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Sex-biased kleptoparasitism of Hooded Mergansers by Ring-billed Gulls.—Kleptoparasitism is common in many seabirds (Furness 1987; Duffy 1980, 1982), including gulls (Grace 1980, Spear and Ainley 1993). In Laridae, 23 of 88 species have been reported to be kleptoparasites (Brockman and Barnard 1979). Among *Larus* gulls differences in kleptoparasitism of conspecifics and other gull species appears to be related to age, with young being pirated more often (Burger and Gochfeld 1981). Some parasitic seabirds may attack certain hosts while ignoring others (Spear and Ainley 1993). Selective kleptoparasitism appears to be related to host species' size and relative abundance (Spear and Ainley 1993), and age and experience of the pirate (Burger and Gochfeld 1981). I could not locate a reference where the parasitic species has shown a consistent preference for attacking one sex over the other of the same species. Here I report on observations of Ring-billed Gulls (*Larus delawarensis*) differentially kleptoparasitizing male and female Hooded Mergansers (*Lophodytes cucullatus*) feeding in a saltwater pond in the coastal saltmarsh of Aransas National Wildlife Refuge, in the coastal region of Texas in Refugio and Calhoun counties, approximately 65 km north of Corpus Christi.

TABLE 1

VISIBLE PREY CAPTURE RATES OF HOODED MERGANSERS AND NUMBER OF PARASITIC ATTACKS BY RING-BILLED GULLS AT A COASTAL SALTMARSH POND ON THE TEXAS COAST

Sex	Number of dives	Captures		Gull attacks		Prey theft	
		Total	%	Total	%	Total	%
Males	97	6	6	0		0	
	78	4	5	0		0	
	68	2	3	0		0	
	82	4	5	0		0	
Total	325	16	5	0	0	0	0
Females	79	3	4	2	66	1	50
	46	2	4	2	100	1	50
	34	1	3	1	100	1	100
	49	2	4	2	100	1	50
Total	208	8	4	7	88	4	57

In Texas, Ring-billed Gulls are abundant in winter along the coast and are known to rob food from several gull species (Payne and Howe 1976) and other water birds, particularly ducks, and they commonly parasitize diving and fish-eating duck species. No information on kleptoparasitism of Hooded Mergansers by Ring-billed Gulls is available.

During two days of observation, three (15 November) and one (16 November) pairs of Hooded Mergansers were foraging in a pond 20–50 m away from my blind. Water depth of the pond varied from 30–40 cm. On both days there was a Ring-billed Gull that followed (by swimming) a foraging pair of mergansers and was present the entire time there was any feeding activity by mergansers. The gull apparently followed the mergansers visually while they were underwater for at least one of the pair of ducks, usually the female, would emerge close (<1 m) to the gull after surfacing from a dive. After a successful capture by a female merganser, the gull would take flight and commence harassing the duck with prey. All prey captured by both sexes and brought to the surface consisted of small fish of unknown species. It is not known if it was the same gull following the mergansers on both days. At least three other Ring-billed Gulls joined the first gull in attacking the ducks but were present only for a few minutes after which they flew out of sight. The gull following the mergansers made no attempts to capture prey on its own the entire time it was watched.

During my observations, I followed the foraging activity of the pair of mergansers which the gull was following at the time. I recorded the number of dives by each sex and noted whether a prey item was captured and brought to the surface. After a successful dive by a merganser, the behavior of the Ring-billed Gull was noted as an attack on the merganser if it flew towards the duck and displayed aggression. I then noted whether the gull successfully robbed the merganser of its captured prey.

The Ring-billed Gull differentially parasitized the sexes of the mergansers, selecting females disproportionally (Table 1). Foraging males were never attacked despite their capturing twice as many visible prey (Table 1) as females. The females, however, were attacked 88% of the time after a prey capture. A single incidence was observed of a directed flight of a gull toward one of the males after a successful dive. On this occasion the gull flew toward the male after it surfaced with prey; however, the gull stopped short and did not attack, landing close to the male merganser. The male merganser made no effort to evade the gull as it flew toward it and merely stood its ground. In contrast, upon approach of a gull, females with prey dove or swam away from the gull which persistently chased a swimming bird or fluttered above the water waiting for a female to resurface after a dive. All observed attacks on females lasted less than one min and ended in release of prey or, less often, in consumption of prey by the female merganser. The gulls were successful in robbing the female mergansers of their prey 57% of the times they attacked.

The reasons for preferential parasitism of female Hooded Mergansers by Ring-billed Gulls are unknown. The sexes of the Hooded Merganser and other mergansers show only minor differences in size and weight (Bellrose 1980) but show striking sexual dimorphism in coloration. Since males and females were present in equal numbers during the entire time my observations took place, there was no local density dependent factor that may account for the gulls' differential attack on females. Lamore (1953) noted, over several weeks, that there were no Ring-billed Gull attacks on Common Mergansers (*Mergus merganser*) while both females and males were present in a reservoir in Washington D.C., but he saw repeated attacks and robbing of prey on females once males were no longer present in the reservoir. The reason for the behavior observed by Lamore is unexplained. Grace (1980) showed that Ring-billed Gulls attacked female Common Mergansers 12 times and males only once; however, there is no information regarding the number of each sex present at the time of the attacks.

Differential attacks on the sexes are unlikely to be related to sexual differences in prey capture success rates of the host. Male mergansers had greater prey capture rates, yet were not attacked. It is possible that female Hooded Mergansers are more susceptible to attack because of their behavioral response upon an imminent attack by a gull. If males stand their ground upon approach by a gull, as was observed, it may serve as a cue for the potential parasite that the prey will not be given up. Females may be more likely to be attacked because of their response to approaching gulls. Female mergansers may be more likely to give up prey or release prey with less harassment than males; therefore, it would be more profitable for a gull to expend energy attacking a female despite her lower prey capture success rate.

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Intraspecific variation in egg composition.—Intraspecific egg composition may vary depending upon the size of the egg (e.g., Ricklefs 1977, 1984; Boersma 1982; Birkhead and Nettleship 1984; Alisauskas 1986; Hepp et al. 1987; Rohwer 1986; Hill 1988; Arnold et al. 1991). Statistical techniques derived from allometry (the study of size and its consequences) customarily are used to examine the relation between egg size and egg composition (Reiss 1989). Typically, the log of egg component mass, such as wet albumen, is regressed on the log of egg mass ($\log[y] = \log[a] + b \log[x]$). The slopes of these functions (b) depict the rate at which the egg component varies with egg size. When the slope of a log-log function is equal to 1.0 (isometry), increases in egg size are accompanied by proportionate increases in the particular egg component; consequently, the percentage of egg component will remain constant across eggs of different sizes. Slopes greater than 1.0 (positive allometry) indicate that the component mass increases disproportionately with increases in egg mass; accordingly, large eggs will contain proportionately more component mass than will small eggs. Conversely, slopes less than 1.0 (negative allometry) demonstrate that components increase proportionately less than egg mass, so that large eggs will consist of relatively smaller amounts of the egg component.

Investigations of the allometric relation between egg components and egg size have yielded some apparent differences between altricial and precocial birds. For example, Ricklefs (1984) found for the altricial European Starling (*Sturnus vulgaris*) that albumen content varied isometrically with egg mass, whereas both yolk and lipid mass displayed negative allometry. Hence, the percentage of albumen remained more or less constant in eggs of different sizes, but the percentage of yolk and lipid decreased with increasing egg size. In contrast, Ankney (1980) demonstrated for the precocial Lesser Snow Goose (*Chen caerulescens*) that both albumen and yolk varied isometrically with egg size. To determine the generality of these findings a comparative analysis, using the published data on egg composition allometry, was conducted. The purpose of the present study was to ascertain whether differences exist between altricial and precocial birds with respect to the allometric variation of egg composition.

Methods.—I compiled data from 31 species in 16 families (a summary of species and sources is available from the author). For each species I noted the slope (b) of the allometric (log-log) functions for wet albumen mass, dry albumen mass, wet yolk mass, dry yolk mass, and lipid mass (y variables) regressed on egg mass (x). The general category of development for the species, altricial or precocial, was also recorded (Nice 1962). Because there is disagreement regarding the developmental classification of pelagic-feeding seabirds, I did not include them in the overall analysis (3 families) and present their data separately. The main