DESCRIPTION OF *BURSAPHELENCHUS LIGNICOLUS* N. SP. (NEMATODA: APHELENCHOIDIDAE) FROM PINE WOOD AND HISTOPATHOLOGY OF NEMATODE-INFESTED TREES

BY

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*Bursaphelenchus lignicolus* n. sp. is described and illustrated from wood of pine trees (*Pinus densiflora* Sieb. et Zucc. and *P. thunbergii* Parl.) in Japan. This new species can be distinguished from other species of the genus by a distinct vulvar flap and the shape of spicules. The nematode is widespread throughout central to southwestern Japan in association with trees dead from a virulent epidemic in pine forests. Histopathological studies revealed that *B. lignicolus* occurred mostly in axial and radial resin canals of nematode-infested trees but epithelial cells were also damaged.

Severe damage to pine trees, the cause of which is unknown, is widespread in stands of Japanese red pine (*Pinus densiflora* Sieb. et Zucc.) and black pine (*Pinus thunbergii* Parl.) throughout southwestern Japan. Affected trees are conspicuous because of their quick death after symptoms appear. In fact, pine trees observed to be healthy in early summer die in late summer after showing yellowish foliage. Tokushige & Kiyohara (1969) first observed a species of *Bursaphelenchus* in wood from dead pine trees in severely damaged areas in Kyushu. They showed a widespread distribution of this nematode throughout Kyushu, particularly in association with damaged trees.

Kiyohara & Tokushige (1971) demonstrated the drastic effect of this nematode on Japanese red pine and black pine as the result of inoculations. The very same symptoms occurring in naturally-infested trees were produced by adding suspensions of nematodes to holes made in stems or branches of healthy trees. Death of the trees followed in about 40 days after inoculation when the experiments were carried out in summer.

Since its discovery in Kyushu, this *Bursaphelenchus* has been recovered in many other areas of southwestern to central Japan, indicating a closer relationship with occurrences of dead trees. Numerous specimens of females, males, and larvae were present throughout stems, branches, and roots and emerged from pieces of wood after soaking in water.

Investigations so far show economic importance of this nematode which is described herein as a new *Bursaphelenchus* species.

Measurements were made on specimens fixed in formalin and mounted in glycerine by Golden's method (Golden, A. M., unpublished).
BURSAPHELENCHUS LIGNICOLUS N. SP.

(Fig. 1)

Females (40) (paratypes): L = 0.81 mm (0.71-1.01); a = 40.0 (33-46); b = 10.3 (9.4-12.8); c = 26.0 (23-32); V = 72.7 (67-78); stylet = 15.9 μ (14-18).

Males (30) (paratypes): L = 0.73 mm (0.59-0.82); a = 42.3 (36-47); b = 9.4 (7.6-11.3); c = 26.4 (21-31); stylet = 14.9 μ (14-17); spicules = 27.0 μ (25-30).

Female (holotype): L = 0.86 mm; a = 36; b = 10.3; c = 27; V = 74; stylet = 16 μ.


Male (allotype): L = 0.76 mm; a = 42; b = 9.2; c = 30; stylet = 15 μ; spicules = 27 μ.

Spicules large, uniquely arcuate, paired, not fused, with sharply pointed prominent rostrum; distal ends of spicules with cuticular-like projections. Tail arcuate, terminus pointed, appearing talon-like in lateral view, surrounded by short, oval, terminal caudal alae. Two pairs of caudal papillae, anal pair just pre-anal, post anal pair just before caudal alae origin.

Holotype: Female, collected by T. Kiyohara, 15 July 1969. Slide number Bursaphelenchus 1-1, Government Forest Experiment Station, Laboratory of Forest Pathology Collection, Tokyo, Japan.

Allotype: Male, same data as holotype. Slide number Bursaphelenchus 1-2, Government Forest Experiment Station, Laboratory of Forest Pathology Collection, Tokyo, Japan.

Paratype: Same data as holotype and allotype. Slide number Bursaphelenchus 1-3-50, Government Forest Experiment Station, Laboratory of Forest Pathology Collection, Tokyo, Japan.

Type habitat: Wood of black pine, Pinus thunbergii Parl.

Type locality: Pine Forest, Yorita-cho, Sendai-shi, Kagoshima, Japan.

Diagnosis: B. lignicolus can be distinguished from other species in the genus by a distinct vulvar flap and the shape of spicules. This species closely related to B. fraudulentus (Rühm, 1956) Goodey, 1960 but differs in spicules of which each rostrum is not fused at distal ends.

Though the vulvar flap is similar to that of the genera Laimaphelenchus and Rhadinaphelenchus, this species is regarded as a Bursaphelenchus species because of other diagnostic characters, which are different tail shape from that of Laimaphelenchus and different spiculum form from that of Rhadinaphelenchus.