

RESEARCH NOTES — NOTAS DE INVESTIGACION

THE EFFECT OF PREDATION BY THE NEMATODE *PELODERA CHITWOODI* (BASSEN) DOUGHERTY ON A NON-PROLIFERATING BACTERIAL POPULATION [EFECTO DE LA DEPRADACION DEL NEMATODO *PELODERA CHITWOODI* (BASSEN) DOUGHERTY SOBRE UNA POBLACION BACTERIAL APROLIFERANTE]. Gerald R. Wilt, Department of Botany and Microbiology, Auburn, Alabama 36830, U.S.A.

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The bacteriophagous nematode, *Pelodera chitwoodi* (Bassen) Dougherty, can utilize a single species of bacteria as nutriment and will preferentially migrate to food bacteria (1, 2, 3). The present study was undertaken to determine the effects of predation by *Pelodera chitwoodi* on the total (living and dead bacteria) and viable (living bacteria) population of a non-proliferating bacterial culture.

An *Agarbacterium* sp. provided the sole source of nutriment during the investigation. Bacteria were grown in nutrient broth at pH 7 for 24 hr. Aliquots of the bacteria and growth medium were dispensed into 50 ml centrifuge tubes, and cells sedimented by centrifugation. The cells were washed 3 times by resuspending in sterile phosphate buffer and centrifuged after each rinse. Twenty-five ml aliquots of suspended bacteria corresponding in turbidity to a number 3 McFarland nephelometer standard (approximately 9×10^8 cells/ml) were placed into 3 Erlenmayer flasks (125 ml). Each flask was inoculated with approximately 200 surface sterilized nematodes (1). Controls consisted of flasks with 25 ml of bacterial suspension, and flasks with 25 ml of sterile phosphate buffer inoculated with approximately 200 surface sterilized nematodes. Each flask was stoppered with a styrofoam plug that had a Pasteur pipette inserted through it so the end of the pipette almost touched the bottom of the flask. The mouth ends of the pipettes were loosely plugged with cotton. Each flask was connected to an air pump with plastic tubing and aerated twice daily for 1 hour while incubating at 25 C for 30 days. Two 1 ml aliquots were withdrawn from each flask at the beginning of the experiment and at the end of the first, second, and third week. The number of nematodes in half of the 1 ml samples was counted using a dissecting microscope. The other half of the 1 ml samples was diluted quantitatively by a ten-fold dilution series and 1 ml aliquots were withdrawn from the appropriate dilution bottles for counting bacteria. Total numbers of bacteria were determined microscopically with a Petroff-Hausser counting chamber. Viable numbers were determined by colony counts on Nutrient Agar (Difco) plating media after incubating for 5 days at 25° C.

In 21 days, nematode numbers in the bacterial nutriment increased from 8 per ml at the start of the experiment to a maximum of 104.2 per ml at day 14, but by day 21 had declined to 76.8 per ml (Table 1). Initial mean numbers of bacteria in all flasks containing bacteria were 2.2×10^7 viable cells and 1.4×10^9 total cells. At 7 days viable and total numbers of bacteria in the presence of nematodes were 5% and 41%, respectively, of the viable and total numbers of bacteria in flasks containing no nematodes. Results indicated a greater decrease in the number of viable bacteria than in total bacterial numbers, suggesting that nematodes accounted for the larger decrease in viable numbers observed when bacteria and nematodes were present together. Since total bacterial numbers reflect the number of both living and non-

living cells, and viable counts reflect only living cells, these results suggest that the nematodes feed primarily on living bacteria.

Attempts to study the effects of *P. chitwoodi* predation on proliferating cultures of bacteria were unsuccessful. However, cinemicrographic observations following the migration of *P. chitwoodi* to bacterial colonies showed that continued nematode feeding led to a virtual disappearance of the colony (3).

Table 1. Effect of nematode predation on viable and total numbers of bacteria.

Days	Bacteria/ ml ^x		Nematodes ^y
	Viable	Total	
0	100	100	100
7	5	41	798
14	5	30	1796
21	6	43	∞

x Number of bacteria/ml expressed as a % of controls without nematodes.

y Number of nematodes expressed as a % of controls without bacteria.

RESUMEN

Se estudió el efecto depredador de *Pelodera chitwoodi* sobre el número total y el número de bacterias viables en una población a prolifera de *Agarobacterium* sp. Después de siete días, el número de nematodos aumentó de ocho a 68 por ml. Los números total y el de bacterias viables fueron 41% y 5% respectivamente, en relación al número en el testigo. Los resultados indicaron que la alimentación de *P. chitwoodi* con bacterias tiene un efecto más pronunciado sobre la supresión del número de bacterias vivas que sobre el de las muertas.

LITERATURE CITED

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