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Quantitative Study Of Commercial Dead Sea Mud For Estimation Of Metals And Its Potential Role In Cosmetic Application.

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ABSTRACT

This study focused on analysis of different parameters like moisture content, pH, electrical conductivity (EC), porosity, permeability, major anions (Cl^-), Ash content, and determination of (Na, K, Fe, Mg, Ca) minerals in two types of sample. Two samples of mud collected from different brands of Dead Sea mud mask to study physical and chemical analyses and quantitative estimation of metals. This study focused on analysis of different parameters like, pH (8.04, 9.76), Electrical conductivity (17.43, 8.23), Moisture content (49.60, 55.23), Ash content (41.08, 44.91). In the analysis of mineral composition the amount of Iron found (0.16, 0.11) Sodium (2.5, 1.8), amount of Potassium (14.1, 3.52), amount of Calcium (8.04, 14.37), amount of Magnesium (0.76, 0.55), in two types of samples.

Keywords: Physico chemical parameters, Mineral composition, Dead Sea mud, Face pack.

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INTRODUCTION

The Dead Sea is the lowest place on the earth. It lies landlocked in the Middle East between the regions of Jordan and Palestine. What makes the Dead Sea unique is that the salinity is much greater than that of any other water. In fact, according to scientists, the water is nearly 10 times saltier than oceans.

Scientific studies carried out on the mineral mud have proved beyond any doubt, its benefits in maintaining a healthy skin. The mud has a strong cleansing capacity, which absorbs pollutions, fat, and secretions from the skin. In addition, it has capacities for rehabilitation, renewal and strengthening of the skin layer and is thus ideal for healing rheumatic pains, relieving symptoms of chronic inflammation and increased dryness of skin, seborrhea, psoriasis and eczema.

Along with a very high concentration of sodium chloride, the water is also rich in a number of minerals that are advantageous to overall health. This, along with the clean, unpolluted air and pleasant weather provide an invigorating environment that is truly unlike any other place in the world.

The mud produced from the banks of the Dead Sea has become famous around the world because of its healing capacities. The black mud (which in its natural form is characterized by a sharp smell) is made up of layers of the mountain soil and silt from the waters of the Jordan River and the springs, and it has sunk deep into the lake. On its way, the soil absorbs a very rich concentration of minerals and enriches the lake's waters [1-10].

Benefits of Minerals in Dead Sea mud for the skin:

Benefits of Iron in the skin: Deep-cleaning benefits of Iron is eliminate the surface buildup that contribute to skin inflammation, breakouts, and clogged pores Iron can effectively control chronic skin conditions without the guesswork of over the counter products .also ,its commonly used to reduce the appearance of fine lines and wrinkles and reverse the natural aging process.

Benefits of sodium in the skin: Sodium is an important hydrating product in many anti-aging creams. It defends against the free radicals that accelerate the aging process. Furthermore, it helps to restore youthful and healthy skin.

Benefits of potassium in the skin: It acts as a pH level balancer for the skin. It absorbs the water molecules from the environment and hydrates the skin Apart from keeping the cells hydrated potassium also supports the growth of new skin cells. If your skin does not produce enough new cells, it will appear cracked and dull.

Benefits of Magnesium in the skin: Magnesium has the capacity to detoxify the epidermis and cleanse the skin. It is all the more effective in treating or relieving those areas of the skin that are prone to allergic reactions. It is very effective in reducing wrinkles and fine lines and helps combat breakouts or acne on skin. Moreover, it helps eliminate dry skin and also promotes blood circulation.

Benefits of Calcium in the skin: It provides several advantages to the skin, including dead cell removal, protecting DNA damage with anti-oxidants, and lipid barrier functions. Still, another great feature of this mineral is, when found in adequate quantities; it soothes the nervous system, to reduce the stress in general, which is good for the skin.

MATERIALS AND METHODS

Analyses of Physicochemical Properties : The analyses involves the estimation of moisture content, pH, electrical conductivity (EC), porosity, permeability, major anions (Cl^-), Ash content, Smell and Appearance of the dead sea mud were carried out in the present study.

Determination of Mineral Elements: The elements were extracted from Dead Sea mud by the wet digest method. The digested sample was analyzed for the elemental composition using Atomic Absorption Spectrophotometer (AAS) and Flame Emission Spectrophotometer (FES). Zn, Fe, Mn, Cu, Mg, Na, K and Ca were determined and the concentrations of the elements were presented in mg/L.

RESULTS AND DISCUSSION

The results of the Physicochemical Properties and Mineral Composition are presented in Table 1.

Table 1: Physico chemical evaluation & Mineral composition

Parameter	Type of sample	
	Sample-I	Sample-II
pH	8.04	9.76
Electrical Conductivity (ms/cm)	17.43	8.23
Moisture content (%)	49.60	55.53
Determination of Ash content (%)	41.08	44.91
Determination of Chlorides (ppm)	51.4	37.1
Concentration of Iron (ppm)	0.16	0.11
Concentration of Sodium (ppm)	2.5	1.8
Concentration of Potassium (ppm)	14.1	3.52
Concentration of Calcium (ppm)	8.04	14.37
Concentration of Magnesium (ppm)	0.76	0.55

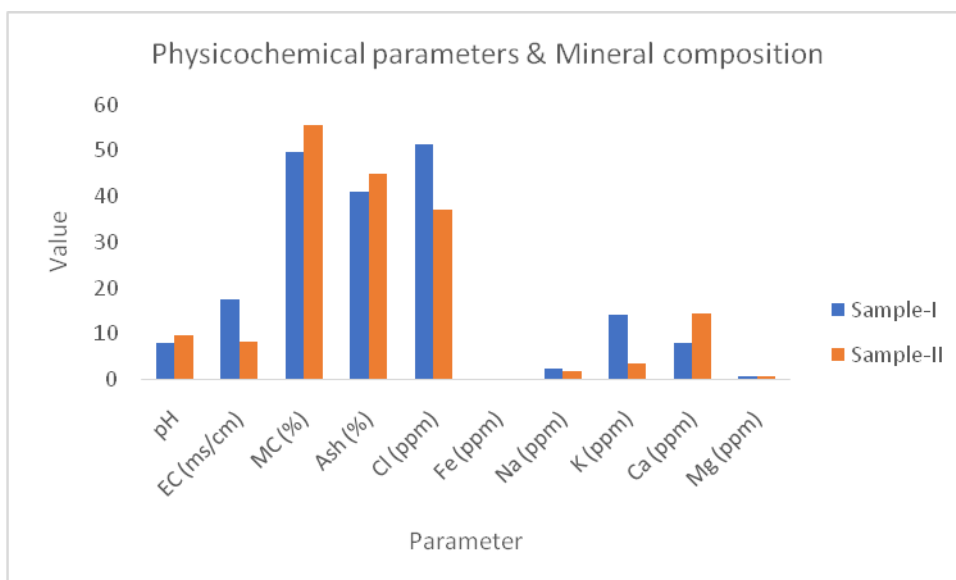


Figure 1: physicochemical parameter & Mineral composition

Author’s contribution statement: Gopala Krishna Devisetty Planned entire study, designed the analysis and wrote the paper Maryam Juma Al-Orimi, ShahdSuleiman Al-Rawahi, ZamZam Mohammed al-siyabi collected the data and performed the analysis.

Statistical analysis: The analysis of variance of the data obtained was done by using completely randomized design (CRD) for different studies. The analysis of variance revealed at significance of P < 0.05 level is mentioned wherever required.

CONCLUSION

The dead sea mud is a good source of iron, sodium, potassium and calcium because the concentrations of these elements in the dead sea mud meet up with the adequate quantity needed by the body daily it has been observed that the regular use of this product does not have any side effects and could be effectively used for cosmetic application in particular as face packs.

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