

margins. The spots enlarged and involved the maximum area of the leaf lamina causing the blight (Fig. B).



FIG. A-B. Collar rot (A) and leaf blight (B) symptoms on winged bean.

The pathogen was isolated from both leaves and collar region on potato dextrose agar medium. The fungus grew fast and covered the entire Petridish within 4 days. It formed hyaline substrate mycelium and brown aerial hyphae made up of monilioid cells. Sclerotia measuring 1-2 mm in diameter and dark brown in colour were formed at later stages. Isolates from leaves and collar regions both were identical.

These cultural characteristics matched with the criteria ascribed to *Rhizoctonia solani* Kuhn³.

Pathogenicity was proved by sowing the healthy seeds in sick soil and also by inoculating the collar region and leaves with mycelial discs. More than 80% pre-emergence mortality was recorded and typical symptoms of the disease developed after 5 days and 3 days of inoculation on collar region and leaves, respectively. Cross inoculations with leaf and collar region isolates produced similar symptoms. Reisolation from artificially infected plants yielded the original fungus.

Collar rot and leaf blight of winged bean has been reported from Papua, New Guinea^{2,4} but not from India and therefore, this is the first report of *R. solani* causing collar rot and leaf blight of winged bean in India.

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EFFECT OF SUB-LETHAL CONCENTRATION OF SUMITHION AND SEVIN ON CERTAIN HAEMATOLOGICAL VALUES OF *SAROTHERODON MOSSAMBICUS* (PETERS)

It was found that lethal ($LC_{50}/48$ hrs) concentration of Sumithion (6 mg/l) and Sevin (10 mg/l) reduced total red-blood corpuscle (RBC) count, packed cell volume (PCV) and haemoglobin (Hb) concentration in *S. mossambicus*, while other parameters such as mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), and mean corpuscular haemoglobin concentration (MCHC) exhibited statistically insignificant increment from the normal fish¹. The present paper describes haematological values of *Sarotherodon mossambicus* (Peters) exposed for a period of 30 days to sub-lethal concentration of Sumithion (2 mg/l) and Sevin (4 mg/l).

TABLE I
Haemogram of *S. mossambicus* exposed to sub-lethal concentration of Sumithion and Sevin

| Blood Parameter | Control | Sumithion exposed | % Change | Sevin exposed | % Change |
|----------------------------------------------------------|-----------------------|------------------------|----------|-----------------------|----------|
| A. Red blood corpuscle (RBC) ($\times 10^6$ m./C.m.m.) | 2.56 ± 0.45 | 3.61 ± 0.44 | +41.01 | 3.23 ± 0.21 | +26.17 |
| B. Mean corpuscular volume (MCV) (C μ) | 111.32 ± 21.64 | 105.62* ± 12.52 | - 5.12 | 112.22* ± 6.64 | + 0.80 |
| C. Packed cell volume (PCV) (%) | 28.5 ± 1.20 | 38.13 ± 0.60 | +33.34 | 36.25 ± 0.72 | +27.19 |
| D. Haemoglobin concentration (Hb) (gm/100 ml) | 8.2 ± 0.32 | 10.35 ± 0.54 | +26.21 | 9.85 ± 0.30 | +20.12 |
| E. Mean corpuscular haemoglobin (MCH) (μ gm) | 32.03 ± 6.89 | 28.67* ± 4.79 | -10.49 | 30.49* ± 1.54 | - 7.45 |
| F. Mean corpuscular haemoglobin concentration (MCHC) (%) | 28.77 ± 1.86 | 27.14* ± 1.63 | - 6 | 27.17* ± 0.87 | - 6 |

Values expressed as mean \pm S.D. of 6 individual observations are highly significant $P < 0.001$, * Insignificant.

Maintenance, size and weight range of fish used have been described earlier². The procedure for calculating various haematological values was described¹. Sumithion, O,O dimethyl O-(3-methyl-4-nitrophenyl) Phosphorothionate and Sevin 1-naphthyl N-methyl carbamate were obtained from Tata Fison and Co. Sumithion, emulsifiable concentrate (E.C. 50%) and carbaryl, wettable powder (WDP 50%) were used in the investigation. To simulate better field conditions only commercial grade insecticides were used. $LC_{50}/48$ hrs value was calculated by probit method³ and approximately 1/3 of the $LC_{50}/48$ hrs concentration was selected for sub-lethal treatment⁴.

The blood values such as total RBC, PCV and Hb concentration exhibited statistically significant ($P < 0.001$) increase following exposure to both insecticides, but other parameters namely MCH, and MCHC indicated statistically insignificant decrement from the normal fish. Similarly the per cent change recorded with MCV was insignificant (Table I). Earlier studies revealed that exposure to Sumithion and Sevin depressed tissue respiration and inhibited SDH activity in *S. mossambicus*². It has been found that stressed fish exhibited asphyxiation due to respiratory failure and anaerobic glycolysis was enhanced². All these physiological changes unequivocally suggest prevalence of 'hypoxic environment' in the treated fish. Increase in the total RBC count, PCV, and Hb concentration observed in the present study could be

attributed to 'hypoxia'. During 'hypoxia' increase in the number of red cells and 'Hb' content was reported⁶⁻⁹ and an erythropoietic stimulating factor (ESF) was detected¹⁰. Hence it is likely that the observed 'hypoxic environment' would have stimulated red cell count, PCV and 'Hb' concentration in the stressed fish.

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