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BETEL VINE IN DENTISTRY

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ABSTRACT

Betel vine is cultivated in open and close areas of many states .Betel vine has got various types of medicinal properties. Different types of varieties of betel commonly used are bangla pan, sweet pan, kopoori pan, deshawari pan, sanchi pan, various roles of this plant has been discussed in this article. Although betel vine leaf itself has numerous medicinal advantages but its misuse with tobacco and areca nut has led to harmful correlations.

Figure : 00 References : 19 Tables : 03

KEY WORDS : Betel vine, Medicinal properties.

Introduction

In India betel is cultivated in open and close areas of many states like Uttar Pradesh, Bihar, Madhya Pradesh and West Bengal. In Assam, Kerala and Tamil Nadu, the betel vine is cultivated in open areas but in Maharashtra, Orissa, Karnataka, Andhra Pradesh the betel vine is cultivated in both open and close areas. In Uttar Pradesh it is cultivated in Varanasi, Gorakhpur, Kanpur, Lucknow, Mahoba and Lalitpur districts.

Betel vine has got various medicinal properties. Different varieties of betel commonly used are bangle pan, meetha pan, kopoori pan, deshawari pan, sanchi pan. The odour, taste and phenolic contents of these varieties of pan vary (Table 1).The betel leaf has astringent action due to its phenolic content. The mesh and salivation produced during chewing has perhaps antiplaque activity, apart from this plaque is also stained which can be a guide for removal of plaque from tooth surface.[15] During brushing it can act as a disclosing agent the experimental studies are required in this field. Pan is supposed to be digestive. The composition of pan having Riboflavin, Thiamine, vitamin c suggests it's utility in stomatitis and gingivitis. (Table 1).

Betel vine has various types of bacterial, fungal, worm born diseases like bacterial leaf spot. Bacterial leaf bilt and bacterial stem rot by zenthomonas comparative variety vatalee cola [17]. The various bacterial and fungal diseases of betel vine are treated by chemicals[14]. If the betel chewer is constantly taking the diseased pan, the effect of these bacterial and fungal diseases on gingival and oral disease has not been studied so far[11]. Apart from this the pan seller usually reuses the effected areas of pan by cutting it even then if the remenants of fungal infection persists,what effect will it have on oral disease is not known.[5,9]

Chewing of betel leaves produces a sense of well being, increased alertness, sweating, salivation, hot sensation and energetic feeling.It also increases the capacity to exercise, physical and mental functions more efficiently for a longer

TABLE- 1: Chemical composition of Betel

Different type of pan	Odour	Phenolic content	% of phenolic content
Bangla pan	Laung like odour	Eugenol	More than 80%
Meetha pan	Soff like odour	Anevol	More than 32%
Sanchi pan	Chipra	Euginol	More than 29%
Deshawari pan	Chipra	Euginol	More than 24.5%
Kapoori pan	Tikha	Tarvenol	More than22%

duration but it may produce a kind of psychoactive effect causing a condition of mild addiction leading to habituation and withdrawl symptoms[6].It is said that six betel leaves with a little bit of lime is said to be comparable to cow milk particularly for vitamins and mineral nutrition.The leaves contain enzymes like diastase and catalase and significant amount of all essential amino acids accept lysine, histidine and arginine which are found only in traces [8].

It is said that if pan is taken with lime and catechu, betel nut has no harmful effects.The properties of catechu has soothing effect in the oral cavity whereas if excess lime is used in pan it is harmful to oral mucora.[10] The periodontal status has been studied by various workers in panchewers but study of pan chewers with no betel nut and its effect on gingival tissue is still lacking in literature. The betel nut has got adverse effect on oral tissues and sole cause of submucous fibrosis. Similarly use of tobacco and various other added substances like kimam, zafrani *etc* has harmful effect on periodontium and may initiate precancerous and causes lesion in oral cavity.

Discussion

Betel leaf is traditionally known to be useful for the treatment of various diseases like bad breath, boils and abscess, conjunctivitis, constipation, headache, hysteria, itiches, mastitis, mastoroitis, otoria, ringworm, swelling in gums, rheumatism, abrasion, cuts and injuries while the root is known for its female contraception effects. In spite of nutritive stimulating and refreshing properties, excessive consumption of betel leaves may prove harmful for teeth and gums, this is because of tobacco based quids which may produce dental caries, oral sepsis, palpitation, neurosis and even oral cancer[2]. But nontobacco based quids are not known for above conditions, however there is no denial that the leaves may contain the good amount of safrole(15mg/g),a carcinogenic agent[4] but it is quickly metabolized in human body into dihydroxy chavicol and eugenol which are excreted along with urine[3]. The utility of euginol in dentistry is well established to relieve pain of a carious tooth. The phenolic content has astringent action on gingival tissue. The betel leaves are also reported to possess antioxidant properties besides antimutagenic and carcinogenic properties due to the presence of ingredients like hydroxyl chavicol and cholinergic acid in it..The cholinergic acid is reported to kill the cancerous cells without effecting the normal cells unlike common cancer drugs [18].Contrary to above there are few reports which indicate that the chewing of betel leaves may produce carcinogenic effects[4].

It is also claimed that the immunefluroscence of betel vine contains carcinogens whereas the leaves possess anticarcinogenic agents, this indicates that the parts of some plant contain carcinogenic and anticarcinogenic substance[19].Special biochemical and genetic researches and clinical trials are needed before imposing malignant properties of betel leaf.

There is a general belief that high incidence of buccal cancer is associated with betel chewing habit. The betel chewing is a common habit in this part of the world. The ingredients chewed consist of betel leaf, areca nut.[16] Dried tobacco leaf, smeared with lime and wrapped around sliced or

TABLE - 2 : Biochemical composition of Betel

	%
Moisture	85.4
Protein	3.1
Fat	0.8
CHO	6.1
Fibre	2.3
Mineral	2.3
Tanin	1-1.3
Total sugar	2.4-5.6
Non reducing sugar	0.6-2.5
Reducing sugar	1.4-3.2
Oil of betel	0.7-2.6
Phenol content of oil	58.8
Euginol	42.5

TABLE- 3 : Nutritive value of Betel

Edible portion	**Fresh leaves**
Energy kcal	44
Calcium mg	230
Phosphorus mg	40
Iron mg	7.0
Carotene mg	5760
Thiamine mg	0.07
Riboflavin mg	0.03
Niacin mg	0.7
Vitamin c mg	5

chopped areca nut and fragment of dried tobacco leaf.The usual beta chewers may use 2-20 betel leaves daily.It has been reported in the study " effect of betel chewing on oral mucosa[15]" that about 14% of heavy chewers who have continued the habit for 20yrs show changes in oral mocosa which can be regarded pre-cancerous.The people who have indulged in betel chewing habit for this long period fall into cancer age group[4]. It is not possible to blame betel chewing alone as a cause of cancer in mucosa , as the control groups in above study showed changes comparable to those of betel chewers. Betel chewing alone has no direct carcinogenic action but it is a cause of periodontal disease[1,13]. It was stated that the components of betel quid were not carcinogenic but betel chewing cause gingivitis, irregularity of teeth and sepsis resulting in chronic irritation and cancer[1]. It was concluded that chewing of betel and areca nut, accept in causing poor oral hygiene, had no role in the production of buccal cancer,but when tobacco was used as wella possible association has been suggested[12]. It was suggested that friction from a jagged tooth alone or in combination with smoking or betel chewing can cause leukoplakia[7].

Conclusion

Although betal Vine has numerous medicinal advantages and has been used for ages by Indian population, its harmful effects can not be overlooked and it should not be used with agents like tobacco or areca nut. Studies have shown that use of betal quid or areca has led to fatal diseases like carcinomas, oral submucous felnosis etc.

References

1. BALENDRA, W. AND CEYLON, J. (1941-1949) Effect of Betal on Oral Mucosa; Paper read at annual meeting of dental association at Scarborough, *England Barch Br. Med. Ass.,* **38**,47
2. CSIR (1969) Council of Scientific and Industrial Research New Delhi. The wealth of India **8**:84-94.
3. CHANG, M.J.W., KO, C.Y., LIN, R.F. AND HSEISH, L.L. (2002a) Biological monitering of environment exposure to safrole and the Taiwanese betel quid chewing Archives of environmental contamination and *Toxicology,* **43**(4) : 432-437.
4. CHEN,C. , CHI., CHANG,K. AND LIU,T. (1999) Safrole- like DNA adducts in oral tissue from oral cancer patient with a betel quid chewing history. *Carcinogenesis* **20** (12) 2331-2334(1999).

5. CHOPRA, R.N.,NAYAR, S.L. AND CHOPRA,I.C(1956) Glossary of Indian medicinal plants 194. CSIR New Delhi
6. CHU,N.S.:(2001) Effects of betel chewing on the central and autonomic nervous systems. *J. Biomedical science* **8** (3): 229-236
7. COOKE, B.E.D.; AND R.COLL.SURG, (1964) Leukoplakia Buccalis *Ann R Coll Surg Engl.* **34**(6): 370–383
8. GOPALAN, C., RAMA SASTRI, B.V. AND BALASUBRAMANIAM, S.C. (1984) Nutritive value of Indian foods, pp. 108 National institute of nutrition (ICMR). Hyderabad, India.
9. GUHA, P. (2003) Commercial exploitation of oil from betel leaves, pp.56-57, In:proc. Sixth regional workshop on oil seeds and oils. IIT, Kharagpur (Ed) Agricultural and Food engineering department, IIT, Kharagpur, India.
10. GUHA, P. "Pan teke selpa sambha bana"(in Bengali) "Exploring betel leaves for cottage industry" . *Journal of AgriSearch* **1**(4): 251-256.
11. KHANNA, S. (1997) Pan vittik silpkendra(in Bengali). "Betel leaf based industry". *Nabanna Bharti,* **30** (2): 169.
12. KHANOLKAR, V. R. (1944) : *Cancer Research.* **4**.313 – 3158.
13. MEHTA, F. S., SANGANA, M. K. AND BARETT, M.A. (1955) Geographical Pathology of cancer- *J.Am.dent.Ass.,* **50,**531-537.
14. MISRA, A. AND SINGH, R. (2010) Study on betel vine disease and their control *Flora and Fauna*. **16** : 21-27
15. SINGHAL, G. D. AND CHUNEKAR, K.C.(1980) Pharmaceutical consideration in ancient Indian surgery Chaukhambha Orientalia, Varanasi, India, Sutra-susruta samhita chaptu 28-46
16. TENNEKOON, E. AND BARTLETT, G.C. (1969) Effect of betel chewing on oral mucosa –*Br J Cancer. Mar;* **23** (1): 39–43.
17. THAKUR, B.S. AND CHUNEKAR, K.C. (1972) Glossary of vegetable drugs in Brahattrayi chowkhamba Sanskrit series, Varanasi.
18. TNN (TIMES NEW NETWORK) (20040 Paan- Indian cure for leukemia.The times of India, Kolkata (31.7.2004). Retrieved on 4.11.2004 from http :// www.hvk.org/ articles/0804/22.html.
19. WR,M.T., D.C.,HSU , H.K., KAO,E.L. AND LEE,J.M. (2004) Constituents of areca chewing related to esophageal cancer risk in Taiwanese men. *Deseases of the esophagus,* **17** (3) : 257-259.

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