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Resprouting of Pioneer and Climax Species in the Pachakumachi Hills, Cumbum Valley, Western Ghats, India

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Abstract

The resprouting ability of plant species allows them to remain in the ecosystem. Resprouting of pioneer and climax species are dependent upon the light regime. Pioneer species need light for regeneration as well as for resprouting. But in the case of climax species it is reverse.

Keywords: *Mallotus tetracoccus, Diospyros ovalifolia* and forest gap.

Introduction

Woody plants are subjected to various types of physical disturbances that lead to the loss of foliage or stems. Whether a species is able to resprout is in many cases a direct function of the frequency and intensity of the disturbance. Disturbance and the possibility of damage are ubiquitous aspects of the life of plants. The formation of open gaps in the forest leads to a rapid recruitment and development of the canopy. Such forest gaps maintain high pioneer tree density and diversity. However, forest openings do not appear to maintain species diversity of non-pioneer, shade- tolerant trees. Patterns of plant growth and other ecological processes are thought to vary as a function of gap size, since gap size directly affects light levels and microclimates, and also affect nutrient availability. Forest openings create significant changes in the microclimate of the area as compared to the original forest understorey. Light levels increase with increasing gap size, and this alone may make a difference in the regeneration of plant species.

Commonly, tree species regenerate from their seeds and seedlings. However, another form of regeneration is resprouting, which is a form of vegetative reproduction in higher plants. In tropical forests that are prone to large-scale disturbances, such as hurricanes, plants of all sizes often survive and resprout after being damaged (Walker 1991; Yih et al., 1991; Basnet 1993; Bellingham et al. 1994). However, the question of exactly how frequently resprouting takes place in forest gaps is one which is not fully answered in detail in the literature. In this study we encountered the resprouting of the pioneer and climax species with respect to closed canopy, small gaps and larger gaps. Resprouting helps species to maintain their diversity in the forest community.

Materials and Methods

Study Site

Our study site in the Pachakumachi hills, of Western Ghats, Tamil Nadu, India lies between 9º 35´ to 9° 45´ N latitude and 77° 15´ to 77° 27´ E longitude. The altitude of the hills ranges from 600 to 2000 m. Our study was carried out at an approximate altitude of 1600 m in evergreen forest.

Resprouting

Mallotus tetracoccus (Roxb) Kurz and *Diospyros ovalifolia* Wight were identified as pioneer and climax species respectively. The resprouting of *Mallotus tetracoccus* (Roxb) Kurz (a pioneer species) and *Diospyros ovalifolia* Wight (a climax species) were noted under the following three conditions: 1) closed canopy regions; 2) small gaps; and, 3) forest gaps. We tagged the damaged trees in all three regions. Also, the authors noted the evidence of resprouting every month for a period of two years (2006- 2008).

Results and Discussion

Table 1 shows the number of damaged, resprouted and non-resprouted individuals for both species. Larger gaps clearly favor the resprouting of the pioneer species, *Mallotus tetracoccus*. But in the case of *Diospyros ovalifolia*, closed canopy conditions stimulate resprouting; whereas non-sprouting individuals were more common in open gap areas.

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Fig 1. Resprouting of the vegetation.

Fig 2. Forest Gap in the Pachakumachi Hills.

Table 1: Resprouting of *Mallotus tetracoccus and Diospyros ovalifolia*

Species Name	Closed Canopy			Small Gap			Large Gap		
	Damaged	Resprouted	NR	Damaged	Resprouted	NR	Damaged	Resprouted	NR
Mallotus tetracoccus	27	13	14	10	6	4	15	13	2
Diospyros ovalifolia	18	17	1	12	5	7	20	8	12