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Research Article

ANTIHISTAMANIC ACTIVITY OF EXTRACT OF *ACHYRANTHES ASPERA*

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INTRODUCTION

The history of medicine dates back perhaps to the origin of human civilization. From the earliest times mankind has used plants in an attempt to cure diseases and relieve their sufferings. Primitive people in all ages have had some knowledge of medicinal plants. Most savage people believed that diseases were due to the presence of evil spirits in the body and could drive by the use of disagreeable substances found in nature.

Plants have been the basis of many traditionalmedicines throughout the world for thousands ofyears and continue to provide new remedies tomankind. Plants have been one of the importantsources of medicines since the beginning ofhuman civilization. The recent resurgence of plantremedies resulted from several factors, such aseffectiveness of plant medicines and lesser sideeffects compared with modern medicines.Indigenous herbs are used as remedies againstvarious diseases in the traditional system ofmedicine or in ethno medical practices. For thepast few decades, compounds from naturalsources have been gaining importance because ofthe 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 importantlead in drug research, resulting in the discovery ofnovel molecules.

Asthma is a disease of the human respiratorysystem in which the airways constrict and becomenarrow, 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 300million worldwide (Christopher and Fanta, 2009). During attacks the smooth muscle cells in thebronchi constrict, and the airways becomeinflamed, swollen and breathing become difficult.The term *asthma* actually comes from the *Greek word panos,* which means to pant or to breathewith an open mouth. In Ayurveda, it is consideredto originate from the affliction of the stomach andother parts of gastro-intestinal tract. In most of thecases, therefore, either in the beginning of thedisease or before each attack, the patient suffersfrom indigestion, constipation or even diarrhea.The seat of manifestation of the disease is lungs (Dash, 2001).

Achyranthes aspera L. (Latjeera) is an erect or procumbent, annual or perennial herb of about 1-2 meter in height, often with a woody base. Stems angular, ribbed, simple or branched from the base, often with tinged purple colour, branches terete or absolutely quadrangular, striate, pubescent, leaves thick, 3.8 – 6.3X22.5 – 4.5 cm, ovate – elliptic or obovate –rounded, finely and softly pubescent on both sides, entire, petiolate, petiole 6 – 20 mm long, flowers greenish white, numerous in axillary or terminal spikes up to 75 cm long, seeds subcylindric, truncate at the apex, rounded at the base, reddish brown.

MATERIALS AND METHODS

Plant material of *Achyranthes aspera* L. of family Moraceae was collected from the local villages of Ratlam district. The plant was identified and authenticated by the taxonomist of botany department of Bherulal Patidar Govt. P.G. College, Mhow (M.P.). 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 ± 2°c for more than 15 days. The air dried plant material was grinded to

powder about 40 – 60 mesh size. The 50gm of the powderedmaterial was loaded into soxhlet apparatus separately for extraction with the solvent of increasing order ofpolarity (n-Hexane, Chloroform and Methanol). Theextract was filtered through Whatman's filter paper. Then the crude extract was concentrated in thevacuum rotary evaporator. The crude extract obtainedfrom plant was applied in asthmatic rats andstabilization 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 *Achyranthes aspera* in anaphylactic Wistaralbino 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 *Achyranthes aspera* 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 0.5ml of 2% Alum along with 0.5 ml of tripleantigen containing 20,000 million *Bordetella pertussis* bacteria. The sensitized rats were divided into four groups. Group I was served ascontrol and have received water with *ad-libitum*but not treated and sacrificed for the observationof mast cells which were found 15.50 ± 2% intact and 88.20 ± 2 % disrupted. Mast cells were observed carefully and percentage of intact anddisrupted mast cells were calculated. Table below showed the effect of active fractions of *Achyranthes aspera* extract on sensitized rats. In the II groupwhich was treated with active fraction of *Achyranthes aspera* extract, it was noticed that when the dose of50 mg/kg body weight were given orally withwater by using oral feeding tube needle, thedisruption of mast cells were found 29.80 ± 2 % disrupted and intact mast cells were found 71.20 ± 2 %. In another dose of 100 mg/kg body weight for the same plant, the disruption of mast cells was found 24.70 ± 2 % and intact mast cells were found 81.10 ± 2 %. In the IV group 10 mg/kgb.w. standard drug Dexamethasone was givenintramuscularly, it was observed that thedisruption of mast cells was 20.40 ± 2 % and intact mast cells was found 84.50 ± 2% which was quite similar to the maximum 100 mg/kg/b. w. ofherbal extract.

CONCLUSION

It appears that the disruption of mast cells is quitedosed 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 result 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 *Tinosporacordifolia* extract	50	Orally	29.80±2%	71.20±2 %
III	Treated with *Tinosporacordifolia* extract	100	Orally	24.70±2%	81.10±2 %
IV	Standard drug Dexametasone	10	Intra muscular	20.40±2%	84.50±2%

P value 0.05, * SEM

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