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Research Highlight

STORAGE OF RECALCITRANT SEEDS: A DILEMMA IN THE HISTORY OF SCIENCE

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During storage, seeds experienced aging as well as deterioration due to the decrease of physiological quality which often results in a reduction of seed viability. This phenomenon causes the overall alterations in seeds. According to literature, some seeds cannot bear water loss and therefore, they cannot be stored by means of conventional methods. These seeds are known as desiccation-sensitive or "recalcitrant" seeds[1].

In this regard, rubber seed falls under the category of recalcitrant seeds. Rubber seeds are the recalcitrant seed which is vulnerable to fungal attack during storage. It is reported that recalcitrant seeds had no dormancy and very short shelf life in storage[2].

The storage of these seeds has been always a challenge for scientists as they can't be dried below 30% moisture content and get damaged. Moreover, they do not have the ability to withstand low temperatures[3]. In these conditions, the metabolism remains active and progress towards germination even in the resting state. Furthermore, when these seeds are dried, water content gets reduced leading towards sub-cellular changes that result in deterioration of seed viability.

There are no proper strategies in order to cope with this situation. However, some scientists enlightened a new hope and reported that recalcitrant shelled rubber seed germination during storage can be repressed through coating the seed with the PEG 6000[4].

Polyethylene glycol (PEG) possesses a cell osmotic potential. It has the capability to restrict the changes in water content as well as oxygen on germination medium or storage so that the PEG molecules that are present outside the cell seed membrane form a film which provides shield to seeds. Moreover, it also plays a role in the buffer for seed moisture content as well as oxygen.

Considering these facts researchers conducted new research in order to analyze the physiological alterations of rubber seed after storing it with PEG 6000 for 16 days to induce secondary dormancy in maintaining seed viability.

During this experiment, differences in treatment with and without PEG 6000 30%

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with 4 replications was used. Afterward, the research team examined the seed germination, moisture content, O_2 consumption, water activity, CO_2 production, protein content, total sugar content, ash content, fat content, peroxide value, seed hardness, electrical conductivity as well as germination of seeds after storage period[5].

This study showed that the physiology of shelled rubber during storage for sixteen days with the PEG 6000 30% coating would be changed not significantly with a viability of 99%. Conclusively, this research will help to store "recalcitrant seeds" more efficiently.

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