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In vitro physiological studies on *Lavandula officinalis* L.

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Leaf discs, internodal cuttings and root cuttings were taken from healthy lavender plants(*Lavandula officinalis* L.), and were cultured on different medium types(Murashige and Skoog,Nitsch&Nitsch and modified Murashige and Skoog). Different cold pre-treatments (3°C for 1, 3, 5 &7 days) ,different auxin types (NAA, 2,4-D and I.B.A.), and different 2,4-D concentrations(0.0, 0.5, 1.0, 2.0 &4.0mg/L) were evaluated.Also,different cytokinin types(Kin, BAP and 2-ip), Different BAP. Concentrations (0.0, 0.5, 1.0, 2.0 and 4.0mg/L) and combinations between both auxin &cytokinin were considered to maximize callus formation &oil yielding ability. The produced global or callus were subjected to maturation and treated with either Glycine,Yeast extract or Tryptophan treatments.In the same time different concentrations(0.0,50,100,150,and 200 mg/l to maximize oil content and oil characters. It was found that modified MS medium ,7 days cold pretreatment,2.0 mg/l 2,4-D. &0.5 mg/l BAP.and 100 mg/L induced the best results. The volatile oil composition of the four treatments of organic additives i.e. Glycine, Yeast extract,and Tryptophane were Twenty compounds. Comparison of the analytical data of the oils revealed marked differences in qualitative and quantitative composition.especially Linalool, camphor,and β-caryophyllene.

Keywords:-Lavender, growth regulators, Additives, Oil content, in vitro.

Introduction

Lavandula officinalis L.is a perennial herb belonging to Lamiaceae family.It is aromatic plant with high industrial and commercial value It is used in food industry, perfumery and pharmaceutical preparations (Zuzarte,et al,2010). *Lavandula officinalis* L. is indogenous to Southern Europe and sometimes found growing wild in the Mediterranean area between the coast and the lower mountain slopes. It is cultivated throughout Europe as well as in different parts of Iran ,(Wichtl, 1994). Micropropagation has become an important and well established means for producing healthy and pollution free medicinal and aromatic. components A total of 32 species of Lavandula have been described in the literature, plus a number of infra specific taxa and hybrids , (Upson, 2002). They are distributed from the Canary Islands, Madeira, Mediterranean Basin, North Africa, South West Asia, Arabian Peninsula, and tropical NE Africa and India. Chaytor, (1937) had classified the genus into five sections: all the common commercial plants belong to two main sections: Stoechas (*Lavandula stoechas*,*L. dentata*, *L. viridis* and *L pedunculata*) and Spica (*L. officinalis*, syn. *L. angustifolia*, *L. latifolia* and *L. lanata*) most are probably hybrids between *L. angustifolia* and spike,*L. latifolia*; there is confusion with the naming of lavenders round the world, owing to differences in their appearance under different climatic and/or husbandry conditions, (Lis-Balchin, 2002)Chemistry of the essential oils of different lavenders. (Naef and Morris, 1992)stated that the main components of *Lavandula angustifolia* are linalool (25–38%) and linalyl acetate (25–45%).They added that some considerable differences between the subspecies *L. angustifolia* ssp pyrenaica (DC), growing wild in NE Spain .Garcia-Vallejo and Velasco -Negueruela.,(1989) stated that three main components were: linalool(20–66%), borneol (6–32%) and camphor (2–14%), in lavender oil. High numbers of shoots appeared after 2 weeks on solid MS medium supplemented with different concentrations of kinetin(Cristea,et al, 2008). Meanwhile, callus formation of Japanese mint (*Mentha arvensis*)was occurred when cultured on MS medium supplemeted with 2.5 mg/l 2.4-D (Archana ,et al, 2010).(Abd El kader,2004) found that storing explants of *Cupressus sempervirens* in the refrigerator for 8 days before culturing enhancing explant development. Wali and Siddiqui,(2010) claimed that the most suitable combination for producing superior numbers of somatic embryos from leaf cultures of *Mentha piperita* L.were obtained when the medium (MS) contained 5.4m M NAA and 2.2 mM BA. This study aimed to find out the most recent possibilities that enhancing high callus formation, induction ,and maturation. Also,maximizing yielding ability and improve oil quality of Lavender through storing of matured callus and adding medium additives.. Also, eleminating problems of the residual effect occurred in conventional propagation

Materials and methods

This study was carried out in tissue culture laboratory, Department of Horticulture Faculty of Agriculture, Moshtohor, Benha University during the period from 2008-2011.Healthy lavender plants were taken,divided,washed with running water and