



Phenological variations of primary biochemicals in male and female plants of *Hippophae salicifolia* D. Don

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Abstract

Dioecious nature of a plant shows variations in male and female individuals of that species, due to their differential role in sexual reproduction. So it is evident for them to have different metabolite stock in various stages of their life. *Hippophae salicifolia* D. Don. is a deciduous and dioecious plant species with its immense livelihood, health, and ecological potential. Focussing on the dioecious nature of this plant species male and female individuals of the *H. salicifolia* were screened for primary metabolite contents viz. Total soluble protein content (TSPC), total free amino acid content (TFAAC) and Carbohydrates (total soluble sugars content-TSSC and total soluble starch content-TSSStC) content in different growing seasons of the year. For this leaves and buds of male and female plants were selected during active and dormant seasons respectively. Variations were observed in primary metabolites in all studied months in leaves and buds of the male and female plant. TSSC in female leaves was lower in May and July whereas it was higher in September and November than male leaves. TSPC were found higher in male leaves than female leaves in all observed month except November. TFAAC in male was most elevated in September whereas it was highest in November in female leaves. Carbohydrate, protein and free amino acid contents were found higher in winter buds which help the plants to cope up with the harsh and chilled winter conditions. During dormancy releasing period, buds showed higher TSSC, lower TSSStC, higher TSPC, and lower TFAAC.

Keywords *Hippophae salicifolia* · Dioecious · Total soluble protein content · Total free amino acid content · Carbohydrates content · Seasonal changes

Abbreviations

HAPPRC	High Altitude Plant Physiology Research Centre
BSA	Bovine serum albumin
TSPC	Total soluble protein content
TFAAC	Total free amino acid content
TSSC	Total soluble sugar content
TSSStC	Total soluble starch content

Introduction

The plant kingdom diversified in the either monoecious or dioecious system for sexual reproduction. About 157 families of flowering plants, which comprise approximately 6% of the 240,000 angiosperm species, were reported to be dioecious (Ming et al. 2007). Cepeda-Cornejo and Dirzo (2010) stated the importance of dioecious plants as providing an outstanding opportunity to examining the trade-offs in resource allocation related to plant sexual reproduction. Male and female sexes in a dioecious species not only differ in reproductive or sexual characteristics but also showed wide range of differences in vegetative traits which is termed as secondary sexual dimorphism (Juvany and Munné-Bosch 2015). Male and female individuals of a dioecious species play different roles in their reproductive biology. A male has to produce pollens, and female spent their resources on developing fruits and seeds, which enforced to male and female individuals of a dioecious species to differ in terms of life

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