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Flavones and flavonoids from wild *Aquilaria sinensis* leaves: *In vitro* bioactivities and *in vivo* regulation against impairment of the plant

Heru Chen and Maoxun Shang
Jinan University, China

Aquilaria sinensis is the famous traditional Chinese medicinal plant in Guangdong, south China. The well-known medicinal part is the resin from *Aquilaria sinensis*, which is the response of the plant against external impairment. Therefore, the formation of resin is an incidental and lengthy process. This makes the resin very scarce and cherish. However, *Aquilaria sinensis* leaves are abundant and reproducible. The current report focused on the isolation of flavones and flavonoids, the *in vitro* bioactivities, and *in vivo* regulation against external impairment of the plant. By applying means of solvent partition and various kinds of column chromatography including silica gel, Sephadex LH-20, C-18 reverse phase HPLC, and HSCCC, on the basis of physical properties and spectra evidences, 12 flavones and flavonoids have been identified. The scavenging effects on nitrite of these compounds were determined. Compound Y1 (mangiferin) and Y2 (2-O- α -L-rhamnopyranosyl-4, 6, 4'-trihydroxybenzo-phenone) were identified as the two most active compounds with scavenging rate $29.43\% \pm 0.74\%$ and $24.56\% \pm 0.77\%$ at the conditions of pH 3, 37, and 30 min duration, respectively. Furthermore, the *in vitro* cancer cell growth inhibition activities of 12 compounds were evaluated by MTT method, respectively. 7 of them were demonstrated good inhibitory activity against DU145, PC-3, and HepG2 cancer cell lines, respectively. It was indicated preliminarily that these compounds may be used as the candidates for developing anti-cancer drug. Most interestingly, as one secondary metabolite, injection of genkwanin with moderate concentration (0.5mM) exhibited significant protective effect against external mechanical and chemical injuries to *Aquilaria sinensis* plants. Five differential expressed proteins including Armadillo repeat-containing kinesin-like protein-1 (PT/ST promoter) and Tetrathionate response regulatory protein TtrR (TC/MG promoter) were identified using differential proteomics analysis method, and the regulation mechanism of genkwanin against the external impairments of *Aquilaria sinensis* plants has been demonstrated preliminarily. It is suggested that genkwanin play an important role in defense of external plant impairment.

Biography

Heru Chen has completed his PhD from the Hong Kong University of Science and Technology with Prof. Richard K Haynes as supervisor. He got his Post-doctoral training with Prof. Dr. Peter W. Schiller in the Clinical Research Institute of Montreal, Canada. Then he worked as a Visiting Scholar in Wuppertal University, Germany. Since March 2008, he has been a full-time Professor and Research Director in the Institute of Traditional Chinese Medicine and Natural Products, College of Pharmacy, Jinan University, China. He has published more than 80 papers in reputed journals and serving as Editorial Board Members of several reputed journals.

thrchen@jnu.edu.cn

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