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RESEARCH ARTICLE

Induction and maintenance of callus cultures in *Bunium persicum* boiss

■ **R.K. SHARMA**

SUMMARY

Best callus initiation was achieved on MS medium supplemented with 2 mgl^{-1} 2,4-D and 4 mg l^{-1} Kn. Petiole measuring 1cm was the most suitable explants for callus formation. 2,4-D was the most suitable auxin for callus growth. Maximum callus growth was achieved on MS medium supplemented with 2 mgl^{-1} 2,4-D and 4 mg l^{-1} Kn. The growth rate of callus on this medium registered a 17 fold increase in four weeks of culture.

Key Words **:** Callus initiation, *Bunium persicum* boiss, Callus cultures

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Bunium persicum (Apiaceae) is a native plant of limited zones of the west Asia and grows as herbaceous plant in dry temperate region of Jammu and Kashmir, Himachal Pradesh and Uttar Pradesh (1800-3300 m). Seed is used as a prized condiment for flavoring dishes and as a carminative in ayurvedic medicines. Volatile constituents of seed: γ-terpinene, cuminaldehyde , ρ-cymene and α-methyl-benzenemethanol are major compounds. Production of this plant is limited due to seed dormancy and several biotic stresses of which wilt diseases are the most serious. Only cold treatments are effective in seed germination. Other treatments such as gibberlic acid, cytokinin, potassium nitrate, washing and light treatments are not useful (Bonianpoor, 1995). Generally *Umbeliferae* species including *Bunium persicum* have antimicrobial properties (Shetty *et al.,* 1994). Potential genetic variability for conventional breeding is limited in *Bunium persicum In vitro* plant regeneration *via* somatic embryogenesis has been achieved from callus derived from mericarp (Wakhlu *et al.*, 1990). The present study was undertaken to establish protocol for callus formation so that the protocol can be useful for the production of various secondary metabolites from callus cultures.

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MATERIALS AND METHODS

Petiole excised from mature plants growing in Bhadarwah (1613 m altitude) Jammu, India were used as explants. They were surface sterilized in 70 per cent ethanol for 30 sec. followed by 0.1 per cent $HgCl_2$ for 2 min and rinsed 4-5 times with sterilized distilled water. MS medium fortified with varying concentrations of 2,4-D, IBA,NAA,BAP and Kn either singly or in combination were used.

Callus initiation was assessed visually using scale of 1-4 (small to largest). Small-"0" was given when no callus was formed. Callus index was calculated as:

$$\textbf{Callus index} = \frac{nXG}{N} x100$$

where n- total number of explants forming callus, G-average callus rating on explants and N- total number of explants cultured. Callus growth was determined by measuring fresh weight after 4 weeks of culture. The growth rate was expressed as the ratio of increase in fresh weight (FW) to initial FW (400 mg per callus piece). The effect of various concentrations of auxins and Kn used for assessing callus growth. Five callus pieces (400mg FW) per treatment were