



Review Article

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NAVANITA AND MARICH IN CHILDHOOD GROWTH: ROLE IN DHATU POSHAN AND SKELETAL DEVELOPMENT

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Abstract

Nutrition, skeletal development, and tissue formation are all part of the process of childhood growth. Specific diets and therapies, such as ghee, milk, and nutritional supplements, play a vital role in this process. The seven *Dhatus* are sequentially nourished by one another and also contribute to the developmental process of the body. Tissue nutrition and metabolic competence are necessary for appropriate skeletal growth. Therefore, the traditional Ayurvedic concept of *Dhatu Poshan* offers a systemic model of childhood growth. Natural compounds and dietary substances such as black pepper (*Marich*) and fresh butter (*Navanita*) support the process of *Dhatu Poshan* and skeletal development. *Marich* has *Katu*, *Tikshna*, *Deepana*, and *Ushna* qualities, while *Navanita* is highly nourishing and supports *Deepana*. Similarly, modern physiology emphasizes the involvement of growth hormone in the skeletal development process. Skeletal mineral accumulation is significant during adolescence. A diet high in calcium and minerals, along with appropriate supplementation, supports the development of the skeletal system; therefore, dietary and nutritional support is considered important for appropriate childhood growth.

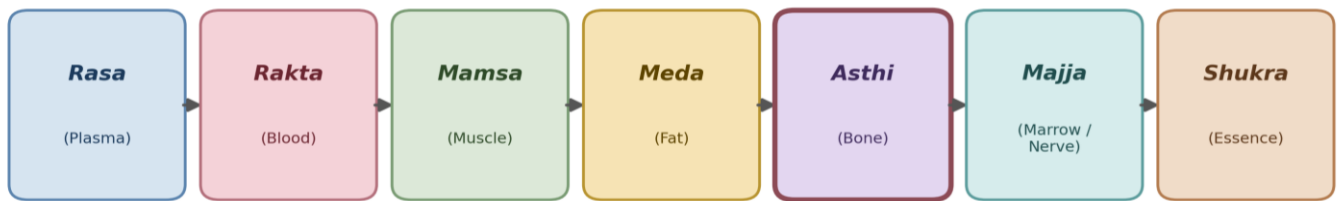
This article explains the role of *Navanita*, *Marich*, and other factors in childhood growth, with special emphasis on *Dhatu Poshan* and skeletal development.

Keywords: Ayurveda, Childhood Growth, *Dhatu Poshan*, *Navanita*, *Marich*, Nutrition

Introduction

Ayurveda describes the development and nourishment of the body as an interconnected process in which nutrients undergo sequential transformation to support and nourish the seven *Dhatus* (body tissues). *Dhatu Poshan* is a fundamental process that plays an important role in the physiological development and maintenance of the body. According to the classical Ayurvedic concept, nourishment proceeds sequentially from one *Dhatu* to the next, beginning with *Rasa* and culminating in *Shukra*. The seven *Dhatus* are *Rasa*, *Rakta*, *Mamsa*, *Meda*, *Asthi*, *Majja*, and *Shukra*, with each *Dhatu* being nourished through the metabolic transformation of the preceding tissue.

Rasa (Plasma) → *Rakta* (Blood) → *Mamsa* (Muscle) → *Meda* (Fat) → *Asthi* (Bone) → *Majja* (Marrow, Nerve) → *Shukra* (Essence)



Sequential nourishment: each Dhātu is formed through metabolic transformation of the preceding tissue

Figure 1: Sequential nourishment (Dhatu Poshan Krama) of the seven Dhatus, from Rasa to Shukra. Asthi Dhātu (bone tissue) is highlighted.

Asthi Dhātu represents the structural framework of the body, corresponding to the skeletal system. In the sequential process of *Dhatu Poshan*, *Asthi Dhātu* plays a vital role in maintaining the structural integrity and strength of the body and is also important in the nourishment of the subsequent *Dhatus*, i.e., *Majja* and *Shukra*. Adequate dietary and nutritional support is essential for a strong skeletal structure. Vitamin D plays an important role in maintaining skeletal health, while dietary fat facilitates the absorption of fat-soluble vitamins, including vitamins A and D.

Ayurvedic literature describes various dietary and nutritional substances, including *Marich* and *Navanita*, that support growth and skeletal development during childhood. *Marich* is characterized by *Katu*, *Tikshna*, *Deepana*, *Ushna*, and *Ruksha* properties, which are associated with supporting digestion and metabolism. *Navanita*, being a nourishing source of dietary fat, is supportive of tissue nourishment. Thus, the combination of *Marich* and *Navanita* supports digestion, assimilation, and nutrient utilization, thereby contributing to tissue nourishment and potentially supporting the growth, development, and strength of *Asthi Dhātu*.

Role of *Navanita*

According to Ayurvedic texts, fresh butter known as *Navanita*, plays an important role in childhood nutrition. *Navanita* possesses *Grahi* and *Deepana* properties and nourishing qualities.

From a nutritional perspective, dietary fat facilitates the absorption of fat-soluble vitamins, including vitamins A, D, E, and K. This provides a physiological context for the traditional use of fat-containing foods as part of a balanced and nourishing diet. Ayurveda, however, does not consider a food beneficial merely because it is heavy or rich; equally important is the body's capacity to digest, assimilate, and metabolically utilize the food. *Navanita*, which possesses *Guru Guna*, is traditionally considered supportive of *Dhatu* nourishment. Classical descriptions also attribute to fresh butter properties that support bowel regulation and digestive function and describe it as beneficial for the heart. It has also been indicated in conditions such as *Grahani*, *Arsha*, and *Aruchi*, which correlate with disorders of digestion and malabsorption, haemorrhoids, and loss of appetite, respectively.

Acharya Charaka emphasizes the use of freshly churned butter, i.e., *Navanita*, as butter that has been stored for prolonged periods is traditionally considered to have fewer of the classical properties attributed to freshly prepared butter.

According to Ayurvedic principles, in the process of tissue nourishment, *Asthi Dhātu* is derived from *Meda Dhātu*. From a modern nutritional perspective, dietary fat facilitates the absorption of fat-

soluble vitamins, particularly vitamins A and D. Vitamin D is essential for calcium absorption and normal bone mineralization, while adequate dietary fat supports the bioavailability of these fat-soluble vitamins. Freshly churned butter (*Navanita*) provides dietary fat and, along with its described natural digestive and nourishing properties, contribute to overall nutritional support for skeletal health when consumed as part of a balanced diet.

Role of Marich (*Piper nigrum* - Black Pepper)

Maricha Piper nigrum (black pepper) is described in Ayurvedic texts as possessing *Ushna* (heating) and *Ruksha* (dry) properties, with a *Katu* (pungent) taste and *Tikshna* (sharp) attributes, which are associated with *Deepana* (appetite-stimulating) activity. Its combination with butter offers a complementary interaction of these properties. *Piper nigrum*, particularly in its dried form, is known for its digestive and appetite-stimulating effects and has traditionally been used in Ayurveda for the management of conditions such as intestinal worm infestation, abdominal colic, and certain respiratory disorders.

Table 1: Comparative Guna-Karma (Ayurvedic Pharmacological Properties) of Navanita and Marich

Property (Guna-Karma)	Navanita (Fresh Butter)	Marich (<i>Piper nigrum</i>)
Rasa (Taste)	Madhura (Sweet)	Katu (Pungent)
Guna (Qualities)	Guru, Snigdha (Heavy, Unctuous)	Laghu, Tikshna, Ruksha (Light, Sharp, Dry)
Virya (Potency)	Sheeta (Cooling)	Ushna (Heating)
Primary Karma (Action)	Grahi, Dipana, Bruhana (Nourishing, digestive-supportive)	Dipana, Pachana (Appetite- and digestion-stimulating)
Contribution to Dhatu Poshan	Provides dietary fat; supports tissue nourishment and Asthi bulk	Enhances Agni and nutrient bioavailability (bio-enhancing, via piperine)
Indicated Conditions	Grahani, Arsha, Aruchi	Krimi (worm infestation), Agnimandya, respiratory conditions

Calcium, Iron and Adolescent Growth

Growth during childhood and adolescence does not occur at a uniform rate. Adolescence is a crucial stage for skeletal development, characterized by rapid growth and bone mineralization. Mineral-rich foods and traditional dietary substances, including milk (*Dugdha*), sesame seeds (*Tila*), chickpeas (*Chana*), amaranth (*Rajgira*), drumstick (*Moringa*), ragi (*Finger millet*), green vegetables etc. can provide important nutrients to support growth and development during childhood and adolescence. In contemporary nutritional science, adequate calcium intake during adolescence is considered particularly important. The recommended daily intake of calcium for adolescents is approximately 1,300 mg. A substantial proportion of adult bone mass is accumulated during this developmental

stage, making adolescence a critical period for establishing optimal bone health. Therefore, adequate nutrition during this period may contribute to the development and maintenance of a strong and healthy skeleton.

During adolescence, the skeleton undergoes rapid growth and mineralization, with a substantial amount of adult bone mass being accumulated during the teenage years. Approximately 40% of adult bone mass is acquired during adolescence, and individuals typically reach about 90% of their peak bone mass by the age of 18. This period is therefore particularly important for adequate nutrition and bone mineralization, as the developing skeleton has a high demand for calcium and other essential nutrients.

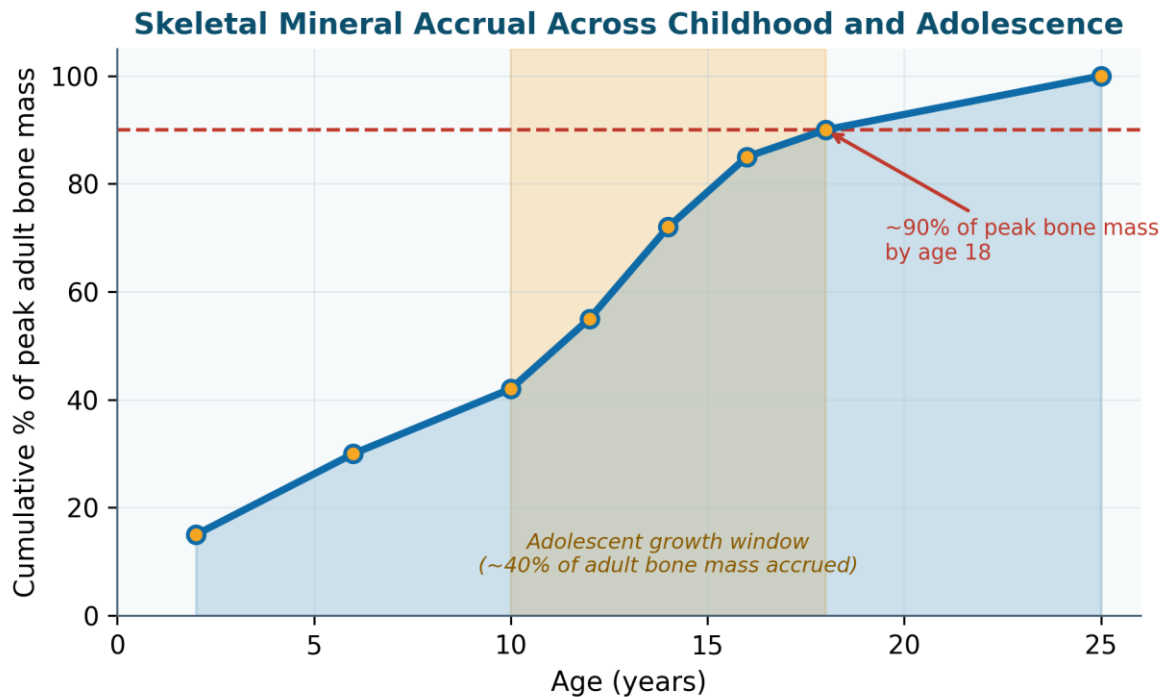


Figure 2: Approximate skeletal mineral accrual across childhood and adolescence, expressed as cumulative percentage of peak adult bone mass. Illustrative curve based on the pattern described in references 6–8.

Table 2: Approximate calcium content of selected traditional dietary sources

Dietary Source	Ayurvedic Name	Approx. Calcium (mg/100 g)
Milk (cow, whole)	Dugdha	~120
Sesame seeds	Tila	~975
Chickpeas (cooked)	Chana	~105
Amaranth grain	Rajgira	~160
Drumstick leaves	Moringa	~185
Finger millet	Ragi	~344

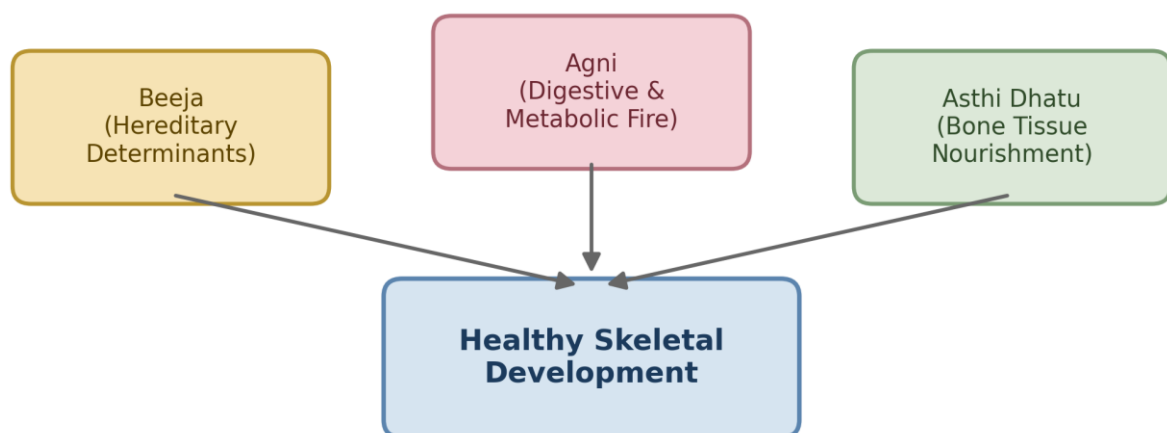
Table 3: Recommended dietary calcium intake by age group

Age Group	Recommended Calcium Intake	Source
9–13 years	1,300 mg/day	Institute of Medicine, 2011
14–18 years	1,300 mg/day	Institute of Medicine, 2011
19–50 years (adult)	1,000 mg/day	Institute of Medicine, 2011

***Asthi-Sara* and Height Measurement**

Ayurveda describes several factors (Figure 3) that contribute to the development and nourishment of the skeletal system. Balanced *Tridoshas* (the three bodily regulatory principles) and proper functioning of *Agni* (digestive and metabolic processes) are considered important for healthy growth and development. The following are some of the fundamental Ayurvedic principles related to the development of a strong and healthy skeletal system:

- ***Beeja*** (hereditary determinants): *Beeja* is considered a primary biological determinant of an individual's constitution, influencing characteristics such as height, body structure, and skeletal development.
- ***Agni*** (digestive fire): Proper digestion and metabolism are considered essential for the formation and nourishment of *Ahara Rasa* (the nutritive essence derived from food), which subsequently supports the nourishment of body tissues, including *Asthi Dhātu* (bone tissue).
- ***Asthi Dhātu*** (bone tissue): The proper development and nourishment of *Asthi Dhātu* is essential for the strength, integrity, and healthy development of the skeletal system.

Figure 3: Factors contributing to the development of the skeletal system

Balanced Tridosha & proper Agni support the sequential nourishment of Asthi Dhātu, contributing to skeletal strength and integrity.

While contemporary perspectives put a lot of emphasis on an individual's height, ancient Ayurveda scholars were concerned about *Asthi-Sara*, denoting the significance of bone tissue. Bones grow not only in length at the sites of growth plates but also in width and volume. Though the genetic predisposition of a specific individual does play a significant role in determining height, there are plenty of ways for their skeleton to become even stronger, including adequate nutritional support.

Facts and Rationale

In order to uphold full scientific and *Shastrokta* truthfulness, genes largely determine the potential for height; twin studies suggest that adult height is approximately 80% genetic. Nutrition and lifestyle will not change the genetic ceiling, but they will help the child reach it instead of failing to do so because of deficiencies.

Optimal intake is needed for the bones, but intake beyond requirements will not lead to a greater outcome and may even be harmful. After the growth plates have united in the late teens, vertical development is over forever, which makes the growing window irreplaceable.

Conclusion

The concept of *Dhatu Poshan* refers to a continuous and sequential process of tissue nourishment. In the context of skeletal development, *Asthi Dhatu* is particularly significant; however, the concept of *Asthi-Sara* shifts the emphasis from height alone to the resilience, strength, and structural quality of the skeleton. *Marich* is traditionally described as possessing *Deepana* properties and supporting digestion, while *Navanita* exemplifies the Ayurvedic emphasis on tissue nourishment. Dietary fat obtained from *Navanita* facilitates the absorption of fat-soluble vitamins, while piperine obtained from *Marich* possesses bio-enhancing properties.

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