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ETHNOBOTANICAL TRADITIONS INVOLVING HALOPHYTES IN HUB, BALOCHISTAN

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Abstracts

This study explores the ethnobotanical knowledge of coastal plants in Hub, Lasbela District, Balochistan. Extensive field surveys were conducted to gather data on how local communities use these plants. The study identified 52 wild coastal plant species from 28 families, utilized for 14 different purposes. These uses include fodder (58%), medicine (24%), food (6%), household utensils (4%), enhancing milk production in cattle (2%), and other miscellaneous uses (6%). The most commonly used species belonged to the Poaceae family (31%), followed by Amaranthaceae (Chenopodiaceae) (12%), Mimosaceae, and Convolvulaceae (5% each). Approximately 58% of the documented plants were halophytes, while the remaining 42% were xerophytes. Various plant parts were employed to treat 14 disease conditions, with leaves being the most frequently used (46%), followed by whole plants (21%).
The local vegetation serves as a crucial resource for impoverished coastal communities that lack basic healthcare facilities, with ethnobotanical knowledge being traditionally passed down through generations. Supporting the cultivation and conservation of these natural resources could lead to their sustainable use and improve the socio-economic status of the local people. It is recommended that both public and private sectors invest in these plants, which have the potential to evolve into a commercially viable industry.

Introduction

Balochistan spans approximately 770 kilometers of the Pakistani coastline, accounting for about 70% of the total, stretching from the Hub River in the east to the Iranian border in the west (Fig. 1). According to a 1998 population census, around 65% of the province's population resides in rural areas, with about 4.2% living along the coast (Anon., 2008). Coastal communities primarily rely on fishing for their livelihood, supplemented by cattle farming, which constitutes about 49% of Pakistan's total livestock. These communities face a significant shortage of basic amenities, healthcare, and education. Consequently, they often depend on traditional plants for medicinal purposes for both themselves and their livestock, as well as for food and fodder. Soil salinization is a major challenge for plant growth and crop production worldwide, affecting approximately 800 million hectares, or about 6% of the global land area (Munns & Tester, 2008). Menzel & Lieth (1999) highlighted that halophytes, or salt-tolerant plants, have various uses for local populations and represent an underutilized resource. In Pakistan, around 26% of the irrigated land is saline (Anon., 2008). Research by Khan et al. (2009) demonstrated the sustainable use of Panicum turgidum as fodder, utilizing low-quality soil and water resources to produce approximately 50 tons per hectare per year of green fodder.

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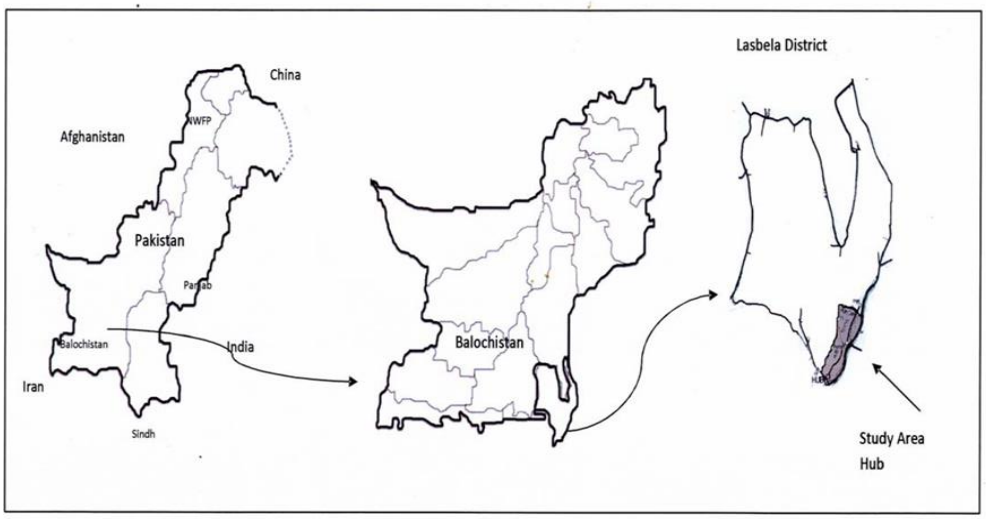

Fig. 1. Map of the study area.

Fig No 1. Ethnobotanical Uses of Halophytes from Hub, Balochistan

Researchers have documented various medicinal uses of plant species in the Makran region of Southern Balochistan (Goodman & Ghafoor, 1992; Leporatti & Lattanzi, 1994). Despite the potential of halophytes to be developed as cash crops, particularly because of their ability to thrive in poor water and soil conditions, they have not received much attention. Coastal plants exhibit unique morphological, physiological, and metabolic traits that allow them to grow and complete their life cycles under saline stress. An extensive study by Khan & Qaiser (2006) on the distribution and economic uses of halophytes in Pakistan highlighted the significant diversity of these plants in Balochistan, attributed to its varied ecological habitats. Numerous medicinal plants are halophytes, including palma rosa, lemon grass, German chamomile, periwinkle, ergot, flea seed, and milk thistle (Patra & Singh, 1995). Various ethnobotanical studies have been conducted across Pakistan, including the northern mountainous regions (Shinwari, 2010; Shinwari & Khan, 2000; Shinwari & Gilani, 2003; Qureshi & Bhatti, 2008; Adnan et al., 2010), identifying many halophytes.

This research aims to collect and document traditional knowledge regarding the uses of coastal plants in Hub, Balochistan. During brief rain spells in the monsoon season, plants emerge. The summer monsoon affects southern Balochistan, while Mediterranean winds bring winter rains. Among the documented species, 22% are utilized for treating various health issues. The most commonly used plant part is the leaf (44%), followed by the whole plant (19%) and seeds (13%, Fig. 2). Different parts of the same plant may be used for multiple ailments. According to Giday et al. (2009), roots are used more frequently (49%) than leaves (42%), with stems/barks (8%), fruits/seeds (6%), and bulbs/rhizomes (4%) also utilized. Remedies for skin diseases and injuries are typically applied externally, while treatments for internal issues are administered orally (Shinwari et al., 2010). Some skin infections and traumas also require oral administration. External application is the most common method (63%) of administering remedies, while oral administration accounts for 37%. Gilani et al. (2010) reported on the phytotoxic properties of local medicinal plants, including the traditional use of toxic plants like Euphorbia caducifolia as

fodder after burning. Similar practices are found in Spain with plants like Tamus communis, Bryonia dioica, and Clematis vitalba, which are cooked to reduce toxicity (Couplan, 1990).
In summary, the data indicates that local halophytes serve as both fodder and medicine, reflecting basic needs and socio-economic conditions. According to WHO, over 80% of Asia's population relies on wild medicinal plants due to cultural familiarity, easy access, simplicity, and effectiveness (Anon., 2009). Coastal communities, in particular, are in urgent need of basic healthcare facilities and socio-economic development programs. The sustainable use of brackish water to cultivate local plants has shown promise, producing low-cost fodder and medicine for impoverished populations, and has the potential to become a viable industry. However, research on indigenous plants is increasing even as their medicinal use declines (Al-Qura'n, 2009). Ethnobotanical data collection from local communities, coupled with chemical analysis of plant materials, can help identify key ingredients for better utilization. Increased awareness of the medicinal value of plants has raised concerns about over-exploitation and the impact of global environmental changes on local flora, necessitating regular review and documentation of indigenous knowledge. Cultivating economically important plants on marginal saline land should also be encouraged.

Materials and Methods

Hub Tehsil in Lasbela District, Balochistan (25°01.621'N and 66°53.025'E), lies on the border with Sindh, approximately 25 kilometers from Karachi in the Saharo-Sindian Phytogeographical region (Ali & Qaiser, 1986). Covering 18,254 square kilometers, Hub has a population of 81,751, with 22% residing in rural areas. Ethnobotanical information was gathered from local residents, the traditional custodians of this knowledge. Plant samples collected throughout the year from various localities were identified using the Flora of Pakistan (Nasir & Ali, 1971-2002; Ali & Qaiser, 1995-2005) and categorized based on habit, usage, and plant type. Medicinal

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plants were further classified by the part used, method of administration, and single or multiple uses.

Results and Discussion

The study reports ethnobotanical data on 48 plant species from 26 families, utilized for 12 traditional purposes (Table 1). These uses include fodder (33 species), medicine (13 species), food (3 species), increasing milk production in cattle (2 species), making axe handles (1 species), pillows (1 species), bird cages and baskets (1 species), local cigarettes (1 species), soap (1 species), dyeing clothes (1 species), and incense to repel snakes (1 species). The majority of species belong to Poaceae (54%), followed by Amaranthaceae (Chenopodiaceae) (15%), and Mimosaceae and Convolvulaceae (12%). The predominant growth forms are shrubs (18), grasses (15), and herbs (12), with a few trees (3). The analysis reveals multiple ethnobotanical uses for certain species, such as Commiphora wightii (Arn.) Bhandari, Euphorbia caducifolia Haines, Cymbopogon jwarancusa (Jones) Schult., and Haloxylon stocksii (Boiss.) Benth. & Hook., each utilized in more than three different ways (Table 1).

The data indicates a high proportion of halophytes (58%), including euhalophytes (33%) and xerohalophytes (25%) (Fig. 1), followed by xerophytes (42%). This reflects the extreme environmental conditions due to the scarcity of water resources. The plants documented are predominantly perennials, adapting to the rare and unpredictable rainfall in arid and semi-arid areas. The vegetation in the study area is mostly open type, dominated by annual species.

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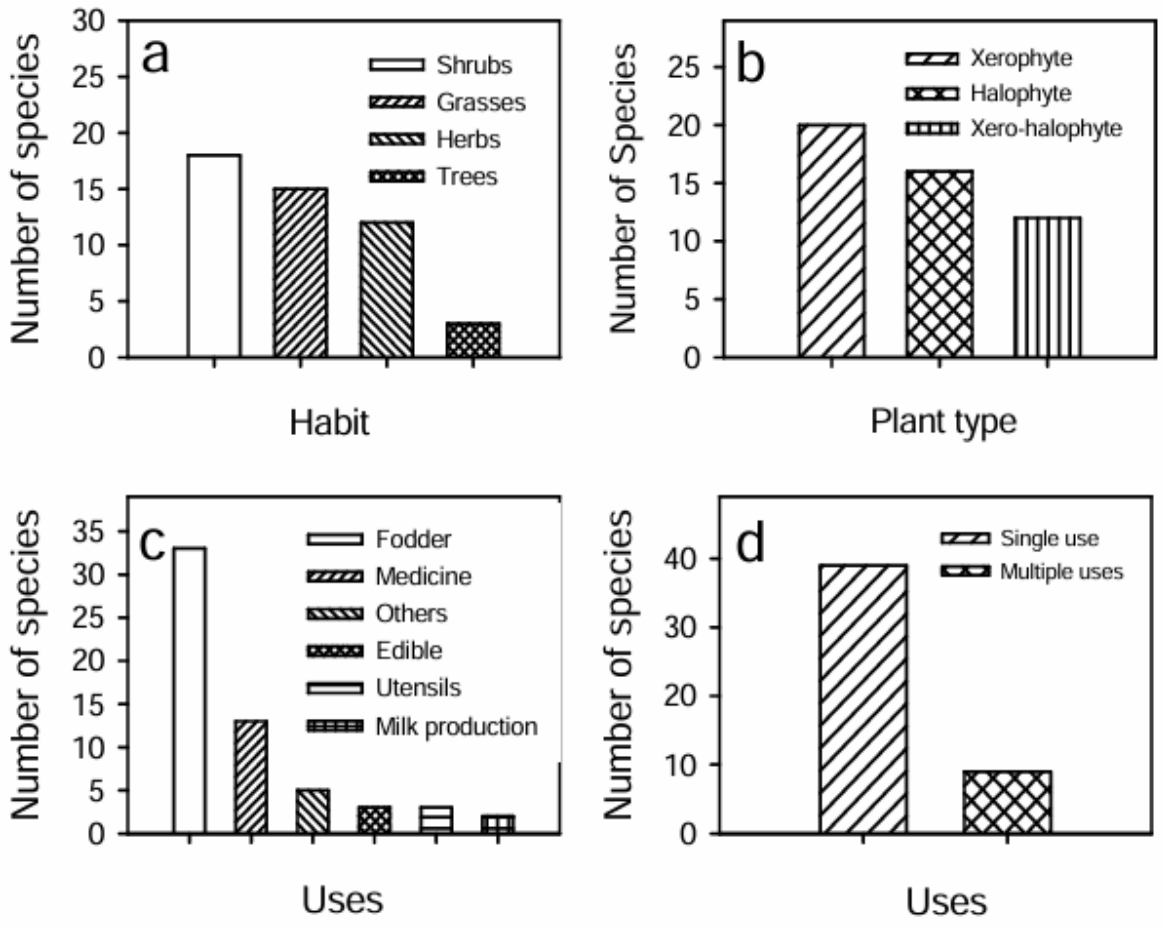

Fig. 2. Distribution of plants with respect to (a) habit (b) plant type (c) traditional uses and (d) proportion of plants with one or more uses.

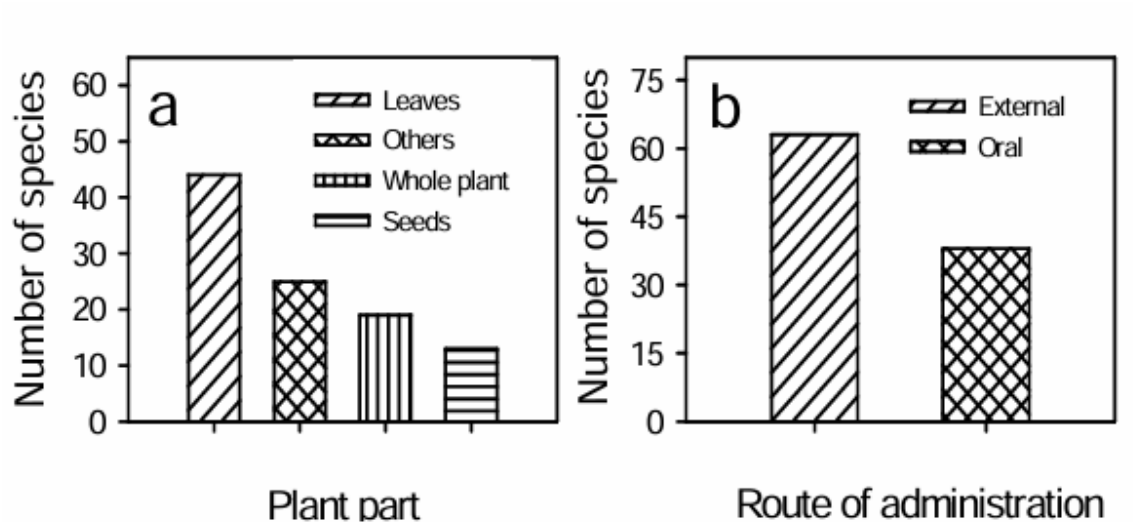

Fig. 3. Distribution of medicinally important plants with respect to (a) plant part used and (b) route of administration.

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