

CONSPECIFIC EGG DISCRIMINATION IN AMERICAN COOTS¹

TODD W. ARNOLD

Department of Zoology, University of Western Ontario, London, Ontario N6A 5B7, Canada.

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Many species of birds can discriminate eggs of other bird species that are added to their nests during interspecific brood parasitism (Rothstein 1975). The ability of birds to distinguish between their own eggs and the eggs of conspecifics could provide insurance against intraspecific brood parasitism and other forms of misdirected parental care (Lanier 1982). However, experiments with several bird species have failed to demonstrate intraspecific egg discrimination abilities (Peek et al. 1972, Hoogland and Sherman 1976, Burt 1977, Grzybowski 1979, Lanier 1982). Clutch size manipulations are commonplace in ornithology (see Lessells 1986:table 1), and such experiments have provided many additional opportunities to observe egg discrimination behavior. I am aware of only five bird species in which intraspecific egg discrimination has been documented: Common Murres, *Uria aalge* (Tschantz 1959); Royal Terns, *Sterna maxima* (Buckley and Buckley 1972); Caspian Terns, *S. caspia* (Shugart, in press); Village Weavers, *Ploceus cucullatus* (Victoria 1972); and Ostriches, *Struthio camelus* (Bertram 1979).

American Coots, *Fulica americana*, are occasionally parasitized by Redheads, *Aythya americana*, and Ruddy Ducks, *Oxyura jamaicensis* (Weller 1971), and by conspecifics (Fredrickson 1970; Arnold, pers. observ.). Weller (1971) demonstrated interspecific egg discrimination in coots that had been experimentally parasitized. In this note, I show that coots are also capable of conspecific egg recognition.

I examined the egg discrimination ability of American Coots nesting in southwestern Manitoba during 1985 and 1986. Six fresh coot eggs were experimentally added to each of eight coot nests during early egg laying. Added eggs were distributed randomly within the existing clutch. All eggs were numbered for individual identification using black indelible ink. On some experimentally added eggs this number was preceded by a small "x." Similarly marked eggs in 109 nests not employed in this experiment gave no indication that coots responded to egg marking. Nests were visited daily during egg laying and approximately every week during incubation. If eggs were missing from the clutch, I examined the nest bowl for buried eggs and, if necessary, searched the pond bottom surrounding the nest. Displaced eggs were returned to the clutch to see if they would be rejected again. Subsequent cases of egg re-

TABLE 1. Selective egg rejection in American Coots. Data include 11 cases of egg rejection from five coot nests (see text).

	Host's eggs	Added eggs
Eggs retained	84	46
Eggs rejected	2	18

jection were treated as statistically independent observations.

Egg rejection occurred at five of the eight experimental coot nests (63%), and it was observed on 11 occasions (one to three occasions per nest). Usually just one egg was rejected per observation ($n = 8$ occasions), but up to three ($n = 2$) and six ($n = 1$) eggs were rejected simultaneously. Eggs that I experimentally added were much more likely to be rejected than the coots' own eggs (Table 1, 2×2 contingency table, $G = 21.24$, $P < 0.001$). One egg was found submerged beneath the nest, all others were rejected by burial in the nest bowl. Egg burial was not observed at 109 control nests, although five eggs were found submerged beneath nests. Fredrickson (1969) observed egg burial at coot nests with experimentally enlarged clutches, but he did not identify which eggs had been buried.

Two of eight coots responded to egg additions by deserting their clutch. Desertion was not observed in 109 control nests which received similar levels of investigator disturbance.

Although coots were successful at egg discrimination when they rejected eggs, they rejected only 28% of the added eggs that were present at any one time. Victoria (1972) and Bertram (1979) also observed a low frequency of errors during intraspecific egg rejection coupled with incomplete rejection of foreign eggs. Because their young hatch asynchronously, coots may incur only negligible costs from retaining conspecific eggs added during late egg laying or incubation (see Fredrickson 1969, Horsfall 1984), but there may be considerable cost associated with inadvertently rejecting or damaging their own eggs during foreign egg removal attempts (Victoria 1972). American Coots are highly territorial (Fredrickson 1970), and this may be a more efficient deterrent of intraspecific brood parasitism than egg discrimination.

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GRASSHOPPER CONSUMPTION AND SUMMER FLOCKS OF NONBREEDING SWAINSON'S HAWKS¹

C. G. JOHNSON, L. A. NICKERSON, AND M. J. BECHARD
Department of Biology, Boise State University, Boise, ID 83725

Key words: Swainson's Hawk; *Buteo swainsoni*; grasshoppers; flocking.

Over the past 100 years, several large flocks of Swainson's Hawks (*Buteo swainsoni*) have been reported in western North America. The accounts describe what appear to have been premigratory aggregations of up to 200 hawks gathered in late summer in locations experiencing grasshopper infestations (Fisher 1893, Bent 1937, Taylor 1946, Woffinden 1986). In June 1985, five flocks (\bar{x} = 76 birds) of immature and adult Swainson's Hawks were observed in southern Saskatchewan and Idaho in areas undergoing grasshopper outbreaks, but, in this case, flocking occurred a full 2 months earlier than previously reported.

We monitored the daily activities of one flock which

was located 11 km southwest of Boise, Idaho, in a 36-km² area of agricultural habitat that consisted of alfalfa and corn fields heavily infested with grasshoppers (*Melanoplus* spp.). The area was crossed at 1.6-km intervals by county roads and included a canal system and reservoir that supported small stands of cottonwoods (*Populus trichocarpa*). It also contained three active Swainson's Hawk nests with young raised successfully in at least two. The third nest, when found in August, was being used as a roost so we were unable to ascertain its productivity.

Observations were made daily between 19:30 and 22:00. We drove within 100 m of the flock and used a window mounted spotting scope to make counts and record observations on feeding behavior. Pellets were collected at the bases of roost trees throughout the summer to determine the diet. Collections were made late in the day prior to beginning daily observations but, on two occasions, pellets were collected in the morning to obtain fresh samples. Mammal bones and insect body parts were used to identify prey.

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