

Plural-breeding Australian Magpies *Gymnorhina tibicen dorsalis* Nesting Annually in the Same Tree

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Summary

A single social group of plural-breeding Western Australian Magpies *Gymnorhina tibicen dorsalis* had two concurrently active nests in the same Marri *Corymbia calophylla* tree over three consecutive years 2003–05. Western Australian Magpies are social birds that breed co-operatively, although they have not been reported previously with nests in the same tree. These nests were positioned such that the centre of the tree did not obstruct the visibility from one to the other. Nesting this closely may facilitate intraspecific brood parasitism, which has been reported in plural-breeding Magpies. Double nesting in this tree was most likely caused by the tree's isolation in a field that formed most of the group's feeding range, within which Magpies generally showed aggression only to larger birds.

Introduction

Western Australian Magpies *Gymnorhina tibicen dorsalis* (hereafter Magpies) are co-operative breeders (Rowley 1976; Hughes *et al.* 2003) and territorial birds (Robinson 1956; Hughes *et al.* 1996). Australian Magpies' territories typically include large trees for nesting and grassy fields for foraging (Carrick 1972; Baker *et al.* 2000), and this species has adapted well to cleared pasture and suburban parks and gardens (Hughes *et al.* 1983; Hughes & Mather 1991). Australian Magpie subspecies show a variety of breeding systems (Hughes & Mather 1991), including plural breeding where more than one female from a social group nest and lay eggs. Plural breeding has been reported for populations of both eastern and western subspecies (Carrick 1972; Hughes *et al.* 1996, 2003; Durrant & Hughes 2005), although two concurrently active nests in the same tree have not been reported (e.g. Higgins *et al.* 2006).

Extra-group paternity in Magpies, at 82%, is the highest recorded for any bird species, and indicates that few offspring within a territory are sired by the social partner of the female. In addition, nearly 10% of juveniles are not the genetic offspring of any female within their territory, suggesting that intraspecific brood parasitism occurs (Hughes *et al.* 2003).

I report on a single social group of Magpies, from Dryandra Woodland (Dryandra), south-east of Perth, Western Australia (32°46'S, 116°58'E), which had two concurrently active nests in the same tree, over three consecutive years. The sets of paired nests are discussed in relation to egg-dumping and the Magpies' local ecology.

Methods and results

The Magpies' home-range was situated in a modified habitat consisting of ~ 5 ha of open field and a small tourist village near the centre of Dryandra. The village consists of eight large and two smaller cottages; a larger dormitory complex;

Table 1
Positions of Magpies' nests in same tree, in relation to each other.

<i>Year</i>	<i>Distance apart (m)</i>	<i>Angle (°)</i>	<i>Height difference (m)</i>
2003	8.6	85	3.7
2004	10.7	105	5.9
2005	11.0	135	1.0
Mean	10.1	108	3.5

and ~ 150 mature pine *Pinus radiata* trees, which form a windbreak that separates the open field from the cottages. Dryandra is 27 000 ha of remnant woodland located in the central Wheatbelt of south-western Australia, with bird species that include those lost from remnants of the Central Wheatbelt (Recher & Davis 1998).

This study was part of a larger study of breeding birds at Dryandra; for detail on observational methods see Fulton (2006). Two concurrently active Magpie nests were detected in the same Marri *Corymbia calophylla* tree in each of the three years 2003–05. The tree stood isolated in an open field ~ 30 m west of a windbreak of pine trees and > 100 m from the edge of the Wandoo *Eucalyptus wandoo* woodland. It had a crown diameter of 18 m, although it was not radially symmetrical, and appeared in poor health with as many dead branches as live ones; despite this it provided many nesting opportunities to the Magpies through a range of compass bearings (Table 1). For the years 2003–05 Magpies were intermittently observed building both nests concurrently in July and incubating eggs and brooding young until fledging in late October and early November. All nests successfully fledged at least one individual.

The Magpies' home-range was defended from potential predators. The following large birds and a python were mobbed: Brown Goshawk *Accipiter fasciatus*, Wedge-tailed Eagle *Aquila audax*, Laughing Kookaburra *Dacelo novaeguineae*, Australian Raven *Corvus coronoides* and a large female South-western Carpet Python *Morelia spilota imbricata*. In addition, Bush Stone-curlews *Burhinus grallarius* were chased from near the clearing. Two medium-sized birds, Australian Ringneck *Barnardius zonarius* and Black-faced Cuckoo-shrike *Coracina novaehollandiae*, were chased intermittently. Smaller birds, including Red Wattlebirds *Anthochaera carunculata*, were ignored near the nest-tree. One Goshawk was killed by the group (see Fulton 2006).

Discussion

Plural-breeding Magpies were not expected to have nests in the same tree, because the nests belong to different females, and females from this subspecies may lay their eggs in another's nest. Hughes *et al.* (2003) identified intraspecific brood parasitism in Magpies *G.t. dorsalis* where juveniles were not the genetic offspring of females from their social group, and egg-dumping has been recorded in *G.t. tyrannica* from south-eastern Australia (Durrant & Hughes 2005). One female may benefit over another by putting her eggs into the nest of another female and thus spreading her offspring over more nests. This might spread the risk of predation or disease over more nests, as a bet-hedging strategy (Durrant 2004; Durrant & Hughes 2005).

The central axis of the tree was not situated between the nests, and each Magpie's nest had an unobstructed view of the other nest, in each year. Unobstructed vision may facilitate egg-dumping, when one female can clearly see that the other's nest is unoccupied, although this is unlikely to be a practical consideration for nest placement. Nest placement is more likely determined by the need for a 'clean' nest-site, free from pathogens accumulated at previous nests.

Magpie nests from individual social groups are clumped in relation to birds' feeding territories (unpublished data; see also figures in Wilson 1946 and Wood & Recher 2004). Nests in these studies were clumped into relatively small sections of the birds' feeding ranges, although concurrently active nests were positioned in different trees. The clumping of nests probably facilitates some social cohesion, although, and more importantly, the nests may be located centrally within the feeding ranges so that the birds can feed while watching for potential nest-predators. In this instance, the centrally placed Marri tree can be seen clearly by birds foraging in the field, and this aided the Magpies in detecting approaching predators. Potential predators that entered the Magpies' feeding territory were mobbed and driven from the area, or killed; smaller birds were ignored.

Magpies have not previously been reported placing their nests in the same tree, although their nests may be clumped semi-colonially (Higgins *et al.* 2006). Ian Rowley (pers. comm.) has never seen two Magpie nests in the same tree. Magpies probably seek out nest-sites that have more than one large tree. In this case, there were originally two Marri trees in the field, but one fell some years ago. It is possible that the Magpies stayed on here because the field provided them with reliable food, which was supplemented with food obtained in the tourist village.

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