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Research Article

EMINENCE OF *ARISTIDA* AND REVEALING STATUS OF OTHER PREDOMINANT UNPALATABLE GRASS SPECIES IN GRASSLAND OF KACHCHH, GUJARAT

***Vyas D. N. and Dabgar Y. B.**
R. R. Mehta College of Science & C. L. Parikh College of Commerce, Palanpur (N. Guj.)
**Author for Correspondence*

ABSTRACT
The study of eminence of *Aristida* and status of other predominant unpalatable grass species was of concern because unpalatable grasses have occupied large areas in the grasslands of Kuchchh, reducing the available space for the growth of palatable species, which is presently very low. The natural seed bank of the palatable grass and herb species are also very low due to intensive grazing. Further the predominant unpalatable species, not eaten by livestock, produce more seeds. Within unpalatable grasses as far as Genus *Aristida* is concerned, it was found as most a predominant unpalatable grass in the grasslands of Kuchchh. The reason behind that is acute shape of its seeds and the flowering glume which is tipped by 3-capillary axis, helping in seed dispersal.

Keywords: *Aristida, unpalatable grass species, Kachchh*

INTRODUCTION
Providing habitat for both the wild and the domestic fauna, grasslands are one of the most crucial ecosystems. This ecosystem neither have species richness nor high standing phytomass like other wooded habitat, but the high productivity of grasslands accounts for one-quarter of all photosynthetic energy conversion (Smil, 1991). Despite the enormous ecological and economical significance, there has not been any systematic inventory of characterization of the grassland ecosystems in the country or the state of Gujarat (Dixit, *et al.*, 2001). In Kachchh, grassland is the most highly used ecosystem as majority of its rural population is either fully or partially dependent on it for their living. As Kachchh grasslands are fodder source for several thousand livestock of different varieties, they were revealed to identify the status of predominant unpalatable grass species, helping to develop an action plan for improving the habitat for further increase in productivity of palatable grass species.

Study Area
Grasslands of Kachchh district of the state of Gujarat were selected as the study area under present research. Kachchh being the biggest district of the state occupies total area of 45,652 sq. km. and is situated between 23°91' N longitude and 70°36' E latitude. The area falls under arid to semi-arid zone of the state. Temperature ranges here from as low as 3°C in winter to as high as 47°C in summer in some part of the Greater Rann of Kachchh. Average rainfall is about 300 mm. annually. The district was divided in to two regions and four clusters based on the types and extent of grassland on ecological and environmental settings (topography, location, rainfall, major soil types). The Banni grasslands, once the largest grassland in Asia, extended to about 3800 sq. km but presently degraded and with reduced grass cover due to human interventions was recognized as Region I, while Naliya the second largest and contiguous grasslands, which still retains its natural grassland instincts, in Abdasa taluka extending up to 120 sq. km was recognized as Region II.

The grassland on hills of very highly undulating terrain of Lakhpat, Nakhatrana and parts of Abdasa taluka, formed Cluster I. The grasslands of the moderately undulating hills of Bhuj, Anjar and parts of Mandvi and Mundra located in the central part of Kutch with minimum area under dense grass was identified as Cluster II. Undulating hills of Bhachau and Rapar, the eastern most talukas, were denoted as Cluster III. The grassland on gentle undulating topography with different ecological and environmental settings of the coastal areas of Lakhpat, Abdasa, Mandavi, Mundra, Anjar and Bhachau talukas was identified as Cluster IV.

MATERIALS AND METHODS

Species richness was based on the inventory of the flora in the identified regions and clusters i.e. Cluster I = Lakhpat, Cluster II = Bhuj & Anjar, Cluster III, Bhachau & Rapar and Cluster IV = Mandvi & Mundra, Region I = Banni and Region II = Naliya. For the standard quantitative assessment belt transect method (Mueller-Dombois and Ellenberg, 1967; Kershaw, 1973) was used. Grasses and herbs were quantified using two 1x1 m. quadrates at every 200-300 m. interval. Within these quadrates line intercept method (Mueller-Dombois and Ellenberg, 1967; Kershaw, 1973) was used to note the cover of grass and herb species. Based on this data collection hectare wise % of cover for grasses was calculated. All the plant species which were found inside and outside as well of the sample plots were identified and documented using 'Flora of the Presidency of Bombay' (Cooke, 1901-1908)' Flora of Gujarat State' (Shah, 1978) and 'Flora of the Indian Desert' (Bhandari, 1995).

RESULTS AND DISCUSSIONS

As far as genus *Aristida* is concerned, four species of it i.e. *A. adscenscionis* L., *A. funiculate* Trin. & rupr. *A. hystriculata* Edgew. and *A. hystrix* L. f. were identified in study area. Because present study deals with unpalatable grass species, all these four species of genus together were considered as grass *Aristida*. The information of the predominant species of unpalatable grasses is given in table 1. This would provide a clear idea of locations which can be brought under prescribed areas for further reclamation and palatable grass fodder production.

Table 1: Status of predominant unpalatable grass species in different clusters and regions of Kachchh

Cluster/ Region	Predominant unpalatable grass species	% of predominant unpalatable grass species in total vegetation cover	total of all unpalatable species	total unpalatable grasses
Cluster	*Aristida* (all four species)	16.06	32.14	46.09
I	*Cymbopogon martini* (Roxb.) Wats.	4.04	8.08	11.60
	Total	20.10	40.22	57.69
Cluster	*Aristida* (all four species)	31.67	49.91	52.16
II	*Dactyloctenium aegyptycum* (L.) p. Beauv.	5.06	7.97	8.33
	Total	36.73	57.88	60.49
Cluster	*Aristida* (all four species)	38.06	60.04	63.58
III	*Ischaemum indicum* (houtt.) Merrill.	5.69	8.97	9.50
	Total	43.75	69.10	73.08
Cluster	*Cymbopogon martini* (Roxb.) Wats.	20.82	40.75	55.35
IV	*Aristida* (all four species)	6.58	12.90	17.52
	Total	27.40	53.65	72.87
Region	*Fimbristylis spathacea* Roth.	6.88	13.72	35.54
I*	*Cyperus rotundes* L.	6.66	13.30	34.44
	Total	13.54	27.02	69.98
Region	*Cymbopogon martini* (Roxb.) Wats.	15.40	28.03	48.43
II	*Aristida* (all four species)	6.58	11.74	20.28
	Total	21.98	39.77	68.71
Overall	*Aristida* (all four species)	14.22	25.87	37.67

**Only in Region I, Cyperus haspen L., the only palatable species was found to be predominant than any unpalatable species with 9.59% of the total vegetation cover*

The percent cover of particular unpalatable predominant grass species was compared in respect of total vegetation cover (palatable and unpalatable), total unpalatable species (including herbs) cover and total unpalatable grass cover to determine its dominance in the grasslands of the study area.

At region and cluster level it was evident that in Clusters I, II & III, grass *Aristida* (all four species) was found to be the most dominant grass. This along with respective second dominant grass species *Cymbopogon martini* (Roxb.) Wats., *Dactyloctenium aegyptycum* (L.) p. Beauv. and *Ischaemum indicum*

(houtt.) Merrill. in each cluster contributed 20.10%, 36.73% and 43.75% of the total vegetation cover respectively. These predominant unpalatable grass species together formed 40.22% , 57.88% and 69.10% of the total of all unpalatable species and 57.69%, 60.49% and 73.08% of the total unpalatable grasses in Clusters I, II & III respectively. While in Cluster IV *Cymbopogon martini* (Roxb.) Wats. was found to be predominant unpalatable grass species. Together with grass *Aristida* (all four species), the contribution of predominant grass species in this cluster was 27.4% of the total vegetation cover, 53.65% of the total of all unpalatable species and 72.87% of the total unpalatable grasses. Unlike other clusters and region, Region I was the only area where species of *Aristida* did not found to be predominant grass species. In this region *Fimbristylis spathacea* Roth. was found to be the predominant unpalatable grass species followed by *Cyperus rotundes* L.. These two species together in the region contributed 13.54% of the total vegetataion cover, 27.02% of the total of all unpalatable species and 69.98% of the total unpalatable grasses. In Region II, *Cymbopogon martini* (Roxb.) Wats. was found to be the predominant unpalatable grass species followed by grass *Aristida* (all four species). These species together in the region contributed 21.98% of the total vegetation cover, 39.77% of the total of all unpalatable species and 68.71% of the total unpalatable grasses. As a whole as far as species of grass *Aristida* (all four species) are concerned they contributed 14.22% of the total vegetation cover, 25.87% of the total of all unpalatable species and 37.67% of the total unpalatable grasses (table 1).

Conclusion

All four species together of unpalatable grass *Aristida* were found to be the predominant in three of the clusters and one of the regions. Which in broad-spectrum in grasslands of Kachchh about $1/6^{th}$ of the total vegetation cover, just above $1/4^{th}$ of the total of all unpalatable species and more than $1/3^{rd}$ of the total unpalatable grasses, proving the genus to be the most predominant in the study area. Along with grass *Aristida* (all four species), *Cymbopogon martini* (Roxb.) Wats., *Dactyloctenium aegyptycum* (L.) p.Beauv., *Ischaemum indicum* (houtt.) Merrill., *Fimbristylis spathacea* Roth. and *Cyperus rotundes* L. were also found to be predominant in the study area. Additionally in Region I, *Fimbristylis spathacea* Roth. and *Cyperus rotundes* L. were found to be predominant grass species. This was the only area where a palatable (but not preferred by livestock) species, *Cyperus haspen* L. was predominant with cover of 9.59% of the total vegetation.

In this scenario it is needful to mention that the natural seed bank of the palatable grass and herb species are very low due to intensive grazing. Biting of new growth of palatable grass species continuously by the livestock does not allow the plant to flower and fruit. Further the predominant unpalatable species, not eaten by livestock produces more seeds, which disperse and establishes in all available suitable habitats. The main cause for grass *Aristida* (all four species) to be the most predominant unpalatable grass is acute shape of its seeds and flowering glume tipped by 3-capillary axis, which helps in dispersal. The sites with exclusive predominance of unpalatable species should be reclaimed. Burning of the grass like *Aristida* at appropriate time during the year would help in decreasing percent cover of the species and providing further area available for palatable grass species to flourish or to be cultivated.

REFERENCES

Bhandari MM (1995). *Flora of the Indian Desert*, MPS Reports, Jodhpur, Rajasthan

Cooke T (1901-1908). *The flora of the Presidency of Bombay* London (Botanical Survey of India, reprinted 1958, Calcutta)**1-3**.

Dixit AM, Silory CS, Gupta L and Mistry N (2001). A Study on Traditional Knowledge of Ethnobotanical Resources of District Kachchh. *GUIDE, Bhuj, Gujarat.*

Kershaw KA (1973). *Quantitative and Dynamic Plant Ecology*, (New York: American Elsevier Publishing Co., Inc).

Mueller-Dombois and Ellenberg H (1974). *Aims and Methods of Vegetation Ecology* (Jhon wiley and Sons, New York).

Shah GL (1978). *Flora of Gujarat State* (S. P. University Press, Vallabh Vidyanagar, Gujarat) **1-2**.

Smil V (1991). *Global Ecology, Environmental Change and Social Flexibility* (Routledge).