

Title A comparison between intact fruit and fruit explants to study the effect of polyamines and aminoethoxyvinylglycine (AVG) on fruit ripening in peach and nectarine (*Prunus persica* L. Batch)

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Abstract

In order to establish whether *in vitro* model systems are suitable to study the reciprocal relationships between ethylene and polyamines (PAs) in peach fruit, whole detached fruit and fruit explants from “Redhaven” peaches and “Stark Red Gold” nectarines at two different ripening stages were subjected to *in vitro* treatments with 10 mM putrescine (Pu), 1 mM spermidine (Sd) or 0.32 mM aminoethoxyvinylglycine (AVG) in the presence or in the absence of labelled Pu or methionine. Labelled Pu uptake studies showed that, in the short-term, much more label was recovered in intact nectarines than in peaches. In fact, in the former, ethylene production was strongly impaired by Pu and Sd at both stages, while it was substantially unaffected in the latter. In treated fruit, flesh firmness, soluble solids content and fresh weight were only sporadically affected. Under the same experimental conditions, AVG almost totally inhibited ethylene production although fruit quality was practically unaltered. In explants obtained from fruit at the firmer ripening stage, Pu and Sd did not alter and even enhanced methionine incorporation into ethylene, while in those from softer fruit only Sd was able to counteract ethylene biosynthesis. Also in this case, AVG dramatically reduced ethylene biosynthesis. Short-term treatments of fruit explants showed that only Sd and AVG counteracted ripening. Comparing results from intact fruit and fruit explants indicates that Pu and Sd exert a differential effect on ethylene and fruit quality, depending upon ripening stage and cultivar.