Alternative uses of Arecanut: Indigenous Medicinal Knowledge and Practices to Manage Diabetes.

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Abstract

The future of areca nut depends upon the qualitative expansion of consumer base. There is a need to strengthen alternate uses. Since the time immemorial, Areca nut has been used in the preparation of medicines particularly in India and China. The present paper emphasizes the need to globalize indigenous knowledge and practices of rural and tribal inhabitants towards alternate uses of areca nut. Since diabetes is a global problem wherein, more than 40 per cent of people above 50 years of age are suffering from Non-Insulin Dependent Diabetic Mellitus (NIDDM), standardization of Indigenous knowledge could generate non conventional market. In this regard, socio-anthropological studies need to be initiated.

Socio-Anthropological studies have been carried out in the traditional areca nut farming regions; Sagar, Hosanagar taluks of Shimoga District and Siddapur taluk of Karawar district. The areca is characterized by coexistence of tribal and rural people. Areca nut is the major commercial crop supported by paddy and sugarcane. Evergreen forest and animal wealth together add to their traditional and folk medicinal knowledge.

The main objective was to find out traditional medicinal knowledge regarding areca nut and its related products with special emphasis on the management of diabetes locally called sihimutra. Fieldwork has been carried out through interview and counseling methods to elicit information. The findings were subjected to clinical tests

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supported by age and sex differential case studies.

The product is called madhumeharista and re titled as Diareca syrup. The ingredients such as areca nut, beetle wine, lime, lemon and certain herbs are used after fermentation. The present clinical study tested the glycemic response among non-insulin dependent diabetic mellitus patients (NIDDM). After, 90 days of trial conducted on 125 patients in different age groups indicated the Level of control that ranged from 66.66 to 77.77 per cent. The mean response was at 68.92 per cent. Standardization of dosage was also carried out and varied with the degree of glycemic response and age group. The sex difference was not at significant level. No side effect has been noticed particularly with regard to blood pressure, respiratory and digestive functions.

Diabetes is a global problem. Majority of patients are after organic methods to manage their diabetes. Diareca could be introduced in the global market since its base is organic. This could also generate rural employment opportunities.

The paper also prompts certain action plans towards promoting market stability. Some of them are: focusing on medicinal and cosmetic values of areca nut, effective use of current propaganda or advertising techniques and media and strengthening corporate systems of research and development.

Keywords : Indigenous Medicinal Knowledge, Non-Insulin Dependent Diabetic Mellitus(NIDDM)

Introduction

The future of arecanut depends upon the qualitative expansion of consumer base. There is a need to strengthen alternate uses. Since the time immemorial. Arecanut has been used in the preparation of medicines particularly in India and China. The present paper

emphasizes the need to globalize indigenous knowledge and practices of rural and tribal inhabitants towards alternate uses of areca nut. Since, diabetes is a global problem wherein, more than 40 per cent of people above 50 years of age are suffering from Non-Insulin Dependent Diabetic Mellitus (NIDDM), standardization of Indigenous knowledge could generate non conventional market. In this regard, socio-anthropological studies need to be initiated.

Objectives of the Study

In the present empirical study, an attempt is made to document indigenous system of knowledge regarding the medicinal preparation of areca nut and beetle leaves. The objectives are:

1. Study of tribal and rural medicinal products related to areca nut and beetle wines.
2. Documentation and clinical analysis of *Madhumeharista* - an areca nut based syrup for the management of Diabetes.

The Study Region

Socio-Anthropological studies have been carried out in the traditional areca nut farming regions; Sagar, Hosanagar taluks of Shimoga, and Siddapur taluk of Karwar district. All these regions fall within the orbit of Western Ghat zone. The topography of the region is dissected and undulating. Since, the area is in the Western Ghat, the forests are dense with rich medicinal plants. People live in separate homesteads. The average rainfall is accounted for 2253.4 mm. The South West monsoon accounts for most of the rains. It sets in about 10th of June and is usually heavy till mid August. The climate is typical of Malnad. Summer is moderately hot. The forest wealth ranges from evergreen versatile trees to bushes and shrubs. Farm forestry is a typical feature supporting agriculture. (Table No. 1).

Land is the most important economic resource in the region. As many as 75 per cent of the total population depends on land based income.

The exploitation of land is of two types- Horticulture and Agriculture. Paddy is the main crop in the wetlands and the areca nut is the perennial crop in the garden lands. The dry land called *kushki* or *byana* is set apart for the natural growth of thatching grass known as *karada*, used for feeding cattle. However, in recent years, the middle and the upper class people started converting such private grazing lands into coconut and cashew plantations apart from acacias and eucalyptus. Sugar cane is cultivated only for jaggery. The extent of sugar cultivation is on the increase as it fetches a better return to the farmers than the paddy. Recently, vanilla cultivation gained momentary importance because of exorbitant price and now loosing its popularity as the demand slashed down.

Table No. 1. Land use pattern in the study region

Sl. No	Type of Land	Percentage to the total
1.	Forest area	19.70
2.	Barren & Uncultivated land	4.50
3.	Land used for nonagricultural uses	8.70
4.	Community grazing land	5.25
5.	Land containing trees (*Soppina betta*)	10.10
6.	Net area cultivated (Includes both Agriculture & Horticulture)	51.75
	Total	100.00

Source: *Consolidated revenue records of respective taluks.*

Non-agricultural productive activities can be classified into three broad categories: others.

1. Village artisans who supply products and maintenance services to meet the needs of agricultural production and produce goods to meet local demands. This group includes carpenters, cobblers, rope makers, basket makers, blacksmiths, potters and others.
2. Agro industries such as oil pressing, gur making, bee keeping, among others.

3. Animal husbandry activities such as dairy, goat, sheep and poultry. Nowadays piggery and inland fishery are gaining importance.

The Population

Demographically, the area shows coexistence of both tribal and rural population. The major tribes are: Haslar, Maratha, golla, kuruba, lambani and Vodda. The others constitute Brahmin, Lingayat, Deeva (Idiga), Gowda (Vokkaliga), Bunt, Madivala, Harijan and Balegara. Majority of tribes have settled in their respective localities cultivating small patches of land. However, more than 70 per cent among them are land less labourers.

As majority of people cultivate areca nut, its medicinal knowledge in this area, has a rich traditional base. Each community has its own hereditary medical practitioners locally called *nati vaidya* or *janapada vaidya*. Tribal people manifest greater degree of medicinal knowledge. The scope of the present paper is restricted to the study of the medicinal value of areca nut and specific focus is made to the management of diabetes, particularly, to the non-insulin dependent mellitus.

Material and Methods: Counseling method was used to unravel the secret of medicinal preparations. Certain important traditional practitioners of medicine were identified and constant interaction was carried out with them for two years. The generated data was further subjected to validity studies. Methodology included:

- Gaining knowledge regarding the ingredients used in the medicinal properties.
- Mode of preparation and dosage specification in the treatment.
- Their diagnostic techniques of different diseases.

Accumulated data are further grouped in to different categories in

accordance with the treatment of diseases, (Table No. 2). As diabetes is a global problem and so for, knowledge concerning the traditional system of treatment to this disease is very much limited, specific focus is made to standardize the medicine. Further, the product was subjected to clinical test. Accumulated data is subjected to the statistical analysis of variance and percentages.

The diagnostic techniques and mode of preparation are not included in this paper. Major focus is given to the clinical analysis and validity test.

Table No. 2 : Medicinal preparation of areca nut for the treatment of diseases/disorders

SL.No.	*Diseases/Disorders*	*Ingredients used*
1	Dysentery	Areca nut
2	Diarrhea,	Beetle leaves
3	Heart burn	Lime,
4	Urinary stones,	Lemon,
5	Jaundice	Jaggery,
6	Excessive passing of flatus	Ginger
7	Flatulent	Clove
8	Colic	Nut mug,
9	Neutralization of hyper acidity	Camphor
10	Leucoderma	Tamarind
11	Leprosy	Roots
12	Cough	Herbs
13	Fists	Barks
14	Obesity	Leaves
15	Intestinal worms	-
16	Eczema	-
17	Tooth ache	-
18	Gonorrhea	-
19	Impotency	-
20	Diabetes	-

Source: *Compiled from Different Sources*

Note: Compositions are different for diseases. The table explains only the ingredients and not the mode of mixture/ composition for the mentioned diseases.

Table No. 2 indicates the broader area of diseases wherein areca nut and beetle leaves are used as one of the major ingredients in the folk medicine. Proportion of ingredients and method of preparation varies with different diseases. It is widely advocated that Supari should not be consumed without adding lime and beetle leaves.

Previous Studies at a Glance

The story of areca nut chewing dates back to antiquity. References to areca nut are found in *Rigveda, Mandala (10) Suktha (145)* more than 4000 years ago. Dhanvantri Nighantu, the ancient text on Ayurvedic medicine mentioned *Panchasugandhikam*, the five natural aromatics connected with betel chewing. They include Piper Chaba, Puga, Clove, Nutmeg, and Camphor. An undated book-*Puguvatee Shathakam;* hundred rhymes on areca nut cultivation and its medicinal uses by Mr. Venkappa in local vernacular Kannada, depicts importance that the areca nut gained in India.

Some of the medical scientists attempted to make anthropological studies regarding indigenous knowledge. Aman (1069), made an elaborate reference of tribal knowledge regarding the alternate uses of areca nut particularly in the treatment of dysentery, Urinary stones and jaundice. Mohan Rao (1982), made an account of the medicinal value of areca nut taking into consideration the ancient scripts. Sirsi *et al.* (1963), made an elaborate clinical studies on the influence of areca nut extracts on adrenalin. Lalitha Dorle and Sirsi (1964), further, conducted laboratory tests in the Indian Institute of Science, Bangalore and reinforced the earlier findings regarding the medicinal values of areca nut. Their findings highlighted the anti bacterial and anti fungal action of the tannins, the main chemical ingredients called polyphenols in areca nut. Nadakarni (1908), in the Indian Materia Medica, the oldest Indian medical encyclopedia mentioned in detail the medicinal values of areca nut along with the method of

preparation among some of the rural and tribal inhabitants. Majumdar et al. (1979) considered areca nut as useful in the treatment of nasal ulcer. The finding was further supported by T.M.A Pai Pharmaceutical Research Center, Manipal (2000). Vignesha (2005) made socio anthropological studies related to the indigenous technology knowledge of tribal and rural inhabitants of western Ghat region regarding the medicinal preparation and application of areca nut in the treatment of certain diseases.

Indigenous Medicinal knowledge to Manage *Madhumeha (Diabetes)*

Diabetes is the most common yet increasing health hazard in the modern days. It is popularly called *Madhumeha* in the Ayurvedic literature. Elaborate mention is found in *Charakasamhitha and Brahathsmitha,* the ancient medical treatise of India.

In the study area some of the native practioners treat diabetes with native medicines. They are the folk medicinal systems carried through generations. One among them is *Madhumeharista*. It is the combination of areca nut, beetle leaves, lemon, lime and certain herbs and roots. Having observed the large number of patients availing this medicine, interest was generated to unravel medicinal secret of this traditional product. For instance, in one of the villages of Sagar taluk (Shimoga District) every Thursday, hundreds of people from far off places, including persons from other states visit native medicine practicing man to get medicine for diabetes. A case study could explain the importance of this medicine: *Mr. N.G. Bhat holds an important position in the Income Tax Dept. at Delhi. He has been suffering from NIDDM for the last 15 years. In fact, at the age of 40 his diabetes was diagnosed. He started taking Madhumeharista and managing his diabetes. According to him a moderate quantity of sugar intake does not affect his glucose composition. Regularly he*

takes two spoons of syrup twice a day.

The study area enjoys a rich heritage of native medical practioners, including women. Each village or tribal settlement has one or two such hereditary professionals. Among them Mr. Durga is well known not only in the region but also among the neighboring states. His case study could explain the role of such people for the society: *Mr. Durga, aged about 55 years belongs to Haslar tribe. His knowledge of folk medicine is hereditary. Basically, he is a landless labourer. Once a week particularly on Thursday, he treats the patients. Rest of the days, he works for the wage. He does not demand any charges for the medicine, It is his hereditary belief that demanding money for the medicine will make their community deity Choudamma angry and the medicine would loose its healing effect. It is left to the patients to remunerate him, either in kind or in cash or whatever they can. He is specialized in the treatment of jaundice, skin diseases and diabetes. Our team has observed a large number of patients coming even from other states. Now, this person has started training his elder son. He is a member of joint family. Apart from his age-old mother, two elder brothers, their wives, children and one unmarried sister constitute other members of joint family. Others do not have the inclination to practice the profession. Medicinal knowledge is kept as a family secret. During eclipse and amavasyes (Full moon day) he does not give medicine. His elder son, who is pursuing his Bachelor of Arts education in the nearby college, wants to continue the tradition with certain improvement and modifications. The women are not supposed to give medicine because of the traditional concepts of purity and pollution. Durga becomes strictly vegetarian on the days of collection and reparation of medicine, and also on all Thursdays. According to him, madhumeha, once started cannot be completely cured but could effectively be managed and the madhumehis*

(diabetic people) could lead a normal life if they regularly consume madhumeharista.

Clinical Trial:

Before starting the clinical study, some of the regular patients taking *madhumeharista* were interviewed. Age group classification along with sex differential data is presented in the Table No. 3.

Table No. 3: Age and Sex composition of Diabetes patients managing with madhumeharistha

Age group	No of Male	Duration of madhumeharistha Dependency No. of years	Female	Duration of madhumeharista Dependency No. of years
70+	5	4	2	2
65-70	9	7	6	4
60-65	15	10	11	7
55-60	28	6	12	6
50-55	18	8	5	7
45-50	23	6	8	4
40-45	15	3	3	2

Source : *Complied from survey*

As the data explain (Table No: 3), percentage of NIDDM male patients within the age group of 40 and 60 account for 74.33, whereas, 60 and above age group represent 25.67 per cent. Among female this percentage is 61.22 and 38.78 respectively. Mean dependency among male is 6.29 years, while for female it is 4.58 years.

Meanwhile, certain socio-economic characteristics and general attitude towards medicinal systems were observed among the respondents. Some of them are:

- Majority of them belong to farming community. Only, 22 per cent depend upon nonagricultural occupation such as business, trade and bureaucratic cadres.
- All of them have the notion that constant dependency on allopathic drug causes major side effects.
- As many as 90 per cent of them belong to literate group.

- Among the clients, 12 per cent have family history of diabetes.
- Majority considers (72 per cent) that it is economical hence, they can afford.
- Respondents represent different caste, class and religion.
- Food habits reveal that 62 per cent are both vegetarian and non-vegetarian and the rest only vegetarians.

With a view to document the product and to initiate further standardization through clinical tests the mode of preparation along with the ingredients were observed: Some of the main combinations are: tender areca nut, Eugenia jambulina (Jambo seeds), lime, beetle leaves, lemon and herbs. After 40 days of fermentation, the liquid is distilled and further filtered. The product is re titled as Diareca Syrup. After due modifications, the product was subjected to clinical test in accordance with modern medical research methods.

CLINICAL TRIAL ANALYSIS OF DIA ARECA SYRUP

Clinical trial was conducted between 5-1-2005 and 5-4-2005 to test the glycemic response by administering the product to Non-Insulin Dependent Diabetic Mellitus patients (NIDDM).The test was administered according to the standard and norms prescribed by the Council for Indian System of Medicine (CISM).

A total of 90 days of clinical trial conducted on 125 patients in different age groups revealed the following percentage of glycemic response.

Table No. 4: Clinical Trial Analysis of *Madhumeharstha*

Age group	Duration of the Diabetic history	No. of Patients	Percentage of control
25-35	2-5 years	6	71.42
35-45	2-7	15	71.77
45-55	6-10	35	72.25
55-65	10-18	38	66.66
65-75	12-22	31	62.50

Source: *Compiled from Survey*

The mean response was 68.92 per cent. The sex differential study was simultaneously carried out among the patients. The differences were not at significant level.

According to the clinical trial (Table No.4), mean percentage of control among Non Insullin Dependent Diabetic Mellitus(NIDDM) respondents is 71.81 within the age group between 25 and 55. On the other hand, it is 64.58 per cent among the category between 65 and 75. Average duration of NIDDM history is 9.4 years for all groups. Whereas, it is 5.3 among 25 to 55 years age group and 15.5 years among above 55 years age group.

Standardization of dosage was also taken into consideration during the clinical trial. The dosage varied with the degree of glycemic response. The product's preservation efficiency is six months. No side effect has been noticed particularly with regard to blood pressure, respiratory and digestive functions.

Scope for further study

India enjoys a rich heritage of indigenous medicinal system. Each region and ethnic groups have traditional folk knowledge. In this era of globalization, development and standardization of such systems could generate employment opportunities apart from improving the rural and tribal economy.

Most of the indigenous medical knowledge is on the verge of extinction. There is a need not only to document the technology but also develop the skill for generating alternative sources of economy. Sustainable development could be effectively implemented with this type of study.

Action Plan: The paper also prompts certain action plans towards promoting market stability. Some of them are: focusing on medicinal and cosmetic values of areca nut, effective use of current propaganda or advertising techniques through media and strengthening corporate

systems of research and development. Standardization of indigenous preparations is needed to globalize the product. In this regard following action plans are suggested.

1. Encouraging clinical trials and studies.
2. Development of media network, and
3. Initiating integration and collaboration process with other firms and agencies related to similar fields.
4. Govt. should encourage through providing either revolving funds or grants to the institutions commercializing the areca products.

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