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Biomass and primary productivity of *Bothriochloa pertusa* L.

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Abstract- A study of a grassland in the Gangetic plain of Bihar, dominated by *Bothriochloa pertusa* L. showed that the maximum biomass of standing live, standing dead, litter and underground part was 782.1 g/m^2 (October), 421.8 g/m^2. (May), 88.3 g/m^2 (June) and 383.9 g/m^2 (October), respectively. The annual aboveground and underground net production of *B. pertusa* was 782 g/m^2 and 322 g/m^2, respectively.

Keywords : Biomass, *Bothriochloa pertusa* L.

INTRODUCTION

Several investigators have studied the biomass and net primary productivity of various grasslands in India.[1-3] The present study deals with biomass and primary productivity of *Bothriochloa pertusa* L. grassland of Bihar, India.

MATERIAL AND METHODS

The present study was confined to the grasslands situated in the Gangetic plain of Bihar about 64 Km cast of Patna approximately 47m above the mean sea level. The typical monsoon climate is characterised by three distinct seasons i.e. rainy (July-October), winter (November-February) and summer (March-June).

The average annual rainfall was 1093 mm of which about 72 per cent was recorded in rainy season. The mean annual relative humidity and maximum and minimum temperatures were 71.8%, 31°C and 20°C, respectively.

The plant biomass on the grassland was evaluated monthly from June 2010 to June 2011 by harvest method. The sampling was done in the last week of each month. The sampling area was 25 cm square for biomass estimation and rive monoliths upto 30 cm depth were dug at random. The standard methods were used to estimate the standing live, standing dead, litter and underground pan of the plant. The primary productivity was calculated by the negative differences between successive monthly biomass values.

RESULTS AND DISCUSSION

The biomass data are given in Table I. The standing live biomass showed peak values in late rainy season (September-November). The decrease in biomass during winter and summer seasons may be attributed to the lower

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temperature and dried conditions. The biomass of standing dead decreased in the rainy season, but it increased in winter and summer seasons. It was due to rapid senescence of plants and transfer of standing green into standing dead compartment.[1] The biomass of the litter varied throughout the study period. The increase from October to May, may be due the input from standing dead of the grasses. The minimum litter in the rainy season may be due to high moisture and temperature decomposing the litter.[4] The underground biomass was maximum in October and minimum in July.

Table 1. Monthly variations in the mean biomass (g/m^2+SEM) of aboveground (Standing live, standing dead, litter) and underground part of *Bothriochloa pertusa* type grassland.

MONTH	Above ground				Underground
	Standing live	Standing Dead	Litter	Total	
June	276.7 ± 8.8	201.6±7.5	88.3±2.5	566.6	312.0±8.9
July	426.3 ± 13.7	98.2±5.7	56.0±2.5	580.5	243.4±9.0
August	624.0 ± 14.1	69.2±3.23	6.6±0.9	699.8	280.5±7.5
September	669.5 ± 13.8	116.2±5.7	5.5±0.9	791.3	302.0±10.6
October	782.1 ± 15.5	215.6±6.5	10.7±1.3	1008.5	383.9±7.1
November	654.6 ± 15.4	280.0±7.0	22.9±2.0	957.5	288.5±8.2
December	623.1 ± 1.3	299.4±8.5	42.3±3.0	864.9	339.2±9.8
January	334.8 ± 7.6	149.8±8.4	57.5±3.0	742.2	269.5±7.6
February	382.1 ± 11.0	357.8±11.4	45.5±2.9	785.5	325.7±11.3
March	246.9 ± 8.8	373.2±7.0	65.6±2.8	685.7	320.8±10.6
April	138.9 ± 5.7	412.6±11.6	69.5±2.4	621.0	324.1±7.7
May	83.6 ± 4.1	421.8±11.0	78.2±2.9	583.7	309.1±7.6
June	201.2 ± 5.1	296.4±7.9	73.7±3.1	571.4	326.3±10.3

The aboveground net primary production was 782 g/m^2/year and the underground production was 322g/m^2/ year. In the total annual net primary production about 62 per cent was contributed by the aboveground production only. The net primary production on the grassland of our study was more than that reported by Murphy (1975)[5] for tropical grasslands. The higher productivity of the present grassland was probable due to dominance of *B. pertusa.*

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