

## ABSTRACT

The present study deals with antioxidant, antimicrobial, anticancer, anti-inflammatory and wound healing potential of tannins extracted from plant tissue and callus culture extracts of *Achyranthes aspera*, *Ipomoea hederacea* and *Ocimum basilicum*. Callus cultures derived from seedling parts may be as effective source of tannins as seedling parts. Seed germination of selected plants under aseptic conditions was achieved using different treatments. Osmopriming showed significant impact in terms of maximum seedling length i.e. 6.8 cm recorded in *I. hederacea* with treatment of 1.5% KNO<sub>3</sub> as compared to hydropriming treatment with seedling length of 6.49 cm. In callus induction of *A. aspera*, *I. hederacea*, *O. basilicum* from leaf, stem and root explants, the optimization was achieved with combinations of NAA + BAP, 2,4-D + BAP, NAA+BAP in MS medium. All the extracts of callus cultures and seedling plant tissues possessed varied amount of tannins with respect to PGR combinations. Leaf callus culture of *O. basilicum* developed on medium MSDK showed more amount of tannins than any other callus culture extract. The lowest tannin content was found in petroleum ether extract of root callus culture on medium MSNK of *I. hederacea*. Effect of different treatment durations of UVC exposure and Sodium Azide induced maximum tannin content in leaf callus culture (MSDK) extract of *O. basilicum* followed by leaf callus culture extract (MSNB) of *A. aspera* and minimum increase in tannin content was observed in leaf callus culture (MSDB) of *I. hederacea*. Maximum and minimum antioxidant activity was shown by tannin content of methanolic and chloroform extracts of leaf and root callus cultures of *O. basilicum* (MSNK) and *I. hederacea* (MSIB) respectively. In antibacterial and antifungal activities maximum zone of inhibition was shown by tannins in methanolic extracts of leaf and root callus culture of *A. aspera* (MSDN) against *E. coli* and *A. niger* respectively. Chloroform extract of root callus culture of *I. hederacea* (MSDI) showed minimum zone of inhibition against *S. aureus* and *A. niger*. Tannins from the leaf callus culture and stem callus extract of *O. basilicum* and *I. hederacea* showed maximum and minimum inhibition of Jurket Cell Line proliferation respectively. Among *A. aspera* and *O. basilicum*, maximum reduction in paw edema size was shown by tannins in methanolic extract of leaf callus culture (MSDN) of *A. aspera*. In four wound models, burn wound model of *O. basilicum* showed better contractions and closure of wound as compared to *A. aspera*. Callus cultures of three plants hold promising ethno-pharmacological efficacy and may be helpful for biodiversity conservation, biomass production and isolation of bioactive compounds for development of plant based remedies.