

# Seed Health and Viability of *Commiphora leptophloeos* (Mart.) J.B. Gillet after Dehydration and Storage

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*Commiphora leptophloeos* (Burseraceae) is a multipurpose tree (pharmaceutical and wood products) from Brazilian semi-arid regions, and its seeds germinate poorly (slowly and intermittently) due to coat hardness. Our study was undertaken to determine how moisture content and storage temperature influence *C. leptophloeos* germination and seed health and to establish storage conditions for long-term seed conservation.

Seeds from several maternal plants were collected from the ground at Petrolina-Brazil, surface-sterilized in 5% NaOCl for 10 min, washed twice in distilled water, and dried at room temperature for 1 day. Seeds were dehydrated at 22C, 15% relative humidity for 0 (control), 96, 168, and 192 h. After each dehydration period, seeds were placed in sealed, impermeable plastic bags and stored for 12 months at -20 and 10C and ambient temperatures that varied from 24 to 30C. For each dehydration-storage combination, moisture content was determined after oven-drying at  $105 \pm 3C$  for 24 h using two replications of 20 seeds each. Germination tests were conducted on four replications of 20 seeds each on moist rolled paper towels under a 20/30C cycle (16/8 h) for each desiccation-storage combination. Germination was recorded daily for 90

days. A seed was considered to have germinated when all structures could be judged to be developing normally. Data were transformed by arcsin and tested by analysis of variance followed by Tukey's test at  $P \leq 0.05$  (Snedecor and Cochran, 1963).

The health test was conducted on four replications of 25 seeds each that had been sterilized in 70% alcohol for 1 min then soaked in 1% NaOCl for 10 min. Seeds were placed on moist filter paper in petri dishes and incubated at 20C for 7 days under alternating ultraviolet light and in darkness (12/12 h). Developing mycoflora were identified and quantified by stereoscopic microscope examination.

*Commiphora leptophloeos* seed germination appeared to be unaffected by dehydration to  $\approx 40\%$  of the initial moisture content, whether tested initially (range 7% to 11%) or after 12 months (range 17% to 22%). Because *C. leptophloeos* naturally grows in semi-arid conditions, it might be expected that the seeds would be able to withstand drying to a low moisture content (Sun and Leopold, 1993). In

our tests, desiccation injury was probably avoided because the seeds were collected after maturation drying was complete (Hong and Ellis, 1990).

Significant differences in germination percentages were found among seeds stored for 12 months at three temperatures (Table 1). Germination following storage at ambient temperatures was higher than following storage at 10C but similar to that at -20C.

An abundant mycoflora represented by 11 species of potentially pathogenic fungi and 12 species of saprophytic fungi was detected. There were high infection percentages for *Aspergillus niger* van Tieghem (92%), *A. flavus* Link ex Fr. (60%), *Cladosporium* sp Link ex Fr. (61%), *Fusarium oxysporum* Schlecht (50%), *Penicillium* sp Link ex Gray (57%), and *Rhizopus* sp. Ehrenb. ex Corda (92%). These fungi persisted on the seeds after storage under all three conditions.

Our results suggest that *C. leptophloeos* seeds are desiccation tolerant and are not sensitive to storage at low temperatures. Adequate sanitation methods need to be developed before seed storage because persistent fungal infection could compromise seed longevity in gene bank conservation.

## Literature Cited

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Table 1. *Commiphora leptophloeos* seed moisture content (MC) and germination percentage after storage at three temperatures for 12 months.

Drying periods (h)	MC (%)	Germination (%)		
		Ambient	10C	-20C
0	6.9	37	9	24
96	2.9	23	18	20
168	2.8	37	27	15
192	2.6	23	13	21
Storage germination means		30 a	17 bc	21 ab

<sup>a</sup>Mean separation by Tukey's test at  $P \leq 0.05$ .

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