



# **Determination of essential elements in medicinal plants of the Sudarban mangrove forest by neutron activation analysis**

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# Introduction

➤ In this research work, Neutron Activation Analysis(NAA) method was employed to assess the essential elements present in two medicinal plants (*Cynodon dactylon*, *Acanthus ilicifolius*) collected from three different locations of the Sundarbans, Bangladesh.

➤ All these samples were irradiated in rabbit irradiation facility of 3 MW TRIGA MARK-II research reactor of Bangladesh Atomic Energy Commission (BAEC) and gamma-ray spectrometry of the irradiated samples was performed using high-resolution HPGe detector system at NAA laboratory of BAEC.



**3 MW TRIGA MARK-II research reactor of Bangladesh Atomic Energy Commission (BAEC)**



**Prepared Samples**



**Sample Irradiation**

# Experimental Data

Sample	Concentration (mg/kg) Soil samples								
	Al	Ca	Dy	K	Mn	Na	Ti	V	
RG-1	79600	19400	6.84	29000	817	9650	5600	87.8	
	±2560	±2490	±0.52	±3550	±47	±448	±396	±4.7	
RG-2	82800	23300	5.72	32300	842	9220	4890	98.5	
	±2630	±2330	±0.45	±3870	±47	±428	±326	±4.7	
RH-1	79100	20400	5.69	27700	771	10200	4740	86.7	
	±2530	±2340	±0.45	±3400	±44	±471	±331	±4.4	
RH-3	73000	20800	6.18	32900	717	10200	4540	85.4	
	±2320	±2090	±0.48	±3980	±40	±470	±300	±4.1	
S-1	70060	22800	6.39	28300	733	11600	4300	77.7	
	±2230	±2240	±0.50	±3500	±41	±535	±288	±3.7	
S-2	75900	22300	7.68	33200	781	11500	5270	83.0	
	±2410	±2150	±0.58	±4010	±43	±532	±340	±3.9	
S-3	77200	26800	7.56	30200	746	11800	4270	86.8	
	±2450	±2430	±0.57	±3710	±42	±541	±284	±4.1	
Samples	Concentration (mg/kg) Plant samples								
	Al	Ca	Cl	Dy	K	Mn	Na	Ti	V
G-1	50400	19360	5340	3.19	26340	818	9070	1160	69.4
	±1930	±1330	±203	±0.53	±3500	±54	±492	±43	±7.4
G-2	33200	23280	5830	1.89	14310	475	9070	613	48.6
	±1280	±998	±342	±0.31	±1950	±32	±492	±26	±5.2
G-3	22420	20840	27850	2.03	32790	813	17283	509	30.8
	±864	±952	±1530	±0.34	±4340	±54	±933	±23	±3.3
H-1	25000	20430	15950	1.41	16560	450	14360	481	40
	±962	±1310	±891	±0.24	±2240	±30	±776	±22	±4
H-3	36625	22830	5910	2.36	17080	491	9445	702	51.5
	±1410	±1390	±345	±0.39	±2300	±33	±512	±29	±5.5

# Conclusion

Total 9 elements (Al, Ca, Cl, Dy, K, Mn, Na, Ti and V) have been determined in plant samples.

Total 8 elements (Al, Ca, Dy, K, Mn, Na, Ti and V) are determined in the soil samples

The concentrations of the elements are safe for human intake. No such toxic elements are found rather some are very essential for human health.

The transfer factor graph shows that Ca has the mobility to most of the plants. Also Mn and Na shows mobility in two plants as the transfer factor value exceeds 1.

In future, the elemental concentration in different parts of such plants can be monitored to assess average daily intake of these parts by the local people and health hazard quotient with the assistance of the results of this study.

