

ACTIVITIES OF THE LITTLE CORMORANT, *PHALACROCORAX NIGER* (VIEILLOT) IN RELATION TO SUNLIGHT IN CAPTIVITY

Habibon Naher and Noor Jahan Sarker
Department of Zoology
University of Dhaka, Dhaka – 1000, Bangladesh

ABSTRACT

The study of the activities of the little cormorant (*Phalacrocorax niger*) was carried out from November 2000 to October 2001 in Dhaka Zoo, Mirpur, Bangladesh. Time spent in preening was the highest (32.25 min/h) in rainy day, lowest (22.47 min/h) in cloudy day and intermediate (14.73 min/h) in sunny day. They rested the highest time (20.77 min/h) in sunny day, lowest (10.57 min/h) in rainy day and intermediate (19.52 min/h) in cloudy day. Diving was observed for the highest (2.25 min/h) in sunny day, lowest (1.15 min/h) in rainy day and in between (1.56 min/h) in cloudy day. Time spent for sunning was the highest (8.44 min/h) in rainy day, lowest (6.75 min/h) in sunny day and intermediate (7.24 min/h) in cloudy day. Gasping was recorded for the highest (9.5 min/h) in sunny day, in between (6.04 min/h) in cloudy day, lowest (5.64 min/h) in rainy day. Time spent for bathing was the highest (6.15 min/day) in sunny day, intermediate (3.17 min/day) in cloudy day and lowest (1.45 min/day) in rainy day. On an average flutter was recorded for the highest time (17 times/h) in sunny day, lowest (4 times/h) in rainy day and in between 11 times/h in cloudy day. Bowing was recorded for the highest (23.3 times/h) in sunny day, lowest (5.2 times/h) in rainy day and intermediate (9.6 times/h) in cloudy day. Mutual display was the highest (10.66 min/h) in rainy day, lowest (5.83 min/h) in sunny day and in between (8.44 min/h) in cloudy day. Mounting was the highest (7 times/day) in rainy day, lowest (4 times/day) in sunny day, intermediate (5 times/day) in cloudy day.

Key words: *Phalacrocorax niger*, sunlight, captivity.

INTRODUCTION

The little cormorant, *Phalacrocorax niger* (Vieillot) is typically a fresh water bird of lakes and rivers and even roadside ditches and ponds (Smythies 1953). It lives exclusively on fish (Ali 1977). Detail information of this bird in Bangladesh is scanty except "experimental studies on food habits of the little cormorant (*Phalacrocorax niger*) (Sarker and Naher 2002)" and "daily activities of the little cormorant (*Phalacrocorax niger*)" (Sarker and Naher 2003). Works on other species of this group like, *P. penicillatus*, *P. aristotelis*, *Nannopterum harrisi*,

etc. have been done by many workers in different countries (Laidlaw 1942, Lamsden and Hadow 1946, Snow 1965). But so far as the information collected it is revealed that the daily activities in relation to sunlight have not yet been studied in cormorants. Hence, an attempt has been taken to study the activities of the little cormorant in relation to sunlight.

MATERIALS AND METHODS

The study was performed in Dhaka Zoo, Mirpur. The area was visited twice in a week. The study was carried out from November 2000 to

October 2001. The observation was made on 19 little cormorants kept in two cages, 8 were in cage named B-14 and 11 birds were in cage named B-15. The size of each cage was 11.96 m x 7.44 m x 3.70 m. One side of the cage had brick wall and the three sides and roof were fitted with nets and iron rods. There was a pool measuring 4.88 m x 2.46 m x 36 cm depth. There were two trees (*Streblus asper*) inside in each cage with 3.44 m and 3.30 m tall for giving a natural environment and habitat to the birds.

During the study period, the activities of the little cormorant were observed only during the day (7:00 am – 5:00 pm) throughout the year, as this bird species is diurnal.

RESULTS AND DISCUSSION

Activities of the little cormorant in relation to sunlight

Preening: Time spent in preening was the highest (32.25 min/h) in rainy day, lowest (22.47 min/h) in cloudy day and intermediate (14.73 min/h) in sunny day (Fig. 1). It was observed that in rainy day the birds were wetted out, so to dry the feathers, the birds were noted to preen the feathers. According to Sarker and Naher (2002) the preening was the highest (1 h 52 min/day) in February and the lowest in August (26 min/day).

Resting: In the observation it was noted that the birds rested for 20.77 min/h in sunny day, 10.57 min/h in rainy day and intermediate (19.52 min/h) in cloudy day (Fig. 1). Sarker and Naher (2002) reported that they took rest about 6.30 h/day in November. Smythies (1953) mentioned that the little cormorants are seen singly or in large flocks, which roost in company in trees. Mackintosh (1914) described that the large cormorants were usually seen sitting motionless on the rocks probably after a meal or mediating on another excursion into the turbid waters.

Diving: Diving was observed for the highest time (2.25 min/h) in sunny day, lowest (1.15 min/h) in rainy day and in between (1.56 min/h) in cloudy day (Fig. 1). According to Sarker and Naher (2002) the diving was the highest (18 times/day) in April and lowest (7 times/day) in November. They also described that they always dived after taking foods and in each dive, they spent 1 to 3 seconds. Lamsden and Haddow (1946) reported that the longest dives varied in individual cases from only 40 sec to 1 min 40 sec and the shortest dives from 5 to 35 sec and the mean was 40 sec. Wallace (1963) mentioned that the cormorants are surface diver. Alertsam (1990) noted the cormorants swim on the surface and from dive under the water and hunt fish, sometimes at considerable depths (10 km or more). Heinroth and Heinroth (1962) described that European cormorants have been recorded down to 60 ft. Mackintosh (1914) described that the cormorants are expert divers. Thomson (1965) mentioned that it may reach a considerable depth, but it commonly brings its catch to the surface before swallowing it.

Sunning: During the study day period, it was observed that time spent in sunning was the highest (8.44 min/h) in rainy day, lowest (6.75 min/h) in sunny day and intermediate (7.24 min/h) in cloudy day (Fig. 1). They sunned after diving, bathing and raining when they got wet. During sunning, they extended their both wings for several seconds. They rubbed their feathers with bill first on the dorsal side of the right wing, gradually continued to the ventral side, then went into the left wing and did repeatedly. Finally, the left side of the head feather was rubbed with left leg and the right side with the right leg. The tail feather was also rubbed with the bill. When one wing rubbed another was remained in the folded position. According to Sarker and Naher (2002) time spent was the highest (50 min/day) in November and lowest (10 min/day) in March. Heinroth (1962) described that

as soon as they finished their bathing or fishing they go ashore and hold their wings out for some minutes to dry. Whistler (1963) described that the little cormorant perches both on the ground and on rocks and on trees.

Gasping: In sunny day, gasping was recorded for the highest (9.5 min/h) in sunny day, lowest (5.64 min/h) in rainy day and in between (6.04 min/h) in

cloudy day (Fig. 1). During this time, the neck was erected upward, the bill was extended forward, the bill was half opened and the gular pouch and the throat were moved continuously, the wings placed at the side. In this time, they stood or sat on the branches of the trees or the cornice or the iron rods that were made to sit for the birds.

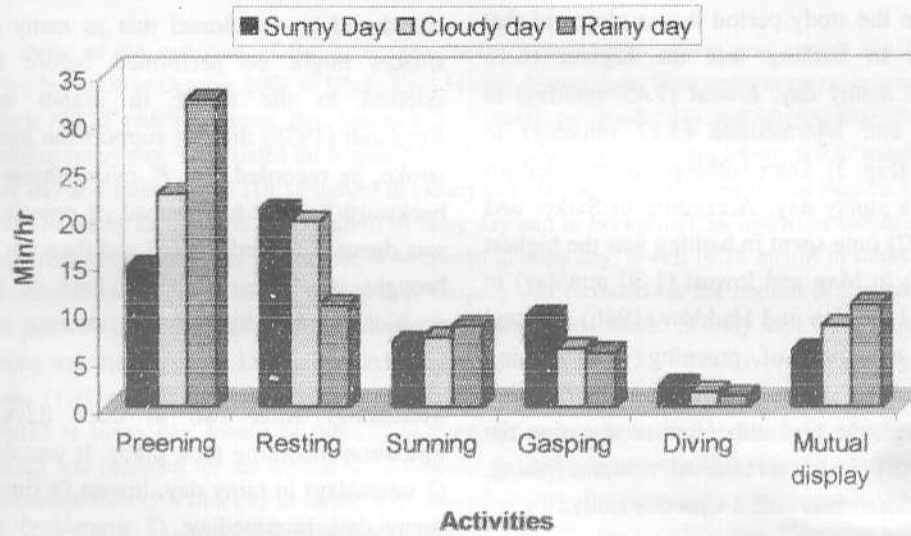


Fig. 1. Activities of the little cormorant in relation to sunlight.

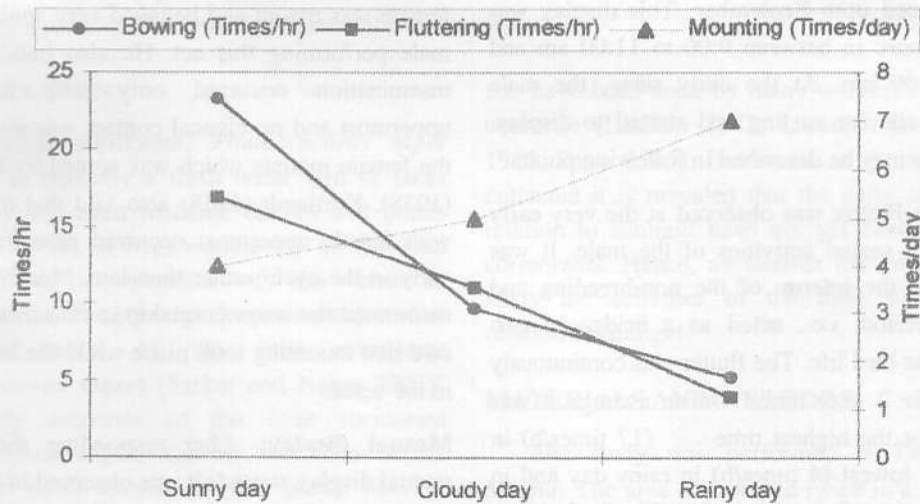


Fig. 2. Sexual activities of the little cormorant in relation to sunlight.

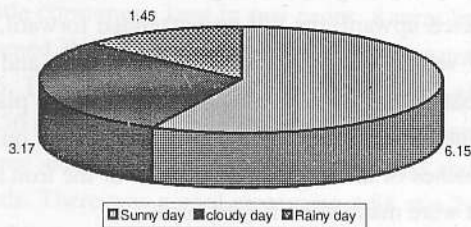


Fig. 3. Bathing time (min/day) of the little cormorant in relation to sunlight.

Bathing: In the study period it was observed that time spent in bathing was the highest (6.15 min/day) in sunny day, lowest (1.45 min/day) in rainy day and intermediate (3.17 min/day) in cloudy day (Fig. 3). Once bathing was recorded for 25 min in a sunny day. According to Sarker and Naher (2002) time spent in bathing was the highest (4 min/day) in May and lowest (1.30 min/day) in December. Lamsden and Haddow (1946) reported that after a period of preening and washing accompanied by vigorous flapping of the half opened wings, the bird either settles down on the water, flies off or after an interval, resumes fishing, which is a close observation with this study.

Sexual activities: The sexual activities of the little cormorant in captivity were started from February and continued upto September. This display was observed more in between 9:00 to 11:00 am and 2:40 to 4:00 pm. At the early stage, the male selected a site for nesting and started to display. The display may be described in following points:

Fluttering: Flutter was observed at the very early stage of the sexual activities of the male. It was observed at the interim of the non-breeding and breeding period, i.e., acted as a bridge in two stages of the bird life. The flutter was continuously occurred for 2 to 9 times. On an average it was recorded for the highest time (17 times/h) in sunny day, lowest (4 times/h) in rainy day and in between 11 times/h in cloudy day (Fig. 2). Laidlaw

(1942) recorded that in case of brandt cormorant (*P. penicillatus*) the time spent in fluttering was 25 seconds.

Bowing: Within 1 to 2 days of advertising display flutter and bowing was observed together. Bowing was recorded for the highest (23.3 times/h) in sunny day, lowest (5.2 times/h) in rainy day and intermediate (9.6 times/h) in cloudy day (Fig. 2). Laidlaw (1942) observed that this display in brandt cormorant but did not mention about the uttering sound and he mentioned that as many as fifteen strokes might be performed before the birds referred to the flutter in brandt cormorant. Kortlandt (1938) did not support the hammer-like stroke, he recorded that *P. carbo* threw the head backward but the bill instead of pointing upward was directed toward the tail and then the head was brought slowly forward and back to the same positions repeatedly and was uttering a gargling sound.

Mounting: After two to three days of pair formation mounting took place. It was the highest (7 times/day) in rainy day, lowest (4 times/day) in sunny day, intermediate (5 times/day) in cloudy day (Fig. 3). Laidlaw (1942) described that in brandt cormorant, at the early stage of pairing the female was mount and behaved very similarly to a male performing this act. He also indicated that insemination occurred only with the male uppermost and no cloacal contact was made when the female mounts which was agreed by Kortlandt (1938). Kortlandt (1938) also said that mountings with female uppermost occurred more frequently early in the cycle rather than late. Mendall (1936) mentioned the water courtship in *P. auritus* and he said that mounting took place while the birds were in the water.

Mutual display: After responding the female mutual display started. It was observed in the study period that this display was performed by both of

the pair. In rainy day it was observed more than other. It was the highest (10.66 min/h) in rainy day, lowest (5.83 min/h) in sunny day and in between (8.44 min/h) in cloudy day (Fig. 1).

ACKNOWLEDGEMENTS

The authors are grateful to the Dhaka Zoo authorities for permitting them to perform the study there and for their co-operation throughout the study.

REFERENCES

- Alertsam, T. 1990. *Bird Migration*. Cambridge University Press, London, 420 pp.
- Ali, S. 1977. *The Book of Indian Birds* (10th edition). Bombay Nat. Hist. Society. Bombay, India, 175 pp.
- Heinroth, O. and K. Heinroth. 1962. *The Birds*. Michigan University Press, America, 181 pp.
- Kortlandt, A. 1938. De uitrukkingsbewegingen en geluiden van *Phalacrocorax carbo sinensis* (Shaw and Nodder). *Ardea*. 27:1-40.
- Laidlaw, W. 1942. Display and sexual behaviour of the Brandt Cormorant. *The Condor* 44(3):86-104.
- Lamsden, W. and A. Haddow. 1946. The food of the Shag (*Phalacrocorax aristotelis*) in the Clyde sea area. *J. Anim. Ecol.* 15:36-42.
- Mackintosh, L.J. 1914. *Birds of Darjeeling and India*. Part 1. J.N. Banerjee and Son Banerjee, Calcutta, 233 pp.
- Mendall, H.L. 1936. The home-life and economic status of the double-crested cormorant *Phalacrocorax auritus auritus* (Lesson). *Univ. Maine Studies. Maine Bull.* 39(3):159 pp.
- Sarker, N.J. and H. Naher. 2002. Experimental studies on food habits of the little cormorant, *Phalacrocorax niger* (Vieillot). *Bangladesh J. Zool.* 30(2):173-182.
- Smythies, E.B. 1953. *The Birds of Burma*. 2nd edition. Oliver and Boyd, Tweeddale Court, London, 668 pp.
- Snow, B.K. 1965. Observations on the behaviour and ecology of the flightless cormorant (*Nonnopterum harrisi*) *IBIS* 108:265-281.
- Thomson, A.L. 1965. *A New Dictionary of Birds*. The British Ornithologists' Union. London. 928 pp.
- Wallace, G.J. 1963. *An Introduction to Ornithology*. 2nd edition. The Macmillan Company. New York Collier-Macmillan Ltd. London, 491 pp.
- Whistler, H. 1963. *Popular Handbook of Indian Birds*. 4th edition. Revised and enlarged by Norman B. Kinner. Edinburgh, Oliver and Boyd, London, 560 pp.