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Influence of solvent concentration on the extraction of phenolic compound and antioxidant activity of 2 lavenders from Benisaf region

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ABSTRACT

The nature of the solvent is important in the extraction of bioactive substances. in this study, we look at the variation of total phenols, Total flavonoids and antioxidant activity of leaves extract of 2 lavenders of benisaf region depending on methanol percentage.Our results show a positive correlation between solvent percentage and yield concentration and a negative correlation between that and phenolic compound concentration. We find that methanol 60 % is the best of antioxidant extraction

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INTRODUCTION

The genus Lavandula L. comprises some of the most promising plants that have been used in screening assays to assess biological properties, such as antioxidant (Matos, 2009) antimicrobial (Moon, 2007; Roller, 2003) insecticidal (Pavela,2005), antifeedant (González-Coloma,2011) parasiticidal (Moon, 2006) and herbicidal (Haig, 2009) effects.

There are many techniques to recover antioxidants from plants, such as Soxhlet extraction, maceration, supercritical fluid extraction, subcritical water extraction, and ultrasound assisted extraction. However, extraction yield and antioxidant activity not only depend on the extraction method but also on the solvent used for extraction

L. multifida is kown by its anti-inflammatory properties (Sosa *et al*., 2005). Leaves contain luteolin 7-O-glycosides, hypolaetin-8-O-glycosides and isoscutellarin-8-O-glycosides and terpenoids (i.e. 15,16-dihydroxy-7,11-dioxopimar-8(9)-ene; 15S,16-dihydroxy-7-oxopimar-8(9)-ene) (Politi *et al*., 2002).

Perverious research demonstrate The following fl avonoids which were reported from L. dentata : genkwanin (apigenin 7-methyl ether), luteolin, apigenin, luteolin 7-glucoside, apigenin 7-glucoside, luteolin 7-rutinoside, vitexin and vicenin-2 (Ferreres *et al*. 1986) the aim of this study is to know the effect of methanol percentage solvent in the extraction of total phenols, total flavonoids and antioxidant from two lavenders species (L.dentata and L. multifida) which grown in Benisaf region (Algeria, NW).

MATERIAL AND METHOD

Material:

Methanol, FolineCiocalteu (FC) reagent, sodium carbonate anhydrous, gallic acid, sodium nitrite, sodium hydroxide, aluminum chloride anhydrous, 2,2- diphenyl-1-picrylhydrazyl (DPPH)

Extraction:

Each 2g of leaves are macerated in 20 ml of methanol using different of this solvent (40%, 60%, 80%)

Phenolic compound and antioxidant activity assay:

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Total phenols are measured using the Folin Ciocalteu method, Tol flavonoids are measured using the Aluminium Trichlorud method, we have been using the DPPH method to evaluate the antioxidant activity (Dif *et al*,2015)

RESULTS AND DISCUSSION

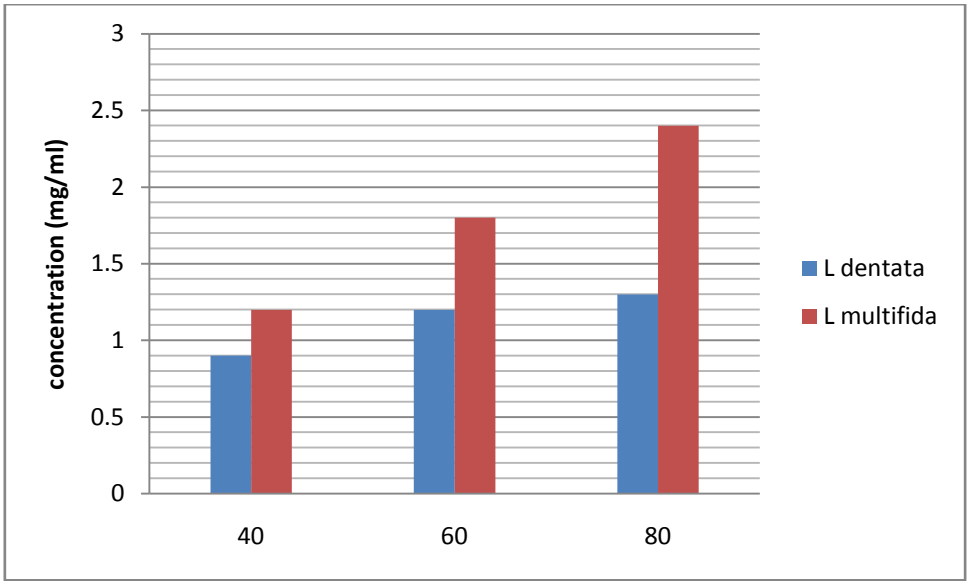

Fig. 1: yield concentration of different lavenders leaves extract from bensiaf region

Our results (figure1) show a positive correlation between yield extract and methanol percentage in other hand our results show (figure 2,3) negative correlation between phenolic compound concentration and methanol percentage This, fact that has been reported has been explained because of the aqueous based solvents may contribute to solubilise a larger range of compounds, some of which may have little or no antioxidant activity (Anwar *et al*., 2013)

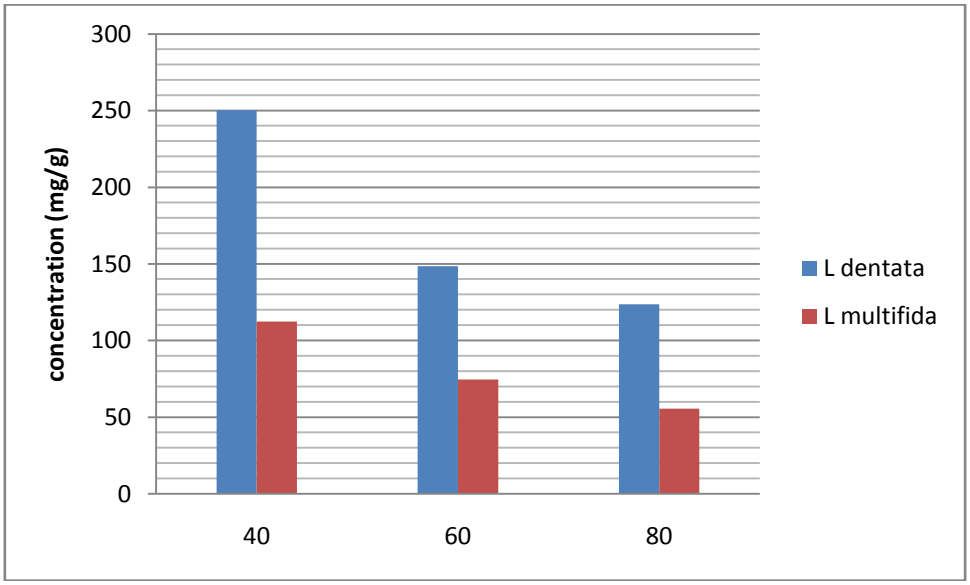

Fig. 2: total phenols concentration of lavenders leaves extract from bensiaf region

The extraction of phenol compounds is depended by various parameters such as temperature, time of extraction and solvent polarity (Hossain *et al*.,2013) .Selection of the most appropriate conditions and solvents are required for the extraction of the highest amount of total phenols compounds. Almost all phenol compounds are considered as bioactive compounds and they are widely present in all parts of the plant (Hossain *et al* 2014).

Due to the bioactive phenol compounds, almost all crude extracts showed different biological activities (Mula *et al*., 2010; Hossain *et al*, 2014; Alabri *et al*., 2014)

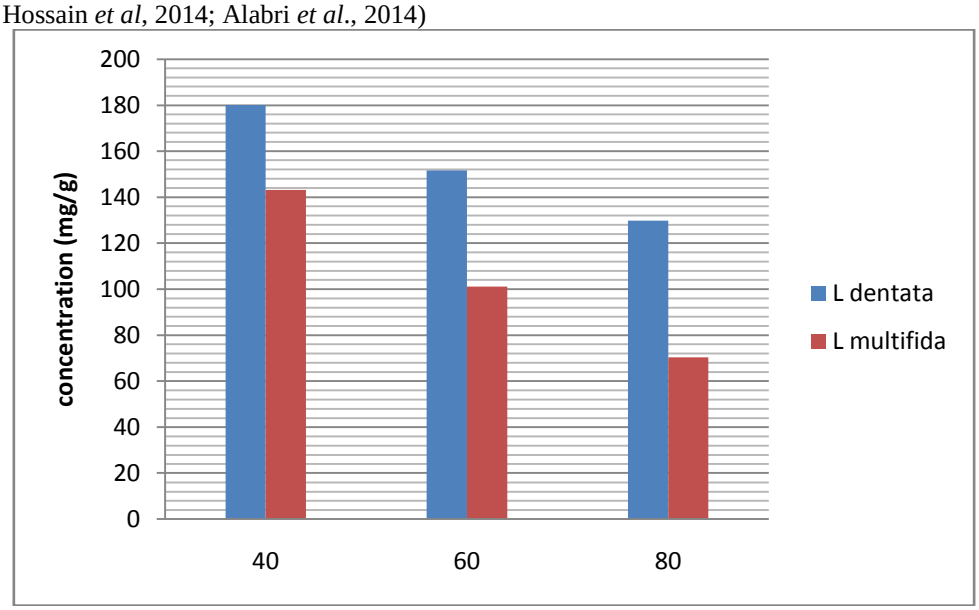

Fig. 3: total flavonoids concentration of lavenders leaves extract from bensiaf region

The difference of inhibition of the crude extracts was depends on the bioactive compounds such as phenols and flavonoids presented in The principle of DPPHmethod is that the antioxidant agents react with the DPPHand produce stable free radicals. Accordingly DPPHchange its own colour gradually. The gradually colour change indicates the sample contains antioxidant agents

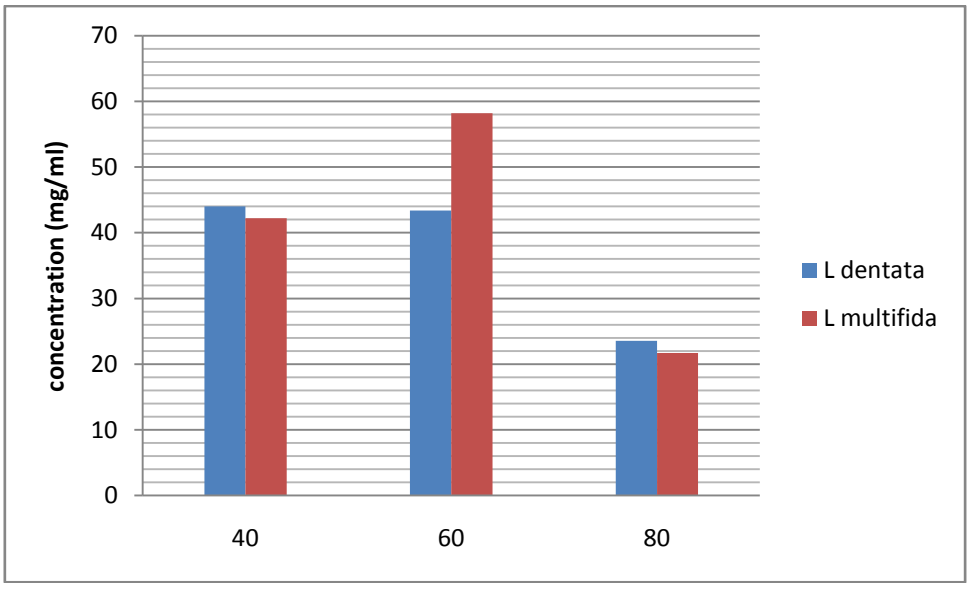

Fig. 4: IC 50 of lavenders leaves extract from bensiaf region

With regards to reducing power, higher reducing .Activities can be attributed to higher amounts of polyphenolics and the reducing capacity of a compound may reflect its antioxidant potential (Rao *et al*.,2010). It has been reported that the reducing properties are generally associated with the presence of reductones, which have been shown to exert antioxidant action by breaking the free radical chain by donating a hydrogen atom (Kumar *et al*., 2012)

Conclusion:

lavenders genera of Bensiaf region (Algeria, NW) was in the first time valorized by the estimation of the phenolic content and the antioxidant due to variation of methanol percentage. futher sudy is important to know the biological activities of these plants characterized of the lavenders of Benisaf region.

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