

FLORAL CHARACTERIZATION OF CAROB TREE (*CERATONIA SILIQUA* L.) FROM THE PROVINCE OF CHEFCHAOUEN (NW OF MOROCCO)

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Abstract. The survey of floral variability of carob tree (*Ceratonia siliqua* L.) from the Province of Chefchaouen (NW of Morocco) marks an unsteady floral mosaic. The determinate and the indeterminate inflorescences development is not controlled by environmental conditions in the study area. In carob tree, the indeterminate inflorescences rate is generally higher than the determinate inflorescences one. The particular inflorescence types have been observed. Inflorescence length and flowers number per inflorescence would not related to environmental conditions. Inflorescence length is superior in male trees when compared to female ones (5.71 cm vs. 4.45 cm). Flowers number per inflorescence in male trees is superior to the one in female trees (42 flowers vs. 30 flowers). In male carob tree, seven flower types have been distinguished differing by sepals and stamens numbers and filament length. In female carob tree, three flower types have been defined in terms of pistil form. The grafting of male or female trees in the domesticated areas affects the sex-ratio in this species. Pollen grains diameter and potential fertility show a high variability and could not be explained by the studied factors. The diameter of pollen grains is $28.3 \pm 2.43 \mu\text{m}$. The aborted pollen rate has been estimated to 15 %.

Key words: Floral variability, pollen, Sex-ratio, *Ceratonia siliqua* L., NW of Morocco.

Introduction

Carob tree (*Ceratonia siliqua* L.) represents the *Ceratonia* genera of the *Caesalpinoideae*, *Leguminosae*, *Angiospermae*, *Spermatophyta* [32]. It is dioecious, monoecious or rarely hermaphrodite [3, 6, 20, 25]. It grows in habitats of the low zone of Mediterranean vegetation with other species such *Pistacia lentiscus*, *Olea europaea* var. *sylvestris*, *Tetraclinis articulata*, *Juniperus phoenicea*, *Pinus halepensis* and *Quercus ilex*, forming the association of *Oleo-Ceratonion*, *Pistacio-Rhamnetalia* [1, 22, 33]. Carob culture is spread in the Mediterranean countries, Western Asia, Australia, South of Africa and USA [11].

In Morocco, it is spontaneous or cultivated in the thermo-Mediterranean and the meso-Mediterranean stages, corresponding to semi-arid and sub-humid bioclimates with minimal temperature over to 3°C and altitude up to 500 m and peculiarly up to 900-1600 m [12, 16, 18, 24, 33].

Many intra-specific varieties of carob tree have been reported in some Mediterranean countries in term of provenance and tree features [5, 6, 7, 11, 26]. Studies led on carob tree from Morocco distinguish several intra-specific types according to tree sex [22] or its domestication importance [13, 14]. Due to its elementary structure of flowers, carob