stage and the stage most resistant to adverse environmental conditions. In *B. xylophilus*, these two functions of dispersal and resistance are performed by two different juvenile stages.

No nematode species has ever had two different juvenile stages designated " dauerlarve " in its life cycle. Since neither the dispersal J3 nor the dispersal J4 qualifies by itself for " dauerlarve " designation, we propose that henceforth, this term not be used to describe the dispersal J4 of *B. xylophilus*. In the interest of consistency, both these juvenile stages should be instead referred to as dispersal juvenile stages to distinguish them from the propagative juvenile stages in the life cycle.

References

BIRD, A. F. (1971). *The Structure of Nematodes*. New York, Academic Press. x + 318 p.

BIRD, A. F. (1980). The nematode cuticle and its surface. In : Zuckerman, B. M. (Ed.). *Nematodes as Biological Models. Vol. 2 : Aging and Other Model Systems*. New York, Academic Press : 213-236.

CASSADA, R. C. & RUSSELL, R. L. (1975). The dauerlarva, a post-embryonic developmental variant of the nematode *Caenorhabditis elegans*. *Developmental Biology*, 46 : 326-342.

FUCHS, G. (1915). Die Naturgeschichte der Nematoden und einiger anderer Parasiten. 1. Des *Ips typographus* L. 2. Des *Hylobius abietis* L. *Zoologische Jahrbücher, Abt. Systematik*, 38 : 109-222.

ISHIBASHI, N. & Kondo, E. (1977). Occurrence and survival of the dispersal forms of pine wood nematode, *Bursaphelenchus lignicolus*. *Applied Entomology and Zoology*, 12 : 293-302.

KONDO, E. & ISHIBASHI, N. (1978). Ultrastructural differences between the propagative and dispersal forms in pinewood nematode, *Bursaphelenchus lignicolus*, with reference to the survival. *Applied Entomology and Zoology*, 13 : 1-11.

LEE, D. L. (1977). The nematode epidermis and collagenous cuticle, its formation and ecdysis. *Symposium of the zoological Society, London*, 39 : 145-170.

MAMIYA, Y. (1984). The pine wood nematode. In : Nickle, W. R. (Ed.). *Plant and Insect Nematodes*, New York, Marcel Dekker : 589-626.

MAMIYA, Y., KOBAYASHI, T., ZINNO, Y., ENDA, N. & SASAKI, K. (1973). [Disease development of pine trees naturally infected with *Bursaphelenchus lignicolus*]. *Transaction of the 84th Meeting of the Japanese Forestry Society* : 332-334.

POINAR, Jr., G. O. (1983). *The Natural History of Nematodes*. New Jersey, USA, Prentice Hall. x +323 p.

RIDDLE, D. L., GOLDEN, J. W. & ALBERT, P. S. (1987). Role of dauer larvae in survival of *Caenorhabditis elegans*. In : Veech, J. A. & Dickson, D. W. (Eds). *Vistas on Nematology*. Hyattsville, Society of Nematologists : 174-179.

Accepté pour publication le 8 novembre 1990.

DECLINE RATE OF *PARATYLENCHUS BUKOWINENSIS* UNDER NON-HOST CROPS

Michał W. BRZESKI

Instytut Warzywnictwa, 96-100 Skierniewice, Poland.

Paratylenchus bukowinensis Micoletzky, 1922 is an economic pest of parsley and celeriac in many regions of Poland (Brzeski & Radzikowska, 1980; Brzeski, 1986*a*). This nematode parasitises umbelliferous and cruciferous plants (Brzeski, 1986*b*). The tolerance limit is low and population increase is relatively rapid due to a high fecundity of females and the long vegetative period of the main host plants (Brzeski, Zepp & D'Errico, 1976). For these reasons, a high degree of nematode control is required, if a susceptible crop is to be grown on an infested field. This cannot be easily achieved using nematicides, and it was considered important to learn about the population decline rate of *P. bukowinensis* under non-host crops as onion, tomato and wheat.

The experiment was conducted in microplots made of concrete well rings in which *P. bukowinensis* was introduced about fifteen years ago. The soil contained also *Heterodera schachtii* Schmidt, a few *Merlinius brevidens* (Allen) and some trichodorids but no other *Paratylenchus* species was ever found. These plots were used for various experiments and, in 1985, cabbage (host plant for *P. bukowinensis*) was grown on all the plots. Non-host plants, onion and tomato, were cropped for next two years. There were 60 plots 0.63 m^2 each, and each plot was sampled in October 1985, 1986 and 1987 by taking thirteen soil cores of 2.5 cm in diameter to a 25 cm depth. Soil from each plot was mixed separately and nematodes were extracted from 100 cm^3 of soil by decanting and sieving through 40 µm sieves, and then washed onto 9 cm in diameter extraction sieves each with a filter. Extraction lasted for two days. The nematodes were then killed, the suspension made up to 10 cm^3 of

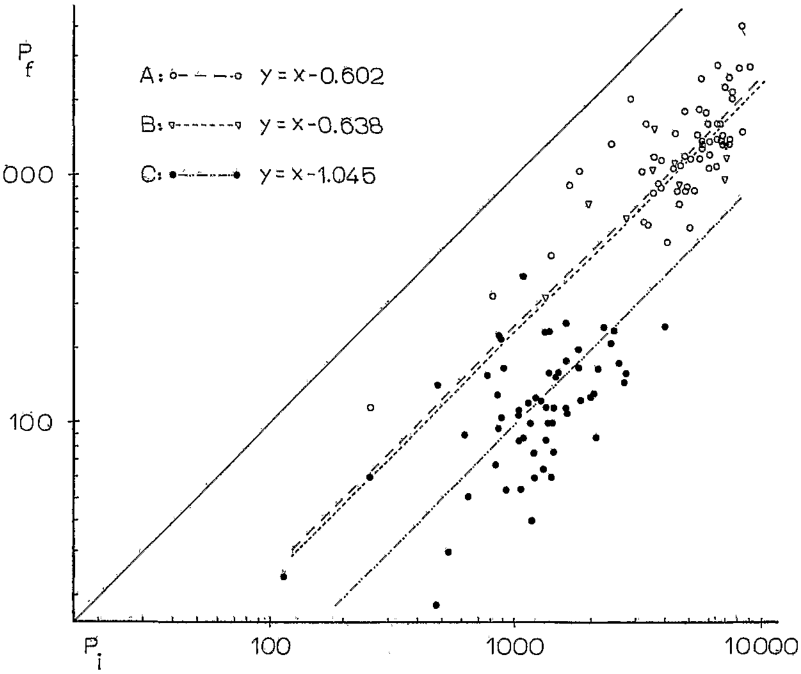

Fig. 1. Decline of *Paratylenchus bukowinensis* under non-host crops. A : Microplot experiment, first year after host-crop; B : Field experiment, first year after host crop; C : Microplot experiment, second year after host crop. Density of nematodes expressed as number of specimens in 100 cm^3 of soil.

water, vigorously stirred, and three to five 1 cm^3 subsamples of suspension were taken with a pipette and the *P. bukowinensis* specimens were counted.

To check if the calculated decline rate is applicable to field conditions, ten plots, 2 × 2 m each, were randomly distributed in an infested field where parsley was injured. Soil samples were taken from these plots in October 1987 following harvest of parsley, and again in October 1988 following wheat. Nematodes were extracted and counted from these samples in the same manner as described above.

The rate of population decline of *P. bukowinensis* in the microplots was independent of initial density, and the regression equation for the first year following the host crop was calculated as $P_f = 0.25\ P_i$, and for the second year as $P_f = 0.09\ P_i$ respectively. This indicates a decline of 75 % of the population in the first year and 91 % in the second year. The field experimental data also showed the decline rate to be independent of the initial density (Fig. 1), the calculated regression for the first year after host crop is $P_f = 0.23\ P_i$, which shows a 77 % decline of *P. bukowinensis*. Thus, the results from microplosts and field experiments do not differ and microplots can be used to simulate *P. bukowinensis* density changes under various cropping systems in a population dynamics model.

Accepté pour publication le 24 juillet 1990.

REFERENCES

BRZESKI, M. W. (1986*a*). [Incidence of plant parasitic nematodes on field vegetable plantations in Poland]. *Zeszyty problemowe Postępów Nauk rolniczych*, 323 : 33-49.

BRZESKI, M. W. (1986*b*). [Host plants of six species of ectoparasitic plant nematodes]. *Zeszyty problemowe Postępów Nauk rolniczych*, 323 : 51-54.

BRZESKI, M. W. & RADZIKOWSKA, A. D. (1980). [Pathogenicity of *Paratylenchus bukowinensis* on parsley]. *Zeszyty problemowe Postępów Nauk rolniczych*, 232 : 43-53.

BRZESKI, M. W., ZEPP, A. L. & D'ERRICO, F. P. (1976). Developmental stages of *Paratylenchus bukowinensis* Micoletzky. *Roczniki Nauk rolniczych Seria E*, 5 : 149-156.