

REGULAR ARTICLE

Ethnobotanical studies of potential wild medicinal plants of Ormara, Gawadar, Pakistan

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Abstract

The study was aimed to document the medicinal plants and their traditional uses in the Omara, Gawadar, Pakistan during 2008-2010. The ecosystem of Makran coast is rich in important medicinal plant wealth. These plants are not only used as herbal drugs but also a source of food, fodder and spices. The climate of Omara is dry, hot arid. Data were collected through direct observations during comprehensively field surveys, questionnaires and interviews of local inhabitants and herbal practitioners. A total of 31 potential medicinal plants belonging to 21 families were identified, traditionally used for remedial measures against special diseases. The inventory of medicinal plants showed family Chenopodiaceae dominating other plant families. Out of total documented species in this area 45% were in the use of local communities as medicine in one or other form. Among the rest, 26% plants have multiple uses and the remaining are utilized as fodder (29%). Indigenous people use various parts of the plant for curing different ailments. As no specific ethnobotanical data are available for such plants in this area, the present work was taken up for the documentation and analysis of traditional knowledge of medicinal plants used by coastal communities. It also determines the homogeneity of information collected on medicinal plants apt for the treatment of different ailments in the study area

Key words: Ormara, Vegetation, Ethno-botanical survey, Medicinal importance

Introduction

The discovery of plants for medicinal purpose to humans has a long antecedent history extending back to old civilizations (Noman, 2003). Many indigenous drugs are obtained from medicinal plants and have been in use of a common man (Ashraf and Noman, 2006). No doubt the poor communities across the globe, trust medicinally valuable plants both for treatment of human and animal ailments. In most instances, certain plant species are considered specific for a particular ailment and others have multiple uses, but occasionally they have mixed usage (Shinwari and Qaiser, 2011). The demand for medicinal plants is rising day by day in the developed and underdeveloped states of the world due to unsatisfactory performance and high costs of

modern medicines. Pakistan is blessed with a diversity of medicinal plants due to its sundry climatic conditions. Approximately, 1500 medicinal plant species have been estimated in Pakistan (Chaudari, 1961).

Out of 1050 km coastal area of Pakistan, 800 km is in Balochistan province. The length of coastal area along Makran comprised about 75% by the mountains. The maximum elevation of these mountains is up to 1500 m. Most of the Makran coastal area is under developed with deserted beaches and have a few fishing villages. Well known beaches of the coast include Ormara, Hingol river, Gwadar, Pasni and Somniani. In Makran coastal region, located midway between Karachi and Gwadar located is a port city known as Ormara. This port is also known as Oraea in the periplus of Erythraen Sea. Historically this port is linked with Alexander the Great, who stayed here for few days during his journey back from Indus region. This area is facing shortage of health care facilities, basic amenities and education for local inhabitants. The local people in these areas rely primarily on traditional plants to cure various diseases (Qasim et al., 2010).

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Materials and Methods

Study area

Coastal town of Ormara (25° 16' 29N 64° 35' 10E) has an area of 15,216km² (Figure 1) with 20,000 inhabitants. This is a part of district Gawadar. The climate is dry and hot arid. The uniformity of temperature is a unique characteristic

of the coastal region in Balochistan. The oceanic influence keeps the temperature lower than that in the summer and higher in winter. The mean temperature in the hottest month of June remains between 31-32°C. The mean temperature in the coldest month of December-January varies from 18-19°C (Figure 2).

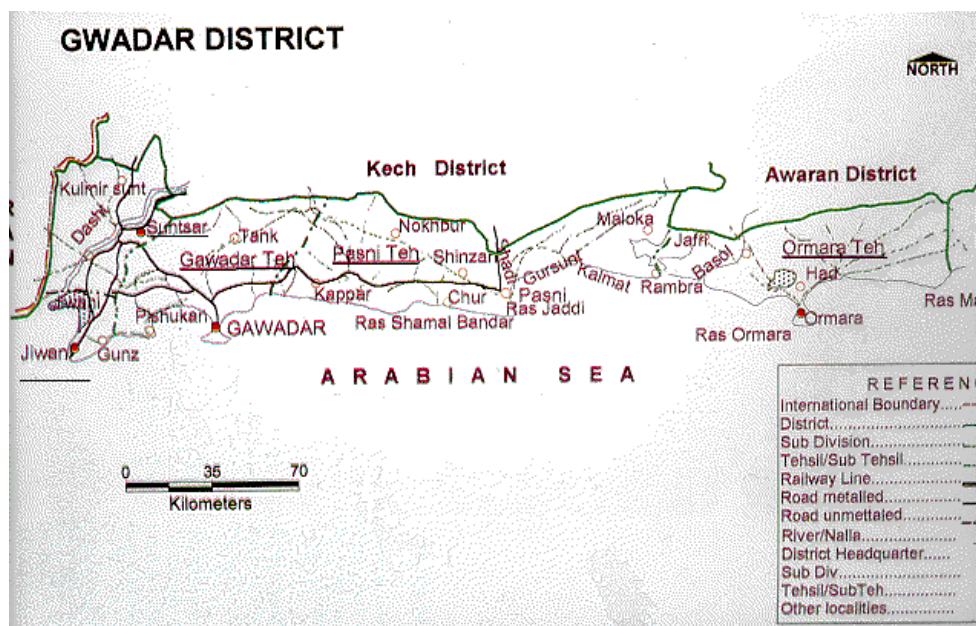


Figure 1. Map of study area, Tehsil Ormara and adjoining areas.

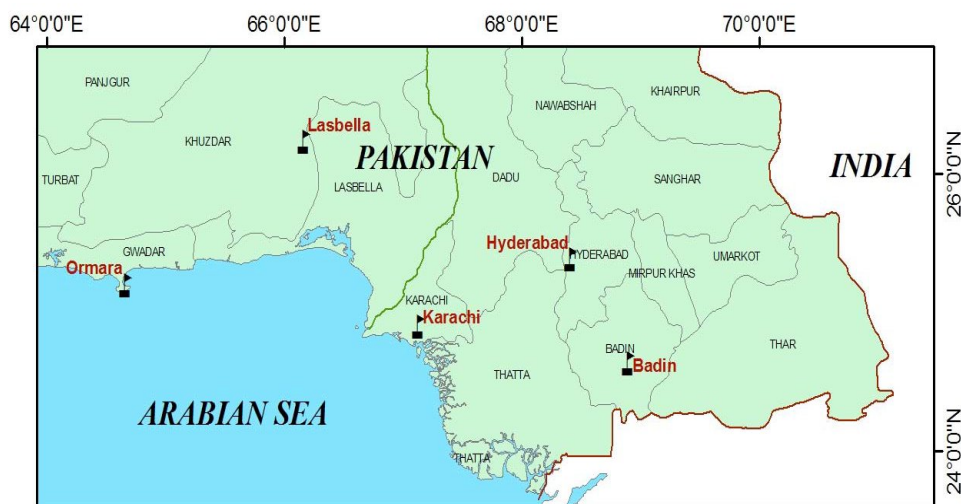


Figure 2. Map depicting coastal belt of Pakistan.

Data collection and traditional folk knowledge

The ethno-botanical information was collected from the indigenous people of different age groups by interviewing them and filling up a questionnaire for documentation. The interviews were carried out in local community to investigate local people and knowledgeable persons who are the main user of medicinal plants (Table 1). About 120 informants were selected for the interviewed on random basis. The indigenous medicinal plants having traditional knowledge of utilization among the people have been selected as reference specimen. The majority of informants interviewed in this study were in the age class of 41-55. A total of 120 persons were surveyed aged between 18-75 years old. Of this number, 90 (60%) were males and 30 (40%) females (Figure 3).

The individual plant samples were collected by arranging regular visits of the area during the 2008-2010. Later on, these samples were identified with the help of flora of Pakistan (Ali and Nasir, 1990-1991; Qureshi, 2004; Ali and Qaisir, 1993-2008) and categorized into various ethnobotanical classes on the basis of their habit, use and plant type (Table 2). Medicinal plants, in particular, were arranged depending upon their part used administration method and medicinal uses.

Data analysis

Ethnobotanical data were analyzed and summarized on the reported medicinal plants and associated knowledge by using Microsoft excels and statistics to determine relative frequencies of citations so as to identify the most common and popularly used plants in the study area. The relative importance of different plants in a given community was determined based on the consensus of informants' responses. It was calculated from the proportion of informants who independently reported knowledge on a given use against a particular disease. The informants' consensus was also used to investigate the effectiveness of medicinal plant/s to treat a particular ailment

Results

The ecosystem of Makran coast is rich in important medicinal plant wealth. These plants are not only valued as herbal drugs but also significant as a source of food, fodder and spices etc. Unfortunately, this wealth is deteriorating and knowledge regarding these plants is diminishing with the passage of time. This study is focusing on

the collection and dissemination of collecting information. Now, this is the right time to propound large scale awareness among all and sundry, particularly among the indigenous population, so that this natural heritage be conserved and utilized craftily.

Present ethno-botanical study was carried out to document the medicinal flora of Tehsil Ormara (Makran coast). Family Chenopodiaceae dominate this area. The plant habit chiefly recorded was shrub followed by herbs, grasses and few trees respectively (Table 2). The majority of plants have been found blessed xerophytic characteristics reflecting capability of a plant to tolerate long spells of drought. In addition, different halophytes have also been reported in this area showing growth even in the presence of a heavy percentage of salt in soil. Due to inadequate rainfall, recorded vegetation is sparse and perennial. Thirty one plant species distributed in twenty one families were identified. Fourteen potential medicinal plants were identified (45.16% of total), which are being used by the folks for treating multifarious disorders /applications (Table 2).

It was also observed that the majority of plants were used by the inhabitants for treating of gastrointestinal problems i.e. *Citrullus colocynthis*. But other plant species i.e. *Cornulaca monacantha* and *Parkinsonia aculeata* have also been recorded successful in providing relief against problems like respiratory tract troubles and Joint pain respectively. People use some plant species like *Inula grantioides* as antidote against snake and scorpion bite (Table 3). An interesting feature of native plants to share is that one plant species may possess multiple pharmacological actions. Among reported plants, 32% species have multiple uses i.e medicinal uses as well as dyes, fodder, building purpose etc. In addition, 29% plant species are in use to feed livestock. Gathered information reflects the attachment of people with certain plants in terms of spiritualism and common beliefs. For example, people of this area believe that fumigation of *Pegnum hermala* seeds is beneficial as it can prevent their homes and families from evils by driving them away. List depicting the floristic composition of the area is given below in Table 3. While meticulous account of plants including ethno-medicinal uses is given below in the Table 2.

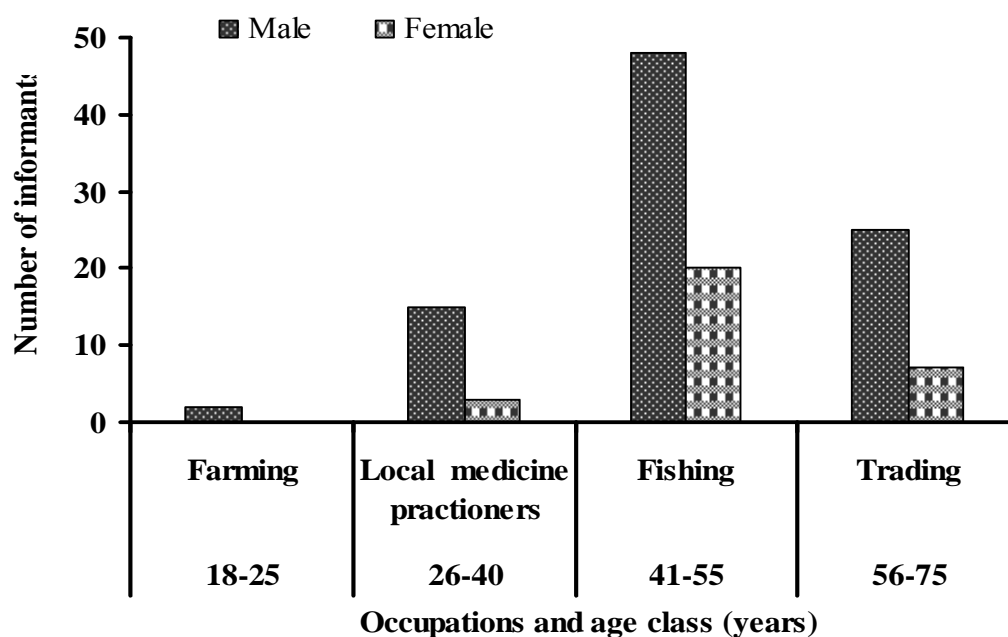


Figure 3. The distribution of informants in occupations and age-classes.

Table 1. Questionnaire for collecting Ethnomedicinal data during Ethnobotanical study.

S #	Informants' details
1.	Name:
2.	Gender:
3.	Age:
4.	Occupation:
5.	Location/Residence:
S #	Questionnaire
1.	Do you know this (given) plant?
2.	If you are aware of this plant, write its common name.
3.	Is this plant cultivated/ wild? If cultivated, cultivated for what purpose?
4.	If wild, availability in natural resources is easy/ difficulty/ very difficult
5.	What are the uses of this plant in this area?
6.	Is this plant is in use of local people for treatment of any disease?
7.	If this plant is used medicinally, then write the name of disease(s).
8.	Which part of this plant is used for treatment of diseases?
9.	Have you ever used this plant for curing any ailment?
10.	Whether this plant is useful as animal fodder?
11.	How we can use this plant?
12.	Have you seen this plant elsewhere other than this location?
13.	Have Government and local residents made efforts for conservation?
14.	What is method of collection and storage?
15.	What is the method of crude drug preparation?
16.	Any comment

Table 2. Plant species and uses collected from Ormara, Gawadar, Balochistan, Pakistan.

S#	Botanical name	Family	Habit	Local name	Parts used	Ethno-medicinal uses	Literature source
1.	<i>Acacia nilotica</i>	Mimosaceae	Tree	Babul	Gum, bark, seeds	Gum of <i>Acacia nilotica</i> is used in treatment of diabetes mellitus, dysentery and sexual debility, Bark-cough, bronchitis, leaf-eucoderma, and gonorrhoea is in vogue among local medical practitioners.	Mahmood et al., 2011; Shakir et al., 2012; Qureshi, 2012; Masum Gazi et al., 2013
2.	<i>Acacia senegal</i>	Mimosaceae	Tree	Hashab gum	Gum, stem bark, root, leaf	Local People use its grind root for dysentery treatment and urinary discharge.	C. P. Khare, 2004; Qureshi, 2012
3.	<i>Avicennia alba</i>	Avicenniaceae	Shrub	Api-api putih	Heartwood, bark and seeds, resin, leaf extract	The heart wood is used to make tonics. The resin has been used in birth control. Dried leaves of it used as antidiarrhoeal and antinociceptive activities	Rehman et al., 2011
4.	<i>Calotropis procera</i>	Asclepiadaceae	Shrub	Ak	Roots, flowers, latex	Indigenous communities consider taking of flowers a mean to improve digestion, catarrh and increase appetite. The milky juice is regarded as a drastic purgative. The root bark with latex is smoked for cough.	Mahmood et al., 2011; Qureshi, 2012; Rameshkumar and Eswaran, 2013
5.	<i>Citrullus colocynthis</i>	Cucurbitaceae	Sub shrub	Timya	The leaves, pulp of the peeled fruit (colocynth), seeds, roots.	Folks use it in treatment of bronchial asthma, rheumatism and tumor diseases. Fruit is used to get relief in constipation. The root is used as tooth stick to relieve toothache.	Mahmood et al., 2011; Shakir et al., 2012; Qureshi, 2012
6.	<i>Indigofera oblongifolia</i> Forssk	Papilionaceae	Diffuse Shrub	Shimmil	Leaves	Its paste is applied over persistent wounds	
7.	<i>Capparis decidua</i>	Capparidaceae	Large Shrub	kdler	Flowers, Fruits, Tender shoots	People use it as a narcotic. Tabeebs (Practitioners of Greek medical system) recommend the flower's powder to reduce blood thickness. The fruit show anti-atherosclerotic, anti-diabetic, anti-hypertensive and anti-hyperlipidemic activity. Tender shoots are made into paste and used as blister on boils	Mahmood et al., 2011; Qureshi, 2012
8.	<i>Cornulaca monacantha</i>	Chenopdiaceae	Hard shrub	Gundak	leaves	Native population uses it for treatment of liver problems and jaundice, as a hepatic and a purgative. It is considered an excellent pasture for camels, despite the spines on the leaves	Shakir et al., 2012

Table 2. Cont..

S#	Botanical name	Family	Habit	Local name	Parts used	Ethno-medicinal uses	Literature source
9.	<i>Cymbopogon jwarancusa</i>	Poaceae	Grass	Nadag	Leaves, flowers.	People use leaves for making tea and flowers to treat flu and fever. It is also used as expectorant. Hakeems regard this plant as Anti-septic, appetizer, carminative, concoctive, diaphoretic and diuretic.	Usmanghani <i>et al.</i> ,1997; Qureshi, 2012
10.	<i>Haloxylon stocksii</i> (Boiss.)	Chenopodiaceae	Shrub	Khar	Young twigs	The poultice of young twigs is applied on the broken bone of the cattle. A more common use is application of paste of the ash on boils to heal	Qureshi, 2012
11.	<i>Parkinsonia aculeata</i>	Papilionaceae	Tree	Vilayati Babul	Roots, seeds and leaves	Roots of this plant are used to relieve pain in the heels, limbs, and joints. Furthermore, plant has antimalarial, antimicrobial, anti-inflammatory and antidiabetic. Leaves and seeds can be fed to sheep and goats to cure diseases.	Spencer <i>et al.</i> ,1947; Bhakuni <i>et al.</i> , 1974; Leite <i>et al.</i> , 2011
12.	<i>Zizyphus nummularia</i> (Burm.f.)	Rhamnaceae	Shrub	Her	Seeds, fruits and bark	The paste of leaves is applied on head in fever for relief. Fruit is considered as tonic and used in curing liver problems.	Qureshi, 2012
13.	<i>Peganum harmala</i> L	Zygophyllaceae	Perrenial Herb	Gandaku	Seeds and leaves	A common believe among natives of this area is that spiritual powers are linked with this plant. Fume of leaves and seeds are used to exorcise the spells of evil spirits. Seeds are regarded as narcotic. Decoction of seeds is given in laryngitis.	Asgarpanah and Ramezanloo, 2012
14.	<i>Commiphora wightii</i> (Arn.) Bhandari	Burseraceae	Shrub	Sadaf/Gugur	Gum and leaves	Natives believe that its smoke drive away evil spirits as well as remove the evil eye (snakes) from the home. It is also used as carminative, deterrent, diuretic and emollient. Local tabeeds recommend taking its ground seed to reduce blood cholesterol.	Qureshi, 2012

Table 3. Ethnobotanical benefits of plant species identified in Ormara, Gawadar, Balochistan, Pakistan

S #	Name of Species	Family	Habit	Part used	Uses
1.	<i>Aerva javanica</i>	Chenopodiaceae	Shrub	Twigs and leaves	Pillow filling
2.	<i>Atriplex stocksii</i>	Chenopodiaceae	Shrub	Fresh leaves	Fodder
3.	<i>Capparis spinosa</i>	Capparidaceae	Shrub	Flowers, seeds	Seeds are edible. Animal feed
4.	<i>Gentiana olivierii</i> Griseb	Gentianaceae	Herb	Stem, leaves	As a vermifuge, fire wood, food, fodder
5.	<i>Haplophyllum tuberculatum</i>	Rutaceae	Perennial herb	Whole plant	Cough suppressant
6.	<i>Indigofera articulata</i>	Fabaceae	Sub-shrub	Young twig	Medicine
7.	<i>Inula grantioides</i> Boiss	Asteraceae	Shrub	Whole plant	Use to help heal lacerations and festering. Boiled parts are used as antidote to snake bite.
8.	<i>Launaea nudicaulis</i>	Asteraceae	Herb	Leaves	Leaves are eaten raw as a vegetable.
9.	<i>Lawsonia inermis</i>	Lythraceae	Shrub	Leaves	Coolant in humans and veterinary medicine.
10.	<i>Panicum turgidum</i>	Poaceae	Grass	Leaves	Fodder
11.	<i>Reseda aucheri</i>	Resedaceae	Perennial	Leaves	The plant possesses antimicrobial activity
12.	<i>Rhizophora mucronata</i>	Myrsinaceae	Large shrub	Bark, leaves, stem	Fuel wood, source of tannin
13.	<i>Salvadora oleides</i>	Salvadoraceae	Shrub	Roots, twigs	Fodder and medicine
14.	<i>Sueda fruticosa</i>	Chenopodiaceae	Shrub	Whole plant	Used in washing hairs
15.	<i>Solanum incanum</i>	Solanaceae	Shrub	Roots	Helpful in healing of infected fingers, toes, or nails
16.	<i>Tamarix indica</i> wild	Tamaricaceae	Shrub	Whole plant	Fuel wood, veterinary medicine
17.	<i>Zizyphus mauritiana</i>	Rhamnaceae	Shrub	Bark, seeds	Medicinal, fodder

Discussion

Green wealth of any area appears to be a major resource that can yield hundred and thousands benefits to the inhabitants in one or the other way. Using plants for medicinal purposes is not a new phenomenon. Luckily Pakistan is ranked as richest floristic regions in the world while the Makran coast is well known for its ancient heritage. In spite of reported medicinal plants, unfortunately, much of the potential is still in the camera due to multifarious reasons ranging from a paucity of knowledge to lack of conservatory efforts.

Environmental conditions in combination with resource availability emerge as a key feature in determining the distribution and functional distinctiveness of the species occupying a particular region (Noman et al., 2012). Having a hot and arid climate, Tehsil Ormara receives inconsistent rain fall. Therefore, the predominant plant habit is shrub with plant types i.e. Xerophytes and halophytes. One can also observe the diversity of woody plants and small herbs, and, after rains, ephemeral

flowering species. The vegetation of this zone i.e. the coastal belt of Balochistan can be divided into several distinct communities (Ahmad, 1987). Ethno-botanical information showed that most of the plants belong to family Chenopodiaceae. Present report got support from the studies of the Goodman and Ghafoor (1992) who reported that most of the plant species in the Makran region fit into this family. In addition, Lasbella district of this coastal belt has somewhat resembled percentage of family Chenopodiaceae in its vegetation composition (Qasim et al., 2010). Results show most of the reported plant species are in use as a medicine by the population of this area. This is in line with finding of different workers reporting diverse usages of plants, particularly as medicine in the Makran region (Goodman and Ghafoor, 1992; Leporatti and Lattanzi, 1994). As described in Table (2), 45% plants from study area are used to treat different ailments in humans while 29% are in use as fodder specifically and 26% have multiple uses like veterinary medicine i.e. *Acacia nilotica*, tooth brush e.g. *Salvadora Sp.*, coolant i.e.

Lawsonia inermis etc. Share of medicinal plants among all identified species shows trust and believe of commons over these plants as most of the treated disease are common including stomach and liver disorders, joint pain, sting bite treatment and fever or flu. It has also come into notice that in spite of whole plant, different plant parts are used to cure various diseases and even people prefer to use that specific plant part in case of trouble. It is due to the fact that different plant parts have various active ingredients that work. Root and leaves are more frequently used as compared to stem or bark (Gidaya et al., 2009) due to more accumulation of active compounds in that part. Present data also point out the use of leaves by a majority of locals for medicinal purpose. This collected information is similar to the findings of Ketera and Metiso (2012) describing leaves as the most used medicinal plants part because of more active ingredients. As observed in the present study, the use of plants requires different routes of administration. Some of them are taken orally while others may be applied externally depending upon the problem as reported by Shinwari et al. (2010).

Some interesting information has also been collected showing the use of plants linked to old beliefs and rituals like fumes produced by burning of seeds and leaves of *Peganum harmala* are used to get rid of the spell evil spirits. Similarly, paste of plant parts is applied externally in case of snake bites i.e. *Caralluma tuberculata*. A study of literature (Qureshi, 2012) reveals that many a species reported in Ormara Tehsil have also been reported in other parts of the Makran coastal region and southern Balochistan. For example, *Indigofera oblongifolia*, *Commiphora wightii* etc. have also been recorded here in Gwadar and in parts of the Hingol National Park located in Lasbella and Awaran districts.

Conclusion

In conclusion, the data presented in this study indicates two major uses of local plant species that are as fodder and medicine which reflects both their basic needs and socio-economic condition. As per WHO report, we are living in a continent, where 80% of the population is not in a position to afford proper health care services and in turn relies upon wild medicinal plants because of their acquaintance, unproblematic access, easy use and efficacy (Anon, 2009). Therefore, medicinal plants of this area may be helpful at world level for pharmaceutical sector and conservation biologists. Although these plants are being utilized for human welfare, but due to unawareness and illiteracy

among the commons, in vogue practices like indiscriminate cutting for firewood and silage, cipher efforts for conservation etc. May result in the outright disappearance of some species from local flora. On the other hand, formidable challenges like climatic variations; poor soil fertility etc. has marked effects on available vegetation. Our coastal inhabitants dreadfully need apposite health care facilities and socioeconomic boost. Here, cultivation and conservation of medicinal plants can become a flourishing industry. This dream can only come true if we all either indigenous population or personnel from scientific avenues come together and take up the gauntlet. Therefore, this is the most appropriate time to adopt a doable strategy emphasizing on studies for detection and separation of novel active constituents from the reported indigenous species. In addition to this, concrete measures must be taken to restore this green treasure.

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