ANALYSIS OF PELLETS DISGORGED BY WHITE-FACED HERONS

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SUMMARY

Pellets disgorged by a White-faced Heron contained parts of beetle species from five families, and other unidentified beetles and yabbies. The parts were of adult beetles whose chitinous exoskeleton is not so readily attacked by the digestive enzymes of birds.

INTRODUCTION

Ardeidae (egrets and herons) are known to regurgitate pellets containing hard and indigestible materials such as bones and arthropod parts (Thomson 1964). In Australia food has been determined from an examination of disgorged pellets from nestling egrets (Maddock 1986; Maddock and Baxter 1991; McKilligen 1984) but not from herons. Published information on the food of White-faced Herons *Ardea novaehollandiae* has been obtained from an analysis of gut contents (McKeown 1934; Lea and Gray 1935; Lowe 1983; Barker and Vestjens 1989; Marchant and Higgins 1990). These have shown a variety of gastropods, arthropods, crustacea, spiders, fish, frogs, lizards and mice. In many cases the arthropods have only been identified to family level.

RESULTS AND DISCUSSION

On 28 October 1987 regurgitated pellets were found immediately underneath an active nest of a White-faced Heron at Monteith, 10 km south-east of Murray Bridge, South Australia. The nest was 6 m high in a river red gum *Eucalyptus camaldulensis* growing at the side of a water channel from the River Murray and contained two easily visible unfledged chicks. The only other nest in the tree was of a Willie Wagtail *Rhipidura leucophrys*. Most of the pellets were about 15-25 mm long and 5 mm wide. Various hard parts of yabbies *Cherax* sp. were scattered around the pellets.

Eight or nine fresh pellets were collected and these contained parts of seven species of beetles from four families and an unidentified beetle from a fifth family (Table 1). Parts of other unidentified beetles and yabbies were also present. The beetle species were typical of a riparian habitat (H. Mincham pers. comm.).

This examination of pellets has allowed a far more accurate identification of the insects taken by White-faced Herons than has previously been obtained from examination of stomach contents. McKeown (1934) was able to identify one species of Whirliegig Beetle *Macrogyris latior* and fragments from the beetle genera *Phyllydras, Berosus,* and the family Gyrinidae from the stomachs of several White-faced Herons from near Narrandera, New South Wales. Lea and Gray (1935) summarised previously published records and added to them but, with the exception of the Water Beetle *Erectes australis,* insects were only identified to the level of order. Barker and Vestjens (1989) listed the analyses of stomach contents of White-faced Herons obtained between 1963 and 1980, and included results from literature to that date. Various beetles from six different families are mentioned. Three of these families are included in Table 1. Only one specimen was identified to species level, the African Black Beetle *Heteronychus arator* of the subfamily Dynastinae.

Lowe (1983) has given a list of items identified from the stomachs of eight White-faced Herons feeding on tidal flats, and six feeding in pasture at Westernport Bay, Victoria, in August 1978. Identification of insects was made to family level. Beetles from the families Scarabaeidae, Dytiscidae and Hydrophilidae were found in three birds feeding in pasture.

One possible reason for the more accurate identification of insects obtained from the pellets is that these contained parts of adult beetles. With the exception of McKeown (1934), who identified both adult and larval forms of Gyrinidae, and larval forms of Dytiscidae beetles, other authors have not indicated if specimens were of adult or larval forms. A diet rich in adult beetles is more likely to produce pellets because of the hard exoskeleton. Most of the chitinous exoskeleton is not attacked by the digestive enzymes of birds, so that recognizable parts such as legs and mouth-parts may remain intact in the stomach or disgorged pellet, and thus allow identification. In general, adult beetles are more easily identified than their larval forms, and also have a higher proportion of undigested chitinous

Table 1. Arthropods identified in regurgitated pellets from White-faced Herons found near a River Murray channel.

CLASS	ORDER	FAMILY	SPECIES
Crustacea	Decapoda		*Cherax sp.*, Yabbie
Insecta	Coleoptera	Dytiscidae	*Homoeodytes scutellaris*, Water Beetle
		Scarabaeidae	*Metanastes vulgivagus*, Scarab Beetle
			Onthopagus binodis, Dung Beetle
		Curculionidae	*Sphenophorus brunnipennis*, La Plata Weevil
		Hydrophilidae	*Berosus australiae*, Water Beetle
			Sternolophus marginicollis, Water Beetle
			Rhantus suteralis, Water Beetle
		Elateridae	unidentifiable Click Beetle

material in their exoskeleton (H. Mincham pers. comm.). On both these counts parts of adult beetles from stomach contents or disgorged pellets are more likely to be identifiable.

In conclusion we suggest that examination of pellets from White-faced Herons and other members of the Ardeiformes could contribute significantly to our knowledge of the food taken by these birds.

ACKNOWLEDGEMENTS

We wish to thank Jennifer Ohlman of the South Australian Museum for identifying the contents of the pellets.

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Received: 22 February 1993