Bioaccessibility by perspiration uptake of minerals from sulfurous peloids

Carla M Bastos[1, 3], Fernando Rocha[1], Carla Patinha[1], Paula Marinho-Reis[2]

1 – Department of Geosciences & GEOBIOTEC, University of Aveiro.
2 – Institute of Earth Sciences (ICT), Pole of the University of Minho.
3 – Exatronic, Lda.

The risks associated with the use of peloids in thermal centers, spas, or at home, need to be tested to develop appropriate safety guidelines for peloids formulations and the release of high concern substances. Also, the beneficial effect of some elements on human health should be assessed, to assist in the interpretation of therapeutic action and effectiveness on dermatological or osteomuscular disorders, using pelotherapy. Our team developed a methodology to understand better the biogeochemical behavior of the elements in peloids formulated bentonite clay and sulfurous mineral-medicinal waters. A stabilized, ready-to-use, artificial perspiration test was used to simulate the peloids' interaction with skin. Thirty-one elements extracted from the two prepared peloids were analyzed by ICP-MS. The data were analyzed and related to the mineralogical composition of the original clay and supernatant composition of the maturation tanks. The content of some potentially toxic elements and metals bioaccessibility by perspiration showed very low solubility and undetectable amounts extracted from the studied samples. This analytical method provided some reliable information about dermal exposure and the identification of some elements that may enter the systemic circulation and for which surveillance and control measures must be implemented.

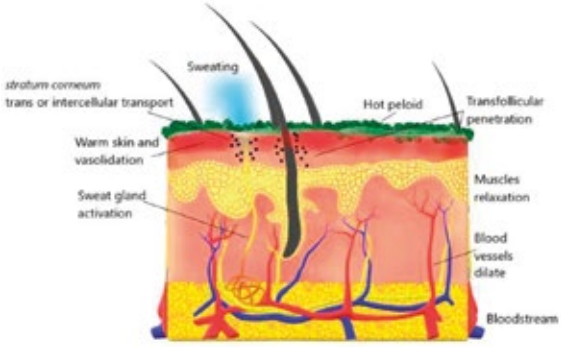

FIGURE 1
Routes of penetration by electric current and heat (iontophoresis in conjunction with pelotherapy.