

## Effect of indole-3-acetic acid on the tumor-like growth of soybean *in vitro*

by

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With 1 figure

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It has been well known for sometime that callus and tumor formation can be enhanced considerably by prolonged irritation with growth substances (BLOCH 1954); it may be desirable to examine the method in connection with sterile cultures. For this reason, the present investigation was undertaken.

100 cc. of modified White's agar medium was measured out into 250 cc. Erlenmeyer flasks to be used for embryo culture. Each flask was stoped with a cotton plug and autoclaved at 250° F for 20 minutes. Addition of different concentrations of indole-3-acetic acid to the nutrient media caused either stimulation or inhibition of soybean embryo *in vitro*.

Embryos of soybean (Monroe variety) were used for this study. The seeds were soaked 24 hours in sterile nutrient solution. Then the seed coats and the cotyledons were removed. The embryos were transferred to culture flasks. The cultures were kept in diffuse light in the laboratory for further observation.

When a very dilute solution of indole-3-acetic acid ( $10^{-9}$  or  $10^{-10}$  molar) was added in the media, the length of the primary roots and the numbers of lateral roots were increased in comparison with those of the control. However, higher concentration of indole-3-acetic acid ( $10^{-3}$  or  $10^{-4}$  molar) inhibited root elongation brought about tumor-like callus formation on the hypocotyl region (fig. 1 a). Callus formation could be observed with the naked eye after 10 days of culturing. Longitudinal and transverse sections of the tumor region were studied. The cortical parenchyma consists of giant cells. It is evident that the enlargement of the cortical parenchyma cells is caused by the treatment of indole-3-acetic acid and tumors are mainly due to the swelling, disrupting, and crushing of the cortical parenchyma. The phloem proliferated abundantly and vascular strands developed in this tissue (fig. 1 b). The yellow color of the tumor is due to suberization.

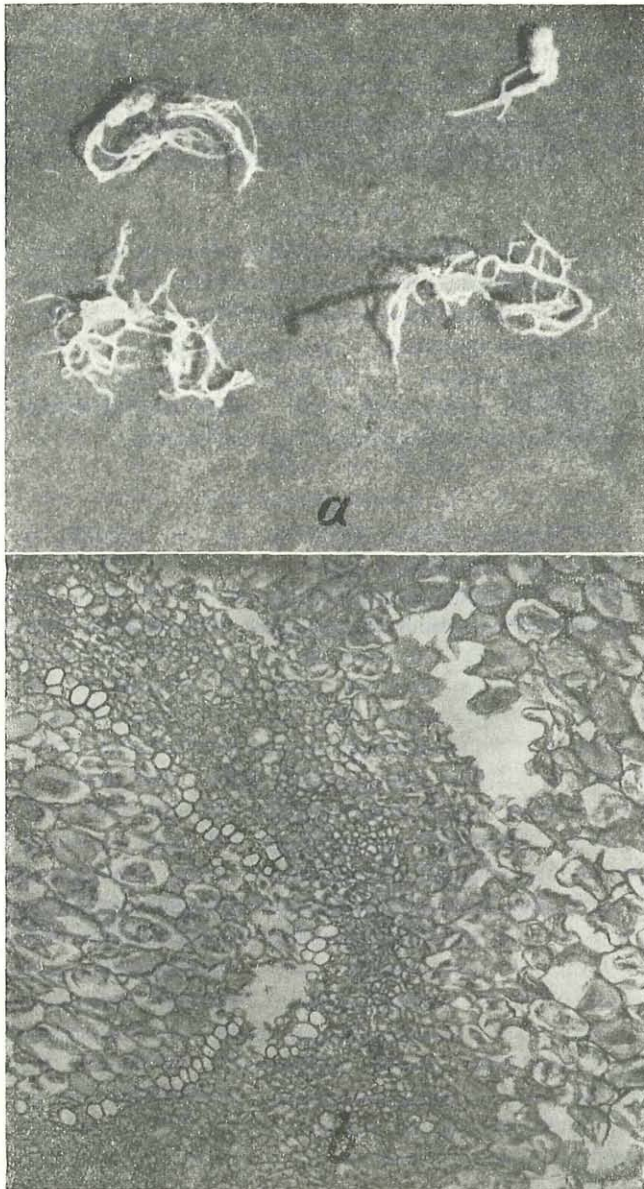


Fig. 1, a: Appearance of tumors after 4 weeks of soybean embryo growth in sterile culture with  $10^{-3}$  molar IAA. The tumorous masses were primarily derived from the hypocotyl region of the seedlings. — b: Transverse section of the tumor region to show the enlarged pith and cortical parenchyma cells and the crushed cortical parenchyma and the proliferated phloem in which the vascular strands developed.  $110\times$ .

The histological changes are different from those observed in soybean seedlings which were treated with 2, 4 — D (SUN 1955). It may be concluded that histological responses to different growth substances show a rather wide variety of patterns and the reactions generally have a significant relationship to the growth pattern of a given species.

#### S u m m a r y

Embryos of the Monroe variety of soybean were used for this study. The embryos were transferred to culture flasks with nutrient media. Addition of higher concentration of indole-3-acetic acid ( $10^{-3}$  or  $10^{-4}$  molar) to the nutrient media inhibited root elongation and brought about tumor-like callus formation on the hypocotyl region. The cortical parenchyma consists of giant cells. The phloem cells proliferated abundantly and vascular strands developed in this tissue.

#### L i t e r a t u r e c i t e d

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Zeitschrift/Journal: [Phyton, Annales Rei Botanicae, Horn](#)

Jahr/Year: 1958

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