

## CHARACTERISTICS AND FLORISTIC COMPOSITION IN SALINE ALKALI HABITATS

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A sizeable area of the Indo-Gangetic plains of Indian subcontinent is characterized by high salt content high E<sub>Ce</sub> and poor soil structure. Plants having resistance to these conditions invade, ecise and survive in these habitats. This report presents the ecology of these habitats embracing floristic composition in relation to some habitat characteristics viz., soil moisture content, E<sub>Ce</sub>, pH, soil organic matter and total nitrogen content.

Three study sites were selected for the present investigation within 100 km radius around Banaras (25° 18' N and 83° 1' E), 76.19 m above sea level and designated as sites I, II and III. These sites represent patches of salt-affected waste land.

Plant species inhabiting study sites were collected in different seasons around the year from June 1986 through May 1987. Composite soil samples were collected from permanently established quadrates to 30 cm depth after scraping the salt crust and vegetation from the surface. Soil analysis was carried out by standard methods (Moodie *et al.* 1963; Piper 1950; Jackson 1962).

These sites were characterized by the presence of white or greyish white deposits of salts throughout the year subsequent to monsoon period with a sparse herbaceous vegetation dominated by grasses. The values of soil moisture content, pH and nitrogen were maximum during rainy season and minimum in summer season. Rainfall recorded during rainy season was 258 mm. An inverse trend was observed in case of E<sub>Ce</sub> of soil, soil organic matter and carbon/nitrogen ratio (Table 1).

Species diversity was maximum during rainy season at all the study sites when communities attained the optimum stage of development. The decrease was gradual and was minimum during summer at all the study sites (Table 2). *Cynodon dactylon* (Linn.) Pers., *Sporobolus diander*, Beauv., *I. linifolia* (Retz.) D.C., *Prosopis cineraria* usually flourished round the year at all the study sites. *Cynodon dactylon* dominated indicating maximum density/m<sup>2</sup> at all the sites.

Rainy season enhanced leaching of excess soluble salts in first few cm of soil which favoured germination of seeds of many species. Relatively higher species

Table 1. Seasonal variation in physico-chemical properties of saline-alkali soil

Parameters	Site I			Site II			Site III		
	Rainy	Winter	Summer	Rainy	Winter	Summer	Rainy	Winter	Summer
Moisture (%)	16.8	11.5	9.6	19.3	14.1	10.2	20.5	13.1	10.4
pH	10.3	10.1	10.1	9.2	9.1	8.9	8.9	8.8	8.6
ECe dSm <sup>-1</sup>	4.9	6.9	7.4	3.3	5.4	5.5	3.0	4.2	4.2
Organic carbon (%)	0.10	0.12	0.13	0.08	0.10	0.12	0.11	0.14	0.15
Nitrogen (%)	0.13	0.02	0.02	0.03	0.02	0.02	0.04	0.03	0.03
C/N ratio	3.23	5.07	6.37	2.99	4.84	5.44	2.72	4.31	5.31

Table 2. Seasonal variation in floristic composition and density/m<sup>2</sup> of study sites

Species	Site I		Site II		Site III	
	Rainy	Winter	Summer	Rainy	Winter	Summer
1. <i>Eclipta alba</i> Hassk	1.9	1.2	—	0.9	0.6	—
2. <i>Portulaca quadrifolia</i> L.	—	—	—	1.2	—	—
3. <i>Elusine indica</i>	2.5	—	—	3.1	—	—
4. <i>Eragrostis tenella</i> Roem. Sch.	4.2	—	—	3.1	—	—
5. <i>Dactyloctenium aegyptium</i> (L.) Beauv.	12.4	5.3	—	7.9	5.6	—
6. <i>Pluchea lanceolata</i> Cl.	1.7	0.6	2.1	—	—	0.7
7. <i>Cyperus rotundus</i> Linn.	2.5	2.2	—	2.9	2.1	2.4
8. <i>Vernonia cinerea</i> Less.	0.7	—	—	—	—	—
9. <i>Sporobolus diander</i> Beauv.	14.8	11.4	9.3	13.6	7.6	5.9
10. <i>Convolvulus arvensis</i> Linn.	0.7	2.6	1.2	2.1	3.4	0.9
11. <i>Euphorbia prostrata</i> Ait.	8.6	0.4	—	5.2	0.5	—
12. <i>I. limifolia</i> Retz. D.C.	0.8	2.9	1.3	0.6	2.3	1.1
13. <i>Phyla nodiflora</i> (Linn) Green	11.2	7.9	—	13.9	9.5	8.1
14. <i>Launaea asplenifolia</i> Hook f.	2.1	—	—	1.9	—	—
15. <i>Alysicarpus monilifer</i> D.C.	4.3	—	—	6.8	7.1	—
16. <i>Cynodon dactylon</i> (Linn) Pers.	28.4	30.1	12.5	25.3	22.1	17.4
17. <i>Dicanthium annulatum</i> Stapf.	2.0	—	—	1.8	—	—
18. <i>Bothriochloa pertusa</i> A. camus	0.7	0.6	—	0.2	—	—
19. <i>Chloris barbata</i> S.W.	2.0	1.9	—	4.2	3.3	—
20. <i>Desmostachya bipinnata</i> (Linn.) stapf	2.9	2.3	—	—	—	—
Total	19	13	5	17	11	6
	20	17	3	17	12	3