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Historical Note

History of *Yavaka* from Ethno-pharmacological Perspective

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Abstract

The paper aims at ascertaining the identity of *yavaka* and its use as drug, based on meticulous search in Ayurvedic classics and contemporary literature. *Yavaka* is mainly described along with *yava* (*Hordeum vulgare* L.) in *Bṛhatrayī,* and depicted under the group '*kudhānya*'. The morphological characters of *jaī, atiyava* and *tokya* are identified with *yava* in *dhānya varga* in *Bhāvaprakāśa.* A smaller variety of *yava* without *śūka* (bristle) is known as '*jaī*'. A review of Ayurvedic literature has been made to ascertain whether the '*jaī'* mentioned in *Bhāvaprakāśa* is same as the *yavaka* specified in the classics. *Jaī* (*Avena sativa* L.) is commonly known as oat, mainly grown for human consumption and for livestock feed. It is known for its effects on satiety and retarded absorption of nutrients as well as a deterrent of various disorders of the gastrointestinal tract. These beneficial effects are chiefly due to the soluble fiber content of oat which can help in lowering cholesterol, postprandial blood glucose level as well as modifying immune response and reducing risk of colon cancer.

Key words: *Dhānya, Kudhānya varga, Nighaṇṭu, Yava*

1. Introduction

In earlier times, drugs were identified mainly on the basis of factual details available from goat-herds, cowherds, and other forest dwellers who were close to nature. According to Caraka, wrongly identified or administered drug may act as poison and lot of care is needed for proper selection of drugs (*CS.Sū,* Ch. 1.120 & 126).The Ayurveda and Sanskrit literature mention an herb with different names and synonyms which precisely does not describe the botanical identity but connotes mainly the therapeutic utility of the plant (Dixit, 2011). The Ayurvedic works under *Nighaṇṭu* gives mostly the collection of synonyms, throwing light on the significance of terms denoting different aspects like morphology, pharmaco-dynamics etc. of the vegetable kingdom (Bapalal, 2005). However, there is a long list of drugs whose nomenclature stays dubious. Possibly, a lack of appropriate understanding of the verse or Sanskrit phrasing and inability to recognize the medication from the classical information in Ayurvedic literature is responsible for such a situation. There is a need to overcome the lacunae with regards to controversial aspect of traditional medications and set up strategies for their legitimate identification and proper utilization and review of classical Sanskrit and Ayurvedic texts and modern standardisation techniques (Kallianpur *et al.* 2016).

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The major food stuffs that make typical Indian diet regimen from centuries are *dhānya* (cereals), *kudhānya* (inferior quality of cereals), *śimbī* (pulses), *śāka* (vegetables) and so forth as depicted in Ayurveda. The multi grain regimen prevailed during ancient time; people used distinctive sort of cereals in their meals at that time. The diet pattern has changed for last couple of decades and people are totally reliant on wheat and rice. The people are settling on multi grains in their diet now days. Apart from *dhānya varga* cereal's, *kudhānya varga* can play a noteworthy role in the diet. This necessitates the proper identification of botanical identity and usage of *kudhānya* group of plants. The separate division of *kudhānya* was first mentioned by Suśrurta (*SS. Sū* 6.21). *Dravya* of *kudhānya varga* possess moderately lower position among food grains. *Kudhānya* is not widely used as food regime but various references of their usages are found in different Ayurvedic texts. An attempt has been made here to compile the morphological identification of *yavaka* (a plant from *kudhānya varga*) in Ayurvedic and contemporary literatures.

2. Materials and Methods

This study was planned to ascertain the proper identity of *yavaka* in different Ayurvedic literature by a scrupulous review. The *Bṛhatrayī, Laghutrayī, Cakradatta, Bhela, Kāśyapa, Śārṅgadhara, Vaṅgasena* were searched manually with the terms *jaī, yavaka, tokya* and *atiyava*. Different *nighaṇṭu* texts viz. *Paryamuktāvali, Siddhamantra, Dhanvantari nighaṇṭu, Soḍhala nighaṇṭu, Mādhava dravyaguṇa, Madanapāla nighaṇṭu, Kaiyadeva nighaṇṭu, Bhāvaprakāśa nighaṇṭu, Rājnighaṇṭu, Nighaṇṭuādarśa* and books written by contemporary writers were also searched. The key words *jaī, yavaka, tokya and atiyava* were also searched in various search engines as AYUSH portal, DHARA online, PUBMED, Google scholar and Google.

During the search of various Ayurvedic literature to ascertain the identity of *yavaka*, it was found that *yavaka* and similar other varieties viz; *jaī, atiyava and tokya* are also described along with *yava* (*Hordeum vulgare L.*). This paper mainly aims to discuss detailed review of these varieties from various Ayurvedic literature to ascertain whether the *'jaī'* mentioned in *Bhāvaprakāśa nighaṇṭu* is same as *yavaka* specified in the *Bṛhatrayī. 'Jaī'* is commonly known as oat which is widely used for its therapeutic values. The term *jaī'* is not traced in any text book of *Bṛhatrayī,* its first record is found in *Bhāvaprakāśa nighaṇṭu* and in the texts written in and onwards 20th century. *Yavaka* and *'jaī'* both are described along with *yava* which quietly suggest the possibility of the similarity between both these herbs.

2.1 *Yava*

Yava is kept under *śūkadhānya* (awned grains) in *Caraka Saṃhitā*. Caraka kept *sālidhānya*, *ṣaṣṭikadhānya* (rice variety), *bṛīhidhānya* (rice variety), *godhūma* (wheat), *nāndimukhī* (a type of cereal) and *madhūlikā* (a type of cereal). etc. and some other inferior kind of *dhānya* under *śūkadhānya* group (*CS Sū*, ch. 27, 8-22). The action of a drug in Ayurveda is completely based on the *rasapañcaka* (five aspects) of that drug. *Rasapañcaka* is an approach to portray the pharmaco-dynamics of Ayurvedic drugs; which covers five aspects- *rasa* (taste present in the drug), *guṇa* (properties), *vīrya* (potency) *vipāka* (final taste after the digestion of the drug) and *prabhāva* (specific effects). There is no controversy regarding the identity, pharmacodynamics and actions of *yava*. *Yava* is having *madhura* (sweet), *kaṣāya rasa* (astringent); possesses *guru* (heavy), *rūkṣa* (rough), *pichhala* (slimy) and *sara* (laxative) *guṇa* along with *śita* (cold) *vīrya* and *kaṭu (*pungent*) vipāka. Yava* is mainly *kaphapittahara* (reduces *kapha* and *pitta*) and slightly *vātakara* (produces slight flatus). It is *bahupurīṣakara* (increases amount of stool) and imparts various actions in the body *viz; lekhana*

(scrapes fat tissue), *medohara* (reduces obesity), *vṛiṣya* (aphrodisiac), *varṇya, svarya, śvāsa-kāsahara, pīnasahara, twākarogahara, vraṇepathyam, medovātahara* (reduces fat and *vata*), *medhāvardhaka* (brain tonic) and *sthairyakṛta* (promotes stability) (*CS Sū*, ch. 27, 8-22; *SS Sū*. ch. 46.41-42; *AH Sū*. ch. 6.13-14).

2.2 *Yavaka*

Caraka, Suśruta and Vagbhaṭa depicted *yavaka* under *śūkadhānya* and considered it as a most *ahitatama* (unwholesome) and ought not be devoured in daily routine (*CS Sū*. ch. 25.39; *SS Sū*. ch. 21.23; *AH Sū*. ch. 6.6). Caraka indicated *yavaka* in *medoroga* (overweight/obesity) (*CS Sū*. ch. 21.25-26). Although *Bhāvaprakāśa* has not used the term *yavaka* but he depicted it as *tokya*; which is commonly known as *jaī*; further which he elaborated this as a smaller variety of *yava* without *śūka* (*BN śloka* 30) which could be speculated as *yavaka*, as mentioned in *Bṛhatrayī.*

There are couple of references of *yavaka* in various writings regarding its Ayurvedic pharmacodynamics and uses. Cakarpāṇi considered this as *triṣṇāvardhaka* (causes thirst) and *tridoṣakara* (increases *vāta, pitta* and *kapha*) (*CS Sū*. ch. 27.13-15) (It may be because of *amla rasa* (sour) and *uṣna virya* (hot). It is depicted as a causative agent of *raktapitta* (bleeding disorders), *prameha* (diabetes), *kuṣṭha* (skin disorders) (*CS Nī*. ch.2.3; *CS Sū*. ch. 4.5; *CS Sū*. ch. 5.5). Suśruta considered this as *śleṣmprakopaka* (increases *kapha*) (*SS. Sū*. ch. 21.23). *Yavaka, hāyana, pāṃsu, vāpya, naiṣadhaka* are *madhura* (sweet), *uṣna* (hot in intensity) *gurū* (difficult to process), *snigdha* (unctuous), *amla* (sour toward the end of digestion), *śleṣmpittalā* (increase *kapha* and *pitta*), helps in disposal of urine and faeces effortlessly. These are *nindita* (awful) in their in their reverse order of enumeration. Cakrapāṇi used *kudhānya* term for these type of inferior quality of *dhānya*. (*CS Sū*. ch. 27.11). Even during *nighaṇṭu* period in *Siddhamantra* also, *yavaka* is kept under *doṣalavarga* and it is considered *pittakāra* (increases *pitta*).

Avena sativa L., commonly known as *jaī* is grown on a small scale in western Himalayas. There is another variety, *Avena sterilis* L. (Syn. *Avena byzantine* C. Koch; *Avena sativa auct.* Non L.) which is cultivated chiefly in western Uttar Pradesh, Bihar, Punjab, few parts of Maharastra, Madhya Pradesh and Bengal for fodder purpose. Cultivation of oats is generally confined to places where horse breeding is practiced (Vardhana, 2008). *Bhāvaprakāśa nighaṇṭu* (*BN*) has depicted particular morphological characters of *jaī, atiyava* and *tokya* along with *yava* in *dhānyavarga*. However there are synonymous terms like *atiyava* (*yava* without *śūka* or bristle), *asit-āruṇa* (*yava* of black-red color variety) and *jaī* (another variety of *yava*) [*BN Dhānyavarga*, 27-30]. There are also reference of *tokya* (*yava* without *śūka* or bristle) and similar varieties in other *nighaṇṭu* texts. The opinions differ among intellectuals to consider *jaī* as *yavaka*. Thakur Balwant Singh considered *yavaka* to be an inferior kind of *śāli*; Caraka classified it as variety of *bṛīhi,* however it is not identified with not the oat (*Avena byzantine* C. Koch) which has been called *yavikā* by Ḍalhaṇa and ought to be grouped with the varieties of *atiyava* (Singh, 1999). *Jaī* is delineated in *tṛṇādivarga* in *nighaṇṭu Ādarśa*. It is depicted as *Avena byzantina* C. Koch: Syn *Avena sterilis* var. in cultivated group, and considered as an exotic plant, nutritionally rich in vitamin B_1 and used as a fodder for horses (Bapalal, 2007). Nadkarni in *Sandigdha Vanauṣadi Darśikā*, names *Avena sativa* L. to be *jaī* which is also known as *yavikā* in hindi (Trivedi, 1975). *Yavaka* is portrayed and distinguished as *Avena sativa* L. in *Bedivanaspatikoṣa* (Bedi, 2005). These above references conclude *yavaka, tokya* and *jaī* as a same identity. Even today two main species of oat are *Avena sativa* (white oats) and *Avena byzantine* (red oats) belong to genus *Avena* (Cheickna, 2012).

2.2.1 The History of *Avena sativa* L.

The source of *Avena sativa* L. is asserted to be from Near-East, Mediterranean, and China-Japan centers of diversity but still it is unverifiable. The Romans marked this as "brutal bread grain of the Germans". Historian Pliny considered oats as a weed among cereals that could be in charge of the degeneration of barley. The Lonicerus in 1737 was the main person, who sanctified the utility of oats as a food crop (avogel.ca/en/plant-encyclopaedia). Oats grew as a weed of different grains (principally barley and wheat) and represent a crossover between a few wild animal types, including the European *Avena byzantina* and the Ethiopian *Avena abyssinica* (Ben-erik-van-wyk, 2005, p.80). The domestication of oats was showed up moderately late in Bronze Age Europe. The archaeological record of oats as a staple sustenance for people is accounted late in central Europe around 1000 BCE. The straw is a vital wellspring of roughage for farm creatures (Zhou, 1999). The oat is introduced as a crop in India. There are references to oat in *Āīn-i-Akbarī* composed by Abu'l Fazl (1590), the during Akbar's period. The extensive scale development of oat during the British period started towards the start of nineteenth century. The Maharaja Hari Singh (1925-1947) imported seeds from Europe and first presented this in his stud ranches. It is introduced in the Himalayan locale in late seventies (Misri, 1984).

The oat and oatmeal's demand as standard sustenance expanded after the Food Drugs Administration (FDA) allowed its wellness claim with respect to solvent fiber from entire oats in January1998 (Ben-erik-van-wyk, 2005). It is utilized as a nervine tonic; in spermatorrhoea, palpitation, restlessness, cardiovascular tonic, debility, stimulant, antispasmodic, thymoleptic, anti-depressant and also utilized in menopausal stage. Additionally it is also utilized in diarrhoea, dysentery and colitis. Oat is a good emollient too. The heat has no effect on the antioxidant property of the oat flour. Homeopathic tincture of seeds is utilized as a nervine tonic. Beta-glucan from the oats fortifies immune capacities. Avenacosides displays solid antifungal action in vitro (Khare, 2007).

Despite the fact, that it is considered as a most nutritious cereal containing a reasonable extent of all the nourishment components. It ought not to be utilized as the sole article for daily eating purpose for a long time even with the milk, by virtue of its inclination to produce skin emissions because of the disturbing characteristics of 'avenin' one of its ingredients (Singh, 2005). Some celiac disease patients are oat bigoted. The avenin-receptive mucosal T-cells are responsible for mucosal inflammation in these types of patients. It might have an explanation behind villous decay and irritation in patients with celiac disease (Hansen, 2004). The sudden ascent in INR is accounted for using Panax Clavis (A formulation having blend of *Tribulusterrestris*, *Avenasativa* and *Panax ginseng*) (Turfan, 2012). These few references also indicate the *kudhānya* concept of Āyurveda.

2.3 Other varieties mentioned along with *Yava* and *Yavaka*

We came across the depiction of numerous different varieties (inferior to *yava*) which may have comparative activity or morphological characters to *yava* (*Hordeum vulgare* L.) described along with *yava* in different Ayurvedic literature.

Vāgbhaṭa mentioned *anuyava* which is *niḥśūka* (without bristle) variety and kept alongside *yava* (*AH Sū*. Ch. 6.6). Four varieties of *yava bheda* viz. *bahupriyā, atiśūka, tokya* and *hārita* are portrayed under *śimbī-śūkadhānya varg*a alongside *yava* in *Paryamuktāvali* (*PM. śloka*18-20). *Yavaka* is portrayed under *doṣalavarga* and having *yava* shaped *taṇḍula* and *śleṣmpittakara* in *Siddhamantra* (*SM śloka,* 161). It is depicted as a type of *bṛīhi* in *Dhanvantari*

nighaṇṭu (*DN. śloka,* 63*).* The less potent varieties of *yava* are also described in *Soḍhalanighaṇṭu* (*SN. śloka*114)). *Nyunayava* has been described in *kudhānya varga* alongside *yava* and *vaṃśjoyava* in *Mādhavadravyaguṇa (MD śloka*, 4). *Atiyava* is mentioned as *alpaguṇa* (less potent) than *yava* in *Madanapāla nighaṇṭu* (*MN śloka* 24-25). It is portrayed as *śūkarahita* (without *śūka*) and *tokya* is depicted as *harita* (green) *yava* in *Kaiyadeva nighaṇṭu*. The *aśūkamuṇḍayava* and its qualities are mentioned in *Rājnighaṇmu* (*RN śloka,* 69-70).

3. Concluding Remarks

Yava (*Hordeum vulgare* L.*)* and *Jaī* (*Avena sativa* L.), belongs to family Poaceae. *Yava* is utilized as a part of various therapeutic preparations. It is used for *santarpanajanya roga* like *prameha, kuṣṭha* and *medoroga* and for *lekhana karma* (Kumari, 2015). Barley (*Hordeum vulgare* L.) is an annual, erect, stout and tufted grass growing up to 0.5-1.2 m. and leaves are few and linear- lanceolate; spike is terminal (5-6cm long) and thickly bloomed. Glumes (two) are small, narrow; short awned and encasing three spikelets. Its fruit is caryopsis, elliptic, 9 cm long, short pointed, smooth and free or adherent to palea or both to lemma. Flowering and fruiting is around February-April (Figs. 1-4) (Ross, 2005). Presently there is resurgence for the cultivation of Oat which may be attributed its utilization food, feed and fodder. Oat (*Avena sativa* L.) is an annual herb with hollow, jointed stems bear terminal, panicle flower heads of part (spikelet) of the drooping flower head contains two or three florets enclosed by two chaff like bracts(glume). The lower bract (lemma) usually does not have an awn (a bristle like projection) unlike the Wild Oat (*Avena fatua*) (Singh, 2005).

It can be concluded, both are yearly, erect, stout and tufted grass of 50 to 100 cm (0.5 to 1.2m), fruit is caryopsis; the grains are firmly encased and adhering the lemma and palea. Flowering and fruiting of both is during February-April. Grains are part utilized. Both are having a critical substance constituents- Beta glucan. Beta glucan (β-glucan) is a solvent fiber promptly accessible from oat and barley grains that has been gaining interest because of its numerous utilitarian and bioactive properties. It's advantages in insulin resistance, dyslipidemia, hypertension, and corpulence is already documented (Elkhoury, 2012). High utilization of whole grain nourishments is related with a reduced risk of endless maladies including CHD, hypertension and type-2 diabetes. The suggested mechanisms involve diminishment in serum lipid concentrations and blood pressure, expanded insulin sensitivity and decrease in thrombotic and inflammatory markers (Thies, 2014).

All these varieties are depicted as mediocre characteristics of *yava*. There is a probability of similarities in some properties or attributes of all above mentioned varieties with *yava*. The synonyms based on therapeutic (*karmātmaka*) actions are more prevalent; over synonyms based on morphology in ancient texts. There is portrayal of *yavaka, atiyava, tokya* and some different species alongside *yava* and its properties/activity are additionally very like *yava*. This leads to few perplexities, still there is no specific botanical demarcation regarding these different types or varieties or species. There may be plausibility that these varieties or species may have a place under genus *Avena.* Nadkarni and others have established *Jaī* as *Avena sativa* L., which is ordinarily known as oat. The archaeological record of oats is around 1000 BCE. However, the utility of oats as an edible was established in 18th century (jic.ac.uk/Chelsea/cereal_evolution).

Abbreviations: *Aṣṭāṅga Hṛdayam—AH*; *Bhāvaprakāśa nighaṇṭu—BN*; *Caraka Saṃhitā—CS*; *Dhanvantari nighaṇṭu –DN*; *Madanapāl nighaṇṭu – MN*; *Mādhava Dravyaguṇa— MD; Paryamuktāvali – PM*; *Siddhamantra – SM*; *Soḍhalanighaṇṭu – SN*; *Suśruta Saṃhitā — SS*

Appendix

Fig. 1. *Yava* (*Hordeum vulgare* L.)

Fig. 2. ***Jaī*** (*Avena sativa* L.)

Fig. 3. *Yava* (*Hordeum vulgare* L.) grains

Fig. 4. ***Jaī*** (*Avena sativa* L.) grains

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