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THE OCCURRENCE OF *LONGIDORUS VINEACOLA* IN SCOTLAND
WITH NOTES ON ITS DISTRIBUTION IN EUROPE

by
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Longidorus vineacola Sturhan *et* Weischer 1964 was first described from the rhizosphere of grape root stocks from Germany (Sturhan and Weischer, 1964) and has subsequently been recorded from Israel (Cohn and Krikun, 1966) Belgium (Aboul-Eid, 1970), France (Dalmasso, 1970), Russia (Lisetskaya, 1971), Bulgaria (Choleva-Abadzhieva, 1975), Jordan (Hashim, 1979), The Netherlands (Seinhorst and Van Hoof, 1982) and Greece (Brown, 1983; Brown and Taylor, 1987). It has also been reported once from Eire (Taylor and Brown, 1976) and once from England where it was associated with damage to a spring barley crop (Williams *et al.*, 1981). It was found to damage celery and onions (Cohn and Auscher, 1971), vine and sage (Choleva-Abadzhieva, 1975) and carrots, garlic and green pepper (Williams *et al.*, 1981).

Surveys undertaken in the British Isles to determinate the distribution and abundance of plant-parasitic nematodes tended to have few samples from more remote areas (Taylor and Brown, 1976; Boag and Orton Williams, 1976) and to rectify this further soil samples from such areas were examined at the Scottish Crop Research Institute. In 1980, soil samples were submitted from the Macaulay Institute for Soil Research and one, from the island of Berneray, off the west coast of Scotland, was found to contain *L. vineacola*. Subsequently further samples taken by the senior author from the Island of Coll and Tiree, also off the west coast of Scotland, contained *L. vineacola*. The present paper records the morphometrics of *L. vineacola* found in Scotland and comments upon the possible reasons for its unusual geographical distribution.

Materials and Methods

Soil samples collected from the islands of Berneray, Coll and Tiree were taken from a depth of 10-20 cm. Nematodes were extracted from the soil using a modification of the sieving and decanting technique (Boag, 1974). The nematodes were identified and measured using a Reichert diapan microscope with drawing arm after they had been heat killed at 60°C, fixed in triethanolamine formalin (TAF) and processed and mounted in glycerol by a method similar to that of Hooper (1970). The geographical distribution of *L. vineacola* was mapped from information obtained from the nematological literature and from specimens received from Germany, France, Belgium and The Netherlands.

Results

Longidorus vineacola was detected once from Berneray and from widely dispersed sites on Tiree (4) and Coll (5) (Fig. 1). The soil type was either a sand or loamy sand and the associated host crops included barley (*Hordeum sativum* Jess), potato (*Solanum tuberosum* L.), rape (*Brassica oleracea* L.), turnip (*Brassica rapa* L.) and a rye grass (*Lolium perenne* L.) and white clover (*Trifolium repens* L.) pasture.

Examination of specimens from seven of the Scottish populations indicated that they were morphologically very similar but that some measurements differed from the type specimens and from other European populations (Table I, Fig. 2). The Scottish specimens had a significantly shorter odontostyle, body and tail (92 μm , 7.2 mm and 33 μm for females respectively compared with 97 μm , 8.2 mm and 50 μm for the paratypes). The shorter bodies and tails of the Scottish populations distinguished them from all other European populations, the next most similar population being that from England (Fig. 2).

Discussion

Longidorus vineacola is a relatively common species in some European countries (Fig. 1) but within the British Isles, which have been intensively surveyed for plant-parasitic nematodes, there have been only two previous records. It has been suggested for other similarly rare species, e.g. *Paralongidorus maximus* and *Trichodorus sparsus*, that these species had been introduced from Europe by man (McElroy *et al.*, 1977; Boag, 1978).

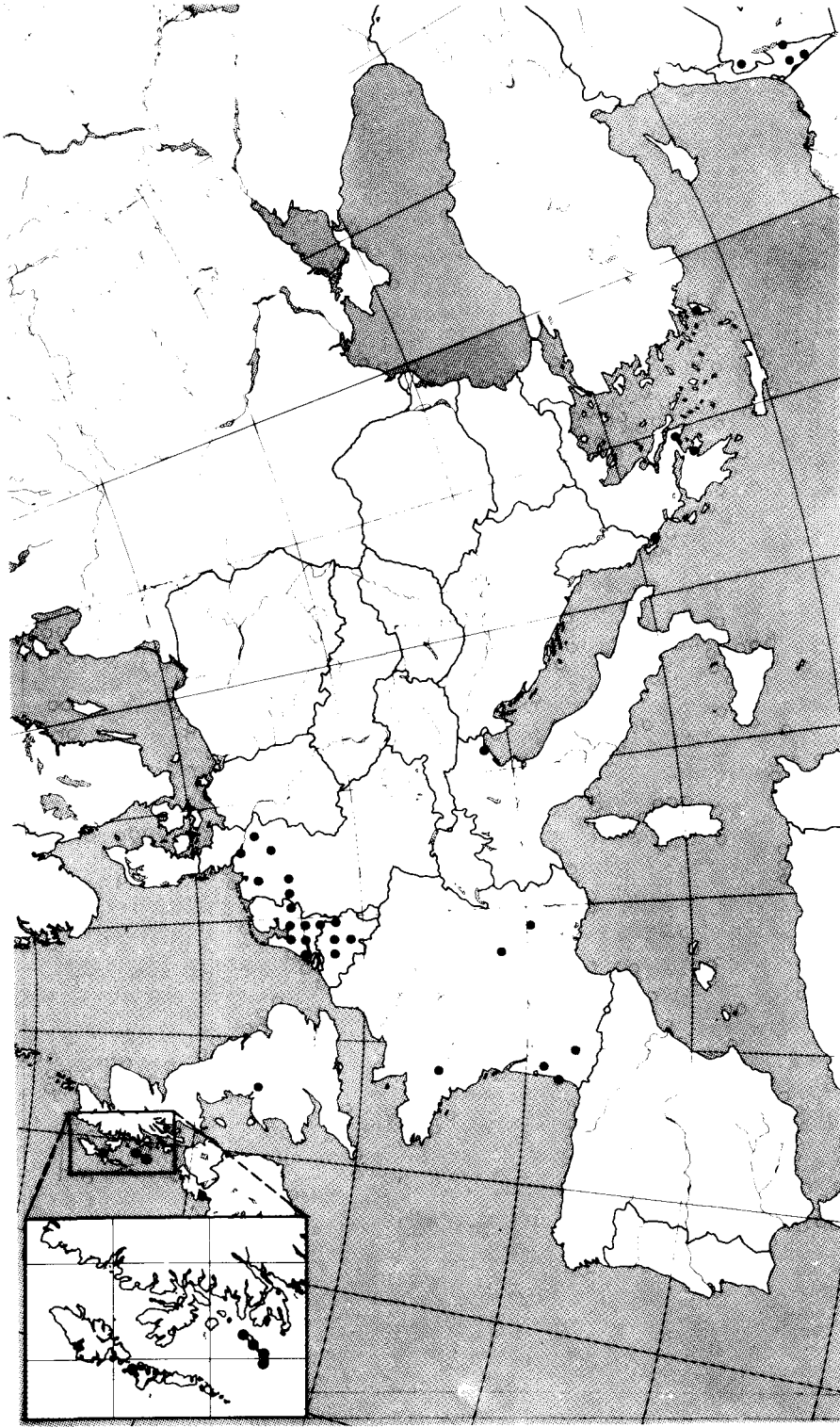
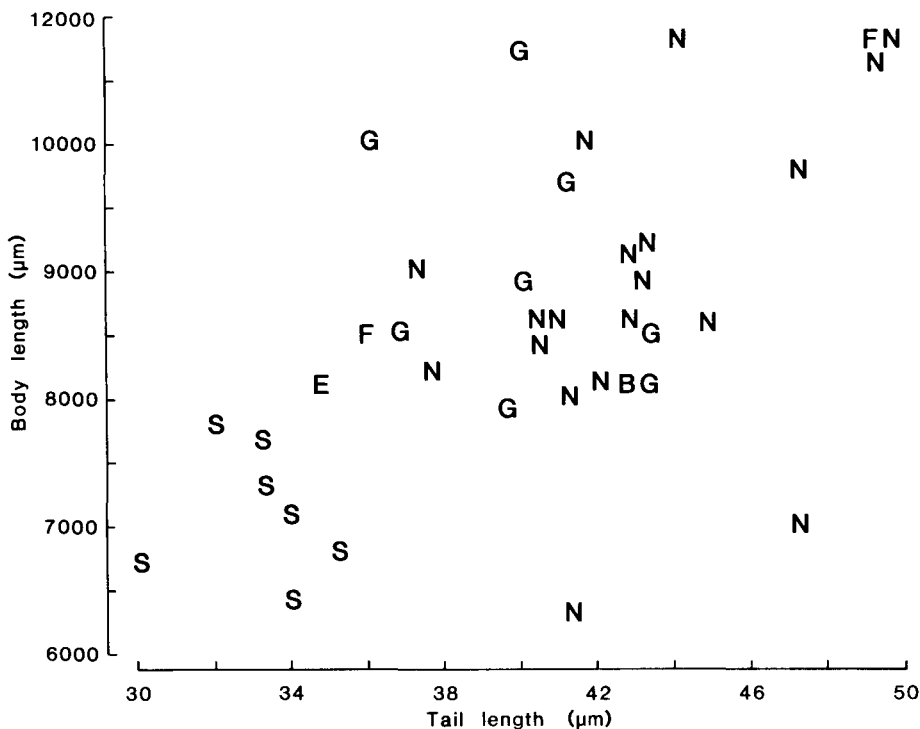


Fig. 1 - Geographical distribution of *Longidorus vineacola* in Scotland and Europe.

Table I - *Morphometric data of Longidorus vineicola from Scotland*

	Female (n=33)				Male (n=37)			
	Minimum	Maximum	Mean	Coefficient of variation %	Minimum	Maximum	Mean	Coefficient of variation %
L (μm)	6327	8991	7161	8.9	5661	7659	7005	6.8
a	111	176	143	10.8	129	172	154	7.4
b	16	24	19	9.1	15	22	18	9.6
c	177	281	216	10.0	174	243	205	9.9
c'	0.75	1.06	0.91	6.3	0.76	1.06	0.91	7.9
V	47	53	50.6	3.0	—	—	—	—
Testes (μm)	—	—	—	—	2331	3441	2976	8.6
Odontostyle (μm)	87	100	92	3.4	85	96	91	3.5
Odontophore (μm)	40	51	46	7.2	40	51	47	7.0
Spear (μm)	131	144	138	2.8	131	147	138	3.0
Anterior to guide ring (μm)	26	31	29	4.2	26	31	28	5.3
Anterior to oesophageal / intestinal junction (μm)	333	432	379	7.9	342	432	388	6.2
Anterior to vulva (μm)	3219	4218	3626	7.8	—	—	—	—
Tail length (μm)	30	37	33	5.2	31	38	34	6.2
Width at head (μm)	18	19	19	1.8	17	19	18	3.0
Width at guide ring (μm)	24	26	25	2.2	24	26	25	2.2
Width at oesophageal / intestinal junction (μm)	36	46	41	6.7	37	44	40	4.7
Maximum width (μm)	44	56	50	6.2	41	50	45	5.3
Width at anus (μm)	35	40	37	4.0	35	41	38	4.4
Length of spicules (μm)	—	—	—	—	52	59	55	5.1
Number of supplements	—	—	—	—	10	14	12	7.6



improbable. It is more probable that the nematodes were introduced by man since the islands have been inhabited continuously for nearly 5,000 years and there have been many contacts between the islands and the continent e.g. missionaries and Viking (Banks, 1977).

Longidorus vineacola was the only longidorid nematode recovered from Berneray and Tiree and was the predominant species on Coll where low numbers of *L. elongatus* were also found. The maximum number of *L. vineacola* recovered at any one site was 120 nematodes per 200 g soil. This population was not as great as the 4,000 nematodes per litre soil recorded by Williams *et al* (1981) damaging barley but was greater than the 80 per 200 g soil of *L. elongatus* suggested as a threshold for damage to grass by Seinhorst and Kozłowska (1979). *L. vineacola* may therefore be a potential pest of the existing crops on the islands or of new alternative crops e.g. lower bulb (Banks, 1977).

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S U M M A R Y

Longidorus vineacola Sturhan *et* Weischer is reported for the first time from Scotland where its distribution appears to be restricted to three islands off the north west coast. Morphological data from seven populations indicated that they were similar to one another but differed from other European populations by having a shorter body, odontostyle and tail. It is suggested that it was probably introduced by man and that the similarity in morphology between populations indicated that the species had been introduced on one occasion and then subsequently spread between and within the islands.

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