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**Use of baits for assaying chemicals applied as soil drench to control
Phytophthora foot rot of black pepper**

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One of the major diseases of black pepper (*Piper nigrum* L.) is the foot rot caused by *Phytophthora capsici* ('*P. palmivora*' MF₁) which causes severe economic losses (1). Prophylactic spraying and drenching with copper fungicides are recommended (3, 4). The fungicides applied to the soil are degraded by both biotic and edaphic factors. The concentration of the undegraded fungicide present in the soil affects the activity of the pathogen. In this paper, a method to assay the chemical applied to the soil by using baits is described.

Baiting technique

The bioassay was done by using *Albizia falcataria* leaflets as baits. Briefly, the method involves placing the test soil in a beaker and adding distilled water in the ratio of 1 : 4 and floating twenty *Albizia falcataria* leaflets with the lower surface in contact with water (25 g soil + 100 ml distilled water). The baits become infected within 72 h and the fungus emerges at the edges of the leaflets and sporulates. Positive baiting could be confirmed by examining the baits under microscope (2).

Bio-assay

Soil inoculum was prepared by mixing chopped infected black pepper leaves and soil in the proportion of 1 : 9. Twentyfive grams of this inoculated soil was taken and 100 ml distilled water added to get a soil water suspension. Copper in the form of bordeaux mixture, copper sulphate and copper oxychloride was added to the soil water suspension to get concentrations of copper ranging from 50 to 500 ppm. Two replicates were maintained for each treatment. Twenty *A. falcataria* leaflets were floated in each beaker and incubated at room temperature in laboratory conditions ($26^{\circ} \pm 2^{\circ}\text{C}$). In this bio-assay, positive baiting was obtained upto 300 ppm although the percentage of baiting was low (Table 1). In the baiting test, even if one bait becomes infected, that shows the activity of the fungus in soil. The activity of the fungicides on resting spores of *P. capsici* are not known. Turner (5) has reported that the activity of the fungicide applied to the soil against *Phytophthora* on black pepper was the result of concentration-volume-time-interaction (5, 6). When the concentration gets reduced, the activity of the fungus may be resumed. To control *Phytophthora* infection in black pepper, prophylactic soil drenching with copper oxychloride is being followed. The activity of the fungicide in soil over a period of time could be monitored using this method. This method is being adopted for monitoring the soil population of *Phytophthora* in fungicide applied plots (unpublished). This method also could be used to fix up the concentration of newer chemicals to be used as soil drench. The concentration arrived by this method may be

TABLE 1 : Baiting in contaminated soil with different concentrations of copper

Conc.	Name of the chemical		
	Per cent baiting*		
	Bordeaux mixture	Copper oxychloride	Copper sulphate
50	100.0	100.0	100.0
100	100.0	22.5	20.0
200	32.5	15.0	0.0
300	22.5	5.0	0.0
500	No positive baiting	No positive baiting	No positive baiting
Control	100.0	100.0	100.0

*Average of 2 replications.

more realistic since it simulates field conditions rather than traditional *in-vitro* trials with culture media.

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1. Anandaraj, M., Jose Abraham, Sarma, Y. R. and Balakrishnan, R. *Indian J. agri. Sci.* 59 : 751-753 (1989).
2. Anandaraj, M. and Sarma, Y. R. *Mycol. Res.* 94 : 1003-1004 (1990).
3. Ramachandran, N., Sarma, Y. R. and Anandaraj, M. In: *Diseases of Black Pepper* (Sharma, Y. R. and Prem Kumar, T., Eds.), National Research Centre for Spices, Calicut, pp 158-174 (1991).
4. Sarma, Y. R. and Nambiar, K. K. N. *Proc. Phytophthora Diseases of Tropical Cultivated Plants* (Nambiar, K. K. N., Ed.), Central Plantation Crops Research Institute, Kasaragod, pp 209-224 (1982).
5. Turner, G., J. *Trans. Brit. mycol. Soc.* 61 (1) : 186-189 (1973).
6. Zentmyer, G. A. *Phytopathology* 45 : 398-404 (1955).

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Two new storage rots of *Gaderi* (*Colocasia antiquorum*) from Kumaon

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Colocasia antiquorum rhizome is locally known as *Gaderi* in Kumaon. It is used as vegetable in a variety of ways. During December 1988, incidence of two serious diseases of *Colocasia antiquorum* rhizome rendering the rhizome unfit for consumption were noticed. One of the diseases was characterized by small brown patch under the scales in the beginning. The infection patches enlarged in diameter and depth as the disease