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## Effect of Habitat Condition and Grazing

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**ABSTRACT:** In situations when seeds fall near the established plants of associated species, the survival of subsequent seedlings may depend upon the influence exercised by associated plants of various species and biotic disturbances particularly grazing by herbivores. Although a comprehensive study has been carried out by Ross and Harper (1972) and Mack and Harper (1977) on effect of neighbours, the quantitative measurements on the effect on seeding population are lacking. Cavers and Harper (1967) and Putwain and Harper (1970) have suggested poor recruitment of new individuals from seeds in established plant communities. Chippindale (1948) suggested that seedlings of grasses can survive for long duration in grassland community without showing increase or loss in biomass. In a forest community along with established vegetation, the grazing by cattle and goats is also an important factor which affect the survivorship of seeding populations.

**KEYWORDS:** seeds, grazing, population, cattle, goats, biomass, vegetation, herbivores, grasses, duration

### I. INTRODUCTION

Bishop et. al. (1978) reported that rabbit grazing affect the size and structure of *Hieracium* population in a number of ways in Australia while Fet Chen (1978) noted that the grazing by cattle is cause of decline in population of *Kochia astrotricha* and elimination of *Atriplex vesicaria* population in Australia. Thus, an attempt has been made to evaluate the effect of associated vegetation and limited grazing on the survival and growth of transplants of the three species of *Desmodium* in R.R. College campus. [1,2]

### II. MATERIALS AND METHODS

The effect of associated vegetation on the transplants of three *Desmodium* species was studied in the R.R. College campus. The R.R. College campus vegetation is a tropical dry deciduous forest dominated by *Holoptelea integrifolia* and *Prosopis juliflora*. Two study sites were selected; first, the one acre area of the Botanical garden where all the associated plants were removed, and second, the natural forest area adjacent to the Botanical garden where the limited grazing by cattle and goats is allowed. Three permanent quadrats of 1m x 1m size were established for each *Desmodium* species in each study site. Ten transplants of each species grown in earthen pots at four leaf stage were tranaplanted in the first week of August.[3,4] Thus there were three replicate quadrats of each *Desmodium* species in each study site. The survivorship of the transplants was evaluated at monthly intervals. Three transplants of each species were harvested from each quadrat at end of August, September and October for the estimation of vegetative and reproductive features and biomass estimation.

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*Holoptelea integrifolia*



*Prosopis juliflora*

Each harvested transplant was dried at 80° C for 24 hours in a hot air oven for determining its dry biomass following Mishra (1968).

### III.RESULTS AND DISCUSSION

The survivorship of *Desmodium repandum* was high in unprotected area as about 67% transplants survived at the end of growing season .The length of shoots was increased from 10.46 cm to 23.5 cm by the third harvest. Similarly the

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biomass per transplant also increased from 0.06 gm to 0.32 gm at the end of growing season. The number of fertile plants was very low, that is 0.67. The number of fruit were 10 per plant. It is suggested that the transplants showed good vegetative growth, while the reproductive growth was very low. In the protected area, the transplants of *Desmodium repandum* exhibited 100% survivorship[5,6] till the end of growing season . The transplants showed higher vegetative growth as compared to the unprotected area. However, the pattern of growth was same as in case of unprotected area. Despite higher survivorship of plants, the fruit production per plant was about same as in case of unprotected area. The observations indicate that the transplants exhibited higher survivorship than in unprotected area while the vegetative and reproductive growth was almost similar in both treatments. In protected area, *Desmodium gangeticum* transplants exhibited 100% survivorship. The vegetative growth parameter exhibited the same trend of growth behavior as in unprotected area, however, the vegetative growth 62 was considerably higher when the transplants were protected from grazing. The transplants of this species produced flower and fruits only in the protected situation although fruit production was very low. The survivorship of *Desmodium gangeticum* was 67% in the unprotected area . [7,8]The length of shoots increased from 3.8 cm at the first harvest to 9.8 cm at the time of third harvest. The corresponding values for leaf area and biomass per plant were 2666 mm<sup>2</sup> to 4533 mm<sup>2</sup> and 0.08 to 0.55 gm per plant, respectively. The transplants of this species did not produce flower in unprotected area. The survivorship of *Desmodium triflorum* transplants was 100% in protected area . The length of its transplants shoots increased from 2.5 cm to 9.17 cm from first harvest to third harvest. Similarly the leaf area and biomass per plant also increased from 333 mm<sup>2</sup> to 1516 mm<sup>2</sup> and 0.026 gm to 0.21 gm per plant, respectively. This species produced flowers and fruits but fruit production was very low in protected area. *Desmodium triflorum* also showed 67% survivorship in unprotected area . The growth behavior of transplants of this species in unprotected area was almost same as in protected area. The results indicate that grazing has little effect on the growth of the transplants of *Desmodium triflorum*. All three species of *Desmodium* exhibited the same pattern of vegetative growth in protected area , however, the growth was more in all the species than in unprotected area . [9]

## IV.CONCLUSIONS

All the three species produce flowers and fruits in the protected area with highest fruit production by *Desmodium repandum* followed by *Desmodium gangeticum*. The number of fruit per plants were almost same in *Desmodium repandum* and *Desmodium triflorum*. In protected area *Desmodium repandum* made less reproductive effect (19.5%) than the other species as compared to the unprotected area. These observations suggest that *Desmodium repandum* is a r-selected species where as both perennial herb exhibit k-selected strategy. The comparative study of the three species of *Desmodium* indicates that *Desmodium gangeticum* showed higher leaf area and biomass per plant than the other two species. Among the remaining two species the annual *Desmodium repandum* exhibited higher leaf area and biomass than the *Desmodium triflorum* (perennial herb). However, *Desmodium repandum* produce more fruits per plants than the two species. *Desmodium triflorum* showed poor reproductive growth while there was no flowering in *Desmodium gangeticum*. *Desmodium repandum* made maximum reproductive effort (25%) followed by *Desmodium triflorum* (6.25%).[9]

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