OBSERVATIONS ON APHELENCHOIDES LIMBERI STEINER, 1936, FROM MUSHROOM COMPOST

BY

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*Aphelenchoides limberi* from mushroom compost fed on mushroom mycelium (*Agaricus hortensis*) and on *Botrytis cinerea*. The nematodes reproduced rapidly without producing any males. The shape of the tail terminus varied considerably in different females.

Nematodes extracted from mushroom compost from Amersham, Bucks, were *Aphelenchoides limberi* Steiner, 1936, not *A. composticolor* Franklin, 1957 the usual mushroom parasite (Moreton, John & Goodey, 1956). Specimens of *A. limberi* were few suggesting either that it was a secondary invader or the compost was old (see Goodey, 1960). *A. limberi* was therefore tested to see whether it damaged mushroom (*Agaricus hortensis* Cooke).

Ten hand-picked *A. limberi* were washed in sterile water and inoculated onto a 8.75 cm petri dish growing mushroom mycelium on 5% malt agar. After 3 weeks the mushroom showed damage and was beginning to disappear, many nematodes were visible but there was some contamination by a secondary fungus. From this population 50 hand-picked specimens, washed in sterile water, were inoculated onto a fresh mushroom plate. Individual hand-picked larvae were also added to separate mushroom plates. Three weeks later, the mycelium on the plate inoculated with 50 specimens showed signs of damage. Many nematodes and eggs were present and the nematodes could be seen feeding on the mushroom hyphae. Four weeks after inoculation, some 77,000 *A. limberi*, adults and larvae, were recovered from this plate. Three plates which had each received a single larva also showed mycelium damage 4 weeks after inoculation and contained nematodes in all stages of development. All these plates appeared to be free from secondary contaminants. This *A. limberi* also reproduced freely on plates of the fungus *Botrytis cinerea* Pers. ex Fr.

*Aphelenchoides limberi* Steiner, 1936, has rarely been reported since first described. Measurements of the specimens from mushroom agree with those of Steiner (1936) & (1940) (Table I). *A. limberi* is characterised by the obtuse to truncate female tail and the absence of males. The great variation in the shape of the female tail terminus reported by Steiner (1940) occurred in specimens in my cultures, including the progeny of the single larvae. The tail tip varied from smoothly rounded to dorsally or ventrally obliquely truncate or transversely trunc-
Table I

Measurements of Aphelenchoides limberi Steiner, 1936

<table>
<thead>
<tr>
<th>n</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>V</th>
<th>Stylet length</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Steiner, 1936</td>
<td>31.8</td>
<td>7.8</td>
<td>15.3</td>
<td>70</td>
<td>11 μ*</td>
</tr>
<tr>
<td>From Steiner, 1940</td>
<td>3</td>
<td>0.67-0.82</td>
<td>30.6-32.6</td>
<td>(9.5-11.7)</td>
<td>17.8-19.6</td>
</tr>
<tr>
<td>Ex mushroom culture</td>
<td>25+</td>
<td>0.65</td>
<td>31</td>
<td>10.1</td>
<td>16.7</td>
</tr>
</tbody>
</table>
| * calculated from diagrams
| + Specimens fixed in T.A.F., stained in cotton blue lactophenol, mounted in glycerin.

cate, of which the last was the most common. Some specimens had a very short muco centrally on the end of the tail. A prominent post-vulval sac was present in the female reaching just over half way from vulva to anus. The lateral field was narrow, 1/7-1/10 mid body-width, with four incisures. No males were found in any of the above cultures.

A. limberi was first described from bulbs of Iris tingitana from the Netherlands. Steiner, (1940) recorded it again from a lesion in a dahlia tuber from Germany and from elm roots from California, U.S.A. and amplified his original description. Andrássy (1954) claims to have found females and males of A. limberi feeding on the cells of cotton roots in Hungary. Unfortunately he did not describe the males although this appears to be the only record of their occurrence. None of these records suggested that A. limberi was a fungal feeder, but it may well have been fulfilling this role.

Reproduction in A. limberi is parthenogenetic, indicated by successful cultures from single larvae; also a detailed examination of the gonads of young and mature females failed to reveal any sperm or sperm-producing organs.

A. limberi is easily distinguished from A. composticola, a frequent parasite of mushroom mycelium, by the absence of males, the blunt tail and four incisures on the lateral field compared with three in the latter.

Mr. C. W. Graham, N.A.A.S., Coley Park, Reading, Berks noticed that the mushroom compost from Amersham contained an Aphelenchoides sp. Dr. Mary T. Franklin, Rothamsted, made a preliminary examination of the compost and supplied some Aphelenchoides on which the above observations were made.

ZUSAMMENFASSUNG

Beobachtungen über Aphelenchoides limberi Steiner 1936 aus Pilzkompost

Aphelenchoides limberi aus Pilzkompost ernährte sich auf Agarplatten an Pilzhyphen (Agaricus bortensis), vermehrte sich schnell und zerstörte das Myzel. Er vermehrt sich auch an dem Pilz Botrytis cinerea. Im Aussehen und in den Maßen entsprachen die Tiere aus dem Kompost der Originalbeschreibung. Die Form der Schwanzspitze ist sehr variabel. Männchen traten in den Kulturen nicht auf.