Preliminary phytochemical screening of *Berberis asiatica* roots

[*1]S.C. Sati, [2] Bharti Ruhella, [2]Rekha Naithani, [3]S.V. Tyagi and [4]Maneesha Dobhal
[1]Department of Chemistry, H.N.B. Garhwal University,
(A Central University) Srinagar, Garhwal, Uttarakhand, India.
[2]Department of Home Science, H.N.B. Garhwal University,
(A Central University) Campus, Pauri, Garhwal, Uttarakhand, India
[3]Department of Chemistry, DAV PG. College, Dehradun, Uttarakhand, India
[4]Department of Chemistry, Govt. P G College, Devprayag, Tehri, Garhwal, India
[*]**Email:** sati_2009@rediff mail.com
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Abstract- Medicinal plants have bioactive compounds which are used to curing of various diseases. In this present investigation *Berberis asiatica* roots extract was studied. For phytoconstituents five separate solvents (100 ml of each) namely methanol, ethanol, chloroform, ethyl acetate and deionized waterwere used to obtain extracts from plant material. The extracts were subjected to qualitative phytochemical screening using standard procedure. Phytochemical screening reveals the presences of tannins, alkaloids, steroids Saponins, glycosides, flavonoids, anthraquinones, polyphenols and terpenoids.

Introduction

Almost all the prevailing traditional medicine systems rely upon the indigenous plants or plants derived products. With proper processing and prescription medicinal plants are being considered as safe to treat different ailments[1].From the past few decades year by year the world population is turning their attention towards the traditional medicine systems[2]. Because of their lesser side effects and cost effectiveness. Whenever a person suffering from any ailment that does not find an exact treatment within the modern medicine system such as Rabies, Alzheimer's, Diabetes, Hypertension and several type of Cancer[3-7]. In such situation he or she tries to seek the cure by taking prescription of the traditional medicine system[8].

During past few years a research towards traditional medicine system has been observed among the Diabetes suffering population of India. Numerous plants originated in India from Himalayan region, Western ghat and Gangetic planes have been reported that find their use in management of diabetes[9]. However, the current research and knowledge has established that the direct use of crude medicinal plants or plants derived products can confer the actual health benefits due to presence of other compounds also[10]. Therefore it is important to screen and identify the compounds present in those plants. This knowledge may further be utilized to developdifferent types of drugs, herbal medicines, health products, cosmetic products and supplementary foods. The

present work has been focused on the plant *berberis asiatica* which is not being much explored by the researchers. But, it is well known to the local tribal's of Garhwal Himalaya. They use its root and stem to treat different types of wounds including mouth

ulcer and diabetes.

Berberis asiatica belongs to the family *Berberidaceae*is a short lived enduring shrub lesser then 10 meter height. It is native to the Western and Central Himalaya in India and Myanmar.Its vernacular names are daruharidra, kilmora, daruhaldi and kingod[11-12]. Its bright yellowroots and tomentose stem are used as a Ayurvedic preparation by the local population of Garhwal Himalaya and the fruits of the species are eaten as a dessert[13].

Materials and methods

Collection of plant material

The plant material was collectedfrom theforest of village Khola, block Khirsu (Longitude: 78.8679886 Latitude: 30.172 2334 and Elevation: 1766 m), Pauri Garhwal Uttrakhand, India during August 2021 and identified with the help of expert Taxonomist.[14]The collected plant roots were washed out in running tap water to remove the mud and microorganisms, shade dried for 15 days and chopped in to small pieces and further dried for another 15 days. Then these small pieces turned into coarse powder of roots using the household grinder and stored in air tight container till further use.

Chemicals and reagents

Iodine crystals (99%), Chloroform (99%), Sulphuric acid (98%), Hydrochloric acid (35%) (Himedia), Methanol (99%), Ethlye acetate (99%), Ethanol (99%) (MERK), Potassium iodide (99%), Ammonia solution (25%), Ferric chloride (98%), Lead acetate (99%) (Fisher scientific), Deionized distilled water(DI water) (milli Q), Benedict's quantitative reagent (Himedia), freshly prepared Wagner's reagent obtained by dissolving 6 gm of potassium iodide and 2 gmof iodine crystals. Similarly the Ferric chloride solution was prepared by dissolving 2 gm of Ferric chloride in 50 ml DI water.

Preparation of root extracts

Previously prepared coarse powder of roots turned into fine powder and5 gm of prepared powderwas extracted viafive separate solvents (100 ml of each) namelyMethanol, Ethanol,Chloroform, Ethyle acetate and DI water. Each of the extract was accomplished through magnetic stirring at the temperature 75° C for 1 hour. Further theextracts were filteredwith the help of Whatman filter paper no. 42 (Whatman International). All extracts were preserved in refrigerator at till further use.

Phytochemical screening

Each of the prepared extracts was treated as per the standard procedures to identify phytochemical components.

1) **Screeningof the tannins (Ferric chloride test):** In a test tube holding 2 ml of the prepared extract was treated with 4-5 drops of freshly prepared ferric chloride solution.Brownish green layer confirmed the presence of tannins[15].
2) **Screening of the alkaloids (Wagner's test):** A test tube filled with 2 ml of extract , 5-6 drops ofWagner's reagent were added slowly.The reddish-brown accelerate confirmed the acquaint ofalkaloids[16] .
3) **Screening of the steroids (Salkowski's Test):** 2 ml of chloroform was mixed in 2 ml of

extract; further similar volume of concentrated $H_2SO_4$was added. The top layer revolve red and bottom layer revolve yellow with green glare, confirmed the presence of steroids[17].

4) **Screening of the saponins:** To identify the existence of saponins, 2ml of extract liquefyin 2 ml of Benedict's reagent. Blue –black acquaint indicates the presence of saponins[18].

5) **Screening of the cardiac glycosides:** To identify the presence of cardiac glycosides, 2 ml of extract liquefy with 2ml of chloroform in a test tube, after that add 1 ml of sulphuric acid added in it. Deep reddish brown color confirmed the presence of cardiac glycosides[19].

6) **Screening of the flavionds (Lead acetate solution Test):** Recognized the existence of flavonoids,2 ml of extract liquefy with 2 ml of 10 percent lead acetate. Yellowish green color confirmed the presence of flavonoids[20].

7) **Screening of the anthraquinones:** Firstly, 1 ml of extract simmers with10 percent of HCL for few moments by water bath process. Upon cooling to the room temperature the same amount of choloroform and few drops of Ammonia solution (10%) were added in it. A rose pinkcolor confirmed the present of anthraquinones[21]**.**

8) **Phenol screening: (ferric chloride test)** To identify the existence of phenols, 1 ml of extract and 2 ml milli Q water combined in a test tube than few drops of 10 percent of ferric chloride in it. Appearance of blue or green color indicates presence of phenols [22].

9) **Examinationfor Terpenoids: (Salkowski's Test):** 2ml of extract is liquefy with 2ml of chloroform after that few drops of sulphuricacid consciously added in it.Presence of reddish brown color specify the terponoids[23].

Table-1 phytochemical examination of *Berberis asiatica* Roots

Phytochemicals	**Methanol extract**	**Ethanol extract**	**Chloroform extract**	**Ethyl acetate extract**	**Aqueous extract**
Tannins	_	+	+	+	+
Alkaloids	+	_	+	_	+
Steroids	_	_	_	_	_
Saponins	+	+	+	_	_
Cardiac glycosides	_	_	_	_	_
Flavonoids	+	+	+	_	+
Anthraquinones	_	_	_	_	_
Phenols	_	_	_	_	_
Terpenoids	_	_	_	_	_
+ component is present ; - component is absent					

Results and discussion

The screening accomplished with the five types of extraction solventson*Berberis asiatica* root powder. The presence of vital components having significant therapeutic values has been confirmed. The outcome is summarized in Table-1.The screening process shows dissimilar results in different type of extraction solvents. The tannins are

absent only in methanol extracted. Alkaloids present in methanol, water and chloroform extracts. Saponins presence found in methanol, ethanol and chloroform extract. Flavonoids absent only in ethyl acetate extract.Steroids, cardiac glycosides, anthraquinones, phenols, and terpenoids were absent in all extracts.

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Disclaimer Statment

Authors declare that no competing interest exists. The products used for this research are commonly used products in research. There is no conflict of interest between authors and producers of the products.

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