

Utilization study of stems and leaves of tienchi ginseng Evaluation of anti-hypertensive effects, toxicity, and safety of stems and leaves of tienchi ginseng

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Abstract

Tienchi ginseng tea (TGT) was prepared from the above-ground organs, stems and leaves, of Tienchi ginseng, which is a special product from China. Tienchi ginseng contains saponins as the main effective ingredient. In male stroke-prone spontaneously hypertensive rats, increases in systolic blood pressure (SBP) and diastolic blood pressure (DBP) were significantly inhibited by the consumption of 4% TGT solution in drinking water from a prehypertensive age (6 weeks of age). In contrast, intake of TGT had no effect on SBP or DBP in normotensive Wistar Kyoto rats. These results were evaluated using a telemetric system. Saponins were divided into two groups; the 20(s)-protopanaxadiol (PPD) group, including ginsenoside Rb₁, Rc, Rb₂, Rb₃, and Rd that show hypotensive effects, and the 20(s)-protopanaxatriol (PPT) group, including ginsenoside Rg₁ and Re that show the opposite effect to the PPD group. Furthermore, only PPD saponins were included in TGT, whereas both PPD and PPT saponins were present in the rhizome of Tienchi ginseng. Furthermore, an evaluation of safety using the Ames test and toxic potency using an acute toxicity test with the TGT extract revealed no gene mutagenicity, and the fatal dose was more than 2000 mg/kg. This study demonstrated that TGT has anti-hypertensive effects and provides better safety compared with the rhizome of Tienchi ginseng.

Keywords : tienchi ginseng, saponin, blood pressure, stroke-prone spontaneously hypertensive rat, telemetric system

I Introduction

Tienchi ginseng (*Panax notoginseng* (Burk.) F. H. Chen) is a special product from the province of Yunnan in China, and Tienchi ginseng cultivated in Bunzan prefecture has especially high quality. The rhizome of Tienchi ginseng is the main part used for herbal medicine, including for the treatment of tachycardia, cardiac angina, apoplexy, and atherosclerosis in clinical settings¹⁾. The above-ground organs, stems and leaves, are mostly discarded. This study examined the possibility of using only the stems and leaves of Tienchi ginseng as Tienchi ginseng tea (TGT). Saponins, the main

effective ingredients of Tienchi ginseng, are divided into two groups; the 20(s)-protopanaxadiol (PPD) group, including ginsenoside Rb₁ ((3 β ,12 β)-20-[(6-*O-D*-glucopyranosyl-*D*-glucopyranosyl) oxy]-12-hydroxydammaran-3-yl- β -*D*-glucopyranosyl- β -*D*-glucopyranoside) and ginsenoside Rd ((3 β ,12 β)-20-(*D*-glucopyranoxy)-12-hydroxydammar-24-en-3-yl 2-*O*- β -*D*-glucopyranosyl- β -*D*-glucopyranoside) that show hypotensive effects, and the 20(s)-protopanaxatriol (PPT) group, including ginsenoside Rg₁ ((3 β ,6 α ,12 β)-3,12-dihydroxydammar-24-ene-6,20-diyl bis- β -*D*-glucopyranoside) and ginsenoside Re ((3 β ,6 α ,12 β)-20-(*D*-glucopyranosyloxy)-3,12-dihydroxydammar-24-en-6-yl