

**INTERNATIONAL JOURNAL OF ADVANCES IN PHARMACY,
BIOLOGY AND CHEMISTRY****Research Article****Study on the Extract of *Morus alba* in Asthamatic Rats****SHEELA KUMAR¹, MANJU JAIN², IRSHAD BABA¹, P.N. SHRIVASTAVA¹,
MUNEER AHMAD¹.**¹. Pest Control & Ayurvedic Drug Research Lab. S.S.L Jain P.G. College Vidisha, MP, India.². Dept. of Botany, Govt. Girls College, Vidisha, MP, India.**Abstract**

INTRODUCTION: Asthma is a disease of the human respiratory system in which the airways constrict and become narrow, often in response to a trigger such as exposure to an allergen, cold air, exercise, or emotional stress. *Morus alba*, known as white mulberry, is a shortlived, fast-growing, small to medium sized mulberry tree, which grows to 10–20 m tall.

MATERIALS AND METHODS: The 50gm of the powdered material was loaded into soxhlet apparatus separately for extraction with the solvent of increasing order of polarity (n-Hexane, Chloroform and Methanol). The crude extract obtained from plant was applied in asthmatic rats and stabilization of mast cells was observed.

RESULTS: When the dose of 100 mg/kg body weight of *Morus alba* extract was applied, the disruption of mast cells were found 17.70±2 % and intact mast cells were found 82.30±2 %. In contrast with IV group in which 10 mg/kg b.w. standard drug Dexamethasone was given intramuscularly, it was observed that the disruption of mast cells was 20.40±2 % and intact mast cells was found 84.50±2%.

Keywords: Asthma, *Morus alba*, Dexamethasone, mast cells and Disruption.

INTRODUCTION

Plants have been the basis of many traditional medicines throughout the world for thousands of years and continue to provide new remedies to mankind. Plants have been one of the important sources of medicines since the beginning of human civilization. The recent resurgence of plant remedies resulted from several factors, such as effectiveness of plant medicines and lesser side effects compared with modern medicines. Indigenous herbs are used as remedies against various diseases in the traditional system of medicine or in ethno medical practices. For the past few decades, compounds from natural sources have been gaining importance because of the vast chemical diversity they offer. This has led to a phenomenal increase in the demand for herbal medicine in the last 2 decades. They are relatively safe, easily available, and affordable to the masses. These drugs have given important

lead in drug research, resulting in the discovery of novel molecules.

Asthma is a disease of the human respiratory system in which the airways constrict and become narrow, often in response to a trigger such as exposure to an allergen, cold air, exercise, or emotional stress (Prasad et al., 2009). Asthma affects 7% of the total population and approx 300 million worldwide (Christopher and Fanta, 2009). During attacks the smooth muscle cells in the bronchi constrict, and the airways become inflamed, swollen and breathing become difficult. The term *asthma* actually comes from the *Greek word panos*, which means to pant or to breathe with an open mouth. In Ayurveda, it is considered to originate from the affliction of the stomach and other parts of gastro-intestinal tract. In most of the cases, therefore, either in the beginning of the disease or before each attack, the patient suffers

from indigestion, constipation or even diarrhea. The seat of manifestation of the disease is lungs (Dash, 2001).

Morus alba, known as white mulberry, is a short-lived, fast-growing, small to medium sized mulberry tree, which grows to 10–20 m tall. The species is native to northern China, and is widely cultivated and naturalized elsewhere. The trees are generally deciduous in temperate regions, but trees grown in tropical regions can be evergreen. The flowers are single-sex catkins; male catkins are 2–3.5 cm long and female catkins 1–2 cm long. Male and female flowers are usually on separate trees although they may occur on the same tree.

MATERIALS AND METHODS

Plant material of *Morus alba* of family Moraceae was collected from the local villages of Guna district. The plant was identified and authenticated by the taxonomist of botany department of S.S.L. Jain College Vidisha. A voucher specimen of the plant material was procured in the herbarium data sheet of the laboratory. The plant material was washed thoroughly with water and then air dried in shade at room temperature $25 \pm 2^\circ\text{C}$ for more than 15 days. The air dried plant material was grinded to powder about 40 – 60 mesh size. The 50gm of the powdered material was loaded into Soxhlet apparatus separately for extraction with the solvent of increasing order of polarity (n-Hexane, Chloroform and Methanol). The extract was filtered through Whatman's filter paper. Then the crude extract was concentrated in the vacuum rotary evaporator. The crude extract obtained from plant was applied in asthmatic rats and stabilization of mast cells was observed.

OBSERVATION AND RESULTS

In the present study, anti-histaminic or mast cell stabilizing activity was evaluated using active fractions of *Morus alba* in anaphylactic Wistar albino rats. Mast cells play a crucial role in the development of many physiological changes during allergic conditions of asthma. When the foreign particles come in to contact of mast cells, it trigger number of dramatic actions in the mast cells because they work as antigens. During dramatic actions mast cells release variety of chemicals like histamine that is a vasodilator which dilates blood vessels in the body. Another is serotonin which constricts blood vessels. Heparin is an anticoagulant but it doesn't play role in asthmatic conditions. After histamine, leukotrienes and other substances also play important role in allergic and asthmatic conditions. However, body always develops

immunity against antigen through increasing the production of antibody. Immunoglobulin E (IgE) is an antibody which always binds histaminic receptors on the surface of mast cells during asthma and allergy. It is the antigen-antibody (IgE) reaction which controls the mast cells to release histamine, leukotrienes and other substances. However, body required supportive drugs for the increment of immunity. Hence, active fractions of *Morus alba* tried for the control of asthma through inhibiting the release of histamine from mast cells which is possible to stabilize the mast cells by using selected plant extract purified active fractions.

For the anti-histaminic activity, all the groups were sensitized by injecting subcutaneously 0.5 ml of 2% Alum along with 0.5 ml of triple antigen containing 20,000 million *Bordetella pertussis* bacteria. The sensitized rats were divided into four groups. Group I was served as control and have received water with *ad-libitum* but not treated and sacrificed for the observation of mast cells which were found $15.50 \pm 2\%$ intact and $88.20 \pm 2\%$ disrupted. Mast cells were observed carefully and percentage of intact and disrupted mast cells were calculated. Table below showed the effect of active fractions of *Morus alba* extract on sensitized rats. In the II group which was treated with active fraction of *Morus alba* extract, it was noticed that when the dose of 50 mg/kg body weight were given orally with water by using oral feeding tube needle, the disruption of mast cells were found $35.60 \pm 2\%$ disrupted and intact mast cells were found $64.40 \pm 2\%$. In another dose of 100 mg/kg body weight for the same plant, the disruption of mast cells were found $17.70 \pm 2\%$ and intact mast cells were found $82.30 \pm 2\%$. In the IV group 10 mg/kg b.w. standard drug Dexamethasone was given intramuscularly, it was observed that the disruption of mast cells was $20.40 \pm 2\%$ and intact mast cells was found $84.50 \pm 2\%$ which was quite similar to the maximum 100 mg/kg/b. w. of herbal extract.

CONCLUSION

It appears that the disruption of mast cells is quite dosed dependent. It is inversely proportional to the doses, as the doses increases, the disruption of mast cells decreases. However, intact mast cells percentage is similar to the doses, as the doses increases the intact mast cells percentage also increases. Hence, the anti-histaminic activity is directly proportional to the doses because the number of intact mast cells was found to be increasing simultaneously with increasing the

doses. The results when compared to the control seem to be quite significant at $p < 0.05$ when student “t” test was applied. All the values

obtained after the treatment by plant extract were highly significant.

Table . Effect of active fraction of plant extract on albino rats.

Group	Treatment	Dose (mg/kg b. w.)	Route of administration	Mast cells de-granulation	
				Disrupted %	Intact %
I	Control Sensitized	--	Not given	88.20±2%	15.50± 2%
II	Treated with <i>Morus alba</i> extract	50	Orally	35.60±2%	64.40±2 %
III	Treated with <i>Morus alba</i> extract	100	Orally	27.70±2%	82.30±2%
IV	Standard drug Prednisolone	10	Intra muscular	20.40±2%	84.50±2%

P value 0.05, * SEM

REFERENCES

1. Agrawal B. and Mehta A.. Efficacy and safety of seed kernel of *Moringa oleifera* in the treatment of bronchial asthma. *Indian J Pharmacol.* 2008;40 (1): 28-31.
2. Ahirwar B, Ahirwar D. and Ram A. Anti-histaminic activity of AVB-01- A polyherbal formulation. *Phcog. Mag.* 2008;4 (15): S 46- S 49.
3. Ballaha B. and Chaurasia OP. Medicinal plants of cold desert Laddak used in the treatment of stomach disorders. *Indian J. Traditional Knowledge.* 2009;8 (2):185-190.
4. Barnes PJ. Anti-inflammatory therapy for asthma. *Ann. Rev. Resp. Med.* 1993;44: 229-249.
5. Dash Bhagwan. Ayurvedic cures for common diseases. A complete book of Ayurvedic remedies. Hind Pocket Books Publication, Delhi.
6. Ejaz-ur-Rehman. Indigenous Knowledge of medicinal plants village Bareli Kass & its allied area district Kothli, Azad J & K, Pakistan. <http://www.siv.edu>
7. Elujoba AA, Odeley OM. and Ogunyemi, CM. Traditional medicines development for medical and dental primary health care delivery system in Africa. *African Journal of Traditional, Complementary and Alternative Medicines.* 2005;2: 46 – 61.
8. Gupta YK, Katyal Jatinder, Kumar Gajendra, Mehla Jogender, Katiyar C. K., Sharma Naveen and Yadav Satpal. Evaluation of Antitussive activity of formulations with herbal extract in sulphur dioxide induced cough model in mice. *Indian J. Physiol. Pharmacol.* 2009;53 (1): 61-66.
9. Hannaway Paul J. The asthma self help book. Orient paper Backs, Delhi. Pp. 1996: 235.
10. Harborne JB. (1984). Phytochemical methods. A guide to modern techniques of plant analysis. 2nd edn. Chapman and Hall Publ. London. Pp. 1-128.
11. Havsteen B. Flavonoids: A class of natural products of high pharmacological potency. *Biochem. Pharmacol.* 1983;32: 1141-1148.
12. Iqbal M. (1993). International trade in non-wood forest products. An Overview – Rome, FAO.
13. Jain AK. and Vairale MG. Some Threatened Angiospermic Taxa of Chambal Eco-region. *Phytotaxonomy*, 2007: 107-110.
14. Jha RK. Ethno-medical plants used against asthma at Chotanagar, Jharkhand, India. *Ad. Plant Sci.* 2001;14 (1): 95-97.
15. Kabelitz L, Gruen T, Celot P, et al. (2003). References substances. Product List. Phyto Lab., GmBh & Co. Kg. Vestenbergsgreuth Lab., Addipharma. Pp. 1-58.
16. Prasad R, Lawania RD, Manvi, Gupta R. Role of herbs in the management of asthma. *Phcog. Rev.* 2009;3:247-58.
17. Raghunathan K. (1976). Preliminary Techno-economic survey of natural resources and herbal wealth of Ladakh. CRIMH Publication, New Delhi. pp. 1-12.
18. Saxena RC. (2003): Anti-histaminic activity of the Saponin isolated from *Achyranthes aspera* Linn. Paper presented in 3rd World congress on Medical and Aromatic Plants (WOCMAP), from 3-7 Feb. Chiang Mai University Thailand. pp. 137.