

**Research Paper**

*Afr. J. Traditional,
Complementary and
Alternative Medicines*
www.africanethnomedicines.net

ISSN 0189-6016©2007

TREATMENT OF COMMON AILMENTS BY PLANT-BASED REMEDIES AMONG THE PEOPLE OF DISTRICT ATTOCK (PUNJAB) OF NORTHERN PAKISTAN

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Abstract

District Attock is one of the resource-based areas of medicinal plants in the north of Punjab province of Pakistan. The local people of the area have always used medicinal plants for their common ailments by traditional methods. Indigenous knowledge of local people about medicinal plants is directly linked to their culture and history. It is therefore felt worthwhile to record the indigenous knowledge about the plant-based remedies. The present communication deals with the common diseases treated by plant based remedies such as abdominal pain and worms, asthma, cough and bronchitis, cold, flu, influenza, diabetes, diarrhea, dysentery, digestive disorders, ear infections and eye complaints. 25 species belonging to 25 genera were used for common ailments. It was found that plant based remedies were used in effective prescriptions, which are simple, inexpensive, and acceptable among the local inhabitants of the area.

Key words: Ailments, medicinal plants, Attock, Pakistan

Introduction

District Attock is a famous historical region situated in the north of Punjab province of Pakistan. It acts as a gateway for the province N.W.F.P. of Pakistan. Due to its unique location, it has very useful resources of medicinal plants. District Attock lies between 37^o and 34^o North latitude, 71.45 and 73^o east longitude. The river Indus bound it on North and West. In east lies district Haripur of North West frontier province and Rawalpindi district of Punjab. Southern side is occupied by district Chakwal of the Punjab. The average annual rainfall is 783 mm. The mean maximum and mean minimum temperature in January is 17.9 °C and 5.2 °C respectively. The mean maximum and mean minimum temperature in July is 42 C^o and 26.45 C^o respectively. The total area of the district is 6856.703 sq. km (Anonymous, 1998).

The area has a rural culture of old traditions and the local people have their own principle and choice for a village site, house, family, dress and ornaments, weddings, childbirth, death ceremonies, cultural functions, festivals and socio-religious belief. The local ladies are more dynamic and laborious in comparison to the gents. The lack of communication with modern civilization have kept them closer to nature where they derive many of their day-to-day needs. The people of the area are very much close to natural vegetation, both in their habitat and livelihood. So, the people of the area have empirical observations of nature and by communicating with other people of their culture, they derive indigenous knowledge of the local plants. They, thus gain indigenous knowledge generation after generation from their ancestors. Plant and plant materials available from the local area are used as food fodder, medicine, veterinary medicines, timbers, households, oilseeds and also for socio-religious and other purposes. Similarly, local people in various villages of the area would gather indigenous medicinal plants throughout the year for marketing, personal and whole community use with in the area. In this way, the ethnobotanical knowledge of wild and cultivated plant use is directly linked to local culture and history.

Medicinal plants are valuable natural resource and regarded as potentially safe drugs. They have been playing an important role in alleviating human sufferings by contributing herbal medicines in the primary health care systems of rural and remote areas where more than 70% of population depends on folklore and traditional systems of medicines. The reason for their popularity is due to the high cost of allopathic medicines and side effects which encouraged manufacturers of Greco-Arab and Ayurvedic systems of medicines to merge their orthodox medicine with local traditional medicines in order to spread health coverage at a reasonable prize (Shinwari and Khan, 2000).

Pakistan occupies a unique position among developing countries as it has a good potential with in the variety of medicinal plants due to its varied climatic and edaphic factors, which reflect diversity and valuable medicinal plant heritage. About 6,000 flowering plants have been reported to occur in Pakistan. A very large number of drug plants are found in northern and northwestern parts of country (Ali and Qaisar, 1986).

The study area has three distinct regions, Chhachh, Sarwala and Nala Tract. The vast area and varied agro-climatic conditions of this area make it possible for all types of the medicinal plants and other usefull plants to grow. Rich biodiversity of medicinal plants in this area demand extensive research. The documentation of indigenous knowledge of local people about the use of plants is often the source of ideas for developing plants species for wider use and economic benefit and there are a large number of unidentified plant species in the area which could prove useful. The local people have good knowledge of the utilization of natural resources in this area. This knowledge is going to be lost because of the interference of modern cultural changes. Continuity of this practice will result in the loss of such knowledge. Therefore, efforts were made to understand the indigenous knowledge of local people with special reference to chemical constituents and ethno-pharmacological practices for the treatment of common day ailments. The present study was designed to investigate the ethno-medicinal potential of local people. It was also considered necessary to identify the medicinal plants, chemical constituents and their ethnopharmacological uses among different groups of society, for future research in production technology, phytochemistry and production of pharmaceutical products for wider circulation.

Methodology

The present research work was carried out during March 2004 to February 2006 through field surveys in different remote villages of the District of Attock. The questionnaires were devised to identify the indigenous knowledge of plant-based remedies from local people. The research work was unique in that the emphasis was on both men and women and also herbal doctors (Hakims). The medicinal herb data sheet was incorporated into the research work as a means of obtaining detailed information on specific medicinal plant species used in indigenous recepies. During the survey, 150 men, 50 women and 10 local herbalists (Hakims) were interviewed from different villages in the area. Frequent field trips of the area were conducted according to the life form, flowering period and season of utilization of plant products by local people. The plant specimens were collected, dried, poisoned and identified with help of flora of Pakistan (Nasir and Ali, 1970-1995 ; Stewart, 1972) and deposited as voucher specimens in the herbarium of Quaid-i-Azam University, Islamabad. Plant-based remedies were presented with common disease's name followed by botanical name of species, local name, English name, part used, chemical constituents and preparation and use. For chemical constituents prior informed consent (PIC) was used in carrying out this work. The investigation on chemical constituents of the medicinal plants were reviewed from Baquar, (1989) and Bartram, (1995).

Results

The data on 10 common diseases, namely abdominal pain and worms, asthma, cough, bronchitis, cold, flue and influenza, diarrhea and dysentery, digestive disorder, ear infections and eye complaints which were analysed with the plants as presented in Table 1. Information on indigenous recipes were originally documented from local communities of the area and chemical constituents of the medicinal plants were given as reviewed by Baquar, (1989) and Bartram, (1995).

Table 1: List of medicinal plants used for various conditions and their chemical constituents according to Baquar, (1989) and Bartram, (1995).

Disease	Botanical Name / Local Name / English Name	Part Used	Chemical constituents	Preparation & Use
Abdominal pain & worms	<i>Albizzia lebbek</i> (L) Benth. Sirrien Siris tree	Seeds are dried	Acyclic ester Heneicos, enyl hydroxy- tetracos, enoate, lupeol, leanolic acid, docosanoic acid and B- sitosterol	Seeds are dried and then ground to obtained powder (Safoof). About half teaspoon of this powder is taken with water at night for abdominal worms.
	<i>Punica granatum</i> L. Anar Pomegrenate	Seeds	Isopelletierine, Pseudopelletier- Ine, methyl – IsOpelletierine, pectin, Sorbitol, Manitol	Seeds are dried in sunshine and ground to made powder. This powder about 1/4 th teaspoon with water is prescribed twice time in a day, for killing the abdominal worms of children.
	<i>Ricinus communis</i> L. Arund Castor oil	Leaves	Malic acid, citric acid, oxalic acid, glycolic acid, tartaric acid, ascorbic acid, succinic acid, fumaric acid, sucrose, glucose, xylose and raffinose	Fresh young leaves are fried in ghee. Then these are wrapped over abdomen. This traditional phytotherapy is prescribed for abdominal pain.
	<i>Trachyspermum copticum</i> (L.) Link. Ajwain Bishops weed	Seeds	essential oil	Seeds are ground with loaf sugar (Gur) and made into small tablets. When these tablets are taken with hot water, it cures abdominal pain.
Asthma, cough & bronchitis	<i>Adhatoda vasica</i> Nees Bhakker Vasaka	Leaves	Peganine, vasicinone, adhatodine, anisoline, vasakin, and oxohakonaol	The fresh juice extract obtained from leaves, is mixed with honey and ginger juice. One teaspoon thrice a day, is recommended to all types of cough, chronic bronchitis and asthma.
	<i>Abelmoschus esculentus</i> (L.) Moeinch Bhindi English name: Laday finger (Okra)	Fruit	Sucrose, Glucose	Fresh fruits are cut into small pieces and then boiled in water, to obtain mucilaginous decoction. This decoction is prescribed for cough, throat infection and bronchitis.
	<i>Psidium guajava</i> L.	Fruit	Xylose, Sorbitol	Green immature fresh fruit of the

	Amrood Guajava			plant is fried and then crushed and mixed the teaspoon of honey. This is used for old cough, bronchitis and chronic whooping cough.
Cold, flue and influenza	<i>Ficus benghalensis</i> L. Bohr Banyan tree	Aerial adventitious roots (Prop).	Leucoanthocyanidin and leucoanthocyanin	Fresh prop roots are boiled in water for half an hour. Then this decoction is used for chronic flue and influenza. This decoction is used for 3-5 days regularly.
Diabetes	<i>Adhatoda vasica</i> Nees Bhekkar Vaisaka	Leaves	Peganine, vasicinone, adhatodine, anisoline, vasakin, and oxohakonaol	Extract obtained from the fresh leaves of plant mixed with water. About 10ml of extract is use triplicate per day. It will shows symptomatic hypoglycemic action to lower blood glucose level of Diabetics.
	<i>Aloe vera</i> L. Kunwargandal Aloe	Aerial parts	Polysaccharide, and glucuronic acid	Equal quantity of extract obtained from the fresh aerial parts of <i>Fagonia indica</i> , Fresh leaves and stem of <i>Aloe vera</i> and Fresh Branches of <i>Tinosporia cordifolia</i> . Then these three extracts are mix up and use small teaspoon thrice a day. According to the rural inhabitants of the area this formula is very old and 100% effective to lower the blood glucose level of Diabetics.
	<i>Ficus benghalensis</i> Linn Bohr Banyan tree	Aerial parts	Leucoanthocyanidin and leucoanthocyanin	The latex obtained from the aerial parts of the plants (leaves and young branches) and mixed with honey and use orally to control rise of blood sugar among Diabetics.
	<i>Momardica charantia</i> L. Karala Bitter gourd	Fruit	Pectin, glycosides, saponins, alkaloids, reducing sugars, resins, phenolic constituents	The juices obtained from the fresh fruits of plant and use one small cup daily. This juice also exhibited anti-diabetic properties.
Diarrhea and dysentery	<i>Adiantum capillus veneris</i> L. Thundi khui Booti Maidens hour	Aerial parts	Kaempferol, hydroxyl adiantone, oxohakonanol and adiantone	Juices are obtained from the fresh aerial part of plant and mix the loaf sugar (Gur) in this juice to obtain a sweet syrup (Sharbat). This syrup is used as one glass twice in a day. It is very effective phytotherapy prescribed for the control and treatment of chronic diarrhea and dysentery.
	<i>Coriandrum sativum</i> L. Dhania Coriander	Fruit	Linalool, geranyl acetate, camphor, cystine, histidine,	Dried fruits are ground to made powder. One teaspoon of this powder is taken with glass of

			lysine, arginine, aspartic acid, serine, glycine, glutamic acid, alanine, phenylalanine, isoleucine and leucine	water twice in a day for diarrhea and dysentery.
	<i>Mangifera indica</i> L. Amb Mango tree	Seed	Tannins	Seeds of the plant are dried in sunshine and then ground to obtained powder. One teaspoon of this powder with glass of water is taken twice in a day for chronic dysentery and diarrhea.
	<i>Punica granatum</i> L. Anar Pome granata	Rind of Fruit	Isopelletierine, Pseudopelletierine, methyl – IsOpelletierine, Sorbitol, Manitol	Rind of the fruit is dried in sunshine and ground to make powder. Mix equal quantity of sugar in this powder. About ½ teaspoon and ¼ teaspoon with water is recommended to adult and children respectively for diarrhoea and dysentery.
Digestive disorders	<i>Foeniculum vulgare</i> Mill. Sounf Fennel	Fruits	Fenicularin, nelumboside and umbelliferone	About 250 gram dried fruits of plant is ground to obtain powder, and mix with equal quantity of powder form of the seeds of pomegranate, 375 gm of sugar candy and 4-6 seeds of Green cardamom in powder form. This powder (Safoof) is used one teaspoon thrice in a day before and after meal. This phytotherapy is recommended for indigestion, loss of appetite, chronic dyspepsia, Gastritis, Intestinal colic, vomiting and heart burn.
	<i>Trachyspermum copticum</i> L. Ajwain Bishops weed	Fruits	Essential oil, thymol, turpene.	About 125 gram of the dried fruits of the plant is ground to obtain powder. Mix it with equal quantity of powder form of the dried fruits of <i>Foeniculum vulgare</i> (Sounf), <i>Phyllanthus emblica</i> (Amla) fruit bark without seeds, <i>Terminalia chebula</i> (Hures) dried fruit, <i>Terminalia bebrica</i> (Behra) dried fruit bark without seeds, 10-15 gm of Black pepper seeds and 50 gm of Black salt. This mixed powder (Safoof) is used as one teaspoon after every meal. This very effective traditional phytotherapy recommended for Vomiting, Nausea, Gastritis, loss of appetite, Dyspepsia, flatulence, Anorexia, heart burn and gas

				trouble.
	<i>Mentha sylvestris L.</i> Pehari/chitta podina Wild mint	Aerial parts	Oleanolic acide, ursolic and menthol	A tea is made from the dried aerial parts of the plant and fennel and green cardamom fruits. This tea is prescribed for gastric trouble, intestinal colic, vomiting and Nausea.
Ear infections	<i>Cucurbita pepo L.</i> Kadoo Pumpkin	Fruit	Protein, linoleic and oleic acid and tocopherols	Juice obtained from the fresh fruit of the plant and then mix a Rose extract (Arq-e-Gulab). This is used as eardrops for removing Otitis.
	<i>Fagonia indica Burm. f.</i> Dhumian Fagonia	Aerial parts	Alpha-L-arabinopyranosyl]-ur solic acid-28-O-[beta-D-glucopyranosyl] ester, 3-O-[betaD-glucopyranosyl-arabinopyranosyl]-olean olic acid	Aerial parts of the plant are dried undershade and then ground to obtained powder. 250 gm of this powder is mixed with equal quantity of the powder of fruits of <i>Trachyspermum copticum</i> (Ajwain) and <i>Terminalia chebula</i> (Hareer). Then this mixed powder is used orally as half teaspoon twice in a day with water for ear infection and other ear diseases.
	<i>Raphanus sativus L.</i> Mooli Radish	Underground part	Tocopherol, caffeic acid and ferrulic acid	Juice obtained from the underground part of the plant is cooked with sesame oil (Til) until all the juice is mixed and oil is left behind. Then this oil is used as ear drops for the treatment of ear ailments.
	<i>Solanum nigrum L.</i> Kuchmach Nightshade	Leaves	Tigogenin, petanin, solamargine, solasodine and solasonine	Fresh leaves are crushed and pure leaf extract is obtained. 3-4 drops of this extract is used as eardrops at night for one week. This traditional phytotherapy is prescribed to treat earache, bleeding of ears and boils of ear.
Eye complaints	<i>Acacia nilotica (L.) Delile</i> Kiker Acacia Gum	Leaves	Arabic acid, calcium, potassium salts	Fresh leaves of the plant are plucked and mashed to obtain paste. The paste is tied with cloth as a bandage on eyelids for night, and in morning it is opened. It is very old and effective traditional phytotherapy recommended to treat redness of eyes, pain and conjunctivitis.
	<i>Calendula arvensis L.</i> Zergul mushki Marigold	Aerial parts	Sesquiterpene glycosides	Aerial parts of the plant are dried under shade. After drying, water is mixed and eyes are washed with this mixture thrice in a day for conjunctivitis and painful eyes. Crushed form of fresh flowers is also useful for redness of eyes and conjunctivitis.

	<i>Cynodon dactylon</i> (L.) Pers Khabul gaaha Common grass	Whole plant	Cynodin, hydrocyanic acid and triticin	The paste of the whole fresh plant along with the root paste of <i>Cyperus rotundus</i> (Deela gaaha) is applied externally on eyelids. This is prescribed to reduce the swelling, redness of eyes and to relieve the eye pain.
	<i>Euphorbia hirta</i> L. Dodhi Spurse	Latex of Aerial parts	Triterpenoids, Sterols, Alkaloid, Glycoside and Tannin	Milky latex obtained from the fresh aerial parts of the plant. Adding then dilutes the milky latex boiled but cooling clean water. 2-3 drops put in eyes thrice in a day for treatment of eye complaints such as redness of eyes and to remove foreign body from eyes.
	<i>Andrachne aspera</i> Spreng Rumtotia Andrachne	Root	Piperidine alkaloids andrachcinine and andrachcinidine	Fresh roots of the plant are collected and peeled off to remove the upper bark of roots. Then these roots are applied in eyes as needle (Surma Salai). This is done to remove the foreign body from the eyes as well as for painful eyes.
	<i>Phyllanthus emblica</i> L. Amla Phyllanthus	Fruit	Lupeol, ellagic acid and mucic acid	Fresh juices obtained from the fruit of plant and then mix a big teaspoon of honey in this juice. This is orally used for keen vision as a eye tonic, conjunctivitis and other eye complaints.

Useful findings about indigenous medicinal plants

Collection

Medicinal Plants gathering is done by all members of the community while children also play an important role in the collection of medicinal plants. Gatherers are mainly low income people. Shepherds, men, women and Nomad ethnic groups, also collect medicinal plants.

Different parts of the plant can be used to treat different conditions. For example, the fruit of *Acacia nilotica* (Kikar) has aphrodisiac action and bark of the same species have different primary action to the fruit by being strongly diuretic. Identification of the correct time for collecting plant species is crucial. Optimal timing has a direct link with the part of plant used.

Processing

Fresh and dried plants were both used. Processing techniques were found to be same throughout the study area. Various techniques were observed but the most popular proved to be sun drying and shade drying. According to specialists (Hakims and elderly people) of the area, shade drying is considered to be better than sun drying because during sun drying the volatile oil like contents of the plants were destroyed.

The optimal method for drying herbs according to Bartram (1995) is to spread the unwashed, dust-free, organic plants out on racks in a well ventilated room away from sun lights, and excessive heat. Turning or agitation should occur daily, and the herb should not under go further preparation until the procedure has been successfully completed. Further processing for internal use included decoctions, fresh juices, infusions, syrups and cooking the herb. However, these alternative preparations do provide substantial medicinal benefits.

Table 2: List of medicinal plants used for ethnopharmacological treatments

S. #	Botanical name	Local name	Voucher No.	Family
1	<i>Abelmoschus esculentus</i> L.	Bhindi	07	Malvaceae
2	<i>Acacia nilotica</i> L. Delib	Kiker	82	Mimosaceae
3	<i>Adhatoda vasica</i> Ness	Bakker	01	Acanthaceae
4	<i>Adiantum capillus-veneris</i> L.	Thundi khui booti	29	Adiantaceae
5	<i>Albizia labbak</i> (L.) Benth	Sirrien	84	Mimosaceae
6	<i>Aloe vera</i> L.	Kunwargandal	43	Liliaceae
7	<i>Andrachne aspera</i> Spreng	Rumtotia	24	Euphorbiaceae
8	<i>Calendula arvensis</i> L.	Zergun Mushki	19	Asteraceae
9	<i>Coriandrum sativum</i> L.	Dhania	33	Apiaceae
10	<i>Cucurbita pepo</i> L.	Kadoo	209	Cucurbitaceae
11	<i>Cyanodon dactylon</i> L. Pers	Khabul gaaha	31	Poaceae
12	<i>Euphorbia hirta</i> L.	Dodhi	43	Euphorbiaceae
13	<i>Fagonia indica</i> Burm. f.	Dhumian	225	Zygophyllaceae
14	<i>Ficus bengalensis</i> L.	Bohr	86	Moraceae
15	<i>Foeniculum vulgare</i> Mill	Sounf	81	Apiaceae
16	<i>Mangifera indica</i> L.	Amb	09	Anacardiaceae
17	<i>Mentha sylvestris</i> L.	Pehari podina	12	Lamiaceae
18	<i>Momardica charantia</i> L.	Karala	210	Cucurbitaceae
19	<i>Phyllanthus emblica</i> L.	Amla	11	Euphorbiaceae
20	<i>Psidium guajava</i> L.	Amrood	76	Myrtaceae
21	<i>Punica granatum</i> L.	Anar	24	Punicaceae
22	<i>Raphanus sativus</i> L.	Mooli	51	Brassicaceae
23	<i>Ricinus Communis</i> L.	Arund	34	Euphorbiaceae
24	<i>Solanum nigrum</i> L.	Kuchmatch	04	Solanaceae
25	<i>Trachiospermum copticum</i> L.	Ajwain	08	Apiaceae

In fact, some plants are thought to have a greater efficacy when used individually for a particular ailment. For example, *Tribulus terrestris* (Caltrops, Bhakra) roots' decoction is most commonly used for kidney stone and kidney disorders. Fresh leaf juice of *Adhatoda vasica* (Vasaka, Bekkar) is given to reduced blood glucose level of diabetic patient. Similarly juice obtained from fresh leaves of *Solanum nigrum* (Night shade, Kuchmach) in 2-3 drops is used in the night for ear infection and ear bleeding. Grinding of dried and fresh herbs is also a common technique.

Storage

Dried herbs should be stored in an air-tight container in a cool, dry, dark environment to prevent the loss of volatile oils and possible spoilage. Storage conditions includes the use of cloth bags (not air-tight), clear glass bottles and plastic bags. On some occasions the plants were stored in direct sunlight, but were usually kept either inside a dark room or outside on the verandah. Further preparation of dried herbs were rarely stored. These preparations (decoctions, infusion), can only be stored for a few days before their quality deteriorates.

Cultivation Practices of Medicinal plants:

Cultivation of medicinal plants is mostly done by the local people of Chhachh region (About 53%). The farmers cultivate certain medicinal plants along these crops, fodders and vegetables for their own domestic used and small scale for local markets in the Chhachh region. These cultivated medicinal plants were not produced in large

quantities because local farmers have little or no marketing strategy and ability. In Sarwala and Nala tract of Tehsil Attock, the cultivation of medicinal plants is undertaken but to lesser degree (30% & 17% respectively). The commonest cultivated medicinal plants for treatment of various ailments are, *Abelmoschus esculentus* (Bhindi), *Aloe vera* (KunwarGandel), *Foeniculum vulgare* (Sonf), *Solanum nigrum* (Kuchmach), *Mentha sylvestris* (Pehari Podina), *Trachyspermum copticum* (Ajwain) and *Raphanus sativus* (Mooli).

It was also observed that the most households grow medicinal plants for themselves, relatives and neighbours and not for commercial purposes. An understanding of the market potential for medicinal plants could provide rural farmers with the incentive for cultivation of high demand species.

Discussion

Life and diseases go together, where there is a life, diseases are bound to exist. Dependence and sustainability of men, women, children and animal life were revolving to exist. Traditional uses of natural plants remedies provide potential indicators for biological activities. In the last few decades, there is a resurgence of public interest in medicinal plants and their role in primary health care (Haq, 1983). Alternative medicine using herbal mixtures is becoming more popular as these are believed to be safer and natural. However, there still exists an immense gap between the local traditional knowledge and modern medical sciences. This has resulted in the development of research priorities on plant used in traditional medicine to provide important sufficient information for commercialization. According to WHO, about three quarters of the world population relies upon traditional medicines (TM) mainly herbs for their healthcare. TM is now increasingly becoming essential part of the medicinal curriculum at a global level and it is anticipated that the modern physicians who are also skilled with some alternate methods of treatment are likely to be more successful physician in the years to come (Shinwari and Khan, 1999). Thus there is a huge potential of medicinal plants in health care of not only in remote areas like Attock of developing countries but also in the industrialized world and the acceptance of botanicals in modern medicines is likely to increase in future.

In this study data on 25 medicinal plant species belonging to 18 families were presented. Main emphasis was on the traditional plant based remedies which are used through out the area and the correlation between their actions and active chemical constituents which were reviewed by Bradly (1992) and Baquar (1989). It was found that the people of the area had and still have rich heritage of indigenous knowledge related to medicinal plants. In developing country like Pakistan, the benefits of modern medicine and health care is a luxury because only a small percentage of the population have access to it. Every year a considerable amount of scarce foreign exchange is used in the importation of modern drugs. The utilization of indigenous plant-based drug resources will increase the importance of the local industry on the one hand and will minimize the expenditure incurred on the purchase of foreign drugs on the other. Hence there is a need for the inclusion of herbal medicines at primary health care level, since their long standing use as plant drugs without toxic effects would reasonably guarantee their medical efficacy and safety. It is concluded that collaborative work amongst the taxonomists, ethnobotanists, ethnopharmacologists and phytochemists is essential for the productive evaluation of these resources.

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