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TITLE

Review on Various types of *Makaradhwaja* (Gold containing mercurial preparation)

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ABSTRACT

BACKGROUND: *Makaradhwaja* is a gold containing mercurial preparation. It is a commonly prescribed medicine among most Ayurvedic practitioners for vigour and vitality. It is prepared mainly by two methods - *Kupipakwa* (preparation of medicine in a special glass made container called *Kupi* layered seven times over with Fuller's earth, by administering high temperature) and *Kharaliya* (preparation of medicine by triturating all the compounds using a mortar and pestle) method, the former being the popular choice for preparation. The references for the preparation is different in different texts, this disparity causes changes in its chemical composition especially the ppm of gold, which also affects the efficacy of the compound. **AIM:** The preset paper aims to review this difference between the procedures and its utility in the therapeutic application. **MATERIALS & METHODS:** Information from various research articles, Ayurvedic texts and P.G. dissertations were reviewed for the completion of the study. **RESULTS:** Many speculations have risen regarding the safety and toxicity of *Makaradhwaja*, due to the presence of heavy metals like mercury and gold. Following which many toxicity studies have been conducted, successfully establishing the medicine as broadly safe for usage in measured quantity. The efficacy of the medicine overrides all baseless concerns and remains the choicest of medicine among Ayurvedic practitioners. **CONCLUSION:** The review concludes that *Makaradhwaja* is widely safe to use prepared by all the different methods, when administered under proper supervision. The easy availability of the medicine in medicinal stores even without a prescription has led to the usage by many as self medication. This has resulted in the irrational use of the medicine, consequently deprecating its value which should be prevented.

Keywords: *Makaradhwaja, Methods of preparation, Safety*

Introduction

The preparation of medicine from *Parad* (Mercury), in *Rasashatra* has been described by many methods. These different dosage forms thus made are *Kharaliya Rasayana*, *Parpati Rasayana* (Medicine prepared by direct heat method in the form of flakes), *Kupipakwa Rasayana*. *Makaradhwaja* can be prepared by two of these methods – *Kharaliya* (*Chandroday Rasa*) and *Kupipakwa* (*Makaradhwaja*). *Kupipakwa Makaradhwaja* is made using elements like *Swarna* (gold) and *Gandhak* (sulphur). It also contains heavy metals like *Parad*. The three elements i.e. *Swarna*, *Gandhak* and *Parad* are taken in different ratios for eg: 1:8:16, 1:8:24 or 1:2:4 in *Valukayantra* (sand bath) [1,2] and subjected to heat for obtaining the *Kupipakwa Makaradhwaja*. While in *Kharaliya* method, trituration of the following compounds is done to obtain *Kharaliya Makaradhwaja* - Powder of *Jatiphala* (*Myristica fragrans*), *Laxang* (*Syzygium aromaticum*), *Karpur* (Camphor), *Marich* (*Piper nigrum*), *Kasturi* (*Abelmoschus moschatus*), *Swarnabhasma* (Gold ash) and *Rasasindoor* (A *kupipakwa* preparation consisting of mercury and sulphur).

Many formulations have been mentioned under the name of *Makaradhwaja* and *Chandroday Rasa*, though named differently in different texts (Table.no.1) the preparation of *Makaradhwaja* remains the same. The first reference for the preparation of *Makaradhwaja* by *Kupipakwa* method is mentioned in Rasendra Chintamani.

The word *Makaradhwaja* was first coined by Rasratnakar. In some texts *Chandroday Rasa* has been prepared, having the same therapeutic action as *Makaradhwaja* by *Kharaliya* method. *Makaradhwaja* is used as a *Rasayana* (rejuvenator), *Vrishya* (aphrodisiac) and *Shukral* (Spermatogenic) drug. It is the drug of choice in various diseases like *Sannipatajjwara* (fever originating from the aggravation of *Tridoshas*), *Twakroga* (Skin diseases), *Raktadosha* (blood related disorders), *Vranastrava* (oozing from wounds), *Aruchi* (anorexia), *Atisara* (diarrhoea), *Pravahika* (dysentery), *Spotha* (boils) etc. [3]

In the *Kupipakwa* method the *Makaradhwaja* is obtained at the neck of the *Kupi* while the particles of *Swarna* are found at the bottom, whereas in *Kharaliya* method *Swarnabhasma* is triturated along with all other contents. This apparent separation of *Swarna* particles in the former method and blending in the latter creates difference in the chemical composition of the final product obtained. There is need to evaluate the therapeutic action as well as the safety of *Makaradhwaja* prepared by both methods. Hence an attempt has been made to review its properties as per the available literature.

Materials and method

All available textual references of *Makaradhwaja* were reviewed. Scientific studies conducted on *Makaradhwaja* and digitalised information available from various reliable sources were collected and analysed.

Observations

Makaradhwaja is prepared by two different methods as follows:

Kupipakwa method: Amalgam of *Swarna* and *Shuddha Parad* is taken in a *Khalvayantra* (mortar and pestle) and triturated for 4 - 6 hrs, subsequently *Shuddha Gandhak* is added to it in the following ratio of 1:8:16. *Mardan* (trituration) is continued for 24 hrs until a fine *Nischandra Kajjali* - A stage attained during trituration of *Kajjali* (a dry powder like preparation of mercury and usually sulphur) wherein the preparation becomes completely black and lustre free is obtained. Then it is subjected to *Bhavana* with *Ghrutkumari Swaras* (the juice of *Aloe Vera*), this is done by adding sufficient quantity of the *Ghrutkumari Swaras* to *Kajjali* and trituration is done for 3 hrs followed by drying it in the sun.

This *Bhavit Kajjali* (the mercurial preparation which has undergone *Bhavana*) is then filled in a *Kachkupi* (a glass bottle specifically prepared to endure long duration of heat). This *Kupi* is then placed in a *Valukayantra* (sand bath) and heat is supplied was in *Kramagni* pattern i.e. 3 hrs of *Mandagni* (120 -250 C), 6 hrs of *Madhyamagni* (250 -450 C) and 3 hrs of *Tivragni* (450 - 650 C). During the course of heating, a hot *Shalaka* (thin rod) is repeatedly inserted in the mouth of the *Kupi* to disperse the accumulation of sulphur fumes, which may create blockage. After which the mouth of the *Kupi* is corked and it is subjected to heat for another 2 hours. After this, the *Kupi* is kept aside for cooling. A fine thread is tied over the *Kupi*, 1 inch below the collected final product, and water is sprinkled over it to break it. *Makaradhwaja* is then collected from the neck of the *Kupi*.^[4]

While in an another reference 6 hours (*Dviyama*) of *Mandagni*, followed by 6 hours of *Madhyamagni* and 6 hours of *Tivragni* is said to be administered for the preparation of *Makaradhwaja*.^[5]

Kharaliya method: In this method first the following contents are mixed and subjected to trituration - *Rasasindoor*, *Jatiphala Churna*, *Lavang Churna*, *Karpur Churna* and *Marich Churna*. Then *Swarna Bhasm* and *Kasturi* are added to this mixture, trituration is continued for 3 hrs further. Tablets of *Dvigunja* size (250 mg) are prepared. ^[6]

Presently the *Bahirdhoom Vidhi* (heat applied in open medium) mentioned by *Rasatarangini* is the one being followed, with changes in the procedure of heating and use of gold in three different forms – *Varkha* (sheets of gold), foils and *Bhasmas*. In which the maximum particles of gold was found to be in the *Makaradhwaja* prepared using gold *Varkha*^[7]. The procedure of *Gandhak Jarana* (the Addition and engulfing of Sulphur by Prad or mercury) for *Triguna*, *Shadguna Baliyarit Makaradhwaja* (three times, six times mercury infused *Kajjali* respectively) has shown to increase the efficacy of the preparation and also the ppm of gold. The increasing level of *Gandhak* is linked with proportional rise in the level of gold in the final product obtained.^[8] Additionally, the efficacy of *Makaradhwaja* made from *Ashtasanskarit Parad* (mercury which has undergone the eight stepwise procedures of purification) is shown to be better than only *Shodhit Parad* (purified mercury) when used in preparation of the medicine. ^[9]

Discussion

There are many references found in different *Rasa* texts by the name of *Makaradhwaja* and *Chandroday Rasa* based on the method of preparation. Few are as follows as mentioned in table 1:

Table no.1: Formulation and its references

Sr.No	Formulation	Classical Text Reference
1	<i>Chandroday Rasa</i>	Rasa Chandashu Rasendra Sar Sangrah Yog Chintamani Yog Ratnakar Bhaishajya Ratnavali
2	<i>Makaradhwaja</i>	Rasa Ratnakar Rasendra Sar Sangrah Bhaishajya Ratnavali Rasamritam Rasratnamanimala Rasatarangini

The therapeutic activity of *Makaradhwaja* & *Chandroday Ras* are compiled in table 2.

Table no.2: Therapeutic Considerations

Sr.no	Formulation	Therapeutic Activity
1	<i>Makaradhwaja</i>	Removes signs of ageing like wrinkles and greying of hair, Brain booster, Improves skin glow, Rejuvenation medicine, Aphrodisiac, Improves Longevity and abates oldage ^[4]
2	<i>Chandroday Ras</i>	Aprodisiac and Improves Strength, agility and metabolism. ^[6]

Kupipakwa Makaradhwaja is found at the neck of the *Kupi*, while *Swarna* or gold particles are found at the bottom of the same. The data of research studies of Sanjay Khedkar et al in the article - Standard manufacturing process of *Makaradhwaja* prepared by *Swarna Patra*, *Varkh* and *Bhasma* wherein gold content was found to be 131pp, 268 ppm and 19 ppm respectively. This variation found in the gold content may be due to the difference in particle size. [12]

In another article, the metallographic study of gold containing herbo-mineral preparation *Makaradhwaja* the nature of growth of columnar crystal Mercuric sulphide was shown to be devoid of gold while in ICP spectrophotometry, gold content found was 130 ppm. [8] Another study by Prasanta Kumar et al in their study “Chemistry of *Kupipakwa Rasayana*” have mentioned the presence of very minute quantity of gold in combination with mercuric sulphide at the neck of the *Kupi*. [13]

The present market scenario offers *Kupipakwa Makaradhwaja* in two different forms – *Makaradhwaja* and *Siddha Makaradhwaja*. There are five different pharmacies offering the product in various format namely Dhootpapeshwar, Zandu, Dabur, Baidyanath, Uma Ayurvedic Pvt. Ltd. The product is sold as *Makardhwaja*, *Siddha Makardhwaja*, *Swarna Makardhwaja* etc. The *Kupipakwa* method is preferred by almost all manufacturers. *Kharaliya Vidhi* and *Antardhoom Vidhi* (Administering heat to the medicinal preparation, keeping it in a closed environment) mentioned in Rasatarangini remains to be explored for its full potential. The safety evaluation of the preparation reveals that it is safe for usage and does not produce untoward effect on the body when given in the correct dosage. The easy availability of the product teamed with its popularity in enhancing vigour and vitality has caused it to be used indiscriminately by the masses.

Conclusion

There has been no analytical study conducted on *Makaradhwaja* by *Kharaliya* Method & the benefits or harm of mixing *Swarna* found at the bottom of the *Kupi* with the product at the neck to produce *Makaradhwaja*. Further studies must be conducted to evaluate the therapeutic and safety concerns of *Makaradhwaja* made from both the methods.

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