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Short Communication

Screening of Selected Medicinal Plants for the Antioxidant Potential

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Abstract. Screening of selected prominent medicinal plants of Pakistan, used by local herbal practitioners for treatment of various ailments, namely *Hyoscyamus niger*, *Carthamus lanatus*, *Foeniculum vulgare*, *Citrullus colocynthis*, *Cissampelos pareira*, *Hypericum dyeri*, *Hypericum perforatum*, *Equisetum arvense* L., *Cichorium intybus*, *Momordica charantia*, *Solanum xanthocarpum*, *Galium aparine*, *Xanthium strumarium*, *Ammi visnaga* and *Euphorbia helioscopia*, using 2,2-diphenyl picryl hydrazyl (DPPH) radical assay was undertaken. *C. pareira*, *E. arvense* L. and *C. intybus* were found to be devoid of antioxidant activity, while the rest displayed variable levels of antioxidant potential.

Keywords: antioxidant activity, medicinal plants, DPPH radical assay, Pakistan

According to the World Health Organization, approximately 75-80% of the world population use plant-based medicines (WHO, 2007; 2003). Pakistan has a great wealth of medicinal plants worth a lot for the country. These plants are locally used by the herbal practitioners for treatment of various ailments and consumed by the public. Unfortunately, very little work is reported regarding the exploration of antioxidant potential of medicinal plants, especially in Pakistan.

Antioxidants are free radical scavengers such as glutathione peroxidase, catalase, superoxide-dismutase, present in lower concentrations than biomolecules and may prevent, protect or reduce the oxidative damage and defend the body against a number of diseases. (Adetuyi and Ogundahunsi, 2010; Hussain *et al*., 2009; 2008a; Khan *et al*., 2008; 2006; Odukoya *et al*., 2002; Oke and Hamburger, 2002).

In previous studies, the medicinal plants of Pakistan were explored for phytochemicals and heavy metal contents along with phytomedicinal, agrochemical and allelopathic potentials (Hussain and Khan, 2010; Hussain *et al*., 2009; 2008a; 2008b; 2006a; 2006b; Khan *et al*., 2009a; 2009b; 2008; 2007; 2006; 2005). In the present work, efforts have been made to investigate prominent medicinal plants of Pakistan for the antioxidant potential.

Table 1 shows the botanical names and families of selected medicinal plants along with the results of antioxidant assay. The medicinal plants were collected from their natural habitat in Peshawar and its surrounding areas while some were purchased from a local market in Peshawar, Khyber Pakhtunkhwa, Pakistan and identified at the Department of Botany, Kohat University of Science & Technology, Pakistan.

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The plants were shade dried, powdered, extracted with MeOH and aluminum coated thin layer chromatographic plate of each extract was developed. The developed spots were viewed in the UV-light at 365 and 254 nm; the efflorescent points were marked, sprayed with 2,2-diphenyl picryl hydrazyl (DPPH) reagent and the colour produced on the plate was noted (Oke and Hamburger, 2002; Odukoya *et al*., 2002; Wagner and Bladt, 1996). DPPH reagent, is specifically used for the detection of polyphenolic compounds through forming complexes with the free hydroxyl group present in the crude extract (Khan *et al*., 2008; 2006; Oke and Hamburger, 2002; Odukoya *et al*., 2002). Wagner and Bladt (1996) reported causal relationship between

Table 1. Antioxidant potentials of the selected medicinal plants

Medicinal plants	Family	Antioxidant assay	Colour of efflorescent spots
Hyoscyamus niger	Solanaceae	+ +	Bluish
Carthamus lanatus	Asteraceae	+ + +	Yellow
Foeniculum vulgare	Apiaceae	+ +	Blue
Citrullus colocynthis	Compositae	+ +	Blue
Cissampelos pareira	Compositae	-	-
Hypericum dyeri	Hypericaceae	+ + +	Deep purple
Hypericum perforatum	Hypercaceae	+ +	Bluish
Equisetum arvense L.	Equisetaceae	-	-
Cichorium intybus	Asteraceae	-	-
Momordica charantia	Cucurbitaceae	+	Bluish
Solanum xanthocarpum	Solanaceae	+ +	Bluish
Galium aparine	Rubiaceae	+ +	Blue
Xanthium strumarium	Compositaceae	+ + +	Yellow
Ammi visnaga	Umbelliferae	+ +	Deep bluish
Euphorbia helioscopia	Euphorbiaceae	+ +	Bluish

- = no antioxidant activity; + = low antioxidant activity; + + = moderate antioxidant activity; + + + = significant antioxidant activity.

colours of the spots on TLC plates and antioxidant activities in DPPH radical assay.

The results showed that except *C. pareira, E. arvense* L. and *C. intybus*, all the medicinal plants contained varying quantities of antioxidants, displaying low, moderate or significant antioxidant activity. The major constituents of the plant material under investigation consisted of polyphenolic compounds. In the present study when the TLC plates were sprayed with DPPH solution, it gave very prominent colours.

The method of screening of the medicinal plants for the antioxidant potential will provide a bio-assay guided study of the natural products. It has showed the presence of antioxidant activity in varying degrees in the studied plants. The study will also provide a reliable step towards the standardization of materia medica of Pakistan. The local practitioners use the studied medicinal plants for the treatment of different types of diseases. Therefore, the present work will help to judge the validity of their claims and throw light on their toxic effects.

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