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***Parquetina nigrescens* Checks the Ulceration and Oxidation**

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Ulcer, when found in the gastrointestinal tract is called as peptic ulcer, which is a hole in organ wall. It has a relationship with ABO/Rh blood types, as it is mostly found in persons of A (37.1%) and O (35.6%) blood groups. While it is least present in the AB blood group person and the people with Rh -VE blood type are also at less risk (Rasmi *et al.*, 2009). Its prevalence increases after the age of 30 years and highly prevalent within the age of 30-39 years (Bener *et al.*, 2006). It can be due to smoking, diabetes, medicines and over eating. A bacterium; *Helicobacter pylori* can also cause ulcer by secreting urease protein and inducing oxidative stress (Kebapcilar *et al.*, 2009; Mortazavi *et al.*, 2011). Although, oxidants are produced in the body through metabolic pathway, they can damage the cells by reacting with lipids, proteins or genetic material and also cause inflammation (Wu and Cederbaum, 2009). But oxidation relating diseases like ulcer can be treated well with the use of plants; they reduce the extensive damage caused by oxidation via reducing the reactive oxygen species (Akah *et al.*, 2007; Rifat-uz-Zaman *et al.*, 2006). *Parquetina nigrescens* is such a medicinal plant which inhibits inflammation, improved blood parameters and has analgesic property (Agbor and Odetola, 2005; Owoyele *et al.*, 2009). Its extracts reduce the lipid oxidation in rat's liver by inhibiting oxidative species (Ayoola *et al.*, 2011). Thus plants can be helpful in reducing the ulcer caused oxidative stress.

Parquetina nigrescens is a woody vine, with large leaves and fleshy petals; it turns black upon drying (Venter, 2009). Due to its many remedial properties, Kayode *et al.* (2009) examined curative tendency of its extracts in protecting the mice liver and stomach from ulcer. They incorporated the different concentration of plants hexane and chloroform extracts as a pretreatment before the ethanol-induced ulcer and oxidative stress. Ethanol induction caused gastric lesions with reduced activity of anti-oxidant enzymes; superoxide dismutase (SOD) and catalase (CAT). Moreover it also caused a detrimental reduction in reduced glutathione (GSH) levels in both liver and stomach. The stressed animals pretreated with plants extracts showed nearly normal level and activities of these anti-oxidant agents, which were comparable to that of standard anti-ulcer drug; cimetidine. But both these extracts showed different anti-ulcer behaviors depending upon their concentrations. As hexane extracts, when applied in concentration of 500 mg kg⁻¹ body weight (b.wt.), reduced the ulcer index more vigorously (62%) than its 1000 mg kg⁻¹ b.wt. induction (52%). Whereas, chloroform extracts reduced the ulcer index relatively at higher concentrations; 31% at 500 mg kg⁻¹ b.wt. and 70.9% at 1000 mg kg⁻¹ b.wt. But this activity pattern of hexane extracts varied when observed in liver and gastric-mucosal enzymes activation. At higher concentrations it provided slightly more but non-significantly different, health benefiting effects, from its lower concentrations. It significantly increased the activity of SOD and CAT enzymes at both concentrations, but more strongly at 1000 mg kg⁻¹ b.wt. Likewise the chloroform pattern was also changed in the liver and stomach enzymes activity induction. As chloroforms' both concentrations increased the enzyme activity, which were non-significantly different from each other. Such pattern was again followed by the chloroform and hexane extracts in increasing the levels of both gastric and liver GSH. Thus, all these parameters (ulcer index, SOD, CAT activities and GSH levels) in plant treated animals were significantly different from diseased animals. This signified that plant *P. nigrescens* protected the animals' liver and stomach by reducing ulcer-caused oxidative stress. But these parameters were non-significant when compared in cimetidine supplemented and extracts-pretreated animals, which means extract's curative potential was as high as that of standard drug. During experiment it was also noted that hexane extracts caused least cytotoxicity and can be safely used at concentration of 7.5 g kg⁻¹ b.wt. Whereas its maximum required concentration was not more than 1 g (1000 mg) kg⁻¹ b.wt. Thus *P. nigrescens* showed potent curative property and provided a safer extract (hexane extract) for ulcer prevention. Its use was more reliable than the compared drug, because drugs usually cause toxic effects. Shabahang (2010) during his study on drug-caused side effects reported the cimetidine caused erythema multiforme. It is a type of allergic reaction, usually contributed by medication or infection. Hence, *P. nigrescens* should be used instead of cimetidine to treat the oxidative stress of liver and stomach.

Oxidative species are the products of metabolic reaction but their over production due to some disease or inadequate food intake can be the source of diseases e.g., ulcer. Ulcer is the oxidative damage of cells or tissues and can be treated through antioxidant species. Plants are important source of antioxidants and Kayode *et al.* (2009) conducted a hepatogastric protective study on a medicinal plant *P. nigrescens*. According to their findings this plant provides liver and

stomach an antioxidant protection. It enhances the activities of oxidant eaters (SOD, CAT and GSH) and reduces the gastric lesions; its hexane extracts have cytotoxicity less than a standard cimetidine drug. Thus the use of *P. nigrescens* is beneficial from the point of view of ulcer prevention and its use will also lessen the inflammation and other health problems.

REFERENCES

- Agbor, G.A. and A.A. Odetola, 2005. Effect of *Parquetina nigrescens* on erythrocyte indices and serum electrolytes of rats following acute blood loss. *Pak. J. Biol. Sci.*, 8: 527-531.
- Akah, P.A., L. John-Africa and C.S. Nworu, 2007. Gastro-protective properties of the leaf extracts of *Ocimum gratissimum* L. against experimental ulcers in rat. *Int. J. Pharmacol.*, 3: 461-467.
- Ayoola, A.O., O. Akinloye, O.O. Oguntibeju, J.M. Oke and A.A. Odetola, 2011. Antioxidant activities of *Parquetina nigrescens*. *Afr. J. Biotechnol.*, 10: 4920-4925.
- Bener, A., M.F. Derbala, S. Al-Kaabi, L.O. Taryam, M.M. Al-Ameri, N.M. Al-Muraikhi and T.M. Al-Mansoor, 2006. Frequency of peptic ulcer disease during and after Ramadan in a United Arab Emirates hospital. *Eastern Mediterranean Health J.*, 12: 105-111.
- Kayode, A.A.A., O.T. Kayode and A.A. Odetola, 2009. Anti-ulcerogenic activity of two extracts of *Parquetina nigrescens* and their effects on mucosal antioxidants defence system on ethanol-induced ulcer in rats. *Res. J. Med. Plant*, 3: 102-108.
- Kebapcilar, L., I. Sari, A.H. Renkal, A. Alacacioglu and A. Yuksel *et al.*, 2009. The influence of *Helicobacter pylori* eradication on leptin, soluble CD40 ligand, oxidative stress and body composition in patients with peptic ulcer disease. *Internal Med.*, 48: 2055-2059.
- Mortazavi, M., A. Akbarzadeh, A. Farhangi, M. Mehrabi, Z. Hosseinian, M.J. Mokhtari and Z. Saffari, 2011. Immunosuppressive proteins isolated from spiral and coccoid cytoplasmic solutions of *Helicobacter pylori*. *Pak. J. Biol. Sci.*, 14: 128-132.
- Owoyele, B.V., A.B. Nafiu, I.A. Oyewole, L.A. Oyewole and A.O. Soladoye, 2009. Studies on the analgesic, anti-inflammatory and antipyretic effects of *Parquetina nigrescens* leaf extract. *J. Ethnopharmacol.*, 122: 86-90.
- Rasmi, Y., M. Sadreddini, T. Peirovi, M. Jamali, F. Khosravifar *et al.*, 2009. Frequency of ABO blood group in peptic ulcer disease in iranian subjects. *Pak. J. Biol. Sci.*, 12: 991-993.
- Rifat-uz-Zaman, M.S. Akhtar and M.S. Khan, 2006. Anti-ulcerogenic screening of *Cichorium intybus* L. leaf in Indomethacin treated rats. *Int. J. Pharmacol.*, 2: 166-170.
- Shabahang, L., 2010. Characteristics of adult outpatients with erythema multiforme. *Pak. J. Biol. Sci.*, 13: 1106-1109.
- Venter, H.J.T., 2009. Nomenclature correction in *Parquetina* (Apocynaceae: Periplocoideae). *South Afr. J. Bot.*, 75: 557-559.
- Wu, D. and A.I. Cederbaum, 2009. Oxidative stress and alcoholic liver disease. *Semin. Liver Dis.*, 29: 141-154.