Antioxidant activity of different crude fractions of *Sonchus eruca*

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Abstract: In the present study, the antioxidant potential of different crude extracts of *Sonchus eruca*, was evaluated. The extracts were investigated for its antioxidant activity using 2, 2-diphenyl-1-picryal-hydrazyl (DPPH) method. The crude fractions evaluated were *n*-hexane, chloroform, ethyl actate and water. The ethyl acetate extracts from S.eruca at 500µg/mL exhibited highest 79.11% DPPH activity fallowed by chloroform showing 67.19%. The other extracts of plants also showed significant antioxidant activity. [Riaz Ullah, Jameel A. Khader, Naser M. AbdEIslam, Farman Ullah, Muhammad Ullah, Kamin Khan, Sultan Ayaz. **Antioxidant activities of different crude fractions of *Sonchus eruca*** *Life Sci J* 2013;10(2):835-837] (ISSN:1097-8135). http://www.lifesciencesite.com. 117

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Introductions

This is reported that oxidative stress is among the major causative factors in induction of many chronic and degenerative diseases including atherosclerosis, ischemic heart disease, ageing, diabetes mellitus, cancer, immunosuppression, neurodegenerative diseases and others. A great number of aromatic, medicinal, spice and other plants contain chemical compounds exhibiting antioxidant properties. Oxidative process is one of the most important routes for producing free radicals in foods, drugs and even in living systems. The most effective path to eliminate and diminish the action of free radicals which cause the oxidative stress is antioxidative defense mechanisms. Antioxidants are those substances which possess free radical chain reaction breaking properties. Recently there has been an upsurge of interest in the therapeutic potential medicinal plants as antioxidants in re- antioxidants in reducing oxidative stress-induced tissue injury. Among the numerous naturally occurring antioxidants; ascorbic acid, carotenoids and phenolic compounds are more effective. They are known to inhibit lipid peroxidation (by inactivating lipoxygenase), to scavenge free radicals and active oxygen species by propagating a reaction cycle and to chelate heavy metal ions. The study done on medicinal plants and vegetables strongly supports the idea that plant constituents with antioxidant activity are capable of exerting protective effects against oxidative stress in biological systems. On continuation of our experimental work for the search of antioxidant activity of medicinal plants, we studied extracts of *Sonchus eruca*. The free radical scavenging activity against 1,1-diphenyl-2-picryl hydrazyl (DPPH) was evaluated during the course of work. (Prakash V etal 2009).

Materials and methods

Plant materials

Plant material was collected from Darra Adam Khel KPK Pakistan in flowering season in March-May 2012. It is identified by plant taxonomist.

Extraction and fractionations

The whole plants was dried under shade for 10 days and milled into powder with electrical grinder and finally dipped in methanol for one month. It was shacked throughout and finally methanol was evaporated through rotary evaporator. The resulting methanol extract (80 g) was fractionating by separating funnel into *n*-hexane, chloroform, ethyl acetate and water fractions. These fractions were evaluated for antioxidant activity.

Antioxidant bioassay

DPPH diphenylpicrylhydrazyl method was adopted for antioxidant activities. The molecule of 1, 1-diphenyl-2-picrylhydrazyl is character- ized as a stable free radical by virtue of the delocalization of the spare electron over the molecule as a whole, so that the molecules do not dimerise, as would be the case with most other free radicals. The delocalization also gives rise to the deep violet color, characterized by an absorption band in ethanol solution centered at about 515 nm. When a solution of DPPH is mixed with that of a substance that can donate a hydrogen atom, then this gives rise to the reduced form with the

loss of this violet color (although there would be expected to be a residual pale yellow color from the picryl group still present). Test samples were allowed to react with stable free radical, 1, 1-Diphenyl-2-picrylhydrazyl radical (DPPH) (from Sigma Aldrich) for half an hour at 37º C. The concentration of DPPH was kept as 300 µM. The test samples were dissolved in DMSO while the DPPH solution was prepared in ethanol. After incubation, decrease in absorption was measured at 515 nm using multiplate reader (Spectra MAX-340). Percent radical scavenging activity by samples was determined in comparison with a DMSO treated control group [12]. % Radical scavenging activity was calculated by using the following formula: % RSA= 100 – {(OD test compound / OD control) X 100 (Hussain J etal 2013).

Results and discussion

Free radicals are involved in many disorders like neurodegenerative diseases, cancer and AIDS. Antioxidants due to their scavenging activity are useful for the management of those diseases. DPPH stable free radical method is a sensitive way to determine the antioxidant activity of plant extracts (Koleva et al., 2002; Suresh et al., 2008) The therapeutic potential of natural medicinal plants as an antioxidant in reducing such free radical induced tissue injury, suggests that many plants have antioxidant activities that can be therapeutically useful (Kanatt et al., 2007). Keeping in mind the importance of antioxidant activity, *Sonchus ercua* were screened for antioxidant activity.

Results obtained are given in table 1. From Table-1 it is clear that ethyl acetate showed the highest activity 79.11 % fallowed by chloroform showing 67.19%. It is comparable with standard showing result of 91.12 %. Also moderate result observed for *n*-hexane and water fractions. These fractions can be use for the isolation of antioxidant agents.

Table. 1. Antioxidant Activities of Crude Fractions against DPPH Radical.

S. No	Name of extracts	Concentration	Results	Standard *n*-Propyl gallate
1	***n*-Hexane**	**500µg/mL**	34.12%± 0.01	91.12%± 0.01
2	**Chloroform**	**500µg/mL**	67.19%.±0.01	
3	**Ethyl acetate**	**500µg/mL**	79.11%±0.01	
3	**Water**	**500µg/mL**	45.31%±0.01	

Different pharmacological activities had shown by *Sonchus eruca* including antimicrobial, carbonic anhydrase II inhibition, urease inhibition, antiglycation, cytotoxic and phytotoxic. (Hussain J etal 201, Zia M etal 2013, Jameel A Khader etal 2013).

(Hussain J etal 2011) had reported that ethyl acetate of *Sonchus eruca* had 61.32% DPPH activity and chloroform extract had 56.74% DPPH activity. These slight variations in the result with current study may be due to different environmental conditions of the collected area. Medicinal plant parts are commonly rich in phenolic compounds, such as flavonoids, phenolic acids, stilbenes, tannins, coumarins, lignans and lignins. These compounds have multiple biological effects including antioxidant activity (Packer et al., 1999).

Conclusion

This is preliminary study showed that ethyl acetate is the most active crude fraction as a antioxidiant agent. It may be use in future for isolation the antioxidant constituents.

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