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Comparative study of bhashma prepared by using different marine-originated animal materials

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Rasa shastra is a main pharmaceutical branch in *Ayurveda*. Mercury is the main material in *Rasa shastra*. Other than mercury, different animal materials, minerals, gems, marine-originated materials and some toxic plants are also described under *Rasa shastra*. *Shankha*, *Shukthi* and *Kaparda* are some of the commonly used marine-originated animal materials. These materials contain Calcium and are categorized under *Suda varga*. The objective of this study is to prepare *shankha*, *shukthi* and *kaparda bhashmas* according to *Rasa shastra* and to perform the physico-chemical analysis of these *bhashmas* including the determination of Calcium percentage. The boiling and steaming method was used for the purification, and incineration was done by using the muffle furnace at 550°C. *Bhashma* standardization parameters like *Rekha purnatva*, *Varitharathva*, *Uththama*, *Gatha rasathva*, *Avami*, *Anjana sadrusha sukshma* and *Danta grana kacha kacha* were performed for all these *bhashmas*. Calcium percentage in each *bhashma* was determined using titration method. Results revealed that all the *bhashmas* are within the standard parameters according to classical texts. According to modern physico-chemical analysis, total ash contents were 99.2%, 98.5%, 98% respectively. Acid insoluble ash values (52%, 77.8%, 57% respectively) were higher than water soluble ash values (3.8%, 2.65%, 1.65% respectively). Moisture content of all the samples were relatively low (0.4%, 1.3% 0.95% respectively). All the samples were having an alkaline pH value (8.2, 8, 8.7). The highest Calcium percentage was reported from *shukthi bhashma* (99.3%) and lowest from *kaparda bhashma* (78.4%). It can be concluded that all the *bhashmas* were having the standard quality according to *Ayurveda* as well as modern physico-chemical parameters. Among these, *Shukthi bhashma* which has the highest Calcium percentage can be highly recommended as a nutritional supplement for Calcium deficiencies.

Keywords: *Bhashma*, Calcium percentage, *Kaparda*, Marine originated, *Shanka*, *Shukthi*

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