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BRIEF COMMUNICATIONS

TRYPTOPHANE, TRYPTAMINE, SUGARS, pH AND THE REGENERATION OF THE PHYSIOLOGICAL TIP IN THE AVENA COLEOPTILE

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In earlier investigations it was found that the geotropic reaction of decapitated coleoptile sections in auxin solutions is very sensitive to the concentration (ANKER 1954, 1956). Similar sections, kept horizontally in water, can be used for determining with great precision the beginning of the regeneration of the physiological tip (ANKER 1967). At 23 °C the curvature starts about 2 hours after the decapitation, the exact moment being variable due to unknown factors.

In the present investigation it was tried to shorten this period by addition of "food factor" and of probable precursors of indoleacetic acid, the latter substance being considered as the auxin produced by the new tip.

The following changes of the medium, however, were all without any influence on the beginning of the auxin production: 1) addition of sugars (1.0 and 0.5% glucose and 1% sucrose); 2) pH = 6.9 (tap water) or 4.5 (Na- or K-phosphate buffers with phosphoric or citric acid); 3) addition of tryptophane (0.1, 1.0 and 10 mg/l); 4) addition of tryptamine (0.1 and 1.0 mg/l).

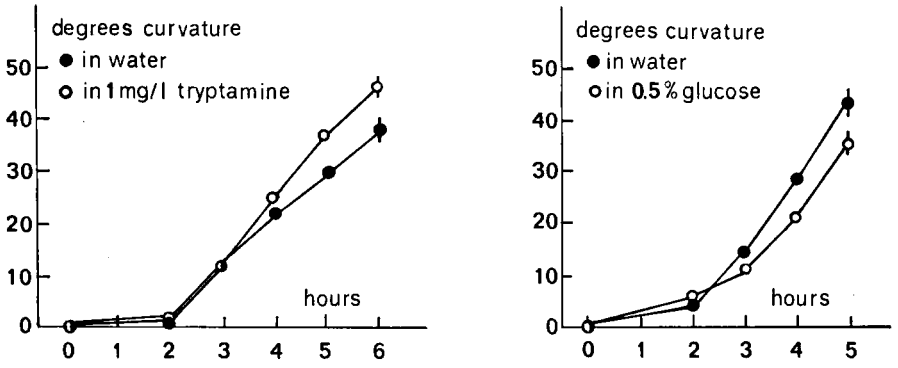
That tryptophane and tryptamine did not speed up the regeneration does not disprove the idea that one of them is the direct precursor of IAA. Apparently the auxin production by the new tip is delayed by the rate of the process in which the enzyme activating the precursor is synthesized. The results with tryptamine point in this direction. Once the enzyme has been synthesized, the added precursor stimulates the geotropic reaction (see figure).

With tryptophane no stimulation was observed. Neither was the straight growth of vertical intact or decapitated sections stimulated by this substance, added in concentrations ranging from 0.1 to 500 mg/l. At the highest concentration even small inhibitions were found.

Tryptamine, on the other hand, applied in the same concentrations increased the growth rate in the highest concentration.

These results with tryptophane and tryptamine confirm those of THIMANN & GROCHOWSKA (1968) qualitatively and quantitatively, and therefore support their idea that tryptamine, not tryptophane, is the precursor of IAA in the *Avena* coleoptile.

Although sucrose and glucose did not influence the beginning of the geotropic reaction, the latter substance always retarded the development of the curvature (see figure). The cause of this phenomenon is being investigated.



Influence of tryptamine and glucose on the development of the geotropic curvature after the regeneration of the physiological tip.

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