

INTERSPECIFIC AGGRESSIVE BEHAVIOUR BETWEEN ROBINS AND OTHER BIRDS IN EUCALYPT FOREST

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Records were kept for 328 interactions between Scarlet/Flame Robins and other landbirds at a site in south-eastern New South Wales. Fifty-seven per cent of interactions were between robins and other ground-foragers, particularly with Jacky Winter (41%). Bark-foragers, foliage-foragers and honeyeaters were rarely, if ever, attacked, except when they came near nests of robins. Honeyeaters were responsible for 57 per cent of the attacks directed at robins.

INTRODUCTION

Many species of Australian honeyeater aggressively defend food resources and space from intruders; not only from conspecifics but also from a wide range of interspecific intruders (Dow 1977; Paton 1980; Loyn *et al.* 1983; Woinarski 1984). Their aggressive behaviour has been described as 'remarkably indiscriminate' (Dow 1977) and extends to species as ecologically dissimilar as fairy-wrens, finches and grebes (Dow 1977; Paton 1980).

Records of interspecific aggression among other Australian passerines are few. Interspecific territoriality, nest-site defence or dominance behaviour have been recorded for some species of robin, whistler, treecreeper, pardalote and corvid (Rowley 1973; Erickson 1974; Noske 1979; Loyn 1980; Debus 1982; Woinarski and Rounsevell 1983; Robinson 1989a). Other studies of sympatric species of fantail, whistler, fairy-wren and pardalote conversely have reported little or no interspecific aggression (Rowley 1963; Woinarski and Rounsevell 1983; Cameron 1985; Woinarski 1987). Here I present information on aggressive interactions recorded between either Scarlet Robins *Petroica multicolor* or Flame Robins *P. phoenicea* and other species of bird in a forest environment in south-eastern Australia. I also discuss the possible causes of the observed aggressive behaviour.

STUDY SITE AND METHODS

The study was carried out at a site of approximately 300 ha near Nimmitabel, on the Southern Tablelands of New South Wales (36°46'S, 149°22'E). The site consists of open *Eucalyptus viminalis*, *E. pauciflora* forest and some grassland, and is described in more detail elsewhere (Robinson 1992).

Between March 1984 and March 1986, individually colour-banded Scarlet and Flame Robins were followed for periods of 5–45 minutes, during which time the frequency and duration of all interspecific disputes, the identity of the aggressor and identity of the bird being attacked (hereafter termed 'recipient') were recorded. Possible causes of the aggressive behaviour were noted whenever possible.

RESULTS

Twenty-eight species of bird were involved in a total of 328 interspecific interactions with Scarlet/Flame Robins at Nimmitabel — 16 species with Scarlet Robin and 23 species with Flame Robin (Table 1). For those interactions in which Scarlet/Flame Robins were the aggressor ($n = 159$), 80 per cent were with ground-foraging species, notably with Jacky Winter (70%) and occasionally with Hooded Robin, Eastern Yellow Robin and Buff-rumped Thornbill. Only six per cent of attacks by robins were directed at honeyeaters (Table 1). Species that were never, or rarely, involved in aggressive interactions with Scarlet/Flame Robins despite being common in the study area included: Superb Fairy-wren, White-browed Scrubwren *Sericornis frontalis*, Striated Thornbill, Golden

TABLE 1

Records of aggressive interactions between Scarlet/Flame Robins and other species of birds. Records are arranged by frequency within the subsets of honeyeater interactions, ground-forager interactions and interactions with other species. An asterisk indicates that birds were displaced from close to nests.

	Scarlet/Flame Robin as				Total
	Aggressor Sc	Fl	Recipient Sc	Fl	
HONEYEATERS					
White-naped Honeyeater <i>Melithreptus lunatus</i>	2*		12	37	51
White-eared Honeyeater <i>Lichenostomus leucotis</i>		2*	27	9	38
Yellow-faced Honeyeater <i>Lichenostomus chrysops</i>	1			8	9
Brown-headed Honeyeater <i>Melithreptus brevirostris</i>		2		2	4
New Holland Honeyeater <i>Phylidonyris novaehollandiae</i>		1*		2	3
Eastern Spinebill <i>Acanthorhynchus tenuirostris</i>	1				1
GROUND-FORAGERS					
Jacky Winter <i>Microeca leucophaea</i>	59	52	6	17	134
Eastern Yellow Robin <i>Eopsaltria australis</i>		1		19	20
Hooded Robin <i>Melanodryas cucullata</i>		2*	3	8	13
Buff-rumped Thornbill <i>Acanthiza reguloides</i>	7	1			8
Grey Shrike-thrush <i>Colluricincla harmonica</i>	1*		2	1	4
Willie Wagtail <i>Rhipidura leucophrys</i>		1	2		3
Superb Fairy-wren <i>Malurus cyaneus</i>	1		1		2
Yellow-rumped Thornbill <i>Acanthiza chrysorrhoa</i>		1			1
Richard's Pipit <i>Anthus novaeseelandiae</i>		1			1
OTHER SPECIES					
Grey Fantail <i>Rhipidura fuliginosa</i>	5	4*	5	1	15
Striated Thornbill <i>Acanthiza lineata</i>	4*	1			5
Dusky Woodswallow <i>Artamus cyanopterus</i>		1*		3	4
Rufous Whistler <i>Pachycephala rufiventris</i>	1*			2	3
Laughing Kookaburra <i>Dacelo novaeguineae</i>		1*			1
Sacred Kingfisher <i>Halcyon sancta</i>	1*				1
Satin Flycatcher <i>Myiag racyanoleuca</i>				1*	1
Varied Sittella <i>Daphoenositta chrysoptera</i>	1				1
Striated Pardalote <i>Pardalotus striatus</i>				1	1
Horsfield's Bronze-cuckoo <i>Chrysococcyx basalus</i>		1			1
Shining Bronze-cuckoo <i>Chrysococcyx lucidus</i>	1				1
Fan-tailed Cuckoo <i>Cuculus pyrrhopterus</i>		1			1
Pallid Cuckoo <i>Cuculus pallidus</i>		1			1
TOTALS	85	74	58	111	328

Whistler *Pachycephala pectoralis*, Rufous Whistler, Red-browed Treecreeper *Climacteris erythrops*, White-throated Treecreeper *C. leucophaea*, Spotted Pardalote *Pardalotus punctatus* and Striated Pardalote.

Some species were only/mainly displaced by Scarlet/Flame Robins if they came within c. 10 m of nests (Table 1). The robins also displaced or scolded Pallid Cuckoos, Fan-tailed Cuckoos, Shining Bronze-cuckoos and Horsfield's Bronze-cuckoos that came too close to nests.

For those interactions in which Scarlet/Flame Robins were the recipients of the attack ($n = 169$),

57 per cent were initiated by honeyeaters, especially by White-eared Honeyeater and White-naped Honeyeater (Table 1). A further 35 per cent were initiated by ground-foragers, including 14 per cent begun by Jacky Winters (Table 1).

Interspecific interactions occurred throughout the year (Table 2) but some seasonal patterns appeared to differ between the two species of robin. Thus, Flame Robins interacted most often with Jacky Winters in winter and spring, while Scarlet Robins interacted most often with Jacky Winters in autumn.

DISCUSSION

As found by some other studies of interspecific aggression between insectivorous birds (Slagsvold 1978; Woinarski and Rounsevell 1983), nest-site defence was one cause of aggression between robins and other bird species. Interspecific aggression by robins towards cuckoos also presumably represented nest-site defence or defence of young: one pair of Flame Robins played host to a Fan-tailed Cuckoo and cuckoldry of Scarlet Robins by Horsfield's Bronze-cuckoo has been observed elsewhere (Howe 1932). However, interspecific interactions between robins and other insectivores occurred throughout the year, not just in the breeding season (Table 2), and additional causes are needed to explain the remaining aggressive behaviour.

Mistaken identity has been proposed as one possible cause of interspecific aggression between similarly plumaged birds (Murray 1971; Savard and Smith 1987). It was an unlikely cause of the aggression directed towards male robins by honeyeaters and other species, given the bright-red breasts of adult males. However, it may explain why robins sometimes attacked Jacky Winters, as Jacky Winters somewhat resemble female robins in appearance and behaviour. Field observations, though, showed that robins responded to nearby Jacky Winters much less often than they responded to nearby robins, implying that the robins were able to identify Jacky Winters and behaved accordingly.

Instead, competition for food appeared to be the most likely cause of interspecific aggression between Scarlet/Flame Robins and Jacky Winters. The Jacky Winter was one of the few other insectivores at the study site that pounced for prey in the open forest. Its foraging behaviour and use of foraging space in winter and spring was similar to that of the robins; each species tending to forage in open forest and pouncing or snatching for prey on or close to the ground. Both species of robin consequently may have benefitted by displacing Jacky Winters from shared feeding sites in order to increase their potential food supply; particularly as the time cost of the aggressive behaviour was low ($< 0.2\%$, Robinson 1989b).

Potential increases in food availability similarly may explain the interspecific aggression observed occasionally between Scarlet/Flame Robins and Hooded Robin, Eastern Yellow Robin and

TABLE 2

Seasonal distribution of aggressive encounters between robins and other species of birds expressed as number of encounters/hour. The smaller sample sizes for Flame Robins in autumn and winter are due to the birds' absence from the study site from late April to August.

	Autumn	Winter	Spring	Summer
SCARLET ROBIN				
Observation time (h)	37.8	34.4	21.7	29.1
Interactions with:				
All honeyeaters (n/h)	0.38	0.29	0.41	0.34
All non-honeyeaters	1.67	0.26	0.88	0.31
• Ground-foragers	1.46	0.23	0.73	0.10
• Jacky Winter	1.26	0.06	0.65	0.03
FLAME ROBIN				
Observation time (h)	16.3	8.8	22.5	22.9
Interactions with:				
All honeyeaters (n/h)	0.12	1.02	1.24	1.04
All non-honeyeaters	1.17	3.52	2.18	1.00
• Ground-foragers	1.10	3.52	1.73	0.70
• Jacky Winter	0.31	2.73	1.38	0.39

Buff-rumped Thornbill. The latter three species all forage on the ground (Recher and Holmes 1985; Ford *et al.* 1986, pers. obs), and overlapped at least partly with Scarlet and Flame Robins in their use of habitat and space (Robinson 1989b). Accordingly, the larger Hooded and Eastern Yellow Robins may have benefitted from displacing Scarlet/Flame Robins whenever they entered the larger birds' foraging space; Scarlet/Flame Robins may have benefitted from displacing the smaller Buff-rumped Thornbills from mutual foraging sites. Although interspecific aggression between these species was recorded only rarely, it has been proposed that such occasional disputes may signify interference competition between dominant and subordinate species (Beaver and Baldwin 1975; Sherry 1979; Maurer 1984) and may lead to avoidance of the dominant's foraging space by the subordinate bird (Morse 1974; Beaver and Baldwin 1975).

Aggressive interactions between robins and honeyeaters comprised a tiny percentage of the robins' behavioural time budgets (c. 0.1%, Robinson 1989b). Honeyeaters nonetheless were the most frequent aggressors towards robins (Table 1) and sometimes chased them for distances of up to 40 m. These observations support results suggesting that honeyeaters exclude many birds which enter their foraging space in order to

increase the honeyeaters' potential food supply, even when overlap in foraging niche is relatively small (Ford 1981; Ford and Paton 1982; Loyn *et al.* 1983; Wykes 1985). Results from this study further suggest that some insectivorous birds in Australia likewise use brief acts of aggression to displace birds that forage in similar ways or utilize the same feeding area. It remains to be seen whether such aggressive acts lead to increases in the robins' available food supply.

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