



Impact of silver nitrate on the survival and regeneration potential of explants of *Hippophae salicifolia* (Seabuckthorn) D. Don

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ABSTRACT

Hippophae salicifolia D. Don is an important plant of manifold benefits ranges from ecological refurbishment to socioeconomic development in their growing provinces. *In vitro* propagation practices in *H. salicifolia* hindered by various obstacles, among them explant necrosis or mortality is most important, especially when mature plants are the source for explants and in that case ethylene production by explants was supposed to be the main culprit. In this study, full strength Woody Plant medium with various hormonal combinations fortified with different silver nitrate/ AgNO_3 concentrations of 0.5, 1.0, 1.5, 2.0 mg/L utilized to assess the impact of AgNO_3 on survival and other developmental parameters in *H. salicifolia* mature and seedling explants. Silver nitrate efficiently controlled necrosis and reduced the explant mortality in the culture by enhancing survival percentages of the explants to the $80 \pm 1.00\%$ in mature explants and $96 \pm 0.45\%$ in seedling explants with supplementation of 2 mg/L in hormonal combination i.e., 15.0 mg/L BAP + 5.0 mg/L IAA + 2.0 mg/L GA3. Silver nitrate significantly influenced the development of average shoot numbers in seedling explants with highest average shoot number 53.4 ± 2.70 at 2 mg/L AgNO_3 supplementation with hormonal combination 15.0 mg/L BAP + 5.0 mg/L IAA + 2.0 mg/L GA3, although shoot regeneration from mature explant remained modest to AgNO_3 supplementations. *In vitro* generated shoots grown in media supplemented with silver nitrate when subjected for rooting, they failed to induce roots in rooting media.

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1. Introduction

Hippophae salicifolia D. Don., commonly known as Seabuckthorn, a highly valuable plant species of high altitude distributed from temperate to subalpine Himalaya. Its fragmented habitats dispensed in Euro-Asia, mainly in the Central- East Asia, viz., Pakistan, Nepal, and India between 2000 and 3600 m above mean sea level [1]. In Indian context, it is distributed in different states of the

country including Himachal Pradesh, Uttarakhand and Sikkim in North, while Arunachal Pradesh in North East [2]. The species prefers low humidity, wet landslips, and riversides to grow better and also in arid and wet conditions [3,4]. The species also showed stress tolerance effects in terms of temperature, moisture, high soil pH, and salinity [5–7]. *H. salicifolia* is a small thorny, deciduous and dioecious tree species with a very high ecological significance due to its robust nitrogen-fixing rooting system that's have a crucial function in soil and water preservation, regulating desertification, land reclamation, reforestation, and wildlife habitats establishment in its growth regimes [3]. The leaves, fruits, seeds, roots, bark and thorn has been traditionally used in different aspects. Fruits of the plant are rich in organic acid, amino acids, necessary fatty acids, phytosterols, flavonoids, vitamins and minerals [8]. This species is a rich source of antioxidants [9–11] and other biological

Abbreviations: ASN, Average Shoot Number; PGRs, Plant growth regulators; HC, Hormonal combinations; SNC, Silver Nitrate Concentrations.

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