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Pharmacological Review of Pazhampuli (Garcineagummi-cutta)-A Herbal Drug.

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ABSTRACT

Garcineagummi-cutta has been used in South India from time immemorial as a condiment for flavouring curries in place of tamarind or lime. G.gummi-cutta is mostly used in Kerala and Kanyakumari district of Tamil Nadu in cooking to add sour taste to fish curry. It is also used to preserve dry fish. The polyisoprenylated benzophenone and xanthone derivatives are known for their antioxidant, apoptotic, anti-cancer, anti-inflammatory, antibacterial, anti-viral, anti-fungal, anti-ulcer and anti-protozoal properties. The Hydroxycitric Acid content of garcineagummi-cutta reduce net fat deposition from denovolipogenesis during weight gain and it also reduces food intake resulting in weight reduction. It also alters serum lipid profile. Currently it is marketed as an anti-Obesity drug. There are so many studies for and against its medicinal properties. So a thorough pharmacological and clinical evaluation of the drug is the need of the hour.

Keywords: Hydroxycitric Acid, Anti-obesity, Total cholesterol, LDL-cholesterol, Cardiotonic, Antioxidant, Polyisoprenylated benzophenone.

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INTRODUCTION

There is revamped demand for preparations (drugs and nutrient supplements) which can prevent or delay the onset of various diseases. This focus on primordial and primary prevention by complementary supplementation of nutrients and drugs needs further evaluation and thorough scientific study. It is in this light we examine the pharmacological effects of *Garciniagummi-gutta* commonly known as Malabar tamarind. The fruit rind and its extract (both dried and fresh) have been used in various culinary preparations of South India since time immemorial. Till recently contemporary texts explained *Pazham Puli* as old stock of commonly used tamarind. Recent ethno-pharmacognostical and literary research work established that *Pazhampuli* refer to the fleshy rind of *Garcineagummi-cutta* [1]. Vernacular names for *Garcineagummi-cutta* in Kerala and Kanyakumari district of Tamil Nadu are Korukkapuli, Kodakapuli, Pathyapuli, Malabar puli etc [2]. The commonly used tamarind plant (*Tamarindusindicus*) is said to be indigenous to Africa and was introduced to India [3].

As red chillies, peanut, and cashew, tamarind also became very popular with Indians in course of time. Before tamarind became popular *Garcineagummi-cutta* was the major source to give sour taste to food in Indian cooking and was called *Puli* i.e. tamarind. The new tamarind replaced to a large extent the hither to used *Garcineagummi-cutta*. In course of time *Garciniagummi-cutta* was outdated in day today cooking and came to be called *Pazhampuli* meaning old tamarind. So the medicinal properties and uses attributed to *Pazhampuli* actually denote those of *Garcineagummi-cutta*.

Ayurveda, Siddha and various other traditional medicines mention the positive health effects of *Garcineagummi-cutta*. The major constraint in reaping the benefits of our large repository of traditional knowledge is the lack of scientific effort and required infrastructure to establish various pharmacological effects of these preparations conclusively. This can not only bring in new approaches to treatment but also has the potential to reduce costs.

Garciniagummi-cutta is attributed to have anti obesity and purgative properties. Although none of the studies conducted so far has been able to fully refute or establish these effects. While considering only the effects of a few phyto chemicals in the fruit and its extract may be myopic as at what doses which chemical have this effect or what interactions these chemicals have in the body is still unknown. It is to our advantage only to have a renewed approach to the scientific and broad study of traditional/alternative medicines.

Garciniagummi-gutta(L) Robs. previously known as *Garciniacambogia*(Gaertn) Desr. belongs to family Clusiaceae. Medium sized tree with drooping branches. Leaves are dark green, shining, elliptic-obovate. Male flowers are fascicled; female flowers solitary. Berry ovoid, yellow or red when ripe with 6-8 grooves [4]. Malabar tamarind (*Pazhampuli*) consists of dried rind of *Garciniagummi-cutta*. The ripe fruit is halved or sectioned and spread in thin layers, dried in the sun for three to seven days to moisture level of about 15 to 20 percent and smoked [5].

Phytochemistry

Rich in acids, Hydroxycitric Acid (HCA), lactone, garcinol, isogarcinol, cyanidin-3sambubioside, phenolic flavonoids, carbohydrates, proteins, steroids, terpenoids, cardiac glycosides, phlobotannins.

Uses

It has been used in South India from time immemorial as a condiment for flavouring curries in place of tamarind or lime. Thas and PazhamPuli[3] Siddha MateriaMedica mentions that *Garciniagummi-cutta* has no adverse effects, it relieves diseases caused by derangement of Three Faults, relieves fever, vomiting, eye and liver diseases *G.gummi-cutta* is an antidote for venomous bites including cobra and scorpion sting. It has wound healing properties. It can also be added to the diet of patients undergoing treatment for skin conditions. In this respect it is just opposite to the conventional tamarind which should be avoided in sick regimen of patients. Tamarind is considered an *Apathyapathartha*. Extensive details are given regarding the process of *G.gummi-cutta* before it is added to diet or drugs as an ingredient. *G.gummi-cutta* is mentioned as an ingredient of several drug preparations also. The fruit juice is claimed to have anti-scorbutic, anthelmintic

and cardio tonic properties. It finds application in the treatment of piles, dysentery, tumours, pains and heart complaints [6].

Contemporary relevance

*G.gummi-cuttai*s mostly used in Kerala and Kanyakumari district of Tamil Nadu in cooking to add sour taste to fish curry. It is also used to preserve dry fish. The polyisoprenylatedbenzophenone and xanthone derivatives are known for their antioxidant, apoptotic, anti-cancer, anti-inflammatory, antibacterial, anti-viral, anti-fungal, anti-ulcer and anti-protozoal properties [5].

The Hydroxycitric Acid (HCA) has been known for its hypo-lipidemic property. Of late Hydroxycitric Acid is marketed for its anti-obesity properties. Evidences to anti-obesity effect are based mostly on animal models. Several biochemical mechanisms are postulated to consolidate these claim [7].A study claims that Hydroxycitric Acid may reduce net fat deposition from denovolipogenesis during weight gain and it also reduces food intake resulting in weight reduction. Some clinical studies also showed that there is a significant reduction in Body Mass index, food intake, Total cholesterol, LDL, Triglycerides, and Serum leptin levels and enhanced excretion of urinary fat metabolites [8-13]However, some clinical trials do not support the claims that *Garciniagummi-cutta* is an effective weight-loss aid [14-17]. A meta-analysis found a possible small, short-term weight loss effect (Under 1 kilogram) [8]. Further studies are required to come to a definite opinion about the usefulness of *G.gummi-cutta*as a weight reducing agent.

Other actions of *G. gummicutta*

Anti-inflammatory, anti-thrombotic, ant-oxidant and post prandial hypoglycaemic effects have been demonstrated in animal models. [18-20]

Adverse effects

Garcnieagummi-cutta is a diet and drug used by people from time immemorial. It may be safe when used in the traditional way. However when phytochemicals from the plant are used their safety profile has to be established before human use. Nearly 17 clinical studies have proved the safety of garcinia and its derivatives [21].

Dosage

Dietary dosage of up to 2800 mg/day was considered safe [22].

CONCLUSION

This ancient drug that has stood the test of time needs further evaluation. Anti-emetic, anti-dotal, anti-pyretic actions as mentioned in Siddha literature need further studies. The beneficial effects of using *G.gummi-cutta* in the diet regimen of skin patients and wound healing properties also need evaluation. Siddha Medicine claims *G. gummi-cutta* is useful in all human ailments. So a thorough pharmacological and clinical evaluation of the drug is the need of the hour.

REFERENCES

- [1] Stephen, E.S., 2005.Complementary and alternative medicine. In: Dennis LK, Eugene B, Anthony SF, Stephen LHD, Llarry JL, editors. Harrisons Principles of internal medicine. 16th ed., p. 67.
- [2] Thas, J.J., Shri Hari Om Ashram Gold Medal winning paper,1979.Gujarat Ayurveda University, Jamanagar,
- [3] Thas, J.J. and Pazham Puli, 2002. Souvenir cum Scientific Abstracts, Second National Conference on Siddha Medicine for All Ages, Tirunelveli, pp 31-33
- [4] Anon, 1976. The Wealth of India,CSIR.,NewDelhi,X 114, 114
- [5] Naveen, G.A.P.N. and G. Krshnakumar, 2013.Traditional and medicinal uses of Garciniagummicutta fruit –a review Species, pp: 4(10) 4-5.

- [6] Varghese, S. and J. Thomas, 2000. *Garciniatinctoria* - a lesser-known, evergreen tree of multiple uses. *Indian Horticulture*, 45(2): 21
- [7] Pittler, M.H. and E. Ernst, 2004. Dietary supplements for body-weight reduction: a systematic review. *American Journal of Clinical Nutrition*, 79(4):529–536.
- [8] Westerterp-Plantenga, M.S. and E.M.R. Kovacs, 2002. The effect of (-)-hydroxycitrate on energy intake and satiety in overweight humans. *International Journal of Obesity*, 26(6):870–872.
- [9] Preuss, H.G., D. Bagchi, M. Bagchi, C.V.S. Rao, D.K. Dey and S. Satyanarayana, 2004. Effects of a natural extract of (-)-hydroxycitric acid (HCA-SX) and a combination of HCA-SX plus niacin-bound chromium and *Gymnemasylvestre* extract on weight loss. *Diabetes, Obesity and Metabolism*, 6(3):171–180.
- [10] Girola, M., M.D. Bernardie and S. Contos, 1996. Dose effect in lipid lowering activity of a new dietary integrator (*Chitosan*, *Garciniacambogia* extract, and Chrome) *Acta Toxicologica Et Therapeutica*, 17:25–40.
- [11] Hayamizu K, Ishii Y, Kaneko I Effects of *Garciniacambogia* (Hydroxycitric Acid) on visceral fat accumulation: a double-blind, randomized, placebo-controlled trial. *Current Therapeutic Research*. 2003;64(8):551–567
- [12] Thom, E., 2000. A randomized, double-blind, placebo-controlled trial of a new weight-reducing agent of natural origin. *Journal of International Medical Research*; 28(5):229–233.
- [13] Roman Ramos, R. and J. Flores Saenz, 1996. Alarcon Aguilar en MCF. Control of obesity with *Garciniacambogia* extract. *Investigacion Medical Internacional*; 22(3):97–100
- [14] Heymsfield, S.B., D.B. Allison, J.R. Vasselli, A. Pietrobelli, D. Greenfield and C. Nunez, 1998. *Garciniacambogia* (Hydroxycitric acid) as a potential antiobesity agent: a randomized controlled trial. *Journal of the American Medical Association*, 280(18):1596–1600. [PubMed]
- [15] Kriketos, A.D., H.R. Thompson, H. Greene and J.O. Hill, 1999. (-)-Hydroxycitric acid does not affect energy expenditure and substrate oxidation in adult males in a post-absorptive state. *International Journal of Obesity*, 23(8):867–873. [PubMed]
- [16] Van Loon, L.J.C., J.J.M. Van Rooijen, B. Niesen, H. Verhagen, W.H.M. Saris and A.J.M. Wagenmakers, 2000. Effects of acute (-)-hydroxycitrate supplementation on substrate metabolism at rest and during exercise in humans. *American Journal of Clinical Nutrition*. 72 (6):1445–1450. [PubMed]
- [17] Onakpoya, I., S.K. Hung, R. Perry, B. Wider and E. Ernst, 2011. The use of *Garcinia* extract (Hydroxycitric Acid) as a weight loss supplement: a systematic review and meta-analysis of randomized clinical trials. *Journal of Obesity*, 2011:9 pages. 509038
- [18] Preliminary investigation of antithrombotic activities of methanolic seed extracts of *GarciniaCombogia* in rats. ASIKA, E. C.; IDONIJE, B. O.; OKHAI, O.; IRIBHOGBE, I. O. // *Annals of Biological Research*; 2011, Vol. 2 Issue 3, p333
- [19] Asghar, M., E. Monjok, G. Kouamou, S.E. Ohia, D. Bagchi and M.F. Lokhandwala, 2007. Super CitriMax (HCA-SX) attenuates increases in oxidative stress, inflammation, insulin resistance, and body weight in developing obese Zucker rats. *Molecular and Cellular Biochemistry*, 304(1-2):93–99.
- [20] Wielinga PY, Wachters-Hagedoorn RE, Bouter B, Hydroxycitric acid delays intestinal glucose absorption in rats. *American Journal of Physiology*. 2005; 288(6):G1144–G1149.
- [21] Chuah, L.O., S.K. Yeap, W.Y. Ho, B.K. Beh and N. BanuAlitheen, 2012. *In vitro* and *in vivo* toxicity of *Garcinia* or hydroxycitric acid: a review. *Evidence-Based Complementary and Alternative Medicine*, 2012:12 pages. e197920 [PMC free article]
- [22] Deshmukh, N.S., M. Bagchi, T. Yasmin and D. Bagchi, 2008. Safety of a novel calcium/potassium salt of hydroxycitric acid (HCA-SX): I. Two-generation reproduction toxicity study. *Toxicology Mechanisms and Methods*, 18(5):433–442. [PubMed].