

CHAPTER 1

INTRODUCTION

It has long been known that flowering plants have produced a great variety of flowers. Each flower produces its own kind of fruit, and each fruit contains one or more seeds. Interest in pollination biology is as early as civilization of mankind. For example, early man propagated and developed the banana removing most of the seeds and improving the texture and taste. Farmers have shown a keen interest in improving their fruit production. Most fruit productions depend upon pollination that it is no wonder why civilized people have long been interested in this biological incident. However, an interesting in the pollination has not been restricted to agricultural applications. Pollination systems have long been recognized as a model for understanding the interplay between natural selection and evolution. In numerous instances, the selective forces operating on plant population and their pollinators can be fairly well described. Plants, with their elaborate and specialized floral designs, and animal with their complex systems of reproduction and behavior, are ideal models for exploring the process of adaptation (Real, 1983). As seed is the important product of seed plants, studies on pollination biology are vital for improvements of the seed productions. In pollination process, biotic or abiotic agents transfer pollens to the stigma. After pollination, pollen develops a pollen tube, which grow through the pistil and discharge the male gametes in the vicinity of the egg cell. Then, fertilization is taken place and eventually develops into embryo and seed stages. However, the presence of strong pre- and post-fertilization barriers are the major constraint in plant reproductions.

Afgekia sericea Craib (Figure 1.1, 1.2). is an endemic species to Thailand. This species tends to become a rare species due to its habitat fragmentation and a small natural population (Boonkerd, 1992, 2001; Prathepha, 1999; Prathepha and Baimai, 1999). This species has many long racemose inflorescences with some 100-400 florets (Boonkerd, 1992). However, the amount of fruit setting is rather small, and in some plants no pod setting were observed. Moreover, it is surprising that plants grow in Bangkok never produce pod, despite of plenty number of complete flowers and ample supply of water. It is found that plants grow in their natural habitat

produce flowers mainly during the period of rainy season while plants raised in Bangkok produce flowers almost all year round. The failure of fruit setting may be due at least in part to the lacking of pollinators (Boonkerd, 1992). However, a papilionaceous type of flower suggests that *A. sericea* is probably a self-pollination plant (Boonkerd, 1992; Douglas, 1997; Snow et al, 1996). Anyhow, from the preliminary study, visitors (pollinators and non-pollinators), visit the flower for various reasons. The flower shows the relationship with some probable pollinators in some extent. From the aforementioned information and my own observation. It is interesting to investigate pollination biology of *A. sericea* in its natural habitat.

Objectives

The objectives of this research are:

1. To determine floral biology (floral development and morphology, flowering phenology, anthesis process, and nectary studies) of *Afgekia sericea* Craib.
2. To investigate the pollination biology (pollen viability and germination, pollen-stigma interaction, and self-incompatibility studies) of *Afgekia sericea* Craib.
3. To study fruit setting of *Afgekia sericea* Craib.

Anticipated Benefit of this Research

1. The research will be the first report of pollination biology of *Afgekia sericea* Craib.
2. Knowledge of pollination biology of *Afgekia sericea* Craib can be used in conservation program of this species.
3. The finding of this research will be used for basic studying in field of pollination biology in other species.



Figure 1.1 *Afgekia sericea* Craib: **a**, natural habitat at Sakaerat Environmental Research Station (SERS), Nakhon Ratchasima Province; **b**, compound leaves; **c**, inflorescences.

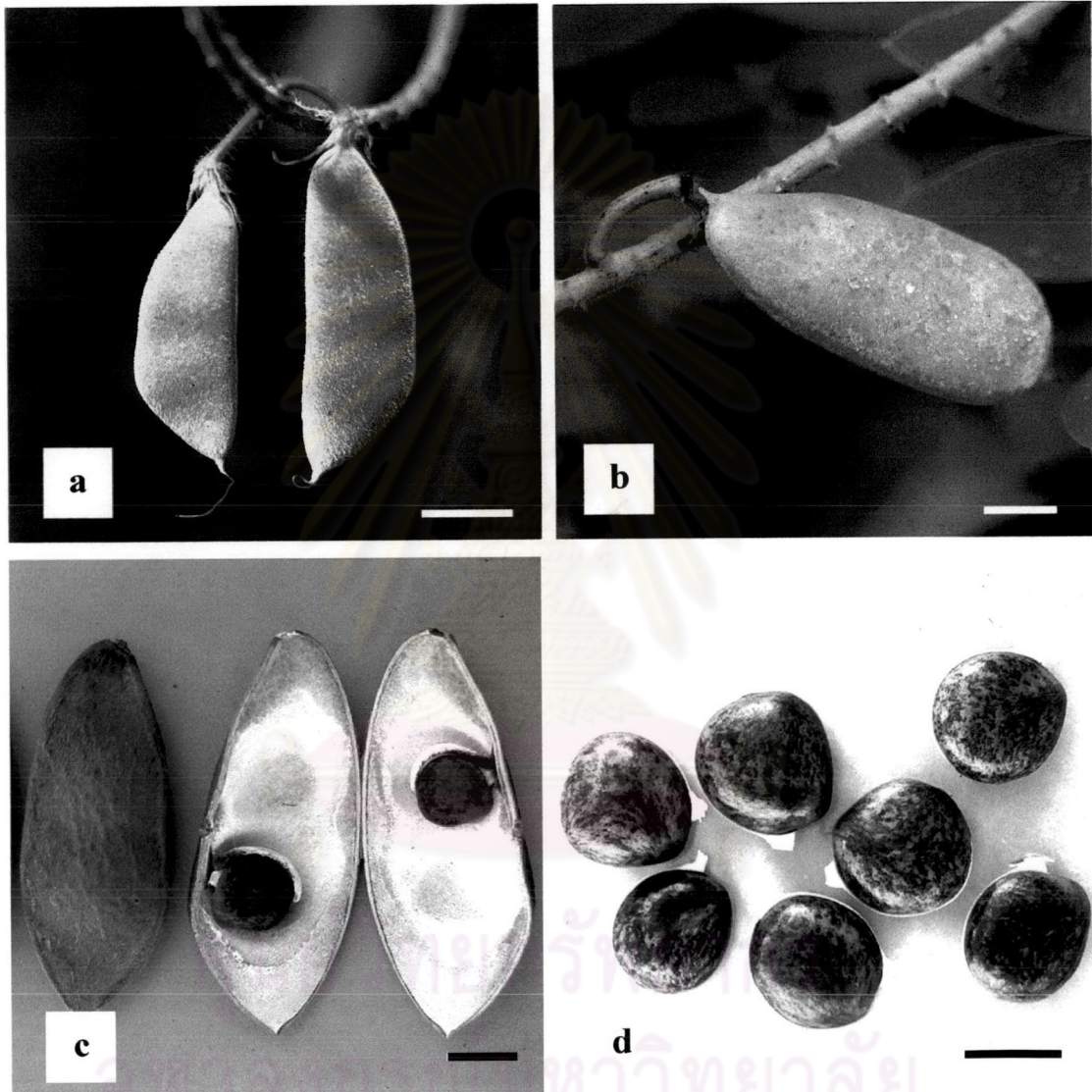


Figure 1.2 *Afgekia sericea* Craib: **a**, young pods; **b**, mature pod; **c**, ripe pod with seeds; **d**, mature seeds, bar = 1cm.