

## P2: Conservation of Palestinian Biodiversity by *In vitro* culture

Raed Alkowni<sup>1</sup> and Khalid Sawalha<sup>2</sup>

<sup>1</sup>Department of Biology and Biotechnology, An-Najah National University, Nablus, Palestine

<sup>2</sup>Department of Life Sciences, Al-Quds University, P.O.Box 20002, Abu-Dis, Palestine

### Introduction

Flora of Palestine is rich with economic plants that can be exploited for biotechnological applications. Many of these plants face dangers and threats in their natural habitats; hence introduction of selected plants to tissue culture is viable approach to conserve plant biodiversity in Palestine. Various plants including: anise, mint, sage and akoub were used to establish cultures on artificial MS medium supplemented with plant growth regulators. It was recorded that some plants are faster in callus initiation more than others depending on ex-plant origin, hormonal treatment and environmental conditions. The calli were used as starting cultures to establish suspension, root or shoot differentiated cultures following various treatments by phyto-hormones and adjustment of physical environment. The potential of using such cultures for different applications was examined. For example regeneration, secondary compound production and genetic engineering were recorded. These applications can be activated for further scientific studies and economic exploitation. The main aim of establishing such research is to conserve medicinal plants through tissue culture technology to meet biodiversity approach, in addition to t examine the amenability of the targeted plants for different culture systems

Ex-plant material mainly stems and leaves were used in aseptic technique to introduce and establish primary callus cultures. Hormonal supplement (mainly auxin and cytokinin balance) was adjusted according to criteria depending on plant species and environmental conditions applied. Callus cultures were then used to regenerate whole plants, to establish other cultures like suspension or used for organogenesis. Plant cultures were maintained and sub-cultured to conserve plant stock *in vitro*. More than 21 of the most popular Palestinian plants were targeted for reservation *in vitro*. Those plant are the following: anise (*Pimpinella anisum*), mint (*Mentha sps*), sage (*Salvia palaestina*), akoub (*Gandelia tournefortii*), carrot (*Daucus carota*), broad bean (*Vicia faba*), potato (*Solanum tuberosum*), Sawsan (*iris haynei*), tomato (*Solanum lycopersicum*), wheat (*Triticum spp*), blackseeds (*Nigella ciliaris*), chickpeas (*Cicer arietinum*), bean (*Phaseolus*), cyclamen (*Cyclamen persicum*), maize (*Zea mays*), Syngonium (*Syngonium podophyllum*), olive (*Olea europa*), fenugreek (*Trigonella sps*), date palm (*Phoenix dactylifera*), barely (*Hordeum vulgare*), Lublab (*Senecio sps.*)

The Callus cultures of all tested plants were established and maintained. The most ideal ex-plant for establishing cultures was found the stem for all examined plants. The hormonal balance was proved as vital parameter for culture initiation with auxin high ratio. The growth rate of suspension cultures was faster than calli cultures. Garden and potentially economic plants from *flora Palestina* are important as biodiversity members while biotechnological applications can be performed for human benefits. The most powerful and economic promises of using wild and cultivated plants in biotechnology are based on conservation value and secondary compounds production as bioactive compounds which can be used as pharmaceuticals, food additives, bio-pesticides or even as perfumes. Adding to that the rescue of threatened species can be applied by *in vitro* cultivation.