

THE BEETLES, THE HAWKMOTHS AND THE BEES: OBSERVATIONS OF BAOBAB NOCTURNAL VISITATION, BY POTENTIAL POLLINATORS – BUT NO BATS

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Research Rationale

The African baobab (*Adansonia digitata* L.) is used for many purposes across Africa. Leaves are harvested and consumed in many West African countries, and this results in greatly reduced flowering and fruit production. In southern Africa, the fruit are highly valued, more so than the leaves. Baobab fruit is used for domestic and medicinal needs. Local people also generate an income from selling baobab fruit. Local people and researchers have observed a consistent fruit disparity within baobab populations across Africa, a phenomenon that to date has not been reported in other baobab species. Within baobab populations, there are trees that produce between 50 and 200 fruit per year (producers, locally referred to as “females”), whilst other trees produce less than five fruit per year (poor producers, referred to as “males”). We observed the nocturnal visitors to flowers of seven producers and seven poor producer trees from two baobab populations in Vhembe, Limpopo, from 20h00 to 06h00 over five weeks (October/November 2018). We recorded the time of visitation and the type of visitor.

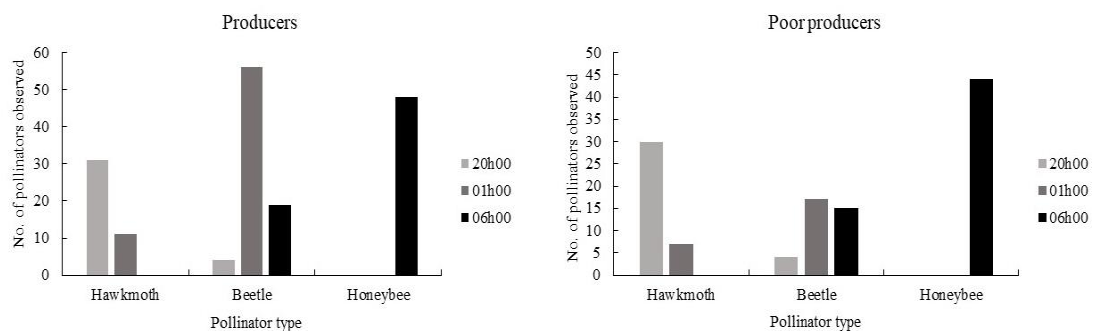


Figure 1. The total number and type (hawkmoths, beetles and honeybees [including many other bees, wasps, stingless bees, leaf-cutter bees, and bumble bees, that visit the flowers]) of visitors observed visiting flowers at 20h00, 01h00 and 06h00 for seven producers and seven poor producer trees over five weeks. Visitor type differed between tree types ($P = 0.025$), and differed significantly over time ($P < 0.001$).

Research Highlights 2018

Both tree types have similar pollinator patterns, in the number and the types of visitors that visit flowers. The predominant visitor changed over time for both tree types. Beetles

predominated in the early period, then hawkmoths around midnight, and finally bees in the early morning in both tree types. Bats were not observed visiting baobab flowers, despite fruit bats being spotted in the baobab regions. These results differ from findings from previous pollination studies conducted on East and West African baobab populations, as fruit bats were thought to be primary pollinators of the African baobab.

Impact of the Research on Tree Health

The pollination of baobabs in southern Africa is poorly understood. Our study (Chetty 2018/9, MSc with distinction) observed beetles, hawkmoths and bees visiting the baobab flowers throughout the night (Fig. 1). Although we spotted bats in the areas with baobabs, none had visited baobab flowers throughout the study period. Previous studies have reported various species of fruit bat as the African baobab's primary pollinator. However, these studies were conducted in West and East African baobab populations. Although there have been reports of hawkmoths visiting baobab flowers in southern Africa, pollination-focused studies on southern baobab populations have been negligible.

Our study is the first we know of to conduct pollinator observations on southern African baobab populations, and the results are very clearly different from that of East and West Africa. The findings of this study could imply that pollinators differ in baobab populations between regions, which could have further implications regarding differences in floral and nectar characteristics, and therefore requires future work. Our findings lead to many other research questions regarding plant-pollinator interactions within the African baobab, which is likely to affect baobab productivity. There is also increasing local and international demand for baobab products and trees are being highly utilised to sustain local livelihoods. An increase in fruit production through more effective pollination would be a highly welcome boost for baobab dependent communities. Artificial pollination to boost fruit production is a possibility, and should be trialled.

Research Outputs for 2018 (outputs also for previously CTHB-funded projects)

Articles in Peer-Reviewed Journals

Paumgarten F, Locatelli B, Witkowski ETF. 2018. Wild foods: safety-net or poverty trap: A South African case study. *Human Ecology* 46, 183-195. <https://doi.org/10.1007/s10745-018-9984-z>. IF=1.642

Popular articles

Cron, G.V. June 2018. Only one African baobab species – not two! *Veld & Flora*, June 104(2): 64-67.