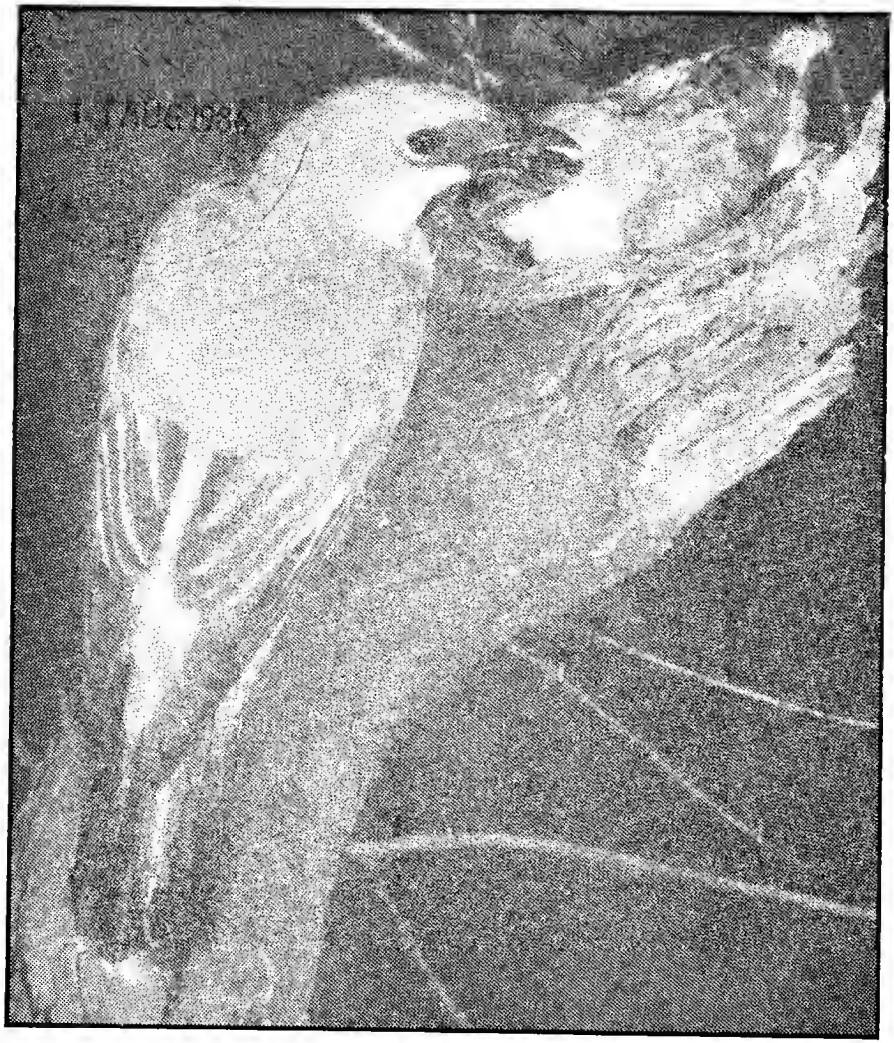
NORTHERN TERRITORY NATURALIST



NT Field Naturalists' Club May 1986 No. 9

THE NORTHERN TERRITORY FIELD NATURALISTS' CLUB
FOUNDED 1977

The objects of this club are to promote the study of and interest in the flora and fauna of the Northern Territory and in its conservation. The club provides opportunities for discussion and dissemination of information among its members by regular meetings, publications and fieldwork. It works in close contact with scientific institutions wherever possible, and encourages the publication of scientific and informed popular literature in the various fields of natural history.

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Advice to Contributors
Contributions to the N.T. Naturalist need not be members of the N.T.F.N.C., although all members are urged to contribute. Contributions may take one of the following forms:

Letter to the Editor
A letter should be a short comment on a previous publication in the N.T. NATURALIST, a comment on an issue of topical interest in natural history, or a brief report of field trip. Letters may be handwritten provided they are well presented. Only one copy of a letter is required.

Notes
If you have made a series of observations (for example, on the behaviour of a bird or other animal) or have notes on something new or unusual in the field, then this is the place to report your findings. Contributions should be in the order of 200-500 words and provided with a title.

Articles
An article should run to a maximum of about 1500 words (four to five double-spaced typed, A4 pages) and deal with a topic in the sciences. It should be written in a manner intelligible to readers without a specialist knowledge of the subject. Articles should be appropriately illustrated by clear, black ink graphs, diagrams or photographs.

Cover: White-bellied Cuckoo-shrike Coracina papuensis, *Darwin. Photo - Johnny Estbergs.*

RECENT OBSERVATIONS AND HABITAT PREFERENCE OF THE KULTARR, *ANTECHINOMYS LANIGER*, IN THE NORTHERN TERRITORY

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Introduction

The Kultarr, *Antechinomys laniger*, is to be found in scattered populations throughout much of the arid zone of Australia but is considered to be rare over most of its range (Valente 1984). During a three year study of the biology and distribution of the European Rabbit, *Oryctolagus cuniculus*, in the Northern Territory, the Kultarr was found to be inhabiting specific areas which were infested with rabbits. The habitat of these areas was severely degraded. Opportunistic observations were made to gain some insight into the sharing by a native mammal and an introduced pest species of a mutually preferred and considerably altered habitat. The observations are discussed particularly in relation to the Kultarr's status and habitat preference.

Methods

The study period was between August 1980 and August 1983. Observations were made at night while spotlighting for rabbits along transects that covered numerous habitat types. Some of these transects were in areas free of rabbits. Where possible the Kultarr was caught by hand but as the rabbit had priority most observations were sightings only. Time did not permit more detailed examination beyond recording the sex of captured animals.

Study Area

The rabbit study was carried out at eight major sites throughout the southern Northern Territory between latitude 22°45' S and latitude 26°00' S. The most northerly site was on Newhaven and Mt Wedge Stations followed by The Garden, Ambalindum, Simpsons Gap National Park and Temple Bar, Owen Springs, Idracowra, Erldunda and by Mt Cavenagh Station, the most southerly site. In general the study sites were visited at approximately three month intervals on a seasonal basis. Although rainfall during the year prior to the first sighting

of the Kultarr was below average, during the following period it was above average with a high summer incidence. Average annual rainfall ranges from 275mm at Mt Wedge through 263mm at Owen Springs to 185mm at Idracowra.

Results

Eleven *A. laniger* were seen on thirty visits to Owen Springs Station, sixteen were seen on ten visits to Idracowra Station and two were seen together on one of nine visits to Mt Cavenagh Station. Rabbit shooters also reported seeing the Kultarr in the Mt Cavenagh area. The species was not seen at any of the other study sites. Figure 1 shows the locations of the sightings within the Station boundaries. On a later visit to the study site on Owen Springs in February 1984 at least six were observed and two weeks later Gibson (pers. comm., 1985) observed fourteen in the area.

Surveys of the three Stations where the Kultarr was seen varied within the period of the rabbit study. The Owen Springs area was visited between March 1981 and March 1983. The rabbit study on Owen Springs was wide ranging and the visits covered different areas of the Station at various times. The main Idracowra site was visited between February 1981 and December 1982. On the first visit to Idracowra *A. laniger* was also seen west of the railway line (Fig. 1) but this area was not covered on subsequent surveys. Mt Cavenagh was visited between December 1980 and April 1983. Sightings were made in all months of the year except May and November.

Six animals were captured and five of these were males. The one female, caught on Owen Springs on 1 December 1982, had naked young. This is near the end of the breeding cycle reported by Woolley (1984). A female caught on the February 1984 visit to Owen Springs was found to be lactating.

The three widely separated areas where *A. laniger* were seen in this study have similarities which may suggest a preferred habitat type for the species.

The area on Owen Springs Station consists of gently sloping or undulating calcrete plains, a unit of Muller Land Systems as described by Perry *et al.* (1962). The soils are mainly shallow calcareous earths with nodules of calcrete throughout the soil profile. Areas of bare ground more or less covered with calcrete nodules are not uncommon and shallow gullying is extensive. The vegetation is sparse with

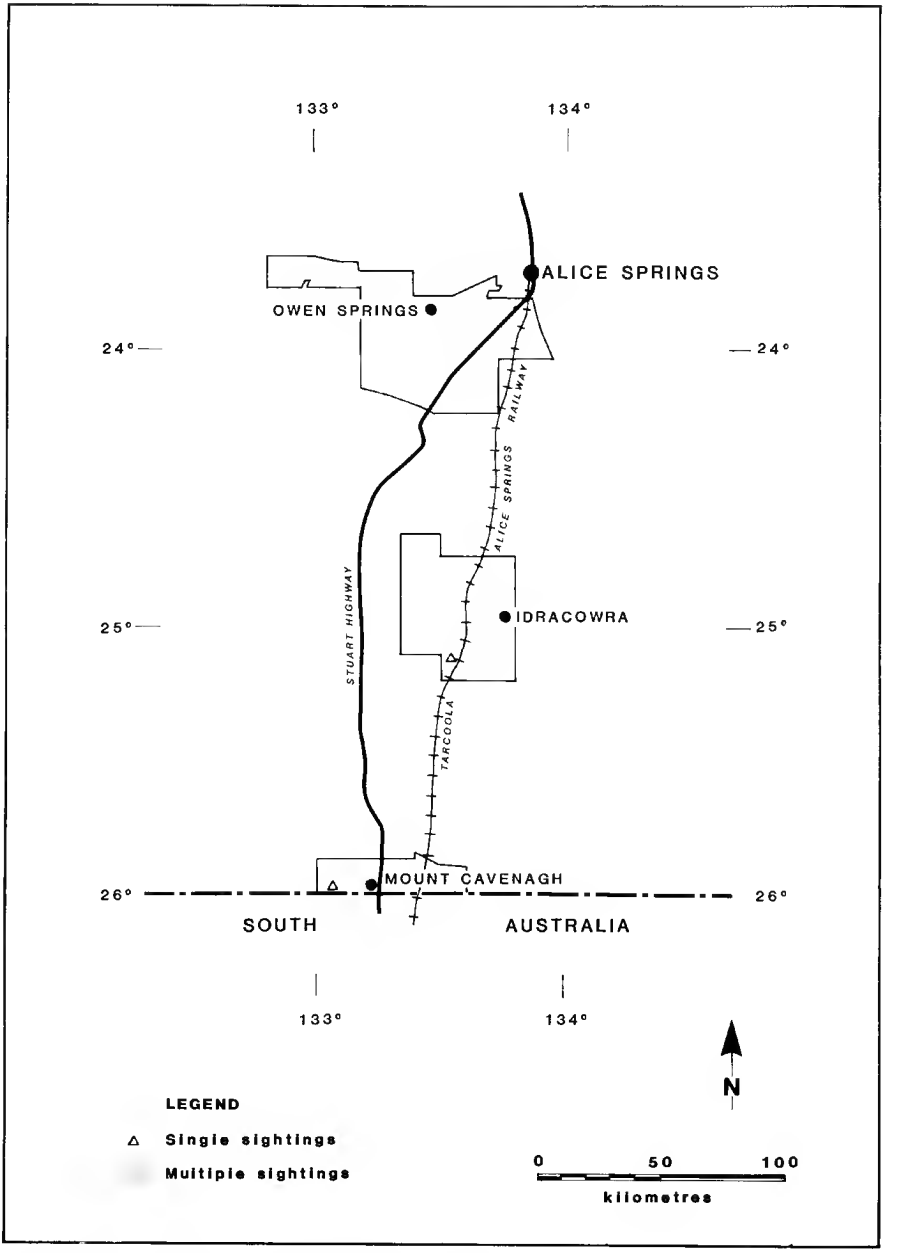

Fig. 1. Location of *Antechinomys laniger*

Witchetty Bush *Acacia kempeana* dominating the upper storey except along the major creek lines where Ironwood *Acacia estrophiolata* tends to dominate. The understorey is composed mainly of short biennial grasses (*Enneapogon* spp. dominant) and forbs (*Sclerolaena* spp. dominant), with some extensive areas of perennial grasses where *Aristida glandulosa* dominates.

The main area on Idracowra Station consists of gently undulating stony plains with occasional sand dunes, being units of Ebenezer and Endinda Land Systems (Perry *et al.* 1962). Calcareous soils are less common in Endinda Land System but as with Muller and Ebenezer Land Systems seem to be one of the factors of importance to the Kultarr. Areas of bare soil with or without lateritic surface gravel, in the form of claypans are found throughout. Vegetation is very sparse and in this case almost treeless. Chenopods, particularly Southern Bluebush *Maireana astrotricha*, are dominant. The area west of the railway line is a unit of Ebenezer Land System.

The Mt. Cavenagh site, a unit of Cavenagh Land System (Perry *et al.* 1962), is similar to the Owen Springs site, however *Sclerolaena* sp. are almost absent from the vegetation and the soils are derived from low granite hills in the area with intrusions of calcrete. Clay pans are a feature of the site.

Habitats adjoining these areas included sand dunes, Mulga woodland, river frontage with River Red Gums *Eucalyptus camaldulensis* and small swamps of Northern Bluebush *Chenopodium auricomum* with minor Coolibah *Eucalyptus microtheca*. *A. laniger* was not seen in these habitat types where the vegetation was often quite dense.

Habitats covered on the study sites where the Kultarr was not seen were very diverse and ranged through spinifex sand plains, hills and salt lakes to various *Acacia* shrublands and arid woodlands.

Discussion

Valente (1984) describes the Kultarr as being adapted to life on open land, and inhabiting desert plains, stony and sandy country where grasses and small bushes constitute the principal vegetation, and *Acacia* scrubland. The factor common throughout the three sites of this study where the animals were seen is a mixture of bare ground and open sparsely vegetated ground, often on calcareous soils and this agrees with Valente's habitat descriptions. The sites are well suited for the animals' adaptation to living in an open habitat. The

mixture of bare ground and sparsely vegetated ground may also be important for the Kultarr to forage for insects in the bare areas with the vegetated areas providing shelter as well as prey.

The species is also considered by Valente (1984) to be rare over most of its range with populations fluctuating with seasonal conditions. Because of the infrequency of the visits to the sites and the different areas covered on Owen Springs especially, it is difficult to comment on abundance or on any likely seasonal variation in population levels. However, they were found to be fairly common in at least two of the areas studied and in general were seen fairly constantly throughout the period of the sightings.

While stating that the Kultarr appears to be neither endangered nor vulnerable and not directly affected by human activity, Valente (1984) considers that its security may be reduced by changed or intensified land use. The three areas of this study are amongst the severely degraded rangelands in Central Australia. They have been subject to cattle grazing since before the turn of the century and have suffered from degradation by rabbits for a similar period. While there is no direct competition between the Kultarr and rabbits and cattle for food, it has been able to survive and apparently thrive in an environment that has been severely affected by man's introduced mammals. In an ironic twist it could be that a native mammal has been able to benefit, in at least one habitat, from severe land degradation.

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THE STATUS OF CUCKOO-SHRIKES (CAMPEPHAGIDAE) IN THE DARWIN AREA, NORTHERN TERRITORY, 1974-1984.

John L. McKean

Summary

Five species of two genera of cuckoo-shrikes occur in the Darwin region. Counts taken throughout an eleven-year period indicate that three species are year-round residents and two species are dry season visitors. The Black-faced Cuckoo-shrike appears to have a peak northwards passage in May with many birds probably leaving Australia for the New Guinea region. Brief data on local breeding are presented and a few taxonomic remarks given.

Introduction

This is the fourth of a series of papers summarizing data on birds in the area of the Sanderson Sewerage Ponds, Darwin from 1974 to 1984. The study is continuing. Although the observations are subject to observer bias, they have been made with reasonable monthly regularity.

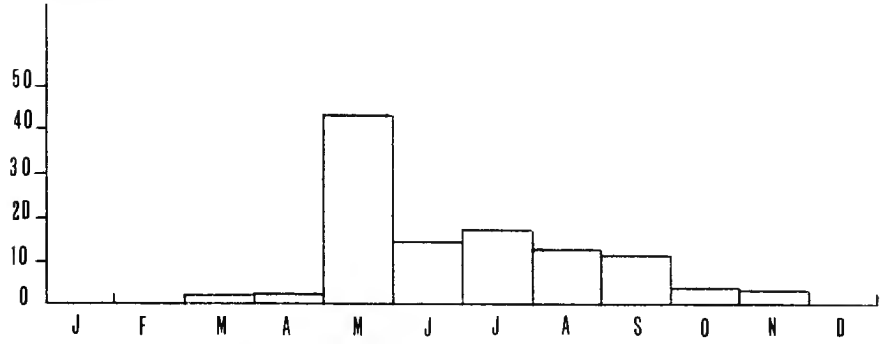
To arrive at figures for the histograms, the maximum number of each species recorded monthly at every site was scored. These monthly values were then totalled and averaged to arrive at mean monthly values for the eleven-year period.

To test whether the population samples were significantly different from month to month, the data were tested by the Friedman two-way analysis of variance. The monthly figures are ranked within a given

year from lowest to highest. The test, which is based upon the chi-square distribution, determines whether the rank totals for the months differ significantly.

Results and Discussion

1. Black-faced Cuckoo-shrike *Coracina novaehollandiae*



χ^2_r = 64.29, degrees of freedom (df) = 11, $p<0.001$.

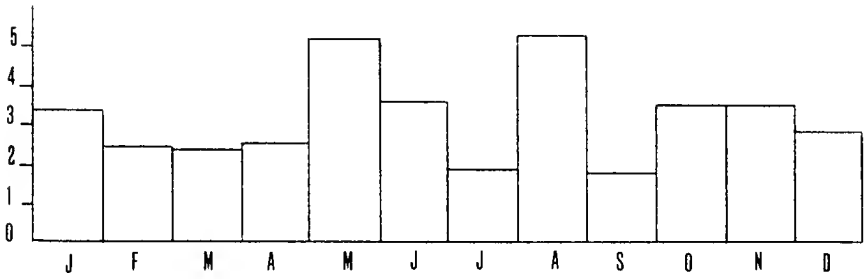
The result is highly significant, hence the uneven distribution among the months is real.

The Black-faced Cuckoo-shrike has a wide distribution ranging from China and India through Indonesia to the Solomon Islands and Australia (Peters *et al.* 1960). It seems likely on the basis of my own and others' field observations of various forms in this complex that the Australian breeding races *C. n. novaehollandiae*, *C. n. melanotis*, and *C. n. subpallida* are best treated as a separate species or semi-species associated with the complex of forms that breed from Indonesia to Asia. Mason and McKean (1982) have already suggested that *personata* of the Lesser Sunda Islands is best treated as a separate species. The race *C. n. subpallida* of mid-Western Australia is apparently sedentary while some at least of the population of *C. n. melanotis* and probably some of the thinly differentiated race *C. n. novaehollandiae* move northwards to winter in northern Australia and the New Guinea region with stragglers reaching the Lesser Sunda Islands and the Solomons (cf. Mayr 1944; Mees 1961, 1982; Rand and Gilliard 1967; Mason and McKean 1982).

It seems likely on geographical grounds that part of the population reaching Darwin passes onto areas north of Australia, possibly to the Moluccas and perhaps West Irian. At the time of peak northward passage (May), we have a number of records of parties of Black-faced Cuckoo-shrikes flying out to sea. As with the Sacred Kingfisher (Thompson 1984), there is no conspicuous return passage. It is, of course, possible that the birds moving south return by a different route or faintly possible that the mortality in the wintering areas north of Australia is so severe that returning birds hardly affect our data. My guess is that the return passage is fast, the birds not making a landfall on the Darwin coastline. It might also be made at night or at an altitude where they would not normally be detected by observers.

We have no breeding records from the Darwin area and in fact the species is largely absent during the months that breeding has been recorded in the Northern Territory viz. October to January (Storr 1977).

2. White-bellied Cuckoo-shrike *Coracina papuensis*



χ^2_r = 15.17, df = 11, p>0.10.

The results are not significant. The rank totals and means indicate higher numbers in May and October, but the trend is not strong enough to preclude these data from occurring on chance alone.

The White-bellied Cuckoo-shrike occurs from the Moluccas through New Guinea to the Solomons and throughout northern and eastern Australia. It breaks up into a number of sub-species and in northern

Australia is considered sedentary, which agrees with our data.

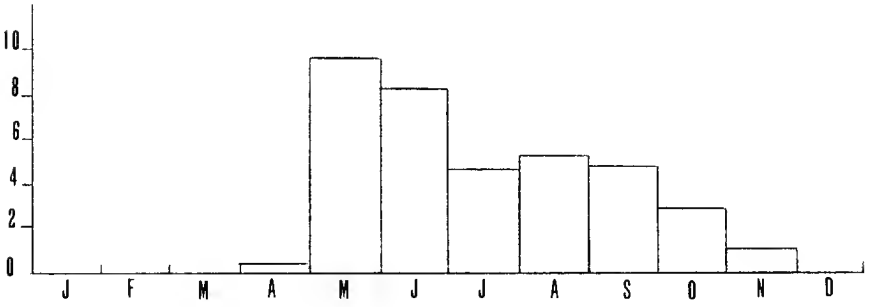
W.R. Mason and I have found nests with eggs most commonly in the Darwin area between September and November, with one nest in June. Storr (1977) gives the breeding months in the Northern Territory as December and January.

3. Cicada-bird *Coracina tenuirostris*

Cicada-birds occur from Sulawesi through New Guinea to the Solomons and throughout northern and eastern Australia. In the study area it was rare (only 9 sightings), but it was recorded in both wet and dry seasons. It occurred in both mangrove and monsoon rainforest, both of which are habitats that suffered extensive structural damage in Cyclone Tracey (1974). In mangroves to the west of Darwin which suffered much less damage, the species is more abundant. We have no local breeding records but males collected in November and January had enlarged testes.

The call of the Northern Territory form differs considerably from birds in north Queensland, New South Wales, the Solomons and Timor, which to my ears all sound different from each other. A study of geographical variation in vocalisations and morphology could well provide some interesting results.

4. White-winged Triller *Lalage tricolor*



$\chi^2_r = 28.09$, df = 11, $p<0.01$.

The results are very significant hence the uneven distribution among

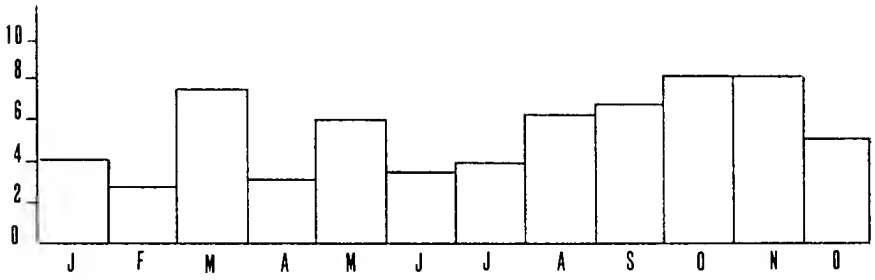
the months is not likely to be due to chance alone.

The White-winged Triller *Lalage tricolor* is sometimes regarded as a subspecies of *Lalage sueuril* of Indonesia, which differs in its lack of an eclipse plumage, sedentary habits, calls and other characters. The White-winged Triller is a strict migrant in southern Australia, arriving in spring and departing in autumn (Chapman 1976). The species is common in winter months in northern Australia and some of the Australian population winter in Papua New Guinea. It is unclear as to what percentage of the Papua New Guinea birds are breeding residents and how many are migrants from Australia (Clapp 1980).

Although our data are suggestive of a passage movement northwards, it seems unlikely that many, if any, of the birds reaching Darwin pass further north than Melville or Bathurst Islands, as the species is not known from the Moluccas or West Irian. A possible explanation of the peak in May and June is that during these months many of the males are fully or partially in their conspicuous breeding plumage which would increase the chance of their being seen.

Although we have no records from our study area some birds do nest at times in the vicinity of Darwin. W.R. Mason and H.A.F. Thompson have records of the species nesting in the mangroves at Nightcliff (3 nests with eggs in October in open forest in the Middle Point area; one nest with eggs in November; one nest with eggs, two nests with young in February).

5. Varied Triller *Lalage leucomela*



$\chi^2_r = 8.62$, df = 11, $p>0.50$.

The results are not significant and the rank totals and means indicate bird numbers are more or less evenly distributed throughout the year. The Varied Triller is found throughout New Guinea and adjacent islands, across northern Australia from the Kimberleys to Cape York and south along the eastern coastal region to northern New South Wales. It breaks up into a number of subspecies. In the Northern Territory it is considered sedentary, which agrees with our data. Our only breeding record from the study area is a nest with young found by W.R. Mason in mangroves at Buffalo Creek in February.

Acknowledgements

Many people contributed counts and other information utilized in this report, especially J.A. Estbergs, A.L. Hertog, W.R. Mason and H.A.F. Thompson. K.S. Shurcliff kindly extracted the data and carried out the statistical analysis.

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A NOTE ON THE BIOLOGY AND DISTRIBUTION OF *MASTOTERMES DARWINIENSIS* FROGGATT

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Introduction

Most Top End residents sooner or later become aware of the so-called 'Giant' termite, *Mastotermes darwiniensis* Froggatt. The damage caused by this species is well documented (Hill 1942; Gay and Calaby 1970), but although some authors (Ratcliff, Gay and Greaves 1952; Gay 1970) have commented that it is absent from some soil types, no explanation of its particular distribution has been offered.

M. darwiniensis is the sole living representative of the family Mastotermitidae, of which fossil genera have been found in Europe,

North and South America and Australia. The family is regarded as being primitive, having diverged early from an ancestral termite line derived from the cockroaches.

Present Distribution

Mastotermes is generally distributed across tropical Australia with its southern limit approximating the Tropic of Capricorn. However, there are some puzzling aspects of its distribution within this broad range. Some of the gaps in its known distribution may be due to lack of collections and some, for example the Great Sandy Desert, due to lack of suitable habitat. A large area of Cape York Peninsula, however, appears to be perfectly suitable, with similar vegetation and soils to equivalent latitudes in the Northern Territory. Despite the similarity, particularly of the *Eucalyptus tetrodonta* dominated open forests, *Mastotermes* does not occur much further north than Laura.

In Western Australia, north of the Tropic, *Mastotermes* does not occur west of 116°30'E (apart from one record which will be discussed later).

A possible explanation of the present distribution of *Mastotermes*, and its seemingly disproportionate destructiveness in relation to man-made structures and crops, is based on ancient sea levels and our limited knowledge of the biology of the species in its natural habitat.

Biology

In undisturbed areas, *M. darwiniensis* co-exists with as many as 25 other species of termites, although only two or three of these feed on sound wood and could be regarded as competitors for food. The most important competitor is *Coptotermes acinaciformis* (Froggatt), whose range extends over most of Australia.

C. acinaciformis colonies are founded by alate pairs, usually at the base of a tree, and in Northern Australia older colonies build conspicuous mounds which, although originating in or next to the base of a tree, stump, or log, may be free-standing after the original food source has been consumed. Such colonies are headed by the original pair of reproductives, the enormously distended, relatively immobile queen and the king being housed in a special chamber at about ground level near the centre of the nest. Each colony feeds in a number of trees, logs, etc. at various distances from the nest (Greaves 1959).

In undisturbed areas, *Mastotermes* forms relatively small colonies which occupy about the same space as a *C. acinaciformis* colony in the same area. The nest is usually below ground level at the base of the tree. Although laboratory trials have shown that *Mastotermes* is capable of founding colonies with alate pairs, it is extremely rare to find colonies headed by such pairs, only one first form reproductive having been recorded, and that from a man-made structure rather than in native forest (Hill 1942). Colonies are instead headed by large numbers of neoteinic reproductives; these are workers which have the reproductive organs and functions of adults but which have few other adult characteristics. *Mastotermes* is capable of producing such reproductives in relatively small groups of workers and under favourable conditions, such as an increased food supply, the colony could be rapidly increased in size by turning numbers of workers into neoteinics and thus increasing its reproductive capabilities. In this respect, the theoretical age of a colony is infinite.

I believe that competition from other species, in particular *C. acinaciformis*, generally restricts the size and abundance of *Mastotermes* colonies in undisturbed forests.

Although *C. acinaciformis* is capable, under favourable conditions, of producing neoteinic reproductives after the loss of the queen, clearing of an area usually totally removes the population. In contrast, *Mastotermes*, even if all existing nests are destroyed and no reproductives escape, is capable of forming new colonies from isolated groups of workers existing in woody material left in the soil, and can persist in cleared land for at least several years.

For long periods at various times in the geological history of Australia, parts of the present land mass have been submerged. These include most of Cape York Peninsula and the Western Pilbara. The family Mastotermitidae has existed in Australia since the Eocene at least (Krishna 1970). I suggest that *Mastotermes*, because it may have lost the ability to establish new colonies from alate pairs under field conditions, and under competitive pressures from other species, has been unable to extend its range into areas which became available when sea levels fell.

Human influence on the environment is advantageous to *Mastotermes* in several ways. Clearing, which removes competition in the form of *Coptotermes*, is usually followed by provision of a food source such as crops, fences, or buildings. As discussed above, these are optimum conditions for *Mastotermes* expansion. Colonies may also

be transported, in poles or girders for example, or even in firewood. The species was introduced to Lae, Papua New Guinea, and I suspect that some of the records for Australian localities, eg. Onslow in W.A. (the record mentioned above) and Karumba in Queensland, are introductions also. They are in any case associated with population centres rather than undisturbed native forest.

It seems then, that *Mastotermes*, a relict species only able to compete with more advanced families by its particular reproductive strategy, and whose range may even be shrinking in undisturbed areas, has become a destructive pest under man's influence.

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This bibliography updates that compiled by Elizabeth Estbergs (*N.T. Naturalist* No.3: 20-36). The authors would appreciate being notified of any errors or omissions from this list. These should be sent to the Editor.

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AGONISTIC BEHAVIOUR OF FIGBIRDS AT A FRUITING BANYAN FIG

David Kowalick,
6/35 Bradshaw Tce, Nakara.

Between 13:30 and 14:30 on 20 June 1985 in the Civic Park, Darwin, approximately 15 brown-plumaged Figbirds *Sphecotheres viridis* were observed feeding on the immature fruits of a defoliated Banyan *Ficus virens*. Two other non-fruiting Banyans flanked the defoliated tree. From these trees approximately eight Black-faced Cuckoo-shrikes *Coracina novaehollandiae* and one Yellow Oriole *Oriolus flavocinctus* attempted to feed on the fruiting tree. The Figbirds fluffed their body feathers, fanned their tails and with outstretched necks gave a raucous chattering call when confronting the cuckoo-shrikes and oriole. Only about one in ten attempts by these intruders was successful in acquiring fruit before being driven off by a Figbird. A Helmeted Friarbird *Philemon buceroides* was apparently ignored as it fed in the tree with the Figbirds.

On the following day at the same time and location Figbirds were again observed defending their feeding space from Black-faced Cuckoo-shrikes as well as ten adult male Figbirds. The male Figbirds were however more successful in obtaining fruit by forming a group and simultaneously raiding the tree. The male Figbirds succeeded in aquiring food on about eight in ten attempts by using this strategy. These birds were constantly giving a high-pitched bell-like call which became louder and more frequent just prior to each raid on the fruiting tree.

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