



First records of active bait fishing for Great (White) Egrets (*Ardea alba*)

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Abstract

Active bait fishing behavior is well known for the *Butorides* species, and this behavior has been reported for nine species of heron (Réglade *et al.* 2014). We report and discuss here the first documentation of active bait fishing Great (White) Egrets *Ardea alba*.

Key words: Ardeidae; baiting; *Butorides* sp.; innovation; tool-use.

Introduction

The publication of new and/or unusual behaviors in birds is of importance as these reports constitute the raw information for a recent research in animal cognition, which compares the rate of innovation and the brain size among taxonomic groups in a larger perspective of studies on innovation mechanisms in vertebrates (Overington *et al.* 2009).

Since the first direct record in 1957 of an active baiting or bait fishing Green Heron (*Butorides virescens*), this unusual behavior has been reported for 15 bird species of which nine are herons (Kushlan 2011, Ruxton and Hansell 2011, Lovell 1958, Oake and Oake 2014, Réglade *et al.* 2014).

We report here the tenth active baiting heron

species as proved by three first observations (of which two are videos) of Great Egrets *Ardea alba* fishing with bread as bait.

Results

Three observations have been found by a targeted search on the internet.

The oldest record of a possible active bait-fishing Great Egret is simply documented by one commented photograph posted on Flickr. On the 18th of August 2006, this bird found a piece of pizza crust on the shore of Lake Emerald (Florida, USA), dropped it on the water and watched it as it drifted (Schutter 2006).

The second record is based on four videos of a

Great (White) Egret observed and filmed in the public garden of the Museum of the Republic in Rio de Janeiro, Brazil, on in the morning of 30 November 2012 (Carlos dos Santos 2012a, b, c, d, e). This urban garden with an ornamental man-made pond is situated near the Bay of Guanabara (Atlantic Ocean) and its mangroves, where many herons feed. An aquatic turtle and very small fish (Carlos dos Santos 2012b) can be seen in this pond where fish are mainly represented by Cyprinidae (carps) and Cichlidae (*Tilapia* sp., *Geophagus brasiliensis*), some individuals of which are larger than the egret itself.

The observer, who previously filmed a Great Egret fishing in this pond (Carlos dos Santos 2012a), noticed this time that the heron stood and crouched on the concrete edge and seemingly tried to fish by manipulating pieces of bread thrown on the water by a man from a bridge above. In one of the videos (Carlos dos Santos 2012d) the egret manipulates and crumbles the largest floating bread pieces four times, then drops the pieces within striking range and makes an unsuccessful strike. This egret could have accessed the floating bread directly but during this video sequence she took a large piece of bread on her left side, crumbled it and dropped the smaller pieces just in front of her (second bread manipulation out of four). At one time she appeared to be looking so intently at potential prey that she almost fell into the water. Another video (Carlos dos Santos 2012c) shows a picking up of some bread to crumble it before dropping the pieces, two unsuccessful strikes and a short interaction with a Chinese goose (*Anser cygnoides*). Indeed, a couple of Chinese Geese occasionally robbed the bread from the Great Egret (Carlos dos Santos 2012e). Although it made several strikes with two observed successes, the egret did not catch many prey, maybe because the fish were too big.

Finally, a third record was filmed and observed during several days mid-June 2013 in the

Iberostar Hacienda Dominicus hotel in Punta Cana - Dominican Republic (Mitchell 2013). During this footage, a Great Egret can be seen manipulating pieces of bread in a pond and finally catching a fish. Guests often threw bread to feed ducks and coots. As fish fed on the bread, herons of three species (one Great Egret, two Snowy Egrets (*Egretta thula*) and several Green Herons could alternatively practice passive and active bait fishing (Réglade and Mitchell 2014). If the bread sank too deep, this egret would actually grab the bread out of the water and drop it again. It would bring to the pond bits of bread landed on the shore. It would also keep previously used bread to re-use it farther away. This Great Egret was observed catching fish roughly every minute while the supply of suitable bait lasted.

Discussion

To qualify it as an active bait fishing behavior, the use by an animal of an edible (bait) or inedible (lure) item to attract and/or distract fishes in order to catch them followed by a waiting period, some longer some shorter, must be observed (Ruxton and Hansell 2011). In the 2006 Florida case, noted above, the report of active baiting for Great Egret seems real but is insufficiently documented to be conclusive (Schutter 2006).

The main issue with the two other filmed observations (Carlos dos Santos 2012d, Mitchell 2013) is to confirm active bait fishing behavior after having eliminated other alternative hypothesis. A hypothesis of this behavior being a simple play, as observed for other heron species with different items, seems improbable because these birds were clearly fishing just after manipulating bread with successful fish catching. A second hypothesis being a removal of the bread from water in order to better see prey, seems also improbable, especially for the 2012 Brazilian case because one time it took some bread on its left and put it

just in front of itself (Carlos dos Santos 2012d). A third hypothesis being a softening of bread in order to eat it can be eliminated because these birds did not eat the bread at all and in fact caught fish.

In order not to over interpret such observations, and to be sure of a non-random behavior, other behavioral signs are important to note during observed bait fishing sequences. In the case of these two egrets, several aspects of their behavior reinforce their active and seemingly deliberate component: 1) bringing pieces of bread from the shore on the water as shown in the 2013 Dominican case (bait bringing); 2) taking large pieces of bread not immediately within its striking range in order to drop them just in front of itself as shown by the 2012 Brazilian case or grabbing the pieces out of the water if it sank too deep before dropping it again shown by the 2013 Dominican case (bait repositioning); 3) crumbling the largest pieces of bread as shown by the 2012 Brazilian case could be bait resizing as every time it took a piece the egret briefly and vigorously stirred his head from right to left (note that this action has been observed for a Green Heron too (Cardona 2011)); 4) several trials of fish catching with two successes for the 2012 Brazilian case and more for the 2013 Dominican case.

Thus together these observations can be accepted as the first available records of active bait fishing Great Egret. Like *Butorides*, Great (White) Egret has a widespread range around the World and presents a great ability to adapt its feeding tactics and strategies (Kushlan and Hancock 2005). But unlike *Butorides* species, with several decades of reported active bait fishing behavior observations since 1957 (Kurosawa and Higuchi 1993), we have found only the three recent observations of Great Egrets actively using bait, a possible case in 2006 and two certain cases in 2012 and 2013, which is intriguing especially when considering that passive bait fishing is known at least since 1957 for this species (Lovell 1958). Maybe these

Great Egrets only recently learnt how to fish with bread after observing humans feeding birds and fish and after making the logical association between bread in water and fish aggregation feeding on bread, like recently suggested for Black-crowned Night Heron (*Nycticorax nycticorax*) (Pratt *et al.* 2011). Or maybe ornithologists previously missed this active behavior in the wild or had not published their observations, like for the Black-crowned Night Heron (Réglade *et al.* 2014).

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