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*BAUHINIA RACEMOSA*LAM., AND ITS ALLELOPATHY

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ABSTRACT:
Bauhinia racemosa Lam., is important medicinal plant generally grown on agricultural bund. The pot culture experiment of Cyamopsis tetragonolobus (L.) Taub. var. 'Sadafali' was arranged beneath canopy of Bauhinia tree which shows Promotory effect on morphological parameters as well as protein, carbohydrates, chl-a, chl-b and total chlorophyll. Data was analyzed by appropriate statistical method.

Keywords: Allelopathy, *Bauhinia racemosa* Lam., Cyamopsis tetragonolobus (L.) Taub. var. 'Sadafali'.

INTRODUCTION AND REVIEW:

Inhibitory effects of certain plants have been noticed since past hundreds of years. Some plants inhibit other plants by means of chemicals they synthesize, a process known as 'Allelopathy', while some exhibit a sort of competition of a non-chemical form. Some say that 'Allelopathy' as one of the parts of competition. To minimize confusion, term 'interference' may be used to encompass both 'Allelopathy' and 'Competition' (Muller, 1969 c.f. Rice, 1984).

Molisch (1937) introduced the word 'Allelopathy' (Greek words: '*allelon*' means reciprocal and *'pathos'* means that happens to one) for harmful as well as beneficial, biochemical and reciprocal interactions among plants including microorganisms. Allelopathy is defined as "any direct or indirect harmful/useful effect by one plant on another through the synthesis and secretion of chemicals into the environment."

Agroforestry trees viz. *Dalbergia sisso, Acacia catechu,* and *Bombaxcei baaffect* germination growth and dry matter production of crops viz. *Triticum aestivum, Brassica campestris* and *Hordeum vulgare*. These crops may be cultivated underneath of *A. catechu* with least or without harm. The importance index of these agroforestry trees is *A. catechu> B. ceiba> D. sisso* (Singh *et al*, 2006).

MATERIAL METHOD:

Extracts were obtained by crushing plant materials 10% aqueous extracts (stock solution) obtained from leaves of *Bauhinia racemose* Lam. were filtered with muslin cloth and Whatman filter paper NO.1, stored in refrigerator and further diluted with distilled water to get extracts of 2.5 %, 5 %, and 7.5 % (Narwal, 1994) and used for laboratory bioassay experiments.

Certified hybrid seeds of test crop plants selected for present study were procured from agricultural shops of local market of Ahmednagar.

Cyamopsis tetragonolobus (L.) Taub. var. 'Sadafali' [Navalakha seeds Pvt. Ltd. Pune-411042 (INDIA).

Seeds of test plants were surface sterilized with 0.01% Mercuric chloride followed by thorough washing with distilled water before use. Effect of different extract concentrations on seedling growth parameters viz. seed germination (Ger), Shoot growth (Sg), Root growth (Rg) and Total

seedling growth (TSg) of test crop plants were recorded after 5th day.

Ten seeds were germinated in each of the sterilized containers of 12cm diameter, using germination paper or Whatman No.1 filter paper. Triplicates of the containers were maintained. 10 ml of extract was added in the Petri dishes/containers containing seeds. The slight emergence of radicle was considered as a sign of germination. % Germination was calculated. Photographs were taken with digital camera ('Sony' make). % Inhibition or % stimulation of seed germination and seedling growth parameters over control was calculated from which graphs were drawn.

Effects of extracts on seedling growth parameters recorded were statistically analyzed (single factor ANOVA followed by CD at O.05% ,P-level at 0.05% alpha value and Tukey's HSD test) for finding out any correlation in between extract concentration and seedling growth and denoted by alphabets (a, b, c, d).

Black polyethylene bags were filled with local field soil. Seedlings of *Cyamopsis tetragonolobus* (L.) Taub. var. 'Sadafali'. (two/bag) were planted and placed under shed net. Leaf extracts of *Gliricidia* and *Bauhinia* of 2.50 to 7.50% concentration were added (20ml per bag /per week). Bags were kept under shade net. Morphological parameters were recorded. Chlorophylls (Arnon, 1949 c. f. Sadasivam, 1997) carbohydrates (Hedge and Hofreiter 1962 c. f. Sadasivam 1996):and proteins (Lowry *et al*, 1951 c. f. Sadasivam, 1996): were estimated after 30 days. Result were tabulated and statistically analyzed. HPTLC analysis of Root stem and leaf were done.

RESULT AND DISSCUSSION:

Effect of leaf extracts of *Bauhinia* on 'Sadafali' variety

Aqueous leaf extracts of *Bauhinia* exerted inhibitory effect on seedling growth parameters of 'Sadafali' variety of *Cyamopsis*. Extracts inhibited 'Ger', 'Rg', 'Sg' and 'TSg' of the test plant by 3.33 to 10.00%, 32.92 to 50.00%, 11.53 to 23.95% and 20.44 to 33.51% over control respectively. (Table NO 1, Graph NO 1).

B) Effect of leaf extracts of *Bauhinia racemose* L. on vegetative growth of *Cyamopsis tetragonolobus* L var. 'Sadafali' (Table NO 2, Graph No 2):

Extracts of *Bauhinia* leaves exerted significant and concentration correlated promotory effect on the morphological parameters of the test crop plant. Height, number of leaves, length of leaflets, breadth of leaflets and leaf area were increased by 8.52 to 41.51%, 8.64 to 16.05%, 2.41 to 13.45%, 7.60 to 29.82% and 44.29 to 61.52% over control respectively. In laboratory bioassay experiments leaf extracts of *Bauhinia* inhibited seedling growth parameters but in pot culture experiments leaf allelochemicals might have been degraded due to the addition of cow dung manure that enhanced morphological parameters of *Cyamopsis*.

Effect of leaf extracts of *Bauhinia racemose* Lon chemical composition of *Cyamopsis tetragonolobus* (L.) Taub. var. 'Sadafali' (Table NO3):

C1: In pot culture experiments and estimations were done. Leaf extracts of *Bauhinia* enhanced N, P and K by 17.22 to 28.57%, 37.84 to 56.76%, 23.08 to 42.31%; micronutrients viz. Fe and Zn by 104 to 117%, 22.38 to 50.35% over control respectively. Extractsincreased the protein

and carbohydrate contents in the leaves of *Cyamopsis* by 60.75 to 78.08%, 51.39 to 87.67% but decreased Chl-a, Chl-b and total chlorophylls by 5.56 to 16.67%, 11.59 to 15.94%, 8.00 to 16.00%, respectively over control (Table NO 3).

SUMMARY CONCLUSION:

Leaf extracts inhibited seedling growth of 'sadafali' Leaf extracts of *Bauhinia racemose* L. exerted significant and concentration correlated promotory effect on the vegetative and morphological parameters of the 'Sadafali' variety of *Cyamopsis tetragonolobus* (L.) Taub. Height, number of leaves, length of leaflets, breadth of leaflets and leaf area were increased. In laboratory bioassay experiments leaf extracts of *Bauhinia* inhibited seedling growth parameters of *Raphanus* varieties and promoted 'varieties of *Cyamopsis*. In pot culture experiments leaf allelochemicals enhanced morphological parameters of *Cyamops*is. *Bauhinia* does not possess severe negative allelopathic potentials. Therefore, may be grown along bunds.

In pot culture experiments and estimations were done. Leaf extracts of *Bauhinia* enhanced N, P and K micronutrients viz. Fe and Zn over control respectively. Extractsincreased the protein and carbohydrate contents in the leaves of *Cyamopsis* but decreased Chl-a, Chl-b and total chlorophylls.

HPTLC analysis revealed that the roots, stems and leaves of bund growing roots, stems and leaves *Bauhinia variegata*L. contained 'β-sitosterol' (in mg/g) 0.64 ± 0.004, 1.54 ±0.019 respectively. Roots of trees didn't contain 'β-sitosterol'. Amount of 'β-sitosterol' in an order of: Leaves> stems.

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Table No: 1Effect of aqueous leaf extract of *Bauhinia racemosa Lam. Encycl on* germination & seedling growth of*Cymopsistetragonoloba* L. varieties.

Varieties	Growth Parameters	Control	Extract concentration			CD at 0.05%	P - Value
			2.50%	5%	7.50%		
'Sadafali'	Rg	3.22a ± 0.22	2.16b ± 0.22 (-32.92)	2.16b ± 0.24 (-32.92)	1.61c ± 0.20 (-50.00)	0.41	1.04E-05
	Sg	4.51ab ± 0.32	3.99a ± 0.29 (-11.53)	3.43a ± 0.31 (-23.94)	3.54a ± 0.30 (-21.51)	0.57	0.056
	TSg	7.73a ± 0.51	6.15b ± 0.49 (-20.44)	5.59b ± 0.54 (-27.68)	5.14bc ± 0.47 (-33.51)	0.94	0.003
	Ger %	100.00	96.67 (-3.33)	93.33 (-6.67)	90.00 (-10.00)		

Data presented are means of three replicates; values within the same row with different letters are significantly different at 0.05% P-level by Single factor ANOVA test followed by CD &Tukey's test [Figures in parantheses indicate % stimulation (+) and % inhibition (-) over control; Sg: shoot growth, Rg: root growth,TSg: total seedling growth and Ger: seed germination].