

Short Communications

Food of the Darter *Anhinga melanogaster* in the Alligator Rivers Region, Northern Territory

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The dietary habits of the Darter *Anhinga melanogaster* have not been described for habitats in tropical Australia, although several authors have analysed stomach contents of specimens from temperate localities. Serventy (1939) found only fish in nine *A. melanogaster* collected from estuarine habitats in south-western Western Australia. McNally (1957) examined the stomachs of forty-eight specimens collected from 'large inland waters' in Victoria, while Vestjens (1975) examined the stomachs of nineteen specimens from Lake Cowal in inland New South Wales. These latter two studies suggested that introduced fish comprise most of the food items of *A. melanogaster* in inland temperate Australia.

This note presents data on the food of the Darter inhabiting a freshwater wetland in the Alligator Rivers Region of the Northern Territory, 250 km east of Darwin. Specimens were collected on the floodplain of the Magela Creek, a tributary of the East Alligator River. The floodplain fills during the wet season and remains inundated throughout much of the following dry season. Darters are present throughout the year on the floodplain and associated billabongs, and small numbers breed on the floodplain during the early dry season. Mean density on the Magela floodplain based on systematic ground-counts from 1981 to 1984 was 1.4 km⁻² but Darters were usually more abundant during the dry season (S.R. Morton, K.G. Brennan & M.D. Armstrong unpubl.).

Methods

Thirteen Darters were collected from the Magela floodplain, approximately 15 km north of Jabiru, during the dry season. Specimens were collected on 16-22 June 1982 (two birds), 19 October 1982 (one bird), 8-29 July 1983 (nine birds) and 5 August 1983 (one bird). One additional bird was recovered after drowning in a gill net in Goanna Billabong on 2 August 1984. Following collection, individuals were weighed, stomach contents were removed and stored in 70% ethanol until analysis. Prey items were identified, and measured to the nearest 0.1 mm using calipers. Prey item dry weights were calculated using specific log transformed length-weight regression equations (Dostine unpubl.).

Results

Composition of the diet

Prey of Darters consisted almost totally of fish and included nine species from seven families (Table 1). Four species were represented by single individuals. Plotosid catfish comprised approximately 60% of the diet by dry weight; 12 of 14 stomachs contained this prey type, and one other stomach contained plotosid pectoral spines. The plotosid *Porochilus rendahli* was especially important. Two species, *Ambassis* sp. and *Mogurnda mogurnda* were numerically important but together comprised less than 10% of prey by dry weight. Two stomachs contained fragments of freshwater sponge.

Plant material was present in twelve stomachs and was usually a minor component. It consisted mainly of vegetative parts of aquatic plants including *Hydrilla verticillata*, *Najas tenuifolia* and various aquatic grasses. The seeds of *Nymphaea macrocarpa*, *N. violacea*, *Caldesia oligococca*, *Heliotropium indicum*, *Caldesia procumbens* and *Oryza* sp. were recorded from stomachs but comprised a minor fraction of the plant material.

Prey size

The mean length and range of lengths for each prey type are shown in Table 1. Prey ranged in size from 27-161 mm. Small prey such as fishes of the families Centropomidae, Melanotaeniidae and Eleotridae comprised more than half of the number of individual prey items; however, these prey were present in only three of 14 stomachs. Large prey types (i.e. > 70 mm) were predominantly plotosid catfish; these types possess a tapering attenuate body form.

There was considerable individual variation in the range of prey size. The stomach of one Darter contained 13 prey items consisting of 11 *Mogurnda mogurnda*, and single items each of *Oxyeleotris nullipora* and *Glossamia aprion*, with an overall mean length of 47 ± 25 (s.d.) mm. The

TABLE 1 Prey items found in Darters, expressed as percentage of total dry weight of prey, number of individual items and frequency of occurrence in stomachs. Prey size is expressed as mean length and range of length measurements for each prey type.

Prey category	% dry weight	No. prey items	Frequency <i>n</i> = 14	Prey length (mm) $\bar{X} \pm s.d.$	range
Osteichthyes:					
F. Apogonidae					
<i>Glossamia aprion</i>	9.8	1	1	123	—
F. Centropomidae					
<i>Ambassis</i> sp.	3.7	21	2	33 $\pm$ 5	27-48
F. Clupeidae					
<i>Nematalosa erbi</i>	4.4	1	1	102	—
F. Eleotridae					
<i>Mogurnda mogurnda</i>	5.6	16	2	45 $\pm$ 11	28-69
<i>Oxyeleotris nullipora</i>	0.3	4	2	31 $\pm$ 3	27-35
F. Melanotaeniidae					
<i>Melanotaenia splendida</i>	0.2	1	1	39	—
F. Plotosidae					
<i>Porochilus rendahli</i>	29.5	12	7	108 $\pm$ 28	68-161
<i>Tandanus ater</i>	17.8	4	4	130 $\pm$ 12	117-141
Unidentified					
Plotosidae	12.6	12	7		
Total Plotosidae	59.8	28	12	105 $\pm$ 24	68-161
F. Teraponidae					
<i>Leiopotherapon unicolor</i>	6.6	1	1	96	—
Total Osteichthyes	90.6	73	12		
Porifera:					
F. Spongillidae	0.1	+	2		
Plant Material	9.1	+	12		
Inorganic material	0.2	+	1		
Total dry weight (mg) and no. of items	81 445	73			

stomach of the Darter collected from Goanna Billabong contained five plotosids with an overall mean length of 136 ± 23 (s.d.) mm. This individual contributed over 24% of the total sample by dry weight.

Discussion

These results are consistent with reports of the importance of fish in the diet of anhingids (e.g. McNally 1957; Owre 1967; Vestjens 1975; Birkhead 1978). The diet of *A. melanogaster* in the Alligator Rivers Region appears to be dominated by plotosid catfish, particularly *Porochilus rendahli*. Most prey are relatively slow-moving benthic types such as plotosids, eleotrids and the apogonid *Glossamia aprion*. However, Darters are also capable of capturing agile types that inhabit the mid- to surface layers of the

water profile, such as *Ambassis* sp. and *Melanotaenia splendida*.

Fish communities of the Magela floodplain are diverse and include 27 species from 16 families. Introduced species are absent. Earlier published observations on dietary habits of *A. melanogaster* refer to habitats in which introduced species form a major component of fish communities. The diet of Darters reported by McNally (1957) was dominated by English Perch *Perca fluviatilis* but included small quantities of six species of native fishes. Vestjens (1975) also found *P. fluviatilis* to be an important dietary item; this species occurred in 12 of 19 Darters sampled from Lake Cowal in New South Wales.

The presence of plant material in stomachs of Darters has been noted previously (e.g. Hill 1925; Burrell 1925; Vestjens 1975). Ingestion of plant material is probably accidental and occurs primarily when portions of aquatic plants are swallowed together with fish prey. Small quantities of plant material may also be ingested via the stomachs of prey.

The length of prey items found in Darters from the Magela floodplain ranged from 27-161 mm. The length of fish prey found in stomachs of Darters by Vestjens (1975) (mean, 130 mm; range, 90-198 mm) was greater than the mean length of most prey types recorded in this study. Thus, Darters subsisting on native fish in the Alligator Rivers Region appear to capture smaller prey than those eating introduced fish in temperate south-eastern Australia.

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