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SHORT BREEDING SEASON OF FIGBIRDS *Sphecotheres viridis* IN DARWIN, NORTHERN TERRITORY

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Opportunistic observations of 55 nests of Figbirds over eight years on the Northern Territory University campus suggest that nesting commences in early September and that the breeding season lasts between two and three months only. Laying was apparently synchronized and two eggs were usual. Nests were often close together indicating some advantage in quasi-colonial nesting, either through improved predator surveillance or defense, or facilitation of post-breeding dispersal and feeding activities.

INTRODUCTION

The Figbird *Sphecotheres viridis* has a wide distribution in coastal and sub-coastal northern and eastern Australia, as well as New Guinea and Timor. In the Northern Territory, the species occurs south to Katherine (Storr 1977). Until recently very little was known about the nesting biology of the species. Crouther and Crouther (1984) observed the timing, success and parasitism rates of 61 nests of Figbirds over three years near Mackay, Queensland. They also gave estimates of incubation and nestling periods, although no supporting data were presented. In the Northern Territory, Frith and Davies (1961) recorded clutches in December and January but their survey covered a wide region from Darwin to Arnhem Land.

While conducting a study on the breeding biology of the Rufous-banded Honeyeater *Conopophila albogularis,* I made opportunistic observations of Figbirds over eight years on the Casuarina campus of the Northern Territory University (NTU) in the northern suburbs of Darwin. These observations suggested that nesting in Darwin was highly synchronized, and began in early September each year.

METHODS

I observed figbirds at monthly intervals, more frequently between August and March, from 1989 to 1992, with limited observations for 1993–1995. Nests were generally accessed by climbing the nest-tree or by standing on the roof of a 4WD vehicle parked beside the tree; nest contents were viewed using an angle-adjustable mirror mounted on a 3 m rod.

The study site was the south-eastern corner of the Casuarina campus of the Northern Territory University (NTU) and adjoining ovals. The campus was dominated by one to three-storey buildings, carparks and lawns which supported mainly Black Wattles *Acacia auriculiformis*, Yellow Flame Trees *Peltophorum pterocarpum* and the introduced African Mahogany *Khaya senegalensis*. These tree species also dominated the periphery of the ovals, with a few Banyans *Ficus virens* and Milkwoods *Alstonia actinophylla*.

As observations were opportunistic, nests were usually discovered after laying, often after hatching or close to fledging. To estimate the laying date (within 10-day periods), therefore, I assumed that the incubation and nestling periods were each 17 days, as reported by Crouther and Crouther (1984). As laying and hatching took place at daily intervals (Crouther and Crouther 1984), the nest cycle, from the laying of the first egg to fledging of the last young, was taken to be 35–36 days. Rainfall data for Darwin airport (5 km from the study site) were provided by the Bureau of Meterology, Darwin.

RESULTS

Details of 55 nests were recorded. Of these, 44 (80%) were built in the Black Wattle, a common pioneer species in both urban and natural habitats, most abundant on the edge of monsoon rainforests and paperbark woodlands. The other main plant species (15%) used on the campus was the Yellow Flame Tree, another commonly cultivated species of monsoon rainforest and floodplain margins. These two plant species, plus the African Mahogany, were the major species occurring on the campus. One Figbird nest was also found in the mangroves fringing the suburb of Nightcliff.

Nests were often close together, suggesting quasi-colonial nesting (see also Woodall 1980).

Distances between nest-trees in one cluster of three ranged from 10.2 m to 21 m, averaging 14.7 m; and in another cluster of three, from 15.3 m to 27 m, averaging 19.7 m. The same trees were used over at least five years by 'colonies', but it was not possible to determine whether the same individuals were involved each year. Heights of 28 nests ranged from 3.3 m to 10 m, averaging 6.0 m (*sd*, 1.8).

Of nine nests inspected with eggs, seven had 2 eggs, one had 1 egg and 1 recently-hatched chick, and one had 3 eggs. Three additional nests contained two small nestlings. Two medium-sized to large nestlings were recorded at 11 nests, while one and three such young were seen at two others. At two further nests, one young was inside the nest, and another was perched just outside, indicating that the brood was two. At other nests the number of young was indeterminate. Observations at two nests suggested minimum total nesting cycles of 34 and 35 days respectively, and at three other nests, minimum nestling periods of 14 days (2 nests) and 15 days (1 nest).

There was a clear peak in egg-laying in September when all years were combined (Fig. 1), significantly more than in October and November ($\chi^2 = 30$, ldf, $p < 0.001$). In 1990, seven of eight nests (whose contents were seen) had nestlings in mid- to late October. In 1991, six out of ten nests had nestlings in October, while another two had young in November; and one nest was even started in the following January. In the 1992–93 wet season, all 14 nests whose contents were seen had nestlings in mid-October. In 1993, three nests only were seen, and each had males sitting on 3 October. In 1994, seven nests were found on 15 October and each had nestlings, although at two of these nests, one or both young were perched on the rim of the nest. In 1995, adults were sitting on three nests (presumably with eggs) found on 16 September, and another two nests had nestlings on 16 October. Sitting birds were never encountered in August or beyond November, despite an even sampling effort from August to March (Noske, in prep.).

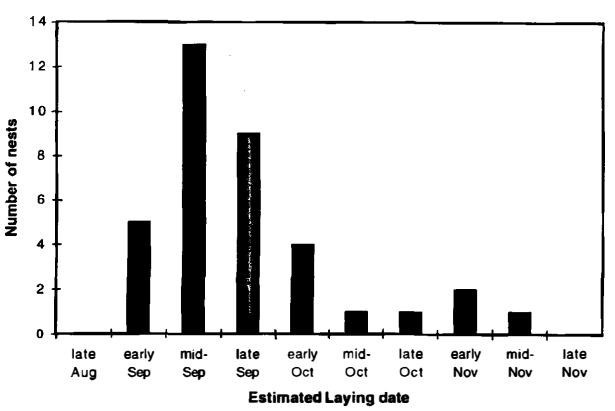

Figure 1. *Estimated laying dates for Figbirds on Northern Territory University Casuarina Campus (1988–1995).*

Total rainfall at Darwin airport for the wet seasons (November-April inclusive) 1989–90 to 1992–93 averaged 1 423 mm, ranging from 1 039 mm to 2 211 mm (data supplied by Bureau of Meteorology, Darwin). Only 1992–93 received substantial rain (>100 mm) in October, while four other wet seasons during the main study period received at least 40 mm in November (Fig. 2). Monthly rainfall totals increased in December, except in December 1991 when only 18 mm were registered.

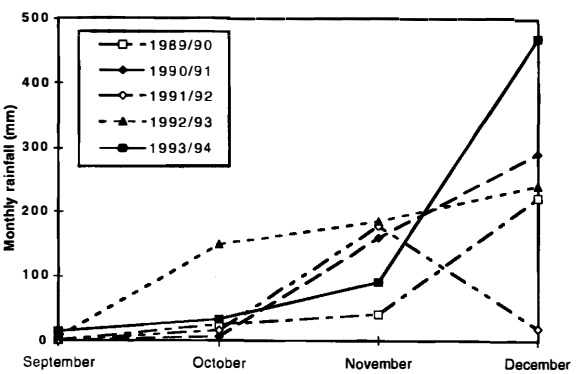

Figure 2. *Monthly rainfall for wet seasons, 1989–90 to 1992–93 at Darwin airport (data from Darwin Bureau of Meteorology).*

DISCUSSION

The nest data clearly indicate that the clutch size in this population is usually two rather than the three stated by Chapman (1986) for the species. Crouther and Crouther (1984) reported that the clutch size of Figbirds at their study site was usually two or three eggs, occasionally four, but did not provide data. Observations at NTU

nests suggested nesting cycles of about 35 days, consistent with the estimates given by Crouther and Crouther (1984).

Crouther and Crouther (1984) observed nesting of Figbirds over three years near Mackay, Queensland, where the first date of laying varied only nine days over the three seasons, the three dates being 12, 13, and 21 November. Breeding normally ceased with the onset of the wet season in January, the latest fledging date being 6 February in a drought year (Crouther and Crouther 1984). The breeding season at the Mackay site thus extended over about two months only, from mid-November to mid-January. The NTU Darwin Figbirds began laying in the first two weeks of September each year, about two months before the Mackay population. Significantly, however, the start of the breeding season for figbirds at both localities was quite consistent between years. In Darwin for the period 1989–93, the first substantial rains fell during November in four of the five wet seasons, and during October in the other (Fig. 2). Although the amount of early rain varied, only one season (1991) received less than 250 mm by the end of December. Thus Darwin figbirds started nesting approximately 1–2 months prior to the onset of the wet season, by which time a large proportion of young had already fledged. The one nesting record for January (in 1992) followed an atypically dry December (in 1991).

Notwithstanding records of nests with eggs as late as January (Matthews 1914; Frith and Davies 1961) in the Top End, why should figbirds in Darwin breed in September, starting at approximately the same date each year? Several hypotheses are plausible. There is a marked increase in the abundance of fruit in September in Top End monsoon forests (O. Price, pers. comm.). Yet figs (e.g. *Ficus benjamina, F. virens*) and fruits of the palm *Carpentaria acuminata* are available for much of the year in Darwin suburbs. Chafer (1992) documented several reports of figbirds feeding nestlings with insects. Although I did not observe feeding behaviour systematically, adult figbirds were seen eating cicadas many times in late October of the 1992–93 breeding season. It is feasible that breeding of local figbirds is timed so that adults can take advantage of these large, super-abundant insects, the major species of which begins to emerge in September (G. Brown, pers. comm.). Finally, the timing of breeding may relate to climate, and the increased risk of nest failure due to thunderstorms or heavy rain during the early wet season. Crouther and Crouther (1984) reported large nest losses (mostly of eggs) following a wild electrical storm with strong winds and heavy rain. In Darwin, young figbirds are often found on the ground following such storms, which are frequent in the early wet season. Heavy rain may also cause fruit spoilage and loss.

Perhaps the most remarkable aspect of the breeding season of figbirds at both Mackay and NTU is its brevity, lasting two to three months. This restricted breeding season contrasts with the protracted breeding, lasting eight to ten months, of Rufous-banded and White-throated Honeyeaters *Melithreptus albogularis* inhabiting NTU (Noske, unpubl. data). Why should figbirds have such a restricted breeding season? One possible explanation is that individuals might benefit from colonial defense of their young if the latter hatch and fledge within a week or so of each other. Predators, such as snakes or predatory birds, and brood-parasites (such as the Common Koel *Eudynamys scolopacea*), will be detected and repelled more quickly if parents from several clustered nests are vigilant. Figbirds defend their nests vigorously (e.g. Beland 1977; Woodall 1980), particularly at the nestling stage (pers. obs.). Indeed, dive-bombing birds made physical contact with the author at several nests. This anti-enemy hypothesis could be tested by comparing rates of attack of dummy predators, and nest success, of pairs nesting in a cluster with those of pairs nesting in isolation.

Another possible reason for a short breeding season relates to the demography of the species. As figbirds at the study site nested in the same trees, even the same branches, year after year, despite an abundance of suitable nest-trees, there appears to be some advantage in retaining a place in the breeding 'colony'. Given the scattered nature and small size of monsoon rainforest patches in the Top End, such breeders may be relatively sedentary and confined to one or a few patch(es). Non-breeders, on the other hand, may benefit by foraging over much wider areas to take advantage of fruiting sources some distance from their natal grounds. After breeding, figbirds in Darwin commonly form large flocks of 100 or more (Crawford 1972; pers. obs.), apparently in response to heavily-fruiting figs or other fruit sources. Thus a short breeding season may facilitate

the aggregation of young figbirds, which then form mobile flocks to locate and exploit scattered food sources over a wider range than that utilized by breeding adults. Clearly further demographic studies of the species, involving colour-banding or radiotelemetry, are necessary to evaluate these hypotheses.

REFERENCES

Beland, P. (1977). Mimicry in orioles of south-eastern Queensland. *Emu* **77**: 215–218.

Chafer, C. J. (1992). Notes on the distribution of and insectivory in the Figbird *Sphecotheres viridis* in the Illawarra and Shoalhaven Regions of New South Wales. *Aust. Bird Watcher* **14**: 282–285.

Chapman, G. (1986). Figbird. In 'Readers' Digest Complete Book of Australian Birds', 2nd ed. (Eds R. Schodde and S. C. Tidemann) P. 584. (Readers' Digest Services: Sydney.)

Crawford, D. N. (1972). Birds of the Darwin area. *Emu* **72**: 131–148.

Crouther, M. M. and Crouther, M. J. (1984). Observations on the breeding of Figbirds and Common Koels. *Corella* **8**: 89–92.

Frith, H. J. and Davies, S. J. J. F. (1961). Breeding seasons of birds in subcoastal Northern Territory. *Emu* **61**: 97–111.

Matthews, G. (1914). A list of the birds of Melville Island, Northern Territory. *Ibis* **2**: 91–132.

Storr, G. M. (1977). 'Birds of the Northern Territory'. Western Australia Museum Spec. Publ. No. **7**. (Western Australian Museum: Perth.)

Woodall, P. F. (1980). Communal breeding in the Figbird. *Sunbird* **11**: 73–75.

Postscript:

In 1996, 23 of 28 nests found in four separate suburbs of Darwin during the first two weeks of November had recently fledged young and the remainder nestlings. One pair feeding a fledgling began a second clutch in late November. Three nests in one shrubby tree were within a 2.5 m radius.

BOOK REVIEW

Australian Birds of Prey — The Biology and Ecology of Raptors.
Penny Olsen. University of New South Wales Press, Sydney, 1995. 256 pages including about 250 colour plates plus many drawings, tables and figures. RRP $59.95.

This is it! This is the reference book on Australian raptors that has been missing from our bookshelves. Australian Birds of Prey must be the most readable, understandable and, most importantly, interesting presentation of facts yet published on any group of Australian birds.

This book is not intended as a field guide, or as a complete reference on Australian raptors. Rather, it presents a wonderfully illustrated overview of the life of diurnal raptors, with particular reference to the Australian species as examples.

The nine chapters each introduce several related topics. These are:

1. Introducing Raptors (major topics include discussion of the physical characteristics with a global perspective);
2. Australia's Raptors (descriptions and distribution maps, fossil records, relationships and nomenclature);
3. Raptor Ecology (distribution, habitats, populations);
4. Raptors as Predators (hunting, predator-prey relationships);
5. Raptor Reproduction (a detailed account of all aspects of raptor breeding biology);
6. The Healthy Raptor (the impact of pesticides, feather care, physiology);
7. Studying Raptors (surveying, trapping and handling);
8. Raptors and Humans (interaction with humans, rehabilitation);
9. Conservation and raptors (threats and solutions).

The book also includes a comprehensive bibliography for each chapter and a subject and species index. The text is amply illustrated and supported by many photographs, drawings, tables and figures. Indeed, the superb photographs illustrate most aspects of the biology and ecology of Australian raptors. A few very recognizable photos, particularly Lindsay Cupper's, have previously been published, but the vast majority are new.

I have noticed a couple of editorial errors on page 114 where the captions for Grey Falcons and Black Kites at nests have been transposed. Also the photo of the Letter-winged Kite on page 122 looks suspiciously like a Black-shouldered Kite. These aside and a few editorial and typesetting errors noted in the text, I could not criticize this wonderful book. It provides a most complete treatment of Australian raptors and is by far the best book of its kind. It really is an achievement in Australian ornithology.

Thank you Penny.

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