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Abstracts

Study on influence of seed moisture and storage temperature for seed germination and seed storage period of *Ipomoea alba* L. This study was separated into four experiments based on the condition of storage temperature as follows; room temperature, 5 °C, -10 °C and -196 °C. These experiments were designed in Split Plot Design with 4 replicates, including 2 factors as main plot with 4 level of percent moisture in seed at 6, 8, 10 and 15.4 and sub plot with 7 level of period for seed storage at 0, 3, 6, 9, 12, 15 and 18 months. The results showed that seed moisture and period of seed storage affected to the percent of seed germination of *I. alba* in all of storage temperature. The room temperature with 6, 8 and 10 percent of seed moisture (storage for 18 months) showed the seed germination at 77, 82 and 60 %, respectively, while non-reduced seed moisture could be storage about 9 months. The seed moisture not affected to seed germination of *I. alba*, which was kept at low temperature for 18 months. In addition, seed moisture of 6, 8, 10 and 15.4 % at 5 °C, -10 °C and -196 °C exhibited the seed germination as (85, 83, 85 and 49 %), (94, 83, 89 and 78 %) and (83, 75, 75 and 67 %), respectively.

Introduction

Thailand is considered to be a major agricultural country and one of the world major foods producing country. The DOA Genebank, Department of Agriculture is a center for the conservation of plant genetic resources to maintain the viability of plant germplasm. At the present, the capacity of seed storage is about 190,000 samples.

Ipomoea alba L., commonly known as moonflower, is a member of the Convolvulaceae family (Austin and Huáman, 1996; Saensouk, 2007). In Thailand, moonflower plants are generally grown for eaten flower as vegetable such as steam, stir-fry, used in curries and soup.

The propagation method of moonflower is seeding. However, information on moisture and storage temperature of moonflower seeds has not been reported for Thailand. The objectives of this study were to estimate the influence of seed moisture content, storage temperature on seed germination and seed storage period of moonflower in DOA Genebank.

Materials and Methods

1. Plant materials

Fully mature seeds of moonflower were collected from Nakhon Ratchasima Province, Northeast of Thailand during May 2017. When the fruit changed to dark brown, the seeds were separated before its break down.

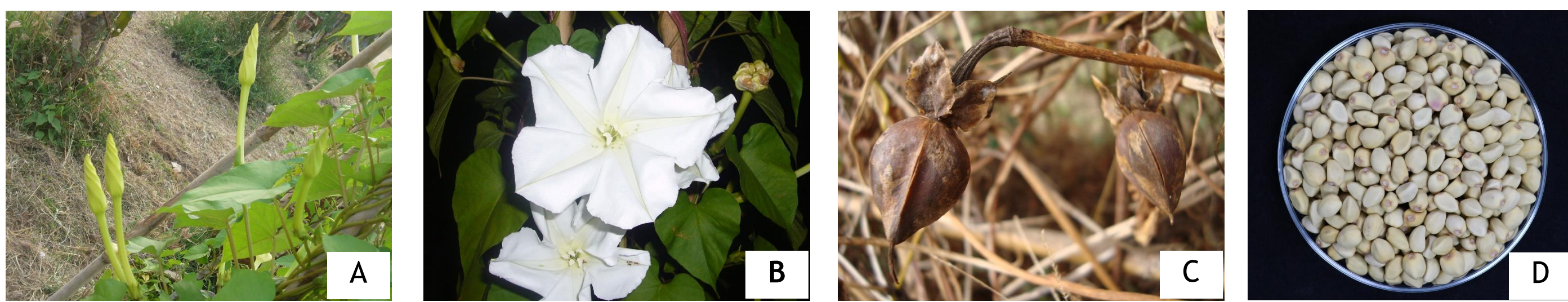


Figure 1. Young flower (A), flowering (B), fruit (C) and seeds of moonflower (D).

2. Seed storage

After the harvest, seed moisture content was determined by Air-Oven method (ISTA, 2014) as 15.4%, reduced moisture in seed at 6, 8 and 10% by drying room (at 25 °C, RH 15%). Seed stored at room temp. (28-30 °C), 5 °C (medium term storage), -10 °C (long term storage) and -196°C (in liquid nitrogen). Seed germination tested at 0, 3, 6, 9, 12, 15 and 18 months, respectively.

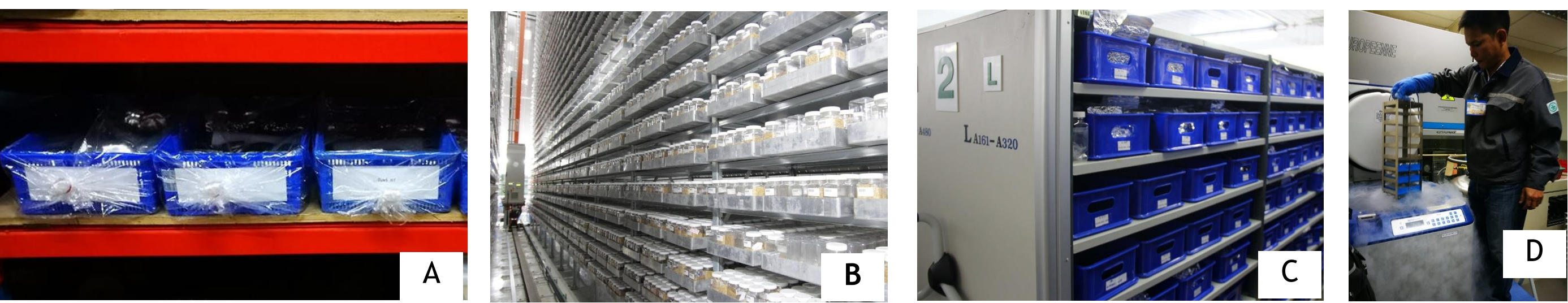


Figure 2. Seed storage at room temp. (A), 5 °C (B), -10 °C (C) and -196°C (D).

3. Germination test

Seed germination was applied followed the ISTA. The BP method (Between Paper) was tested after seeding 7 days and repeating germination in 14 days at last.

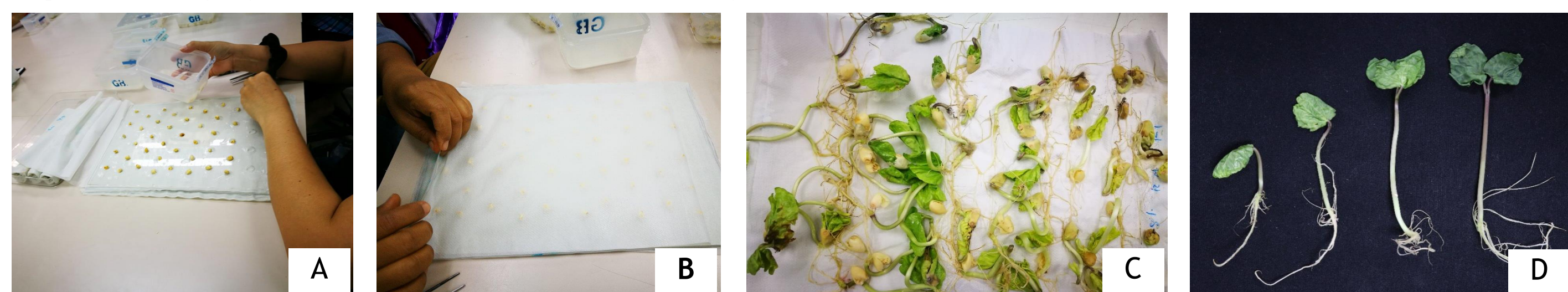


Figure 3. BP method (A,B), seed germination (C) and normal seeding (D).

Results

The results indicated that seed moisture content (SMC) and storage temperature (ST) had affected to seed germination and period for seed storage at 0, 3, 6, 9, 12, 15 and 18 months in DOA Genebank.

Seeds stored at room temperature with 6, 8 and 10% of SMC (stored for 18 months) showed the seed germination at 77, 82 and 60%, respectively. While the non-reduced moisture seeds (SMC 15.4%) could not retain their viability after the storage more than 9 months.

Seeds stored at low temperature, showed high level of germination. Seed moisture of 6, 8 and 10% at 5, -10 and -196 °C exhibited the seed germination as (85, 83 and 85%), (94, 83 and 89%) and (83, 75 and 75%), respectively.

While the seed moisture of 15.4 % stored at 5, -10 and -196°C showed the seed germination as 49, 78 and 67%, respectively.

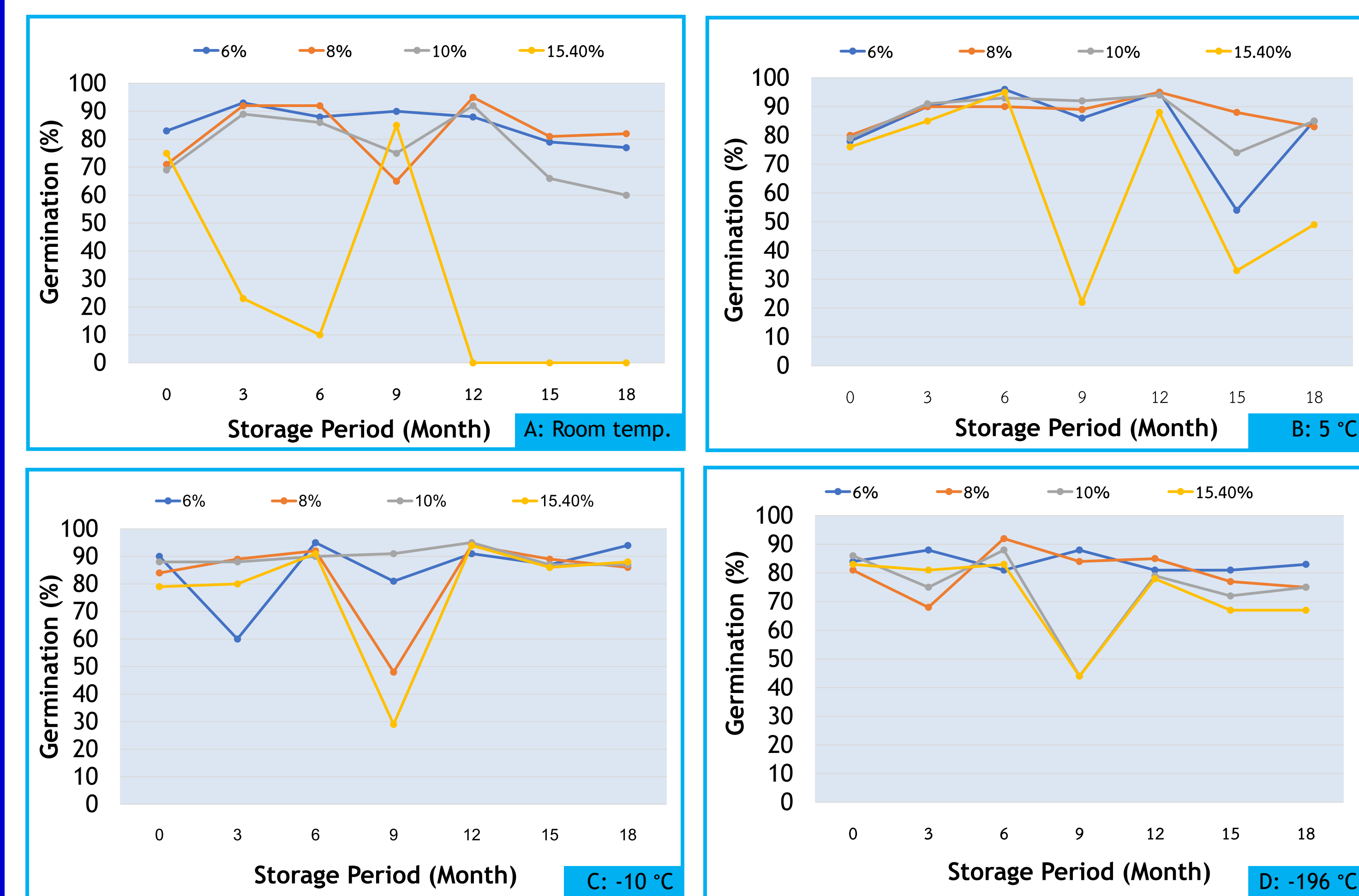


Figure 4. Seed germination at room temp (A), 5°C (B), -10°C (C) and -196°C (D).

Conclusions

This study demonstrated that the influence of seed moisture content and storage temperature on seed germination and seed storage period of moonflower. Seed stored with low moisture content (6-10%) and low temperature at 5°C, -10°C and -196°C showed longer storage life than 18 months.

Thus, the quality of seeds during the storage period is strongly influenced by the quality of the initial seed (before storage), seed moisture content, temperature and humidity during the storage period.

References

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