

GUM OF STERCVLIA URENS, ANOGEISSUS LATIFOLIA, ACACIA NILOTICA: METAL ANALYSIS

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Abstract: Gum of Sterculia urens ,anageissus latifolia and acacia nilotica collected from six tahasils of Gadchiroli district of Maharashtra(India) and subjected to metal ion analysis. The data obtained as, sodium (0.0026-0.0038%),potassium (0.1516-3.5920%),magnesium (0.2640-1.7160%),calcium(0.1800-1.0000%) and iron(0.00007%).The concentration of metal ions do not show regularity.

Keywords: *Sterculia urens, anageissus latifolia, acacia nilotica, gum, metal analysis.*

Introduction:

Gadchiroli is one of the tribal district of Maharashtra, situated at the north latitude 19-21⁰ and the east langitude 80-81⁰.The geographical area of district is 14412sq.km.with 78.4% reserve forest¹. As per 2011 census, population of a district is 1,072,942².The schedule caste (S.C.) and schedule tribal (S.T.) population in the Gadchiroli district is 38.3%,³ thus recognized as “Tribal District.” The whole Gadchiroli district distributed into twelve tahasils namely Gadchiroli, Armori, Desaiganj, Kurkheda,Korchi, Dhanora, Chamorshi, Mulchera, Aheri, Etapalli, Bhamaragad and Sironcha.

A forest range in district (Gadchiroli) is very rich in commercially and pharmaceutically important. The local tribal healer are very much familiar with the medicinal plants and their uses. After fulfillment of basic needs foods and shelter a man has found some alternatives from medicinal plants to cure different human diseases⁴ plant gum are exudates, which are weep continuously after mechanical injury to the trunk or branches of a tree.⁵ Gums are used in a food industry as binding agents, clarifying agents,thickening agents,emulsifiers, stabilizers etc.^{6,7}

Sterculia urens is a medium sized deciduous tree, the branches spread horizontally to grow height upto 15-20 meter. It's bark is greenish-gray colour. It is native to India.

Anogeissus latifolia is a medium to large sized tree with height 30-35 meter with a straight and cylindrical hole upto 100 cm in diameter. It is distributed all over India in desiduous forest.

Acacia nilotica is medium sized tree, which grow 15-20 meters high with dark brown or black longitudinally fissured bark. It is sub tropical genus abundant families of the species which are under study –

Table 1:names and families of species.

Sr.No.	Botanical name	Common name	Family
1	<i>Sterculia urens</i>	Gum karaya	Sterculiaceae
2	<i>Anogeissus latifolia</i>	Gum ghatti	Combretaceae
3	<i>Acacia nilotica</i>	Babul	Fabaceae

The metal ions sodium, potassium, calcium, iron etc play significant role in a human body to satisfy metabolic needs.⁸

Sodium ion is the major cation in a human body. The male body content about 92 g sodium. The sodium balance by in a human body is linked with water and further maintained by a kidneys. Sodium is essential nutrient in a body which maintain the blood pressure of a body. It plays important role for the excitability of the muscles and cells, transporting nutrients and substances through plasma membranes.⁸ Potassium is an important cation in a human body which maintains water balance, acid base balance, osmotic pressure, activation of enzymes and mediation of cation hydrate and protein metabolism. It also maintains neuromuscular activity and heartbeats.⁹ An adult human body contains 110-137 g of potassium.¹⁰

Magnesium is the fourth most abundant mineral in a human body which is essential for more than 300 reaction within a body. A human body contain approximately 25g magnesium. It is used in various biological function. It regulates diverse biochemical reaction in a body, like protein synthesis, regulation of blood pressure and blood glucose.¹²⁻¹⁴

Calcium regulates excitability which effect peripheral neuromuscular mechanism. It is essential to maintain integrity of the skeletal muscles.¹⁵ It plays an important role in formation of bone and teeth, contraction of muscles, normal functioning of enzymes, blood clotting and normal heart rhythm. About 99% of body's calcium is stored in bones and teeth. The adult human body contains nearly 1000 g calcium.¹

Iron is an abundant metal in a human body. The human body contains iron is 3-4 g¹⁷ It is contained in hemoglobin also responsible for a red colouration of human blood.¹⁸ It is essential for growth, development, normal cellular functioning and synthesis of some hormones and connective tissue.¹⁹⁻²⁰ It also bind, transport and release oxygen in a body.²¹

Materials and Methods :

i) Study Area: The gum samples *Sterculia urens*, *Anogeissus latifolia* and *acacia nilotica* are collected from Kurkheda/ Korchi, Ettapalli /Bhamaraghad and Gadchiroli/Dhanora tahsils respectively from the Gadchiroli district of Maharashtra. The crude gum samples bring 'Handpricked select gum methods' to obtain gum of good quality.

ii) To draw a calibration curve for sodium ion: The process given below is followed to draw a calibration curve-

- 1) Set up flame a photometer
- 2) Prepare standard solutions of sodium ion with concentration 0.001, 0.002, 0.003, 0.004, 0.005, 0.006, 0.007, 0.008, 0.009 and 0.010% in doubled distilled water.
- 3) Select a sodium filter, aspirate highest concentration solution (0.010%) of sodium and intensity 100.
- 4) Aspirate distilled water to obtained intensity reading zero.
- 5) Aspirate all the sodium solution in increasing order of concentration.
- 6) In between two reading of sodium solution aspirate distilled water to obtain zero reading.
- 7) Plot a graph of concentration (x-axis) verses intensity (Y-axis), which is known concentration curve.
- 8) Aspirate an unknown solution (gum solution) and record intensity.
- 9) Concentration of unknown solution read off from the calibration curve.

(Parallel process is carried out for other metal ions also)

Result and Discussions

Table 2: concentration of metal ions

Sr.No	Sample Name	Sodium%	Potassium%	Magnesium%	Calcium%	Iron%
1	<i>Sterculia urens</i>	0.0026	3.5920	1.7160	0.1800	BDL
2	<i>Anogeissus latifolia</i>	0.0026	0.5867	0.1680	1.2000	BDL
3	<i>Acacia nilotica</i>	0.0038	0.1516	0.2640	1.0000	0.00007

(Note BDL-Below Detectable Level)

The metal ion analysis conclude's that the concentration of metal ions varies as, sodium (0.0026-0.0038%), potassium (0.1516-3.5920%), magnesium (0.2640-1.7160%), calcium (0.1800-1.0000%) and iron (0.00007%).

The concentration of metal ions do not show regularity as the characteristics of gum mainly depend upon climatic condition, environment, soil, age of the tree and place where the tree grows.

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