

Germinated seedling assemblage beneath Metallic Starling (*Aplonis metallica*) nesting tree at Lockerbie Scrub, Queensland

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Abstract

In March 2022, seedlings under a Metallic Starling nest tree in Queensland were counted. The dominant species included *Antiaris toxicaria* subsp. *macrophylla* and *Canarium australianum*. Results support the idea that seeds accumulate near colony trees and may aid rainforest recruitment, though direct dispersal attribution is limited. This provides field evidence for seed germination after passage through starlings and emphasizes the need for replicated studies.

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Introduction

The role of frugivorous birds during seed dispersal is an important ecological process in tropical rainforests, as it affects the movement of seeds, the recruitment of seedlings, and in the longer term the composition of the forest. In the tropical rainforests of Australia, birds make up a major part of the vertebrate community that disperses seeds and are thus responsible for the transport of seeds from a wide range of fleshy-fruited plants (Westcott *et al.* 2008). Starlings have also been noted to act as agents of seed dispersal in the tropical parts of Australasia and the Pacific. According to Bell (1982), who refers to observations made by Jared Diamond, seeds that had passed through Metallic Starlings (*Aplonis metallica*) in New Guinea were later eaten by Stephan's Ground-Doves (*Chalcophaps stephani*). In north-eastern Queensland, Moore (1991) examined germination after seeds had passed through Metallic Starlings, and the closely related Micronesian Starling (*Aplonis opaca*) has been shown to play an important role during seed dispersal on Guam (Kastner *et al.* 2021). In northern Queensland, Metallic Starlings breed in colonies and mainly feed on fruits and seed arils from

rainforests; large amounts of seeds, guano and other organic matter build up under the trees in which the colonies are active (Natusch *et al.* 2016). It seems that Moore (1991) is the only earlier study to have directly investigated the effect of passage through Metallic Starlings on the germination of rainforest seeds. The current observation adds to this scant knowledge by recording the composition of the seedlings that have germinated under a Metallic Starling nesting tree at Lockerbie Scrub.

Methods

In March 2022, observations were carried out under a communal nesting tree inhabited by Metallic Starlings at Somerset Road, Lockerbie Scrub (-10.759, 142.567), near the tip of Cape York Peninsula, the northernmost point of the Australian mainland in northern Queensland. We incidentally counted seedlings beneath the nesting tree (Fig. 1). This observation did not form part of a formal vegetation survey and no specific sampling area was set up, so it follows that the results give only a description of the seedling assemblage found at this location.



Figure 1. Under the nesting tree at the Somerset Road location. Photograph by A. J. Bean.

The seedlings were assigned to the lowest taxonomic rank that could be reliably determined using the diagnostic vegetative characteristics visible at the time of observation. Identification was undertaken using Zich *et al.* (2020). Where species-level identification was not possible, seedlings were recorded to genus, while seedlings below approximately the tenth-leaf stage that lacked sufficient diagnostic characteristics were retained in an unidentified category.

Results

Under the nesting tree along Somerset Road eight categories of seedling were recorded: five of these were identified to species or infraspecific level, two to genus, and one consisted of unidentified early-stage seedlings (Table 1). The group contained a mix of rainforest species, one of which was by far the most common and a number of the others occurring at lower frequencies.

The count records the composition of the germinated seedlings found under the nesting tree

at the time of observation, and the taxon-level counts and percentages are given in Table 1.

Discussion

The fact that this study was based on a single site does not prove that Metallic Starlings directly dispersed the seeds that were recorded: the seeds were not linked to individual birds, no non-colony tree was compared and no specific sampling area was employed. Yet the mixture of rainforest plant seedlings found under the nesting tree along Somerset Road is in agreement with the considerable amount of seed deposition noted beneath Metallic Starling colonies (Natusch *et al.* 2016) and serves as a complementary, *in situ* aspect to the germination trials described by Moore (1991). Moore found that in 18 of the 34 plant species tested (52.9%), successful germination occurred after the seeds had passed through Metallic Starlings; across all species, 396 of the 1,972 gut-passed seeds germinated (20.1%). There was no overlap at the species level between

Table 1. The plant species which were recorded among the seedlings that had germinated under the Metallic Starling nesting tree at Somerset Road, Lockerbie Scrub, Queensland, in March 2022.

Taxon	Seedlings	
	Number	%
<i>Antiaris toxicaria</i> subsp. <i>macrophylla</i>	48	30
<i>Alectryon tomentosus</i>	16	10
<i>Canarium australianum</i> var. <i>australianum</i>	24	15
<i>Cayratia cardiophylla</i>	8	5
<i>Horsfieldia australiana</i>	16	10
<i>Melicope</i> sp.	8	5
<i>Macaranga</i> sp.	8	5
Seedlings below approximately the tenth-leaf stage	32	20
Total	160	100

the plants recorded in the current seedling assemblage and those reported by Moore, although both studies included the genus *Canarium*. Moore reported that *Canarium muelleri* had approximately 20% viability after passage through Metallic Starlings. Evidence from another starling species supports the idea that such birds play a wider seed-dispersal role. On Guam, the Micronesian Starling carries out an important remaining seed-dispersal function in a forest that has few bird species (Kastner *et al.* 2021). In light of the known accumulation of rainforest seeds under Metallic Starling colonies, these observations show that nesting sites may affect local seed rain and recruitment. To establish whether Metallic Starling nesting colonies consistently change the composition or density of rainforest regeneration, replicated counts at both colony and control trees using defined sampling areas and repeated monitoring are required.

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