



**Biomass and primary productivity of *Guizotia abyssinica* L at
Aurangabad District**

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Abstract:

The present paper deals with biomass and primary productivity of *Guizotia abyssinica* L. Grass land adjoining area of Aurangabad District *Guizotia abyssinica* L. was dominated and showed that the maximum biomass of stand in glive, standing dead, litter and under ground parts were 782.1 g/m² (October), 421.8 g/m² (May), 88.3 g/m² (June) and 383.9 g/m² (October), respectively. The annual above ground and under ground net production of *Guizotia abyssinica* L. was 782 g/m² and 322 g/m², respectively.

Keywords: Biomass, primary productivity, *Guizotia abyssinica* L.

1. Introduction:

Guizotia abyssinica is an erect, stout, branched annual herb, grown for its edible oil and seed. Niger seed yields about 30–35% of its weight in oil which is clear, slow-drying, and edible. Niger seed oil is a polyunsaturated semi-drying oil. It has a pale yellow or orange color with a nutty taste and sweet odor. The raw oil has a low acidity and can be used directly for cooking. Several investigators have studied the biomass and net primary productivity of various grasslands in India.



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The present study biomass and primary productivity of *Guizotia abyssinica* L. Grass land adjoining area of Aurangabad District.

2. Material and Methods:

The present study was confined to the grasslands situated in the Aurangabad of Bihar about 80.1 Km of Gaya and 178.9 Km from Patna approximately 47m above the mean sea level. The typical monsoon climate is characterized 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 percent was recorded in rainy season. The mean annual relative humidity and maximum and minimum temperatures were 32°C and 20°C, respectively.

The plant biomass on the grassland was evaluated monthly from June 2020 to June 2021 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 drive monoliths up to 30cm depth were dug at random. The standard methods were used to estimate the standing live, standing dead, litter and underground part of the plant. The primary productivity was calculated by the negative differences between successive monthly biomass values.

3. Result and Discussion:

The biomass data are given below the 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 low 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 plant and transfer of standing green into standing dead compartment.¹The biomass of the litter varied through out the study period. They increase from October to May, it may be due to 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.

The aboveground net primary production was 782 g/m²/year and the underground production was 322g/m²/ 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 *Guizotia abyssinica L.*

Table 1. Monthly variations in the mean biomass (g/m²+SEM) of aboveground (Standing live, standing dead, litter) and underground part of *Guizotia abyssinica L.* type grassland.

MONTH	Aboveground				Underground
	Standing live	Standing Dead	Litter	Total	
June	274.7±8.8	202.6±7.5	86.3±2.5	563.6	312.0±8.9
July	424.3 ±13.7	96.2±5.7	56.0±2.5	576.5	243.4±9.0
August	624.0 ±14.1	69.2±3.23	6.6±0.9	699.8	280.5±7.5
September	668.5 ±13.8	114.2±5.7	5.5±0.9	788.3	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	380.1 ±11.0	357.8±11.4	45.5±2.9	783.5	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	202.2±5.1	296.4±7.9	73.7±3.1	572.4	326.3±10.3

**4. Conclusion:**

1. In monthly variation in mean biomass of a grassland the standing live maximum in October i.e 782.1 ± 15.5 and minimum in may i.e 83.6 ± 4.1 . Standing dead maximum in May i.e 421.8 ± 11.0 and minimum in August i.e 69.2 ± 3.23 . and in litter maximum in June i.e 86.3 ± 2.5 and minimum in August i.e 6.6 ± 0.9 .
2. In the total annual net primary production about 62 per cent was contributed by the aboveground production only.

5. Reference:

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