

Famine Food of Arid Rajasthan: Utilization, Perceptions and Need to Integrate Social Practices by Bio-Resolutions

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ABSTRACT A survey of the desert plants as used for the medicinal/nutritive supplementation by the desert inhabitants has been undertaken. The specific use of plants/plant parts for a specific purpose has been documented. Experimental work to analyze the constituents for the purpose it is being used, has commenced. The observations indicate that plant species such as *Cenchrus biflorous*, *Prosopis cineraria*, *Calligonum polygonoids*, *Tribulus terrestris* and *Acacia nilotica* etc are being used as famine foods whereas, *Salvadora oleoides* and *Citrullus colocynthis* are used for the medicinal purpose. Chemical analysis of the medicinal plants used is in progress to link perceptions of inhabitants with the scientific evidence of constituents.

INTRODUCTION

Utilization of wild plants has been known since long time. Dietary uses of plant and their parts such as fruits, nuts, seeds and leaves have been documented from different parts of the country Becker (1986), Bhandari (1978), Campbel (1987). Dietary sources and social aspects have been reported by Grivetti (1976). Social practices of using local plants as the famine foods in arid region of Rajasthan has been observed as a regular practice during the course of studies undertaken by us. It has been observed that different herbs, shrubs and trees are being consumed in their different preparations and incorporated in their diet by the desert inhabitants during the period of draught. The perceptions of the people about utility of these plants had revealed that these plants contain sufficient amount of proteins, minerals, micro nutrients etc to compensate protein Energy malnutrition (PEM) deficiency. Plants are consumed specifically by the local inhabitants for specific deficiencies in their diet and it supplements which occur owing to scarcity of green leafy vegetables and fresh crops during the draught period.

While a time-tested sequence of plants consumption has been observed, the real scientific utility of each plant and its parts/products need to be resolved bio-chemically for confirming the utility of consumption and offering the bio-alternatives of the shortage of availability of essential food parts during draught period. A

comprehensive survey has been undertaken to enumerate various famine food plants consumed by the local inhabitants of desert and based on them the research programmes have been formulated to cater the needs of deficient food in their daily diet as the alternative desert medicine. Present paper highlights the details of the work done.

MATERIAL AND METHODS

Field survey has been conducted in desert settings of Rajasthan. During the survey, the information about the specific uses of plants of medicinal importance for different purposes and uses of emergency food during the famine period as narrated by the local population have been recorded. A specific survey on traditional knowledge about perception and uses of famine food was conducted in three villages of Jaisalmer region.

The information gathered was recorded in a pre-tested survey schedule using questionnaire method. The data obtained were analyzed with respect to use of local plants for medicinal purpose and for the alternative famine foods during the period of draught. Analysis was made with respect to plants types used, their specific parts consumed and possible utility of these plants in the perceptions of the local inhabitants.

RESULTS AND DISCUSSION

A survey of traditional knowledge of local

inhabitants about the perception and uses of locally grown plants species, specific plant parts consumed to meet their macro and micro nutrient requirements during draught period was undertaken. The details are mentioned below:

A. Plant Species and Their Practices of Utilization and Perceptions of Inhabitants

1. ***Cenchrus biflorous* (Bhurat):** Most widely grown grass of the desert collected in normal years. During famine period this plant is used as emergency food in the area. The seeds are enclosed in prickly husk. The seeds are grounded and baked into thick sogra. It is considered as most nutritious food of famine. The seeds are believed to contain high fat and trace elements as stated by local population. This knowledge requires scientific validation by analysis of plant and their parts.
2. ***Prosopis cineraria* (Khejari):** Most common tree species growing on sand throughout the year. Young pods of the plant called sangeri, which are used as vegetable. Mature pods contain sweet pulp are eaten as fruit. Bark of khejari is grounded and mixed with flour to prepare rotis during severe famine period.
3. ***Calligonum polygonoides* (Phog):** This is very common bush growing on bare sand dunes of the desert. During the month of February and March its buds known as Lason are used by the local population with butter milk and salt. Flowers are believed to contain high amount of protein.
4. ***Tribulus terrestris* (Kanti, Gokhru):** *Tribulus terrestris* are annual herb, its small spiny fruit are used during famine. Its hard seeds are stored and ground to powder for baking into bread or mix with bajara.
5. ***Acacia nilotical* (Banwalio):** A moderate size ever green tree. Seeds are known as 'nilario' are eaten roasted or raw at the time of acute scarcity.
6. ***Capparis decidua* (Ker):** A very common thorny shrub or tree of the desert found throughout the region, it contains red edible berries. The unripe fruits are pickled and are also use as vegetable, known to contain high amount of protein.
7. ***Zizyphus nummularia* (Bordi):** A thorny bush very common in dry open plains it grows even in scanty rain fall. The fruits when ripped are stored, ground and eaten during scarcity. The local people use to distill the spirituous liquor from fruits, flowers, bark, roots etc. In winters fruits are dried, grounded and sieved. The powder so form are eaten as such or mixed with jaggery. Fruits are known for cooling effect.
8. ***Citrullus colocynthis* (Tumba):** A perennial cucurbit grown on sand dunes through the region of Jaisalmer and Barmer. Seeds washed with salt water many times to remove the bitter principal or buried with salt in small pit in the sand and kept covered for few weeks, later washed, dried and grind to make chapattis either solely or mixed with bajara. Kankra a delicious dish is also prepared by mixing seeds with bhurat flour during famine.
9. ***Citrullus lanatus* (Matira):** A watermelon of the desert grows in the dry sand pulp of the fruit are eaten as fresh. Seeds are dried and made into flour which then mixes with bajra to prepare roti. The roasted seeds with salt are also eaten by the people. Used during famine period by local inhabitant.
10. ***Cucumis callosus* (Kachari):** The plant is very common through out the area on sand. The ripe fruits are eaten as such while unripe fruits are used as vegetables. Available during famine and in normal days also. Fruits are known to contain vitamin C.
11. ***Salvadora oleoides* (Kharo Jal, pilu):** An evergreen shrub or small tree, found throughout the arid region. Ripe fruits are eaten as such in bunch. The fruits are eaten by local people but are believed to produce tingling and small ulcer in the mouth if taken in excess. They are also dried and used when food is in scarcity.
12. ***Lasiurus hirsutus* (Sevan):** It is one of the most common and valuable fodder grass of the desert. Seeds are collected grounded and mixed with Bajra flour and baked into sogra during famine period and are to known to rich in vitamin A.
13. ***Sorghum halpense* (Baru):** This plant can withstand long drought and is therefore, considered as good famine plant for cattles. The number of plants enumerated above and their utility as perceived by users, provide an important consolidation of knowledge. Findings of the study have shown that in the arid part of Rajasthan number of locally available flora has been utilized by local population in their diet as

supplement to compensate their nutritional requirement. Traditional knowledge of utilization of local food in this part has not been scientifically work out while from other part of the country no. of studies have been conducted. In Burkina faso Smith et al. (1995) have documented that 20 % of all food items consumed were wild species which contains more mineral values then cultivated one, during past decade few studies have been conducted on utilization of wild plants in infants by Ogle and Grivette (1985), Detwyler (1986), Campbell (1987), McGregor (1995), Locket (1999) suggested that wild plants are important snacks food for children of different ages. These wild foods were major source of vitamins and minerals mainly contains carotenoids and vitamin C Fleuret and Fleuret (1991). Few studies have been conducted on uses of wild plants during pregnancy and lactation by Fitzgerald et al. (1992) as alternative food during pregnancy. John et al. (1992) made review of food sources for vitamins.

B. Bio Resolution of Plants in Use: Work in Progress

There appears to be an urgent need for bio resolutions of many plants / plant parts to substantiate the perceptions of the local inhabitants of the desert through valid scientific protocols. Recently the chemical analysis of few of the famine foods / plants as reported by the people has been commenced by our group.

***Salvadora oleoides* (Mithi Jal):** This species represents an evergreen shrub or small tree, found throughout the arid region. Ripe fruits are eaten as such in bunch. The detailed observations gathered from the population utilizing the plant has shown that fruits of this tree called Peelu are being consumed during draught period to mitigate the deficiency of salts and other essential electrolytes in the human body.

***Citrullus colocynthis* (Tumba):** This plant represents a perennial cucurbit grown on sand dunes through out the region of Jaisalmer and Barmer. Seeds washed with salt water many times and grind to make chapattis. Very frequently used during famine.

Findings of the study have shown that in the arid part of Rajasthan, number of locally available flora has been utilized by local population in their diet as supplement to compensate their nutritional requirement.

In addition to be reportedly plants of nutritive

values, the analysis done by us showed the plant extract as insecticidal in nature also. Further work on compound isolation is in the progress. Exploitation of useful nutritional and medicinal constituents from the local flora of desert could be a useful application of available phyto-chemical technology to offer the bio-molecules as alternatives to commercially available synthetic supplements. In addition, scientific analysis of plants being in practice, could provide rationale substantiation to the perceptions of the people.

A comprehensive compendium of record of practice and beliefs of different ethno-medicines of tribal population of Rajasthan has been provided by Dam (2003). Recently, review and quality standards on Indian medicinal plants have been documented with their associated details in number of publications of I C M R (Gupta et al. 2004a, b, 2005a, b).

However, an integration of perceptions and practices of people with valid chemical analysis to support and offer the alternative Bio-resolution has been attempted. Present paper is an initiation in this direction.

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