

Physiological and biochemical changes during seed deterioration in *Perilla frutescens* (L.) Britton

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SUMMARY

Accelerated ageing test was conducted in laboratory on seeds of 20 different accessions of *Perilla frutescens* (L.) Britton to understand the effect of deterioration on seed health and viability. Seeds were aged for 48 and 72 hours through accelerated ageing treatment (100% RH and 44°C temperature) and were analyzed for various physiological and biochemical parameters. The germination percentage, vigour index, speed of germination and seedling length decreased as the accelerated ageing period increase in all seed lots. Average increase in the electrical conductivity values of seed leachates over control was 106.55 per cent after 48 hrs and 170.27 per cent after 72 hrs of ageing treatment. Total soluble protein declined by 30.83 per cent after 48 hrs and 50.34 per cent after 72 hrs of accelerated ageing. Thousand seed weight was positively correlated with speed of germination and germination percentage and was negatively correlated with lipid peroxidation and decrease in soluble proteins. Lipid peroxidation values increased significantly in aged seed lots over the control.

Key Words : Seed ageing, Germination, Seed vigour, Protein profile, Lipid per oxidation

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Perilla frutescens (L.) Britton is an important underutilized, multipurpose, traditional crop of India, China, Japan, Korea, Thailand and other Asian countries. In India, *Perilla* is mainly grown as a minor oilseed crop in Himalayan highlands and requires adequate research, marketing and conservation interventions as many of these underutilized crops are now drawing increase attention of policy maker world wide for their nutritional and other desirable traits. The seed oil is used for cooking, as a drying oil and as a fuel. The seeds are eaten by people and used as bird seed. The foliage is used as a potherb, for medicine and for food colouring. Limited information is available on the metabolic changes that occur during seed deterioration.

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MATERIALS AND METHODS

Freshly harvested seeds of twenty accessions of *Perilla frutescens* after material and methods were procured from the N.B.P.G.R, New Delhi (collected during NATP project by different NBPGR regional stations and grown at Shillong station) for comparative study on various physiological and biochemical parameters.

Each of the twenty accession seeds were divided into three lots and evaluated for various important physiological and biochemical parameters after giving accelerated ageing treatment (44°C temperature and 100% relative humidity) for 48 and 72 h. Untreated seed stored at ambient conditions served as control. The aged seeds were air dried under ambient conditions in moisture content laboratory and were analyzed for various physiological and biochemical parameters as follows.

Moisture content estimation was done by gravimetric method (Low constant temperature oven method, at 103°C for 16 hr) as per ISTA Rules (ISTA, 1993).