

# EFFECT OF SOME GROWTH REGULATORS ON THE GROWTH OF *HENDERSONULA TORULOIDEA NATTRASS*

K. C. SRIVASTAVA

Department of Botany, D.A.V. College, Kanpur

(Received 11 Jan. 68; revised 15 Feb. 68)

Effect of different concentrations of indole-3 ylacetic acid, indole butyric acid and alpha-naphthalein acetic acid on the growth of *Hendersonula toruloidea* Natrass, causing brown rot of fruits of *Malus sylvestris* Mill was studied. It was observed that indole acetic acid and alpha-naphthalein acetic acid supported good growth of the fungus in lower concentrations (0.1 & 0.5 ppm) but at 50 ppm the growth was inhibited. Indole butyric acid promoted the growth at the concentration of 50 ppm but an inhabitation in growth was observed at lower concentrations.

The information available on the effect of growth regulating substances on fungi is very scanty and contradictory. Leonian & Lilly<sup>1</sup> observed that  $\beta$ -indole acetic acid promoted the growth of some fungi at lower concentrations but inhibited at higher concentrations. *Merulius similis*<sup>2</sup>, *Colletotrichum capsici*<sup>3</sup>, *Fusarium oxysporum f. Corianderii*<sup>4</sup> also gave similar results. Mehrotra<sup>5</sup> however could not find any stimulation in growth of *Phytophthora* sp. by hormones. Davis & Dimond<sup>6</sup> observed that indole acetic acid did not inhibit the growth of *F. oxysporum f. Lycopersici* whereas 2-naphthoxy acetic acid reduced mycelium weight of the fungus. Recently, Agnihotri & Prasad<sup>7</sup> observed in *C. capsici f. Cyamopsicola* that indole acetic acid, 2-naphthoxy acetic acid and naphthyl acetic acid exhibited an increase in the growth of the fungus at lower concentrations. In the present investigation, effects of indole-3 acetic acid, indole butyric acid and  $\alpha$ -naphthalein acetic acid have been studied on the radial vegetative growth of *H. toruloidea*, a causal organism of brown rot of fruits of *M. sylvestris*<sup>8</sup>.

## MATERIALS AND METHODS

*H. toruloidea* was isolated from diseased fruits of *M. sylvestris* and a single spore culture was maintained on potato dextrose agar medium. 100 ppm stock solutions of each of the hormone (Indole acetic acid, indole butyric acid and naphthalein acetic acid) were prepared and diluted to give 0.05, 0.1, 0.5, 1.0 and 50.0 ppm concentrations. One ml solution of each concentration was incorporated in 20 ml of 2 per cent potato dextrose agar medium and after sterilization at 15 lb steam pressure for 15 minutes placed in 4 in. diameter petridishes. The fungus was inoculated in the centre of each seeded plate by agar disc method using discs of 1 cm diameter. The incubation was done at  $35 \pm 3^\circ\text{C}$ . for 6 days after which radial advance of the fungus colony was measured. Plates seeded with potato dextrose agar medium inoculated with the organism served as controls.

## OBSERVATIONS AND DISCUSSION

The radial growth of the fungus colony has been recorded in Table 1.

TABLE 1

EFFECT OF GROWTH REGULATORS ON THE GROWTH OF *H. toruloidea*.

S. No.	Concentration in ppm.	Radial growth of the fungus in mm		
		Indole acetic acid	Indole butyric acid	$\alpha$ -naphthalein acetic acid
1	0.05	69.50	65.50	54.75
2	0.10	85.00	53.75	67.75
3	0.50	79.00	72.00	79.00
4	1.00	66.50	72.75	74.50
5	50.00	64.25	82.75	62.50
6	Control	76.25	76.25	76.25
	General mean	73.42	70.50	70.83

*Statistical Analysis*

## INDOLE ACETIC ACID

Treatments Highly significant

Replicates Non-significant

S. E. 1.425

C. D. at 5% P 4.29

2 &gt; 3 6 &gt; 1 4 5

## INDOLE BUTYRIC ACID

Treatments Highly significant

Replicates Non-significant

S. E. 1.60

C. D. at 5% P 4.82

5 &gt; 6 4 3 &gt; 1 &gt; 2

 $\alpha$ -NAPHTHALEIN ACETIC ACID

Treatments Highly significant

Replicates Non-significant

S. E. 1.36

C. D. at 5% P 4.10

3 6 4 5 2 1

From the Table 1 and statistical analysis, it is evident that indole acetic acid promoted maximum growth of *H. toruloidea* at 0.1 ppm. concentration. 0.5 ppm concentration was found as good as control. At 0.05, 1.00 and 50.0 ppm the growth was inhibited.  $\alpha$ -naphthalein acetic acid supported the growth of the present organism at 0.5 concentration which was not significantly superior to control but superior to the rest of treatments. 0.05, 0.1, 1.0 and 50.0 ppm concentrations were found toxic for the growth of the fungus. Thus the present organism is similar to *F. oxysporum* f. *Corianderi*<sup>4</sup>, *F. oxysporum* f. *Lycopersici*<sup>3</sup>, *M. similis*<sup>2</sup>, *C. capsici*<sup>3</sup>, and two strains of *C. capsici* f. *Cyamopsicola*<sup>7</sup> in which different hormones in lower concentrations were found favourable for the growth of fungi but higher concentrations were toxic. In case of indole butyric acid a peculiar growth of the present organism was observed. Maximum and significantly superior growth was recorded in 50.0 ppm concentration of the hormone. Lower concentrations of the hormone upto 1.0 ppm proved toxic for the radial growth of the present organism.

#### ACKNOWLEDGEMENT

Thanks are due to Prof. R. C. Mathur, Head of Botany Department D.A.V. College, for providing the facilities for the present investigation and also to Shri R. C. Pandyatiga Senior Statistician, Government Agriculture College, Kanpur, for statistical analysis of the data.

#### REFERENCES

1. LEONIAN, L. H. & LILLY, V. G., *Amer. J. Bot.*, 24 (1937), 135.
2. BANERJEE, S. & MUKHOPADHYA, S., *Ind. J. Mycol. Res.*, 3 (1957), 59.
3. MISRA, A. P. & MAHMOOD, M., *Ind. Phytopathol.*, 14 (1961), 20.
4. MATHUR, R. L., Ph.D. thesis Rajasthan Univ. (India), 1963.
5. MEHBOTRA, B. S., *Curr. Sci.*, 20 (1951), 131.
6. DAVIS, D. & DIMOND, A.E., *Phytopathol.*, 43 (1953), 137.
7. AGNIHOTRI, J. P. & PRASAD, N., *Labdev J. Sci. Technol.*, 4 (1966), 260.
8. SAXENA, G. C., M.Sc. thesis. Agra Univ. (India), 1967.