



**INTERNATIONAL JOURNAL OF  
PHARMACEUTICAL SCIENCES**  
[ISSN: 0975-4725; CODEN(USA): IJPS00]  
Journal Homepage: <https://www.ijpsjournal.com>



## Review Article

# Herbomineral Nano-Formulations of Alternative System of Medicine

Snehal Bhavsar\*, Bhagyashri Patil, Komal Bhoi, Shital Patil, Harshada Jadhav,  
Tulsi Ahuja

R.C. Patel Institute of Pharmaceutical Education & Research Shirpur, India.

### ARTICLE INFO

Published: 15 Feb. 2025

**Keywords:**

Herbomineral, Nano-  
formulations, Ayurveda,  
Siddha, Unani.

**DOI:**

10.5281/zenodo.14876124

### ABSTRACT

The herbs and herbal substances are of significant research interest because of their diverse medicinal applications. Several folk evidences have been reported in the formulations of the ancient worlds the pharmaceutical system, encouraging researchers to look for scientific support. Several herbal compounds have been discovered and tested for therapeutic efficacy against pathophysiological disorders. Recently, attempts have been undertaken to employ these herbal components to create nanoparticles for biomedical applications. Green synthesis is a method of producing nanoparticles from herbal/biogenic ingredients that has yielded several metallic nanoparticles. The metal nanoparticle-herb combination may have a higher efficacy against many pathophysiological diseases. This review aims to present the many metal nanoparticles derived from various herbal resources, as well as their role in health and ailments. Although green nanoparticle synthesis is the newest area of research, there is not much data available about its physiological effects, compatibility, and toxicity. This review aims to go to detail about the role of medicinally significant herbs in metal nanoparticle synthesis, as well as their physiological compatibility and therapeutic efficacy. Furthermore, the limitations (toxicity) of green nanoparticle synthesis are considered and discussed, as well as their future prospects in health and disease. This review opens the door to a completely novel perspective in medical plant research by integrating nanotechnology with herbs, known as Herbonanocentials.

### INTRODUCTION

Norio Taniguchi first introduced the concept of nanotechnology in 1974 at Tokyo Science University. This branch of technology has proven to be effective in physical and chemical sciences,

but it also opens new options in medical sciences like as imaging, sensing, artificial implants, and improved medication delivery.<sup>1,2</sup> Nanotechnology provides the opportunity to generate nanoparticles through bottom-up and top-down methodologies,

\*Corresponding Author: Snehal Bhavsar

Address: R.C. Patel Institute of Pharmaceutical Education & Research Shirpur, India.

Email : [snehalbhavsar10@gmail.com](mailto:snehalbhavsar10@gmail.com)

**Relevant conflicts of interest/financial disclosures:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



allowing reengineered materials at the nanoscale for the development of new and enhanced products.<sup>3</sup> There are several types of nanoparticles available for different applications. Nanotechnology applications in the pharmaceutical industry include the development of nanomedicine, nanorobots, biomarkers, and biosensors, among others. Nanotechnology is expected to be useful in describing and giving scientific evidence for Ayurvedic medicine, with a special reference to herbomineral formulation.<sup>4</sup> The herbomineral composition remains healthy for a long shelf life, because of its micronized fixation.<sup>5</sup> The combined use of metal and pharmaceutical compounds results in a Herbomineral or Rasaushadhi formation known as 'Rasa dravyas'. Rasa means mainly Parada (Mercury). Rasa-aushadhis (Herbo-mineral metallic preparations) refer to the composition of mercury, ferrous metals, and minerals. Rasaushadhi is considered an effective treatment in the Alpanamatra (low dose).<sup>6</sup> Traditional medicine systems have been used for thousands of years to provide healthcare to people in South-East Asian countries and other parts of the world. Traditional medicines have recently gained popularity among the general public due to a variety of reasons. They remained to be an excellent source of treatments for people all over the world to ensure their health.<sup>7</sup> The World Health Organization (WHO) also encourages, advises, and promotes traditional medicines in national health programs since they are easily available, relatively safe, and people have faith in them, and their industrial manufacture is environmentally beneficial.<sup>8</sup> There is huge potential for Ayurveda to make a significant contribution to world healthcare, the science is gaining demand as an effective alternative to traditional medicine due to its methodical approach to curing and preventing ailments using natural resources. It is traditional and ancient system have been used for a long time,

these drugs are accepted as safe, which is the final indication of their nontoxic positive effects.<sup>9</sup> Health is described as the state of physical, mental, social, and spiritual well-being of humans, according to the Siddha system of medicine.<sup>10</sup> The Siddha system states that the universe is made up of five basic elements known as Panchaboothams, which are Earth, Water, Fire, Air, and Sky. In the Siddha system of medicine, gold is associated with the earth, lead with water, copper with fire, iron with air, and zinc with space. Changes in these Panchaboothams are known to reflect on people's physical, mental, and spiritual wellness.<sup>11</sup> Apart from these metals, Mercury, Sulphur, and Copper are among the most essential metals used in the Siddha system of medicine. Metals and minerals used in Siddha medicine have advantages such as efficacy at tiny doses, lack of disagreeable odour or taste, more rapid action, and shelf life of hundreds of years as compared to plant-based remedies alone, and they do not lose their potency after long-term storage.<sup>12</sup> In Siddha system Parpam (mineral/metallic oxides), Chendhooram (mineral/metallic sulphides), Chunnam (caustic or significant oxides), and Pathangam (sublimation) are the most widely employed mineral-based formulations. Among these, Parpam and Chendooram class of medications are frequently utilized, with potential therapeutic benefit.<sup>13</sup> Parpam's shelf life is 100 years, while Chendooram's is 75 years).<sup>14</sup> A metal is harmful at the macro level, but when reduced to nano-sized particles and the appropriate dose is taken, it does not affect the consumer.<sup>15</sup> It does not accumulate in their bodies.<sup>16</sup> The process of converting raw metals into nanosized particles is intriguing. With modern scientific advances, researchers are attempting to quantify the particle size of metals present in various herbomineral preparations. In recent years, adequate attention has been paid to studies on metal-based herbal remedies utilized as ethnic medicine for treating infections and other



chronic disorders.<sup>17,18</sup> Siddha herbo-mineral formulations have strong antibacterial action.<sup>19</sup> Shilajit's traditional herb-mineral mixture is an effective antiviral agent.<sup>20</sup>

#### Advantages of Herbo-Mineral Preparations:

1. Proper preparation is necessary. According to the supplied data, there are various herbo-mineral formulations available in the market that are effective in skin disorders, diabetes, anemia, cancer, liver illnesses, etc.<sup>21</sup>
2. Unani herbomineral formulation is an excellent and safe therapeutic option for chronic urticarial.<sup>22</sup>

3. Herbo-mineral formulations are cost-efficient, safe, and successful in managing hepatocellular carcinoma (HCC), bringing up new therapeutic applications for cancer treatment.<sup>23</sup>
4. Herbal nanomedicines are safer, more bioavailable, and offer more therapeutic value compared to traditional herbal and synthetic pharmaceuticals.<sup>24</sup>

#### Herbomineral Nano-formulations in Ayurveda, Siddha, Unani

Sr.no	Herbomineral nano formulations	Used in Common disease	References
<b>A</b>	<b>Ayurvedic formulation</b>		
1.	Shanka bhasma	Anti-ulcer	<a href="#">25</a>
2.	Tarakeshwara rasa	Diabetes mellitus	<a href="#">26</a>
3.	Shwaskuthar rasa	Asthma and allergy	<a href="#">27</a>
4.	Hridayarnava rasa	Cardiac diseases	<a href="#">28</a>
5.	Kampavatari rasa	Parkinson's disease.	<a href="#">29</a>
6.	Divya amvatari rasa	Anti-inflammatory and anti-arthritis	<a href="#">30</a>
7.	Trivanga bhasma	Diabetes mellitus and as Diuretic.	<a href="#">31</a>
8.	Navayasa lauha	Anemia	<a href="#">32</a>
9.	Shadanga paniya	Useful dehydration, headaches	<a href="#">33</a>
10.	Shwasananda vati	Respiratory ailments	<a href="#">34</a>
<b>B.</b>	<b>Siddha formulations</b>		
1.	Agasthiyar kuzhambu	Varicose ulcer	<a href="#">35</a>
2.	Linga chenduram [HMLC]	Viral hepatitis infection	<a href="#">36</a>
3.	Panchapadana chenduram	Cancer (cervical adenocarcinoma)	<a href="#">37</a>
4.	Vaalai rasa chendooram	Diagnosis, microsurgery of ear and therapeutic applications	<a href="#">38</a>

5.	Naaga chendooram	Anti-cancer activity	<a href="#">39</a>
6.	Chanthirothaya tablet (CHTM)	Rheumatoid Arthritis (RA)	<a href="#">40</a>
7.	Kalludaikkudoori mathirai	Renal stone	<a href="#">41</a>
8.	Vayu mathirai	Analgesic, anti – pyretic, Anti- inflammatory, hepato- protective and antioxidant activities	<a href="#">42</a>
9.	Santha santhrothaya mathirai	Hepatic disorders	<a href="#">43</a>
10.	Thamira parpam	Anti-ulcerogenic activity	<a href="#">44</a>
<b>C.</b>	<b>Unani formulations</b>		
1.	Kushta hajrul yahood	Renal and bladder calculi.	<a href="#">45</a>
2.	Kushta jast	Immune function (muqawwi-i-badan) & antipyretic (dafi‘a Humma)	<a href="#">46</a>
3.	Dolabi	Diabetes	<a href="#">47</a>
4.	Kushta marjan	Cough, asthma and anorexia.	<a href="#">48</a>
5.	Khamira Marwarid khas	Immune suppression.	<a href="#">49</a>
6.	Sufoof jawahar mohra	Organ stimulant, useful in general weakness	<a href="#">50</a>

## CONCLUSION:

This review opens the door to a completely novel perspective in medical plant research by integrating nanotechnology with herbs, known as Herbonanoceticals. There are many herbomineral nano-formulation available in different systems of medicine such as Ayurveda, Siddha and Unani but there is lack of validation that’s why there is strong need of appropriate validation. Integrating alternative systems of medicine with modern nanotechnology which can enhance the bioavailability and efficacy of traditional herbal

remedies. This fusion of ancient wisdom with cutting-edge technology has the potential to revolutionize healthcare. The Integration of traditional knowledge with modern technology has the potential to unlock new possibilities in healthcare, making ancient wisdom more accessible and effective for modern healthcare challenges. By combining conventional herbo minerals with nanotechnology, researchers and manufacturers can create innovative products.



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**HOW TO CITE:** Snehal Bhavsar\*, Bhagyashri Patil, Komal Bhoi, Shital Patil, Harshada Jadhav, Tulsi Ahuja, Herbomineral Nano-Formulations of Alternative System of Medicine, Int. J. of Pharm. Sci., 2025, Vol 3, Issue 2, 1239-1246. <https://doi.org/10.5281/zenodo.14876124>

