Estimation of Diffusible Auxin Under Saline Growth Conditions

Of all the chemical substances that plants may encounter in their external environments, none impairs or inhibit their growth on so large a scale as salt[1]. Studies from various aspects have been reported in the literature, but the influence of salinity on auxin physiology has mostly remained unexplored. Though the effect of sodium salinity on auxin transport has recently been reported[2], we still do not know its effect on the diffusible auxin. The present studies were, therefore, undertaken to estimate the amount of diffusible auxin recovered from *Zea mays* L., coleoptile tips, raised under saline conditions.

Seeds of *Zea mays* L. (Orla-266) were thoroughly washed and soaked for 5 h in tap water and NaCl solution (0.4% w/v in tap water) and planted on 0.75% agar, prepared in the respective solutions, in medium-sized beakers, which were then covered. The seedlings were raised in complete darkness for 94 h, except for 4 h beginning at 48 h, when they were exposed to red light to suppress mesocotyl growth.

Tips, 5.0 mm in length, were removed from 94 h coleoptiles. Four tips were grouped and placed on a 1.5% agar block ($11 \times 8 \times 1$ mm) in replicate assemblies for a diffusion time of 2.0 h. After diffusion the tips were discarded and the blocks were kept at 4 °C in a water-saturated atmosphere for the next 24 h, and then assayed by the standard Avena curvature test (*Avena sativa* L. cv. Victory). These experiments were repeated 3 times on different days with essentially similar results. The temperature throughout was maintained at 25 ± 1 °C and only green safelight[3] was used for manipulations. Statistical evaluation of the data was made by Student's *t*-test.

The seedlings raised under saline growth conditions were smaller, as compared to the control, confirming the earlier finding[2]. Also from the results of the *Avena* curvature bio-assay (Table) it can be observed that salinity treatment significantly reduced the curvature response, thus indicating a reduction in the amount of diffusible auxin recovered from the treated seedlings. It has also been reported[2] that salinity did not affect either the polarity or the amount of auxin transported through *Zea* coleoptile segments. Therefore, it can be concluded from the present studies that salinity reduced the amount of diffusible auxin rather than its transport, which in turn inhibited the growth. This reduction may have been a direct effect of salinity or an indirect one, i.e. through reduction in the supply of cytokinins[4,5] which in turn influences the amount of diffusible auxin recovered[6]. Further studies to delineate the role of salinity and cytokinins are in progress.

Zusammenfassung. Der Auxingehalt von Koleoptilenspitzen von *Zea mays* L.-Keimlingen wird durch saline Wachstumsbedingungen herabgesetzt.

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Effect of salinity on the 'diffusible' auxin of the *Zea mays* L. coleoptile tips

Treatments	Mean curvature degrees ± S.E.
100 µg/l IAA	21.88 ± 0.52
Control	15.38 ± 0.32
Salinity	11.13 ± 0.40

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[7] Part of the work supported by a grant from USDA under the PL-480 research programme.

Electron Microscope Studies on the Dissociation of Actomyosin by Pyrophosphate

Glycerol-extracted muscle fibres in the rigor state relax if Mg-pyrophosphate (Mg-PP) is added to the bathing solution[1,2]. Biochemical studies demonstrated a dissociation of the actomyosin complex by Mg-PP at high ionic strength[3,4] and suggested that the contractile proteins of the Mg-PP relaxed fibres are likewise dissociated into actin and myosin. However, the interpretation of these findings is complicated in the light of mechanical experiments: the stiffness of Mg-PP relaxed fibres is comparable to that of rigor muscle if the fibres are stretched by applying small amplitude sinusoidal length changes at frequencies above 1 Hz[5]. In correspondence with these apparently contradictary results, electron microscope, optical[6] and X-ray[7] diffraction studies of Mg-PP relaxed fibres seem to combine characteristics of both the ATP-relaxed and the rigor state.

HUXLEY[8] demonstrated that shearing forces disintegrate myofibrils into separate actin and myosin filaments if relaxing conditions (presence of ATP, absence of Ca^{++}) are maintained during homogenization. Likewise it should be possible to isolate single filaments if the ATP of the homogenization solution is replaced by PP or nonsplittable ATP-analogs, e.g. β, γ-imino-ATP (AMPPNP)[9], which are thought to imitate only the plasticizing action of ATP produced by dissociation of actomyosin. Conversely the presence or absence of single filaments after the homogenization of myofibrils in such

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