

## Seasonal Variation of Some Bioactive Compounds and Physiological Characteristics in Peony (*Paeonia lactiflora* Pall.)

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### Abstract

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We determined the phenolic and total flavonoid contents and some physiological characteristics (water potential, chlorophyll fluorescence, chlorophyll index) of *Paeonia lactiflora* Pall., growing in the Botanical Garden, Mongolian Academy of Sciences. Cultivated plants were harvested at the beginning of vegetation (May), flowering (June), seed formation (July), seed dispersal (August) and end of vegetation season (September). Phenolic content in leaf and stem was increased during the vegetation period and the highest level was reached during the seed formation stage, and it decreased at the end of the vegetation stage. On the contrary, the total flavonoid content in leaf and stem is decreased linearly as the development stages advanced and the highest level was observed at the flowering stage. Variations of water potential, chlorophyll fluorescence and chlorophyll index of cultivated *P. lactiflora*, increase at the beginning of vegetation and flowering stages, and decrease from seed formation stage to end of the vegetation stage.

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### Introduction

There are 116 tribes, 674 categories and 3014 species of vascular plants, of which 53 endangered species and 81 species of rare plants in Mongolia (Red Book of Mongolia, 2013). Among them 1,000 species of plants, which considered as essential ingredients in medicine (Ligaa, 2015).

*Paeonia lactiflora* is a herbaceous perennial of the family Ranunculaceae, and widely distributed in Russia, Mongolia, Korea, Japan and China. In Mongolia, it occurs in Mongol Daguur and Khyangan regions (Grubov, 1986). This plant is recorded in the List of Very Rare Plants of Mongolia and it is also included in the

Mongolian Red Data Book, with very rare status. *Paeonia lactiflora* was known as the white peony (*P. albiflora*) when it first introduced into Europe. It has been brought to England in the mid of 18th century, and is the parent of most modern varieties. There are many colors now available from pure milk white to pink, rose, and near red along with single to fully double forms. They are prolific bloomers, and have become the main source of peonies for the cut flower business (Josef *et al.*, 2004).

The genus *Paeonia* has received considerable interest from scientists, as it contains the root