

Phytochemical Profiling and Assessment of Anticancer Activity of *Leptocarpha rivularis* Extracts Obtained from In Vitro Cultures

- Rubio J.^a
- Arias G.^a
- Robles-Kelly C.^a
- Silva-Moreno E.^b
- Espinoza L.^c
- Carrasco H.^d
- Olea A.F.^d

Abstract

Plant cell culture is a source of plant material from which bioactive metabolites can be extracted. In this work, the in vitro propagation of *Leptocarpha rivularis*, an endemic Chilean shrub with anticancer activity, is described. Different media were tested and optimized for the introduction, propagation, and rooting steps of the micropropagation process. At the end of this process, 83% of plants were successfully acclimatized under greenhouse conditions. Callus induction from the internodal stem segment was performed using various combinations of phytohormones. Green-colored, friable, and non-organogenic callus was generated with a callus induction index higher than 90%. The chemical composition of extracts and callus, obtained from clonal plants, was assessed and the results indicate that the phytochemical profiles of extracts from micropropagated plants are like those found for plants collected from natural habitats, leptocarpine (LTC) being the major component. However, no LTC was detected in callus extract. HeLa and CoN cells, treated with LTC or extract of micropropagated plants, exhibit important diminution on cell viability and a drastic decrease in gene expression of IL-6 and mmp2, genes associated with carcinogenic activity. These effects are more important in cancer cells than in normal cells. Thus, micropropagated *L. rivularis* could be developed as a potential source of efficient antiproliferative agents. © 2022 by the authors. Licensee MDPI, Basel, Switzerland.

Author keywords

Callogenesis; Cell viability; Gene expression; Micropropagation; Phytochemistry