

**PROTECTION BEHAVIOURS OF BREEDING
WHITE-PLUMED HONEYEATERS *LICHENOSTOMUS PENICILLATUS***

When eggs or young or both are threatened, parent birds can protect them in various ways. The most common responses are aggression, either direct or ritualized, or the feigning of injury to distract and lure the threat away from the nest (Eibl-Eibesfeldt 1970). The White-plumed Honeyeater *Lichenostomus penicillatus*, when breeding, employs both of these responses. The birds' reaction appears to depend primarily on the type of intruder, e.g., whether or not the trespasser is a potential predator of the eggs or nestlings.

White-plumed Honeyeaters are common throughout south-eastern Australia, inhabiting open forests and woodland areas often in association with watercourses (Pizzey 1980). Between 7 July 1978 and 22 November 1980 I made casual observations of honeyeater behaviour while walking a regular route through an open eucalypt woodlot 1.6 ha in area in Beverly Hills, NSW. The site was walked three times each month, with additional visits being made in the breeding season.

AGGRESSIVE DISPLAYS

There were two types of aggressive behaviour: chasing, where an adult honeyeater would fly at an intruder and force it to leave the area; and arcing, where an adult would hover back and forth above the intruder. Loud calling often accompanied both of these activities. During the breeding season chasing or arcing or both was recorded against seven species of birds, including conspecifics (Table I). Generally White-plumed Honeyeaters chased birds of a similar size, e.g. conspecifics and Willie Wagtails, and used the arcing behaviour against larger intruders, e.g. Red Wattlebirds and Laughing Kookaburras. In the breeding season the rates of chasing and arcing (3.60 and 1.25 per month respectively) were much greater than in the non-breeding months (1.25 and 0.25 per month respectively). On most occasions (58%) only one intruder and one attacker was involved. A further 16% of the interactions involved a pair of Honeyeaters opposing one or two intruders. Many of the chases of Red Wattlebirds and the one of the Australian Magpie involved two or more White-plumed Honeyeaters.

DISTRACTION DISPLAY

Where the intruder was a potential predator the White-plumed Honeyeaters employed a distraction display. In my observations the display was noted against ravens and humans, though it is likely it would also be used

TABLE I

Aggressive interactions by breeding White-plumed Honeyeaters.

Species Attacked	Wt (g)	Chased	Arcing
White-plumed Honeyeater <i>Lichenostomus penicillatus</i>	17	11	0
Willie Wagtail <i>Rhipidura leucophrys</i>	22	6	0
Red Wattlebird <i>Anthochaera carunculata</i>	125	10	8
Black-faced Cuckoo-shrike <i>Coracina novaehollandiae</i>	130	1	1
Pied Currawong <i>Strepera graculina</i>	300	0	1
Laughing Kookaburra <i>Dacelo novaeguineae</i>	305	0	2
Australian Magpie <i>Gymnorhina tibicen</i>	387	1	0

when Currawongs, Kookaburras and Magpies were present. In the display an adult when disturbed at a nest would fly to the ground and, with wings fluttering, run about 15 m from the nest site. If the intruder did not follow, the adult returned and repeated the display. When the intruder did follow, the Honeyeater continued to flutter along the ground and then would suddenly fly away in a wide semi-circle back to the nest tree.

While one adult was displaying another adult often dived at, and arced above, the intruder. Actual contact was never observed and both adults called loudly throughout the encounter. Since no banding was attempted, and the species is not conspicuously dimorphic, it is not known whether the display was sex specific.

The display was observed only on the four or five days prior to the fledging of the nestlings. On four occasions I was able to follow the progress of individual nests, visiting each five or six times during the incubation-nestling period. In the three nests that produced fledglings, the distraction display was not seen until the chicks were nine days old. During those nine days the adult reaction to my presence was simply loud calling with occasional arcing overhead. During incubation the adults gave little or no response when I was close to the nest. Of another four nests visited periodically, the display was observed when the chicks were past the downy stage and most chicks were near fledging.

DISCUSSION

White-plumed Honeyeaters, when nesting, respond actively to the presence of intruders close to the nest. The form of response given is dependent on the type of intruder and the stage of nestling development. If the trespasser is a conspecific, or a bird of similar size, it is chased. If the threat is larger, arcing is used to displace the bird from the nest area. The presence of more than two Honeyeaters in attacks on intruders is consistent with reports of this species being a communal breeder (Dow 1980). Finally, when the intruder is a potential predator, the adult honeyeaters attempt to distract it from the nest by a combination of feigning of injury and intensive arcing. This response was evident only during the four to five days prior to the chicks fledging.

When breeding, the adult birds have to meet additional costs in time and energy, e.g. egg production, nest building and brood raising. Time and energy expenditures are greatest during the nestling phase and should the chicks be predated all the input would be lost. This may explain the appearance of the distraction display late in the nestling period. By the time the chicks are nine days old the added costs of the display, including the risk of being attacked while doing it, are negligible compared to the accumulated expenditure and the total investment. Thus, at this stage of the breeding cycle, a distraction display is deemed worthwhile if it increases the chances of survival of the parents' genes in the offspring.

A number of Australian meliphagids exhibit distraction displays. Yellow-tufted Honeyeaters *Lichenostomus melanops* (Chisholm 1934) and Fuscous Honeyeaters *L. fuscus* (Ford pers. comm.) have displays very similar to that of White-plumed Honeyeaters. Others, such as the White-eared *L. leucotis*, White-cheeked *Phylidonyris nigra*, and New Holland *P. novaehollandiae* Honeyeaters have also been observed feigning injury or death when nestlings appeared to be endangered (Bourke 1955; Stone 1917; Paton 1979).

The success of distraction behaviours in enhancing the survival chances of the young has been quantitatively established for only a few species that employ such responses, e.g. Red Grouse *Lagopus scoticus* (Jenkins 1963). However, the fact that such behaviours have evolved independently in a wide range of bird families (including ducks, waders and many passerine families, Armstrong 1947) would imply that having a distraction display for at least part of the incubation-nestling period confers some benefit in terms of increased reproductive success.

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