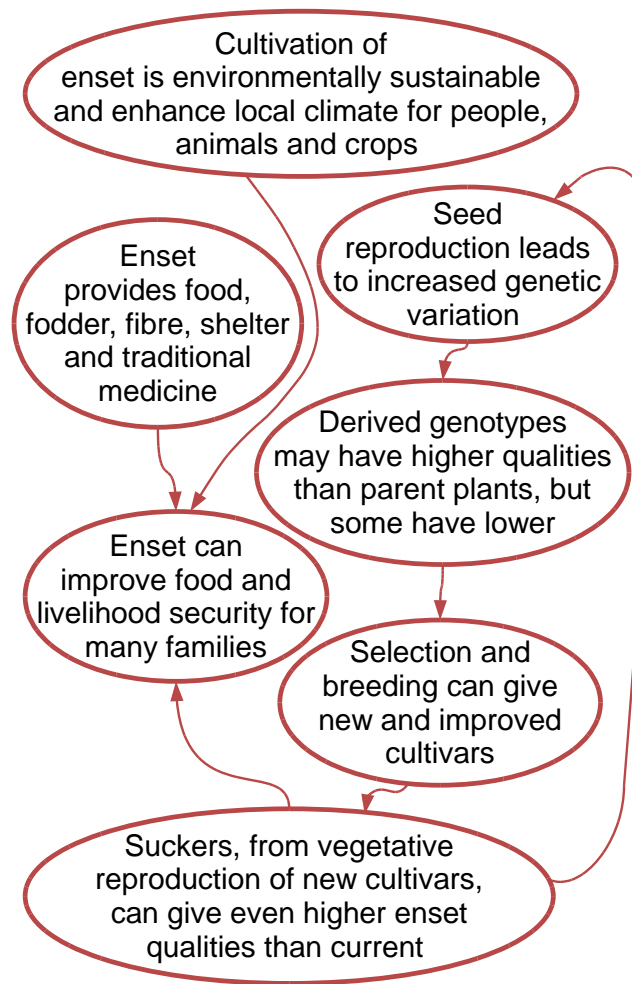




Seedlings: 3 weeks ↑ 9 months ↓



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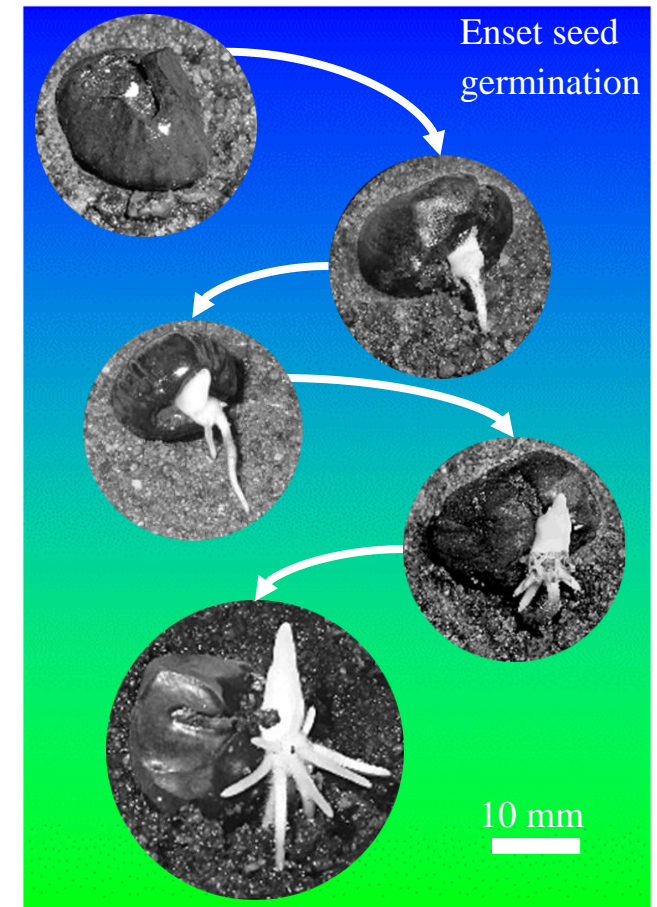
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Enset seeds and seedlings

For research and development



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Background

Enset (*Ensete ventricosum*) is an important multi-purpose and drought-tolerant crop in parts of Ethiopia. Many landraces exist, but there is need for additional varieties, with new or improved traits. Because reproduction is usually vegetative (which ensure the new plants having exactly the same genotype as the old), there is no variation within clones/landraces. A straight-forward way to achieve more genetic variation, to select desired qualities from, is sexual reproduction through seeds.

This study aimed at testing enset seed for germination and to investigate the extent of variation among seedlings from individual plants.

Method

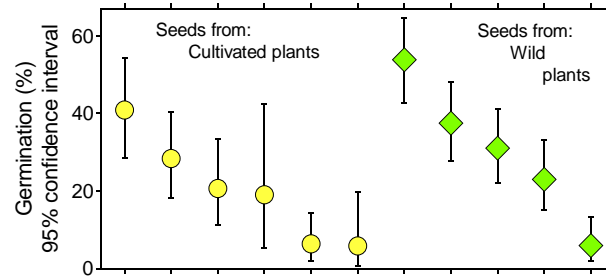
Seeds were collected from 14 enset plants; five wild and nine cultivated, when the banana-look-like enset fruits were ripe (orange to brown in colour). Collection sites were within the area Sodo – Tercha – Wolkite – Asela – Haramaya, located at N 06°50'–N 09°25', E 37°11'–E 42°02', Ethiopia. Additional plants with ripe fruits were checked but had no, or only few, seeds. Seeds were cleansed from pulp and dried. Experiments were conducted at Wolaita Sodo University, 2011.

For germination tests, seeds were first soaked for 24 h. Thereafter, they were either directly placed on moist sand under plastic sheets (23°C) or subjected to treatments with different chemicals (as: acid, base, hypochlorite, nitrogen), mechanical scarification or hot pre-treatment.

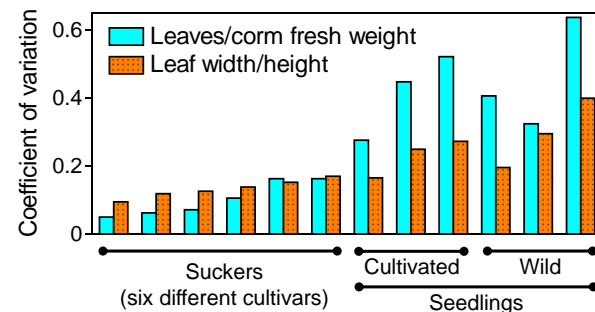
For growth of seedlings, newly germinated seeds were planted in pots with ½ local soil, ¼ sand and ¼ dry cow dung, and allowed to grow for 6 months before plant traits were recorded.

Results

Number of seeds per enset plant was about 100–2000, and common number of seeds per fruit was about 10 for cultivated and 20 for wild plants.



Germination varied between seeds from different plants, but overall circa 25 % germination can be expected within 12 weeks if seeds are placed on moist sand. There was no significant positive effect of chemicals, scarification or warm pre-treatment. However, we found that germination occurred quicker when seeds were soaked for one week, mixed with moist sand and slowly dried during three weeks. This response ensures good timing of enset seed germination in nature.



Extent of variation was larger for seedlings than for suckers from corms ($p < 0.001$). This is due to genetic recombination, which in turn is the basis for traditional breeding through selection of suitable individuals. Therefore, seedlings can be used to develop new cultivars through selection.

Conclusions

When aiming to develop and introduce new clones, with new or improved qualities, seedlings can be used in addition to genetic engineering, as it is not always possible to find one or a few genes that allows development of the desired clone. With the random recombination of the entire genome, which is the result of natural sexual reproduction with seeds, the number of combinations of genes, and thus expressed characteristics, is nearly endless. Seedling can be used in research for selection of new cultivars with desired traits.

Use of enset seeds and seedlings

We recommend seeds to be used for development of improved enset cultivars, but that seeds, and seedlings, for propagation should not be used as a substitute of farmers' current way of clonal propagation. The reason and logic for this statement is that plants from seeds have other characteristics than the parent plants. The use of enset seeds gives genetic variation which can be used to develop improved cultivars through selection and breeding. Thus, the breeding and testing should follow the variety release procedure, and be done in controlled ways.

Reproduction of enset on farms

When farmers are planting corms as traditionally done, they know that they get a plant with same qualities as they had before, and methods are well established. When distributing enset among groups of people not previously used to it, it is important to use well documented landraces or cultivars, vegetatively propagated through corms, in order to achieve the expected performance and be able to give proper advice regarding agricultural practice and resource use.