

Effect of N,P and K on Growth and Biocrude Yield of *Euphorbia antisiphilitica*

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Several reports of positive influence of fertilizer application could be found on agricultural and cash crops, but such reports on petro-crops are lacking. Thus, effect of NPK application on *E. antisiphilitica* were studied and reported in this paper.

Experiment was conducted in earthen pots measuring 12" in height and 10" in diameter, having 4.0 kg sandy soil containing 0.80 mg N (NH₄), 1.31 mg P (PO₄) and 1.07 mg K 100 g⁻¹ soil. Various doses of nutrients (Table 1) were applied in ten replication. Each dose of fertilizer was mixed in the soil and filled into the pot. One month old plants of *E. antisiphilitica*, of uniform size (around 15.0 cm) and fresh weight (4.0 g) were planted in the month of June and irrigated twice a week. After six months of growth, plants were uprooted, cut into aboveground and underground parts, washed, dried in the folds of blotting sheets and fresh weight, dry weight and length of the plant were recorded. Biocrude in dried aboveground mass was extracted using hexane in soxhlet apparatus at 40°C for 18-20 h. Chlorophyll and sugar were estimated following Arnon's (1949) and Dubois *et al.* (1951) method respectively.

Study reveals that supplementation of nutrients individually promoted the growth and

productivity of *E. antisiphilitica* (Table 1). Increasing doses of nutrients although increased the biomass, biocrude, sugars and chlorophyll content but at higher doses of N and P, the content is somewhat low. Data further show that N₄, P₃ and K₅ yielded maximum biomass, whereas N₃, P₃ and K₃ resulted higher sugar and chlorophyll content (Table 1). Kaicker *et al.* (1975) reported increased latex yield with the application of N whereas K gave comparatively higher biocrude than to N and P application (Table 1). This may possibly be due to role played by K in ionic equilibrium in soil solution which favoured influx of a nutrient essential for biocrude formation.

References

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- Kaicker VS, Singh B, Turkhede DB, Singh HP, Chaudhary B & Betsax AR 1975 Varietal yield of opium at different fertilizer levels. *National Symposium on Recent Advances in the Development, production and Utilization of Medicinal and Aromatic Plants*, CIMPU Lucknow, 24-26 February

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Table 1 Effect of different doses of NPK on plant growth parameters and metabolites of *B. antisiphilitica*.

Treatments (mg kg ⁻¹)	Length (cm)		Fresh Weight		Dry weight (g)		Biocrude yield (% dw)	Sugars (mg g ⁻¹ dw)	Chlorophyll (mg g ⁻¹) fresh weight	
	AG*	UG**	AG	UG	AG	UG			a	b
Control	25.1	15.3	38.0	8.6	3.0	1.4	7.1	50.0	0.354	0.146
Nitrogen										
32.1 (N ₁)	22.5	22.1	42.9	13.0	3.5	1.8	8.9	85.4	0.559	0.262
64.3 (N ₂)	25.6	20.2	50.6	12.6	4.4	1.6	9.0	96.2	0.583	0.283
96.4 (N ₃)	25.9	20.9	59.7	14.1	5.5	2.4	10.6	105.7	0.796	0.372
128.5(N ₄)	32.3	30.8	76.4	24.6	8.0	5.0	8.6	102.5	0.610	0.306
192.8(N ₅)	31.2	24.7	48.9	19.7	4.3	3.1	8.5	82.1	0.502	0.211
SEm	NS	±1.78	NS	±0.18	±0.55	NS				
CD at 5%		3.71		0.37	1.16					
CD at 1%		5.07		0.51	1.58					
Phosphorus										
17.2 (P ₁)	23.3	27.9	39.7	10.8	3.9	1.8	7.8	56.8	0.396	0.283
34.4 (P ₂)	27.9	29.6	49.8	12.7	5.0	2.2	8.0	74.0	0.484	0.305
68.7 (P ₃)	30.7	35.9	65.1	18.6	6.0	2.8	8.1	99.7	0.587	0.365
103.1(P ₄)	29.6	38.2	55.5	21.5	5.9	4.6	8.4	80.5	0.413	0.246
137.4(P ₅)	22.8	30.5	37.2	9.7	2.9	1.6	8.0	58.5	0.312	0.275
SEm	±1.16	NS	NS	NS	±0.19	±0.29				
CD at 5%	3.36				0.40	0.61				
CD at 1%	—				0.55	0.83				
Phosphorus										
9.0 (K ₁)	29.0	30.1	45.9	11.5	4.2	1.8	9.0	72.3	0.466	0.221
18.0 (K ₂)	32.3	30.7	60.2	11.1	5.0	2.0	9.2	79.1	0.557	0.292
36.2 (K ₃)	31.7	37.6	71.5	13.4	6.7	2.3	9.4	86.8	0.608	0.359
54.2 (K ₄)	35.6	43.1	89.0	21.5	8.2	4.2	10.3	63.5	0.533	0.299
72.3 (K ₅)	38.9	40.0	97.5	26.8	8.9	4.3	10.1	60.5	0.495	0.253
SEm	±7.03	±7.48	±23.0	±0.39	±3.45	±0.91				
CD at 5%	15.32	16.31	50.30	0.81	7.69	1.99				
CD at 1%	21.49	22.87	70.38	1.1	10.95	2.79				

NS = Non Significant *AG = Aboveground **UG = Underground dw = dry weight