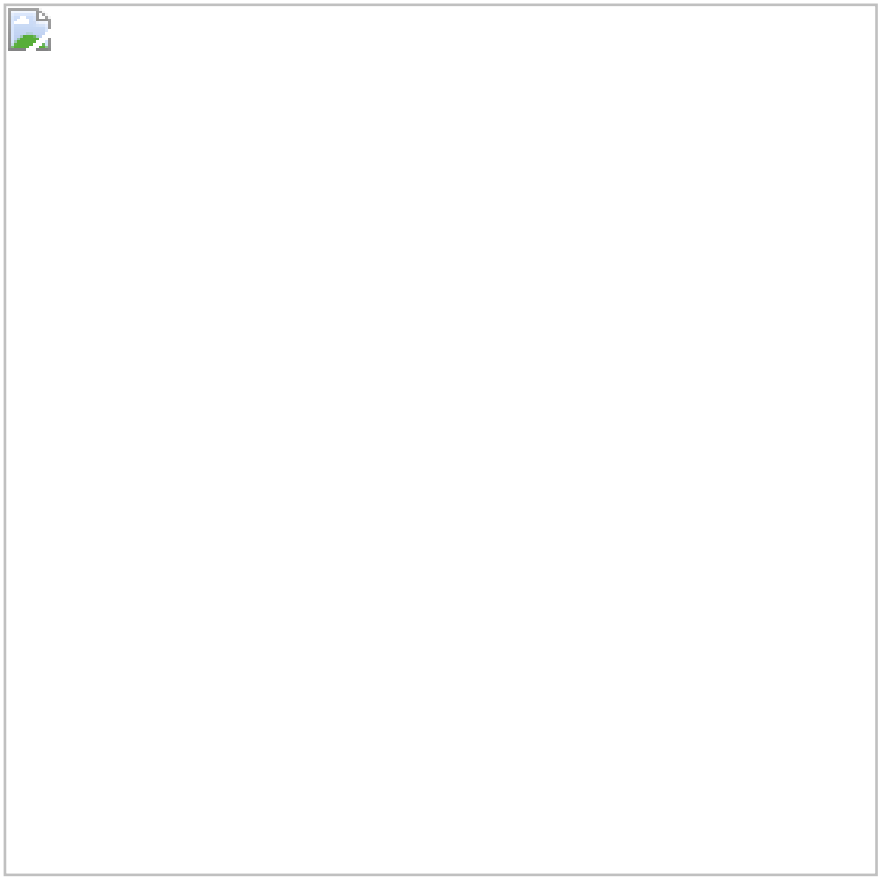

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Diet of Cattle Egret *Bubulcus ibis* chicks in an intensively managed farmland in South Africa

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Abstract. The diet of chicks was investigated in an intensively managed farmland in South Africa, after a prolonged drought, during the second brood (February/March). In comparison with other African studies, a larger proportion of frogs (mainly juvenile *Pyxicephalus adspersus* frogs) and a smaller proportion of grasshoppers (locusts and crickets) was recorded. This may have been due partly to exceptionally low rainfall rather than to different habitat or geographical location. The large proportion of locusts and flies in the diet indicates that the Cattle Egret may play an important role in pest control.

Key words: Cattle Egret, *Bubulcus ibis*, food, South Africa

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INTRODUCTION

During the last century, the Cattle Egret expanded its range from central Africa to all regions of the world (del Hoyo et al. 1992). In the Afrotropical region, it has especially successfully colonised the grassland biome (Kopij 1997a, 1999a). In a few recent decades, large areas of the grassland were transformed into cultivated fields and pastures for the cattle and sheep. The Cattle Egret is supposed to feed mainly on invertebrates regarded as harmful to the cultivated plants and domestic animals (tick control). To test this premise, diet of the Cattle Egret chicks has been analysed in an intensively managed farmland in the central part of the grassland biome, where maize cultivation and cattle breeding predominate.

MATERIAL AND METHODS

Fresh boli were collected during February and March 1998 (second brood) in a heronry composed of ca. 200 Cattle Egret nests. This heronry was located near a purification plant in Ooseinde, Bloemfontein, Free State, South Africa, in a close proximity to an urban settlement and intensively managed farmland (Kopij 2002). Rainfall was very low during the first half of the 1997/1998 breeding season (November–December: 55 mm) and very high later (January–February: 410 mm).

From each bolus, prey items (in most cases, boli contained whole, not digested specimens) were separated, counted and identified directly after the collection has been made. For insects and amphibians, identification keys by Scholtz & Holm (1985) and Passmore & Carruthers (1995) respectively, have been used. Estimation of dry mass of particular prey taxa is based on calculations given by Kopij et al. (1996) and Kopij (1997b, 1999a).

RESULTS AND DISCUSSION

Imagi of Orthoptera and larvae of Diptera were the main food of Cattle Egret chicks (Table 1). In terms of weight, the most important groups were, however, Orthoptera and Anura (Amphibia).

Table 1. Diet of the Cattle Egret chicks. Total data for higher taxa include data for lower ones.

Taxa	Prey items		Dry mass	
	N	%	(g)	%
Mollusca	2	0.1	0.10	0.07
Gastropoda	2	0.1	0.10	0.07
Arthropoda	1 261	91.9		
Arachnida	19	1.4	0.80	0.57
Araneae — unidentified	8	0.6	0.32	0.24
Atypidae	6	0.4	0.24	0.18
Araneidae	4	0.3	0.20	0.15
Argiope sp.	4	0.3	0.16	0.12
Ixodidaidea	1	0.1	0.04	0.03
Insecta	1 242	90.5		
Odonata	3	0.2	0.40	0.30
Odonata — larvae	2	0.1	0.26	0.19
Ephemeroptera — larvae	2	0.1	0.20	0.15
Orthoptera	808	58.5	38.90	29.12
Acrididae	636	46.3	25.50	19.10
Gryllidae	127	9.2	11.40	8.54
Tettigonidae	15	1.1	0.80	0.59
Orthoptera — unidentified	30	2.2	1.20	0.89
Mantodea	14	1.0	0.40	0.30
Blattodea	13	0.9	0.70	0.52
Isoptera	15	1.1	0.30	0.22
Coleoptera	50	3.6	1.90	1.39
Carabidae	7	0.5	0.20	0.15
Dytiscidae	4	0.3	0.10	0.07
Dytiscidae — larvae	12	0.9	0.60	0.44
Tenebrionidae	11	0.8	0.60	0.44
Scarabaeidae	2	0.1	0.10	0.07
Myliridae	2	0.1	0.06	0.04
Coccinelidae	2	0.1	0.04	0.03
Coleoptera — larvae	10	0.7	0.20	0.15
Diptera	280	20.4	8.60	5.69
Asilidae	3	0.2	0.10	0.07
Tabanidae	1	0.1	0.30	0.22
Calliphoridae	3	0.2	0.03	0.02
Muscidae	4	0.3	0.04	0.03
Diptera — pupae	14	1.0	0.10	0.07
Diptera — larvae	200	14.6	6.00	4.49
Diptera — unidentified	55	4.0	1.10	0.81
Lepidoptera	53	3.9	1.20	1.17
Pieridae	2	0.1	0.06	0.03
Colias electo	2	0.1	0.06	0.03
Lepidoptera — larvae	49	3.6	1.50	1.11
Hymenoptera	2	0.1	0.06	0.04
Vertebrata	112	8.2		
Amphibia	101	7.4	63.80	47.76
Pyxicephalus adspersus	44	3.2	44.00	32.96
Cacosternum boettgeri	7	0.5	0.40	0.30
Kassina senegalensis	2	0.1	0.30	0.22
Rana angolensis	2	0.1	7.00	5.24
Xenopus laevis	1	0.1	1.00	0.74
Tomopterna cryptotis	1	0.1	0.30	0.22
Bufo rangeri	1	0.1	3.00	2.25
Amphibia — unidentified	24	1.7	7.20	5.39
Amphibia — tadpoles	19	1.4	0.60	0.44
Reptilia	3	0.2	12.0	8.98
Mabuya capensis	2	0.1	6.00	4.49
Serpentes — unidentified	1	0.1	6.00	4.49
Mammalia	8	0.5	3.50	2.59
pieces of meat	3	0.2	1.50	1.11
pieces of intestines	4	0.3	2.00	1.48
Stones	1	0.1	1.00	0.74
Total	1 373	99.9	133.51	100.0

The former group was represented mainly by Acrididae, while the latter mainly by juvenile forms of Bull Frogs *Pyxicephalus adspersus*. Lepidopteran larvae only supplemented the diet. The larvae constituted staple food of the Cattle Egrets during the 1994/1995 drought, when these birds ceased to breed in the central Free State (Kopij & Butler 1996).

All over the Afrotropical region, Orthoptera and Anura constitute two main components in the diet of Cattle Egret chicks. These prey compose more than half of the total mass of the diet (Fig. 1). The proportion of these two prey groups may vary with geographical location, habitat, season of the year or prevailing weather conditions. In this study, markedly higher proportion of juvenile frogs and lower proportion of grasshoppers were recorded if compared with other studies (Fig. 1). This can be partly due to exceptionally low rainfall rather than due to different habitat or geographical location. After a prolonged drought, late breeding Cattle Egrets may forage mainly around dams and may switch to feed mainly on frogs and other small vertebrates living there. Under drought conditions, these vertebrates search for moisture and may become more common around dams and other water bodies than elsewhere. Cattle Egrets might be attracted by such local concentration of prey. This is partly supported by the fact that in similar habitat but under normal weather conditions, much lower proportion of frogs was recorded in the diet of Cattle Egret chicks (Kopij & Butler 1996, Kopij 1999a).

Large proportion of locusts in the Cattle Egret diet indicates that this bird may play an important role in controlling these insects regarded as harmful in agriculture. Dipterans are vectors of micro-organisms pathogenic to cattle and other domestic animals. Their relatively large proportion in the Cattle Egret diet confirm the opinion that this bird plays a role in pest control. Although the Afrikaans name of the Cattle Egret is "bosluisvöel" which means "tick bird", the role of this egret in controlling ticks infesting cattle and sheep has been probably greatly overestimated (Siegfried 1966, 1971, O'Connor 1993, Kopij 1999b and this study).

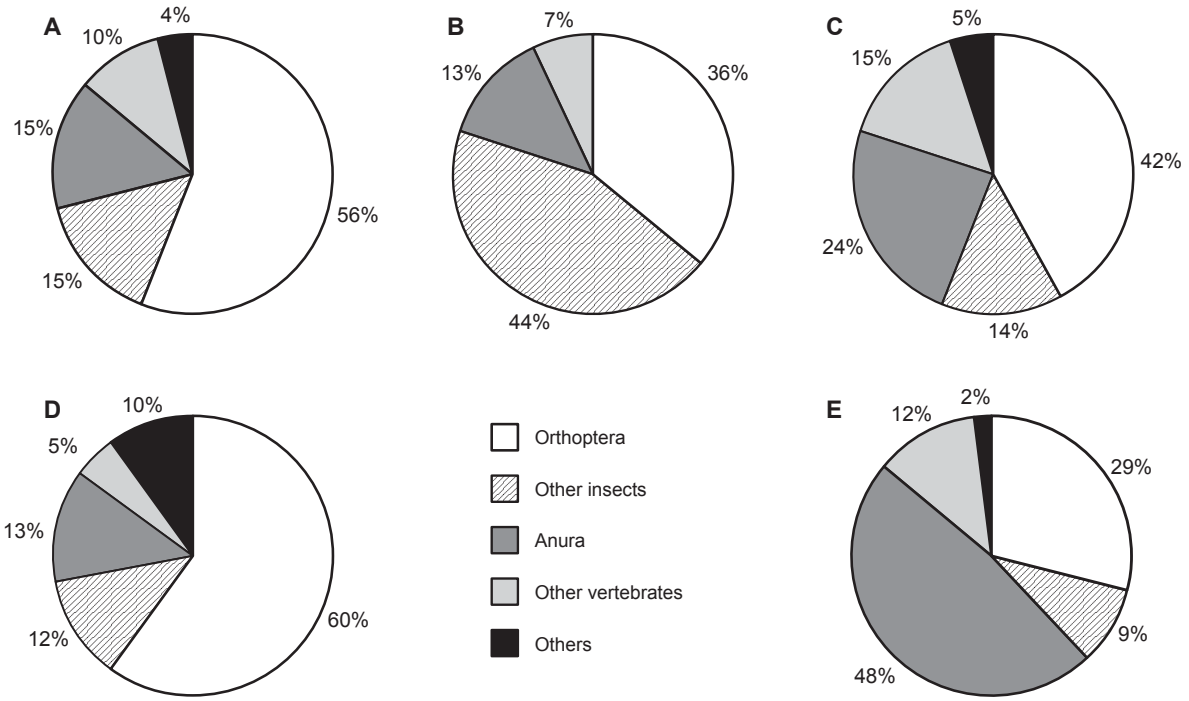

Fig. 1. Comparison of mass of the main components of the diet of Cattle Egret chicks studied at five localities. A — Paarl, Western Cape (Siegfried 1966), B — Stellenbosch, Western Cape (Siegfried 1971), C — Wolwekop, Free State (Kopij 1999b), D — Former Transval (O'Connor 1993), E — Bloemfontein, Free State (this study).

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STRESZCZENIE

[Pokarm piskląt czapelki złotawej w krajobrazie rolniczym Oranii, RPA]

Skład pokarmu piskląt z drugiego lęgu ustalono na podstawie analizy wypluwek zebranych w okresie przedłużającej się suszy (Tab. 1). W porównaniu z innymi rejonami afrotropikalnymi, widoczny był większy udział żab (głównie młodocianych form żaby olbrzymiej) a mniejszy prostoskrzydłych (szarańcza i świerszcze) (Fig. 1.). Było to prawdopodobnie związane z niższą niż zwykle ilością opadów. Duże ilości szarańczy i muchówek w diecie, wskazują że czapelka złotawa odgrywa ważną rolę w kontrolowaniu bezkręgowców negatywnie oddziałujących na gospodarkę rolną człowieka.