ISSN: 0975-8232

IJPSR (2010), Vol. 1, Issue 6 **(Review Article)**

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received 15 March, 2010; received in revised form 26 April, 2010; accepted 15 May, 2010

ANTIDIABETIC ACTIVITY OF *BERBERIS ASIATICA* (D.C.) ROOTS

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Keywords:

Berberis roots,

Soxhlet,

extraction,

Antidiabetic Activity,

Berberine

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ABSTRACT

Barberries are a large group of evergreen shrubs, found in Lalitpur, Allahabad, Bhopal and Haldwani etc. It is an evergreen shrub. Commonly, its fruits are called as berries. This plant is generally use in case of diabetes and mouth ulcer, as a traditional use. Type 2 diabetes mellitus (formerly called NIDDM, type II or adult-onset) is characterized by insulin resistance in peripheral tissue and an insulin secretory defect of the β- cell. This is the most common form of diabetes mellitus and is highly associated with a family history of diabetes.

INTRODUCTION: Barberries is a large group of evergreen shrubs, found in Lalitpur, Allahabad, Bhopal and Haldwani etc [1]. It is an evergreen shrub. Commonly, its fruits are called as berries. The plant is generally used in case of diabetes and mouth ulcer, as a traditional use [2], 1.2-1 meter height and stem up to 10 cm in diameter. Its bark is rough, furrowed, and somewhat corky. Twigs are glabrous or shortly pubescent, pale yellowish. Leaves are 2.5-6.3 cm by 1.3-3 cm oblong, elliptic, or broadly obovate, usually with large distant spinous teeth, sometime entire, very coriaceous, dark green with very prominent primary and secondary pale reticulate venation above, glaucous beneath. Petiole is absent or sometimes distinct up to 10 mm. Inflorescence a simple raceme up to 3 cm long, often with a few long- stalked flowers at the base. Pedicels 4-10 mm long, slender, often glaucous. Fruit is 7-10 mm long.

Type 2 diabetes mellitus (formerly called NIDDM, type II or adult-onset) is characterized by insulin resistance in peripheral tissue and an insulin secretory defect of the β- cell. This is the most common form of diabetes mellitus and is highly associated with a family history of diabetes [3].

Traditional uses of *Berberis asiatica* roots [4]:

- For mouth ulcer; “As an Anti-inflammatory”
- As an Analgesic
- For antipyretic action
- As Diuretic
- As Hepatoprotective
- As an antimicrobial
- As an Antioxidant
- As a Strong wound healer
- As an Anti-rheumatic
- As an Immunogogue
- For Adaptogenic properties
- As stimulant

MATERIAL AND METHODS: Plant material: The roots of *Berberis asiatica* were collected from Haldwani (Uttaranchal) and authenticated at College of Agriculture, Indore. Voucher specimen was submitted in Dept. of Pharmacognosy Bundelkhand University Jhansi with Plant authentication no. **BU/PCOG/397**

Selection of Extract: Hydro alcoholic extract was selected for the in-vivo activity, being nontoxic. The roots were dried under shade and then powdered. The dried powdered material was subjected to extraction in Soxhlet apparatus [5].

Chemical Constituents: It contains alkaloids Berberine, Berbamine, Palmatine and Oxyacanthine. Berberine is its marker compound and it is isoquinoline alkaloid.

Pharmacological Activity: In the experiment a total of 50 rats were used. Diabetes was induced in all rats except one group (5 rats) one week before starting the experiment. The rats were divided into 5 batches one for antidiabetic study. In each batch five rats were used for every group.

Test Animals: Male wistar albino rats (160-200 g) were used in the experiment.

- Normal rats + Saline Solution
- Rats + Alloxan
- Diabetic Rats + Dose I
- Diabetic Rats + Dose II
- Diabetic Rats + Standard Drugs

Parameters:

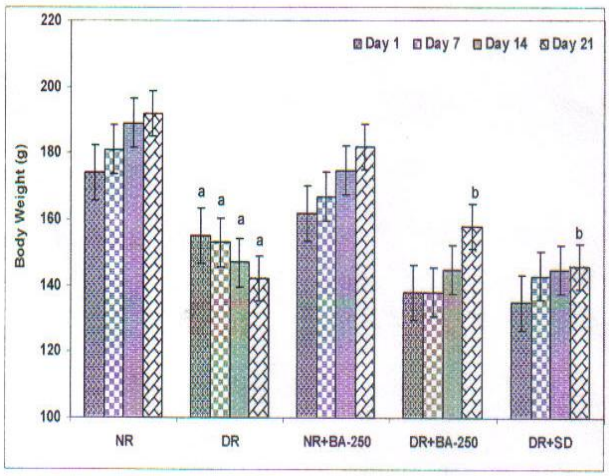
- Body weight
- Blood Glucose Level
- Morphological changes
- Behavioral Changes

Blood glucose level was checked by glucometer (accu-chek comfort) and blood was drawn by cutting the tail or from tail vein [6].

TABLE 1: EFFECT OF *BERBERIS ASIATICA* ROOTS (50% ETHANOLIC) EXTRACT ON BODY WEIGHT

TREATMENT/DAYS	1 DAY	7 DAY	14 DAY	21 DAY
Normal Rats	174 ± 6.52	181 ± 8.22	189 ± 6.52	192 ± 7.58
Diabetic Rats	155[a] ± 16.96	153[a] ± 13.04	147[a] ± 10.37	142[a] ± 7.58
Normal Rats + BA -250	162 ± 5.70	167 ± 5.70	175 ± 6.12	182 ± 6.71
Diabetic Rats + BA-250	138 ± 10.37	134 ± 7.58	145 ± 12.25	158[b] ± 9.08
Diabetic Rats + SD (Glibenclamide)	135 ± 20.00	143 ± 18.91	145 ± 18.37	146 ± 18.51
SEM	8.34	7.4	7.34	6.84
CD(p=0.05)	17.4	15.44	15.32	14.27

Body weights of treated and non treated (extract of Berberis asiatica) Normal and diabetic rats and the diabetic rats treated with standard drug (Glibenclamide) at day 1, 7, 14 and day 21 of growth. (Fig. 1)

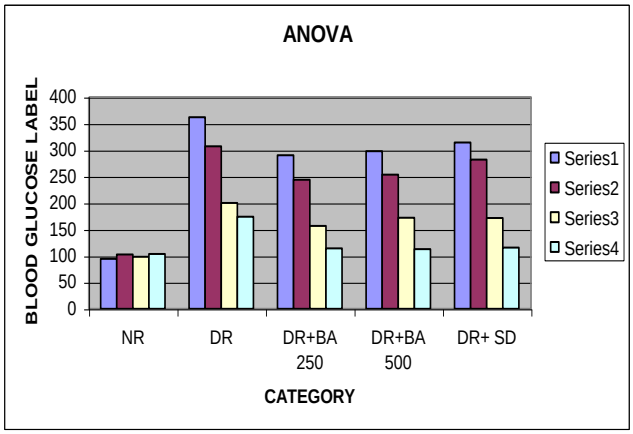


A: Significant at 5% as compared to treatment 'NR'
B: Significant at 5% as compared to treatment 'DR'
Figures in the parenthesis shows ±SEM

ANOVA was done by **"Stat disc"** software. P value is significant. Variation among column, mean is greater than expected by chance. (Table 2 and Fig. 2)

Table 2: Anova Test

NR	DR	DR + BA (250)	DR +BA (500)	DR + SD
94.6	362	290	298	314
102.6	307	244	253.6	282
98.2	200	156.6	172	171.6
103.4	174	114	113	115.6



RESULT AND DISCUSSSION: The extract shows a stronger anti diabetic action then the standard drug, Glibenclamide. Regarding Morphological changes rats are supposed to get fungal infections and reddening of tail. Loco motor activity slows down. Sometimes body wt. Decreases in case of diabetic rats.

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