SHORT COMMUNICATIONS

THE RESPONSE OF SMALL BIRDS TO EXTREME HEAT

During a summer visit to Hamelin Station, Shark Bay, in 1983 I observed an unusual behaviour of small birds during an extremely hot day. On 5 January one pair of White-browed Scrubwrens *Sericornis frontalis*, four Splendid Fairy-wrens *Malurus splendens* — one male and three females, and five White-winged Fairy-wrens *Malurus leucopterus* — two males and three females were observed sheltering together in a shallow underground hollow formed by a partly dislodged limestone rock. The shelter was 650 mm long and extended to a depth of 300 mm below ground level; the branches of a 2.0 m high *Acacia tetragonophylla* bush shielded an entrance 330 mm wide.

Air and ground temperatures were measured with shaded mercury thermometers and relative humidity was recorded with an MIK 5317 air humidity tester (Sina), which was calibrated with a series 96 Sensorcheck (Sina) prior to use. Observations were made from a point 10 m north of the shelter with the aid of 8 × 30 mm field glasses between 12:30–13:30 hours, 14:10–16:10 hours and 17:00–18:30 h. Temperature and humidity measurements recorded in and around the shelter at 14:00 hours are shown in Table I.

TABLE I

Microclimatic data recorded in and around the bird shelter at 14:00 h on 5 January 1983.

	Temperature (°C)	Humidity (% R.H.)
Open, unshaded area		
Ground level	63.0	
30 cm above ground	52.5	21.0–22.0
200 cm above ground	51.5	
In Bush		
Ground level	51.5	
30 cm above ground	49.6	21.0–22.0
200 cm above ground	47.0	
Underground hollow		
At bottom	41.8	39.8

No interspecific nor intraspecific aggression was observed amongst the birds while they sheltered from the heat. The White-winged Fairy-wrens were more restless than the other species: they emerged from underground every 10–13 min for as long as 3 min and searched through ground litter and probed behind bark with their bills, then returned to the shelter. On three such occasions all the other birds apparently took fright by fleeing from the shelter with the White-winged Fairy-wrens and taking refuge in the nearby undergrowth, but they returned, usually within 30 sec. While I observed, both the Splendid Fairy-wrens and Scrub-wrens attempted three foraging expeditions and neither species spent more than 2–5 min outside the shelter at any one time. None of the birds left the protection of the undergrowth nor roamed farther than 5 m from the shelter. Each species abandoned the shelter at approximately the same time and by 18:10 hours it was deserted; temperatures in the shaded and unshaded areas were 33.9°C and 37.2°C, respectively.

Aggression between small passerines in Australia's temperate regions is poorly documented. Rowley (1963) observed only slight aggression between malurids in south-eastern NSW; however, honeyeaters often indiscriminately attack all bird species throughout the year (Dow 1977).

White-winged Fairy-wrens (Tidemann 1980), Splendid Fairy-wrens (Loaring 1965; Rowley 1981) and White-browed Scrubwrens (Bell 1983; pers obs) live in territorial groups, though these observations were made outside the arid regions of the species' distributions. Absence of intraspecific aggression has been reported for several other arid zone bird species (Wyndham 1980: Thomas *et al.* 1981; Davies 1982) and Finlayson (1932) noted the lack of antagonism between Zebra Finches *Poephila guttata*, Budgerigars *Melopsittacus undulatus*, Crimson Chats *Ephthianura tricolor*, Magpie-larks *Grallina cyanoleuca*, Willie-wagtails *Rhipidura leucophrys* and Rainbow Bee-eaters *Merops ornatus* sheltering in railway carriages from the heat.

By seeking refuge in the underground shelter the Scrub-wrens and Fairy-wrens remained relatively inactive during the hot part of the day and the toleration by each species of the presence of others would minimize body heat production and help maintain water balance. Fisher *et al.* (1972) stated that small seed eaters need to drink throughout the day to prevent dehydration and perhaps the foraging expeditions of the Scrub-wrens and Fairy-wrens serve to provide water as well as energy.

REFERENCES

BELL, H.L. 1983. Co-operative breeding in the White-browed Scrub-wren *Sericornis frontalis*. Emu 82: 315-316.
DAVIES, S.J.J.F. 1982. Behavioural adaptations of birds to

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environments where evaporation is high and water is in short supply. J. Comp. Biochem. & Physiol. 71A: 557-566.
DOW, D.D. 1977. Indiscriminate interspecific aggression leading to almost sole occupancy of space by a single species of bird. Emu 77: 115-121.
FINLAYSON, H.H. 1932. Heat in the interior of South Australia and in Central Australia. Holocaust of bird-life. S. Aust. Orn. 11: 158-160.
FISHER, C.D., E. LINDGREN & W.R. DAWSON. 1972. Drinking patterns and behaviour of Australian desert birds in relation to their ecology and abundance. Condor 74: 111-136.
LOARING, W.H. 1965. Social behaviour in the Banded Blue Wren *Malurus splendens*. W. Aust. Nat. 10: 15-17.
ROWLEY, I. 1963. The reaction of the Superb Blue Wren, *Malurus cyaneus*, to models of the same and closely related species. Emu 63: 207-214.
———. 1981. The communal way of life in the Splendid Wren, *Malurus splendens*. Z. Tierpsychol. 55: 228-267.
TIDEMANN, S.C. 1980. Notes on breeding and social behaviour of the White-winged Fairy-wren *Malurus leucopterus*. Emu 80: 157-161.
THOMAS, D.H., G.L. MACLEAN & C.F. CLINNING. 1981. Daily patterns of behaviour compared between two sandgrouse species (Aves: Pterocliidae) in captivity. Madoqua 12.
WYNDHAM, E. 1980. Diurnal cycle, behaviour and social organisation of the Budgerigar, *Melopsittacus undulatus*. Emu 80: 25-33.

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A NOTE ON COMMUNAL BREEDING AND DISPERSAL OF YOUNG OF THE HOODED ROBIN *PETROICA CUCULLATA*

Courtney & Marchant (1971) noted that, in the ACT, breeding pairs of the Hooded Robin *Petroica cucullata* repeatedly were attended by an additional male, either fully plumaged or beginning to assume full plumage. The share in nesting duties undertaken by supernumary birds could not be ascertained. Rogan (1964) reported and photographed two females that apparently laid in the same nest, suggesting polygamy by the species.

At Wollomombi, near Armidale NSW, during a study from 1978 to 1982, only one pair of Hooded Robins was observed. The pair occurred in a largely cleared paddock outside woodland. The birds only entered the woodland when following mixed-species feeding flocks, usually based on the Buff-rumped Thornbill *Acanthiza reguloides*. Outside the woodland they regularly followed flocks based on either the Yellow-rumped Thornbill *Acanthiza chrysorrhoa* or Brown Treecreeper *Climacteris picumnus*. The Hooded Robins occupied a home range of *ca.* 6 ha during the breeding season, which expanded to *ca.* 30 ha during the non-breeding period. There seemed to be no other Hooded Robins within a kilometre in all directions.

Presuming that the pair were the same birds throughout the study period, I was able to follow their fortunes. In 1978 they nested at least twice on bare horizontal branches in large trees; both nests were predated. In 1979 they nested again, in a similar situation, with the same result. In 1980 they nested again, in a stump one metre high and underneath a dense bush of *Bursaria spinosa*. They laid and hatched two eggs and both young fledged on 29 September. I banded both young.

The young birds were netted, while still with their parents, in March 1981, and both showed evidence of moulting into male plumage. Moult was complete by about May of that year, because two banded males were seen and no other Hooded Robins are known to have been banded in the area.

In October 1981 two unbanded birds and a banded male were back in the home range that had been occupied by the unbanded breeding pair in previous years. I saw the female carry nesting material up to a large tree, accompanied on each trip by the two males. The nest, possibly just commenced, could not be seen. Meanwhile, 200 m distant, a new pair of Hooded Robins had set up a territory or home range. The new pair consisted of a banded male and unbanded female. Aggression occurred between the pair and the trio along what I presume was a territorial boundary. All birds, including the helper male, joined in territorial disputes. Unfortunately, because of absence, I could not follow up events during the rest of the season.

In autumn of 1982 the new pair was absent but the trio of two old birds and a banded male were seen together during autumn and early winter. I made few visits during the breeding season of 1982 and found only two birds, a banded male and unbanded female. These birds could have been the new pair; unlikely however, because it was absent the previous autumn. Alternatively, the original male may have died and been replaced by his helper son.

It would seem that the Hooded Robin meets the

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