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## SEQUENCE OF SENESCENCE IN SORGHUM SEED DURING ACCELERATED AGEING

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AGEING is an inevitable and irreversible process in any living being and seed is no exception. Roberts[1] considers it reasonable to suppose that there could be a group of key cells most of which have to remain functional if the seed is to retain germinability. So long as the cells concerned with the assimilation and transportation of food and the meristematic regions are alive, the seed remains viable and capable of germination. Banerjee[2] reported the mesocotyl region including the root and shoot meristems to be the most vital and 'key tissue' in the seeds of onion and barley.

An experiment was conducted with CSH 5 hybrid sorghum seeds to monitor the sequence of senescence during ageing. Two hundred grams of seeds retained by 9/64″ round hole sieve were kept in the accelerated ageing cabinet maintained at 40 ± 1°C and 95% relative humidity. Samples of seeds were drawn every two days for 16 days and tested for viability by the topographical tetrazolium test. The germinability of aged seeds was simultaneously assessed by the ISTA method[3].

Frequency score of the seeds with tissues unstained after tetrazolium colour development along with the percentage germination is presented in table 1. The topographical tetrazolium test conducted on the progressively aged seeds showed increasing deterioration in the form of more unstained tissues. When the sequence was observed, it was the tip of the scutellum which showed the first sign of deterioration closely followed by scutellum bottom and aleurone layer. Coleorhiza, root apex, coleoptile and shoot apex were the next parts of the embryo to exhibit the sign of deterioration. Middle portion of the scutellum and the mesocotyl region were the last to senesce (figure 1).

A close association between the frequency of seeds showing the deterioration of scutellum tip (column No. 6 + 11 of the table 1) and the percentage of seeds

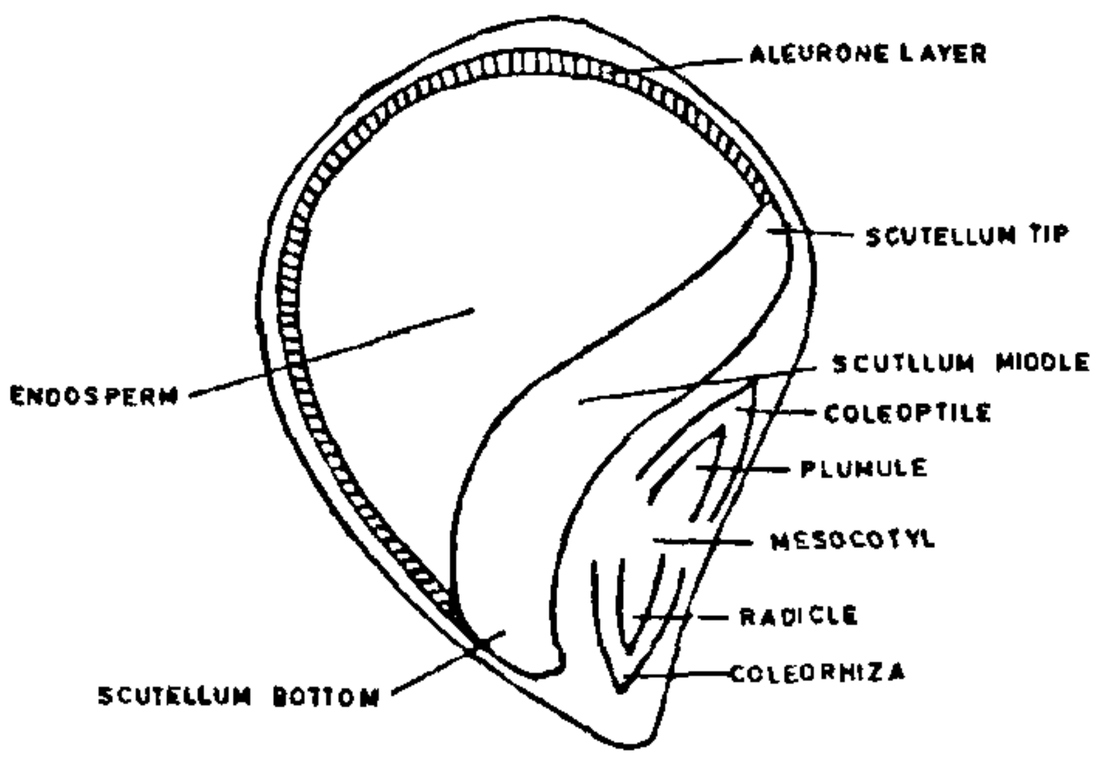


**Figure 1.** L.S. of Sorghum seed

**Table 1** *Frequency score of the seeds aged acceleratedly with tissues unstained after tetrazolium colour development (out of 100 seeds) and percentage germination.*

| Ageing (days) 1 | Coleoptile 2 | Shoot apex 3 | Coleo-rhiza 4 | Root apex 5 | Scutellum tip 6 | Scutellum middle 7 | Scutellum bottom 8 | Meso cotyl 9 | Alerone layer 10 | Full seed 11 | Germination percentage 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 4 | 4 | 6 | 2 | 22 | 4 | 34 | 0 | 14 | 4 | 79 |
| 2 | 11 | 3 | 28 | 9 | 50 | 13 | 64 | 8 | 42 | 3 | 62 |
| 4 | 12 | 4 | 17 | 7 | 43 | 7 | 50 | 4 | 43 | 7 | 57 |
| 6 | 10 | 4 | 12 | 4 | 45 | 1 | 40 | 4 | 47 | 8 | 52 |
| 8 | 14 | 9 | 16 | 4 | 37 | 2 | 39 | 2 | 61 | 25 | 48 |
| 10 | 12 | 7 | 9 | 4 | 42 | 3 | 29 | 1 | 57 | 39 | 29 |
| 12 | 7 | 6 | 10 | 4 | 13 | 2 | 7 | 2 | 27 | 65 | 15 |
| 14 | 5 | 7 | 12 | 5 | 10 | 3 | 9 | 0 | 22 | 78 | 3 |
| 16 | 5 | 5 | 7 | 5 | 5 | 0 | 5 | 5 | 10 | 90 | 0 |

not germinated was evident. Hence, while assessing the seed viability through topographical tetrazolium staining, the seed showing unstained portion at the tip of the scutellum can be considered as non-germinable.

19 March 1984

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## ISOLATION OF *CANDIDA GUILLIERMONDII* FROM SUSPECTED BOVINE LYMPHANGITIS CASES

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INFECTION due to *Candida* species is usually restricted to the alimentary canal but association of this organism in causing diseases of the respiratory and reproductive systems and as cutaneous/subcutaneous mycoses are also reported. *C. albicans* is by far the commonest species associated with clinical condition but *C. tropicalis, C. krusei, C. parapsilosis, C. pseudotropicalis* may occasionally have causal roles[1]. Mathias[2] observed thrush of the rumen. Systemic bovine candidiasis was first reported in cattle by McCarty[3]. Farley[4] isolated *C. albicans* and other yeasts from cultures of foot and mouth disease virus in strips of bovine epithelium. Stuart[5] isolated *Candida* sp from an outbreak of bovine mastitis and attempted to reproduce the condition experimentally. Prasad and Prasad[6] isolated *C. parapsilosis* in mastitis milk following antibiotic therapy from a pre-existing bacterial infection. Mills and Hirth[7] reported systemic candidiasis in calves as a result of prolonged antibiotic therapy.

A number of cattle suffering from abscesses throughout the body were not responding to antibiotics therapy. The infection spread to healthy and aged bullocks and was clinically suspected for bovine lymphangitis. In the present investigation *C. guilliermondii* was isolated from pus swabs.

The samples were streaked on Sabouraud's agar plate containing chlorampenicol and cycloheximide and were incubated at 37°C under aerobic conditions. Creamy growth was noticed within 48 hr of incubation. The organisms were slightly oval-shaped. On Sabouraud's broth no surface growth was visible but bubbles were noticed. The isolate failed to produce germ tube in fresh rabbit serum. It was negative for urease activity and fermentation of maltose and lactose while it was positive for glucose and sucrose. On both corn meal agar and chlamydospore agar, very fine mycelium with small clusters of blastospores at the septa were observed and chlamydospores were absent. On the basis of of these characters the isolate was identified as *C. guilliermondii*.

It is difficult to comment on the role of the organism in causing bovine lymphangitis as pathogenicity studies with the isolate in a homologous host are necessary to establish it as an etiological agent. The ubiquitious nature of the genus *Candida*, its association with gastro-intestinal, respiratory, reproductive tract infections and its involvement in cutaneous/subcutaneous mycoses in different species of animals, birds and humans warrant a systematic study on its involvement in the etiology of the disease.

The authors thanks the Director, Indian Veterinary Research Institute for facilities.

4 August 1984; Revised 1 October 1984

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## ARNETH COUNTS OF NEUTROPHILS IN THREE HILL STREAM FISHES

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VERY little information is available on the Arneth count of granulocytes of fishes[1-5]. Arneth count is an