



RESEARCH PAPER

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Taxonomic diversity and folk medicinal recipes used for various ailments in Torkoh area Chitral, PakistanSamin Jan¹, Izhar Ahmad¹, Naveed Akhtar¹, Arshad Iqbal¹, Sher Wali^{2*}, Fazli Rahim³¹*Department of Botany, Islamia College Peshawar, Pakistan*²*Department of Botany, Shaheed BB University Sheringal, Dir (U), Pakistan*³*Department of Botany, Bacha Khan University Charsadda, Pakistan***Key words:** Taxonomic, diversity, folk, recipes, medicinal, Torkoh.

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Abstract

Human being is constantly concerned about his health since his origin on this planet. The usage of plants has been going forward with him among all the civilizations. This usage has been cultured in different forms that has been transmitted from generation to generation and will continue during the life of human beings. The research area is rich in terms of biodiversity represented by enormous numbers of plants of all categories of lower and higher plants. The selected plants used in folk medicinal recipes belong to different groups including Pteridophytes, Gymnosperms and Angiosperms. Torkoh Valley of Chitral has a different consumption of plants for diverse purposes. Herbal recipes are among one of them, as the inhabitant of the area have faith in that the medicinal herbs have harmony and synergy with the human body as the nature has imparted them with a variety of chemical constituents. Folk medicinal recipes are prepared in a variety of manners to cure various ailments. Indigenous knowledge about the folk medicinal recipes of 38 plant species belonging to 29 genera of 25 families was obtained from the local people. Almost all plants have multiple folk medicinal uses. Folk medicinal recipes are mostly unique and specific to the research area.

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Introduction

Plant-based medicines have a reputable place, particularly in developing countries where modern health facilities are not satisfactory. Indigenous remedies are attaining reputation in both rural and urban areas because they are active, harmless and inexpensive. Information gathered from ethnic groups has played an important role in the discovery of new products from plants as chemotherapeutic agents (Katewa *et al.*, 2004). Just like the allopathic medicine system, the traditional herbal system uses exceptional combination of plant to treat diseases.

The fact is that different plants have different chemicals that can cause different results on different organisms. The daily proper quantity and quality in take has been standardized by the traditional experienced elders of the society and transferred to the next generation. That is why local people are always in search of authentic recipes. People inhabiting the tribal localities and villages have used indigenous plants as medicines for generations because this knowledge is based on experience. The tribes and villages also have no health facilities as they are far away from cities. Most inhabitants are poor or middleclass and they cannot afford expensive synthetic drugs (Shinwari & Khan, 1998).

In Pakistan, about 84% people depend upon traditional medicine for almost all their medicinal needs (Hocking, 1958). Today a lot of people are using the traditional system for various diseases in different parts of the world. Sugimoto *et al.* (1991) reported 12 herbs used in traditional Taiwanese medicine against kidney disease. Ndamba *et al.* (1994) described the use of Traditional herbal medicine for the treatment of urinary disorder and schistosomiasis in Zimbabwe. The herbal recipes are in common use for food and drinks against malnutrition in India and Brazil (Patil 1987, Almeida *et al.* 1990). Diabetes is a serious disease and its treatment is very difficult and need long follow up. The herbal traditional treatment for diabetes mellitus investigated and reported from different parts of the

world (Hale *et al.* 1989, Mandango *et al.* 1990, Gbile *et al.* 1990, Mckeon 1994, Vedavathy and Rao, 1995, Yamamoto *et al.* 1995). The herbal remedy for the treatment of malaria has a wide use throughout the globe, and their effectiveness been reported by various scientists (Pandian *et al.* 1989, Ratis *et al.* 1991, Silva, 1991, Kinyuy *et al.* 1993, Ruebush *et al.* 1995).

The herbal medicines occupy distinct position right from the primitive period to present day. For the present study Torkoh a hilly and remote area in Chitral, Khyber Pakhtunkhwa Pakistan, was selected. This area has a rich floristic biodiversity which has not previously been worked out and required studies regarding the species composition and taxonomic grouping. The people are mostly dependant on the use of local plants as medicines. The indigenous knowledge regarding their use of plants as medicines and the unique folk medicinal recipes were to be recorded and reserved.

The present study was designed to gather knowledge about the flora of the research area and to classify medicinal plants of the area into major taxonomic groups. Aim was to obtain data on the local uses of the medicinal plants and to record the novel and region specific medicinal recipes, so that they can be scientifically assessed as well as preserved.

Materials and methods

Taxonomic Diversity

The research area was visited, in different seasons, several times for collection of data during the year 2012–2013. The plants of medicinal importance were collected, dried in old newspapers and later on identified and preserved on standard herbarium in the herbarium of the Islamia College Peshawar. The plants were identified with help of local floras and available literature. The identified plants were classified into different taxonomic categories as Pteridophytes, Gymnosperms and Angiosperms. Each of these groups was divided into families, genera and species.

Folk Medicinal Recipes

Plants of folk medicinal importance were classified on the basis of their local use. Knowledge about the local use of these plants as medicines was obtained from the local people including elder ladies through interviews and questionnaires and The folk medicinal recipes for the medicinal plants collected was obtained. Information about the folk medicinal recipes of each medicinal recipe was obtained at least from three (3) persons in different parts of the research area in order to get the most authentic and reliable data.

Results and discussion

Man is always concerned about his health since his inception on this planet. The use of plants has been evolved with him among all the societies. This practice has been refined in different forms that has been transferred from generation to generation and will continue throughout the life of human beings. It was earnestly felt to record the native use of herbs before the information is lost with the deterioration of the traditional communities. The wide use of Allopathic medicines has reduced the preparation and use of recipes from the local medicinal herbs. But still many people use these plants to cure various diseases locally and also to avoid expenses. The preparation of ethnomedicinal recipes, dosage, mode of administration and plant uses are discussed.

Medicinal herbs collected from different parts of research area used in herbal recipes revealed a total of 38 plant species belonging to 29 genera and 25 families were collected, from the research area, which are known to be used indigenously by the people of the area. Out of the plants collected Angiosperms were represented by 26 plant species, while Gymnosperms and Pteridophytes by a single species each. Family Asteraceae was represented by the highest number of species i.e. 5. All the plant species are arranged in order of their families which in turn are arranged alphabetically. Most of the plants had more than one medicinal use.

Mentha is the most used genus in which there are 3 species from which the recipes are prepared and used for the removal of abdominal pain, cooling agent, against vomiting, dysentery, diarrhea, dyspepsia, typhoid, stomachache, appetizer, anthelmintic, carminative and as stomachic agent. Similarly *Foeniculum vulgare* and *Berberis lycium* are in abdominal pain, toothache, pain, sore throat, blood purification, jaundice and urinary disorders. The folk medicinal recipes of the other plants give effective results for various ailments. The data collected regarding various aspects including classification of the plants into various taxonomic groups and data regarding their folk medicinal recipes was recorded in a comprehensive table (Table 1).

Table 1. Plants Used for Folk Medicinal Recipes.

S. NO.	Family	Botanical name	Local name	Habit	Part Used	Folk Recipes
	Angiosperms Asteraceae	<i>Anthemis cotula</i> L.	Sherisht	Perennial herb	Inflorescence	Fresh or dried flowers are crushed and boiled in water to make a tea which is use during the gastro intestinal disorders especially for stomachic gas trouble. Or flowers are dried, powdered and then mixed with flour to make bread and this bread is quite good in abdominal pain.

S. NO.	Family	Botanical name	Local name	Habit	Part Used	Folk Recipes
	Asteraceae	<i>Artemisia parviflora</i> Roxb. ex D. Don	Kharkhalich	Shrub	Seeds, leaves	The seeds are dried and grinded into powder and are taking one spoon daily before breakfast as stomachache and anthelmintic. The leaves are bitter in taste and eaten fresh to control diabetes.
	Asteraceae	<i>Artemisia scoparia</i> Waldst. & Kitam.	Xaa	Shrub	Flowering extracts	Aqueous extract from flowering shoots, called “xaaoug”, the flowers are chopped and boiled with sugar. Half cup of decoction is drunk thrice daily after meal to treat malaria. Infusion of the plant is prepared by boiling the whole plant which is used as purgative.
	Asteraceae	<i>Carthamus arborescens</i> L.	Pome	Annual herb	Flowers and Seed	Flower and seeds of this herb are powdered. The mixture is boils in milk. For the taste sugar or salt is added; one glass of milk is daily use for the treatment of small pox. A paste is prepared from the powder of flowers, which is applied on face for the fairness. The seeds are crushed and separated the oils from the seeds which are applied on the eruptive skin and the condition of measles. The seeds are also eaten as laxative and mixed with sugar.
	Asteraceae	<i>Cichorium intybus</i> L.	Khesti	Perennial shrub	Roots	The roots are washed, boiled in water and filtered. The filtrate is kept in open sky for the whole night water. A little amount of salt is added and is drink before breakfast to cure typhoid, constipation and nausea.
	Alliaceae	<i>Allium sativum</i> L.	Wrenzo	Perennial herb	Leaves and Bulb	The bulbs are put in Dasi ghee and roasted. That ghee is used for relieving body pain by applying or eating. The fruit is grinded its juice is extracted and used for earache. Leaves and bulb used are chopped and boiled in water; this hot water is drunk during flue and fever. The leaves are eaten fresh to cure cough. While the bulbs are grinded and make a soup without salt, which is used to lower blood pressure and also the bulbs and leaves are used as condiment.
	Amaranthaceae	<i>Pistacia khinjuk</i> Stocks.	Binju	Tree	Fruits	Fruits are eaten for their taste and as nutritive tonic. The Beadsor the dried fruits are burnt and their fumes are used as devil repellent. Fresh leaves and bark of plant are collected, washed, boiled in water and a cup of the decoction is taken early in the morning before breakfast usually for body cooling, refrigerant and hepatitis.

S. NO.	Family	Botanical name	Local name	Habit	Part Used	Folk Recipes
	Apiaceae	<i>Coriandrum sativum</i> L.	Danu	Perennial herb	Seeds, leaves and stem	Seeds, leaves and stem are aromatic and used as a condiment in fresh or dry form. Juice of the herb prepared by the crushing of leaves stem and flowers and cooked for 10 minutes in butter along with salt and water. This soup is used for small pox and in the condition of nausea. Seeds are grinded and the powdered is mix with oil or water, used as poultice for ulcer, this paste is useful for pimples, blackheads and dry skin.
	Apiaceae	<i>Carum carvi</i> L.	Hojoj	Perennial herb	Seeds	Seeds of this plant are used locally for indigestion, gastrointestinal disturbances and abdominal pain. The seeds are boiled in water with little salt and this mixture is drunk for the cure of gastric and other abdominal pain. The seeds are also chewed as stomachache and sour throat.
	Apiaceae	<i>Daucus carota</i> L.	Kheshgoom	Herb	Seeds, Root and Leaves	Carrot is cultivated as vegetable. Locally 5 gm. of the seeds of Carrot are boiled in water sugar is added and an herbal tea is prepared, which cures abdominal pain. The underground part is used as vegetable and eaten to improve eyesight. Leaves are used as dish wash because the leaves are aromatic.
	Apiaceae	<i>Foeniculum vulgare</i> Mill.	Saunf	Annual herb	Seeds and Fresh Leaves	Seeds and fresh leaves are chewed for cough, abdominal pain, toothache and pneumonia. The seeds are grinded and mix with black tea for the cure of severe coughing. By chewing the seeds or leaves it gives freshness to the mouth because it is aromatic, therefore it is used as mouth freshener. From The dry or fresh leaves a special type of soup is prepared known as “budiyongoug” is use for abdominal pain. It is also used as best toothache. It is an aromatic gastric stimulant, clears the organs of obstructions particularly the digestive tract, liver, spleen and kidneys.
	Berberidaceae	<i>Berberis lycium</i> Royle	Kowary	Shrub	Root, Fruits and Stem	The roots and stem are grinded into powder. Powdered drug is mixed with desi ghee and tablets are made. These tablets are used thrice a day as tonic when taken with milk and for early recovery of external and internal wounds and broken bones. The powder is boiled in water along with small amount of sugar, half a cup before sleeping is used for pain, sore throat and jaundice. Similarly 500gm each of fruit and bark is placed in water overnight and small along with 100 gm of sugar. After 24 hrs shacked well. The mixture is filtered and Half a cup daily early in the morning before breakfast is used in blood purification, jaundice and urine burning.

S. NO.	Family	Botanical name	Local name	Habit	Part Used	Folk Recipes
	Boraginaceae	<i>Arnebia euchroma</i> (Royle) I.M.Johnst.	Phusuk	Perennial herb	Root and stem	The roots and lower stem used as dye for coloring cloths, dyeing carpets made of wool. The roots are boiled in water, chopped and a paste is made, applied over swellings and ulcerated wounds.
	Cannabinaceae	<i>Cannabis sativa</i> L.	Bong	Annual or cultivated	Leaves and Floral buds	The dried leaves, floral buds and seeds of opium are crushed and boiled in water; the mixture is filtered through a cloth. The decoction obtained is mixed either honey or sugar. This drink is used is highly sedative and appetizing and also used as narcotic, for malaria treatment, dysentery and refrigerant. The juice of the leaves are mixed with <i>Brassica</i> oil and applied on the head to remove dandruff and vermin.
	Capparidaceae	<i>Capparis spinosa</i> L.	Kaveer	Shrub	Inflorescence	Floral buds are used 225 gm of floral buds are collected and soaked in 1 liter of water in a clay pot for one week. After one week 50 gm of sugar is added 4 table spoon thrice a day is used to treat jaundice, bronchitis, malaria and typhoid. From The dried fruits and flower buds soups is prepared locally known as Kaveer. In the Kaveer small pieces of bread, vinegar, and powder black pepper is added. This soup is prepared especially prior to fasting (Sehri).it prevent extreme thirst during fasting in summer days and in jaundice and bronchitis. The root bark is beaten with stone and the juicy squeezed is mixed with olive oil, very useful for the eczema, blisters, swelling joints, sting of animals and as anthelmintic.
	Eleagnaceae	<i>Elaeagnus angustifolia</i> L.	Shinjoor	Tree	Fruit and Flowers	Freshly opened flowers are strongly aromatic and are used in marriage religious ceremonies. Ripe fruits are eaten raw for their good taste. Fifty ripe fruits are boiled in water with 100 gm of sugar to enhance flavor and syrup is prepared. Half a cup of this syrup is used for sour throat and high fever.
	Fagaceae	<i>Quercus incana</i> Bartram	Banj, Seray	Small tree	Bark and Fruits	About 200 gm of collected bark is cut into small pieces and boiled in hale liter of milk up to the extent that it becomes gelatinous. This gelatinous mass is used as bandage for broken and cracked bones. The fruits are half roasted, grinded into powder form and mixed with desi ghee for use in urinary infections especially when the urine oozes drop by drop (enuresis) as a tonic. Similarly fruits endosperm is grinded, kneaded with flour, mixed with sugar and tablets are made. One to two tablets are taken for dysentery and diarrhea thrice a day. The bark is boiled in water and is used as black color dye for hair.

S. NO.	Family	Botanical name	Local name	Habit	Part Used	Folk Recipes
	Fumariaceae	<i>Fumaria indica</i> Hausskn, Pugsley.	Shatara	Annual herb	Whole plant	Whole plant is boiled in water to prepare a decoction and is used for constipation. The juice of the leaves is applied to the gums of children's, for strengthening. The plant is dried in shade and grinded into powder. Two tea spoonful's' is taken with cold water for dyspepsia and vomiting. The dried whole plant is boiled in water and decoction is prepared. It is mixed with a little vinegar and used usually at morning before breakfast for coolness of the body, jaundice and blood purification.
	Hippocastanaceae	<i>Hippophae rhamnoides</i> L.	Mirghinz	Shrub	Berries	Berries are crushed and mixed with yogurt to make a paste which is applied on face as a face mask, used for treating skin infections especially for virgin girls whose menstruation cycle just started. The fruit juices are mixed with rose water and dropped into irritated eyes. Two to three Berries are eaten thrice a day before meal by high blood pressure patient to reduce cholesterol and irregular palpitation.
	Lamiaceae	<i>Salvia rhytidea</i> Benth.	Korotch	Annual herb	Leaves and seeds	Fresh leaves are used as salad. Seeds are chewed before sleeping at night and breakfast for curing of stomachic problem. The leaves are chopped, mixed with flour and sugar to make a Chitralli dish known as kali to cure the abdominal pain especially of children.
	Lamiaceae	<i>Mentha longifolia</i> (L.) L.	Bain	Perennial shrub	Leaves	The dried leaves are powdered and stored in glass bottle. About two teaspoonfuls are taken thrice a day with green tea to vomiting. The powdered leaves are mixed with curd and paste is prepared for the treatment of dysentery, diarrhea and cooling agent. The tea of dried leaves is carminative.
	Lamiaceae	<i>Mentha spicata</i> L.	Saspru	Annual herb	Flowers, leaves	A paste is made from flowers and leaves and is used to cure dyspepsia, stomachache and typhoid. A soup is prepared from the decoction by boiling of the leaves and is used during typhoid fever. The paste of flowers or leaves is boiled in milk, sugar or salt is added for the taste and drink during the stomach pain and as an appetizer.
	Lamiaceae	<i>Mentha royleana</i> Wall. ex Benth.	Podina	Perennial shrub	Leaves and stems	Leaves and young stems are used as condiment and it is also used as anthelmintic. The dried leaves are made into powder and mixed with curd in the summer as stomachic agent, carminative in diarrhea and dysentery. The fresh leaves are eaten to control vomiting.

S. NO.	Family	Botanical name	Local name	Habit	Part Used	Folk Recipes
	Linaceae	<i>Linum usitatissimum</i> L.	Shenthiki	Perennial herb	Seeds	Seeds are grinded and fried, mixed with butter and paste is prepared. One table spoonful thrice a day is used in urinary tract infections and bed wetting of children. Seeds are chewed and kept for few minutes in between the jaws for toothache and infectious gums. Two tea spoonful of seed before meal is very effective for high blood pressure.
	Lythraceae	<i>Lawsonia inermis</i> L.	Shorang	Annual herb	Leaves and Flowers	Grinded leaves and flowers are used as mehndi, for foot cracks and for boils and split skin near nails. The leaves and flowers are chopped and the paste is lap on head and feet for 2 hours in summer. It removes excessive heat of body, give relief in headache and control the dandruff on skull. The paste of fresh flowers is used for skin burning. The powder of leaves and flower mix with olive or <i>Brassicca</i> oil and rubbed once at night daily for the growth of hair and removing of dandruff. It is also very effective against athlete foot disease.
	Malvaceae	<i>Alcea rosea</i> L.	Layn	Shrub	Flowers	Red or pink petals are dried, grinded into powder and mixed with molasses (gur) and a poultice is made which is applied to boils and pussy wounds for drying puss. The powdered materials are also roasted in oil or dasi ghee and applied to pussy wound of diabetes patient.
	Moraceae	<i>Morus nigra</i> L.	Shahtoot	Tree	Fruits	The fresh or dry fruits are laxative and used in jaundice, dyspepsia and as blood purifier. A juice is prepared from the fruits and boiled with a little sugar. One cup or half a cup before or after meal three time a day specially used for the cure of dyspepsia and sore throat and purification of blood.
	Poaceae	<i>Zea mays</i> L.	Juwari	Shrub	Grains	From the Grains flour is obtained; the breads are made and are eaten with cooked <i>Brassicca</i> leaves which very useful to cure constipation, weight loss and stomach pains (stomachache). People above 60 years of age eat bread with milk at night daily to protect them from high blood pressure, heart attack and brain hammerage. This remedy is also very useful for diabetes and high blood pressure patient for the control of blood sugar and cholesterol level. The grains are also boiled in water for 2hours and this water is also drink for abdominal pain. The grains are roasted in sand or salt and powder. This is mixed with sugar and used as food stuff on long journey and grazing cattle's in remote hilly area.

S. NO.	Family	Botanical name	Local name	Habit	Part Used	Folk Recipes
	Polygonaceae	<i>Rumex hastatus</i> D. Don	Sirkonzu	Herb	Leaves	The leaves are boiled in water, chopped and cooked in dasi ghee or oil, which increase appetite and also used as purgative and astringent. The juice of plant is mixed with equal amount of vinegar and sugar. Half a cup early in the morning before breakfast is used as heart tonic, cooling, apparent and diuretic.
	Ranunculaceae	<i>Clematis graveolens</i> Lindl.	Chontruk	Perennial herb (climber)	Leaves extracts	The leaves are crushed and a paste is prepared, which is used in the condition of eczema. By the cutting of a stem or a branches a milky exudates comes out which is applied to boils, swelling joints and ulcerated wounds.
	Rosaceae	<i>Crataegus songarica</i> K. Koch	Gooni	Tree	Fruits and Flowers	Fresh fruits are edible and a jam is prepared from it. The jam is mixed with dasi ghee and honey as sexual and cardiac tonic. The plant is also used as fuel wood, leaves are used as fodder. The flowers are boils in water and this water is drink for fever, without any addition of sugar or salt.
	Rosaceae	<i>Rosa webbiana</i> Wall. ex Royle	Throni	Shrub	Fruit	The fruits are boiled and strained in water then little amount of sugar is added. Now this decoction is used to cure asthma. The ripe fruits are eaten by shepherds during their journey from one place to another place. The juices of fresh petals are warm with honey and put in eyes at night for irritating eyes and improving eye sight.
	Rosaceae	<i>Amygdalus communis</i> L.	Badam	Tree	Seeds	Seeds are chewed as brain tonic. Oil extracted from seeds is used for massage on skin, as well as the nuts are grinded and little amount of milk is added and lap on face for pimples and facial complexion.
	Solanaceae	<i>Datura stramonium</i> L.	Bangedewana	Perennial shrub	Stem, Leaves, and Flowers	The stem leaves, and flowers are heated in a pan and used for backache. Leaves are smoked to relieve asthma. The paste of leaves is applied on hairs as anti-lice. Slightly warm leaves are applied externally for removing swellings. The plant is boiled in water and is kept at home to expel insects (insecticide). The juice is used in case of insect bite.

S. NO.	Family	Botanical name	Local name	Habit	Part Used	Folk Recipes
	Solanaceae	<i>Solanum nigrum</i> L.	Pirmilik	Shrub	Fruit juice	<p>Ripened fruits are collected and their juice is extracted. This extracted juice is effective in case of irritating eyes; water is mixed with the juice and uses it as an eye drop. The fruits are crushed and a paste is prepared which is mixed with oil and used as a facial mask.</p> <p>The Fruits of <i>Datura stramonium</i>, <i>Solanum surattense</i> and <i>Solanum nigrum</i> are crushed together and boiled in milk. When jelly like substance is formed, then the boiling is stopped. Bandage is made from this and used externally for abscess, sores, warts and boils.</p>
	Vitaceae	<i>Vitis vinifera</i> L.	Droch	Perennial climber	Fruit juice	<p>Fruit juice is used in the case of dyspepsia. Also use in the grape water. The fruits are very juicy and testy therefore peoples very like grapes. A special type of juice is prepared from the fruits, the fruits are soaked into the water for several days then the juice made which is known as “drochooug” a full or half glass is taken daily in the condition of dyspepsia.</p>
	Gymnosperms Ephedraceae	<i>Ephedra gerardiana</i> Wall. ex Stapf	Somani	Shrub	Stem, Leaves	<p>The powder of stem is mixed with leaves of <i>Cannabis sativa</i> or <i>Nicotiana tabaccum</i> to prepare snuff. Stem is boiled in water for one hour, the boiled stem is dried, crushed in to powder and is added into tea. Honey is mixed one table spoon daily is used for cure of asthma and tuberculosis. Extracts from young stems is mixed with olive oil and applied to face to protect from sunburn. The freshly collected stem is washed in running spring water, crushed with specially made stone and soaked overnight in goat or cow milk. Next morning boiled and filter through a cloth. To the filtrate honey is added. It is drunk by whole member once a year. It is believed that it gives immortality to life and strengthens the immune system. It purifies blood and remove toxin.</p>
	Pteridophytes Adiantaceae	<i>Adiantum cappillius veneris</i> L.	Bi Aishaesanra or Sumbal	Perennial herb	Whole Plant	<p>A little amount of sugar, one tea spoon of rice and <i>Adiantum</i> is boiled in water the decoction is eaten with carrot, two or three times a day for curing measles.</p>

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