

Antioxidant and anti-inflammatory activities of loquat (*Eriobotrya japonica*) tea

Phyu Phyu Khine Zar¹, Kozue Sakao², Fumio Hashimoto^{1,3}, Akiko Morishita², Makoto Fujii⁴, Koji Wada^{1,5} and De-Xing Hou^{1,2*}

¹Course of Biochemical Science and Technology, United Graduate School of Agricultural Sciences; ²Department of Biochemical Science and Technology; ³Department of Horticultural Science, Faculty of Agriculture, Kagoshima University, Kagoshima 890-0065, Japan; ⁴Totsukawa Noujou Ltd Co, Nejime, Kagoshima 893-2503, Japan; ⁵Faculty of Agriculture, University of the Ryukyus, Senbaru, Nishihara 1, Okinawa 903-0213, Japan

Corresponding author: Prof. De-Xing Hou, Faculty of Agriculture, Kagoshima University, Kagoshima 890-0065, Japan

Submission date: October 14, 2013; Acceptance date: November 24, 2013; Publication date: November 28, 2013

ABSTRACT

Background: Fresh loquat leaves contain several kinds of flavonoids and have been reported to have preventive effects against some human diseases such as diabetes, coughs and ulcers. Recently, fresh loquat leaves in Japan were processed to a beverage, called loquat tea, after the fresh leaves are roasted at 350°C for 30 minutes. However, the scientific evidence supporting the functions of these processed leaves is still minimal.

Objective: The aim of this study is to investigate the antioxidant and anti-inflammatory activities of roasted loquat tea extract (LTE) *in vitro* and in culture cells.

Methods: Bioactive fractions of LTE were separated by column chromatograph. Antioxidant activities were determined by DPPH and ROS assay. Pro-inflammatory mediators cyclooxygenase-2 (COX-2) and prostaglandin E₂ (PGE₂) were determined by Western blot and ELISA assay, respectively. Chemical quantification and characterization were analyzed by HPLC, FR-IR, and NMR. Phenolic content was measured by Folin-Ciocalteu assay.

Results: The results showed that loquat tea extract (LTE) possessed stronger DPPH scavenging activity than fresh. Cellular data revealed that LTE inhibited the production of reactive oxygen species (ROS), and further suppressed the production of COX-2 and PGE₂ in lipopolysaccharide (LPS)-activated RAW 264.7 cells. Chemical quantification and characterization data indicated that LTE contained new bioactive phenolic components that were produced from the roasting processes of fresh loquat leaves.

Conclusions: Loquat tea made from roasted loquat leaves contained new bioactive phenolic compounds that contribute to its antioxidant and anti-inflammatory activities.

Keywords: Loquat tea, Antioxidant activity, Anti-inflammatory activity, Chemical characterization