

INVESTIGATING CELL CULTURES OF *DITTRICHIA VISCOSA* AS BIOFACTORIES OF NATURAL AGROCHEMICALS

CARETTO S.*, DE PAOLIS A.*, BOARI A.**, EVIDENTE A.***, MASI M.***, VURRO M.**

*) Istituto di Scienze delle Produzioni Alimentari (ISPA) - CNR, 73100 Lecce, Italy

**) Istituto di Scienze delle Produzioni Alimentari (ISPA) - CNR, 70126 Bari, Italy

***) Department of Chemical Sciences, University of Naples "Federico II", 80126 Napoli, Italy

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Dittrichia viscosa (L.) Greuter (syn. *Inula viscosa* L. (Aiton)), is a bushy plant belonging to the *Asteraceae* family, widely spread in the Mediterranean regions. It is a precious source of natural compounds of agricultural and pharmaceutical interests. Indeed, allelopathic compounds acting against other plants, strong-smelling oil, repellents to predators, protectors from plant diseases, and attractants for pollinators have been isolated by this plant. The plant has also been used for centuries in traditional medicine for the care of human health. Due to its abundance in bioactive compounds, the plant appears as a very suitable source of many potential agrochemicals to be used in pests management, including insects, diseases, and particularly weeds. The main factors affecting the phytochemical content of the bioactive compounds in plant tissues are represented by the natural genetic diversity originating from plant adaptation to different soil and climatic conditions. Plant cell and tissue cultures obtained from known genotypes can be effective bio-factories of valuable natural compounds, characteristic of the original plants, to be used for various applications, from pharmaceutical to bio-pesticide continuous production. For this purpose, callus cultures of *D. viscosa* were established by optimizing culture medium, type and concentration of phytohormones, light and temperature. With the aim of scaling up biomass

production, fast-growing cell suspensions were obtained from friable calluses into a liquid medium, characterized by a subculture cycle of fourteen days. At the stationary phase, *D. viscosa* cells and spent medium were separately collected and lyophilised. Solvent extraction of both matrices, suspension cells and medium, was carried out by using methylene chloride and ethyl acetate (EtOAc). The biological activity of the obtained extracts was investigated by assaying phytotoxic and fungicide effects. Results showed that both organic extracts from cell suspensions revealed phytotoxic effects against cress (*Lepidium sativum* L.) and broomrape (*Phelipanche ramosa* (L.) Pomel) seeds, while only the EtOAc extract from the spent medium was weakly effective against the same species. A moderate fungicide activity against *Aspergillus carbonarius* was also detected for EtOAc from cell extracts. Further studies are in progress to identify and quantify the bioactive compounds. From these preliminary results, *D. viscosa* cell cultures can be considered a promising production system of natural agrochemicals.