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NANOTECHNOLOGY AND ALCHEMY IN MEDIEVAL SIDDHA TRADITIONS –A REVIEW

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ABSTRACT

Globally in present days, Nanotechnologies are spectacularly alike, particularly alchemy. It exhibits two features. The first face matches the real results of old medieval alchemy in that nanotechnology, as a method of materials science, has already produced a variety of new and improved products. The term *Rasayana* is also used by the *Rasa Siddhas* to designate their alchemical "Work in two parts" with its dual emphasis on transmutation and bodily transubstantiation. In this alchemical context, rasa is a term for fluid metal mercury, the mineral hierophany of the vital seed of the phallic God Shiva. In the ancient Siddha period, *Siddhars* found the transformation of an atom present in things and they made them act in a calm way for many creative works. The activity of the atom for producing creative works is done through those spiritual powers, herbs, *kuligai*, *guru*, *chunnam*, etc, by them. Nanotechnology is an important field of concept for future scientific research (Feynman, 1960). Nanotechnology research can be expanded for the promotion of engineering, communication technologies, biology, chemistry, physics, robotics, and the fields of medicine. In present days, for example, instrumental analysis of the polyherbal Siddha formulation *Ashuwathi chooranam* (AC) such as FT-IR, XRD, SEM, and ICP-OES has been done. The ultimate goal of targeted drug delivery is to evolve clinically useful formulations and the size of these nanoparticles also determines the mobility, circulation, and migration of nanoparticles upon administration. Formulations with nanoparticles are highly advantageous.

KEYWORDS: Nanotechnology, Siddha Alchemy, Medieval, FT-IR, SEM, XRD, and ICP-OES.

INTRODUCTION

Globally in present days, Nanotechnologies are spectacularly alike, particularly alchemy. It exhibits two features. The first one matches the original outcome in the old medieval alchemy in that nanotechnology, as a discovery of new materials science, has already given rise to a variety of new and enhanced products. The second one matches the hope of alchemy; promoters of nanotechnology claim that it will eventually give us a procedure that one of matter can be converted into any other, and will lead to unmatched wealth, reconstruction of the body, and eternal life.[1]

ALCHEMY IN MEDIEVAL SIDDHA TRADITIONS

The term *Rasayana* is also used by the Rasa Siddhas to choose their alchemical "Work in two parts" with its dual significance on transmutation and bodily transubstantiation. In this alchemical text, rasa is a term for fluid metal mercury, the mineral hierophany of the essential root of the phallic God Shiva. The South Indian historians of Siddha Medicine who maintain the *Siddhar* alchemists had already excellent in their craft long before the time of the sixth- to the seventh century like *Tirumular* and *Nandhi.*[2a] The *Siddhar Bogar*, who is said to have lived in the third to fifth centuries A.D, is today worshipped at that site in the *Palani* Hills of Tamil Nadu where he is said to have practiced and taught Alchemy.[2b] In practical terms, the alchemy of the *Maheswara Siddhas* was more therapeutic than transmutational, for which reason it funneled directly into South Indian Siddha medicine.[2c] Elsewhere, architectural or archeological information provides us with very few clues to the history of tantric alchemy. Eighth century Kashmiri text that is most attentive to the iconography and plastic reproduction of divine images contains mercurial preparations used to coat stone sculptures and thereby increase the resistance to the elements. In coastal Karnataka *Siddheswara* temple was dedicated in A.D. 1030, and in earlier centuries a number of temples to Shiva *Siddheswara* were constructed in Srisailam in Andrapradesh. During twelfth to thirteenth century in Malaysia, found the Shiva temple containing a mercurial *Linga* and various alchemically prepared elements are evidence for the spread of medieval alchemy to greater India. A History reveals the Indian culture and Medicine in the olden days.[2d] The Siddha alchemists were, by and large, because; they are itinerant and made Siddha alchemy a pan-Indian phenomenon.[2e] The alchemical works of the 'eighteen *Siddhars'*, the famous creators of these traditions,

emerge to be quite recent in those years. The body of legend attached to this part moves us back, newly, to the lore of magical alchemy.[2b] In the Tamil *Siddhar* tradition name *"Korakkar"* and other established a transmuting *Linga* of Shiva. According to work done by *Siddhar Konganar* and *Korakkar* had an animated mercurial pill called "bogi" which held in mouth, afforded him the power of flight.[2f] In the ancient Siddha period, *Siddhars* found the transformation of an atom present in things and they made them act in a calm way for many creative works. The activity of the atom for producing creative works is done through those spiritual powers, herbs, *kuligai, guru, chunnam*, etc., by them.[3]

NANOTECHNOLOGY AND SIDDHA

Nanotechnology is an important field of concept for future scientific research (Feynman, 1960). Nanotechnology research can be expanded for the promotion of engineering, communication technologies, biology, chemistry, physics, robotics, and the fields of medicine. In this discipline of medicine, for the therapeutic drug delivery system and advancement of treatments for various diseases that are dreadful and other disorders, nanotechnology is effective.[4]

The *Siddhar Thirumoolar* in *Thirumanthiram* has quoted in a song that the size of the atom can be said division of a single hair of the cow is made into 100 parts, then again 1of 100 is divided into 1000 parts. Further 1 of 1000 is again divided into 100,000 and the resulting particle atom is analogous to the size of the life existing. Thus *Thirumoolar* explains surviving life is equivalent to an atom.[3a] Numerous medicines are prepared from herbs, metals, and minerals, herbo-metallic mineral is one of the distinctive features of the Siddha system of Medicine. These medicines are put together in the configuration as *Chooranam, Parpam, Chendooram, Guru, Chunnam, Kattu, Kalangu*, etc. In the classical literature on the Siddha system, the Herbo- mineral and other preparations are specified to be administered to humans in the smallest doses.[5]

Worldwide there is proof of the increasing shift towards the use of traditional medicine.[6]

Earlier, sophisticated instruments and techniques for analysis have been high-yielding in the physicochemical characterization of the *parpam (bhasmas).* These studies traversed greatly the distinct features of *parpam* (*bhasma)* devising the similar metal, chemical nature, and crystalline structure in the middle and the end products. These have involved Atomic Absorption Spectrophotometry (AAS), flame photometry, Inductively Coupled Plasma

Atomic Emission Spectrometry (ICP-AES), X-ray diffraction (XRD) analysis and *p*Hmetry, etc.[7]

In present days, for example, instrumental analysis of the polyherbal Siddha formulation *Ashuwathi chooranam* (AC) such as FT-IR (Fourier Transform Infrared Spectroscopy) an analytical technique used to identify organic, polymeric, and in some inorganic materials, XRD (X-Ray Diffraction) used to analyze the structure of crystalline materials, SEM (Scanning Electron Microscope) provides high-resolution imaging used to investigate microstructure and chemistry of a range of materials, and ICP-OES (Inductively Coupled Plasma- Optical Emission Spectrometry) used to find the composition of elements, has been done and the results exhibited in the FT-IR spectroscopy of the sample exhibit the presence of functional groups like alkyl halides, aromatics, alkenes, 1^{o} amine, etc. The SEM analysis showed the presence of Nanoparticles is defined as particulate dispersion or solid particles with a size in the range of 100-800nm in diameter. The XRD analysis of AC came to an end that the major peaks are identified that range 48-75nm in correlation with organic molecules probably plays an important role in making it Nanostructuring and safe at therapeutic doses. The ICP-OES analysis in AC revealed that heavy metals such as mercury, lead, cadmium, and arsenic are within the limits.[8] And numerous Siddha preparations from mercury, cinnabar, gold, silver, etc. The metal silver undergoes various processes such as grinding with leaf juices, and calcination, where the chemical modification of the drug is made at the molecular level, and the end product is biologically active nanoparticles.[5], thus when administration the freeing of the drug in the bio environment reaches the desired biodistribution.[4a] SEM analysis of AC showed the Nano size particles and size lesser have valuable properties that can be used to improve drug delivery. Compound drug delivery mechanisms are being advanced, together with the ability to get drugs through the bio environment.[8a]

CONCLUSION

The application of Nanotechnology in medicines vows to bring a modification by transforming the way, current pharmacological agents. Formulations with nanoparticles are highly advantageous.[9a] Dr. Paul Ehrlich, traversed through the development of a different delivery system, today has culminated in an era of modern drug therapy encompassing Nano-sized drug carrier systems and/ or medical devices.[9] The ultimate goal of targeted drug delivery is to develop clinically useful formulations and the size of these nanoparticles also

determines the mobility, circulation, immigration, and finding the way in the biological system upon administration.

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