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Occurrence and distribution of *Bursaphelenchus* species in Switzerland

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In Switzerland, pine forests cover about 43000 hectares and are dominated by Scots pine (*P. sylvestris*). Most of these forests are located in the Alps where they protect human infrastructures against the impacts of natural hazards. Here, we present the results of a nation-wide survey on the occurrence of *Bursaphelenchus* species that was conducted between 2009 and 2011 in Swiss pine forests, including sites in proximity of risk areas (e.g. airport and sawmills), and in pine bark and solid wood packing material. In the pine forests, a total of eight *Bursaphelenchus* species were identified by morphological and molecular methods. The most frequent species were *B. vallesianus*, followed by *B. sexdentati*, *B. leoni*, *B. eggersi*, and *B. mucronatus*. *B. borealis*, *B. pinophilus*, and *B. polygraphi* were only rarely found. Although most species can probably be considered as saprotrophs, *B. vallesianus* and *B. mucronatus* may be involved in pine dieback observed in some areas. Five of these eight *Bursaphelenchus* species (including *B. mucronatus*) were also isolated from symptomatic pines at risk areas. In the bark of the sampled trees *Bursaphelenchus* nematodes were practically absent. The quarantine species *B. xylophilus* was only detected in imported pine bark from Portugal. This survey shows that *B. xylophilus* is not present in pine forests in Switzerland. However, the recovery of the closely related species *B. mucronatus* suggests that local climatic and ecologic conditions may be suitable for the establishment of *B. xylophilus*.