



Notes on behavioural observation of some water birds during the Annular Solar Eclipse

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Abstract:

*In this communication, we report the behaviour of various water birds observed during the annular solar eclipse which happened on 26th November 2019. We observed the behaviour of eight species of birds viz. Greater Flamingoes *Phoenicopterus roseus*, the Indian Cormorant *Phalacrocorax fuscicollis*, Pied Avocet *Recurvirostra avosetta*, Black-winged stilt *Himantopus himantopus*, Eurasian spoonbill *Platalea leucorodia*, Northern shoveler *Spatula clypeata*, Little grebe *Tachybaptus ruficollis* and Dalmatian pelican *Pelecanus crispus* throughout the eclipse period i.e. from 8:05 AM to 10:51 AM. Various behavioural changes were observed in all the targeted species except the Indian cormorant. It rested on a pole for the whole eclipse period. Detailed observations are given in the note. Reduction in light levels due to solar eclipse does affect the activity of birds.*

Key Words: Solar Eclipse, Behaviour, Birds, Bhavnagar

An annular solar eclipse was visible from 8:05 to 10:51 AM on 26 December 2019 in India. Solar eclipse, a rare and uncommon environmental event, can influence and modulate the behaviour of animals (Murdin 2001; Gil-burmann & Beltrami 2003). Following observations were made during the eclipse at airport Road Lake (21.762837° N, 72.183624° E) in Bhavnagar city using Nikon binoculars (10*50).

Greater flamingos (n=24) on the day of the eclipse were seen foraging constantly from 8:05-9:20 AM. All of them started calling together from 9:21 to 9:35 AM. After the peak of the eclipse (i.e. after 9:21 AM), many flamingo individuals started preening. Activities of Indian cormorants varied throughout the eclipse period. Pied avocets (n=13) were observed feeding through the initial phase of the eclipse i.e. from 8:05 to 8:50 AM. But pied avocets went onto the resting phase from 8:51 to 9:35 AM. Eight of them continued resting even after 9:35 AM while the other five started feeding again. Black-winged stilts (n=50) were seen resting in a flock throughout the study period. But as the eclipse increased, flocks of black-winged stilts from outside the lake started arriving and joined the original flock of 50. A group of five black-winged stilts arrived at 8:52 followed by a flock of 20 at 9:06 AM. Three other groups of 30, 50, and 10 black-winged stilts arrived from 9:21 to 9:35 AM. Eurasian spoonbills (n=30) were seen resting in water during the initial stage of eclipse i.e. from 8:08 to 9:20 AM. From 9:21 to 9:35 AM five spoonbills started feeding, 21 continued resting while 12



started vocalizing and four flew away from the lake. After 9:35 AM, 12 individuals continued calling, 29 rested in water whereas eight individuals arrived from outside the lake. Activities of northern shoveler (n=80) varied throughout the eclipse. Little cormorant (n=1) rested on a pole for most of the observation. It started feeding at 9:21 to 9:35 AM along with one little cormorant which arrived from somewhere outside the lake. After 9:35, both perched at the wood in the lake. Little grebe (n=1) spent most of the time feeding. Between 9:35 and 9:50 AM, it was joined by a flock of eight grebes that arrived from outside the lake. Pelicans (n=2) rested on a small patch of land in the lake throughout the study period.

Table 1: Ethogram

Bird	Time intervals						
	08:05-08:20	08:21-08:35	08:36-08:50	08:51-09:05	09:06-09:20	09:21-09:35	09:36-09:50
Greater flamingo	FD(n=24)	FD(n=24)	FD(n=24)	FD(n=24)	FD(n=24)	C(n=24)	PR(n=4), FD(n=17),C (n=3)
Indian Cormorant	Rp(n=2)	Rp(n=2)	Fi(n=2), FD(n=4)	Rp(n=2),Fb (n=2)	Rp(n=1)	Rp(n=1),Fb(n=1)	_
Pied Avocet	FD(n=13)	FD(n=13)	FD(n=13)	Rw(n=13)	Rw(n=13)	Rw(n=13)	FD(n=5),R w(n=8)
Black winged stilt	Rw(n=50)	Rw(n=50)	Rw(n=50)	Rw(n=50),F i(n=5)	Rw(n=55), Fi(n=20)	Rw(n=75), Fi(n=30), Fi(n=50), Fi(n=10)	Rw(n=165)
Eurasian Spoonbill	Rw(n=30)	Rw(n=30)	Rw(n=30), FD(n=4)	Rw(n=34)	Rw(n=34)	FD(n=5),C(n=12), Fo(n=4), Rw(n=21)	Fi(n=8), C(n=13), Rw(n=29)
Northern Shoveler	PR(n=10), Rl(n= 50), Rw(n=20)	Rl(n= 50), Rw(n=20)	PR(n=4), Rw(n=50), Rl(n=10)	Rw(n=54), Rl(n=10)	FD(n=5), Rw(n=54), Rl(n=5)	Rw(n=54), Rl(n=10)	Rw(n=54), Rl(n=10)
Little Cormorant	Rp(n=1)	Rp(n=1)	Rp(n=1)	Rp(n=1)	Rp(n=1)	FD(n=1), Fi(n=1)	Rp(n=2)
Little grebe	Rw(n=1)	FD(n=1)	FD(n=1)	FD(n=1)	FD(n=2)	Fi(n=8),FD(n=10)	FD(n=18)
Dalmatian pelican	Rl(n=2)	Rl(n=2)	Rl(n=2)	Rl(n=2)	Rl(n=2)	Rl(n=2)	Rl(n=2)

**Table 2: Different type of behaviours observed in bird species**

	BEHAVIOURS
FD	Feeding
R	Resting
Rp	resting on an object; prolonged perching on a pole or a stick in water
RI	resting on land; simply sitting or standing with no noticeable movement
Rw	resting in water; no efforts for movement and neck resting on body(in case of ducks)
F	Flight
Fb	taking off from place 'A' within a lake and settling at place 'B' within a lake
Fa	taking off from place 'A' within a lake and settling at same place
Fo	taking off from within lake and flying outside the lake
Fi	arrived at lake from outside the lake
PR	Preening
C	Calling; making some kind of voice, could either be begging call, roosting call, or some other
B	Bathing; Rapid action of submerging in water and coming out

Kumar S. (1981) observed the changes in the activity of cattle egrets because of the solar eclipse. Trigunayat (1997) observed that roosting Black-crowned Night-herons altered a variety of behaviours, including increased calling, preening, and perch shifting. Nanikov et al. (2001) also mention behavioural changes in several birds due to solar eclipse. A similar trend was observed in this study as well. From these limited field observations, we can conclude that reduced light level due to annular solar eclipse does interrupt normal bird behaviour patterns.

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