OBSERVATIONS ON THE GERMINATION OF CERTAIN NATIVE PLANT SEEDS

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Pittosporum cornifolium

In December, 1975 I received seeds of Pittosporum cornifolium from the late Dr. Jack Ballin. The seeds were sown on January 13th 1976 and placed in a cool greenhouse in the Christchurch Botanic Gardens. The first seeds germinated during the first week of the following August and germination continued over a period of several weeks. The method of germination was rather distinct and inspired me to make the following notes and observations.

The radical emerges from the testa and starts growing down into the soil. The hypocotyl then commences to emerge and as it does so it elongates and becomes bent double. It spends several days elongating before the cotyledons and the plumule finally pull free from the testa and the soil. The hypocotyle is pubescent with spreading to slightly deflexed white hairs produced in regular parallel rows. There are usually from 9 - 14 rows of hairs.

Eventually the hypocotyl straightens, and to the cotyledons the seedlings stand about 42 mm tall. The cotyledons are ovate to ovate-lanceolate, 15 - 18 x 5 - 7 mm, glabrous, shining above, paler beneath with the midrib and 1 or 2 lateral nerves distinct. The petioles are clad with hairs similar to those of the hypocotyl. The plumule is also pubescent.

The following are measurements of the growth rate of one seedling :-

Date:	Time:	Height:	Total Daily Growth Rate:
August:			
9th	9.00 a.m.	bend of hypocotyl 3 mm above ground level	-
10th	9.00 a.m.	bend of hypocotyl 4 mm above ground level	1 mm
11th	9.00 a.m.	bend of hypocotyl 4.5 mm above ground level	0.5 mm
12th	9.00 a.m.	bend of hypocotyl 5 mm above ground level	
	4.00 p.m.	bend of hypocotyl 6 mm above ground level	1.5 mm
13th	9.00 a.m.	bend of hypocotyl 6.5 mm above ground level	
	4.00 p.m.	bend of hypocotyl 7 mm above ground level	1 mm
14th	9.00 a.m.	bend of hypocotyl 7.5 mm above ground level	
	4.00 p.m.	bend of hypocotyl 8 mm above ground level	1 mm
15th	9.00 a.m.	bend of hypocotyl 8.5 mm above ground level	
	4.00 p.m.	bend of hypocotyl 9 mm above ground level	1 mm
16th	9.00 a.m.	bend of hypocotyl 9 mm above ground level	
	4.00 p.m.	bend of hypocotyl 9.5 mm above ground level	0.5 mm
17th	9.00 a.m.	bend of hypocotyl 10 mm above ground level	
	4.00 p.m.	bend of hypocotyl 10.75mm above ground level	1.25 mm
18th	9.00 a.m.	bend of hypocotyl 12 mm above ground level	

Date:	Time:	Height:	Total Daily Growth Rate:
August:			
		At this stage the hypocotyl commenced to straighten and pulled the seed free from the soil.	
18th	4.00 p.m.	bend of hypocotyl ± at right angles 15 mm above ground level	4.25 mm
19th	9.00 a.m.	bend of hypocotyl 19 mm above ground level almost straightened	4 mm
20th	9.00 a.m.	hypocotyl almost straight; the point just below the testa at 20 mm above ground level	1 mm
26th	9.00 a.m.	hypocotyl quite erect and 22 mm long, cotyledons still encased in the testa	
September:			
9th	9.00 a.m.	Cotyledons just starting to burst out of the testa. Hypocotyl 28 mm long.	

The growth rate of other seedlings varied slightly, but the one measured was probably about average. Towards the end of August there is reason to believe that the increasing solar heat in the greenhouse caused the testa to harden and delayed the emergence from it of the cotyledons. Had the test been conducted under cooler conditions the cotyledons may have been quicker to emerge.

Coxella dieffenbachii

Seed of this plant was received from the Chatham Islands early in 1976 and sown on June 3rd 1976. It was divided into approximately two equal lots, one being placed in a heated greenhouse with an average temperature of 15° - 16° C and the other in a cool greenhouse with an average temperature of 7° - 9° C and occasionally dropping to near zero.

Germination started in early August, the seeds in the heated house being the first to germinate. The seed in the cool house followed some 2 - 3 weeks later. However, while the seed in the heated house was the first to germinate, relatively few seedlings emerged (about 17), whereas with the seed in the cool house the germination percentage was very good. The seedlings were later potted up and are growing very well.