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Mineral constituents and antimicrobial activity of three rasashastra formulations

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Abstract

Identification of mineral and chemical constituents present in commercially available Rasashastra drugs named 'Manikya Rasa' (MR), 'Abhrak Bhasma' (AB) and 'Abhrak Bhasma' (ABS) - prepared in the laboratory were performed using XRD, FTIR, XRF and AAS. The presence of organic constituents was established by thermo gravimetric analysis. Since only MR had significant organic matter content MR was sequentially extracted in to its hexane, dichloromethane and methanol. MR and solid residue, AB, ABS and aqueous extracts of plant constituents of ABS - *Ficus benghalensis* and *Ricinus communis* were evaluvated for their antimicrobial activity against *Pseudomonas aeruginosa* (ATCC-27853), *Escherischia coli* (ATCC 25922), *Staphylococcus aureus* (ATCC 25923), *Staphylococcus aureus* – MRSA and *Candida albicans* (ATCC 90028) using well diffusion assay, a modified version of the same and the agar dilution assay. Mineralogical analysis revealed a number of minerals including mica, cinnabar, chalcopyrite, sphalarite, arsenolite as constituents in MR while AB and ABS consisted of altered mica and iron oxides. All the drugs showed minor amounts of toxic elements and significant amounts of essential elements. MR, its residue, solvent extracts and *Ficus benghalensis* aqueous extract showed significant antimicrobial activity at least against two or more microorganisms, while AB and ABS were inactive against all the microorganisms. The most susceptible bacterium was *S. aureus*, while none of the tested component showed activity against *C. albicans.* This study reveals that antimicrobial activity may be augmented with some minerals with the combinations of organic matter, as opposed to having only altered mica and iron oxides.

Biography

A.U. Wijenayake, a graduate in Geology, University of Peradeniya. Currently, pursuing her Postgraduate studies at the Postgraduate Institute of Science (PGIS) in the same university.

She has published,
Wijenayake, A U, C L Abayasekara, H MTGA Pitawala, and R Bandara. Antimicrobial activity and geochemical characters of some herbo-metallic drugs. Vol. 17. Peradeniya University Research Sessions, 2012.

The Role of Herbometallic Preparations in Traditional Medicine - A Review on Mica Drug Processing (Under review).

A Mineralogical and Chemical study on of two commercially available traditional mica drugs (ready for submission).

The other three authors are senior academic members of Faculty of Science, University of Peradeniya.