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Insect Pollinators and Floral Visitors of Mango *(Mangifera indica* L. cv. Carabao)

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In mango (*Mangifera indica* L. cv. Carabao), the efficiency of insect pollinators such as *Trigona biroi* Friese, honeybees (*Apis cerana* Fabricius and *Apis mellifera* Linn.), and flies (*Chrysomya* sp. and *Eristalis* sp.) was compared at Opina's Mango Farm, in Barangay Sirang-Lupa, Calamba City, Laguna from 03 November 2006 to 10 April 2007. The relative abundance and foraging behavior of insect pollinators was also documented. Some aspects of the floral biology of mango were observed as it influenced pollinator foraging.

A total of 21 insect species belonging to five orders visited mango flowers. The primary pollinators were stingless bees (*Trigona biroi*), calliphorids (*Chrysomya* spp.), syrphids (*Eristalis* spp.) and honey bees (*Apis cerana* and *A. mellifera*). Pollinators actively foraged from 700–1059 h, with the peak period occurring at 800–859 h. The foraging activities of the pollinators synchronized with anthesis. Prior to the introduction of bee colonies in the mango farm, the fruit set in caged (2.13%) and uncaged (3.34%) inflorescences did not vary. After the introduction of bee colonies, the fruit set in the uncaged inflorescence (41%) was significantly higher than that in the caged inflorescence (0.7%). The terminal inflorescence, floral longevity (5 d) and scent, and sticky pollen provided enabling conditions for insect pollination.

Key Words: mango, pollination, *Trigona biroi*, *Chrysomya* spp., *Eristalis* spp., *Apis cerana*, *Apis mellifera*

INTRODUCTION

Among the major fruit crops in the Philippines, mango (*Mangifera indica* L.) ranks third in terms of production (DA-BAS 2007). Of the mango varieties, 'Carabao' has the highest export potential. With the current and future demands for mango, it is important to sustain its supply. However, with the conversion of agricultural farms to commercial establishments, it is necessary to maximize harvest per unit area. The strategies of growers include the use of fertilizers, pesticides, irrigation and flower induction hormones. Although these conditions may help the crop to reach the highest stage of flowering, they will not cause the fruit to set. Pollination is the critical factor. In the Philippines, no study on mango pollination has been made so far. Recent research has focused only on pests (De Jesus et al. 2003, 2004; Medina et al. 2005) and flower induction (Boniel and Protacio 2002).

Some agricultural practices adversely affect pollinator diversity. Kremen et al. (2002) observed that intensification brought about a significant reduction in the density of pollinators, including native bees. Pesticide application on mango significantly reduced bee populations in 3 d. Free (1999) reported that the use of insecticides is probably the most serious threat to wild populations in agricultural areas and provides the greatest deterrent to using bees as pollinators.

In order to increase mango production through the use of pollinators and from the point of view of conservation, it is necessary to understand the ecology of pollination. This study was conducted to observe some aspects of floral biology that contribute to pollination efficiency, identify the pollinators and other floral visitors of mango and their relative abundance and foraging behavior, and assess the contribution of pollinators to fruit set.

The study was conducted at Opina's Mango Farm in Barangay Sirang-Lupa, Calamba City, Laguna from 3 November 2006 to 1 April, 2007.

MATERIALS AND METHODS

Description and Layout of the Experimental Area

Opina's Mango Farm (Fig. 1) was chosen as the site for the