

Studies on Bound Gibberellins

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Mature pea seeds contain relatively high amounts of bound gibberellins. To elucidate the formation of these gibberellins during seed development and their fate during subsequent germination, labeled gibberellin A₁ was injected into excised pea pods, ca. 13 to 16 days after anthesis. After being excised and injected, the fruits were grown in sterile culture. Immature seeds harvested 2, 4 and 8 days after injection, mature seeds, and shoots, roots and cotyledons of seedlings derived from treated seeds and harvested at different time intervals after germination, were analysed for labeled gibberellin A₁ and its conversion products.

The labeled GA₁ was partly converted to two compounds with little biological activity. An increasing part of the GA₁ and of its conversion products appeared in a bound form which could be partially converted back to GA₁ and its conversion products by means of mild acid hydrolysis.

The results so far obtained with germinating peas provide evidence that at least part of the bound gibberellins present in the seeds is mobilized during germination, since the ratio between free and bound gibberellins increased shortly after germination in the cotyledons and both GA₁ and its conversion products were found at rather high activities in the shoots of the seedlings.

When pea seeds were soaked for 24 hours in either water or AMO-1618, an inhibitor of gibberellin biosynthesis, (250 mg/l) there was no difference in the growth rate of the seedlings in the first three days. However, from the fourth day after germination onwards shoot growth was increasingly reduced in the seedlings from the AMO-treated seeds. It can therefore be concluded that early germination is independent from new GA synthesis, very likely because the necessary gibberellin is released from the bound form.

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