

Preferred Feeding Site of *Trichodorus christiei* on Tomato Roots¹

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In agar culture, *Trichodorus christiei* Allen usually feeds in the region of elongation, subapical meristematic region and the root cap of various plant species (1, 2, 3, 5, 6, 9). In the following experiments, the relative numbers of *T. christiei* present per millimeter of root length and the proportion of those feeding were determined along three regions of primary roots of tomato (*Lycopersicon esculentum* Mill. 'Rutgers'): (i) the tip region (=distal 2 mm of the root, including root cap, subapical meristem and the region of elongation); (ii) hairless region; and (iii) root hair region (= proximal part of root lined with root hairs).

Tomato seeds were surface-sterilized in 0.1% HgCl for 7 min, rinsed in sterile distilled water

and germinated on yeast extract agar. Noncontaminated seedlings, one per dish, were transferred to 50-mm petri dishes containing 1% water agar 3 mm deep. Each root (2-3 mm long) was pushed into the medium with a pair of forceps. Seedlings were kept for 1 day in darkness at 25 C, for further root growth to an average of 6 mm into the agar, and then 100 *T. christiei* juveniles and adults and some associated free-living nematodes from a colony maintained on corn were pipetted in 0.2 ml water onto the agar surface. On each of the following 4 days, the total number of *T. christiei* on the three root regions, and the number feeding were counted and the lengths of the regions were measured. A nematode was considered to be on the root when it was no more than 0.1 mm away from it, and to be feeding when it was immobile and its head touched the root or root hair surface at a right angle. Often the stylet movement could be seen at X80 magnification. Bacterial growth on the water agar was negligible. Average results of two experiments with 16 replicates each are shown in Table 1.

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TABLE 1. Relative numbers of *Trichodorus christiei* per mm of root and percentage of feeding *T. christiei* in three regions of tomato roots, and their lengths, on four consecutive days in agar culture.

Day	Root Regions								
	Tip			Hairless			Root Hair		
	Length in mm	<i>T. christiei</i>		Length in mm	<i>T. christiei</i>		Length in mm	<i>T. christiei</i>	
	No./mm	% feeding		No./mm	% feeding		No./mm	% feeding	
1	2	1.2 bc ¹	39 xy ¹	4.3	0.4 c	37 xy	6.6	1.1 bc	45 x
2	2	1.6 ab	45 x	14.1	0.5 c	20 yz	7.9	1.2 bc	30 yz
3	2	2.1 ab	46 x	21.3	0.4 c	14 z	9.3	0.5 c	15 z
4	2	2.3 a	55 x	26.7	0.2 c	14 z	10.8	0.2 c	10 z

¹Figures followed by the same letter are not significantly different ($P = .05$) according to Duncan's Multiple Range Test. Any comparisons between values in columns and/or rows for like data are statistically valid.

After one day, there were no significant differences among the relative numbers of *T. christiei* present per millimeter of root in the three root regions. On the 3rd and 4th days, however, significantly higher relative numbers were present in the tip region than in the hairless or root hair region.

On the first day there were no significant differences in percentage of *T. christiei* which were feeding among the three regions. No significant differences occurred in the percentage of nematodes feeding in the tip region among any of the four days. In the hairless and the root hair region, however, the percentage decreased significantly between the first and third day. The high percentage of feeding nematodes in the root hair region on the first day was in part due to a number of nematodes feeding on root hairs.

Some nematodes were observed to terminate the feeding process by a snapping-away movement of the head from the root surface, as if some resistance had to be overcome. This may have been caused by a temporary connection between nematode and root surface, similar to the feeding tube which is formed within the buccal cavity of *T. similis* and which remains attached to the feeding site after feeding (8).

With time, the relative numbers of *T. christiei* present and feeding increased in the tip region, whereas in the other regions they decreased. These observations agree with those reported for *T. similis* on tobacco, strawberry and rape-seed in monoxenic culture (7). Pitcher

(4) observed *T. viruliferus* in higher numbers on the distal 5 mm of extending apple roots than on other root regions. Rohde and Jenkins (5) reported that *T. christiei* moved away from dying tomato roots. I conclude that young tissues, such as actively growing root tips, provide the most suitable feeding sites for *Trichodorus christiei*.

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