

Flavonoids and Antioxidative Enzymes in Temperature-Challenged Roots of *Scutellaria baicalensis* Georgi

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The active compounds in the roots of *Scutellaria baicalensis* Georgi, a traditional Chinese medicinal plant, are mainly flavonoids which have anti-inflammatory, antitumour, and anti-HIV activity, respectively. The increasing annual average temperature has rendered the *S. baicalensis* plants grown in some ancient producing regions no longer suitable for their medicinal usage. Hydrogen peroxide plays an important role in root responses to abnormal temperature in *S. baicalensis*. Baicalin and baicalein and antioxidative enzymes were anticipated to detoxify H_2O_2 in *S. baicalensis*. Here, we show that abnormal temperatures (10 and 40 °C) decreased the content of flavonoids as compared with the normal temperature (30 °C), and the transcripts of UDP-glucuronate:baicalein 7-*O*-glucuronosyltransferase and -glucuronidase involved in the interconversion between baicalin and baicalein were affected by the 40-°C treatment. High temperature also increased the activities of catalase and peroxidase. Reverse transcription-polymerase chain reaction (RT-PCR) analysis revealed that the transcript levels of peroxidase 2, peroxidase 3, monodehydroascorbate reductase 2, and dehydroascorbate reductase were significantly increased under high-temperature conditions. The respective genes would be candidates for improvement of the adaptation of *S. baicalensis* plants to abnormal temperatures and for regulation of the contents of the active compounds.

Key words: *Scutellaria baicalensis* Georgi, Abnormal Temperature, Active Compounds