

Therapeutic and Preventive Potential of Bala (*Sida cordifolia* Linn.) as a Rasayana in Adolescent Female Health: A Critical Review

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Abstract: *Adolescence is a crucial developmental phase in a female's life, marked by significant physiological and endocrinological changes, including the onset of menarche. Ayurveda emphasizes Rasayana therapy for promoting optimal growth, hormonal balance, and reproductive health during this transition. Bala (Sida cordifolia Linn.), renowned for its Rasayana, Balya, and Brimhana properties, plays a pivotal role in nourishing Sapta Dhatus, fortifying reproductive tissues, and enhancing Ojas. Its Madhura Rasa, Sheeta Virya, Snigdha and Picchila Guna facilitate endocrine regulation, ensuring menstrual homeostasis and psychosomatic stability. This critical review evaluates the therapeutic efficacy of Bala in adolescent girls, correlating Ayurvedic principles with contemporary scientific insights. The study highlights Bala's immunomodulatory, neuroendocrine-stabilizing, and uterine-tonic effects, underscoring its potential in addressing pubertal transitions and reproductive health disorders. Further clinical research is warranted to standardize Bala-based interventions for optimizing adolescent well-being.*

Keywords: Rasayana, Bala, *Sida cordifolia* Linn., Adolescent Health, Menarche, Female Reproduction

I. INTRODUCTION

Adolescence marks a critical transitional phase in a female's life, characterized by significant physiological, psychological, and endocrinological changes. Among these, the onset of menarche signifies the maturation of the reproductive system, governed by the interplay of Doshas and Dhatus as per Ayurvedic principles. While classical texts of Ayurveda, including those by Acharya Vagbhata and Acharya Kashyapa, state that the ideal age for menarche is around 12 years, contemporary trends indicate an early onset, sometimes as young as 9 years, owing to dietary habits, lifestyle modifications, and environmental influences.⁽¹⁾

The formation of Raja (menstrual blood) is described in Ayurveda as an upadhatu (secondary tissue) of Rasa Dhatu, undergoing transformation under Agneya influences. Chakrapani clarifies this sequential process by explaining that Artava remains in a Saumya state during formation but acquires an Agneya nature at the time of excretion, paralleling the hormonal regulatory mechanisms of the Hypothalamic-Pituitary-Ovarian (HPO) axis in contemporary science.⁽²⁾ The maturation of reproductive tissues—breasts, uterus, and external genitalia—occurs progressively with the accumulation and cyclic excretion of Raja, marking the establishment of reproductive potential.⁽³⁾

In this crucial developmental phase, adolescent girls often experience physiological stress, mood fluctuations, metabolic imbalances, and disorders related to early or delayed menarche.⁽⁴⁾ Ayurveda emphasizes Rasayana therapy as a fundamental approach to promoting optimum growth, hormonal balance, psychological stability, and immune competence. Rasayana, by acting at the level of Sapta Dhatus, nourishes and strengthens both Sharira (body) and Manas (mind), ensuring a smooth transition through puberty while preventing premature ageing and menstrual irregularities.⁽⁵⁾ Among various Rasayanadravyas, Bala (*Sida cordifolia* Linn.) is highly revered for its Balya, Brimhana, Rasayana, Vrushya, and Prajasthapana properties, making it a potential therapeutic agent in adolescent health.⁽⁶⁾ Bala, with its Madhura Rasa, Sheeta Virya, Snigdha and Picchila Guna, effectively enhances Shukra and Artava formation,

strengthens reproductive tissues, and supports endocrine balance. Its Ojovardhaka (immunomodulatory) property further contributes to overall vitality and well-being.⁽⁷⁾

This critical review aims to analyze the Rasayana Karma of Bala in adolescent girls, highlighting its role in physiological maturation, reproductive health, and psychosomatic stability. The study also emphasizes the need for further clinical exploration and standardization of Bala-based interventions to address the challenges of pubertal transitions and reproductive health disorders in the contemporary era.

II. MATERIAL AND METHODS

This study employs a critical review methodology, analyzing Ayurvedic texts and contemporary research to assess Bala (*Sida cordifolia* Linn.) as a Rasayana in adolescent girls. Classical references from Charaka Samhita, Sushruta Samhita, and Kashyapa Samhita were reviewed alongside modern pharmacological studies. Inclusion criteria focused on Bala's effects on growth, reproductive health, and psychological well-being, while irrelevant studies were excluded. The data were systematically analyzed to correlate Ayurvedic principles with modern scientific insights.

III. RESULTS

Menarche And Reproductive Maturity:

According to Ayurveda, the onset of menarche is a significant milestone in a female's life, marking the transition to reproductive maturity. Acharya Vagbhata describes this transition by comparing it to the flowering and fruiting of plants, emphasizing that reproductive elements like Sukra and Raja are not fully developed before a certain age. Vagbhata specifies that Raja and Stanya become evident only after twelve years and start declining after fifty years. Acharya Kashyapa extends this analogy, stating that just as a fruit within a flower is initially imperceptible, so too are Shonita and Sukra before their maturity.⁽⁸⁾ These observations highlight the role of age and physiological preparedness in reproductive health. Kashyapa further states that menarche and menopause can be influenced by dietary habits and overall health, which aligns with modern observations of variations in menarcheal age due to lifestyle and nutritional factors.

Formation of Raja:

Raja, also referred to as Artava, is formed from Rasa Dhatu and is expelled cyclically from the uterus. Charaka, Sushruta, Dalhana, Vagbhata, and Chakrapani describe Raja as a refined essence of Rasa, whereas Vagbhata refers to it as blood accumulated in the uterus before discharge.⁽⁹⁾ Chakrapani further elaborates on this process using the terms Avirbhava and Tirobhava, describing the initial nourishment phase and the subsequent transformation leading to menstrual discharge. The modern endocrinological perspective supports this Ayurvedic view, explaining that hormones from the hypothalamus reach the pituitary, then the ovaries, and finally the endometrium, where blood accumulates before menstruation. Additionally, the development of secondary sexual characteristics such as breast formation, uterine growth, and vulvar maturation is linked to Raja accumulation.⁽¹⁰⁾

Impact of Modern Lifestyle On Menarche:

The decreasing age of menarche in contemporary times has been attributed to changes in diet and lifestyle, including the consumption of processed foods. Rapid growth spurts and fluctuating growth rates during adolescence are accompanied by psychological challenges such as anxiety, stress, and mood swings, along with physical symptoms like paleness, back pain, and nausea.⁽¹¹⁾ Ayurvedic Rasayana therapies are known to counteract these negative effects by promoting overall nourishment and physiological balance.

Role of Rasayana In Adolescent Health:

Rasayana therapy, as described in Ayurveda, plays a crucial role in promoting the health and well-being of adolescent girls. Rasayana drugs are believed to enhance tissue nourishment, boost immunity, and support overall physiological functions. Rejuvenation therapy has been shown to have both physical and psychological benefits, mitigating early aging effects and enhancing disease resistance. Modern research supports this concept, indicating that Rasayana drugs can help balance endocrine secretions, regulate mood swings, and support normal folliculogenesis, glycemic control, and lipid metabolism. These therapies also assist in ovulatory function regulation, cyst resolution, and hormonal balance, thereby addressing conditions like hirsutism and polycystic ovarian syndrome (PCOS).⁽¹²⁾

Bala As A Rasayana For Adolescent Girls

Bala (*Sida cordifolia* Linn) is a well-documented Rasayana herb with multiple benefits, including Balya (strengthening), Brimhana (nourishing), and Ojo Vardhaka (immune-enhancing) properties. Its cooling (Sheet Virya), unctuous (Snigdha), and sweet (Madhura) nature contribute to its effectiveness in adolescent health. The transition from childhood (Balyavastha) to old age (Jaravastha) is governed by the dominance of different Doshas, influencing Dhatu composition and physiological changes. During puberty, Pitta Dosha predominates, while Kapha governs childhood and Vata dominates menopause, leading to progressive Dhatu depletion. This progression results in conditions such as menopausal syndrome, primarily caused by estrogen level fluctuations.⁽¹³⁾

Mode of Action of Bala :

Bala (*Sida cordifolia*) is a revered herb in Ayurveda, classified under Balya and Rasayana Dravyas. It is extensively utilized for its strengthening, rejuvenating, and adaptogenic properties. As a Rasayana, Bala plays a pivotal role in fortifying adolescent reproductive health by enhancing Dhatu Poshana, improving Ojus, and maintaining hormonal equilibrium.

Pharmacodynamic Properties of Bala⁽¹⁴⁾:

Rasa (Taste)	Madhura
Guna (Qualities)	Snigdha, Guru
Virya (Potency)	Sheeta
Vipaka (Post-digestive effect)	Madhura
Doshagnata	Vata-Pitta Shamaka

Mechanism of Action⁽¹⁴⁾:

Dhatu Poshana (Tissue Nutrition): Bala promotes proper nourishment and development of Rasa, Rakta, Mamsa, and Shukra Dhatus, which are crucial for optimal reproductive health in adolescent females.

Balya and Rasayana Effect: By virtue of its Rasayana properties, Bala augments cellular vitality, enhances Ojus, and imparts VyadhiKshamatva (immunity), thereby preventing reproductive disorders.

Hormonal Modulation: Bala exerts adaptogenic and neuroendocrine-regulating effects, aiding in the homeostasis of reproductive hormones, ensuring a balanced menstrual cycle.

Uterine Tonic: Bala strengthens uterine muscles, supporting optimal uterine function and menstrual regulation.

Nervine Strengthening: Due to its Medhya (intellect-promoting) action, Bala pacifies Vata, ensuring stable neurological functions and mitigating stress-induced reproductive irregularities.

Shukra Janana (Enhancement of Reproductive Fluids): Bala nourishes and enhances the quality of Artava (menstrual blood) and Shukra Dhatu, ensuring reproductive well-being.

IV. DISCUSSION

The present critical review elucidates the Rasayana attributes of Bala (*Sida cordifolia* Linn.) in the context of adolescent female health, emphasizing its profound influence on physiological maturation, reproductive well-being, and psychosomatic equilibrium. Ayurveda delineates adolescence as a pivotal transitional phase governed by the interplay of Doshas and Dhatus, necessitating appropriate nutritional and therapeutic interventions to ensure optimal development.

Bala, categorized as a Balya and Rasayana Dravya, exhibits multifaceted therapeutic potential in adolescent girls. Its Madhura Rasa, Sheeta Virya, Snigdha and Picchila Guna facilitate comprehensive Dhatu Poshana, ensuring nourishment and fortification of Rasa, Rakta, Mamsa, and Shukra Dhatus. This, in turn, fosters reproductive health by modulating hormonal equilibrium and augmenting Ojus.

The adaptogenic and neuroendocrine-stabilizing properties of Bala contribute significantly to menstrual homeostasis. By pacifying Vata and Pitta Doshas, Bala harmonizes the functions of the Hypothalamic-Pituitary-Ovarian (HPO) axis, ensuring timely and regular menstrual cycles. Furthermore, its Medhya action aids in neurological stability, mitigating stress-induced menstrual irregularities and promoting mental well-being.

Bala serves as a potent Garbhashaya Balya (uterine tonic), strengthening the uterine musculature and supporting optimal endometrial function. Its Brimhana effect enhances Artava quality, ensuring the proper formation and cyclic excretion of Raja, thereby addressing conditions such as oligomenorrhea and primary dysmenorrhea.

The Ojovardhaka and VyadhiKshamatva-enhancing properties of Bala render it an effective immunomodulator, fortifying adolescent girls against recurrent infections and physiological stressors. The herb's adaptogenic nature aids in coping with the metabolic demands of puberty, preventing premature senescence and enhancing overall vitality.

V. CONCLUSION

Bala (*Sida cordifolia* Linn.) is a potent Rasayana that supports endocrine balance, reproductive health, and psychological well-being in adolescent girls. It offers a natural intervention for early menarche, menstrual irregularities, and pubertal stress. Future research is needed to validate its efficacy and enhance its role in adolescent healthcare.

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