

HONEY BEES ENSURE THE POLLINATION OF *PARKIA BIGLOBOSA* IN ABSENCE OF BATS

by Kristin Marie Lassen, Moussa Ouédraogo, Yoko Luise Dupont, Erik Dahl Kjær, and Lene Rostgaard Nielsen

Fruit trees are important components of the West African agroforestry parklands supplying people with fruits when food supplies are scarce. Even so, only little is known about the pollination ecology of the economically and nutritionally important fruit tree African locust bean (*Parkia biglobosa*).

The main objective of the present paper was thus to investigate the pollination ecology of the study species. Central objectives were to compare the pollination ecology at two sites with differences in annual precipitation, and to discuss how future pollination is likely to be affected by potential climate change and how beekeeping may influence fruit production.

The study took place in Burkina Faso. Exclusion trials were established using bags with differently sized mesh around the flower buds, separating the pollinators in groups depending on their size. Pollination success of the different treatments was assessed in terms of fruit and seed production. The results were combined with direct observations of potential pollinators visiting flowers, which made it possible to determine the importance of different pollinators. We used newly developed genetic markers to establish the paternity of seeds from the exclusion treatments and to determine pollen dispersal distances.

Observations of flower visitors revealed more bats at the more humid site compared to the dryer site. However, at both study sites, there was no statistical difference between fruit yield from open-pollinated and bat-protected flowers.

Honey bees were found to be very important pollinators, but we could not find any correlation between yield and the number of honey bee colonies within given radii from the mother-trees.

The small bees also pollinated *P. biglobosa*. However, the yield was much lower than for inflorescences with access to honey bees.

It is likely that increasing the number of honey bee colonies may increase the rate of cross-pollination and thereby the yield of *P. biglobosa* due to increased competition and more flights between trees. Still, the main limitation for the productivity seems to be maternal resources for maturing the developing fruits and seeds. Beekeeping may potentially mitigate negative effects of climate change. However, if an area e.g. becomes as dry as the drier study site in Burkina Faso, the main limitation will most likely be lack of precipitation.



Honey bees gathering pollen from Parkia biglobosa inflorescence during early morning, Pinyiri, Burkina Faso