

Anti Diabetic Activity *MATRICARIA CHAMOMILLA* in Streptozocin Induced Diabetic Rats

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ABSTRACT

M.chamomilla has different medicinal properties due to its active phytochemical constituents and may able to treat diabetes & its complications. Methanolic extract of *M.chamomilla* was prepared from whole plant are subjected to acute oral toxicity studies and found that the methanolic extract of *M.chamomilla* is safe to use up to the dose of 2000mg/kg. The methanolic extract of *M.chamomilla* was found to be in dose dependent against Streptozotocine induced diabetes in rats. The reduction of the elevated blood glucose levels in diabetic rats on treatment with the extract at two different concentrations confirmed that methanolic extract of *M.chamomilla* posse's Antidiabetic activity & has shown significant effect when compared to Streptazotocine administration. It needs comprehensive investigations for developing a safe and effective herbal drug. Further research is required to isolate the biomolecules responsible for the antidiabetic and its complications.

KEY WORDS: *M.chamomilla*, Antidiabetic activity

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I. INTRODUCTION

There are many herbal remedies suggested for diabetes and diabetic complications medicinal plants form the main ingredients of these formulations' some of the drugs are includes ;Annona squamosa,Arlemisia pallens, Beta vulgaris ,Camelliasinesis, Murrayakoenigii, Phaseolus vulgaris , Ficus bengalensis , Matricaria chamomilla etc.

One of the most common herbs used for medicinal purposes is chamomile whose standardized tea and herbal extracts are prepared from dried flowers of Matricaria species .Chamomile is one of the oldest most widely used and well documented medicinal plants in the world and has be

recommended for a variety of healing applications .In this review we will discuss the use antidiabetic activity of chamomile

Materials and methods

A fresh leaf of Matricaria Chamomilla was collected and will be authenticated Dr .PV.Prasanna-scientist E botanical survey of India Hyderabad.

Collection and Authentication of Plant Material

The Aerial Parts of *M.chamomilla* were collected and authenticated.

Extraction of Plant Material

The plant is grinded in to a coarse powder with the help of suitable grinder.

Preparation of extracts

The collected leaves and flowers of Matricaria Chamomilla were washed thoroughly with water to remove the extraneous matter. After washing the leaves and flowers were dried in shade and grounded 1 kg of powder was extracted with methanol in a Soxhlet apparatus for 3 days. The extract was filtered and the filtrate was concentrated under reduced pressure using a rotatory evaporator at 40°C until the extra solvent completely dried. The yield of methanolic extract was x%. The extract was stored in the cooling condition in refrigerator at 4°C until further use. The extract was dissolved in 1% carboxyl- methyl cellulose distilled water used for the animal studies.⁴

Evaporation of Solvent

The filtrates (methanol extract) obtained were evaporated using Rotary evaporator in a porcelain dish. They rendered a gummy concentrate of greenish black. The extract was kept in vacuum dissector for 7 days.

Animals

Healthy Adult Male wistar rats of 8-10 weeks old with Average weight in the range of 150-180gms were selected. Animals are housed 4 per cage in temperature controlled (27 °C ±3 °C) room with light/dark cycle in a ratio of 12:12 hrs is to be maintained.

The Animals are allowed to acclimatize to the environment for seven days and are supplied with a standard diet and water *ad libitum*. The prior permission was sought from the Institutional Animal Ethics Committee (IAEC) for conducting the study.

Acute toxicity studies

The acute oral toxicity of a lyophilized water extract of chamomilla (matricaria) flowers will be evaluated using 2 groups of 12 female rats of the wistar strain. The 2 groups will receive a single oral dose of 720 and 1440 mg/kg, respectively, and were observed for 24 h post-dosing. They will be observed for evidence of acute toxicity.

Induction of diabetes

Diabetes was induced in the overnight fasted male albino wistar rats by a single intraperitoneal injection (*i.p.*) of streptozocin (55 mg/kg body

weight) dissolved in 0.1 M citrate buffer (pH=4.5), Normal control rat received citrate buffer only as vehicle. After 3 days induction of diabetes injection of STZ blood sample was collected from the retro-orbital of the rat eyes and plasma, glucose level were determined. The animals confirmed diabetic by the elevated plasma glucose levels (200 mg/dl) were used for the present study.

Waste disposal

Wastage will be removed regularly and frequently in a safe and sanitary manner and will be incinerated, animal tissues, carcasses also incinerated if they have to be stored they will be packed in a leak proof plastic bag and stored in required temperature avoiding decomposition and contamination, if hazardous chemicals used first they are neutralized and disposed.⁵

Experimental Study Design

Diabetic rats were divided in to five groups with each group six animals.

- Group-I: Rats served as normal control group.
- Group-II: served as diabetic/disease control.
- Group-III: Diabetic rats treated with *M.chamomilla* plant extract at a dose 100mg/kg (low dose).
- Group-IV: Diabetic rats treated with *M.chamomilla* plant extract at a dose of 200mg/kg (high dose).
- Group V: Diabetic rats treated with Metformin (standard drug) at 450mg/kg. The treatment was given for 14days and blood samples were collected at different intervals.⁶

Collection of blood samples

Blood samples were collected from all the groups of animals at 0th, 7th, 15th day intervals through puncture of retro orbital plexus and were centrifuged at 3000 revolutions per minute (rpm) for 15 minutes. Serum was separated and stored at -20°C and then used for estimating blood glucose levels.

II. STATISTICAL ANALYSIS

All the values will be expressed as mean ±standard deviation (S.D). Statistical comparisons between different groups will be done by using one way analysis of variance .P value <0.05 will be considered as statistically significant.

III. RESULTS & DISCUSSION

%Yield value of Ethanolic Extract from Aerial Parts of *M.chamomilla* (EEMC) was found to be **24.2%**

Preliminary Phytochemical Screening

Investigation revealed the presence of steroid, Alkaloid, Tannins & Flavonoid in Ethanolic Extract of *M.chamomilla*.

Preliminary Phytochemical Screening; Table No.2

Phytochemical	Results
Steroid	+
Alkaloid	+
Tannin	+
Carbohydrate	-
Phenol	-
Flavonoid	+
Saponin	-

(+) Present

(-) Absent

Acute toxicity studies

As per (OECD) draft guidelines 423 male Wister rats were administered *M.chamomilla* and doses was be selected in the sequence (1.75- 5000) using the default dose progression factor, for the purpose of toxicity study. Animals are observed individually at least once during the first 30 minutes after dosing, periodically during the first 24 hours and daily thereafter, for a total of 14 days,. In all the cases, no death was observed within 14 days. Attention was also given to observation of tremors and convulsions, salivation, diarrhea, lethargy, sleep and coma. Overall results suggested the LD₅₀ value as 2000 mg/kg. Hence therapeutic dose was calculated as 1/10th and 1/20th i.e. 100mg/kg and 200 mg/kg of the lethal dose for the purpose of antidiabetic investigations.¹⁰

Glucose:

Table 3: Effect of *M.chamomilla* extract on serum glucose levels (mg/dl) in diabetic rats

Groups/Interval	0 th Day	7 th Day	15 th Day
Normal	83.3±4.23	79.1±5.36	77.7±5.62
Diabetic control	283.8±5.01	286.4±12.4	300.3±8.64
EEMC (100mg/kg)	293.1±9.83	152.9±6.91**	110.1±17.1**
EEMC (200mg/kg)	280.5±42.4	85.5±7.20***	64.7±20.7***
Metformin (450mg/kg)	211.0±34.7	79.7±10.2***	68.3±2.4**

All the values of mean±SD; n=6; ** indicates p<0.01, *** indicates ^ap<0.001 vs diabetic control.

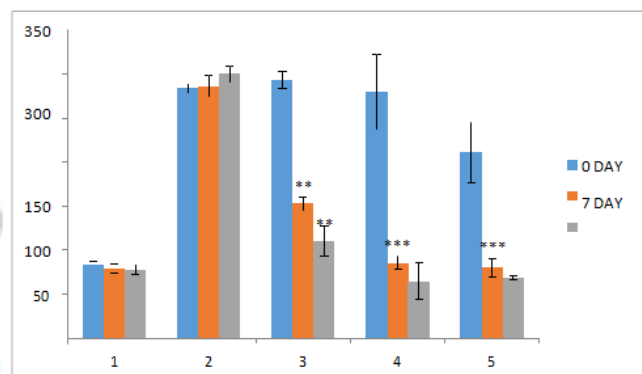


Figure 1: Effect of *M.chamomilla* extract on serum glucose levels (mg/dl) in diabetic rats

All the values of mean±SD; n=6; ** indicates p<0.01, *** indicates ^ap<0.001 vs. diabetic control.

On induction of toxicity with Streptazotocin monohydrate the glucose levels were elevated than normal in all groups. Plant extract *M.chamomilla* was administered to group-3 (100mg/kg) and group-4 (200mg/kg) and standard drug (Metformin) was administered to group-5 (450mg/kg). on treatment with extract and Metformin the glucose levels were reduced significantly.

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