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Analysis of traditional pharmacopeia product from Morocco 'Rhassoul'

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ABSTRACT

We study here the contamination of Rhassoul, an inexpensive clay mineral readily available in many places of the Atlas Mountains in Morocco. It used for centuries in various cosmetics (embellishment of skin and hair) and is thus non-toxic. Many people add various herbs or other substances to the Rhassoul in order to strengthen it. Our results showed that the concentration of Lead and copper found in non-elaborate samples of Rhassoul were low. However, when Rhassoul was mixed with other products, these concentrations increased. © 2011 Trade Science Inc. - INDIA

KEYWORDS

Rhassoul;
Concentration of lead;
Non-elaborate;
Herbs;
Traditionally.

INTRODUCTION

According to certain authors, traditional medicine plays an important role in the general state of health of a population^[1]. Many medical remedies and mixtures used in this medicine can present a health risk due to the presence of toxic products such as trace elements (Lead, Copper, Cadmium...etc)^[2].

Moroccan pharmacopoeia is rich in medical knowledge inherited from Arabic medicine. Recently, ignorance, poverty and illiteracy have increased the factor risk for populations practising these customs^[3]. The Moroccan population is particularly exposed to the dangers of these products^[4]. Use of traditional cosmetics and remedies such as Rhassoul is very common, especially among women.

In this context, our work explores new ways of valorization of Moroccan clay, called locally Rhassoul, an inexpensive clay mineral readily available in many places of the Atlas Mountains in Morocco. It is generally

used for the embellishment of skin and hair and is thus non-toxic. Rhassoul is a trioctahedral magnesium montmorillonite, characterised by the presence of magnesium in the octahedral layers and silicon in the tetrahedral layers. It possesses an important cation exchange capacity, because of its high magnesium ion content^[5]. Some typical properties of Rhassoul are the viscoelasticity of its aqueous solutions, swelling, a high ion exchange capacity, and strong adsorption of inorganic components, making it suitable for many applications^[6].

This traditional product "Rhassoul" is usually mixed with water and made into a paste, which is then applied on the hair and skin. Many people add various herbs or other substances in order to strengthen it. The mixture of plants added to Rhassoul, consist of: rose petals, leaves, myrtle, lavender flowers, clove...etc. Some formulas add: cuprous oxide, oak gall and tamarisk gall^[3].

MATERIAL AND METHODS

Throughout this study, 5ml polystyrene crystal tubes,

with polyethylene corks were used^[7]. Prior to use, all tubes and corks were cleaned in 10% HCl for 24h, thoroughly rinsed with distilled water and then dried in a desiccators on calcium chloride^[7].

Sampling

The samples of Rhassoul were obtained from local herbalists in different markets in Marrakech. we analyze three types of Rhassoul: Rhassoul 1 (elaborate traditionally by women), Rhassoul 2 (elaborate commercially at factories), Rhassoul 3 (non-elaborate)

Preparation of samples and digestion

In this part of the study, the objective was to compare three type of Rhassoul. Rhassoul samples (1g) were oven-dried overnight at 400°C.

Weighed samples of 0,5 g were digested in 5 ml of acid mixture (nitric acid 50 %, sulfuric and perchloric acid 50 %) in a microwave.

After digestion, Rhassoul samples (1 ml) were mixed with four volumes of distilled water.

Each freshly microwave digested Rhassoul sample was divided into three aliquots.

Analysis

The recovered liquids were diluted in a suitable amount of demineralized water for trace element analysis. Trace metal concentrations were determined by graphite furnace atomic absorption spectroscopy. Metal concentrations were expressed as mean individual values \pm standard deviation. All statistical analysis were done by SPSS vergin 11.

RESULTS AND DISCUSSION

The analysis of Lead and Copper in the three digested Rhassoul samples yielded concentrations ranging from 0,14 $\mu\text{g/g}$ to 0,49 $\mu\text{g/g}$ for lead and 0,07 $\mu\text{g/g}$ to 0,58 $\mu\text{g/g}$ for copper as shown in TABLE 1.

TABLE 1 : Results for chemical analysis of Rhassoul samples.

Sample		Lead	Copper
Rhassoul 1 (Traditionally elaborate)	M \pm SD $\mu\text{g/g}$	0,36 \pm 0,04	0,29 \pm 0,02
Rhassoul 2 (Commercially elaborate)	M \pm SD $\mu\text{g/g}$	0,49 \pm 0,02	0,58 \pm 0,04
Rhassoul 3 (Non-elaborate)	M \pm SD $\mu\text{g/g}$	0,14 \pm 0,01	0,07 \pm 0,02

M: Mean. SD: Standard deviation

The highest lead and copper concentration was in the Rhassoul paste with added materials (traditionally and commercially elaborate Rhassoul). However, the concentration of lead and copper in non elaborate Rhassoul sample was generally low.

Rhassoul is mixed with various herbs and products which are very rich in trace elements especially (lead and copper). For example cuprous oxide that is the inorganic compound with the formula Cu₂O. It is one of the principal oxides of copper. This red-coloured solid is a component of some antifouling paints. It can be dangerous for health: Causes irritation to skin. Symptoms include redness, itching, and pain. Hair and skin discoloration are possible from exposure to copper fume.

CONCLUSION

Lead and copper concentrations reported in the non-elaborate samples of Rhassoul were low. However, Rhassoul mixed with other products showed higher concentration. Because mixing with other products increase the concentration of lead and copper especially in Rhassoul 2 (commercially elaborate). This high concentration in lead and copper in Rhassoul 2, constitute a health risk for the population, particularly women.

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