The *Elementology of Medicinal Rocks In Nigeria: A Case Study of The Red Rocks Laterite (Atun—Yoruba, Marmara — Hausa).*

AKINNIYI, J. A. and INEGBENBOR, A. I.
Department of Chemistry, Faculty of Science, University of Maiduguri, Maiduguri.

**Abstract:**
The soil is very rich nourished in most of the elements which are essential to biological systems. Within the use of Homoeopathy, there has emerged the collection of verified 'Materia Medica'. The red rock laterite, (Atun — Yoruba, Marmara — Hausa) is used for the treatment of skin eruptions. The samples used in this study were collected from Okeiibo in Ondo state of Nigeria. Using spectroscopic techniques, the following elements, Ca Na, K, Mn, Ni, Zn, Pb, P, S, Bi, Co, Ag, Si, Al, and Fe were confirmed present in the rocks. Iron was found to be 16%, Al2O38% and SiO231%. Sodium, S, Mg, Ca, Mn, Ni, Cu, Zn, Pb, and Fe were present in parts per million (PPM) and their respective values were 1130, 900, 593, 583, 200, 100, 68, 47, and 19. Cadmium, Mo, and Sb were not detected in the samples.

**Introduction:**

To cure himself of diseases, man has tried various methods and materials. As a matter of fact, medical knowledge, as it affects the use of plants, animals, and mineral matters in their free or combined state as drugs had progressed in a pattern of a steady acceleration over many centuries; scientists have helped tremendously in this achievements.

Useful plants have formed the core of the various herbacous species of the different parts of the world. The African edition was born in 1985 (OAU 1985) and it some plant substances which have been used with apparent efficiency.

With every passing year the quest for health and drugs continue to grow. The evolutionary trends in instrumentation and technology has made it possible for scientists to isolate, characterize, synthesize, quantify, test the potency and test the toxicity of the drugs even at such a low level as less than a microgramme (Orehban, 1985).

As far back as 1929, the scientific world had recognized that each family of drugs has a host of other drugs which today form an encyclopedia of its own (Lloyd, 1929) Inorganic elements or their compounds (minerals) are, for example, known to play a role in both plant and animal structures (functional cellular processes (Cumar, 1963; Edward et al., 1966; Hakeem, 1987). Today, however, there is a growing recognition of the adverse effects of cumulative exposure to heavy metals in small amounts and to the so called ‘essential’ elements in large concentrations (WIL, 1973 and 1980).

Rapid advances in analytical techniques and sophisticated instrumentation have enabled scientists to detect and quantitatively determine most naturally occurring inorganic elements or their compounds in non-biological non-organic rocks; living systems and their cells, and plants (Hakeem, 1987). These developments have added new dimension to our understanding of the role of inorganic elements or their compounds both in health and diseases.

The literature on African medicinal rocks frequently used in African traditional medicine is very scanty and in this paper we are reporting some of the results which were obtained in our laboratory while investigating the effects of and the elementology of the red rock laterite, [Atun — Yoruba, Marmara — Hausa].

**Materials and Methods:**
The rock material used in this work was bought off the peg from the local market in Okeiibo. Ondo state, an approximate weight of about, 800g cost N5.0 only. Part of this material was identified by and deposited with the department of Geology, Faculty of science, University of Maiduguri. To determine the trace elements, pulverized rock sample was digested. Flame emission spectrometer (FES) Gallen kamp (FGA 330) was used to determine Na, K and Ca, in the sample. Sulphur and phosphorus were determined gravimetrically as detailed in Vogel (1978).

The other elements were determined by atomic absorption spectrophotometry (AAS) with APV Unicam. Air/propane and air/acetylene (ethylen) flames were respectively used in the FES and AAS procedures. Standard calibration quantitation method was used in both procedures. In this technique, plots of emission (FES) and absorbance (AAS) readings for prepared known standard concentrations of the test element were drawn. From these, concentrations of the relevant elements in the pulverized rock samples were obtained using their measured emission and absorbance value as the case may be. Determination was done in triplicate and value were calculated together with their standard deviation values obtained.
Estimation of trace elements:
Sample preparation and analysis:

Table 1: showing the concentration in part per million (PPM) for trace elements analysis of pulverized red rock laterite (Atun - Jalora) from Okeigbo in Ile-Oluji/local Govt. Area of Ondo state.

<table>
<thead>
<tr>
<th>ELEMENTS</th>
<th>Ca</th>
<th>Sr</th>
<th>Mg</th>
<th>Be</th>
<th>K</th>
<th>Mg</th>
<th>Fe</th>
<th>Pb</th>
<th>Zn</th>
<th>Ni</th>
<th>Cu</th>
<th>Ag</th>
<th>Si</th>
<th>Al</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARS1</td>
<td>583</td>
<td>ND</td>
<td>0.25</td>
<td>ND</td>
<td>592</td>
<td>1150</td>
<td>113</td>
<td>200-100</td>
<td>908</td>
<td>47</td>
<td>19</td>
<td>900</td>
<td>0.6</td>
<td>0.8</td>
<td>0.2</td>
</tr>
<tr>
<td>ARS2</td>
<td>580</td>
<td>ND</td>
<td>0.26</td>
<td>ND</td>
<td>72</td>
<td>148</td>
<td>114</td>
<td>203</td>
<td>99</td>
<td>47</td>
<td>19</td>
<td>910</td>
<td>0.6</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>ARS2</td>
<td>582</td>
<td>ND</td>
<td>0.25</td>
<td>ND</td>
<td>59</td>
<td>152</td>
<td>113</td>
<td>201</td>
<td>99</td>
<td>49</td>
<td>21</td>
<td>905</td>
<td>0.6</td>
<td>0.6</td>
<td>0.2</td>
</tr>
</tbody>
</table>

* These elements were analyzed in percentages.

0.5g of pulverized rock sample was digested by heating for 2 hours with a mixture of HNO and HClO in a 500cm flask.

This was evaporated to 5cm and together with the residue was taken up in 10cm of 2M HNO and 10cm distilled water into 100cm volumetric flask. The volume was made up to mark with distilled water. Blank samples and standard solutions for the various elements were similarly prepared. All samples were stored in plastic containers in a refrigerator maintained at 4°C prior to analysis.

Result and Discussion:
Table 1 represents the results of the trace element analysis of pulverized red rock laterite (Atun-Jalora). Cadmium and Cr were not detectable in the sample. There is however a high concentration of Fe, 30.05%; Al, 12.8%; and Si, 8.499% on average. Sodium, Ca and Mg are just parts per million (PPM) respectively on the average. Bismuth, Cu, Co nd Ag are very low average 0.6, 0.6, 0.25 and 0.02 PPM respectively.

Conclusion:
The high concentration of Al might cause the rock to bite the skin.

References:
Ilakeem A. H (1947) Medical Element legacy. A B of work done India Pakistan and Bangladesh. Journal of the Institute of History of Medicine, 1 Q.