

REVIEW ARTICLE

An Integrative Review of Ayurvedic Principles and Nutritional Composition of Summer Fruits in Karnataka

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ABSTRACT

Grishma Ritu, the summer season of the *Ayurvedic Ritucharya* calendar, is described as a period of *Adana Kala* in which the sun progressively withdraws moisture and strength from the body, producing *Ushna* (heat) and *Ruksha* (dryness) in the environment and aggravating *Vata* while accumulating *Pitta dosha*. Classical texts such as the *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, and *Bhavaprakasha Nighantu* devote an entire section, the *Phala Varga*, to the properties of fruits, several of which are specifically recommended during this season for their *Madhura* (sweet), *Sheeta* (cooling), and *Drava* (liquid) attributes. This review compiles and examines the *Ayurvedic* pharmacological properties (*Rasa*, *Guna*, *Virya*, *Vipaka*, and *Karma*), regional and cultural relevance, nutritive composition, and consumption guidelines of six fruits widely available in Karnataka during summer: Mango (*Mangifera indica*), Watermelon (*Citrullus lanatus*), Muskmelon (*Cucumis melo*), Ice apple (*Borassus flabellifer*), Jackfruit (*Artocarpus heterophyllus*), and Grapes (*Vitis vinifera*). Indications, contraindications, and part-wise therapeutic uses are tabulated, and contemporary evidence on fruit consumption and glycemic control is discussed alongside common public doubts regarding fruit safety and diabetic suitability. The review concludes that the therapeutic benefit of *Phala* during *Grishma Ritu* depends not merely on the fruit consumed but on *Kala* (time), *Maatra* (quantity), and *Agni* (digestive capacity), reinforcing the *Ayurvedic* principle that even the most wholesome food can turn harmful when consumed without regard to season, method, and individual constitution.

1. INTRODUCTION

Diet in *Ayurveda* is never considered independent of time. The classical framework of *Ritucharya*, or seasonal regimen, holds that the qualities of the external environment directly influence the internal *dosha* balance of the body, and that food, activity, and lifestyle must be adjusted through the year to preserve health.^[1-3] Among the six seasons described in the *Ashtanga Hridaya* and *Charaka Samhita*, *Grishma Ritu* (the intense summer months) represents one of the most physiologically demanding periods, characterized by *Ushna guna*, *Ruksha guna*, and progressive depletion of *Deha Bala*. It is precisely during such a season that the *Phala Varga* – the dedicated section on fruits found in every major classical *nighantu* and *samhita* – becomes clinically relevant.^[4-8]

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Fruits are unique among *Ayurvedic* dietary substances in combining palatability with therapeutic value. Unlike cooked preparations, most fruits require no processing, are readily digestible in appropriate quantity, and are described in the classical texts with detailed pharmacological attributes: *Rasa* (taste), *Guna* (qualities), *Virya* (potency), *Vipaka* (post-digestive effect), and *Karma* (specific action).^[4,5] This descriptive framework allows fruits to be matched precisely to the *dosha* disturbances of a given season, and *Grishma Ritu*, dominated by *Vata-Pitta* aggravation, calls specifically for fruits that are *Madhura* (sweet), *Sheeta* (cooling), and *Drava* (liquid, hydrating) in nature.

The present review draws together the classical *Ayurvedic* description and the locally relevant, seasonally available fruits of the Karnataka region, namely Mango, Watermelon, Muskmelon, Ice apple, Jackfruit, and Grapes, to provide a single, structured reference on their *Ayurvedic* pharmacology, cultural usage, nutritive composition, and safe consumption practice. It further attempts to reconcile

classical recommendations with contemporary nutritional evidence, particularly around the widely debated question of fruit consumption in diabetes,^[9-11] and to translate scattered textual and regional knowledge into a format usable for both clinical counseling and public health education. The objective is not merely descriptive cataloguing but an integrative appraisal: To show that the benefit of a fruit is inseparable from the time, quantity, and digestive context in which it is consumed.

Review methodology: Sources for this review were drawn from the primary classical *Ayurvedic* compendia (*Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, *Bhavaprakasha Nighantu*, and *Raja Nighantu*)^[1,2,4,5] together with peer-reviewed secondary literature on *Phala Varga* and seasonal regimen published between 1979 and 2025,^[3,6,7,8,12-16] and contemporary biomedical literature on fruit consumption and glycemic control identified through targeted searches on Mango, Watermelon, and fruit-glucose relationships.^[9-11] Classical sources were prioritized for *dosha*/pharmacological attributions; contemporary sources were used specifically to evaluate the glycemic and nutritional claims discussed in Sections 9 and 10.

1.1. Aims and Objectives

- To examine the classical *Ayurvedic* pharmacological properties (*Rasa*, *Guna*, *Virya*, *Vipaka*, and *Karma*), regional cultural relevance, nutritive composition, and therapeutic uses of six seasonally available fruits in Karnataka during *Grishma Ritu* (Mango, Watermelon, Muskmelon, Ice apple, Jackfruit, and Grapes).
- To reconcile classical *Ayurvedic* recommendations with contemporary nutritional evidence on fruit consumption and glycemic control in diabetes mellitus.
- To demonstrate that therapeutic benefits of fruits depend on the principles of *Kala* (time), *Maatra* (quantity), and *Agni* (digestive capacity).

2. MATERIALS AND METHODS

2.1. Study Design

Integrative narrative review combining classical *Ayurvedic* texts with contemporary peer-reviewed nutritional science on seasonal fruits.

2.2. Classical Sources

Phala Varga and pharmacological data drawn from *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, *Bhavaprakasha Nighantu*, and *Raja Nighantu*.

2.3. Contemporary Sources

Peer-reviewed literature on *Ritucharya* and fruit-related biomedical research (glycemic index/load, fruit-diabetes association, pesticide residues) sourced from standard biomedical databases.

2.4. Fruit Selection Criteria

Six fruits chosen based on seasonal availability in *Grishma Ritu* (March–July) in Karnataka, affordability/accessibility, local cultivation status, and dominant *Madhura*, *Sheeta*, and *Drava* attributes suited to summer physiology.

2.5. Rationale

Selected fruits support hydration (*Jala*), energy (*Bala*), and digestion under *Manda Agni* and are well-established in regional food culture.

3. AYURVEDIC CONCEPT OF GRISHMA RITU

Grishma Ritu falls within *Adana Kala*, the phase of the year in which *Surya* (the sun) is said to progressively draw *Jala* (moisture) and *Bala* (strength) away from living beings, a process described in the classical commentary of Chakrapani on the *Tasyashritiya Adhyaya* of the *Charaka Samhita*.^[1,3] As the environment turns *Ushna* (hot) and *Ruksha* (dry), the body undergoes a corresponding *kshaya* of the *Bala*: *Vata Dosha* increases as a consequence of *Rukshata* (dryness), while *Pitta Dosha* accumulates because of *Ushnata* (heat), setting the stage for its aggravation in the following monsoon season. Simultaneously, *Agni*, the digestive fire, becomes *Manda* (weak), producing a physiological state of reduced appetite and diminished energy that is a common experience during peak summer months.

This combination, dry and depleting externally, weak digestion internally, creates a specific dietary requirement rather than a general one. The *Ashtanga Hridaya Sutrasthana* directs that *katu* (pungent) and *amla* (sour) foods, vigorous *Vyayama* (physical exertion), and direct sun exposure be avoided during this period, and the dietary approach should prioritize substances that are *Madhura* (sweet), *Laghu* (light to digest), mildly *Snigdha* (unctuous), *Sheeta* (cooling), and *Drava* (liquid).^[17] The further explanation recommends cooling beverages prepared with *madhura dravyas* and stored in fresh earthen vessels to maintain natural coolness, enhanced with fruits such as banana and jackfruit for hydration and refreshment, an early textual acknowledgement of fruit as a targeted seasonal intervention rather than an incidental food item.^[2,3]

In modern physiological terms, this classical description parallels the recognized summer pattern of increased insensible fluid loss, heat-related fatigue, reduced appetite, and higher susceptibility to dehydration and heat exhaustion. The *Ayurvedic* emphasis on sweet, cooling, hydrating foods during *Grishma Ritu* therefore anticipates, in its own conceptual vocabulary, several principles that contemporary nutrition arrives at independently when addressing summer dietary needs.

4. PHALA VARGA IN CLASSICAL AYURVEDIC SAMHITAS

Fruits occupy a formally demarcated place in every major classical compendium of *Ayurveda*, indicating the importance the tradition placed on their systematic study.^[1,2,4,14] The principal textual sources are summarized in Table 1.

These sources describe fruits not as a single homogenous category but as substances differentiated by taste combination, potency, post-digestive effect, and specific therapeutic action, allowing a practitioner to select a fruit appropriate to season, constitution, and clinical condition rather than relying on generic dietary advice.^[4-7]

5. ROLE OF PHALA (FRUITS) DURING GRISHMA RITU

The rationale for emphasizing fruit consumption in summer follows directly from the *dosha* picture described above. Fruits recommended for the summer season are predominantly *Madhura*, *Sheeta*, and *Drava* in nature, properties that oppose the *Ushna* and *Ruksha* qualities of the environment and are therefore considered ideal for *Grishma Ritu*.^[5,14] Their contribution can be summarized under three broad functions:

- Restoring *Jala Tattva* (bodily fluid balance) and supporting *Agni*, thereby counteracting the dehydrating effect of heat
- Providing vital energy while helping to reduce vitiated *Pitta* and maintain *Vata* within physiological limits

- Acting as an easily digestible source of nourishment during a period when the digestive fire is naturally weakened.^[14]

A further classical principle relevant to fruit timing is captured in the guidance “*Yamamadhyena na bhoktavyam*” (do not eat within 3 h of sunrise)^[18] often cited as a thumb rule for maintaining a healthy dietary rhythm. Understood together, the classical position frames fruit consumption in summer not simply as a matter of what is eaten, but of when, how much, and in what manner, a theme that recurs throughout this review.

6. SELECTION OF SEASONAL FRUITS FOR THE KARNATAKA REGION

Six fruits form the focus of this review: Mango, Watermelon, Muskmelon, Ice apple, Jackfruit, and Grapes, selected specifically for their prominence in the *Grishma Ritu* diet of the Karnataka region. Their selection follows a set of criteria consistent with *Ayurvedic* seasonal dietetics:

- Natural availability during *Grishma Ritu*, making them the most relevant seasonal choice rather than an imported or off-season option
- Affordability and easy accessibility, making them suitable across all economic groups.

Local cultivation (*Nava*, or freshly harvested), which is considered to render a fruit more nutrient-rich and better suited to the *Deha* (body) of the local population.^[13,15]

A predominance of *Madhura*, *Sheeta*, and *Drava* attributes, which helps balance the aggravated *Pitta* and *Vata* of the season.

Support for *Jala* (hydration), *Bala* (energy), and easy digestion under conditions of *Manda Agni*.

7. FRUIT-WISE AYURVEDIC AND NUTRITIONAL REVIEW

7.1. Mango (*Amra*) – *Mangifera indica*

Mangifera indica, commonly known as Mavinakayyi (raw mango) and Mavina hannu (ripe mango) in Kannada, is consumed in both its raw and ripe forms and is regarded as an important *Grishma Rtu Phala* (summer seasonal fruit) in *Ayurveda* (Figure 1). Its peak availability extends from March to July, corresponding to the period of maximum summer heat (*Grishma Rtu*).^[5,8] It is deeply embedded in Karnataka's food culture, appearing in traditional preparations such as *Appe Huli* and mango-flower chutney in the *Malnad* region, and in the *Ugadi* festival tradition, where raw mango, jaggery, and neem are combined to symbolize the varied experiences of life.

Raw and ripe mango is described with distinct, near-opposite pharmacological profiles in the *Bhavaprakasha Nighantu*.^[5] Raw mango carries *Amla* and *Kashaya Rasa*, *Laghu* and *Ruksha Guna*, *Ushna Virya*, and *Amla Vipaka*; it pacifies *Vata* and *Kapha* but may aggravate *Pitta* in excess. It is indicated in *Aruchi* (loss of appetite), *Hridroga*, and *Kantadosha* and is traditionally used in *Mavinakayi Chitranna*, *Appe Huli*, and *Uppinakayi* (pickle), though it is contraindicated in *Pitta* disorders and bleeding conditions such as epistaxis or menorrhagia.

Ripe mango (*Mavinahannu*), by contrast, is *Madhura* and *Kashaya* in *Rasa*, *Guru* and *Snigdha* in *Guna*, *Sheeta* in *Virya*, with *Madhura Vipaka*; it pacifies *Vata-Pitta* but may increase *Kapha* in excess. It

is indicated for *Vataroga*, *Vibandha* (constipation), *Shukradosha*, and *Shrama* (fatigue), used in preparations such as *Aamras*, mango *Rasayana*, and *Payasa*, and is generally contraindicated only with excessive intake, which may produce indigestion, acne, or increased body heat.^[5,8]

Nutritionally, mango is a rich source of vitamin C, dietary fiber, and mangiferin, along with potassium and magnesium; ripe mango additionally provides beta-carotene (provitamin A).^[8,13,15] Reported benefits include immune support, prevention of heat-related exhaustion, improved digestion, and support for liver function. In *Ayurvedic* terms, mango is *Deepana* (*Agni*-stimulating) and *Brimhana* (nourishing), relieves *Trishna* (thirst) and *Shrama*, and is best consumed in the morning or before meals, ideally with a pinch of salt or jaggery to offset acidity, or soaked in water beforehand; excess or late-night intake is discouraged.

The *Bhavaprakasha Nighantu* extends this analysis further, describing distinct properties for individual developmental stages and preparations of mango, summarized in Table 2.^[5]

7.2. Watermelon (*Tarbooja*) – *Citrullus lanatus*

Citrullus lanatus carries a *Madhura Rasa*, *Guru Guna*, *Ushna Virya*, and *Madhura Vipaka* in the *Bhavaprakasha Nighantu* (Figure 2),^[5] pacifying *Pitta* and *Vata* while potentially increasing *Kapha* in excess. It is indicated for *Daha* (burning sensation), *Trishna* (thirst), *Shrama* (fatigue), and *Mutra Daha* (burning micturition) and is used fresh as slices, juice, smoothies, and fruit salads, with the seeds occasionally used as a snack and the rind employed in traditional dishes. It is best avoided in states of *Mandagni*, in *Kapha*-predominant constitutions, and immediately after heavy meals.

With a water content of approximately 90%, watermelon is among the most hydrating fruits available and is additionally a source of Vitamin A, Vitamin C, and lycopene.^[13,15] It is credited with preventing dehydration, supporting skin and cardiovascular health, and aiding digestion and urinary function. In *Ayurveda*, its *Sheeta* and *Madhura* qualities are considered cooling and hydrating, reducing summer-related fatigue. It is best consumed mid-morning or afternoon as a stand-alone snack rather than after a meal and should be limited at night, in cold conditions, or by individuals with diabetes, given its naturally high sugar content – though its glycemic load in typical portions is considerably lower than its glycemic index alone would suggest^[11] (Section 12).

7.3. Muskmelon (*Kharbuja*) – *Cucumis melo*

Cucumis melo is available from March to June (Figure 3) and, like watermelon, is aligned with *Grishma Ritu* through its naturally cooling (*Sheeta Virya*) and hydrating character, which helps counter dehydration, fatigue, and *Pitta* imbalance. It carries a particular cultural association with *Ramanavami*, where it is used in or served alongside *Panaka* (*Panakam*) as *Naivedya*; its cooling effect balances body heat while its high water content supports hydration, reflecting broader *Satvic* and seasonal dietary practice. It additionally provides Vitamin A, Vitamin C, and potassium^[13,15] and digests better when combined with jaggery, pepper, or cardamom.

Pharmacologically, muskmelon carries *Madhura* and *Amla Rasa*, *Guru* and *Snigdha Guna*, *Sheeta Virya*, and *Madhura Vipaka*,^[5] pacifying *Pitta* and *Vata* while potentially aggravating *Kapha* in excess. It is indicated for *Daha*, *Trishna*, and *Mutrakrichra* (dysuria) and is considered useful in *Amadosha* and *Raktapitta* but is best avoided in

combination with milk, after meals, in excess, or when refrigerated and is contraindicated in *Mandagni* and *Kapha*-dominant states. It is rich in Vitamin A, Vitamin C, potassium, and fiber; is low in calories; and contains lycopene; reported benefits include support for digestion, urinary health, skin, vision, and weight management.^[13,15] The classical advice is to consume it fresh and alone, ideally in the morning or midday, and not in combination with heavy foods.

7.4. Ice Apple (*Tala*) – *Borassus flabellifer*

The tender fruit of the Palmyra palm, *Borassus flabellifer*, is prized in coastal Karnataka for its cooling effect (Figure 4), often eaten as fresh tender pulp or juice, and combined with coconut milk and jaggery in coastal preparations. It carries a *Madhura Rasa*, *Guru* and *Snigdha Guna*, *Sheeta Virya*, and *Madhura Vipaka*,^[5] pacifying *Pitta* and *Vata* while potentially increasing *Kapha* in excess. It is indicated for *Raktapitta*, *Daha*, *Shwasa*, *Kshata Kshaya*, and *Vrana* and is a rich source of electrolytes, including potassium and sodium, along with vitamin C, B-complex vitamins, and natural sugars.^[13,15]

Reported benefits include prevention of dehydration and heatstroke, support for digestion and bowel health, and promotion of skin hydration. Its strong *Sheeta* and *Madhura* qualities are considered particularly effective at reducing *Pitta* and fatigue. The fruit is best consumed fresh and alone, in the morning or midday, and should be avoided after meals, in combination with milk or heavy foods, or in excess, as this may precipitate loose stools or aggravate *Kapha*.

7.5. Jackfruit (*Panasa*) – *Artocarpus heterophyllus*

Artocarpus heterophyllus is grown widely across *Malnad*, coastal Karnataka, and the Western Ghats (Figure 5) and is available through the summer months (March–July), supporting energy and nourishment in the hot, humid climate typical of these regions. It is regarded as a near “complete food fruit” in Karnataka cuisine, with the whole fruit utilized: The raw fruit as a vegetable substitute, the ripe fruit eaten fresh or in desserts such as *Halasina Happala (papad)*, jackfruit chips, *Kotte Kadubu* (steamed idli), jackfruit *Payasa*, and raw jackfruit curry, and the seeds boiled or roasted and added to dishes, reflecting a broadly sustainable, low-waste dietary practice.

Ripe jackfruit carries a *Madhura* and *Kashaya Rasa*, *Guru* and *Snigdha Guna*, *Sheeta Virya*, and *Madhura Vipaka*,^[2,5] pacifying *Pitta* and *Vata* while potentially increasing *Kapha* in excess. It is indicated for *Shrama* and *Daha* and supports nourishment, energy, and reproductive health (through its indication in *Shosha* and *Vrana*) but is contraindicated in *Gulma*, *Ajeerna*, and *Mandagni* and should not be combined with milk, taken after meals, or consumed in excess. Nutritionally, it provides carbohydrates as an energy source along with Vitamin C and Vitamin A, while the seeds are a notable source of plant protein and minerals.^[13,15] Its *Madhura* and *Snigdha* qualities render it *Brimhana* (nourishing), improving strength and reducing fatigue; the classical recommendation is to prefer the ripe fruit in moderation, consumed in the morning or midday as a stand-alone snack rather than with milk or after heavy meals.

7.6. Grapes (*Madhura Draksha*) – *Vitis vinifera*

Vitis vinifera (*Draksha*) carries a *Madhura* and *Kashaya Rasa* (Figure 6), *Guru*, *Snigdha*, and *Mridu Guna*, *Sheeta Virya*, and *Madhura Vipaka*,^[5] pacifying *Pitta* and *Vata* while potentially aggravating *Kapha* in excess. It is indicated for *Daha*, *Trishna*, *Raktapitta*, *Kshata*, *Kshaya*, *Mutraroga*, *Jwara*, and *Vibandha* and is consumed fresh, as juice, in salads and desserts, or, in dried form as raisins, in *Kheer* and

Payasa. Sour or unripe grapes, excessive intake, combination with milk or heavy meals, and consumption by individuals with diabetes are cautioned against.

Grapes are a source of Vitamin C, Vitamin K, antioxidants, natural sugars, and potassium^[13,15] and are credited with supporting cardiovascular health through their antioxidant content, improving skin and immunity, aiding digestion, and providing quick energy and hydration. Their *Sheeta* and *Madhura* qualities are considered cooling, nourishing, and effective at reducing *Pitta* and fatigue. As with the other fruits reviewed here, grapes are best consumed fresh, in the morning or midday, as a separate snack rather than after meals, with unripe or sour fruit and excessive quantity specifically avoided.

Regional proverb: A well-known Kannada saying, “*Hasidaga halasu, undaga mavu*” (“when hungry, eat jackfruit; when full, eat mango”), captures the traditional understanding that jackfruit, being heavier and more filling, suits a state of hunger, while mango, being lighter to relish, is better enjoyed afterward.^[12] A related saying on eating technique, “*Hisidu Halasu, Unde Maavu*,” notes that jackfruit is customarily torn and eaten by hand while mango is best relished by directly sucking the pulp, illustrating how classical dietary wisdom and regional culinary custom reinforce one another.

8. COMPARATIVE OVERVIEW: BEST TIME OF CONSUMPTION AND EFFECTS OF OVERCONSUMPTION

Table 3 consolidates the classically preferred timing for each of the six fruits alongside the principal effects reported with excessive intake, providing a quick clinical or counseling reference.

9. INDICATIONS AND CONTRAINDICATIONS BY PLANT PART

Beyond the fruit pulp itself, several parts of these plants, including the seed, rind, flower, bark, and leaf, carry distinct classical uses. Table 4 summarizes part-wise indications and contraindications for mango, watermelon, and muskmelon; Table 5 continues this summary for ice apple, jackfruit, and grapes.

10. ADDRESSING COMMON CLINICAL QUESTIONS

10.1. Can a Diabetic Patient Eat Fruit?

This remains one of the most frequently raised concerns in clinical practice. A meta-analysis of 19 randomized controlled trials examining the effect of fruit intake on glucose control in diabetes mellitus,^[10] along with a systematic review of the antidiabetic properties of mango in animal models and humans,^[9] together suggests that whole-fruit consumption, taken in appropriate quantity, does not carry the uniformly negative glycemic impact often assumed. It is important to note that the human evidence within these sources is less extensive than the animal-model evidence, particularly for mango-specific effects, and that the fruits and doses evaluated across the pooled RCTs in Ren *et al.*^[10] are heterogeneous; the finding should be read as a moderate signal supporting the safety of appropriate whole-fruit portions rather than a blanket endorsement covering every fruit and every degree of glycemic control discussed elsewhere in this review.

10.2. When Should Fruit be Eaten Relative to Meals?

The *Ashtanga Hridaya Sutrasthana* states that drinking water before, during, or after a meal produces emaciation, balance, or weight gain respectively (“*samasthulakrishna*

bhuktamadhyantaprathamambupah”).^[19] By extension, this principle is applied to fruit consumption: Fruit taken before, during, or after a meal is understood to influence digestion and body composition in a comparable graded manner. This is broadly consistent with contemporary findings that whole-fruit consumption before meals influences subsequent food intake,^[16] supporting the repeated recommendation in this review that fruit is best taken as a discrete, well-timed intake rather than appended indiscriminately to a meal.

10.3. Is it Safe to Consume Fruit Given Current Concerns About Pesticide Residue and Artificial Ripening?

The classical and contemporary answer converges on the same conclusion: Yes, provided the fruit is consumed wisely. Practical guidance includes favoring seasonal and locally grown produce over imported or off-season alternatives, focusing on food quality rather than blanket avoidance, washing or soaking fruit adequately to reduce pesticide residue,^[20] avoiding artificially ripened fruit (for example, mango ripened using calcium carbide),^[21] and peeling where appropriate.

Several widely circulated public concerns deserve a direct, evidence-based response. The claim that watermelon contains erythropoietin, sometimes cited in relation to athletic doping, is not scientifically supported. Concerns regarding calcium-carbide ripening of mango are valid but affect only a subset of the market and are subject to regulation rather than being universal to all mangoes sold.^[21] Pesticide residue on grapes is a legitimate concern but is substantially reduced by thorough washing.^[20] The overarching *Ayurvedic* position, that the right fruit, consumed at the right time and in the right quantity, is both safe and beneficial,^[22] remains a useful organizing principle for addressing these individually varied concerns.

11. DISCUSSION

The integration of classical and contemporary evidence reviewed above reveals several themes of relevance to both clinical *Ayurvedic* practice and public health dietary counseling.

First, the evidence for fruit in glucose management demonstrates reasonable consistency. Fruits rich in fiber, polyphenols, and micronutrients are associated with improved insulin sensitivity, reduced oxidative stress, and slower glucose absorption.^[10,11] Mango exemplifies this relationship at the cellular level, with bioactive compounds documented to inhibit the enzymes alpha-amylase and alpha-glucosidase, enhance insulin secretion, and improve glucose uptake in both animal and human models reviewed in Zarasvand *et al.*^[9] These findings provide biochemical support for its long-standing use in *Ayurvedic* Pramehahara protocols, particularly through the flower and leaf preparations; however, as discussed in Section 11.1, the human evidence base for these specific mechanisms remains limited compared to the animal data.

Second, the presence of natural sugars in fruits – glucose, fructose, and sucrose – presents a counterpoint that cannot be dismissed. These compounds are capable of elevating blood glucose depending on quantity, physical form, and glycemic index. Glycemic index alone, however, provides an incomplete picture: Watermelon, despite carrying a high glycemic index, exhibits a low glycemic load and produces minimal blood glucose spikes when consumed in typical portions.^[11] Clinical outcomes therefore depend less on the isolated glycemic index of a given fruit and more on portion size (glycemic load), fiber content, concurrent food consumption, and individual metabolic capacity.^[11] Evidence from pooled clinical trials indicates that moderate fruit consumption does not significantly elevate glycated hemoglobin levels in the populations studied.^[10]

Third, this contemporary understanding parallels, with remarkable precision, the classical *Ayurvedic* framework of *Kala*, *Maatra*, and *Agni*. Where modern nutrition science emphasizes glycemic load, portion control, and metabolic individuality, *Ayurveda* articulates these principles through *Maatra* (appropriate quantity) and *Agni* (digestive capacity). Where current dietary guidance prioritizes meal timing and food pairing, *Ayurveda* specifies *Kala* (the optimal time relative to meals and seasonal cycles) and identifies contraindicated combinations – such as fruit with dairy products or immediately following heavy meals.^[2,3] This convergence represents a significant point of alignment between the two frameworks regarding portion- and timing-dependent glycemic effects. However, this alignment should not be construed as a general equivalence between systems, since *Ayurvedic dosha*-based individualization and modern population-level glycemic evidence operate at different levels of observation and are not directly interchangeable as forms of evidence.

A final consideration addresses the regional and cultural dimensions embedded within this analysis. The prominence of mango, jackfruit, watermelon, muskmelon, ice apple, and grapes in Karnataka’s *Greeshma Ritu* diet is neither incidental nor arbitrary; rather, it reflects centuries of local agricultural evolution aligning seasonally available produce with the physiological demands of the season – a pattern the classical texts had already articulated in general terms through the *Phala Varga*.^[6,7,14] This recognition offers clinicians and dietary counselors a practical framework for integrating contemporary seasonal nutrition guidance with locally accessible, culturally relevant foods, thereby moving beyond generic or geographically inappropriate recommendations.

12. CONCLUSION

Fruits reviewed: Mango, Watermelon, Muskmelon, Ice apple, Jackfruit, and Grapes, each carry distinct *Ayurvedic* properties, yet share a common *Madhura*, *Sheeta*, *Drava* profile that aligns them with the physiological demands of *Grishma Ritu*. Their benefit, however, is not unconditional. As emphasized repeatedly across the classical sources reviewed, even the healthiest fruit can become harmful when consumed improperly; benefit depends on the right time of consumption (*Kala*), the proper quantity (*Maatra*), and the individual’s digestive strength (*Agni*).

The *Sushruta Samhita Sutrasthana* directly addresses this principle, specifying that fruit which is diseased, worm-infested, overripe, unseasonal, or unripe should be avoided altogether: “*vyadhitam krimijushtam cha pakatitamakalajam, varjaniyam phalam sarvamaparyagatameva cha*.”^[23,24] Read alongside the contemporary evidence on fruit and glycemic control discussed above, this review suggests that seasonal, locally sourced fruit, consumed mindfully and in appropriate quantity, is a scientifically defensible and in *Ayurveda* well-grounded component of a healthy summer diet. For individuals managing diabetes specifically, the evidence reviewed by Zarasvand *et al.*, Ren *et al.*, and Singh *et al.*^[9-11] supports moderate, well-timed whole-fruit intake with attention to portion size and glycemic load rather than blanket avoidance, though individualized medical advice remains essential given the fruit-specific cautions (grapes, ripe mango, jackfruit) noted throughout Section 8.

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14. AUTHORS' CONTRIBUTIONS

All authors give equal contribution in making of this manuscript.

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16. ETHICAL STATEMENT

Ethical approval was not required for this study as it is a review article.

17. CONFLICT OF INTERESTS

The authors declare no conflicts of interest regarding the publication of this paper.

18. DATA AVAILABILITY STATEMENT

The data analyzed in this review were obtained from publicly available sources, including peer-reviewed articles, observational studies, and surveys accessible through databases.

19. DISCLAIMER/VIEW AND OPINIONS

The opinions expressed in this article are solely those of the authors and do not reflect the views of the International Research Journal of Ayurveda and Yoga or its editorial board.

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Table 1: Classical sources describing the *Phala Varga*

Classical text	Section	Approx. fruits described
<i>Charaka Samhita</i> ^[1]	<i>Sutrasthana - Annapana Vidhi Adhyaya (Ch. 27)</i>	~65–70
<i>Ashtanga Hridaya</i> ^[2]	<i>Sutrasthana - Annaswaroop Vijnaneeya Adhyaya (Ch. 6)</i>	~40–45
<i>Bhavaprakasha Nighantu</i> ^[5]	<i>Amradi Phala Varga (Ch. 6)</i>	Comprehensive, fruit-focused
<i>Sushruta Samhita</i> ^[23]	<i>Sutrasthana - Annapana Vidhi Adhyaya (Ch. 46)</i>	~85–90

Table 2: Part-wise and preparation-wise *Ayurvedic* properties of mango (*Bhavaprakasha Nighantu*)

Useful part	Rasa	Virya	Guna	Karma	Action on tridosha
<i>Baal Amra Phala</i> (young raw fruit)	<i>Kashaya, Amla</i>	—	—	<i>Ruchya</i> (appetiser)	<i>Vata-Pittakara</i>
<i>Tarun Amra Phala</i> (grown raw fruit)	<i>Ati Amla</i>	—	<i>Ruksha</i>	—	<i>Tridosha prakopaka, Raktavikara janaka</i>
<i>Pakva Amra Phala</i> (ripe fruit)	<i>Madhura</i> (dominant), <i>Kashaya anurasa</i>	<i>Sheeta</i>	<i>Snigdha, Guru</i>	<i>Vrushya, Hrudya, Varnya</i>	<i>Vatanashaka, Pittajanaka, Kaphavardhaka</i>
<i>Vruksha Sampakva Amra</i> (tree-ripened fruit)	<i>Madhura, Amla</i>	—	<i>Guru</i>	—	<i>Vatahara, Pittakara</i>
<i>Krutrima Pakva Amra</i> (artificially ripened fruit)	<i>Madhura, Amla</i>	—	—	—	<i>Pittahara</i>
<i>Chushit Amra Rasa</i> (sucked juice)	—	<i>Sheeta</i>	<i>Laghu</i>	<i>Atyanta Ruchikara, Balya, Veeryakaraka</i>	<i>Vata-Pitta nashaka, Kaphakara</i>
<i>Amra Beeja</i> (seed)	<i>Kashaya, Madhura</i>	—	—	<i>Chardihara, Atisarahara</i>	—
<i>Dugdha Amra</i> (ripe mango with milk)	—	<i>Sheeta</i>	<i>Guru</i>	<i>Ruchikara, Vrushya, Varnya</i>	<i>Vatapittakara</i>
<i>Amra Pushpa</i> (mango flower)	—	<i>Sheeta</i>	<i>Laghu</i>	<i>Grahi, Pramehahara</i>	<i>Vatakara, Kapha-Pitta naashaka</i>

Table 3: Best time of consumption and effects of overconsumption, by fruit

Fruit	Best time to consume	Effects of excess consumption
Watermelon	Morning/Midday, empty stomach or between meals	Bloating, frequent urination, <i>Kapha</i> increase, indigestion
Muskmelon	Morning/Midday, alone, before meals	Indigestion, heaviness, <i>Kapha</i> increase
Ice apple	Morning/Midday	Loose stools, heaviness, low digestion (<i>Mandagni</i>)
Jackfruit	Morning/Midday, when hungry	Bloating, heaviness, indigestion, <i>Kapha</i> increase
Grapes	Morning/Midday	Loose stools, <i>Kapha</i> increase, high-sugar effects
Mango	Mid-morning/Afternoon, preferably soaked	Heat, acne, <i>Pitta</i> increase, indigestion

Table 4: Part-wise indications and contraindications – mango, watermelon, and muskmelon

Fruit	Part used	Indications	Contraindications
Mango	Fruit (ripe)	Improves energy, digestion, strength	Excess: <i>Pitta</i> increase, heat, acne
Mango	Raw fruit	Improves appetite, digestion	Excess: Acidity, <i>Pitta</i> increase
Mango	Flower	Diarrhea, diabetes support	May increase <i>Vata</i>
Mango	Seed	Diarrhea, vomiting	Excess: Constipation
Mango	Bark	Astringent, wound healing	Not for regular use
Mango	Leaf	Diabetes support	Limited use
Watermelon	Fruit	Hydration, reduces heat, urinary issues	Excess: bloating, <i>Kapha</i> increase
Watermelon	Seeds	Nutritious, protein	Hard to digest in excess
Watermelon	Rind	Cooling, used in dishes	Limited use
Muskmelon	Fruit	Cooling, digestion, hydration	Excess: Heaviness, indigestion
Muskmelon	Seeds	Nutritious, improves strength	Heavy in excess
Muskmelon	Rind	Mild cooling use	Rarely used

Table 5: Part-wise indications and contraindications – ice apple, jackfruit, and grapes

Fruit	Part used	Indications	Contraindications
Ice apple	Fruit	Cooling, reduces heat, hydration	Excess: Loose stools, heaviness
Ice apple	Sap (palm)	Cooling drinks	Fermented form not suitable for all
Jackfruit	Ripe fruit	Energy, nourishment	Excess: Bloating, <i>Kapha</i> increase
Jackfruit	Raw fruit	Vegetable substitute, digestion	Heavy, causes gas
Jackfruit	Seeds	Protein, strength	Hard to digest in excess
Jackfruit	Leaf/bark	Traditional uses	Limited medicinal use
Grapes	Fruit	Hydration, digestion, energy	Excess: Loose stools, <i>Kapha</i> increase
Grapes	Raisins	Nourishing, relieves constipation	High sugar, caution in diabetes
Grapes	Seeds	Antioxidants	Usually not consumed directly



Figure 1: Raw (unripe) and ripe mango (*Mangifera indica*)



Figure 2: Watermelon (*Citrullus lanatus*)



Figure 3: Muskmelon (*Cucumis melo*)



Figure 4: Ice apple (Palmyra palm fruit) (*Borassus flabellifer*)



Figure 5: Mature jackfruit (*Artocarpus heterophyllus*)



Figure 6: Grapes (*Vitis vinifera*)