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THE INHIBITION OF GIBBERELLIN-INDUCED ELONGATION OF RICE LEAF-SHEATH BY AUXIN

EXTENSION growth in several plants under stimulation by exogenous gibberellin is known to be promoted further by a simultaneous application of indole-3-acetic acid (IAA).¹ Either synergistic promotion^{2,3} or additive effects⁴ of IAA and gibberellin have been reported. As regards the gibberellin-induced stimulation of the elongation of monocotyledonous leaf-sheath on the intact plants this interaction has, however, not received much attention. In the excised leaves of wheat a synergistic effect between IAA and gibberellin in promoting elongation was found by Radley.⁵ Recently Ogawa⁶ has studied this aspect on rice leaf-sheath and reported that IAA had no influence on gibberellin-induced stimulation using a dwarf mutant, Tamanishiki.

In the present investigation a normal cultivated variety of rice (*Oryza sativa*, L. var. BCP. I) was used to study the interaction of gibberellic acid and IAA on the elongation in light of the second leaf-sheath in ten-day old seedlings.

The seeds were surface-sterilized, soaked for 24 hours in distilled water and were germinated in petri dishes. On the third day four uniform seedlings were transferred into each of 6" × 1" test-tubes on cotton wool and varying amounts of IAA or gibberellic acid or both in a total volume of 1.5 ml. distilled water were supplied. The controls received 1.5 ml. distilled water. The tubes were illuminated by a fluorescent lamp (100 lux). Length of the second leaf-sheath (mean of four seedlings) was measured seven days after the treatment. The results are shown in Table I.

The present results are in contrast with the mode of interaction of IAA and gibberellin in different plants hitherto reported inasmuch as the lack of either a synergistic promotion or an additive effect of IAA on the action of gibberellin in this case. The effect of IAA at concentrations that promote elongation when

added alone did not become additive to that of gibberellic acid when supplied together. On the other hand a strong interaction was noticed between the two substances in all the concentrations tried; the effect of IAA being inhibitory to the action of gibberellic acid.

TABLE I

The influence of gibberellic acid and IAA on rice leaf-sheath elongation: Length (mm.) of second leaf-sheath represents mean of three experiments

Gibberellic acid ($\mu\text{g}/\text{tube}$)	0	0.25	0.50	0.75	
IAA ($\mu\text{g}/\text{tube}$)	0	38.2 \pm 1.2	52.2 \pm 1.8	64.5 \pm 0.5	73.0 \pm 1.0
0.25	46.3 \pm 1.7	51.3 \pm 1.7	59.0 \pm 1.0	68.5 \pm 1.5	
0.50	47.8 \pm 1.8	50.5 \pm 1.0	53.8 \pm 1.7	65.6 \pm 0.4	
0.75	48.0 \pm 1.0	50.3 \pm 0.3	51.5 \pm 0.5	Not done	

It appears that as long as the concentration of IAA is lower, the action of gibberellin is promoted and as concentration of IAA rises, gibberellin content should also increase to produce same degree of elongation counteracting the action of IAA. An exogenous application of gibberellin could bring an increase in the overall gibberellin status of the intact seedling over that of endogenous IAA, thus causing elongation. A simultaneous application of both the regulators will result in the control of gibberellin-induced elongation by the increased content of IAA. Further studies on the endogenous IAA-gibberellin balance in the intact seedlings will be most helpful in this direction.

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STOLON ROT OF JAPANESE MINT

A SEVERE disease of Japanese mint (*Mentha arvensis* Linn. Sub. sp. *haplocalyx* Briquet var. *piperascens* Holmes) was observed in Jammu Province during October 1963 at two different farms. In new plantations the disease is first observed during the month of May. The initial symptoms of the disease consist of yellowing of leaves and general stunting of the plants. In advanced stages, wilting of the entire plant