



The Morphology of Fruits and Seeds of Lageremia Indica L.

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ABSTRACT: Lageremia indica L. commonly known as crepe myrtle, is an ornamental plant known for its attractive flowers and foliage. The fruit and seeds are also known to be obtained from the boot tree. The aim of this study was to study the fruit and seed morphology of Lagerstroemia indica. The study included analyzes of the quality of fruits and seeds of several Lagerstroemia indica plants and their different morphological methods. Research results show that the fruits of Lagerstroemia indica are small, dry capsules that split open along one side to reveal many small, winged seeds. The seeds are flattened and have a papery layer. The fruits and seeds of Lagerstroemia indica L. appear to be well adapted for wind dispersal.

KEYWORDS: Crepe myrtle, Fruit, Flower, Foliage, Lageremia indica L., seed, panicle, scales, wind.

INTRODUCTION

The study of fruit and seed morphology is important in many fields, including botany, agriculture, and ecology. The morphology of fruit and seed can provide valuable information about the life history and reproductive strategies of plants, as well as their ecological roles and interactions with other organisms. For instance, the study of fruit and seed morphology allows identification of different species of plant, development of agricultural plant breeding programs. In addition, the study of fruit and seed morphology is useful in the conservation and restoration of natural habitats, as well as in the management of invasive plant species. In principle, the study of fruit and seed morphology is essential to a comprehensive knowledge of plant biology and ecology.

THE OBJECT AND METHODS OF STUDY

As an object of the research, in the process of landscaping the area in the city of Tashkent, Lagerstroemia indica in “Green zone of the world” LLC was widely used. Lagerstroemia indica L. belongs to the Lythraceae family and is widely distributed in Southeast Asia and Australia, with at least 50 species in its regions as deciduous shrubs or small trees, and it is called by a special name like crepe myrtle [5]. The genus of Lagerstroemia is distributed from India, Southeast Asia, South China, Japan and Korea to Northern Australia and New Guinea as a horticultural plant and includes about 56 species. Lagerstroemia indica was first cultivated in China around 1,800 years ago, some species of the plant are widely used in gardens and are considered an indispensable source of income by companies and retailers due to their elegant plant architecture, long summer blooms and beautiful scenery [3]. Currently, there are many clones of Lagerstroemia indica that differ in size, growth, condition, pest resistance and flower color designed to serve different landscape purposes [1]. As a landscape tree, Lagerstroemia indica has important economic value. Furthermore, the tree is used in traditional medicine to treat various diseases. From the point of view of ecological importance, Lagerstroemia indica provides food and habitat for a variety of wildlife, including birds and insects. However, it is not considered an important ecological resource because it is not a native species in many parts of the world where it grows. The precise method used will depend on the question of research and the characteristics of the fruit and seeds being measured. You can use a small kitchen scale or a large scale to determine the weight of fruits and seeds of Lagerstroemia indica L. Taking this into account, the measuring method on the scales was used. This method involves using a scale to measure the weight of the fruit or seed [8]. The measurement works were carried out based on the information of the seed measurement organization named after “Seed Identification Guide”. The biometric dimensions of fruits and seeds are measured 0.01 mm by stangencircle, 0.01 g by the electronic scales of VLKT-500 and “Pocket Scale”. The process of measuring fruits and seeds of Lagerstroemia indica L. plant was carried out as follows: the weight of each 100 pieces of fruits was measured, the number of seeds in 1 kilogram of fruit was determined, the productivity of seeds was analyzed, and all the work of measurement was carried out based on the requirements of GOST 13056.4-67 (State standards of the Republic of Uzbekistan 322.15.04.2009) “Method of determining the weight of 1000 seed” [7].

THE RESULTS AND DISCUSSIONS OF STUDY

Lagerstroemia indica L. has red, white, pink or purple flowers with a diameter of 1.5 to 5.0 cm, a length of 12 to 44 cm, and they are located in conical panicles. Each of them has 25 to 500 flowers. The flowers are composed of 6 complex sepals and have a unique appearance. There are also a lot of ovaries [4]. The color of its fruit is brown, dry and in an oval shape, reaching about 9–13 mm in length. The diameter of the fruit is about 6.9–10.1 mm. Its fruit bursts when it ripens, splits in two, and releases the seeds inside. The fruit is hard and woody when ripe and remains on the tree until winter. It can be seen from this table that the lowest indicator of fruit weight was 0.1 grams, the highest was 0.34 grams and the average was 0.2±0.14 grams. Also, the length of the fruits had the following indicator: the lowest indicator was 0.9 cm, the highest was 1.21 cm and the average was 1.05 cm±0.15 cm. In the width of the fruit, the lowest was 0.69 cm, the highest was 1.1 cm and the average was 0.8 cm±0.21 cm. When the number of seeds in the fruit was counted, it was noticed that the size of the fruit is important. There were 21 seeds in small fruits, and 39 seeds in large fruits, and the average indicator was 30±9 [Table 1].

Table 1. The measurements of fruits of *Lagerstroemia indica* L.

Measurements of fruit	The lowest indicator	The highest indicator	Average indicator
The weight of the fruit	0.1 g	0.34 g	0.2 g ± 0.14 g
The length of the fruit	0.9 cm	1.21 cm	1.05 cm ± 0.15cm
The width of the fruit	0.69 cm	1.1 cm	0.8 cm ± 0.21cm
The number of fruit seeds	21	39	30 ± 9

The length of fruit of *Lagerstroemia indica* L. is a capsule about 1–2 centimeters long. The capsule is oval–ellipsoidal shape and consists of two or three segments. Each of segment contains numerous small brown seeds, 1 to 2 millimeters long. The capsules are dry, open along one side, and release many small, winged seeds. Its seeds are flattened, brown and has a papery outer layer [Figure 1].



Figure 1. The appearance of fruits and seeds of *Lagerstroemia indica* L.

The structure of seeds of *Lagerstroemia indica* L. differs from other plant seeds. It mainly consists of three parts–seed coat, endosperm and embryo. The outermost layer of the seed is the seed coat, which mainly functions as a protective covering. It mainly consists of cellulose and lignin. The endosperm is a food storage tissue that provides nutrients to the developing plant embryo during seed germination. Embryo is a young plant and consists of root, cotyledon and embryonic buds [Table 2].

Table 2. The measurements of seeds of *Lagerstroemia indica* L.

Measurements of seed	The lowest indicator	The highest indicator	Average indicator
The length of the seed with wings	0.58 cm	0.9 cm	0.74 sm ± 0.16 cm
The length of the seed without wings	0.12 cm	0.43 cm	0.284 sm ± 0.15 cm



The width of the seed	0.09 cm	0.39 cm	0.258 cm ± 0.14 cm
The weight of 1,000 seeds			2.1±0.2 g

The coat of seed of *Lagerstroemia indica* L. is thin and transparent, red–brown in color. A number of factors must be taken into account in order to obtain accurate and reliable results when measuring the seeds of *Lagerstroemia indica* L. Some things that require attention during the measurement of seeds are: firstly, the condition of the seed, i.e. the separated seeds should not be weak or diseased; secondly, the moisture of seed, it is very important to pay attention to the fact that the separated seeds are dry; thirdly, the purity of the seeds, this is the most important indicator. In principle, it is important to follow the correct measurement rules and use the appropriate equipment to determine accurate and reliable measurements of seeds.

The weight of 1000 seeds of *Lagerstroemia indica* L. is 1.9+2.3 grams [Table 2]. The results of seed measurement were as follows: the lowest indicator of the height of the seed when measured with wings is 0.58 cm, and the lowest indicator of the seed is 0.12 cm when measured without wings. Even the biggest seeds were measured to be 0.9 cm with wings and 0.43 cm without wings. The average value was 0.74 cm±0.16 cm with wings, and 0.284 cm±0.15 cm without wings. It can be seen that the main part of the seeds is their wings. In the process of measuring the width of the seed, the lowest indicator is 0.09 cm, the highest indicator is 0.39 cm, and the average value is 0.258 cm ± 0.14 cm. It can be concluded that the width of the seed is slightly shorter than the length during the process of measurement. *Lagerstroemia indica* L. is mainly spread by wind–related seed dispersal mechanisms. The seeds of the plant are winged, which allows them to be carried by the wind for long distances.

CONCLUSION

In conclusion, the fruits and seeds of *Lagerstroemia indica* have characteristics similar to deciduous trees, which allow the seeds to disperse and survive the winter easily. The fruits and seeds of *Lagerstroemia indica* are tiny, dry, separable capsules that contain numerous small, winged seeds. The general shape and size of the seeds are very variable, so they can vary significantly depending on environmental conditions. The biological and medicinal properties, beautiful and attractive flowers of the plant make it a well–known decorative species around the world.

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