



INTRODUCTION TO KUSHTA: A HERBO-MINERAL UNANI FORMULATION

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ABSTRACT

Kushta (calx) is the finest powder form of the Unani medicinal preparation obtained by calcination of metals, minerals and animal origin drugs, used for the majority of disorders like arthritis, renal calculi, sexual debility etc. *Kushta* (calcined product) is easily absorbed in human body and is highly efficacious in its action. Considering the advantages offered by *kushta* they should be used more regularly. In the recent times, public interest in the world has shifted towards traditional medicine for safety concerns, namely, about the adverse reaction and side effects that entailed use of many allopathic formulations. *Kushta* due to its rapid onset of action provide a very important developing field of research. Keeping these facts in mind an attempt has been made to summarize the vital fundamentals regarding *Kushta*.

Keywords: *Kushta*, Unani, Nanocrystals, *Bhasma*, *Parpams*.

INTRODUCTION

The Horizon of Unani medicine originated from Greece under the patronage of Hippocrates (460 BC–377 BC)¹ and was developed by Arabs into an elaborated medical science based on the frame work of the teachings of Hippocrates and Galen. Since that time Unani Medicine has been known as Greco-Arab medicine. Unani is still popular in many Arab and East Asian countries. In fact Unani medicine and herbal products are gradually more being used in many countries where modern medicine is easily available.²

The indigenous systems use mineral preparations mostly in calcined forms: *Kushta* in Unani, *bhasma* in Ayurveda, and *Parpams* in Siddha. The usage includes even those elements which are otherwise considered toxic and are not administered internally in conventional medicine. Traditional calcination techniques are specialized processes wherein herbal juices are incorporated during preparation of ash. It is claimed that these processes purify the metal and make it therapeutically effective and safe.³

In the present time, public interest in the world has been shifted towards traditional medicine for increasing cost, safety concerns, due to the adverse reactions and side effects that entailed use of many allopathic formulations.⁴

Use of metals and minerals dates back to the time immemorial. It should be known that for long ago, this dosage form was in practice in Greece and Italy. Metals were burnt in the period of Hermis (The father of alchemy).⁵ The use of metals is evident from the epics of Homer.⁶ It is a historical truth that old Unani physicians used some remedies containing certain minerals, such as salts or oxides of copper and lead.⁷ Galen (2nd C A.D.) states, that the efficacy of burnt lead is unparalleled in cancer and copper was burnt before its use because it is harmful for the body when used as it is.⁸ Aribasus (326-403 A.D)⁹ used ash of animal.¹⁰

When a drug is burnt to the extent that it is reduced to ashes then it is regarded as *Ihraq*. This process is mentioned in various classical Unani text books like *Qarabadeen Qadri*,¹¹ *Bayaz Khas*,¹² *Firdaus Ul Hikmat*,¹³ *Kamil Sana*,¹⁴ *Khazain*

Ul Advia,¹⁵ *Tohfatul Momineen*,¹⁶ *Zakhira Khwarzam Shahi*¹⁷.

Ihraq and *Taklees* can be used as a synonym of each other¹⁸ So this description can be regarded as *Taklees*.

The Arabs were master in alchemy. The Arabic word *Al-kimia* and its Latin equivalent 'Chem', the precursor of modern 'chemistry' are derived from the ancient Greek word 'Chemeia'. Prior to the rise of Islamic civilization, the subject of alchemy and its basic characteristics were well established by the ancient Greek civilization. From the very beginning Muslim scholars worked on the alchemical principle formulated by the Alexandrians and further restructured it and aligned it with their own interest and need of the time. The knowledge of alchemy was as a result considered as supernatural science that dealt with the attributes of matter whose origin could not be visualized by the senses. The development of Islamic alchemy began in the 7th century with the writings of Geber (831 A.D), is regarded as 'father of chemistry', who was an Alchemist¹⁹ and wrote many books on alchemy²⁰.

Geber's science of *al-kimiya*, from which both Arabic words 'alchemy' and 'chemistry' stem, was based upon the Hellenistic view that all metals are basically the identical matter, but with varying impurities.²¹ Geber, in his book '*Nakhbe Jabri*' has mentioned the use and method of preparing of *Kushta* of iron, tin, ammonium chloride and mica, sublimation of mercury and sulphur.²²

Rhazes (925 A.D) is also a reputed personality in chemistry²³ was equally renowned in the field of alchemy too. He gave more preference to experimental chemistry rather than theoretical and magical style. In his book *Sirr al-Asrar* (the Latin *Liber Secretorum bubacaris*), he divides his subject matter into three categories: first, on the acquaintance and identification of drugs from plant, animal, and mineral origins and its use in treatment; second, understanding of equipment and tools used; third, the familiarity of the seven alchemical procedures and techniques like sublimation and condensation of mercury, precipitation of sulphur and arsenic, calcinations of minerals,

salts, glass, talc, shells, and waxing. His alchemical texts: *al-Asrar* (the Secrets), and *Sirr al-Asrar* (Secret of Secrets), are the most famous of his alchemical Works. According to Ibn Nadim, Rhazes alchemical writings number 115 books and 30 epistles.²¹ Rhazes, wrote a book "*Kitab Ul Akseer*" on *Kushtasazi* (calcination).¹⁹ and mentioned the uses of *Kushtajat* in *Kitab Al Hawi* describing *Kushta Nuqra* prepared with *doodhi booti* as *mughlize mani* and *muqawwi baah* (aphrodisiac), *kushta Hajrul yahood* prepared with *aab e barag turb* as *mufattit hasat* (lithotriptic), *kushta e faulad* prepared with *aab anar* as *muqawwie meda*(stomachic), *muqawwi jigar* (liver tonic) and prepared with *sankhya* and *shangaraf* as *muqawwie baah* (aphrodisiac) and *mushtahi taam* (appetizer), *kushta khubsul hadeed* prepared with sulphuric acid used for *taqwiyyat hazam*, *kushta e tila* prepared with *araq gulab* as *mufarreh* (exhilarant) *wa muqawwi qalb* (cardiac tonic).⁵

Another prolific author was *Ibn Wahshiyah* (flourished ca. 287/900) who wrote on variety of topics including alchemy, toxicology, rational alchemic activities.²⁴

A treatise on *Taklees*, '*Risaiala fi al Hikmah al Mاستoorah*' known as *Kitab al Taklees* has also been written by *Ibn e Sina*, *Risala dar Azkare Tanqia wa Taklees*⁸, *Risala Fi al Taklees*²⁵ rare books on *Kushta Sazi*.

Kushta is the past participle of *Kushtan* (Persian = "to kill"); therefore it means "killed, conquered. In Unani system of medicine, the term *Kushta* is employed for a dosage form that is used in small quantity and one that is immediately effective. A *Kushta* is a blend of metals, metallic oxides, non metals and their compounds or minerals. The ingredients are oxidized through the action of heat. The preparation of a *Kushta* results in the increased efficacy of a drug, and after entering into the body it exerts its curative role promptly and effectively.²⁶

Classically mineral and animal origin drugs are calcined in crucibles and in pits of different sizes by special processes, having varying numbers of cow dung cakes and with different intensity of heat. The resultant product (*Kushta*) obtained is in the form of fine powder. It is administered orally in small dose with suitable vehicle to make them biocompatible. The efficacy of *kushta* depends upon the processing method.²⁷ Ores are roasted by heating them at high temperature but below the melting point.²⁸

Kushta (calcined product) is easily absorbed in human body and is highly efficacious in its action.²⁹

A small amount of *kushta* can be used for wide range of therapeutics³⁰ depending upon the process of formulation. The advantage of this preparation over herbal preparation is their more stability, lower dose and easy availability.³¹

Kushta has always been neglected and not studied scientifically. A very few scientific reports are available on *kushta* and other drugs of mineral origin. *Kushta* are biological nanocrystals. Nanocrystalline materials are solids, composed of crystallites with size less than 100 nm in at least one dimension.³² As it is proved that drug release depends on particle size, smaller particles have larger surface area, therefore, most of the drug associated would be at or near the particle surface, leading to fast drug release.³³

AIMS OF TAKLEES (CALCINATION)^{11, 12, 34, 35, 36}

1. To change a hard and un-absorbable drug into absorbable form.

2. To remove undesirable parts of the drug e.g. Crab and Stag horn are burnt to remove undesired fluids contain in them.

3. To make a hard drug soft enough to pound easily, e.g. Ruby.

4. To remove toxic effect of drug, e.g. Scorpion and Snake are burnt to remove their poison.

5. To decrease the toxic effects of a drug.

6. To increase the efficacy and potency of a drug.

ADVANTAGES OF TAKLEES

1. Low dose and high efficacy.

2. Use is easy as compared to other dosage forms.

3. Some *kushta* are unparalleled as aphrodisiac.

4. Most of the *kushta* stimulates innate heat of the body.

5. *Kushta* is more stable than other dosage forms.¹⁸

6. Only dosage form in which a bio-incompatible substance is made biocompatible.¹⁸

8. Only dosage form that can be given in acute conditions.

9. It is a dosage form which induces the change in temperament of the drug e.g. the temperament of *sadaf* is cold and dry but its *Kushta* has temperament hot and dry.²¹

10. Can be used in the patient of such diseases where the uptake of large doses of medicine is not contraindicated.

11. All the *kushtajat* are very potent by their action and this property of *kushtajat* is used in presence of severe diseases.⁶

12. The older the *Kushta*, better the effect.²⁹

GENERAL PRECAUTIONS FOR PREPARATION OF KUSHTA^{18, 27, 29,}

1. The material used for the preparation of *Kushta* should be of the best quality.

2. While making the *Kushta*, any addition and deletion of any of the item, duration and the mode of mortaring, the fire used to be subjected, should strictly be followed according to the text.

3. When the fresh juice of an herb is added, it should be either *Muqatar* (distilled) or *Murawwaq* (filtered)

4. When dried herb is added, it should not be more than one year old.

5. Highest precautions should be taken in subjecting the *Boota* (crucible) to the fire.

(a) Fluctuation in the intensity of the heat should be avoided.

(b) The '*boota*' should be subjected to the fire of the cow dung cakes or coal according to the method given in the classical text.

6. Place at which *Kushta* is prepared should be air protected.

GENERAL PHARMACOLOGICAL ACTIONS OF KUSHTA

Kushta are generally preferred for its immortality, longevity, rejuvenation.³⁷

PRELIMINARY TESTS

1. **Loss of metallic luster:** When visually examined preferably in presence of sun light no metallic luster should be observed.

2. **Fineness test:** On rubbing a small quantity of the sample between the fingers it should enter into the lines on the fingers.

3. **Floating test:** If a small quantity of *kushta* is sprinkled on water surface it should float on the surface.^{29,32} but this property of a *kushta* is not standard parameter because this property can be found in various other substances like wood dust. Floating on water only indicates the lightness of *kushta*.²⁷

4. The *Kushta* should not revert to the original state.

5. The *kushta* of a non metal should not emit smoke when placed on fire.²⁹

6. Loss of metallic state.³²

This involves heating of a very thin silver sheet (600 nm thickness) along with a small quantity of *kushta* to red hot for about 5 min. After cooling the sheet to room temperature, no traces of this sample should permanently stick to the silver sheet indicating no alloy formation takes place, thus confirming the metal has totally transformed into *kushta*, its oxide form.

7. When thrown over wall then the prepared *kushta* should stick to the wall.

SOME RECENT STUDIES OF *KUSHTA*

Gold in traditional Ayurvedic medicine as *swarna bhasma* has been characterized as globular particles of gold (avg. 56-57 nm). *Swarna bhasma* and gold nano particles are prepared by transmission electron microscopy analysis. Nano sized gold particle have been proven to be effect in ameliorating symptoms of mycobacterial collagen. Typical features of Ayurvedic *swarna bhasma* have been demonstrated through transmission electron microscopy and atomic force spectroscopy. Nanoparticles are responsible for its fast and targeted action. Subsequent action upon DNA/RNA molecule and protein synthesis within the cell is further hypothesized as possible mechanisms for rapid onset of therapeutic action of *bhasma* preparations. Ayurvedic pharmaceuticals are receiving new thrust through *bhasma* preparations as novel technological applications.³⁸

Jasada Bhasma is a unique preparation of zinc and has been used for the treatment of diabetes and age-related eye diseases. Comprehensive physicochemical characterization of *Jasada Bhasma* using modern state-of-the-art techniques such as X-ray photoelectron spectroscopy (XPS), inductively coupled plasma (ICP), elemental analysis with energy dispersive X-ray analysis (EDAX), dynamic light scattering (DLS), and transmission electron microscopy (TEM) were carried out for the first time and a clearly identifiable fraction of particles were found to be in the nanometer size range.³⁹

Tamra bhasma, the copper based Indian traditional drug, is administered for different ailments of liver and spleen, abdominal pains, colitis, heart problems, anaemia, tumors, loss of appetite, dropsy, eye troubles and tuberculosis. Its synthesis involves treating metallic copper with plant juices and then repeated calcination in presence of air so that the metallic state is transformed into the corresponding oxide form. In this work, a systematic characterization of this traditional drug using various techniques like X-ray diffraction (XRD), scanning electron microscopy (SEM)-energy dispersive X-ray analysis (EDX), X-ray photoelectron spectroscopy (XPS), infrared spectroscopy (IR), thermogravimetry (TG) and surface area measurement were carried out and compared the results with those of standard copper oxide. The results were found to match very well with those of a standard copper oxide confirming the composition of the drug sample and some specific findings of the study provide useful hints on its therapeutic properties.⁴⁰

CONCLUSION

Metallic preparations offer many advantage over plant by virtue of their stability for longer period, lower doses, easy storability and sustained availability. The *kushta* have all along been a mystery, as substance and as medicine. While

the naturally occurring metal carbonates, sulphates and silicates also have been used as medicine, the *kushta* have held a tremendous influence on the alchemists and practitioners for centuries. Considering the advantages offered by *kushta* one must say that the use of *Kushta* should be encouraged.

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