D12 NITROGENASE ACTIVITY IN CORALLOID ROOTS OF CYCAS

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Cycads produce subterranean coralloid roots which contain endosymbolic cyanobacteria that fix nitrogen[1]. Nitrogenase activity in these roots has not been measured in Sri Lanka and this is a report of such a study.

Nitrogenase activity of detached, intact roots of Cycas circinalis was measured in the laboratory under different light intensities, using the acetylene reduction technique. Such activity was also measured in disks of coralloid roots cut from the apex towards the base. Heterocyst numbers of the endosymbiotic Anabaena in these disks were microscopically estimated.

Nitrogenase activity in the intact root was much higher in the light than in the dark. Specific nitrogenase activity was highest in the root disks obtained 6 mm from the apex, whereas heterocyst number per unit volume, was highest in the disks 4 mm further behind.

These results indicate that nitrogenase activity : (a) is stimulated by light, even though these roots naturally exist in the dark; (b) is not correlated to heterocyst number and that specific heterocyst activity appear to decline in the older parts of the root.

Reference

1. Linbald, P, Hallbom, L & Bergman, B (1985) The Cyanobacterium - Zamia symbiosis : acetylene reduction and heterocyst frequency. Symbiosis 1 19 - 28