

TRADITIONAL ETHNOBOTANICAL USES OF HALOPHYTES FROM HUB, BALOCHISTAN

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Abstract

An ethnobotanical study of coastal plants from Hub, Lasbela District, Balochistan is presented. Numerous field surveys were carried out to collect information about the ethnobotanical uses of plants by local people. In total 48 wild coastal plant species from 26 families used for 12 different purposes were noted. Plant uses include fodder (56%), medicine (22%), food (5%), house hold utensils (5%), for increasing milk production in cattle (3%) and other uses (8%). Most frequently used species were from Poaceae (29%) followed by Amaranthaceae (Chenopodiaceae) (10%), Mimosaceae and Convolvulaceae (6%). About 56% of the collected plants were halophytes and rest of them were xerophytes (44%). Different plant parts were used to treat 12 disease conditions however, the use of leaves was highest (44%) followed by that of whole plants (19%). Local vegetation appears to be a major resource for the poor coastal communities which lack basic health care facilities and the information about plants has been passed on from one generation to the others in the family. With a little support, the cultivation and conservation of such natural resources, may result in sustainable maintenance and utilization of this plant wealth and uplift the socio-economic status of the people. It is also recommended that both the public and private sector should be encouraged to invest in these plants which have potential to become an economically viable industry.

Introduction

Balochistan occupies about 770 km long (70% of the total) Pakistani coast starting from Hub River in the east to the Iranian border in the west (Fig. 1). Population census carried out in 1998 indicated that about 65% of population in the province is scattered in rural areas and about 4.2% of them live along the coast (Anon., 2008). Coastal villages depend heavily on fishing for their livelihood followed by cattle farming which is about 49% of total livestock of Pakistan. There is a severe lack of basic amenities, health care facilities and education for the local inhabitants who rely on utilization of traditional plants as a primary source of medicine for themselves as well as their livestock besides their use as food and fodder.

Soil salinization is one of the most important constraints for plant growth and crop production all over the world. Around 800 million hectares of land (about 6 % of the world's total land area) are salt affected (Munns & Tester 2008). Menzel & Lieth (1999) indicated that halophytes or salt tolerant plants have multiple uses for the local inhabitants and are an underutilized resource. In Pakistan about 26% of total irrigated land is saline (Anon., 2008). Khan *et al.*, (2009) established the sustainable use of *Panicum turgidum* as fodder using low quality soil and water resources that can produce ~ 50 ton / ha / year of green fodder.

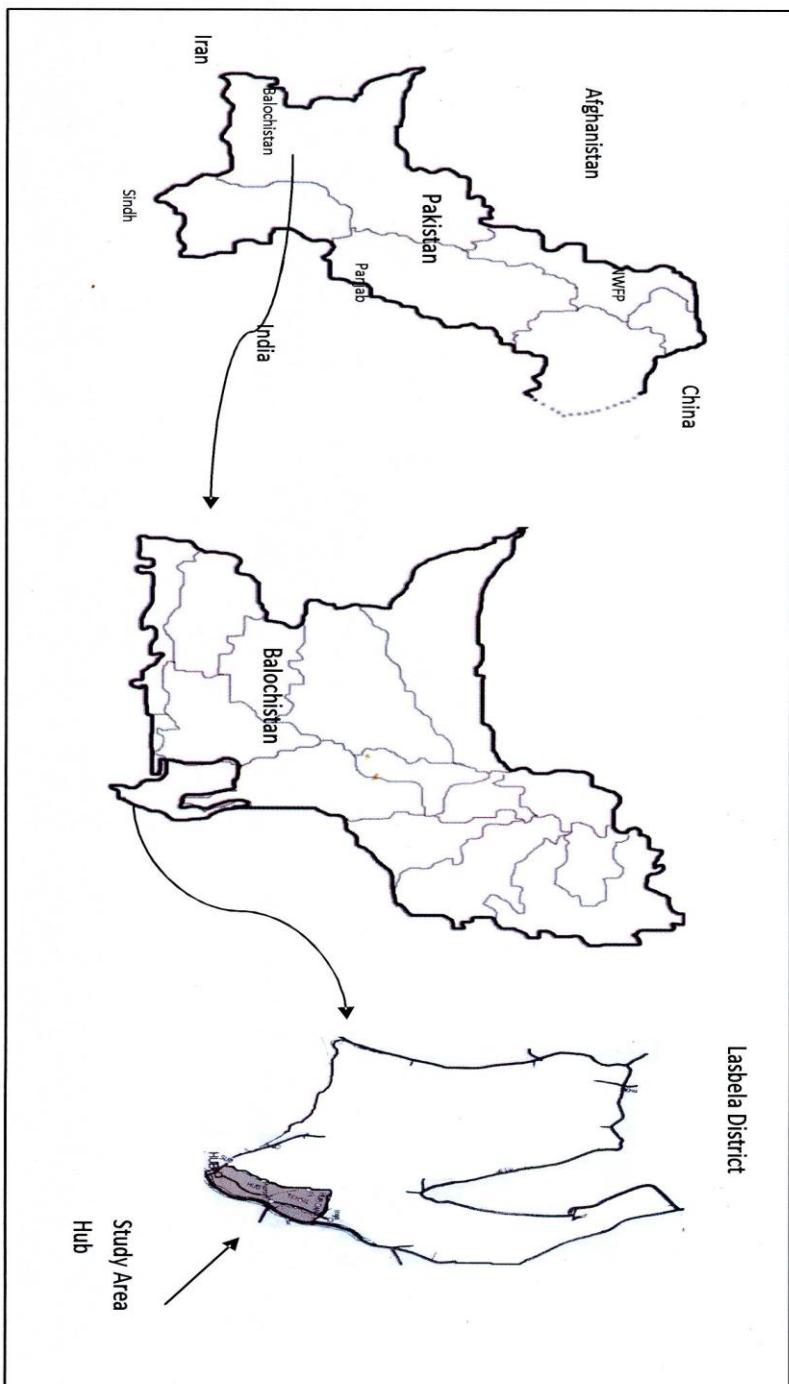


Fig. 1. Map of the study area.

Various usages particularly as medicine of plant species distributed in Makran (Southern Balochistan) has been reported (Goodman & Ghafoor, 1992; Leporatti & Lattanzi, 1994). Halophytes however, received little attention about their tremendous potential as cash crop despite their ability to thrive on poor quality water and soil conditions. The coastal plants develop morphological, physiological and metabolic characteristics not only to grow but also complete their life cycle under salt stressed conditions. Khan & Qaiser (2006) provided an extensive account of the distribution and economic uses of halophytes from Pakistan and reported high diversity among halophytes of Balochistan probably due to the diverse range of ecological habitats. A large number of medicinally important plants are halophytes. Palma-rosa, lemon grass, German chamomile, periwinkle, ergot, flea seed, and milk thistle can be cited as examples (Patra and Singh, 1995). Ethnobotanical studies in various areas of Pakistan have also been carried out (Shinwari, 2010; Shinwari & Khan, 2000; Shinwari & Gilani, 2003; Qureshi & Bhatti, 2008) including those of the northern mountainous regions (Adnan *et al.*, 2010) which include a considerable number of halophytes. The present research was aimed to collect and document traditional local information about the uses of some coastal plants of Hub in Balochistan.

Materials and Methods

Hub Tehsil, District Lasbela in Balochistan ($25^{\circ} 01.621$ N and $066^{\circ} 53.025$ E) is situated at the edge of Sindh just 25 kilometers from Karachi in the Saharo-Sindian Phytogeographical region (Ali & Qaiser, 1986). It has an area of 18,254 square kilometers with 81,751 inhabitants, 22% of which live in rural areas. The ethnobotanical information was collected from locals who are the custodians of this knowledge for generations. The individual plant samples collected from different localities around the year were identified with the help of Flora of Pakistan (Nasir & Ali, 1971-2002; Ali & Qaiser, 1995-2005) and divided into various ethnobotanical classes based on their habit, use and plant type. Medicinal plants were further categorized on the basis of their part used, administration methods and single or multiple uses.

Results and Discussion

Ethno-botanical information of 48 species of plants distributed in 26 families is reported for 12 different traditional usages (Table 1). These include species for fodder (33), medicine (13), food (3), increasing milk production in cattle (2), making axe handles (1), pillows (1), bird cages and baskets (1), local cigarettes (1), soap (1), dyeing clothes (1) and incense to ward off snakes (1). Most species belong to Poaceae (54%) followed by Amaranthaceae (Chenopodiaceae) (15%) and Mimosaceae and Convolvulaceae (12%). The predominant habit recorded were shrubs (18), grasses (15) and herbs (12) and few trees (3). Analysis of the diversity indicated multiple ethnobotanical usages of single species (Fig. 1). About 19% of the plants have multiple uses, for example *Commiphora wightii* (Arn.) Bhandari, *Euphorbia caducifolia* Haines, *Cymbopogon jwarancusa* (Jones) Schult. and *Haloxylon stocksii* (Boiss.) Benth. & Hook., and each used in more than 3 different ways (Table 1). The analyses based on plant type shows the highest proportion of halophytes (58%) including euhalophytes (33%) and xerohalophytes (25%) (Fig. 1). These are followed by xerophytes (42%) which reflect the extreme environmental conditions due to scarcity of surface or underground water resources. Plants reported here are perennials since rainfall is a rare and unpredictable event in arid and semi-arid areas. Open type of vegetation predominate the study area with annual

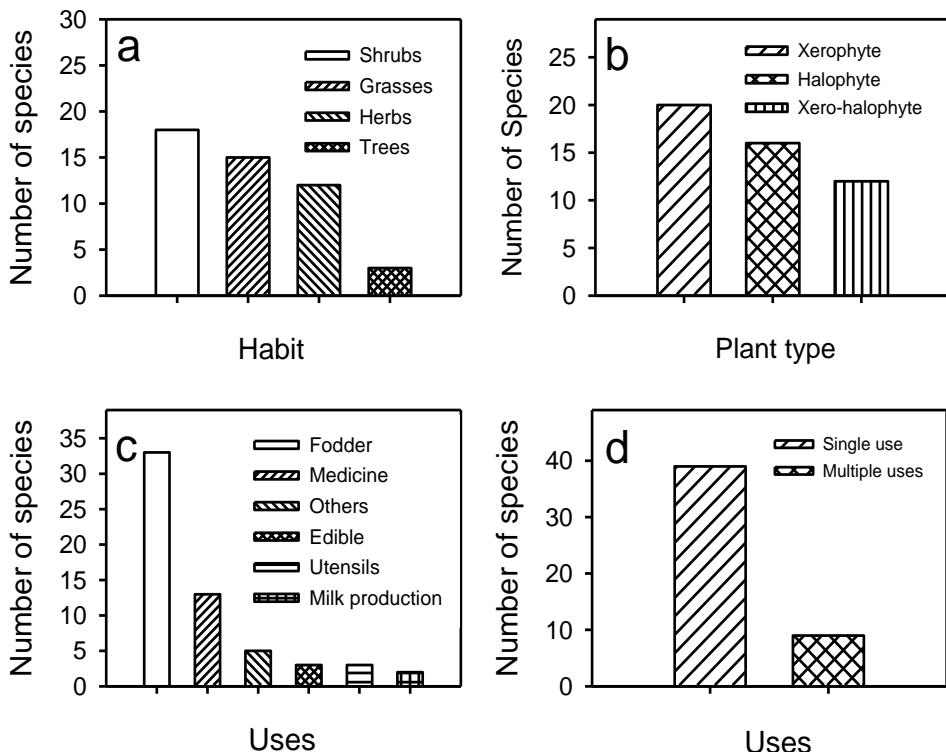


Fig. 2. Distribution of plants with respect to (a) habit (b) plant type (c) traditional uses and (d) proportion of plants with one or more uses.

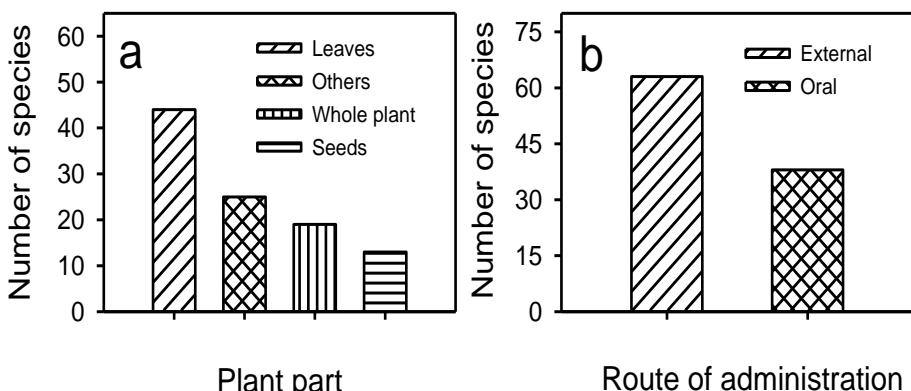


Fig. 3. Distribution of medicinally important plants with respect to (a) plant part used and (b) route of administration.

plants appearing after short spell of rain during the monsoon. Summer monsoon prevails towards the southern part of Balochistan while Mediterranean winds bring winter rains. Among the species documented here, 22% of the plants are used in treating different health problems. Almost all parts of various plants are used, but the use of leaves (44%) is most frequent followed by whole plant (19%) and seed (13%, Fig. 2). However, different parts of the same plant may be used for treating various ailments. Giday *et al.*, (2009) reported more frequent use of roots (49%) in comparison to leaves (42%) followed by stems/barks (8%), fruits/seeds (6%) and bulbs/rhizomes (4%). Remedies prescribed for curing skin diseases and traumas are applied superficially, whereas medication for internal problems involves exclusive oral administration for the remedy (Shinwari *et al.*, 2010). However, some skin infections and traumas also involve oral administration. External application is the most frequent (63%) means of applying the remedies prescribed by the healers and other treatments are administrated orally (37%). Gilani *et al.* (2010) have recently reported the phytotoxic properties of local plant species used as medicine. Some of the interesting observations include the use of toxic plants traditionally as fodder after burning such as *Euphorbia caducifolia*. Similar examples of plants eaten in Spain after cooking are also reported for *Tamus communis*, *Bryonia dioica* and *Clematis vitalba* to remove their toxicity (Couplan, 1990).

In conclusion, the data presented in this study indicates two major uses of local halophytes that are as fodder and medicine which reflects both their basic needs and socio-economic condition. According to WHO reports more than 80% of Asia's population cannot afford formal health care facilities and therefore relies on wild medicinal plant species owing to their cultural familiarity, easy access, simple use and effectiveness (Anon., 2009). Coastal communities are desperate in their need of basic health care facilities and programs for their socio-economic uplift. Sustainable utilization of low quality brackish water for cultivating local plants has already been carried out successfully. Production of low cost fodder and medicine for the poor masses has been proven experimentally and has potential of even becoming a viable and prosperous industry. Paradoxically, research efforts for various uses of indigenous plants are increasing at a time when their use as medicine is diminishing rapidly (Al-Qura'n, 2009). Collection of ethnobotanical data from local communities will be further matched with chemical analysis of plant material to identify the principal ingredients. Therefore, better utilization of indigenous plant resources could greatly benefit the local people.

Along with the increasing awareness about medicinally important plants is the growing concern of their unrestrained use and over-exploitation (Anon., 2009). In addition global environmental changes could alter the composition of local floras which therefore should be regularly revised and the indigenous knowledge should be properly documented. As suggested above, cultivation of economically important plants on marginal saline land should also be encouraged.

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