



Seabuckthorn (*Hippophae salicifolia*) Leaves, a Good Source of Natural Antioxidant Compounds

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Abstract *Hippophae salicifolia* is a popularized important hardy deciduous shrub of the Indian Himalaya and under utilization as a supplement of food, traditional and folk medicine system. The study was focused on quantification of biochemical attributes of leaves collected from male and female plant species by using diverse polarity solvents. Results revealed a significant variation ($p < 0.05$) in the analyzed parameters among solvent systems, and diverse concentration of the analyzed parameters were recorded. The leaves of female plants exhibited potential sources of diverse bioactive constituents (i.e., phenolics 67.39 mg GAE/g and antioxidants (SOD 92.69; FRAP 0.51; DPPH 85.12 mM AAE/100 g dry weight), and ethanol solvent was recorded best followed by acetone and aqueous, respectively. This is the first attempt which highlighted the biochemical attributes of the leaves and reported that leaves of female plants are rich sources of bioactive constituents and can be utilized for food supplement in the form of green tea or other natural health benefit products, which will be useful for reducing the deficiency of malnutrition and generate employment opportunities for local populace of high-altitude villages of Himalaya.

Keywords Seabuckthorn · *Hippophae salicifolia* · Male–female · Antioxidant · Solvent · Himalaya

Significant Statement

H. salicifolia has emerged as natural source of antioxidants. The leaves should be utilized for preparation of green tea and other foodstuffs which will be helpful for reducing the deficiency of malnutrition.

Hippophae salicifolia D.Don (family Elaeagnaceae) is popularized as Seabuckthorn an important hardy deciduous shrub, environmentally and economically vital species of the Himalayan region. A total of seven species are reported worldwide, in which *H. rhamnoides*, *H. salicifolia* and *H. tibetana* are predominantly grown naturally in northwestern (Himachal Pradesh, Uttarakhand and Jammu & Kashmir) and northeastern (Sikkim and Arunachal Pradesh) Himalaya, India [1–3]. Their yellowish-orange berries are consumed to meet their food supplements by the rural populace of Himalaya, while the available literature indicated that very limited information is available till date [3–5], and targeted species is not completely explored. Leaves possess lipophilic antioxidants such as tocopherol, plastochromanol-8, carotenoids and other compounds like flavonol glucosides, ellagitannins and phenolic acids quercetin-3-O-galactoside, quercetin-3-O-glucoside, kaempferol and isorhamnetin, etc. [6]. The species is dioecious, and secondary sexual dimorphism existed in the leaves in morphological, physiological and biochemical characteristics [7]. Female leaves are larger and have more trichomes than the male leaves [8]. Therefore, considering the above facts, the present investigation is focused to quantify the biochemical attributes of leaves portion using various solvent systems, which can be useful for reducing the deficiency of malnutrition of Himalayan communities as well as generate employment opportunities in the rural region of Himalaya.

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