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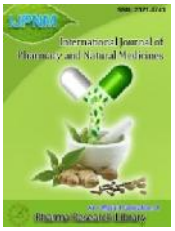

Research Article **Open Access**

A Comparative Study on Anti Arthritic Activity of Butanolic and Ethylacetate Extracts of Different Parts of *Momordica Charantia* Fruit

Venumadhuri R*, Lakshmiprasanna M, Krishna Priyanka D, Kalyani G, Ashok Naik B, Dr. A.V. Badarinath

Dr. K.V. Subba Reddy institute of Pharmacy, Near Dupadu Railway station, Dupadu, Kurnool, Andhra Pradesh.

A B S T R A C T

In the present investigation was carried out to evaluate the comparative study of anti -arthritic property of butanolic and ethyl acetate extract of different parts of *Momordica Charantia* by albumin denaturation assay of five different concentration of different extracts (100, 200,300, 400, 500µg/ml) were using in the study. In albumin denaturation method all the extracts at a dose of 500µg/ml showed maximum protection, whereas the standard drug provided. We concluded that butanolic and ethyl acetate extract of *Momordica Charantia* pulp shows stronger anti-arthritic activity at different concentration when compared to standard drugs and other extracts.

Keywords: Neusiline, Tween-80, Aerosil-200, Kyron T-314, Poly ethylene glycol-400, liquisolid compacts.

A R T I C L E I N F O

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***Corresponding Author**
Venumadhuri R
Dr. K.V. Subba Reddy institute of Pharmacy, Near Dupadu Railway station, Dupadu, Kurnool, Andhra Pradesh.
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1. Introduction

Rheumatoid arthritis is a chronic progressive inflammatory autoimmune disease mainly affecting peripheral synovial joints. It is a systemic disorder where inflammatory changes affect not only joints but also many other sites including the heart blood vessels and skin [1] .It is characterized by inflammation of the joint, which causes swelling, pain, and loss of function. Usually this form of arthritis occurs bilaterally if one wrist is affected the other is also likely to

be affected although often not to the same time. The primary symptoms of rheumatoid arthritis inflammation of the synovial membrane. If untreated the membrane thickness and synovial fluid accumulates. The resulting pressure causes pain tenderness the membrane then produces an abnormal granulation tissue, pannus that adheres to the surface of the articular cartilage and sometimes erodes the cartilages completely. When the cartilages are destroyed, fibrous tissue joints the exposed bond ends. The fibrous tissue ossifies and fuses the joint. So that it becomes immovable, the ultimate cripping effect of rheumatoid arthritis the growth of the granulation tissue causes the distortion of the fingers that characterizes hand of RA suffers. There are many types of arthritis such as Psoriatic arthritis, Infective arthritis, Ankylosingspondylitis, Osteoarthritis etc [2].

Momordica Charantia is also known as Bitter melon [3]. It is a tropical and subtropical vine of the family *Cucurbitceae*, widely grown in Asia, Africa, and the Caribbean for its edible fruit. Its many varieties differs substantially in the shape and bitterness of the fruit [4]. This herbaceous tendril-bearing vine grows up to 5 cm in length. It bear simple, alternate leaves 4-12 cm across, with three to seven deeply separated lobes. Each plant bear separate yellow male and female flowers. The fruit has distinct warty exterior and oblong shape. It is hallow in cross-section, with a relatively thin layer of flesh surrounding a central seed cavity filled with large, flat seeds and pith. The fruit is most often eaten green, as it is beginning to turn yellow. Bitter melon has many phytochemical constituents such as Beta momorcharin, Vicine Charantin, Momodricoscides A and B, Carotenoids, MAP30 Polypeptide P, phenols etc[5]. They are use in since a very long time in Hindu medicine or Ayurveda. Bitter melon has been used in various Asia, Africa herbal medicine systems for a long time [6][7][8]. In Turkey, it has been used as a folk remedy for a variety of ailments, particularly stomach complaints [9]. In traditional medicine of India, different parts of the plant are used as claimed treatment for diabetes, and as a stomachic, laxatives, antibiolius, emetic, anti-helminthic agent, for the treatment of cough , respiratory disease, skin disease, wounds, ulcer, gout etc.

2. Materials and method

Plant material:

The fruit of *Momordica Charantia* where collected from local area of Kurnool, A.P, India.

Preparation of Plant Extract:

Collected fruit of *Momordica Charantia* where separated into seed, pulp & peel .All the separated fruit parts were dried under shade followed by converting into moderately coarse powder .Each samples were extracted with solvents like butanol and ethyl acetate for 72 hours by maceration method.

Drug and Chemicals: Diclofenac sodium was obtained from balaji AP, Kurnool, doubled distilled water from all glass-steel was used throughout the studies.

Stock Solution 100mg of each extract was dissolved in 100ml of respective solvent [butanol and ethyl acetate]. This stock solution has a concentration of 1mg/ml. From this stock solution different concentrations of the extracts were prepared (100 µgm/ml, 200 µgm/ml 300 µgm/ml, 400 µgm/ml, 500 µgm/ml)

Assesment of In-vitro Anti Arithritic Activity

Inhibition of Albumin Denaturation [11][12]

The reaction mixture [5 ml] consists of 0.2ml of egg albumin 2.8 ml of phosphate buffered saline and 2 ml of varying concentrations of 6 extracts so that final concentrations become 100 µgm/ml , 200 µgm/ml, 300 µgm/ml,400 µgm/ml, 500 µgm/ml. Similar volume of doubled distilled water served as control.Then the mixtures were incubated at 37 $\pm$ in a BOD incubater for 15 mins and then heated at 70^0C for 5 mins after cooling ther absorbance was measured at 660nm by using vehicle as a blank .Diclofenac sodium at the final concentration of 100 µgm/ml , 200 µgm/ml 300 µgm/ml, 400 µgm/ml, 500 µgm/mlwas used as reference durg and treated similarly for determination of absorbance the percentage inhibition of protein denaturation was calculated by using the following formulae.

% inhibition= [(abs of control-abs of test)/ abs of control]*100

3. Results and Discussion

Anti arthritic effect of butanolic and ethyl acetate extracts of seed,pulp and peel of *Momordica Charantia* was studied significantly by using in-vitro inhibition of albumin denaturation model. The effect of these extracts on inhibition of protein denaturation in shown in figure 1&2, table 1 to 6.The percentage of arthritic protection of butanolic peel extract was found to be 0 %(100µg/ml), 34.2% (200µg/ml), 50.9%(300µg/ml), 67.2%(400µg/ml), 83.6%(500µg/ml). The percentage of arthritic protection of butanolic pulp extract was found to be 34.2% (100µg/ml), 50.9% (200µg/ml), 50.9 % (300µg/ml), 67.2% (400µg/ml), 67.2% (500µg/ml). The percentage of arthritic protection of butanolic seed was found to be 0% (100µ/ml), 17.1% (200µg/ml), 34.2% (300µg/ml), 67.2% (400µg/ml), 83.6% (500µg/ml).

The percentage of arthritic protection of ethyl acetate peel extract was found to be 0%(100µg/ml), 34.2% (200µg/ml), 50.9%(300µg/ml), 67.2%(400µg/ml), 83.6%(500µg/ml). The percentage of arthritic protection of ethyl acetate pulp extract was found to be 50.9% (100µg/ml), 67.2% (200µg/ml), 67.2% (300µg/ml), 83.6% (400µg/ml), 83.6% (500µg/ml). The percentage of arthritic protection of ethyl acetate seed extract was found to be 0% (100µg/ml), 17.1% (200µg/ml), 50.9% (300µg/ml), 67.2% (400µg/ml), 83.6% (500µg/ml).

The percentage of arthritic protection of standard drug diclofenac sodium (using butanol as solvent) was found to be 0% (100µg/ml), 17.1% (200µg/ml), 34.2% (300µg/ml), 34.2% (400µg/ml), 50.9% (500µg/ml). The percentage of arthritic protection of standard drug diclofenac sodium (using ethyl acetate as solvent) was found to be 0% (100µg/ml), 17.1% (200µg/ml), 34.2% (300µg/ml), 50.9% (400µg/ml), 67.2% (500µg/ml).

Table 1: Composition of Carvedilol Tablets in Mg Anti Arthritic Activity of Butanolic Extracts of *Momordica Chirantia* Peel

Control	Concentration Of Extract µG/ML	Absorbance of extract	Absorbance of Standard	% Inhibition	% inhibition of standard
0.0269	100µg/ml	0.0269	0.0269	0	0
	200µg/ml	0.0177	0.0223	34.2	17.1
	300µg/ml	0.0132	0.0177	50.9	34.2
	400µg/ml	0.0088	0.0177	67.2	67.2
	500µg/ml	0.0044	0.0132	83.6	83.6

Table 2: Anti Arthritic Activity of Butanolic Extract of *Momordica Charantia* Pulp

Control	Concentration Of Extracts µg/ml	Absorbance of extracts	Absorbance Of Standard	% Inhibition Of Extract	%Inhibition Standard
0.0269	100µg/ml	0.0177	0.0269	34.2	0
	200µg/ml	0.0132	0.0223	50.9	17.1
	300µg/ml	0.0132	0.0177	50.9	34.2
	400µg/ml	0.0088	0.0177	67.2	34.2
	500µg/ml	0.0088	0.0132	67.2	50.9

Table 3: Anti Arthritic Activity of Butanolic Extract of *Momordica Charantia* Seed

Control	Concentration Of Extract(µg/ml)	Absorbances Of Extract	Absorbence Of Standard	% Inhibition Of Extract	% Inhibition Of Standard
0.0269	100(µg/ml)	0.0269	0.0269	0	0
	200 (µg/ml)	0.0223	0.0223	17.1	17.1
	300(µg/ml)	0.0177	0.0177	34.2	34.2
	400(µg/ml)	0.0088	0.0177	67.2	34.2
	500(µg/ml)	0.0044	0.0132	83.6	50.9

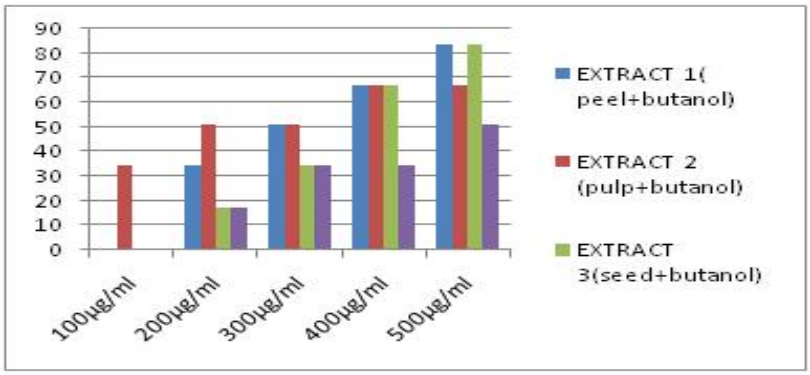

Figure 1: % Inhibition of protein denaturation of butanolic extract of different parts of *Momordica Charantia*

Table 4: Anti Activity of Ethyl Acetate Extract of *Momordica Charantia* of Peel

Control	Concentation Of Extracts µG/ml	Absorbance of Extract	Absorbance of Standard	%Inhibition of Extract	%Inhibition of Standard
0.0269	100µg/ml	0.0269	0.0269	0	0
	200µg/ml	0.0177	0.0223	34.2	17.1
	300µg/ml	0.0132	0.0177	50.9	34.2
	400µg/ml	0.0088	0.0177	67.2	34.2
	500µg/ml	0.0044	0.0132	83.6	50.9

Table 5: Anti Arthritic Activity of Ethyl Acetate Extract of *Momordica Charantia* Pulp

Control	Concentation of Extracts µg/ml	Absorbance of Extract	Absorbance of Standard	%Inhibition of Extract	%Inhibition of Standard
0.0269	100µg/ml	0.0269	0.0269	0	0
	200µg/ml	0.0177	0.0223	34.2	17.1
	300µg/ml	0.0132	0.0177	50.9	34.2
	400µg/ml	0.0088	0.0177	67.2	34.2
	500µg/ml	0.0044	0.0132	83.6	50.9

Table 6: % Inhibition of Ethyl Acetate Extract Of *Momordica Charantia* (Seed)

Absorbance of control	Concentration of Extract µG/ML	Absorbance of Extract	%Inhibition of Extract	% Inhibition of Standard
0.0269	100µg/ml	0.0177	34.20	65.8
	200µg/ml	0.0177	34.20	65.8
	300µg/ml	0.0132	50.92	49.08
	400µg/ml	0.0088	67.28	37.72
	500µg/ml	0.0044	83.64	16.36

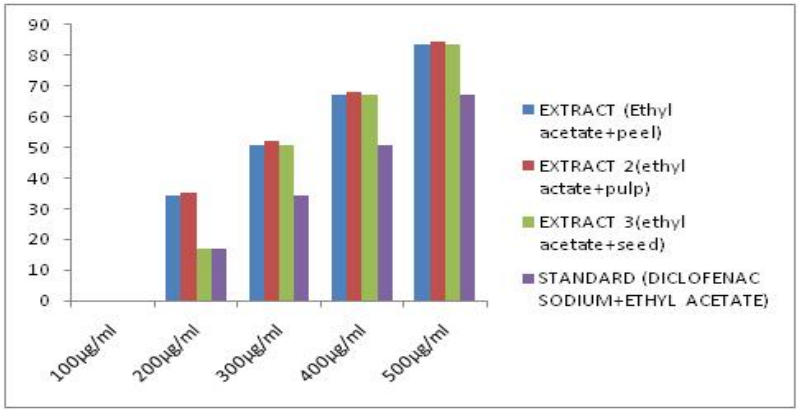

Figure 2: % Inhibition of protein denaturation of ethyl acetate extract of different parts of *Momordica Charantia* fruit

Discussion

Protein denaturation is a process in which protein lose their tertiary structure and secondary structure by application of external stress and strong acid or base, concentrated inorganic salt, organic solvent, heat. Most biological proteins lose their biological function denaturation of protein is one of the cause of rheumatoid arthritis. Documented production of auto antigens of lead to denaturation of protein in certain arthritic disease, modulation of electrostatic hydrogen, hydrophobic and disulfide bonding in denaturation protein, which is the mechanism of protein denaturation[13][14].A decrease in absorbance with dose indicate increasing % inhibition of protein denaturation. From the results of present study it can be started that all the extract of momordica charantia are capable of controlling the production of auto antigen and by inhibiting the denaturation of protein(fresh egg albumin) in dose dependent manner and its effects was compared with thatof standard drug diclofenac sodium. Ethyl acetate and butanolic extract of *Momordica Charantia*pulp showed maximum inhibition of protein denaturation than other extracts.

4. Conclusion

From the results obtained in the present study it may be concluded that ethyl acetate and butanolic extracts of *Momordica Charantia* pulp possess significant antiarthritic activity when compared to other extracts. Hence, it could be beneficial for further work as anti arthritic agent.

5. Acknowledgement

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