Auxins and Rooting of Cuttings

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This article sums up research on rooting of cuttings, and the role of exogenously-supplied IBA and IAA in this process.

Cuttings of *Leucadendron discolor* were incubated with ^{3}H-IBA. It was found that more free IBA was accumulated in bases of cuttings of easy-to-root (ER) cultivar and more conjugated IBA was found in leaves of cuttings of difficult-to-root (DR) cultivar. The conjugate was identified tentatively as IBA-glucose. Both cultivars metabolized IBA rapidly to that conjugate, but ER can probably also hydrolyze the conjugate to free IBA in the base of the cuttings and promote rooting. *Petunia hybrida* cell suspensions were used to study auxin uptake and metabolism. The uptake of ^{3}H-IBA was much higher than that of ^{3}H-IAA. But while the uptake of IBA plateaued after 2 h, IAA uptake continued to increase, causing the percent uptake of the auxins after 24 h to become very close (62% and 46% for IBA and IAA, respectively). Incubation with unlabeled auxins gave similar results.

IBA was metabolized rapidly in Petunia cells to two new compounds, that were identified tentatively as IBA-glucose and IBA-aspartate. By using autofluorography, we were able to show that IBA-glucose was synthesized first, and with time was converted to IBA-aspartate. IBA was also converted rapidly in the medium to a new compound - probably IBA aspartate. The fast metabolism of IBA in the medium suggests that the reaction took place on the cell surface. Whole living cells, aerobic conditions, and biological temperatures were needed for the reaction to take place. IAA was also metabolized rapidly to two new compounds, that were not identified. The metabolism rate was slower than that of IBA. ER and DR plantlets of cherry *(Prunus avium)* were incubated in sterile medium with ^{3}H-IBA. Most of the absorbed label was found in the bases of both cultivars. IBA was metabolized rapidly in the cuttings to a metabolite, that was identified tentatively as IBA-glucose. Autofluorography showed that in the ER cuttings, free IBA was still present after 1 d, disappeared after 2 d, and reappeared after 4 d. No IBA was found in DR cuttings after 1 d. It is possible that the ER cultivar - and not the DR cultivar - possesses the enzymes that hydrolyze the conjugate to free IBA during the appropriate phase of root initiation, thereby promoting the rooting process.

Treatment of mung bean cuttings with IBA resulted in rooting and at the same

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triggers a cascade of reactions that culminates in root formation.

Key words: Auxin conjugates, auxin metabolism, auxin uptake, difficult-to-root, IAA, IBA.