

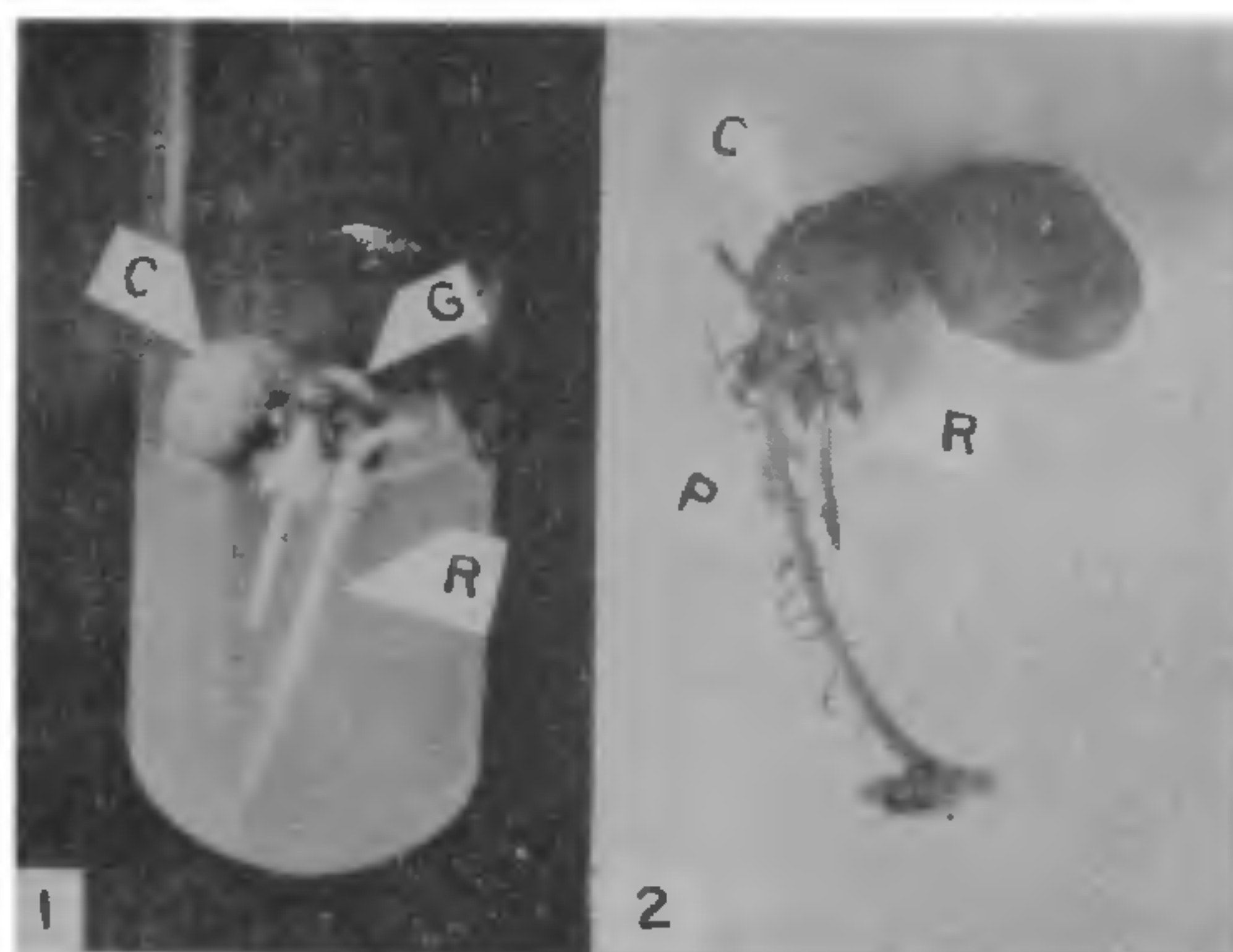
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INDUCTION OF ROOTING IN COTYLEDON CALLUS OF COCONUT

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APPLICATION of tissue culture techniques for clonal propagation of high yielding, disease-resistant and hybrid coconut palms would pave the way for increasing the yield of coconuts several fold. Embryo culture of coconut was attempted before but with limited success¹⁻³. New salt formulations were developed and roots and shoot-like structures obtained in coconut rachilla explants⁴⁻⁶. However, complete plantlet regeneration has not been achieved so far. The present study reports for the first time the induction of roots in callus obtained from coconut cotyledon or haustorium.

Embryos were dissected carefully from aseptically grown 20-day old coconut [tall variety] seedlings. Explants of uniform sizes [10 × 5 mm] from cotyledonary, radicular and plumular zones were cut and planted on Murasige and Skoog⁷ (MS), Schenk and Hildebrandt⁸ (SH) and Y3⁴ basal medium supplemented with 0.5 mg/l alpha naphthalene acetic acid (NAA) and 1 mg/l 6-benzyl aminopurine (6-BAP). The cultures were maintained at 28 ± 2°C and in 1500 lux illumination for 10 hr/day. On MS and SH media, the explants enlarged two-fold within two weeks, turned brown and ceased to grow. But on Y3 medium there was little tissue browning and the cotyledonary explants enlarged 5-7 fold within four weeks. The part of eophyll embedded in plumular explants expanded to some extent and ceased to grow thereafter. There was no response in the radicular explants. As the cotyledon explants enlarged, they acquired dumb-bell-shaped structures due to callus formation on the two marginal cut ends of opposite sides. The callus was light brown in colour, soft, compact and nonfriable. When the tissues were transferred to Y3 medium with higher auxin concentration [1 mg/l NAA] a colourless spot, growth centre appeared on the upper surface of the callus. When the cultures were



Figures 1, 2. 1. Nine week-old culture showing initiation of roots. Note the growth centre above the point of root initiation × 3/4. 2. Ten-weeks-old culture showing numerous roots. Note the presence of pneumatophores on the lead root. × 1 (C-callus; G-growth centre; P-pneumatophore; R-root).

60-70 days old, 7-10 rootlets appeared below the growth centre. The rootlets grew fast and attained 2-5 cm in height within 4 days of initiation (figure 1). Out of the many rootlets one rootlet grew faster than the others as a lead and attained 6-8 cm in length (figure 2). The rootlets were armoured with numerous pneumatophores or breathing roots as seen in normal seedling roots. Haustorial tissue appears to be more potential source of tissue explants for rapid callus formation and regeneration in coconut. Attempt to induce shoot formation on the rooted callus of coconut is in progress.

The authors thank CSIR for financial support.

1 August 1981

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