

Quality control of fruit and seeds of medicinal plants

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Introduction

Seed viability is an important parameter for assessing the success of the introduction, propagation and breeding of plants. The viability of the reproductive diaspores is determined by the place of growth, environmental factors, the overgrowth of maternal plants, the supply of nutrients and water during the growth and development and formation of fruits and seeds, as well as climate and weather conditions during flowering and ripening of fruits. Currently, Botanical institutions are beginning to pay more and more attention to the protection and reproduction of rare and endangered plant species, the creation of seed banks, as well as the introduction of new introduced plant species into the wide culture and practice of gardening. The relevance of scientific work aimed at a comprehensive study of the latent period in plant life.

Materials and methods

Reproductive diaspores are divided into three categories: microbiotic (germination of which lasts up to 3 years); mesobiotics - germination lasts from 3 to 15 years; and - macrobiotic - seeds are viable for over 15 years. Rare and species-reducing species most often fall into the first group (microbiotic). The vast majority of cultivated and cultivated plant species belong to the group of mesobiotics. The

latter group is represented mostly by weedy plant species.

In the twentieth century, methods were developed for non-destructive determination of seed viability and methods for increasing their germination using ultraviolet radiation, a high voltage electric field, and even gamma radiation.

Results and discussion

The most promising method of non-destructive determination of seed viability was radiography. The effectiveness of the use of fluoroscopy was clearly shown to assess the quality of large fruits and seeds with dense covers (*Amygdalus*, *Cerasus*, *Cucumis*, *Cucurbita*, *Foeniculum*, *Helianthus*, *Hordeum*, *Malus*, *Paeonia*, *Phaseolus*, *Pinus*, *Prunus*, *Quercus*, *Triticum*) (Smirnova, 1978; Tkachenko et al., 2016).

With the development of x-ray machines, the development of new microfocuss modifications, using a computer image immediately after shooting objects, it became possible to quickly analyze the quality of fruits and seeds.

At present, it is possible to evaluate the quality, to determine the degree of fulfillment and damage by various pests of the reproductive diaspores (fruits and seeds) of plants of different families, in order to select completed (full-fledged) seeds and use them for growing (Tkachenko et al., 2015a, b, c; Tkachenko et al., 2016).

X-ray analysis of fruits and seeds allows you to get images of much higher quality. Thus, the

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assessment of the quality of seeds of species of the genus *Abies* Hill. (Pinaceae), introduced species of the genus *Malus* Mill. Insects (from the collected seeds of the above plant species) were assigned to Chalcids from the Torymidae family. This is a family of parasitic riders of the subfamily Chalcidoidea of the suborder Stem-bellied order of Hymenoptera insects.

The result of successful introduction tests of different plant species in the Botanical Gardens is to obtain seed offspring in new growing conditions for these species. Reproductive diaspores obtained from plants grown under controlled conditions are included in the Index seminum or Delectus or Lists of spores, fruits, and seeds, where are used for exchange among botanical institutions in the world and are sent out according to applications received. As a rule, before sending the seeds are only subject to thorough cleaning, without special quality control. Often, having received seeds from any botanical garden in the world, of one or another species of plants, it also happens that they cannot germinate. Most often, the cause of failures is attributed either to their poor quality, or to the fact that they quickly lose germination, or undergo adverse thermal effects during transportation. And in view of the small number of seeds sent (or sent), as a rule, they are not involved in checking their germination or identifying the degree of maturation, fulfillment, or full grain. But for the formation of collections of living plants in the Botanical Gardens, this is very important. And the use of the method of fluoroscopy of fruits and seeds can significantly simplify the assessment of the quality of reproductive diaspores entering the Garden. Putting this method into practice will allow, firstly, to quickly identify the presence of pests inside the seeds and urgently take measures to neutralize them; and to select for sending (shipping), to the curators for growing at the breeding nurseries only high-quality, fulfilled, full-grain fruits and seeds (reproductive diaspores).

Conclusion

Using a fluoroscopic method for analyzing the quality and completeness of the forming seeds allows relatively easy and quick control of the collected reproductive diaspores, additionally reveals the presence of viable and fulfilled ones, as

well as enables determination of the degree of their defeat by pests. After express analysis, it is possible to evaluate each batch of seeds as a whole, and select specific completed and full seeds for sowing, and / or remove low-quality, feeble and pest-infected seeds from samples, including those laid for long-term storage.

Special studies should be performed by developing methods for assessing the quality of small, with thin external covers of reproductive diaspores of plants.

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