ISSN : 0974 - 7532 Volume 8 Issue 7

Research & Reviews in

BioSciences

Regular Paper

RRBS, 8(7), 2014 [253-255]

Evaluation of the anti-inflammatory activity of the alcoholic extract of papierbasdoring leaves

Mohamed I.S.Abdelhady[1,3]*, M.Abdul-Azim Mohammad[2,4]

[1]Department of Pharmacognosy, Faculty of Pharmacy, Umm Al-Qura University, Makkah 21955, (SAUDI ARABIA)

[2]Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Umm Al-Qura University, Makkah 21955, (SAUDI ARABIA)

[3]Department of Pharmacognosy, Faculty of Pharmacy, Helwan University, Cairo, (EGYPT)

[4]Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Cairo University, Cairo, (EGYPT)

E-mail : miabdelhady@uqu.edu.sa

ABSTRACT

Powdered, air-dried leaves of Papierbasdoring were exhaustively extracted with hot 80% MeOH, under reflux. The dry residue obtained was suspended in distilled water. Anti-inflammatory effect was determined according to the rat paw edema method using indomethacin as a reference drug. The methanolic extract of the leaves of Papierbasdoring exhibited significant anti-inflammatory activity.

KEYWORDS

Fabaceae;
Papierbasdoring;
Anti-inflammatory.

INTRODUCTION

The family Leguminoseae (Fabaceae) is particularly rich in flavonoids and related compounds about 28% of all flavonoid and 95% of all flavonoid aglycone structures known from the plant kingdom are found in the legumes[1]. Among the Fabaceae is the genus *Acacia* which, comprises about 1350 species and is distributed in tropical and subtropical regions[2]. *Acacia* species contain variety of bioactive components such as phenolic acid, alkaloids, tannins and flavonoids which have numerous biological and pharmacological properties as hypoglycemic, analgesic, anti-inflammatory, antihypertensive, antiatherosclerotic, anthelmintic, antibacterial, and anticancer[3-13]. One of the common plant belong to this family is *Acacia siebriana* which is commonly known as Papierbasdoring[14]. The methanol extract of leaves of *Acacia sieberiana* Resulted in isolation of certain polyphenolic compounds[15]. No studies report on the biological activities of *Acacia sieberiana*. Thus, it was deemed necessary to carry out certain biological study such as anti-inflammatory test to throw light on this important species native to Central America and Mexico and naturalized in over 150 countries including Egypt and KSA[16].

MATERIALS AND METHODS

Plant material

Fresh leaves of *Acacia sieberiana* were collected From a mature tree growing in KSA during April 2011. Powdered, air-dried leaves of *Acacia sieberiana* (150 gm) were exhaustively extracted with hot 80% MeOH (4×300 ml), under reflux. The dry residue obtained was re-suspended in distilled water.

Regular Paper

Animals

Albino rats of both sex of 125-150 g body weight were used for determination of the antioxidant, anti-inflammatory and analgesic activities. Mice of 20-30 g body weight were used for the determination of the median lethal doses (LD_{50}). The animals were obtained from the animal house colony of the National Research Centre, Dokki, Giza, Egypt.

Anti-inflammatory activity

Anti-inflammatory effect was determined according to the rat paw edema method[17], where male albino rats were divided into four groups, each of six animals, 1st group was received 1 ml of saline serving as a control group, 2nd group was received 100 mg/kg body weight of the aqueous extract, 3rd group was received 100 mg/kg body weight of the alcoholic extract and 4th group was received 20 mg/kg of the reference drug indomethacin, then one hour later, all the animals received sub-planter injection of 0.1 ml of 1% carrageenan solution in saline in the right hind paw and 0.1 ml saline in the left hind paw. Four hours after drug administration, both hind paws of sacrificed rats were excised and weighed separately. All tests were done in triplicate and the means were calculated.

RESULTS AND DISCUSSION

Treatment with the methanol extract of leaves of *Acacia siebriana* in rats at 100 mg/kg was capable of reducing the oedema formation by carrageenan in a dose dependent manner by 51% when compared to control. Indomethacin (20 mg/kg) gave a percentage inhibition of 66% (TABLE 1 and Figure 1). The present study revealed one of the pharmacological bases for the ethnomedicinal use of *Acacia sieberiana* in the treatment of inflammation. The ethanol extract of *Acacia siebriana* showed a good anti-inflammatory activity against acute inflammation, suppressing the rat paw oedema. Oedema results from the action of inflammatory mediators such as histamine, serotonin and bradykinin at the site of a local inflammatory insult[18]. The early phase of oedema, beginning from 1 h after the administration of the irritant, is due to the release of histamine and serotonine, while the later phase, occurring from 3 to 5 h after the administration of the irritant is induced by bradykinin, protease, prostaglandin and lysosome[18,19]. The reduction in oedema evinced by *Acacia sieberiana* extract in this study suggests that it contains active constituents which block the release of histamine and serotonin from mast cells and inhibit the activity of other inflammatory mediators.

TABLE 1 : Anti-inflammatory activity of leaf alc. extract of *Acacia siebriana*

Group	Dose in mg/kg body weight	% Oedema	
		Mean ± S.E.	% of Change
Control	1 ml saline	59.4 ± 3.3	-
Alc. extract	100	30.3± 0.4	51
Indomethacin	20	20.1 ± 0.3	66

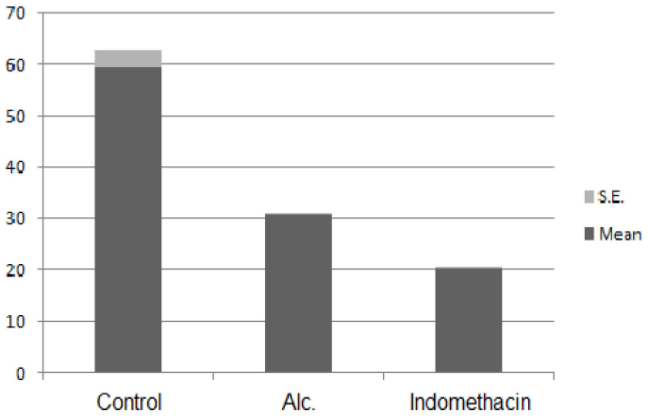

Figure 1 : Anti-inflammatory activity of leaf alc. extract of *Acacia siebriana*

CONCLUSION

In conclusion, the methanolic extract of the leaves of *Acacia sieberiana* (commonly known as Papierbasdoring) has significant anti-inflammatory activity. But previous studies observed that those plants which belonging to the family Fabaceae (Mimosaceae) contain the toxic alkaloid mimosine[20-23], so we recommend safety tests to be done for that interesting *Acacia* species i.e. Papierbasdoring.

ACKNOWLEDGEMENT

Our great thanks for the department of pharmacology, faculty of pharmacy, Helwan University for helping in the test of anti-inflammatory.

REFERENCES

[1] W.C.Evans; Trease and Evans Pharmacognosy. New Delhi, India: Saunders Elsevier, **(2002)**

[2] D.S.Seigler; Phytochemistry of Acacia sensu lato. Biochem.Syst.Ecol., **31**, 845–873 **(2003)**.

[3] R.G.S.Berlin, T.Hantono, T.Okuda, T.Yoshida; Progress in the Chemistry of Organic Natural Products. New York: Springer-Verlag Wein, **(1995)**.

[4] C.C.Lin, Y.F.Hsu, T.C.Lin, F.L.Hsu, H.Y.Hsu; Antioxidant and hepatoprotective activity of punicalagin and punicalin on carbon tetrachloride induced liver damage in rats. J.Pharmacol, **50**, 789-794 **(1998)**.

[5] S.Muhammad, A.Mushtaq, A.Ashfaq; Chemistry of the medicinal plants of genus Acacia. Hamdard Medicine, **41**, 63-67 **(1998)**.

[6] M.A.Omer, A.Z.Al-Magboul, A.A.El-Egami; Sudanese plants used in folkloric medicine screening for antimicrobial activity. Fitoterapia, **69**, 542-545 **(1998)**.

[7] Y.U.Kalsom, H.I.Khairudddin, M.M.Zakri; Flavonol glycoside from the leaves of Acacia mangium and related species. Malaysial Journal of Analytical Sciences, **17**, 109-112 **(2001)**.

[8] Mohamed I.Abdelhady, Amel M.Kamal, Mahmoud Youns; Biological activity and total phenolic contents of ethanolic extracts of three species of Acacia leaves. Journal of Pharmacy Research, **5(1)**, 691-695 **(2012)**.

[9] A.Andrade-Cetto, M.Heinnirch; Mexican plants with hypoglycemic effect used in treatment of diabetes. J.Ethnopharmacol, **99**, 325-348 **(2005)**.

[10] S.Ramli, S.Bunrathep, T.Tansaringkarn, N.Ruangungsi; Screening for free radical scavenging activity from ethanolic extract of Mimosaceous plants endemic to Thailand. J.Health Res., **22**, 55-59 **(2008)**.

[11] B.N.Singh, B.R.Singh, R.L.Singh, D.Prakash, B.K.Sarma, H.B.Singh; Antioxidant and anti-quorum sensing activities of green pod of Acacia nilotica L. Food and Chemical Toxicology, **47**, 778-786 **(2009)**.

[12] Y.T.Tung, J.H.Wu, C.Y.Huang, Y.H.Kuo, S.T.Chang; Antioxidant activities and phytochemical characteristics of extracts from Acacia confuse bark. Bioresource Technology, **100**, 509-514 **(2009)**.

[13] I.O.Ademola, A.I.Akanbi, S.O.Idowu; Comparative nematocidal activity of chromatographic fractions of Leucaena leucocephala seed against gastrointestinal sheep nematodes. Pharmaceutical Biology, **43**, 599-604 **(2005)**.

[14] AgroForestryTree Database A tree species reference and selection guide http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=113

[15] Mohamed I.S.Abdelhady; A novel polyphenolic compound isolated from Acacia sieberiana. Organic chemistry, **9(6)**, 236-238 **(2013)**.

[16] C.S.Walton; Leucaena leucocephala in queensl and pestatatus review series land protection. Brisbane: Department of natural resources and mines, **(2003)**.

[17] C.A.Winter, E.A.Risley, G.W.Nuss; Carrageenin-induced edema in hind paw of the rat as an assay for anti-inflammatory drugs. Proc.Soc.Exp.Biol. Med., **111**, 544 **(1962)**.

[18] J.M.Wallace; Nutritional and botanical modulation of the inflammatory cascade: eicosanoids, cyclooxygenase and lipoxygenase- as an adjunct in cancer therapy. Integr.Cancer Ther., **1**, 7-37 **(2002)**.

[19] M.Harriot, E.Marion, A.Martha, S.Wellford, A.William; Inflammation induced by histamine, serotonine, bradykinin and compound 48/480 in the rat. Antagonists and mechanisms of action. J.Pharmacol.Exp.Therapeutics, **191**, 300-302 **(2004)**.

[20] A.C.Hammond; Leucaena toxicosis and its control in ruminants. Journal of animal Sciences **73**, 1487-1492 **(1995)**.

[21] Nighat Afza, Mahboob Alikalhoro, Rashid Alikhan, M.Aijaz Anwar; Physico-Chemical and Toxicological studies of Different parts of Leucaenia leucocephala. Pakistan Journal of Pharmacolog, **24**, 13-16 **(2007)**.

[22] Patrick K.K.Yeung, Francis T.W.Wong, Joseph T.Y.Wong; Toxic action of mimosine.I.Inhibition of mitosis and DNA synthesis of H.Ep-2 cell by mimosine and 3, 4 dihydroxypyridine. J.Biol.Chem., **21**, **270(16)**, 9597-606 **(1995)**.

[23] M.P.Hegarty, C.P.Lee, G.S.Christie, F.G.De Munk, R.D.Court; Comparative toxicities of mimosine and some chemically related compounds to mouse bone marrow cells in liquid culture. Australian Journal of Biological Sciences, **31**, 115-121 **(1978)**.