



Relationship between equilibrium relative humidity (eRH) and seed moisture content in three orthodox – seed species

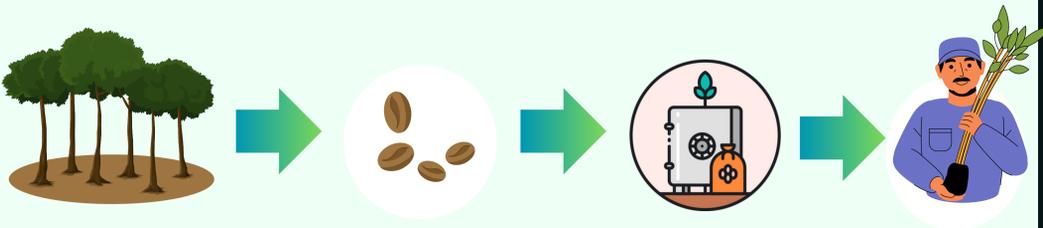


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Abstract

The preservation of seeds in a dry state within seed banks is a crucial strategy for preventing plant extinction. To store seeds effectively, it is essential to control their moisture content, as they will be frozen at a temperature of -20°C . Therefore, determining the moisture content of seeds is a critical step in planning for seed storage. This study aims to analyze the relationship between eRH and seed moisture content in three orthodox seed species: *Turpinia pomifera*, *Antidesma ghaesembilla* Gaertn, and *Rhus rheticsoides*. The methodology involves determining seed moisture content using the oven drying method and measuring the eRH of seed storage containers at 25°C . The humidity is then gradually reduced to 15% or lower, which is the optimal level for seed storage in seed banks. The initial seed moisture content was 77% for *T. pomifera*, 77% for *A. ghaesembilla*, and 62.5% for *R. rheticsoides*. A correlation test between eRH and seed moisture content revealed correlation values of 0.90 for *T. pomifera*, 0.96 for *A. ghaesembilla*, and 0.72 for *R. rheticsoides*. Linear regression analysis showed a significant linear relationship ($p < 0.05$) for *T. pomifera* and *A. ghaesembilla*, no significant linear relationship for *R. rheticsoides*. These findings indicate that the relationship between seed moisture content and eRH varies among tree species. In species where a linear correlation is observed, eRH can be used to predict seed moisture content, allowing for more efficient moisture reduction planning.

Introduction and Objective



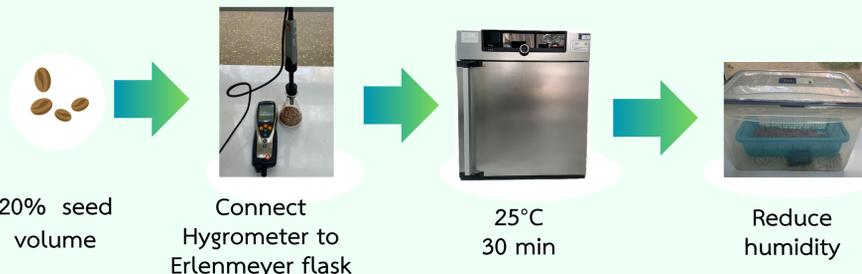
1. To determine the relationship between eRH and the moisture content of three orthodox seeds.
2. To determine the germination percentage of seeds after the moisture content and eRH have been reduced.

Methods

• Oven drying method



• eRH measurement



Conclusions

1. The relationship between eRH and seed moisture content varies by plant species.
2. For *R. rheticsoides* seed germination was higher when eRH decreased.

Results and Discussions

- *T. pomifera* and *A. ghaesembilla* Gaertn. had a linear relationship with eRH.
- *R. rheticsoides* didn't have a linear relationship, possibly due to the specific characteristics of the seed (Figure 1).
- Germination occurred only in *R. rheticsoides*. The lack of germination in *T. pomifera* and *A. ghaesembilla* Gaertn. May be due to the seed coat structure or fungal contamination (Figure 2).

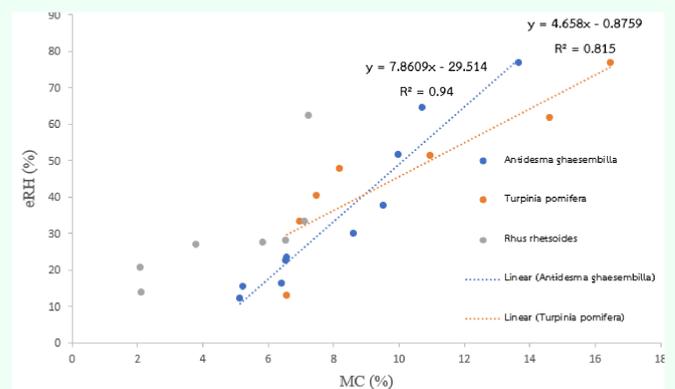


Figure 1. The relationship between eRH and seed moisture content in three orthodox seeds.

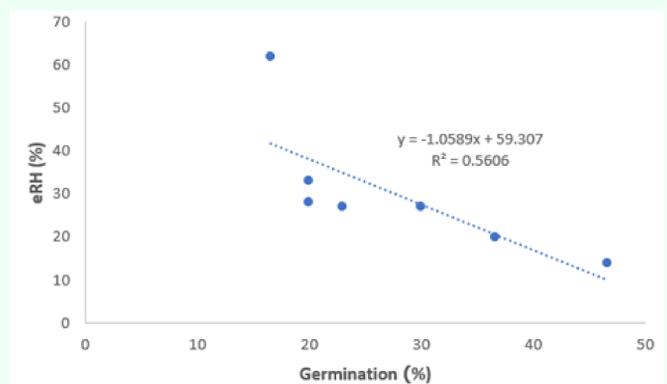


Figure 2. Germination percentage of *R. rheticsoides* in Relation to the eRH value of the seed.

References

- Ellis, R. H., & Hong, T. D. (2007). Seed longevity – moisture content relationships in hermetic and open storage. *Seed Science and Technology*, 35(2), 423-431.
- Karrfalt, R. P. (2017). Seed moisture content, relative humidity, and better storage of longleaf pine seed. *Seed Technology*, 60(2), Fall 2017.