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The influence of methyl jasmonate and salicylic acid on the production of ginkgolides and bilobalide in cell suspension cultures of *G. biloba*

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Objective

Ginkgo biloba, the ginkgo tree, is the oldest living tree, with a long history of use in traditional Chinese medicine. In recent years, the leaf extracts have been widely sold as phytomedicine in Europe and as a dietary supplement worldwide. Effects of *G. biloba* extracts have been postulated to include improvement of memory, increased blood circulation, as well as beneficial effects to sufferers of Alzheimer's disease. The most unique components of the extracts are the terpene trilactones, that is, ginkgolides and bilobalide. Methyl jasmonate (MJ) is signalling molecules in biotic and abiotic stress. Salicylic acid (SA) has been reported to be involved in regulating a number of processes in plants. Therefore, we investigated on the effects of the methyl jasmonate and salicylic acid on the production of ginkgolides and bilobalide in cell suspension cultures of *G. biloba*.

Materials and Methods

1. Cell suspension culture: The cell suspension cultures of *G. biloba* were performed by inoculating 3 g of callus (F.W) into 20 ml MS liquid medium supplemented with 30 g/L sucrose and 3.5 mg/L NAA. Subcultures were every 4 weeks and cut and transferred into the same liquid medium.
2. MJ and SA preparation : MJ was sterilized by filter(0.2 μ m) and SA was sterilized by autoclaving.
3. Feeding: Each MJ and SA (final concentrations 0.01, 0.1, and 1.0 mM) were inoculated in suspension culture cultured for 2 weeks.
4. Analysis of ginkgolides and bilobalide content: The culture were harvested at 12, 24, and 48 hour intervals for a period of 48 hour weighted and quantified by HPLC.

Results and Discussion

MJ and SA treatments were increased ginkgolides and bilobalide production. However, optimal exposure time and concentration of MJ and SA was different following ginkgolide A, ginkgolide B and bilobalide. Ginkgolide B content was higher 8 times than that of control after 48 h at 0.1 mM MJ. Accumulation of bilobalide was enhanced 9 times compared with control after 12 h at 0.01 mM MJ. In case of SA feeding, ginkgolide B and bilobalide were positively affected at 0.1 mM SA, 12 h and 48 h, respectively. Ginkgolide B content was enhanced 9 times compared with control on the same time whereas bilobalide content was increased 5 times. Our results indicated that MJ or SA resulted in the increasing production of terpene trilactone, especially, ginkgolide B and bilobalide.

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