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**A REVIEW ON THE MINERALS- SROTOANJANA AND SAUVIRANJANA**

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**ABSTRACT**

Rasashastra is a branch of Ayurveda pharmaceuticals, termed as Indian alchemy. It deals with the study of minerals, metals, etc. and its use in therapeutics. Anjana is a mineral and is said to be of five types namely sauviranjana, srotoanjana, neelanjana, pushpanjana and rasanjana.

Anjana have different roles like some are useful in treating eye diseases, some used for only beautification and some for both eye diseases and also for enhancing the look of the eyes. Srotoanjana and Sauviranjana are different chemically and have different therapeutic utility. Srotoanjana is cool, soothing, astringent and sweet. It is efficacious in obesity, eye-diseases, hiccups, poison, nausea, excess of phlegm and impurities of the blood. Sauviranjana is said as netrya (beneficial to eyes), rasayana (rejuvenate) and it pacify the tridosha.

From therapeutic point of view, lead sulphide may only be used as anjana in eye diseases irrespective of its sanskrit name sauviranjana or nilanjana. It is opined in a treatise of Rasashastra that Sauviranjana is a type of Srotoanjana.

**Keywords: Anjana, Srotoanjana, Sauviranjana, mineral, collyrium**

## INTRODUCTION

Anjana is a mineral explained in Indian alchemy under the group Uparasa. Different treatises of Rasashastra have classified different types of anjana. Five types of anjana are explained in various treatises namely sauviranjana, srotoanjana, neelanjana, pushpanjana and rasanjana.

The substance that is used to apply collyrium to eye is termed as Anjana. From earlier times, in Asian region application of collyrium is in practice. This application can be divided into three sections. One is for beautifying (cosmetic value), second is for cosmetic as well as for improving vision and third is for relieving disease only and not for cosmetic purpose. Among the anjana explained, sauviranjana and srotoanjana enhances the look of eyes as well as useful in eye diseases; Rasanjana and Pushpanjana are useful in eye diseases but do not beautify the eyes and Neelanjana increases the beauty of eyes but not so useful in therapeutics [1].

Srotoanjana is found in the form of Valmika (anthill) shaped lumps, looks black when broken and gives a red lines (like ochre red) when rubbed. From chemical point of view, srotoanjana is a compound of antimony and sulphur and its chemical formula is  $Sb_2S_3$ . The srotoanjana extracted from the mine is usually of gray colour. In mines it is found in

the form of pits (veins) between the stones. Because it is obtained in the form of srotas (channels), it is called srotoanjana. Antimony elements are also found mixed with these elements in small quantities; some lead, silver and arsenic are also present. The mineral which contains only antimony and sulphur, can be called pure srotoanjana.

In form, it is similar to valmika peak (anthill); when rubbed, it pulls out a red color line similar to Gairika (red ochre) and when broken the inner surface is the colour of blue lotus.

Another compound made of antimony and oxygen is also found in the mines. It is white in appearance but yellow. Sometimes a little red color is also visible in it. It is difficult to say whether this compound has any place in the above mentioned five distinctions. Its color is white like cotton. This substance is said to be the mineral Sauviranjana [2].

As per Ayurveda prakasha- sauviranjana is a variety of srotoanjana itself. The nature of both, apart from the colour, other characteristics and the essence that is obtained through satvapatana are exactly the same. Difference is only that srotoanjana is of Krishna (black) character and Sauviranjana is of pandura (yellow-white) or Bhutra or kapota (pigeon) colour. It is a compound of lead and is formed by chemical reaction of lead with sulphur.

Table 1: Properties of Srotoanjana and Sauviranjana [3]

Attributes	Srotoanjana	Sauviranjana
Rasa (Taste)	Kashaya (Astringent)	Tikta (Bitter), Kashaya (Astringent), Katu (Pungent)
Guna (Property)	Hima (cold), Snigdha (unctuous), Krishna (black)	Hima (cold), Snigdha (unctuous), Shweta (White), Dhumra (Smoky)
Veerya (Potency)	Sheeta (cold)	Sheeta (cold)
Doshaprabhava (Effect on dosha)	Kaphapittasrakopanut (alleviates kapha and pitta)	Tridosahara (alleviates the tridosha)
Karma (Action)	Lekhana (scraping or scarification), Netrya (beneficial to eyes), Grahi (absorbent)	Vrana shodhana and ropana, Drikprasadana (beneficial to eyes), Sangrahi (absorbent), Vayasya (increases longevity), Lekhana (scraping or scarification)
Vyadhiprabhava (Effect on disease)	Hikka (hiccup), Visha (poisonous condition), Chardi (emesis), Vidaha (burning sensation), Sidhma (skin disease), Kshaya (phthisis)	Raktapitta (bleeding disorders), Vami (emesis), Hikka (hiccup), Akshiroga (eye diseases), Vrana (wounds), Kshayaroga (phthisis), Arsha (hemorrhoids), Karnaroga (ear diseases), Visharoga (poisonous condition)

### Description of Stibnite ( $Sb_2S_3$ )

Stibnite is the most important antimony ore. It is found in circular and prismatic crystals, chemically it is antimony trisulphide, composed of Antimony (Sb) 71.4% and Sulphur (S) 28.6%, it usually contains small amount of iron and often traces of silver and gold sometimes lead and copper also, crystals are often very complicated. They are orthorhombic, columnar or occicular in habit. Many of the crystals are curved, bent or twisted. Nearly all, whether curved or straight are longitudinally striated. Cleavage is perfect. The mineral is soft, slightly sectile. Specific gravity is 4.65, metallic lustre, lead grey coloured with little darker streak. The surfaces which are exposed to the air are often coated with a black tarnish, fuses easily in candle flame. It is distinguished with other sulphides by its cleavage and the fumes it yields when heated on charcoal. Its closest resemblance is with galena (PbS) which is less

fusible and yields lead globules. More over galena possesses a cubic cleavage.

The mineral is found as crystals in quartz veins in metalliferous veins associated with lead, zinc, realgar, orpiment, cinnabar, bariter sphalerite and gold. Stibnite is the chief source of metallic antimony [4].

As per DA Kulkarni in the commentary of Rasa Ratna Samuchchaya, it is opined that Sauviranjana is a type of Srotoanjana. The nature of these, features, properties and satva (essence) of these are the same [5]. Sauviranjana is said as Nilanjana, a lead compound by acharya Yadavji [6]. He justifies stating that in the Charaka samhita, Sushruta samhita and Rasarnava Nilanjana is not mentioned whereas mention of Sauviranjana and srotoanjana are available.

### Sauviranjana and srotoanjana

From modern point of view, Anjana could not be compared with one mineral rather they may be compared with various minerals of these

sauviranjana and srotonjana described in ancient texts are the Antimony compounds, i. e., stibnite ( $Sb_2S_3$ ). Though, as per ancient descriptions sauviranjana is white or gray coloured while srotonjana is black but from mineralogical point of view they are Antimony sulphide (stibnite). The colour of stibnite is lead gray when it is pure but usually it contains small amount of iron and other metallic impurities which when powdered finely may look black.

According to yadavji, sauviranjana is nilanjana, a compound of lead. In his support he quotes the statements of Charaka, Sushruta and Rasarnava, stating that nilanjana is not found in above mentioned texts. In these texts mention of Sauviranjana and srotoanjana is available. In Charaka chikitsa seventh chapter two anjana are mentioned to be used in the form of a paste for application in kuṣṭha (skin disease) and two anjanas that are mentioned are Sauviranjan Srotonjana. Further in Chikitsa 20<sup>th</sup> chapter srotoanjana is advised to be used internally in vomiting along with

other drugs, which means srotoanjana can be used internally. 'Dhanvantari nighantu' also states that sauviranjana is said to possess black colour and srotoanjana grey colour like pigeon; on this basis sauviranjana may be lead sulphide and srotoanjana is antimony sulphide. Later on in 'Rasarnava' it is mentioned that srotoanjana looks like blue lotus (nilotpala) on fracture and on rubbing it should give a lining like that of gairika (hematite). This characteristic feature is not found in any of the anjanas mentions above i.e., sauviranjana (PbS) and srotoanjana (Antimony sulphide). Hence it must be some other drug. Now- a- days "Surme isphahani" named drug is being used by Unani doctors as anjana in eye diseases, which is a compound of Iron. Probably it may be the same drug which has been mentioned by 'Rasarnava' and it is a separate drug, than the lead sulphide and antimony sulphide. Hence at present it is said to take srotoanjana as surme ispbahani, sauviranjana as antimony sulphide and nilanjana as lead sulphide or galena.

Table 2: Properties of Srotonjana and Sauviranjana [7]

Particulars	Srotonjana	Sauviranjana
Chemical compound	Compound of Antimony and Sulphur	Compound of Lead and Sulphur
Colour	Black	Yellowish white
Property	-	Heavy
Response to heat	Melts quickly	
Response on rubbing on paper	When rubbed on paper gives an orange colour	When rubbed on paper gives an orange colour
Satva (Essence)	Antimony	
Properties of satva	<ul style="list-style-type: none"> <li>Does not give any colour when rubbed</li> <li>When poured it doesn't spread but it breaks into powder</li> </ul>	

## DISCUSSION

As per the research work on anjana; it may be said that at present in the name of anjana only kala surma (Nilanjana/ PbS) is available in the market. However as per literature two types of anjana are found mentioned since ancient times and scholars are of the view that one is lead compound and another is antimony compound and both are called anjana and are advised to be used in eye diseases. Thus, with a view to determine which is better and more effective in eye diseases, experiments have been conducted, which have proved that Antimony sulphide is harmful to the eyes while Lead sulphide is good for the eyes. Hence, from therapeutic point of view, lead sulphide may only be used as anjana in eye diseases irrespective of its sanskrit name sauviranjana or nilanjana. And in the name of anjana; antimony compound should not be used in eye diseases as the same has been proved harmful to eyes. It may be used for other external applications and other diseases.

## CONCLUSION

Srotoanjana is a variety of anjana, which chemically is said to be antimony sulphide. Its indications are in diseases like Hikka (hiccup), Visha (poisonous condition), Chardi (emesis), Vidaha (burning sensation), Sidhma (skin disease), Kshaya (phthisis).

From therapeutic point of view, lead sulphide is said to be useful as anjana in eye diseases whereas antimony sulphide is said to be harmful. Sauviranjana is heavy and is said to be useful as netrya and rasayana.

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