In vitro regeneration investigation of *Gynura pseudochina* (L.) DC. from stem and leaf explants

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Abstract

Gynura pseudochina (L.) DC., a species of the Asteraceae family, possesses significant medicinal value attributed to its diverse array of biologically active compounds, such as flavonoids, anthocyanins, and saponins. However, conventional propagation methods have proven to be inadequate for generating genetically stable samples. A method is needed to create low-quality plant materials in quantities sufficient to satisfy the growing demands of pharmaceutical applications and scientific research. This investigation was conducted to develop a stem-based *in vitro* growth protocol for *Gynura pseudochina* in order to produce plantlets that are rich in biologically active compounds and are genetically stable. Before being cultured on Murashige and Skoog (MS) media, nodal segments were surface sterilized with different treatment times using 15% sodium hypochlorite (NaOCl). For shoot regeneration, the *in vitro*-grown stem segments were moved to MS media supplemented with varying amounts of 6-benzyladenine (BA) (0.0–3.0 mg/L). In the first stage of organogenesis, *in vitro* leaf explants were moved to MS media containing 2,4-dichlorophenoxyacetic acid (2,4-D, 0.0–1.0 mg/L) to induce callus. After two weeks, callus formation and shoot regeneration were measured; after eight weeks, callus formation rate, shoot length, shoot number, and leaf count were measured. The ideal concentrations for shoot regeneration were 1.5 mg/L and 2.0 mg/L of BA. These led to 3.33 and 2.67 shoots per explant, respectively, with 7.89 to 8.89 leaves and a maximum shoot length of 2.73 cm. Growth was reduced by higher BA concentrations (3.0 mg/L). Callus development was 100% at 0.2 and 0.4 mg/L 2,4-D, but was decreased at 1.0 mg/L. In conclusion, the concentration for achieving efficient plant propagation was determined successfully.

Keywords: *Gynura pseudochina, in vitro culture, BA, 2,4-D, shootproliferation, sterilization, callus induction*