

NOTE BREVI - SHORT COMMUNICATIONS

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DETERGENTS AS FEASIBLE NEMATODE DISINFECTANTS
FOR LIMITED USE IN NURSERIES AND GARDENS

by

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The effect of detergents have been considered in relation to several aspects of nematode biology. Wehunt (1973) found that sodium-containing detergents enhanced the extraction of nematodes. Esser (1963) reported that « Nurelle » detergent gave some control of several types of nematodes and Feder *et al.* (1962) showed that the addition of 1,000 ppm monosodium-lauryl sulphate detergent improved the control of nematodes obtained with sugar. We have examined two commercial detergents, « Savo » and « Rabso », containing 20% dodecyl benzene sulphonate as soil disinfectants.

MATERIALS AND METHODS

The two detergents were made up into six solutions: 1, 2.5, 5, 10, 15 or 20 g/l water. *In-vitro* tests with *Tylenchulus semi-penetrans* Cobb were undertaken by exposing 1,000 second stage larvae in 50 ml of each solution and recording the numbers alive or dead after 48 hr. Each treatment was replicated three times and controls in tap water five times. In a second test the solutions were adjusted to pH7 with 0.2N HCl to study the nematicidal effect of the detergents after the alkalinity was eliminated.

To test the detergents as soil disinfectants one-year old sour orange seedlings, *Citrus aurantium* L., were potted singly in 15 cm clay pots filled with steam-sterilized clay loam, about 5,000 *T. semi-*

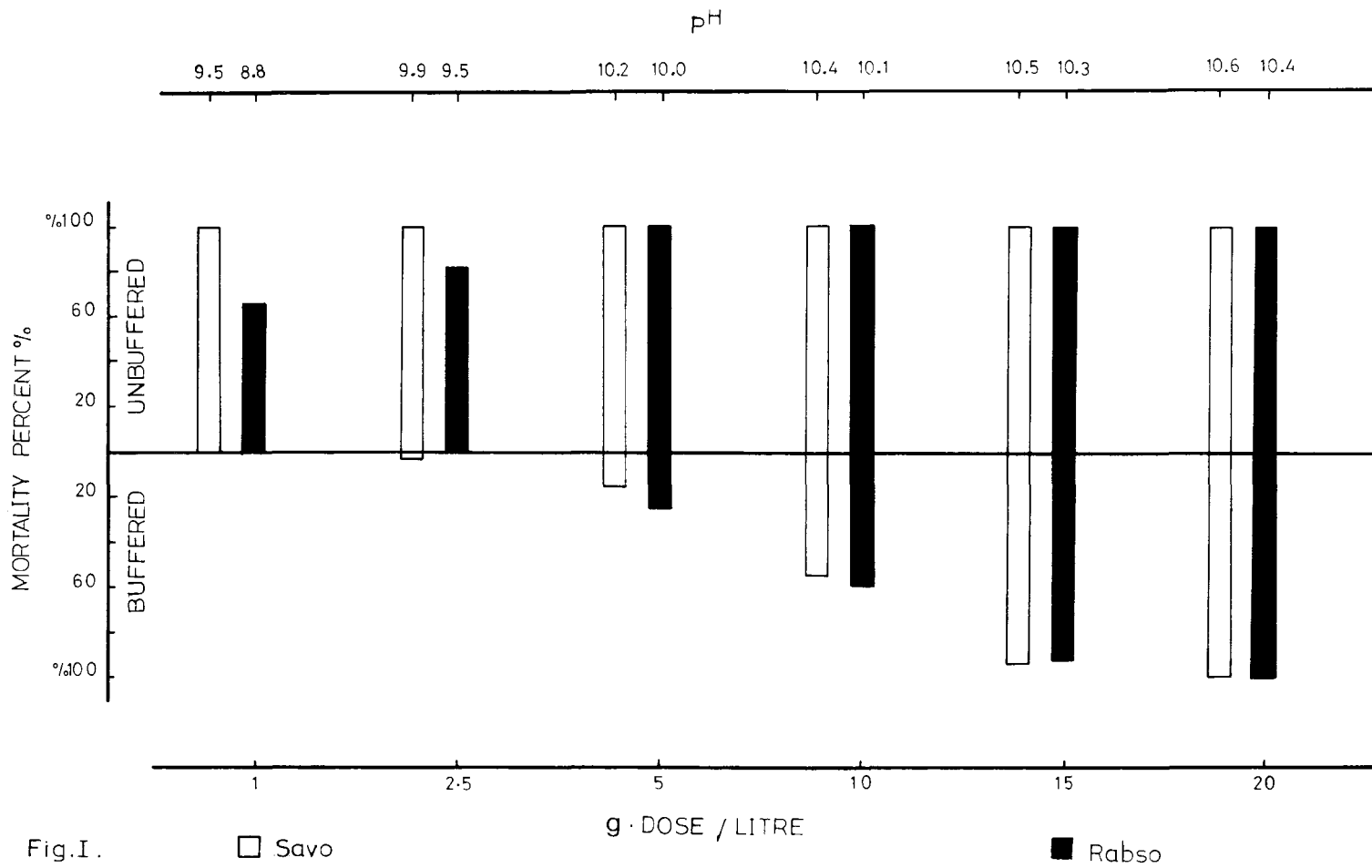


Fig. 1 - Nematicidal action of detergents « Savo » and « Rabso » on the second-stage larvae of *Tylenchulus semipenetrans* (In-vitro).

penetrans added per pot after one month, and after a further month the two detergents were added at the rate of 0.5, 1.0 or 2.0 g per pot. Each treatment, and the untreated control, were replicated four times. Sixty days after treatment the plants were removed from the pots and shoot and root weights recorded. Nematodes in a 250 g soil samples from each replicate were extracted by Oostenbrink's (1960) technique and root populations were extracted from 3 g composite samples using the Waring-blendor technique of Fallis (1943) as modified by Taylor and Loegering (1953).

RESULTS AND DISCUSSION

The *in-vitro* tests showed that both detergents at all the concentrations used were very toxic to *T. semipenetrans* (Fig. 1). The toxicity of the solutions was much reduced when they were buffered at pH7. In pot tests both detergents greatly reduced soil and root populations of nematodes, « Rabso » being more effective than « Savo » (Table I). Interestingly, saprophytic nematodes increased substantially in treated soils. At the highest concentration used « Savo » was very toxic to the sour orange seedlings, at the other dosage rates there was little or no effect on plant growth. The treatments did not increase alkalinity, nor alter the electric conductivity or content of soluble salts in the soil. However, treatments increased the concentration of Na⁺ in the soil which may have had an advantageous effect on plant growth.

Table I - Effect of treatments with « Savo » and « Rabso » detergents on *T. semipenetrans* populations infecting sour orange.

Treatment	Dose (g)	Soil population per 1 kg soil	Total root population	Total soil+root populations per pot	Saprophytic forms per 1 kg soil
Savo	0.5	1024	381	1405	1229
»	1.0	388	331	720	2744
»	2.0	0	35	35	4920
Rabso	0.5	448	206	654	1040
»	1.0	64	0	65	1856
»	2.0	0	0	0	11128
Untreated	—	5004	2247	7251	648
LSD 0.05	—	152	170	654	—
LSD 0.01	—	208	233	898	—

The *in-vitro* tests demonstrated a nematicidal ingredient in the two detergents and this direct toxic effect is probably an explanation for the nematode control. Wallace (1969) finding that an addition of a non-toxic detergent influenced the suction-motility relationship and host-finding of nematodes may also account for the present nematode reduction in treated soils. On a practical level, it is suggested that 0.5 g detergent per 1 kg soil could be applied in nurseries and gardens to control plant parasitic nematodes; higher rates are likely to be phytotoxic.

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