Bursaphelenchus eggersi or *B. hildegardae* (Nematoda: Parasitaphelenchidae)? Does it really matter to New Zealand?

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Introduction: An unexplained mortality of *Pinus radiata* trees was observed in Kaingaroa Forest (KF) in the central North Island of New Zealand (NZ) during a forest health assessment survey conducted in March 2019. Close examination failed to determine the cause with no obvious fungal disease symptoms or insect damage. Subsequently, a group of three trees and a single dead tree were samples and examined for nematodes. Nematodes were isolated from the wood disks and identified as *Bursaphelenchus hildegardae* Braasch *et al.*, 2006. Before this finding, only two *Bursaphelenchus* spp. had been reported from NZ: *B. eggersi* Ruhm, 1956 and *B. fungivorus* Franklin & Hooper, 1962.

Method: The initial sample was collected during a Forest Heath Assessment Survey conducted by SPS Biota Ltd. The sampling was organised in order to study the possible reasons for the observed tree mortality of *Pinus radiata* in Kaingaroa Forest in March 2019. Subsequently, material for the present study was collected mainly in April 2019. In total, more than 158 wood discs from 158 trees and 50 beetles were collected within a 3.8 km radius from the initial detection site. In addition to fresh material, 20 dried specimen of *H. ater* collected prior 2002 were obtained from SCION New Zealand collections and tested for the presence of nematodes.

Acknowledgement: We thank Ruth Griffin, Alice Merrall and staff in the Mycology & Bacteriology team, MPI for nematode extraction and PCR laboratory work; Stephanie Sopow, Stephen Pawson, Carl Wardhaugh and other SCION staff for the overall support especially with supplying historical beetle collection specimens for study.

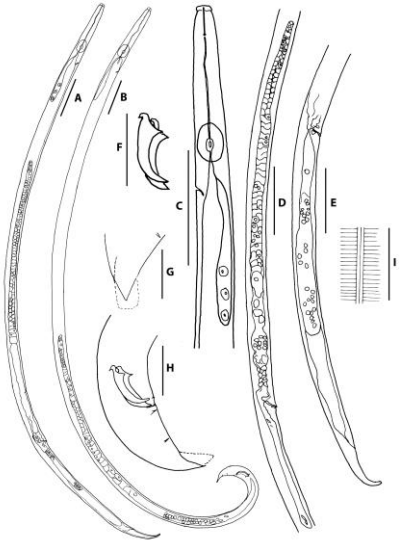

Fig. 1. *Bursaphelenchus hildegardae*. A: Female; B: Male; C: Anterior part of female; D: Reproductive system of female; E: Posterior part of female; F: Spicules; G: Bursa; H: Posterior end of male; I: Lateral lines. (Scale bars: A–C = 50 µm; D–I = 20 µm) (Zhao *et al. 2021 Zootaxa*)

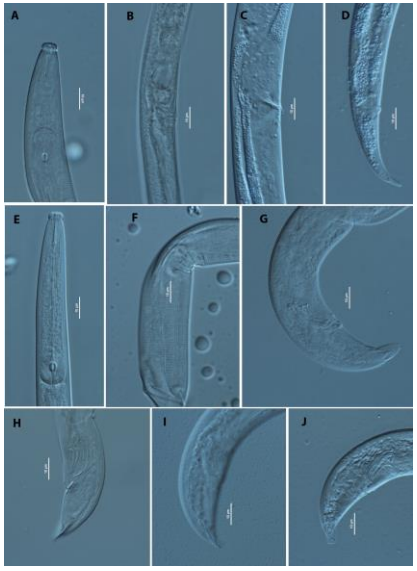

Fig. 2. Light microscope photographs of *Bursaphelenchus hildegardae*. A: Anterior part of female; B–C: Vulva with flap; D: Female tail; E: Anterior part of male; F: Male lateral lines; G–J: Male spicules, busa & Tail. (Scale bars: A–J = 10 µm) (Zhao *et al.* 2021 *Zootaxa*)

Result: *Bursaphelenchus hildegardae* was found in wood samples (*Pinus radiata*) and *H. ater* beetles collected in the Kaingaroa Forest from March to April 2019. Extraction of 158 wood samples showed 6 to be containing *B. hildegardae* giving an average presence of about 3.8 %, and examination of 50 beetles showed 3 to be carrying *B. hildegardae* giving an average incidence of about 6 %. Subsequently, *B. hildegardae* was also found in beetle samples (*H. ater*) collected from Victoria Forest near Reefton on 28 April 2019; pine forest near Tikokino on 20 May 2020; pine wood samples (*Pinus radiata*) from Golden Downs, Nelson forests on 23 October 2020, and Douglas fir (*Pseudotsuga menziesii*) from Waipori, Dunedin on 11 November 2020, respectively.

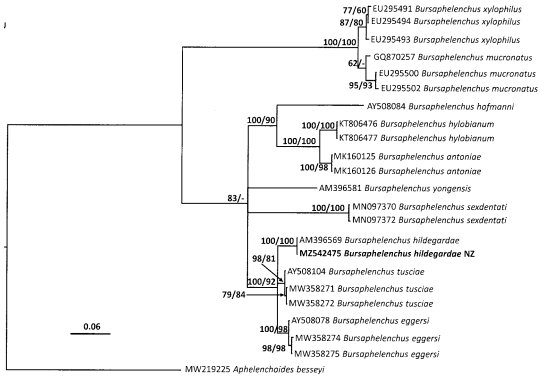

Fig. 3. Bayesian phylogenetic tree inferred from D2D3 gene DNA sequences of *Bursaphelenchus hildegardae*. Posterior probabilities greater than 50% are given on appropriate clades. Nematode species, GenBank accession numbers and locations are listed for each taxon, if known. (Zhao *et al.* 2021 *Zootaxa*)

References: Braasch, H. (2001) *Bursaphelenchus* species in conifers in Europe: distribution and morphological relationships. *EPPO Bulletin*, 31, 127–142.

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