

DETAILED STUDY OF ANCIENT AND CONTEMPORARY KNOWLEDGE OF
UPARATNA W.S.R TO MINEROLOGICAL IDENTIFICATION AND PHYSICO-
CHEMICAL CHARACTERIZATIONDr. Lalitha M. Vatar*¹ and Dr. Chandrashekhar Kuppi²¹Assistant Professor, Department of Rasashastra and Bhaishajya Kalpana, Sharada Ayurvedic Medical College and Hospital, Yadgir, Karnataka.²Head of The Department of Rasashastra and Bhaishajya Kalpana, Sharada Ayurvedic Medical College and Hospital, Yadgir, Karnataka.

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ABSTRACT

Research begins with doubts and ends with facts; facts which serve as new data to be verified again. Thus the process of research never ends, but at the end of it the researcher would have become wiser with plans to counter newer challenges. **Rasashastra** is a special branch of Ayurveda which deals with the metals and minerals into a safe and acceptable form. In Rasashastra apart from Gold and Silver, Mercury, Mica, Arsenic, Zinc, Tin and several other minerals, Gems, Shells, Horns are used. Siddacharyas of Rasashastra had used the gems for the purpose of longevity of life in a human body. **Uparatna or Gems** are crystalline minerals that can be used as a distinct and advantageous remedial measure in astrology. Gems are considered to be the best for strengthening the positive influences of planets. They intensify the rays of the planets they represent. These beautiful, cold, hard stones are believed to provide supernatural powers that would protect the wearer from illness, misfortune and danger.

KEYWORDS: Uparatna, Gems, Siddacharya, Astrology, Longevity.

INTRODUCTION

Uparatna

Gem, semi precious stone, so the uparatna means nearer to ratna, They are slightly lower than RATNAS in their Hardness, Lusture, Transparency and gunas. When a particular ratna is not available then these uparatnas are used which are having nearly similar properties like ratnas. Uparatnas having their mineralogical identification and physico-chemical characters like **Piezoelectricity** is the electric charge that accumulates in certain solid materials (notably crystals certain ceramics, and biological matter such as bone, DNA and various proteins) in response to applied mechanical stress. The word *piezoelectricity* means electricity resulting from pressure **Birefringence** is the optical property of a material having a refractive index that depends on the polarization and propagation direction of light. **Pleochroism** is an optical phenomenon in which a substance appears to be different colors when observed at different angles, especially with polarized light. RISG, Absorption Spectra etc.

Importance of Uparatna^[1]

मणयोऽपि च विज्ञेयाः सूतबन्धस्य कारकाः । देहस्य धारका नृणां जराव्याधिविनाशकाः ॥ आ.प्र 5/1

Mani are helpful in parada bandana and also does deha dharana, jaravyadi nashaka.

गुणाः ²

रत्नानि सोपरत्नानि चक्षुष्याणि सराणि च ग्राहालक्ष्मीविषक्षेप्यपापसंतापजिन्ति च ॥ आ.प्र 5/174

Ratnas and uparatnas are netrya and sara guna, Graha, alaxmi, visha, kshina, papa and santapa nashaka.

Acc to Rasa Tarangini Uparatnas^[3]

वैक्रान्तं सुर्यकान्तश्च चन्द्रकान्तो नृपोपलः। पेरोजकञ्च स्फटिकं क्षुद्ररत्नगणो ह्वयम् ॥ रत्न- 23/154

1) वैक्रान्त (Tourmaline) 2) सुर्यकान्त (Sun stone) 3) चन्द्रकान्त (Moonstone)

4) नृपोपल (Lapis lazuli) 5) पेरोजक (Turquoise) 6) स्फटिका (Rock crystal)

Vaikranta (Tourmaline)Vaikranta is first described as Vaikrantaka Dhatu in Kautilya Arthashastra, 13th chapter. It is explained in all the Rasagranthas right from Rasahridaya tantra in Maharasa and Uparatna Varga, After 8th AD its description is found in all texts.

NIRUKTI⁴ - विकृन्तयति लोहानि तेन वैक्रान्तकः स्मृतः। R.R.S 2/58

कृन्त- is used in the meaning of chedana, As it is too hard leaves marks if it is rubbed on dhatus, As it cures all diseases it is called vaikrantha.

वैक्रान्तस्य स्वरूपम्⁵

अष्टास्रमष्टफलकं सितपीतासितारुणम् । मसृणं गुरु षट्कोणं वैक्रान्तं जात्यमुच्यते ॥ र. तं 23/ 157,158

रसेन्द्र चूडामणि १०/६४, रस रत्न समुच्चय २/६८, रस तरंगिणी २३/१५६,

कैयदेवनिघण्टु 144= वज्रतुल्यगुणा

8 Edges, 8 Surfaces, white, yellow, black or red in colour, smooth, shiny, heavy, 6 angle.

Vaikranta : Substitute for Vajra

Identification	Ra jala ni	Ra ta
Nature		अष्टास्रः, अष्टधारः, अष्टफलकः, षट्कोणः
Luster	मसृणं	
Hardness	choorna vajra, kuvajra,	Guru
Colour	Shweta rakta peeta neela paravatachavishyamala krushna karbura	सितपीतासितारुण

Minerological Identification and Physico-Chemical Characterization of Tourmaline^{6]}

Category	cyclosilicate
Formula (repeating unit)	(Ca,K,Na,□)(Al,Fe,Li,Mg,Mn) ₃ (Al,Cr, Fe,V) ₆ (BO ₃) ₃ (Si,Al,B) ₆ O ₁₈ (OH,F) ₄
Identification	
Color	Most commonly black, but can range from brown, violet, green, pink or in a dual- colored pink and green.
Crystal system	Hexagonal
Crystal habit	Parallel and elongated. Acicular prisms, sometimes radiating. Massive. Scattered grains (in granite).
Cleavage	Indistinct
Fracture	Uneven, small conchoidal, brittle
Mohs scale hardness	7–7.5
Luster	Vitreous, sometimes resinous
Streak	White
S G	3.06 (+.20 -.06)
Density	2.82–3.32
Polish luster	Vitreous
Optical properties	Double refractive, uniaxial negative
R I	n _ω =1.635–1.675, n _ε =1.610–1.650
Birefringence	-0.018 to -0.040; typically about .020 but in dark stones it may reach .040
Pleochroism	typically moderate to strong Red Tourmaline: Definite; dark red, light red Green Tourmaline: Strong; dark green, yellow-green Brown Tourmaline: Definite; dark brown, light brown Blue Tourmaline: Strong; dark blue, light blue
Dispersion	.017
Ultraviolet fluorescence	pink stones— inert to very weak red to violet in long and short wave
Absorption spectra	a strong narrow band at 498 nm, and almost complete absorption of red down to 640nm in blue and green stones; red and pink stones show lines at 458 and 451nm as well as a broad band in the green spectrum

Suryakanta (Sun Stone)

लक्षणम्⁷

विमलो निस्तुषः सिग्धो घृष्टो व्योमसुनिर्मलः । मसृणो निर्वणञ्चैव जात्यः सुर्गोपलः स्मृतः ॥ र. तं 23/183

Clear, without layers, unctous, when rubbed it will be clear like the sky, smooth, without holes.

परिक्षणम्⁸

यस्तु सुर्याग्निसंस्पृष्टः प्रसूते दहनप्रभाम् । स येक जात्यः कथितः सुर्यकन्तः परिक्षकैः ॥ र. तं 23/184

It should look like burning when it comes in contact with intense sunrays.

गुणा:⁹

सूर्यकान्तो मतो मेध्य उष्णञ्चैव रसायनः । बलासवातशमनो विशेषेण च कीर्तितः॥ र.तं 23/185

Suryakanta is usna in virya, nirmala in appearance & rasayana in karmas, destroys vata & kapha. It is a favourite stone of sun planet.

Nature	विमलो निस्तुषः स्निग्धो
Colour	मसृणो निर्वण,
Streak	घृष्टो व्योमसुनिर्मलः when rubbed it will be clear like the sky,
Feel	Snigdha

MI & PCC OF SUN STONE^[10]

Category	Crystal
Formula (repeating unit)	Sodium calcium aluminum silicate(Ca,Na)((Al,Si) ₂ Si ₂ O ₈)
Color	clear, yellow, red, green, blue, and copper shiller
Crystal habit	Euhedral Crystals, Granular
Crystal system	Triclinic
Twinning	Lamellar
S G	2.65
Hardness	5.5-6
Cleavage	001
Diaphaneity	Transparent to Translucent
Density	2.64-2.66
Optical properties	Double Refractive:
R I	1.525-1.58
Pleochroism	1

चन्द्रकान्त (Moonstone)

लक्षणम् ¹¹

यन्मिलं सुमसृणं शिशिरं च पीतं स्निग्धं परं सुविशदं परमं पवित्रम् ।

सावं स्रवत्यथ परं तुहिनाशुसंगा चन्द्रोपलं खलु तदेव मतं तु जत्यम् ॥ र.तं 23/188

Clear, very smooth, cold to touch, yellow, unctous etc In moon rays it looks like secreting.

गुणा:¹²

चन्द्रकान्तोऽतिशिशिरः स्निग्धः पित्तापहः परम् । रक्तपित्तप्रशमनस्तथा दाहनिषूदनः ॥ र.तं 23/189

It is seeta in virya, Unctous, Pittahara Raktapitta and daha shamaka.

Nature	यन्मिलं ,शिशिरं , स्निग्धं परं सुविशदं
Colour	पीतं
Luster	सुमसृणं
Feel	Snigdha

MI & PCC OF MOON STONE^[13]

Moonstone is a sodium potassium aluminium silicate, with the chemical formula (Na,K)AlSi₃O₈.

Category	Feldspar variety
Identification	
Color	Can be numerous colors, including blue, grey, white, pink, green and brown
Fracture Luster	uneven to conchoidal pearly
Mohs scale hardness	6.0-6.5
Birefringence	0.05-0.008
Streak	White
S G	2.16
R I	1.518-1.526
Cleavage	2,1 basal; 2,1 prismatic; 3,1 pinacoidal
Transparency	Transparent to Translucent

नूपोपल, राजावर्त (Lapis lazuli)

Clear, very smooth, free from mala, unctous, neela varna (like sky in sharada rutu)

स्वरूपम्¹⁴

यन्निर्मलः सुमसृणः खलु गारशून्यःस्निग्धञ्च शारदनिरञ्चनिभः सुनीलः ।

कृष्णो गुरुञ्च शिखिकण्टसमप्रकाशो राजोपलः खलु स येव मतस्तु जात्यः ॥ र.तं 23/192

Black, heavy, colour of peacock neck. It is used in unani medicine after preparing its pisti with rose water.

	Ra ja ni	Ra ta	Ra ra sa
Nature		निर्मलः गारशून्यः स्निग्ध	
Rock	Alpa rakto ,nilikaAsita, shikikantasamasoumyam	शारदनिरञ्चनिभः सुनीलः कृष्णो शिखिकण्टसमप्रकाशो	Rakta neelika mishrita
Luster		सुमसृणः	masruna
S G	Guru	Guru	Guru

MI & PCC OF LAPIS LAZULI^[15]

Category	Metamorphic Rock
Formula (repeating unit)	mixture of minerals (Na s3-Al) Al2 (SiO4)3with lazurite

Identification

Color	Blue, mottled with white calcite and brassypyrite
Crystal habit	Compact, massive
Crystal system	None, as lapis is a rock. Lazurite, the main constituent, frequently occurs as decahedral
Cleavage	None
Fracture	Uneven-Conchoidal
Mohs scale hardness	5-5.5
Luster	Dull
Streak	light blue
S G	2.7-2.9
R I	1.5

पेरोजक (Turquoise)

virya, dipana, sara, hridya & vishahara in karmas & destroys netra rogas.

Guna^[16] piroja is kashaya & madhura in rasa, sita in

It is used in the form of bhasma & pisti, { in unani medicine it is said to give strength to heart, brain & stomach. It destroys ashmari. Used in duodenal ulcer & palpitation }.

Colour	हरिताश्मा च भस्मांगं हरितं (Ra ta)	Blue, blue-green, green
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MI & PCC OF TURQOISE^[17]

Category	Phosphate minerals
Formula (repeating unit)	CuAl ₆ (PO ₄) ₄ (OH) ₈ ·4H ₂ O
Strunz classification	08.DD.15
Identification	
Colour	Blue, blue-green, green
Crystal habit	Massive, nodular
Crystal system	Triclinic
Cleavage	Good to perfect

Fracture	Conchoidal
Mohs scale hardness	5–6
Lustre	Waxy to subvitreous
Streak	Bluish white
S G	2.6-2.9
Optical properties	Biaxial (+)
R I	$n_{\alpha} = 1.610$ $n_{\beta} = 1.615$ $n_{\gamma} = 1.650$
Birefringence	+0.040
Pleochroism	Weak
Fusibility	Fusible in heated HCl
Hardness	Just under 6
Solubility	Soluble in HCl

स्फटिक (Rock crystal OR QUARTZ)

स्वरूप¹⁸

Guna

It is madhura in rasa, cool in touch and balya in karma, Destroys rakta pitta, jwara & daha. It is used in the form of bhasma or pisti.

शीतं स्निग्धं निस्तुषं नेत्रहृद्यं घृष्टं धत्ते स्वच्छतां पूर्वतुल्याम् ।

स्वच्छच्छायं यञ्च शुद्धान्तरालं तन्निर्दिष्टं शैवस्रं तु जात्यम् ॥ र.तं 23/213

Its dose is 2-4 ratti.

Cold, unctous, without layers, good for netra and hrudaya, Clear when rubbed.^[18]

	Rajani	Rata
Nature	Nirmala nistushswaccha mani,	शीतं स्निग्धं निस्तुषं
Streak		घृष्टं धत्ते स्वच्छतां

MI & PCC OF QUARTZ^[19]

Category	Silicate mineral
Formula (repeating unit)	Silica (silicon dioxide, SiO ₂)
Crystal symmetry	Trigonal 32
Unit cell	a = 4.9133 Å, c = 5.4053 Å; Z=3
Color	Occurs in virtually every colour ,common colors are clear ,white, grey, purple, yellow etcColorless through various colors to black
Crystal habit	6-sided prism ending in 6-sided pyramid (typical), drusy, fine-grained tomicrocrystalline, massive
Crystal system	α -quartz: trigonal trapezohedral class 3 2; β - quartz: hexagonal 622
Cleavage	{0110} Indistinct
Fracture	Conchoidal
Tenacity	Brittle
Mohs scale hardness	7 – lower in impure varieties (defining mineral)
Streak	White
Diaphaneity	Transparent to nearly opaque
S G	2.65; variable 2.59–2.63 in impure varieties
Optical properties	Uniaxial (+)
R I	$n_{\omega} = 1.543$ – 1.545 $n_{\epsilon} = 1.552$ – 1.554
Birefringence	+0.009 (B-G interval)
Melting point	1670 °C (β tridymite) 1713 °C (β cristobalite)
Solubility	Insoluble at STP; 1 ppm _{mass} at 400 °C and 500lb/in ² to 2600 ppm _{mass} at 500 °C and 1500 lb/in ²

CONCLUSION

1. Before Samhitha kala, the Uparatnas were being used only for ornamental as well as astrological purposes. Later in Samhita Period they entered into

the field of medicine. After the development of Rasashastra, used in the display the wealth & to maintain the health.

2. Shodhita uparatnas are used either in the form of

- Pishti or Bhasmas
- To prove the superiority of shodhana of Ratnas and Uparatnas still analytical & clinical evidences are required.
 - In general pishtis are considered to be sheeta veerya indicated in pittaja vikaras, bhasmas Ushna veerya indicated in vatakapha vikaras.

- Kasinatha Shastri, 11th edn, Varanasi, Motilal Banarasi Das, 23 Taranga, 213 Shloka, 1979; 645.
- www.wikipedia.Quartz.31/5/2021 at 11:30 am.

Abbreviation

- M I & P C C –Minerological identification & Physico chemical characterization
- S G-Specific Gravity
- RI – Refractive Index

REFERENCES

- Shri Madhava, Ayurveda prakasha, edited by Shri Gulrajsharma Mishra, Varanasi, Chaukambha Bharati Academy, (Reprint), Chapter 5th, 1999; 1: 437.
- Shri Madhava, Ayurveda prakasha, edited by Shri Gulrajsharma Mishra, Varanasi, Chaukambha Bharati Academy, (Reprint), Chapter 5th, 1999; 174: 481.
- Sadhananda Sharma, Rasa Tarangini, edited by Kasinatha Shastri, 11th edn, Varanasi, Motilal Banarasi Das, 1979; 23(154): 632.
- Shree Vagbhatacharya, Rasa Ratna Samuchchaya edited by Kapil Dev Giri, (Reprint)edn, Varanasi, Chaukhambha Sanskrit Sansthan., 6th Chapter,60 Shloka, 2013; 15.
- Sadhananda Sharma, Rasa Tarangini, edited by Kasinatha Shastri, 11th edn, Varanasi, Motilal Banarasi Das, 1979; 23-157,158,634.
- www.wikipedia.Tourmaline.31/5/2021 at 11:30 am.
- Sadhananda Sharma, Rasa Tarangini, edited by Kasinatha Shastri, 11th edn, Varanasi, Motilal Banarasi Das, 1979; 23,183,639.
- Sadhananda Sharma, Rasa Tarangini, edited by Kasinatha Shastri, 11th edn, Varanasi, Motilal Banarasi Das, 23 Taranga, 184 Shloka, 1979; 639.
- Sadhananda Sharma, Rasa Tarangini, edited by Kasinatha Shastri, 11th edn, Varanasi, Motilal Banarasi Das, 23 Taranga, 185 Shloka, 1979; 640.
- www.wikipedia.Sunstone.31/5/2021 at 11:30 am.
- Sadhananda Sharma, Rasa Tarangini, edited by Kasinatha Shastri, 11th edn, Varanasi, Motilal Banarasi Das, 23 Taranga, 188 Shloka, 1979; 640.
- Sadhananda Sharma, Rasa Tarangini, edited by Kasinatha Shastri, 11th edn, Varanasi, Motilal Banarasi Das, 23 Taranga, 189 Shloka, 1979; 641.
- www.wikipedia.Moon stone.31/5/2021 at 11:30 am.
- Sadhananda Sharma, Rasa Tarangini, edited by Kasinatha Shastri, 11th edn, Varanasi, Motilal Banarasi Das, 23 Taranga, 192-641.
- www.wikipedia.Lapis Lazuli.31/5/2021 at 11:30 am.
- Sadhananda Sharma, Rasa Tarangini, edited by Kasinatha Shastri, 11th edn, Varanasi, Motilal Banarasi Das, 23 Taranga,210 Shloka, 1979; 645.
- www.wikipedia.Turquoise.31/5/2021 at 11:30 am.
- Sadhananda Sharma, Rasa Tarangini, edited by