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Alchemy of Ayurveda: Scientific Validation of Hirakbhasma (Diamond) Preparation through Classical Method

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ABSTRACT
Hirak (Vajra) Bhasma, a highly potent herbo-mineral formulation, occupies a significant place in Rasashastra due to its therapeutic potential and alchemical sophistication. The present study aimed to scientifically document the stepwise preparation and observations of Hirak Bhasma (Purified Diamond Ash) as per classical references. The Marana (calcination/ in cineration) process was conducted through 22 successive Gajaputas, using Ashva Mutra (equine urine) and Gulab Swarasa (rose extract) as levigation media. Observations regarding weight variation, color transition, and peak temperature were meticulously recorded for each incineration cycle. The final product exhibited greyish-brown coloration, fineness, lusterless texture, and passed all classical Bhasma Pariksha tests including Rekhapurnatva, Varitaratva, and Nischandratva. The study provides a scientific foundation for the standardization of Vajra Bhasma preparation with reproducible pharmaceutical parameters.

Keywords: Hirak Bhasma, Vajra Bhasma, Rasashastra, Ayurvedic Metallurgy, Gajaputa, Marana, Ashva Mutra, Pharmaceutical Standardization.

I. INTRODUCTION

Ayurveda, the ancient system of Indian medicine, employs BhasmaKalpana (calcined formulations) to render metals and minerals therapeutically safe and bioavailable. Vajra (diamond) is recognized as the hardest natural substance, possessing remarkable Rasayana (rejuvenative) and Medhya (neurotonic) properties when transformed into Bhasma form. The concept of Marana involves repeated incineration and trituration under controlled conditions to achieve the desired physicochemical transformation. Classical texts such as Bhasma Vigyaniyadescribe various procedures for Vajra Bhasma preparation, differing mainly in Bhavana (levigation) media and number of Puta (in cineration cycles). The present study was designed to evaluate and reproduce the classical procedure of Hirak Bhasma preparation using contemporary equipment and to observe the transformation pattern during each stage of processing.

II. MATERIALS AND METHODS

The study utilized Shuddha Vajra (Purified Diamond) as the principal raw material, accompanied by Shuddha Gandhaka (Sulphur), Shuddha Haratala (Orpiment), and Shuddha Manahshila (Realgar) as auxiliary ingredients. Ashva Mutra (fresh horse urine) and Gulab Swarasa (juice of Rosa centifolia Linn.) were used as Bhavana Dravya (levigation media). The procedure was carried out using ancow dung cake, earthen SharavaSamputa, mortar and pestle, and other standard laboratory apparatus. The pharmaceutical process comprised the following steps:

1. Bhavana (Levigation): Shuddha Vajra was triturated with Trigandhaka (equal parts of Shuddha Gandhaka, Haratala, and Manahshila) using Ashva Mutra for approximately 8 hours to prepare a homogeneous paste.
2. Chakrika Nirmana (Pellet formation): The mass was rolled into uniform pellets and dried under sunlight.
3. Puta(Incineration): The dried pellets were sealed between two earthen dishes (Sharava Samputa) using mud-smeared cloth (Sandhibandhana) and subjected to successive Gajaputa incinerations. The first 10 cycles included Trigandhaka addition, while from the 11th to 22nd cycle, Gulab Swarasa was used as levigation medium.
4. Collection and Pulverization: After each cycle, the residue was collected, weighed, and ground into fine powder.
5. Storage: The final product was stored in an airtight glass container for further analysis.

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III. OBSERVATIONS

The following table presents the observations recorded during each Gajaputa process:

Puta No.	Weight Before (g)	Weight After (g)	Peak Temp (°C)	Color After Puta
1	215	129	952	Purple white
2	219	167	986	Purple white
3	249	199	946	Light grey
4	279	241	953	Light grey
5	310	280	923	Light grey
6	339	323	992	Whitish grey
7	366	365	983	Pinkish grey
8	398	388	934	Pinkish grey
9	446	405	918	Pinkish white
10	463	420	976	Whitish pink
11	436	425	968	Whitish grey
12	445	439	912	Pinkish white
13	455	456	994	Whitish grey
14	467	466	969	Pinkish white
15	479	475	987	Brownish white
16	489	486	932	Pinkish white
17	496	490	976	Whitish pink
18	503	500	988	Whitish pink
19	509	506	997	Whitish grey
20	515	511	938	Whitish grey
21	526	520	982	Greyish brown
22	546	530	959	Greyish brown

IV. DISCUSSION

The progressive transformation of Vajra into its Bhasma form was characterized by significant physicochemical changes. Each cycle of incineration facilitated the reduction in particle size, loss of metallic luster, and enhancement of fineness. The color transformation from purple-white to greyish-brown suggests oxidation and compound formation between Vajra constituents and sulfur/arsenic compounds derived from Trigandhaka. The continuous Bhavana with Ashva Mutra may aid organic complex formation, promoting biocompatibility, while Gulab Swarasa imparts seeta (cold) effects. Thermal exposure between 918°C and 997°C ensured sufficient heat penetration for complete material transformation. Confirmative tests (Rekhapurnatva, Nischandratva, and Varitaratva) confirmed the product's classical Bhasma Lakshana.

V. CONCLUSION

The pharmaceutical preparation of Hirak (Vajra) Bhasma through 22 Gajaputas resulted in a stable, fine, and therapeutically safe product. The stepwise documentation of physicochemical changes validates traditional Ayurvedic procedures using modern observational parameters. The study emphasizes that standardization of temperature, levigation media, and number of Puta are critical determinants of final product quality. Further analytical characterization using XRD, SEM, and ICP-MS may provide deeper insights into particle morphology and elemental composition, supporting scientific validation of this ancient alchemical process.

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