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Dormancy in Corchorus olitorius seeds

Sumario. Se estudiaron la germinación y latencia de semillas de **Corchorus olitorius** L., una hortaliza conocida en Cuba como gringuele. La eliminación completa o la perforación de la cáscara, o el tratamiento con agua caliente de las semillas, promovieron su germinación. El tratamiento con una temperatura baja a 15°C por 48 horas seguido de 7 días a 25°C, o el tratamiento con ácido giberélico a 25, 50 ó 100 ppm, condujeron también a la germinación.

Corchorus olitorius L. (Tiliaceae) is a common vegetable in Western Nigeria which also occurs on abandoned farms and waste places. Local farmers have by practice shown that germination was obtained only when the seeds were first soaked in warm water before sowing. We here report the results of an investigation into the mechanism of dormancy in this species. Seeds of *Corchorus olitorius* were collected from the University farm in August, 1973 and stored in paper envelopes in a dessicator in an airconditioned laboratory until used. Germination tests were routinely performed in 10 cm petri dishes containing 2 sheets of Whatman's Nº 1 filter paper, and distilled water, except in experiments on chemical treatment when gibberellic acid solution was used. Fifty seeds were sown in each petri dish and 4 replicates were set up for each treatment. In one group of experiments, the seeds were either leached in running tap water or had their testas perforated with a pin or the testas were completely removed. The seeds were then allowed to germinate under light or dark, for 20-days in the case of the learned seeds and 7-days for the other two treatments. Table 1 shows that the failure of untreated seeds to germinate was in some way connected with the presence of the testa. No germination was obtained in the dark in untreated and cold water leached seeds. The piercing of the testa led to a germination of 65 per cent under dark and 70 under light, while the complete removal of the testas gave 100 per cent germination under both conditions. When

Table 1.—Effect of leaching in running tap water, piercing and removal of test on the germination of *Corchorus clitorius* in light or dark.

	Percentage germination	
	Dark	Light
Seeds sown normally	0	3
Seeds leached in running tap water	0	8
Seeds with testas pierced	65	70
Seeds with testas removed	100	100

seeds were leached in hot water for 5-minutes and then left in the dark a germination of 55 per cent was obtained. A sample of seeds was stratified at 15°C for 48 hours and then germinated at 25°C for 7 days — this treatment gave a germination of 70 per cent. Finally, one lot of seeds were treated with graded concentrations of gibberellic acid. The results (Table 2) indicate quite clearly that gibberellic acid had a permissive effect in overcoming dormancy in these seeds. Furthermore, the treatment of these seeds with GA or the removal of their testas produced greater germination than the treatment with hot water. The results presented in this paper indicate that most seeds of *Corchorus olitorius* require a removal of testas or a period at low temperature or treatment with gibberellic acid or some leaching with hot water for germination to occur. In nature this cold temperature requirement is not fulfilled in the habitats where these seeds occur. Extensive leaching may be obtained over the length of a growing season. The removal of the seed coat, which is simulated by gibberellic acid treatment, is achieved when the seed coats decay through the activities of microorganisms in the soil. This and the positive response to hot water treatment is further suggestive of the presence of some water soluble growth inhibitors in the seed coats.

Table 2.—Effect of gibberellic acid on the germination of seeds of *Corchorus olitorius* in the dark

Treatment		Germination %
GA	5 ppm	25
GA	10 ppm	45
GA	25 ppm	65
GA	50 ppm	75
GA	100 ppm	80
	Water control	0

The inhibitor(s) may be inactivated:

a) when there is access to oxygen as when the seed coats are pierced or

b) when treated with gibberellic acid

It has been reported that high oxygen atmosphere stimulated germination in inhibitor imposed dormancy of *Avena fatua* (1), and Xanthium *pennsylvanicum* (2). West *et al* (3), reported that gibberellic acid greatly enhanced germination of unstratified seeds. Wareing *et al* (2) further reported that stratification may be involved, with increasing concentrations of growth promoting hormones or decreasing concentrations of growth inhibiting hormones or possibly the interaction between these

Summary

Germination and dormancy in seeds of *Corchorus olitorius* L. were studied. Complete removal or piercing of the seed coats or warm water leaching of seeds promoted germination.

Low temperature treatment at 15°C for 48 h followed by 24 h at 25°C or treatment with gibberellic acid at 25 ppm, 50 ppm or 100 ppm led to germination.

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El dendrofenograma, una representación gráfica del comportamiento fenológico de los árboles

Abstract. The dendrophenograph, a graphic representation of tree phenology, is described in this paper. This graphic includes an horizontal scale for time and four vertical scales representing respectively, the percentage of leaf flushing, leaf fall, flowering and fruiting. The dendrophenograph is intended for a rapid quantitative comparison of phenology between individual trees or species as well as whole communities.

La fenología es una rama importante de la ecología que estudia las causas y las manifestaciones fisonómicas de los fenómenos de floración, fructificación, caída del follaje, brotadura, ramificación etc, en las plantas. La importancia científica y tecnológica del conocimiento fenológico ha sido considerada por varios autores (1, 4, 5).

En dos trabajos anteriores se ha propuesto una serie de lineamientos metodológicos, con el fin de medir con cierto grado de precisión y rapidez, las principales características fenológicas de los árboles (1, 2). La metodología propuesta en esos trabajos no sólo permite