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Biologically Active Substances in Buckwheat (*Fagopyrum tataricum* L.) Cultivated in Mongolia

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Abstract

From thoroughly air-dried samples of buckwheat plant, we revealed a biochemical composition of 14 components. By thin layer chromatography and quantitative analysis methods we showed that buckwheat has 7 kinds of alkaloids with one dominating alkaloid, and the total weight of all alkaloids equals 0.05%. We also determined the aboveground parts of buckwheat contain the following substances: rutin-3.14%, fat-0.91%, protein-8.23%, carbohydrate-18.52%, monosaccharide-0.37%, disaccharides-1.11%, vitamin C-0.02%, ash-10.57%, acidity-0.05, carotine-15.6mg, cellulose-40.8%, tannin-1.70%, soluble pectins-0.266%, insoluble pectins-0.507%, total amount of alkaloids-0.05%.

Key words: alkaloid, *Fagopyrum tataricum*, flavonoids, Mongolia, pectin, rutin, vitamin

Introduction

Buckwheat (*Fagopyrum tataricum* L.) is a common weed plant in Mongolia. It has been widely used in both Western and Eastern medicines for a long time. Water and spirit extracts of buckwheat have been used for treatment of diseases affecting bronchial and tracheal organs, typhus, vitamin P deficiency, and mechanical developmental problems. This plant contains iron, calcium, phosphorus, citric acid, P, B1 and B2 vitamins and rutin (Tsitsin & Anichkov, 1962). Butin is a flavone compound that is active in treatments for increased permeability and brittleness of capillaries; it can accelerate cell proliferations, and prevent the agglutination of blood cells. It can also enhance vitamin C accumulation and reduce blood fat and cholesterols in humans. Also, it may be very useful for the prevention and treatment of hypertension, arteriosclerosis and diabetes (Wang *et al*., 1995). Buckwheat seeds can be used for human food and livestock feed, especially in pasturelands where bees help disperse the seeds (Tserenbaljid, 2002).

Buckwheat belongs to the family Polygonaceae and is a cross-pollinated plant, and insects are the major pollinators. Buckwheat can be grown under different climatic conditions on a wide variety of soil types, and can be planted at almost any time during the growing season (Taylor, 2004). Buckwheat is an annual herb, 15-70 cm in height, with erect stems branched, with longitudinal striations and 3-8 cm long triangular shaped leaves.

Most of higher plants contain a characteristic pattern of flavone and flavonol glycosides in their leaf or flower, and these substances are ideal taxonomic markers which can be used for plant taxonomy, hybridization or phytogeography (Wang *et al*., 1995). The term 'phenolic compound' embraces a wide range of plant substances which possess an aromatic ring bearing one or more hydroxyl constituents in common. Phenolic substances tend to be water-soluble, since they frequently occur combined with sugar as glycosides, and are usually located in the cell vacuole. The majority of phenolic compounds (especially flavonoids) can be detected on chromatograms by their fluorescence in UV light, the colors being intensified or changed by fuming the papers with ammonia vapor. Because phenolic pigments are visibly colored they are particularly easily monitored during their isolation and purification (Wang *et al*., 1995). Phenolic compounds are all aromatic, so they show intense absorption in the UV region of the spectrum (Harborne, 1976).

Flavonoids are structurally derived from the parent flavone substance, and are mainly water soluble compounds. They can be extracted with

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