

**ANTIBIOTIC PRODUCTION BY  
*FUSARIUM VASINFECTUM*  
ATK. IN SOIL**

EVIDENCE indicating antibiotic production in soils, has so far been presented only in the case of non-pathogenic soil fungi.<sup>1-4</sup> The present note reports production of an antibiotic in soil by a plant pathogenic soil fungus, viz., *Fusarium vasinfectum* Atk. Earlier work<sup>5,6</sup> has already shown that this fungus produces fusaric acid, a phytotoxin, also capable of antibiosis, *in vitro*.

The soil (pH 8.1 and moisture-holding capacity 47.5%) used was collected from the Madras University Botany Field Laboratory Garden. 90 g. of sieved soil taken in 250 ml. Erlenmeyer flasks were given 10 g. of the following amendments: glucose, filter-paper, stubbles of cotton plants (*Gossypium arboreum*), green leaf choppings (*Glyricidia maculata*), farmyard manure and oats. Distilled water was added to each flask to keep the moisture level at 60%. After sterilisation at 20 lb. steam pressure for an hour and a half, the flasks were inoculated with spore suspensions of *F. vasinfectum* and incubated at room temperature (28-32° C.). The uninoculated series served as control. At regular intervals, cultures in replicates of four were removed with minimum amount of distilled water and centrifuged at 3,000 r.p.m. for 45 minutes.<sup>3</sup> The extracts thus obtained were tested for final pH before assaying for antibiotic potency in terms of fusaric acid equivalent.<sup>6</sup>

TABLE I

*Production of antibiotic (expressed as  $\mu$ g. fusaric acid equivalent/g. of soil) in sterilised soil with different amendments*

Age in days	None	Glucose	Filter paper	Stubbles	Farmyard manure	Green leaf	Oats
7	nil	nil	nil	nil	nil	nil	1.25
14	nil	nil	nil	traces	nil	2.30	7.90
21	nil	nil	nil	nil	nil	2.90	2.19
28	nil	nil	nil	nil	nil	2.60	2.00

The results in Table I indicate that *F. vasinfectum* produces this antibiotic in sterilised and amended soil (+ green leaf and oats), the maximum quantity produced (7.9  $\mu$ g./g.) being in the presence of oats. There seems to be no detectable quantities of

this antibiotic in soil with any of the other amendments tried except for traces on the 14th day in stubble amendment. In both oat and green leaf amended soils there was a drift to the acid side from the original pH of 8.1.

Unlike *Aspergillus terreus*, *A. clavatus* and *Penicillium patulum* which were shown by Grossbard<sup>3</sup> to produce antibiotics in soils supplemented with glucose alone, *F. vasinfectum*, as evident from these results, requires ample source of both organic nitrogen and carbohydrate for the production of fusaric acid in soil. In fact, it is worthwhile to note that *P. patulum* produced decreasing quantities of antibiotic with increasing concentration of nitrogen.<sup>3</sup>

The significance of the production of this antibiotic by *F. vasinfectum* in sterilised soil amended with rich source of organic food, especially in the light of increasing knowledge of microbial activity in the rhizosphere<sup>7,8</sup> has been discussed elsewhere.<sup>9</sup>

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University Botany Lab., R. KALYANASUNDARAM.  
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