

**MORPHOMETRIC ANALYSIS OF THE LITTLE CORMORANT  
(*PHALACROCORAX NIGER*)**

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**Abstract:** A total of 49 birds (10 hatchlings, 20 fledglings and 19 adult) of the Little Cormorant (*Phalacrocorax niger*) was taken for the study of morphometric analysis. The study was conducted at Dhaka Zoo, Mirpur and in a village under Chandpur district from January 2003 to December 2004. The average body weights of hatchlings, male fledglings, female fledglings, adult males and adult females were 10.45 ± 3.6 g, 573.5 ± 49.04 g, 520 ± 46.37 g, 527 ± 43.79 g and 460 ± 10.31 g, respectively. The body length of these birds were 7.55 ± 1.24 cm, 53.32 ± 2.25 cm, 51.24 ± 1.25 cm, 52.37 ± 3.5 cm and 51.42 ± 1.25 cm, respectively. The wing lengths of these birds were 3.36 ± 0.635 cm, 37.62 ± 0.613 cm, 36.6 ± 0.37 cm, 37.86 ± 2.03 cm and 36.88 ± 1.23 cm, respectively. The tail lengths of the male fledglings, female fledglings, adult males and adult females were 14.4 ± 0.524 cm, 11.98 ± 0.716 cm, 16.98 ± 0.498cm, 13.5 ± 0.612 cm, respectively. The leg length of the hatchlings, male fledglings, female fledglings, adult males and adult females were 3.36 ± 0.58, 12.76 ± 0.83, 18.53 ± 0.64, 18.41 ± 1.55, 10 ± 0.64 cm, respectively.

mvi-mstf]c: cvbtKŠno cmlLi emn`K At½zi AvKvi AvKuzi Dci GKwJ Mtel Yv KivR Kivi Rb` tgvU 49 wJ cvbtKŠno (10 wJ m`cŃwJZ erPvi, 20 wJ DotZ mŃlg erPvi Ges 19 wJ cY@eq` ) cmlL tbcv nq| Mtel YwJ Rvbpvix 2003 t\_½K wWtmt=Ń 2004 mvj chŠ-XivKv wPwqvLvbvq Ges Pw` cij tRj vi AŠMz GK MŃtg Kiv nq| D³ Mtel Yvq t`Lv hvq wWg t\_½K m`cŃwJZ cvbtKŠno erPvi, DotZ mŃlg bi l gwr` cvbtKŠno Ges cY@eq` bi l gwr` cvbtKŠno cmlLi Mo l Rb h\_vptg 10.45 ± 3.6 MŃg, 573.5 ± 49.04 MŃg, 520 ± 46.37 MŃg, 527 ± 43.79 MŃg Ges 460 ± 10.31 MŃg; Gt` i Mo `N` h\_vptg 7.55 ± 1.24 tm.wg., 53.32 ± 2.25 tm.wg., 51.24 ± 1.25 tm.wg., 52.37 ± 3.5 tm.wg. Ges 51.42 ± 1.25 tm.wg.; Gt` i cvLvi Mo `N` h\_vptg 3.36 ± 0.635 tm.wg., 37.62 ± 0.613 tm.wg., 36.6 ± 0.37 tm.wg., 37.86 ± 2.03 tm.wg. Ges 36.88 ± 1.23 tm.wg.; DotZ mŃlg bi l gwr` cmlLi erPvi Ges cY@eq` bi l gwr` i cŃQi Mo `N` h\_vptg 14.4 ± 0.524 tm.wg. l 11.98 ± 0.716 tm.wg. Ges 16.98 ± 0.498 tm.wg. l 13.5 ± 0.618 tm.wg. | wWg t\_½K cŃwJZ erPvi, DotZ mŃlg bi l gwr` Ges cŃSeq` bi l gwr` cmlLi cvtqi Mo `N` h\_vptg 3.36 ± 0.58, 12.76 ± 0.83, 18.53 ± 0.64, 18.41 ± 1.55 Ges 10 ± 0.64 tm.wg.

**Key words:** Morphometric analysis, Little Cormorant, Bangladesh.

**INTRODUCTION**

There are 38 species of cormorants and shags in the world (Anon 2003). In India, there are four species, namely pygmy cormorant (*Phalacrocorax pygmaeus*), little cormorant (*P. niger*), Indian cormorant (*P. fusciculis*) and great cormorant (*P. carbo*) (Anon 2003). In Bangladesh, there are three species of cormorants, such as the great cormorant (*P. carbo*), the little cormorant (*P. niger*) and the Indian cormorant or shag (*P. fusciculis*) and one species of Darter

(*Anhinga melanogaster*) (Husain 1979, Sarker and Sarker 1988). Extensive works have been done on different species of cormorants in different countries of the world like, Lumsden and Haddow (1946), Stevens (1933), Snow (1960), Blaber and Wassenberg (1989), Williams (1942), Ross (1973), Platteeuw *et al.* (1995) etc. In Bangladesh, some works have been done on different aspects of the Little Cormorant (Naher and Sarker 2004, 2008a,b, Sarker and Naher 2002, 2003, 2007, 2008). But little information is available on the morphometric analysis of the little cormorant except Jerdon (1862), Barnes (1981) and Smythies (1953). So an attempt has been taken to study the morphometric analysis of little cormorant (*P. niger*) in Bangladesh.

### OBJECTIVES

An attempt was therefore made to collect data about the morphometry of the little cormorant (*C. niger*) in Bangladesh.

### MATERIAL AND METHODS

This study was performed at the Dhaka Zoo, Mirpur and in a Colony at the village Shonagada under Chandpur district.

A total of 20 hatchlings, 10 male fledglings, 10 female fledglings, 10 adult males and nine adult females was used in this study. The sex of adult and young was determined by the examination of hemipenis anal region. The adult males and females were collected from the captivity. The hatchlings and fledglings were collected from the colony. The body weight, body length, wing length, tail length and leg length were measured. The relationship of body weight with body length, wing length, tail length and leg length were considered. This relationship was determined statistically following the application of regression co-efficient and correlation co-efficient at 1% level of probability.

### RESULTS AND DISCUSSION

*Body weight:* Weight of the hatchlings (n = 20) was measured on the day of hatching. The weight varied from 4 g to 18.2 g ( $10.45 \pm 3.6$  g). It was always observed that the low weighed (4 to 7 g) hatchlings died immediately after hatching or within one day of hatching.

The body weight of the male fledgling varied from 495 to 620 g ( $573.5 \pm 49.04$  g) (n = 10) and that of female was 455 to 625 g ( $520 \pm 46.37$  g) (n = 10).

The body weight of the adult male ranged from 490 to 610 g ( $527 \pm 43.79$  g) (n = 10) and that of female was 450 to 480 g ( $460 \pm 10.31$  g) (n = 9) (Fig. 1).

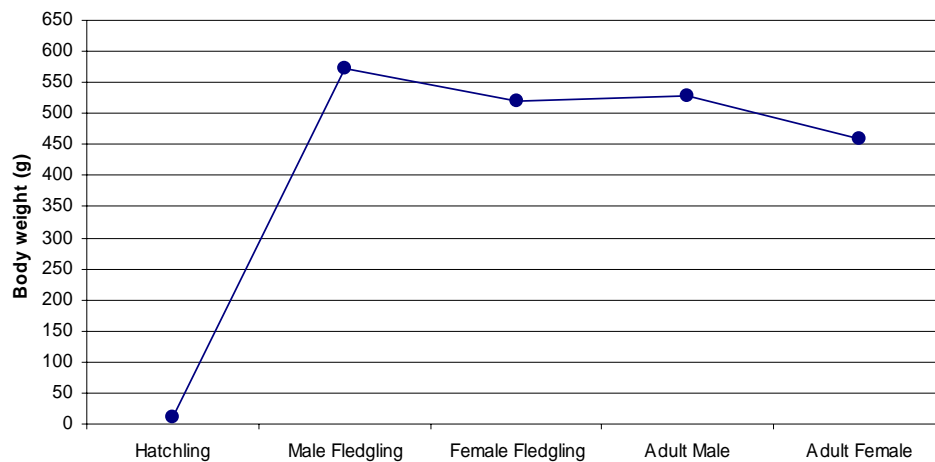


Fig. 1. Body weight at different stages of the little cormorant.

*Body length:* The body length of the hatchlings ranged from 6.32 to 10.8 cm ( $7.55 \pm 1.24$  cm) ( $n = 10$ ).

The body length of the male fledglings varied from 51 to 55.8 cm ( $53.32 \pm 2.25$  cm) ( $n = 10$ ) and in the case of the female it was 50 to 53.66 cm ( $51.42 \pm 1.25$  cm) ( $n = 10$ ).

The average body length of the adult varied from 47 to 59.4 cm ( $50.56 \pm 2.75$  cm) ( $n=19$ ). Whistler (1949) and Smythies (1953) reported that the length was 50.8 cm. According to Barnes (1981) and Jerdon (1862) the length ranged from 22.86 to 50.8 cm. Mackintosh (1914) reported that the length was 68.6 cm.

In this study the body length of the adult male ranged from 49 to 59.4 cm ( $52.37 \pm 3.5$  cm) ( $n = 10$ ) and in case of female it was 47 to 50.9 cm ( $48.44 \pm 1.52$  cm) ( $n = 9$ ) (Fig. 2).

*Wing length:* The wing length of the hatchlings varied from 2.01 to 4.55 cm ( $3.36 \pm 0.635$  cm) ( $n = 20$ ) on the day of hatching. The wing length of male fledgling ranged from 36.87 to 38.9 cm ( $37.62 \pm 0.613$  cm) and that of the female it was 35 to 38.95 cm ( $36.6 \pm 1.37$  cm) ( $n = 10$ ).

The average wing length of the adult varied from 34.5 to 41.65 cm ( $37.01 \pm 1.97$  cm) ( $n=19$ ). Jerdon (1862) and Barnes (1981) reported that the wing length was 21.6 cm and wing expanse was 81.3 cm.

In the present study the wing length of the adult male ranged from 36.33 to 41.65 cm ( $37.86 \pm 2.03$  cm) ( $n = 10$ ) and that of the female was 34.5 to 37.3 cm ( $36.88 \pm 1.23$  cm) ( $n = 9$ ) (Fig. 2).

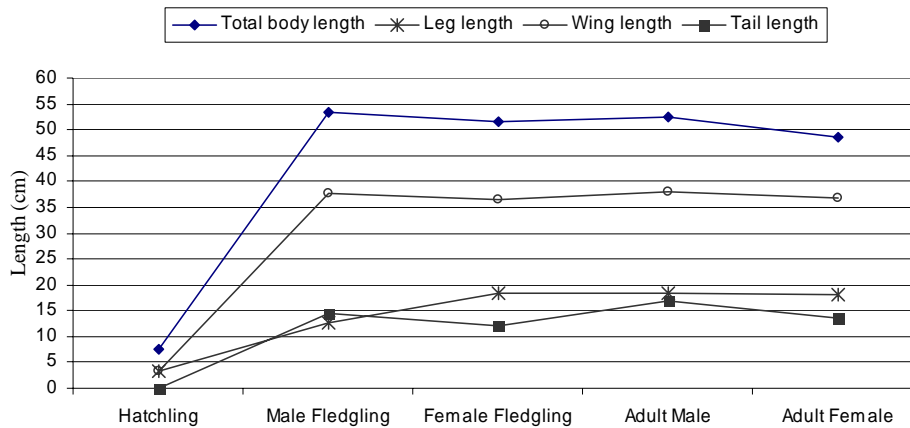


Fig. 2. Measurement of different body parts at different stages of the little cormorant.

**Tail length:** The tail length of the male fledgling ranged from 13.56 to 15.20 cm ( $14.4 \pm 0.524$  cm) and in female fledgling it was 11 to 13.2 cm ( $11.98 \pm 0.716$  cm). In the case of the adult male, it was 15.14 to 17.56 cm ( $16.98 \pm 0.498$  cm) and in the adult female it was 13.14 to 14.4 cm ( $13.5 \pm 0.612$  cm) (Fig. 2).

**Leg length:** The leg length of the hatchlings ranged from 2.55 to 4.88 cm ( $3.36 \pm 0.58$  cm) ( $n = 20$ ). In case of male fledgling, it ranged from 16.88 to 19.30 cm ( $12.76 \pm 0.83$  cm) ( $n = 10$ ) and in the females it was 8 to 19.55 cm ( $18.53 \pm 0.64$  cm). In the case of the adult male it ranged from 16.5 to 21 cm ( $18.41 \pm 1.55$  cm,  $n = 10$ ) and in the adult female it was 16.8 to 19.3 cm ( $18 \pm 0.64$  cm,  $n = 9$ ) (Fig. 2). According to Jerdon (1862) and Barnes (1981) the length of tarsus was 3.2 cm.

In case of hatchlings, the data pertaining to correlation co-efficient of body weight with body length ( $r = 0.723$ ,  $t = 6.621$ ,  $p < 0.01$ ,  $df = 38$ ), wing length ( $r = 0.786$ ,  $t = 12.495$ ,  $p < 0.01$ ,  $df = 38$ ) and leg length ( $r = 0.708$ ,  $t = 12.231$ ,  $p < 0.01$ ,  $df = 38$ ) furnished an idea that the characteristics were highly correlated and their values were significant.

In the case of the fledgling, the data pertaining to correlation co-efficient of the body weight with the body length ( $r = 0.839$ ,  $t = 32.693$ ,  $p > 0.01$ ,  $df = 38$ ), wing length ( $r = 0.830$ ,  $t = 33.794$ ,  $p < 0.01$ ,  $df = 38$ ) and tail length ( $r = 0.884$ ,  $t = 35.125$ ,  $p < 0.01$ ,  $df = 38$ ) furnished an idea that the characteristics were highly correlated and their values were significant. But the relation between the body weight and the leg length was not significant ( $r = 0.630$ ,  $t = 34.49$ ,  $p > 0.01$ ,  $df = 38$ ).

In the case of the adult, the data pertaining to correlation co-efficient of the body weight with the body length ( $r = 0.765$ ,  $t = 30.165$ ,  $p < 0.01$ ,  $df = 36$ ), the wing length ( $r = 0.781$ ,  $t = 32.131$ ,  $p < 0.01$ ,  $df = 36$ ) and the tail length ( $r = 0.738$ ,  $t = 33.125$ ,  $p < 0.01$ ,  $df = 36$ ) and the length ( $r = 0.701$ ,  $t = 35.113$ ,  $p < 0.01$ ,  $df = 36$ ) furnished an idea that the characteristics were highly correlated and their values were significant.

### CONCLUSION

Although the little cormorant is not conserve threatened species yet according to IUCN (2000), but their population is dwindling at an alarming rate. To conserve the species morphometric study on different aspects of its growth and development was essential.

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