ratios) were not decreased in either type of graft (table). Thus the qualitative SR characteristics in SOL grafts were not different from those typical of slow-twitch SOL muscles. Assuming the qualitative properties of the SR are similar in both types of grafts, the quantity of SR per unit of muscle protein must also be the same in nerve-intact and standard grafts. Since nerve-intact grafts have fewer but larger fibers per mg of muscle protein, the quantity of SR would appear to be more closely related to muscle protein concentration rather than the concentration of fibers.

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Stimulatory effect of methyl jasmonate on the ethylene production in tomato fruits

M. Saniewski[1] and J. Czapski

Department of Plant Physiology, Research Institute of Pomology and Floriculture, Pomologiczna 18, 96-100 Skierniewice (Poland), and Department of Food Science, Institute of Vegetable Crops, 22 Lipca 3/5, 96-100 Skierniewice (Poland), 21 November 1983

Summary. Methyl jasmonate at a concentration of 0.5% in lanolin paste was applied to detached mature green and red ripe tomatoes cv. Tempo. One to 10 days after treatment, slices were cut at a depth of about 2 mm for ethylene determination. It was found that methyl jasmonate strongly stimulated ethylene production both in green and red fruits, production was about 1.6 to 7.9 times higher than in control tissue.

Key words. Tomato; *Lycopersicon esculentum;* methyl jasmonate; ethylene production.

Methyl jasmonate (JA-Me) or jasmonic acid have been identified in many plants[2-8] and were found to be powerful promotors of leaf senescence[8-11]. Saniewski and Czapski[12] showed that methyl jasmonate almost totally inhibited lycopene accumulation and stimulated β-carotene accumulation during the ripening of tomatoes. Recently Edwards et al.[13] found that inhibitors of ethylene biosynthesis – aminoethoxyvinylglycine (AVG), aminooxyacetic acid (AOA), and α-aminoisobutyric acid (AIBA) – inhibited lycopene and ethylene biosynthesis in 1.5 cm disks of excised pericarp tissue of tomato cv. Michigan Ohio Hybrid. Application of external ethylene promoted normal lycopene synthesis but did not stimulate ethylene synthesis. The authors suggest that ethylene production is not essential for lycopene synthesis in tomato fruit. The aim of this work was to study the effect of methyl jasmonate, which inhibits lycopene accumulation, on the ethylene production in tomato fruits.

Materials and methods. Mature green and ripe tomatoes, *Lycopersicon esculentum* Mill. cv. Tempo, grown in a garden frame and picked on September 9–27, 1983 were used. Five to 10 fruits were treated with (±) -methyl jasmonate at a concentration of 0.5% (w/w) in lanolin paste (prepared by mixing lanolin with ⅓k part of distilled water). This was applied on one side of the fruit over an area 2.5 cm^2. The other side was treated with lanolin paste without JA-Me as a control. In the course of the experiment, fruits were kept at room temperature (about 20°C) in natural light conditions. After 1–10 days from the beginning of the treatment samples were cut off at a depth of 2 mm and used for determination of ethylene production. Slices, ranging from 150 to 350 mg, were placed in 10-ml glass vials and sealed tightly. After 1–3 h 0.5-ml gas samples were withdrawn and analyzed by gas chromatography. Ethylene production is expressed in nl of ethylene per g of fresh tissue per h. There were 5–7 replications for each treatment and all experiments were repeated 3–5 times. Differences among means were evaluated using the test of Dean and Dixon[14].

Results and discussion. Methyl jasmonate applied to detached mature green tomatoes caused the formation of a yellow colored epidermis and pericarp at a depth of 2 mm at the place of treatment, as observed previously[12].

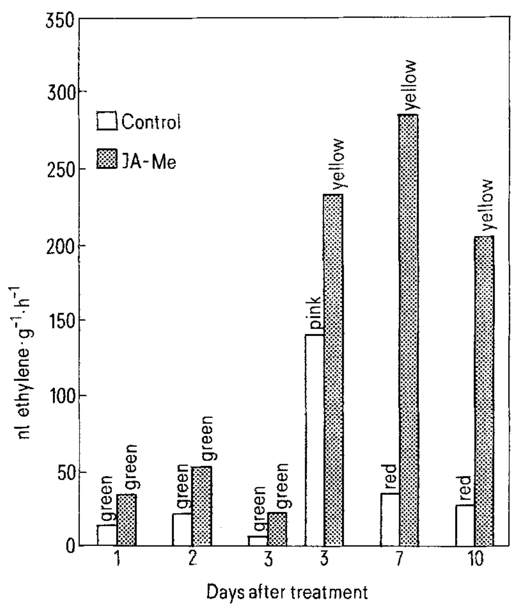

Figure 1. The effect of methyl jasmonate on ethylene production from slices from tomato fruits. Treatments were made on green mature fruits starting on day 0. Each bar represents the means for that particular day of measurement. LSD 1% values are as follows; day 3, 12.4 (green); day 7, 130.1; day 10, 145.3. LSD 5% values are as follows; day 1, 17.2; day 2, 30.2; and day 3 (pink, yellow), 76.2.

Ethylene production by slices was much higher in both green and red fruits treated with JA-Me than that of controls over a period of 1–10 days (figs 1 and 2). The effect of JA-Me on the ethylene production after 1 or 2 days is much more pronounced for red-ripe fruits (fig. 2) than for green ones (fig. 1). A rapid increase of ethylene production can be observed for both treated and control tissue on day 3, when the color of tissues turned pink (control) or yellow (treated with JA-Me) (fig. 1). On days 7–10 ethylene production decreased in control tissues while at the same time it remained almost at a steady level in treated ones (fig. 1).

Ethylene production by green fruits at different times after JA-Me treatment was about 1.6–7.9 times higher than by control tissues (fig. 1). Initially, treatment of red ripe fruits with methyl jasmonate accelerated ethylene production about 9 times compared to control tissues (fig. 2). However, on day 8 ethylene synthesis decreased in treated and control tissue about 3 times as compared to 1 day but differences between treatments remained at a similar level (fig. 2). The inhibitory effect of methyl jasmonate on lycopene accumulation[12] and the stimulatory effect on ethylene evolution in tomatoes indicates that ethylene production is not essential for lycopene synthesis. It is possible that methyl jasmonate blocks a physiological action of ethylene in processes connected with lycopene synthesis. Until now the presence of jasmonic acid or methyl jasmonate in tomato plants has not been reported.

Ethylene biosynthesis in tomatoes occurs via the normal pathway of methionine to S-adenosyl-methionine to 1-aminocyclopropane-1-carboxylic acid (ACC) to ethylene[15–18].

The mechanism of the strong stimulatory effect of methyl jasmonate on ethylene production in tomatoes remains unknown. Detailed study of the effect of JA-Me on ethylene production in intact fruits as well as the level of ACC and the effect of ethylene biosynthesis inhibitors on ethylene production after methyl jasmonate treatments will be undertaken.

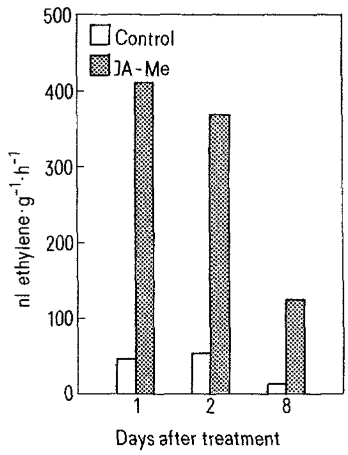

Figure 2. The effect of methyl jasmonate on ethylene production from slices from tomato fruits. Treatments were applied on red ripe fruits starting on day 0. Each bar represents means for that particular day of measurement. LSD 1% value are as follows; day 1, 149.1; day 2, 236.4; day 8, 97.6.

1 Acknowledgments. We wish to thank Dr E. Demole, Firmenich SA, Geneva, Switzerland, for the gift of authentic (±) -methyl jasmonate and Mrs H. Sas for her excellent technical assistance.

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Canavanine in alfalfa *(Medicago sativa)*

S. Natelson

University of Tennessee, Institute of Agriculture, Department of Environmental Practice, College of Veterinary Medicine, P.O. Box 1071, Knoxville (Tennessee 37901, USA), 19 February 1983

Summary. Canavanine was extracted and characterized from various cultivars of alfalfa seed. Values obtained range from 8 g/kg for the Buffalo variety to 14–20 g/kg for the highly weevil resistant variety, Weevl-Chek.
Key words. Alfalfa; *Medicago sativa;* canavanine.

A color reaction between histidine and the pentacyanoferrate reagent, at neutral pH was reported in this journal, recently[1]. This reaction has been used in the past for the identification of canavanine[2–4]. In that paper, claim was made that the color reaction, with alfalfa extract, with the pentacyanoferrate reagent was due to its content of histidine and not canavanine. In reporting a fluorimetric method for canavanine assay, the method was applied to seeds, stems and roots of various cultivars of alfalfa *(Medicago sativa)*[5]. Contrary to the assertion of the author, in the recent paper cited[1], large amounts of canavanine were found in alfalfa seeds ranging from 8 to 16 g/kg. Much smaller amounts were found in the leaves and stems[6]. To explain these contradictions, canavanines were prepared from various cultivars of alfalfa seeds and their properties were compared to canavanine obtained from the jack bean *(Canavalia ensiformis)* and with histidine.