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A Critical Analysis of Properties and Effects of *Viru.Dha* (Sprouts) as per Ayurveda

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Abstract

Eating sprouts is gaining momentum in the name of nutritious and enzyme rich food which can help to gain abundant of nutrients, fats, vitamins etc. and boost digestion. *Ayurveda* says eating raw *Viru.Dha* (Sprouts) are highly unhealthy causing vitiation of *Doshas (Vata, Pita, Kapha), Vishtambhi* (heavy to digest), *Vidahajanak* (burning sensation), *Shool* (colicky pain), *Drishtidushnam* (weaker eyesight), causer of diseases like *Vatarakta (*~ Gout), *Grahni* (~IBS), *Arsha (*piles), and *Sotha* (inflammations on body). Many incidences of deaths are reported due to food poisoning by sprouts, being rich in microbes like salmonella and E.coli. But *Ayurveda* quotes that there is nothing on this earth which cannot be used as medicine. Sprouts can be useful but after a very careful processing. Eating of raw sprouts is prohibited in *Ayurveda*.

Keywords

Ayurveda, Dosha, Microbes, Sprouts, *Viru.Dha*

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INTRODUCTION

Ayurveda is a life science. It describes each and every thing that can effect *Ayu* (life). In Ayurveda it is mentioned how sprouts must be used. Eating raw *Viru.Dha* (Sprouts) is unhealthy. In the presence of optimum pH, temperature, sunlight and moisture a seed sprouts and undergoes decrease in enzyme inhibitors, hormonal changes with release of IAA and Gibberellins. It becomes rich in nutrients-minerals, vitamins, amino acids, vitamin C, vitamin B complex, and cellulose and hemicellulose structural carbohydrates of plants. So, that sprout can survive in external environment according to the theory of 'Survival of the fittest'. At this stage microbes like Salmonella, E.coli grow inside sprouting seed which live in synergistic relationship with sprout; these 'commensal' bacteria help the plants to extract nutrients from environment/soil and protect them against invaders (an important step in preventing them being eaten at time of sprouting). As grazing animals and birds don't feed on seed being rich in bacteria. It is discovered that plants may package their commensal bacteria inside of seeds. So, sprouting plants are colonized from the beginning[1].

Incidences:

Sprouts resulted in outbreaks of extra-intestinal infections, especially urinary tract infections, and high morbidity. Raw alfalfa sprouts, can be a source of serious foodborne disease outbreaks[2].Some of the examples of outbreaks are:

- In 1999, an outbreak of *Salmonella enterica* serotype Mbandaka occurred in Oregon, Washington, Idaho, and California, the outbreak was linked to contaminated alfalfa seeds grown in California's Imperial Valley[3]. Despite the popular perception of sprouts as health food, alfalfa and other varieties of raw seed sprouts are common vehicles for produce-associated bacterial foodborne illness.
- Although sprout-associated outbreaks have been reported since 1973[4].
- Back-to-back multinational outbreaks of gastroenteritis with *Salmonella enterica* serotypes Newport and Stanley in 1995 and 1996[5] [6] and the 1996 Sakai city outbreak of entero-hemorrhagic *Escherichia coli* O157:H7 in >5,000 Japanese school children have refocused attention on the public health hazard posed by seed sprouts[7]. Sprouts are rich source of nutrition but this nutritive values are also carrying high values of microbes.

AIMS AND OBJECTIVES

To evaluate *Viru.Dha* and epidemics due to *Viru.Dha* worldwide.

MATERIALS AND METHODS

Literary works of *Ayurveda* and internet media.

REVIEW OF LITERATURE

Etymology- *Viru.Dhamiti-ankurit*- means germinatinating seed (Sprout) [8].

Viru.Dhakavrita ityankuritmudgadikrita- means sprouting green grams etc[8 9].

Properties of Viru.Dha: *Viru.Dha* are *Vidahakarak* (causes burning when eaten), *Guru* (heavy to digest) [10]. *Vishtambhakarak* (stagnation in abdomen) *Dristidushnam* (spoil eyes) [8 11 12], causer of *Vata*-Pita[9]. It is *Galpanam* (vomiting sensation) [13 14].

***Asewaniye Aahar* (not to eat):** *Viru.Dha* is one of the food which should not be eaten for long time continuously[15].

***Virudha* (anti):** Substance/group of substances which vitiates *Dosha* but does not excrete out of body though it is anti of body is known as *Virudha*[16]. Examples of *Virudha* are Sprouts with meat[17 18] and *Biskanda* (Lotus stalk) [19]. These should not be eaten as they can cause *Napunsakta* (infertility), *Andhaapan* (blindness), *Visarpa* (~erysipelas), *Jalodra* (ascites), *Visphota* (boils), *Unmada* (insane), *Bhagandra* (fistula), *Murcha* (faintness), *Mada* (loss of sensorium), *Aadhyamana* (~tympanitis), *Galagraha* (heaviness in throat), *Pandu* (~anaemia), *Aamvisha* (~unformed final products of digestion), *Kilasa* (skin disease), *Kushtha* (skin disease), *Grahani* (~IBS), *Sotha* (inflammation), *Amlapita* (~acidity), *Jwara* (fever), *Pinas* (~chronic sinusitis), *Santandosha* (defective progeny) death[19], *Gulma* (~mass like structure in abdomen), *Rajyakshama* (tuberculosis), *Tejanasha* (loss of luster), *Daurbalya* (weakness), *Smiritinasha* (loss of memory), *Budhikshaya* (loss of intelligence), *Raktapita* (~hemophilia), and eight types of *Mahavyadhi* (*Vatavyadhi*-ailments due to *Vata*, *Ashmari* (renal stones), *Kushtha* (skin disease), *Prameha* (~frequency/diabetes), *Udararoga* (abdominal disease), *Bhagandra* (fistula) and *Arsha* (piles) [20].

***Samprapti* (Pathogenesis) of diseases caused by *Viru.Dha*:** Due to eating of sprouts when *Rakta Dhatu* gets spoiled along with vitiated *Vata* it causes *Vatarakta* [21]. Sprouts vitiates *Vata* which brings down *Jaladhatu* (water contents) causing *Agnimandya*. This further spoils *Malashaya*

(large intestines) making *Purisha* (feces) liquid producing *Atisaara* [22]. When Sprouts are eaten they causes vitiation of *Dosha* which spoils *Twacha* (Skin), *Mamsa Dhatu* (muscles), *Rakta Dhatu* (Blood) causing *Sotha* (inflammations in body) [23]. Sprouts vitiates *Vata* producing *Shool* [24].

***Sanskar* of *Ankurit* (recipe of germinated seeds):** Germinated green gram is used an aphrodisiac in *Charaka* Samhita. The green gram seeds when germinate they should be properly cleaned along with removal of seed coat. In this way there remains no hiding space for germs. These germinating seeds are now processed very well with other ingredients over fire. It should be boiled up to extent of fully softened sprouts which could be pulverized easily [2].

Increasing Use: Today sprouts are being sold, grown, cooked or eaten raw in the name of health by all strata of people in all ages in name of enzyme rich food providing high level of nutrition-minerals, vitamins, amino acids, fatty acids etc.

Decontamination: Many methods have been employed to make sprouts bacteria free but none is proved to be full proof. In vitro, treating seeds with 20,000 ppm calcium hypochlorite [Ca (O Cl) $_2$] Pre-germination reduces pathogen densities by up to 2.2 log [25, 26]. Higher concentrations of disinfectant or the use of concentrated acids, high temperatures, or bleaches reduces pathogen levels by >3 log; these treatments substantially reduce the proportion of seeds that germinate [27] [28]. But none of these methods completely eliminates pathogens on seeds. Proctor et al. investigated a multistate alfalfa sprout–associated salmonellosis outbreak in which 20,000 ppm Ca (O Cl)$_2$ disinfection was used[29]. Gamma irradiation of sprout seeds or mature product reduces or eliminates colonizing bacteria but irradiating seeds reduces the germination yield and affects the appearance of mature sprouts that germinate[30] [31]. Seeds of different vegetables used for sprouts vary in their resistance to disinfection treatment. In 1999, USDA microbiologists developed a combined irradiation and chlorine treatment that not only kills *E. coli* and *Salmonella*, but also extends the shelf life of alfalfa sprouts from about five days to more than a week and seed germination reduced. Even if there's just a small amount of bacteria on or inside a seed, those cells can multiply to dangerous levels within hours in such conditions. It is too difficult to decontaminate them being fragile and uneven surfaced. Additionally, seeds can harbor germs internally; and seeds

are sprouted in warm, moist environments—ideal conditions for bacterial growth. It is adviced that children, the elderly, and persons whose immune systems are compromised should not eat raw sprouts. The FDA recommends cooking sprouts thoroughly to reduce the risk of illness[32].

Hormonal actions like Gibberellic acid (GA_3).GA3 is toxic and teratogenic to *Xenopus laevis* embryos[33]. Although plant growth regulators are used to promote germination, flowering, proliferation, and fertilization in a wide variety of crops, little is known about the teratogenic effects of high doses of GA3 in mammals; in fact, only 2 studies on teratogenicity in rats have been published[34 35].

In addition, Uçkan et al. (2008) reported that GA3 exposure adversely affected the developmental duration of egg to adult, adult longevity, fecundity, and sex ratio in the larval endoparasitoid, *Apanteles galleriae* [36].

DISCUSSION

Sprouts have become so popular in the name of healthy food that its actual image should be presented. With so many ill effects it cannot be wise to consume raw sprouts as it is being practiced today. Sprouts can be used in medicine for sure. But it is equally important to know how it should be used. An unknown medicine can be toxic same way as poison, weapons, fire and Indra's (God of Rain) weapon to take away life. If used fully acknowledged medicine can be life savior as nectar[37]. Sprouts are useful in preparing an aphrodisiac medicine [38]. When sprouts are eaten raw they can give numerous of disease. There have been many examples citing how sprouts have become cause of taking toll of life. Sprouts when decontaminated with various chemicals or irradiation they destroy germs to some extent but also germinating power of seeds. When seeds are washed there remains nook and corners where germs can remain which multiply within seconds. In *Ayurveda* when they are used they are properly washed. During washing their seed coat is removed opening seed very well to cleaning process. In this process their remains no place where germs could hide. This is further followed by boiling process which cannot leave any chance of germs in sprouts. Due to washing and heating the amino acids or hormones which are essential for seed germination but toxic to humans must be destroyed. A boiled and restructured seed (as in removing its seed coat) cannot grow. On heating proteins

change their structures which must not be harmful now for humans to consume as used in making drug. But when sprouts do not undergo all these mentioned process then this is full of substances which helps a seed to convert into plant.

Seed germinate and pathogens remain in symbiotic relation with them. But these pathogens are harmful for invading animals [39]. High levels of proteins, amino acids, oligosaccharides, and polyphenols in mung beans are thought to be the main contributors to the antioxidant, antimicrobial, anti-inflammatory, and antitumor activities of this food and are involved in the regulation of lipid metabolism[40]. High protein diets burden liver and kidney as more nitrogen is produced than required by body leading to osteoporosis washing more calcium out of kidney in process of eliminating excessive nitrogen[41]. Satiety was significantly greater after a 60% protein meal than after a 19% protein meal [42]. It is described as *Guru* (heavy to digest) and *Vishtambhi* (stays in intestines for longer duration before absorption). A high intake of branched-chain amino acids in combination with a western diet might exacerbate the development of metabolic disease. A diet high in protein can also pose a significant acid load to the kidneys which can cause *Sotha* in body[43]. Two cytosolic glutamine synthetase isoforms play specific roles for seed germination and seed yield[44]. Glutamine is formed by re-assimilation of excessive nitrogen which is ultimately converted to urea for excretion. But this glutamine is excessively dangerous for nerves if present in excess, high level are toxic causing complete and permanent damage to nerves including optic nerve. Glutamine is also excreted by immune cells. Thus, while glutamate is a major component of the body, and an essential part of the nervous system, high levels localized in the nerve cells can be quite toxic, and this is readily demonstrated in animal models. Brain, muscles, gut, liver all wastes are ultimately are converted to glutamine. This is excreted by kidney as urea and ammonia[45.] In the physiological condition, glutamate acts as an excitatory neurotransmitter in the retina. However, excessive glutamate can be toxic to retinal neurons by overstimulation of the glutamate receptors[46]. In this way sprouts are *Drishtidushnama* can be confirmed.

Ayurveda has used sprouts recipe in aphrodisiac but after careful processing. The

content of alpha tocopherol in 3 days old mung bean sprouts helps to prevent sterility and muscular 284 J. Cell Anim. Biol. dystrophy of the reproductive organs and improve the quality of spermatozoa[47].

CONCLUSION

Sprouts are being consumed worldwide in name of healthy food. *Ayurveda* strictly prohibits its use over long time. It leads to numerous diseases which have been shown in many studies. *Ayurveda* utilizes it as medicine but after it has gone through too much washing and heating procedure. So, raw sprouts should not be used as they are being practiced.

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