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Traditional And Modern Scientific Approaches For The Uses Of 'Takra' In Different Diseases: A Review.

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ABSTRACT

Dadhi and Takra are very common food items of Indians and are used as liquid food items from Vedic period. In Ayurveda; their types, qualities, uses, contraindications are mentioned. It is very important 'Anupana' of many Ayurvedic formulations. Also, it is used both as food and medicine. Takra is fundamentally a milk product prepared by fermentation processes. Fermentation increases the shelf-life along with enhancing their taste. This process also improves nutritive value in the milk. Furthermore, by adding some herbs and minerals their properties are fortified. Due to advancement of biotechnology, microbiology and pharmaceutical sciences; numbers of pharmaceutical products are prepared from fermented milk to combat diarrhea, inflammatory bowel syndrome, obesity and various digestive disorders. Takra and Dadhi are natural probiotics and prebiotics diet because the friendly bacteria for the intestines and the body are found in abundance in these remedies. The present review focuses on compositions and roles of synbiotics for human health. Furthermore; additional health benefits like immune-modulation, cancer prevention, inflammatory bowel disease etc. have also been discussed.

Keywords: Takra, fermented milk, gut microbiota, probiotics & intestinal disorders.

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INTRODUCTION

Ayurveda is one of the oldest systems in the world. Being a very oldest system of medicine, Ayurveda plays a very crucial role in providing healthcare service. Ayurveda assumes that every herb and mineral has definite medicinal value.[1] Guna of medicine can be alter by the process of Gunaanterdyana i.e. changing of physical and chemical properties of the substances. Techniques employing for formulating these preparations are as boiling, heating, roasting, washing, fermenting and keeping in specific metal utensils.[2] These Ayurvedic pharmaceutical operations are used for fortification of medicinal values, improving the compliance and increasing the shelf-life. Milk and other dairy products are used in Ayurveda very abundantly. Milk is considered as Jivanya i.e. vital substance in Ayurveda.[3] Modern science also depicts it as 'complete food'. Dadhi, Takra, katwar, Dadhi-Kurchika and Takra-kurchika etc. are mentioned as fermented milk products/food items in Ayurveda. So many research works have been performed to prove the medicinal therapeutic values in various diseases due to presence of electrolytes as Na, K, Mg, Ca & Fe and Vitamins as A, C, D & B complex and various strains of *Lactobacillus* & *Bifidobacterium* and digestive enzymes[4]. Food processing industries adopting new technologies such as value addition, flavors, innovation in packing solution and cold chain makes high quality of safe fermented dairy products. Currently; different kind of synbiotic formulations have been developed for specific purpose which includes syrup, sachet, capsule lozenges, chewing gums, vaginal pessaries etc.[5] because of advancement in pharmaceutical methodology such as microbial strain identification, isolation, storage, microencapsulation etc.[6]

Aspects of fermented milk in Ayurveda

In Ayurveda compendia like Susrutha samhita, Charaka samhita and Ashtanga hridaya; the utility of Dadhi and Takra have been mentioned abundantly. It is grouped under liquid food items and 'Gorasa varga'. It is a fermented dairy product used since ages to gain lot of nutritional values and health benefits. It is very useful in Agni-Vikruti (digestive disorders). Dadhi is unctuous, Usana Virya (hot in potency), Amala rasa (sour in taste) and Amala vipaka. It has healing power for anorexia and stimulates appetite and digestion. Also, it is Grahi, aphrodisiac, sustains life and alleviates Vata. Jata dadhi (properly coagulated curd) alleviates vata dosha. The uppermost thick creamy layer of properly coagulated curd is called "Sara". It is heavy to digest, aphrodisiac, alleviates Vata, decreases digestive power and increases Kapha and Shukra. The watery part settled over the curd is called "Mastu" or "Manda". It is light in nature, increases strength, generates desire for food, relishing, alleviates fatigue, thirst, kapha and vata, cleanses the micro-channels and removes the accumulated faeces. Consumption of Mandajata (incompletely coagulated curd) is strictly prohibited as it exacerbates all the three doshas, causes burning sensation during digestion, increases faeces and urine excretion. [7]

On the basis of taste, Acharya Sushruta differentiated Dadhi into three varieties as-

- Madhura (Sweet)
- Amla (Sour)
- Ati-amla (extremely Sour).

Sweet curd is Maha-abhishyandi, causes heaviness and blocks all the fluid channels of the body, increases Kapha and Meda Dhatu, aphrodisiac, alleviate Vata Dosha and raktapitta. Sour curd increases Pitta, Kapha and Raktaja disorders. Extremely sour curd vitiates Rakta, Vata and Pitta.[8]

In Ayurveda, lot of indications of Takra are stated to enlighten the importance of Takra – "He who uses Takra daily does not suffer from diseases, and diseases cured by Takra do not re-occur; just as Amrita (Ambrosia) is for the gods, Takra is to humans".[9] According to Ayurvedic principle, intestinal disorders are due to diminished Agni, Further diminished Agni produces "Amatwa".[10] Takra has Agni Deepanaguna and Tridosha-Shamanaguna and it relieves in Amatwa from Koshta. Acharya Charaka mentioned that there is no other medicine on Vata-Kapha Pradhan Roga [11] as that of Takra. So, it is used in Udara roga (Gastrointestinal disorders), Grahani (Sprue), Arsha (Piles), Atisara (Diarrhea), Aruchi (Anorexia), Shotha (Swelling) and Mutrakriccha (urinary tract inflammation) etc.[12]

On the basis of cream content, Acharya Charka categorized the Takra into 3 types as [13]-

- Ruksha-without cream
- Ardhoudhgratha sneha- with Half cream
- Snigadha- with full cream.

Acharya Bhavamisra described 5 methods of preparation of Takra depending upon the cream content and quantity of water to be added.[14]

- Ghola- churning of full cream curd without water
- Mathita- churning of fully removed cream curd without water
- Takra- churning of full cream curd by adding ¼ part water
- Udaswit- churning of full cream curd by adding ½ part water
- Chacchika- churning of fully removed cream curd by adding ½ part water

According to Acharya Sushruta; Takra is prepared by churning curd and adding ½ part water.[15]
Very few references of boiling of fermented milk is available in different texts like Astakatwar Tail[16] and Takra kwatha[17]. Archarya Govindnath Sen mentioned 'Dadhai' as Murchana Dravya for Arand Tail Murchana.[18] Archarya Charka mentioned further fermentation of Takra in Takraaristha[18] Arsha Chikitsa and Grahani Chikitsa[19] .

Gut Microbiota

The human gastrointestinal tract is a complex ecosystem that, although sterile at birth, becomes rapidly colonized by microorganisms with a vast microbial population comprising tens of trillions of bacteria and hundreds of different species. The density and diversity increases exponentially moving from the stomach to the colon where the microbial content remains at the highest concentration[20]. The gut microbiota has a significant role in human health and disease. The human gut microbiota is mostly dominated by the phyla Firmicutes and Bacteroidetes.[21- 23] The microbiota facilitates digestion and aids in providing nutrition and in shaping of our immune system.[24]

Probiotics

The term 'probiotics' is derived from a Greek word meaning "for life" and used to define living non-pathogenic organisms and their derived beneficial effects on hosts. The term "Probiotics" was first introduced by Vergin. The latest definition put forward by FDA and WHO jointly is "Live microorganisms which when administered in adequate amounts confer a health benefit to the host".[25] Some of the popularly used probiotic microorganisms are *Lactobacillus rhamnosus*, *Lactobacillus reuteri, Bifidobacteria* and certain strains of *Lactobacillus casei*, *Lactobacillus acidophilus*-group, *Bacillus coagulans, Escherichia coli* strain Nissle 1917, certain *enterococci*, especially *Enterococcus faecium* SF68, and the yeast *Saccharomyces boulardii*.

Prebiotics

Prebiotics are mostly fibers that are non-digestible food ingredients and beneficially affect the host's health by selectively stimulating the growth and/or activity of some genera of microorganisms in the colon, generally *lactobacilli* and *bifidobacteria*[26]. FAO/WHO defines prebiotics as a non-viable food component that confer health benefit(s) on the host associated with modulation of the microbiota. Prebiotics form a group of diverse carbohydrate ingredients that are poorly understood with reference to their origin, fermentation profiles and dosages required for health effects. Some of the sources of prebiotics include: breast milk, soybeans, inulin sources, raw oats, unrefined wheat, unrefined barley, non-digestible carbohydrates and in particular non-digestible oligosaccharides. Few examples of Prebiotics are as nondigestible oligosaccharides such as fructooligosaccharides, galactooligosaccharides, lactulose and inulin.

Synbiotics

'Gibson' introduced the concept of prebiotics and speculated as to the additional benefits if prebiotics were combined with probiotics to form and the term as 'Synbiotics' coined[27]. Probiotics and prebiotics work synergistically to provide a combined benefit.

Takra as Probiotic

Takra and Dadhi are low in fat and calories but contain several important vitamins and minerals, such as vitamin B_{12}, riboflavin, calcium and phosphorus.[28] Fermented milk is a natural probiotic diet because of friendly bacteria for the intestine.

Health benefits of probiotics, probiotics and synbiotics

The gut microbiota has a significant role in human health and diseases. Dysbiosis of the intestinal ecosystem contributes to the development of certain illnesses that can be reversed by favorable alterations by probiotics. There are 3 general mechanisms by which probiotics appear to exert their beneficial effects with important differences seen between probiotic species and strains:[29]

1. Antimicrobial effects
2. Enhancement of mucosal barrier integrity
3. Immunomodulation.

Table.1. Efficacy of probiotics in clinical conditions

S. No.	Target clinical condition	Probiotic Agent
1	Infectious diarrhea in children[30]	*Lactobacillus rhamnosus, Bifidobacterium lactis* and *L. reuteri*
2	Antibiotic associated diarrhea[31]	*Lactobacillus casei, L.acidophilus, Saccharomyces boulardii, Streptococcus thermophilus*
3	Irritable bowel syndrome[32]	*Bifidobacterium bifidum, L, plantarum* (DSM9843), *L. plantarum* (DSM9843), *L. plantarum* 299v(DSM 9843), *B. infantis* 35624, *Escherichia coli* (DSM 17252), *Streptococcus faecium*
4	Ulcerative colitis[33]	*E. coli Nissle, Bifidobacterium bifidum, L, plantarum* (DSM9843),
5	Crohn's disease[34]	*S. boulardii, Lactobacillus casei , Bifidobacterium bifidum*
6	Atopic dermatitis[35]	*Bifidobacterium bifidum, Lactobacillus acidophilus, L. casei*, *L. salivarius* and *L. rhamnosus*
7	Radiation induced diarrhea[36]	*Bifidobacterium bifidum, L, plantarum* (DSM9843), *L. plantarum* (DSM9843), *L. plantarum* 299v(DSM 9843),
8	Hepatic encephalopathy[37]	*Bifidobacterium*
9	Necrotizing enterocolitis[38]	*Lactobacillus* and *Bifidobacterium*
10	Nonalcoholic fatty liver disease[39]	*Lactobacillus casei, L rhamnosus, Streptococcus thermophilus, Bifidobacterium breve, L. acidophilus, Bifidobacterium longum* and *L. bulgaricus*
11	Lactose intolerance[40]	*Lactobacillus bulgaricus ,Streptococcus thermophiles, Bifidobacterium longum L. acidophilus* and *B.breve*
12	Lipid metabolism[41]	*L. bulgaricus, L. reuteri, B. coagulans, L. acidophilus* and *B. longum*BL1
13	Cancer[42]	*L. acidophilus, L. bulgaricus, Propionibacterium freudenreichii* and *B. longum*
14	Obesity[43]	*Lactobacillus gasseri* SBT 2055, *Lactobacillus rhamnosus* ATCC 53103, *L. rhamnosus* ATCC 53102 and

		Bifidobacterium lactis Bb12
15	Immunomodulation[44]	*L. reuteri, L. helveticus*, and *B. coagulans*
16	Bone mineralization[45]	*Lactobacillus acidophilus* NCC90
17	Bacterial vaginosis[46]	*L. acidophilus,L.rahmnosus*GR-1, *L. fermentum* RC-14

CONCLUSION

Fermented milk has remarkable importance for maintenance of health, prevention and curing of several diseases especially related to gastrointestinal track. Fermented milk is described as Pathya and very good Aupanam of numerous Ayurvedic medicines. Takra and Dadhi are natural probiotic diet because the friendly bacteria for the intestine as well as for whole body are found in abundance in it. Some other herbs in fermented milk that are rich in prebiotics like garlic, oats, barley, asparagus, flax seed and wheat bran etc. can be added to make it complete synbiotic products. Various dosage forms of fermented milk like Takra vati and Takrarhista are other examples. The human gut microbiota plays an important role in human health and the modulation of the gut microbiota may be used to treat and prevent an array of diseases. The recent advanced researches show that microbiota found in fermented milk is capable of curing numerous digestive disorders. Treatment of cancer and obesity with probiotic are new avenue for modern medical science but in ancient time Takra was used in treatment of Gulma, Madoroga, and Mandagani etc. Moreover, it may be concluded that concept of symbiotic and their uses in treatment of chronic diseases is the contribution of traditional Indian medical science to the medical world. Furthermore, it is the urgent need of recent time that the health claims and principles regarding intake of fermented milk need to be substantiated and firmly established by properly designed large scale clinical trials.

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