Samson R. A. et al., Fund. appl. aspects of Invertebr. Pathol., Veldhoven: 290–291) clarified the matter by describing the characteristics supporting the determination of the South Bohemian strain as S. kraussei and for comparison, he also presented taxonomic characteristics of three type specimens (holotype and two paratypes) from the nematode collection of United State Department of Agriculture, Beltsville. Unfortunately, all were females and somewhat poorly preserved. In fact, the females from Steinernema have very few useful characteristics for a description of the genus. S. kraussei is the oldest and type species of the family Steinernematidae. Hence, the rediscovery of the type locality and the isolation of topotypes of S. kraussei is very important.

Our main objectives were to find the original locality of S. kraussei and provide our nematode collection with some topotypes of S. kraussei for future taxonomic studies.

Unfortunately, there is little information about the type locality of S. kraussei in Steiner’s description. The sawfly larvae material parasitized with nematodes was collected by Krausse from an outbreak of C. abietis in Westphalen, in the Egge Mountains in the Warburg county, near Neuenherrsee (Krausse A. 1917: Arch. Naturgesch., A6: 46–49). In this region, a major outbreak had persisted for several years and Krausse was appointed by the German government to take charge of the outbreak in this area.

In March, 1991, the authors visited this locality and collected soil samples. The precise location of the original type locality was identified with the help of the local Forest Region employees as the areas “Jages 96, 97 and 98” in a spruce forest of an age typical for sawfly infestations (i.e. 60–80 years old). Interestingly, there has been no outbreak of sawfly in this locality for many years, but another eligible host, wireworms (Elateridae spp.) were recovered from Jages 96–98.

In order to obtain an idea of the wider distribution of S. kraussei in this general area, soil samples were also taken from several sites in adjacent ecosystems (e.g., spruce forest, oak forest and pasture) within 1–3 km of Jages 96–98. The soil samples were assayed for the presence of ento-

Topotypes of S. kraussei were recovered from Jages 96 and 97, and from an adjacent pasture. The male nematodes from these samples had the same overall morphology (body length/width - 1080/85 μm, esophagus - 250 μm, tail - 50 μm, mucro - 3 μm), the same closeness in size and shape of their spiculae (total length - 55 μm, manubrium length/width - 12/15 μm, neck - 12 μm, retinaculum - 16 μm) and gubernaculum (46 μm) as those found by Steiner (op. cit.) and the isolate from C. abietis in South Bohemia (Mráček Z. op. cit.) (Figs. 1–2).

Only a few topotype specimens were saved as permanent mounts. Most of Galleria mellonella cadavers in the traps were severely contaminated by a saprophytic diplogasterid and by fungi in the Petri dish assays, and S. kraussei adults did not produce offspring.

Although we were unsuccessful in rearing S. kraussei in the laboratory, we have rediscovered the original locality of Steiner’s description. It is probable that S. kraussei will be cultured in our laboratory in the future and this will provide more topotypes for the taxonomic study of Steinernematidae.

Z. MRÁČEK, J. WEISER, M. BUREŠ
and L. KAHOUNOVÁ
Department of Insect Pathology,
Institute of Entomology,
Czechoslovak Academy of Sciences,
Braníkovská 31,
370 05 České Budějovice
Czechoslovakia

Received 12 November 1991

Accepted 6 January 1992

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