

First report of successful breeding of Greater Flamingo in the Gulf of Khambhat, India—outside its traditional nesting range

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The Greater Flamingo *Phoenicopterus roseus* is widely distributed across the world. It is found from West Africa eastwards, throughout the Mediterranean to South West, Central, and South Asia, and throughout sub-Saharan Africa (BirdLife International 2017). In South Asia, the species occurs in Afghanistan, Pakistan, India and Sri Lanka. It largely occurs in north-western, central, eastern, and southern India, and also extends up to Sri Lanka, but is rare, or absent, in north-eastern India, and Bangladesh (Ali & Ripley 2001). It is listed as 'Least Concern' as per the IUCN Red List of Threatened Species (BirdLife International 2017).

In Asia, successful breeding of the species is recorded in India, Iran, Afghanistan, and Kazakhstan (Ogilvie & Ogilvie 1986; Akhtar 1948; Gavrilov & Gavrilov 2005; Johnson & Cezilly 2007) and, more recently, in Abu Dhabi, United Arab Emirates (Abdi & Javed 2001). Attempts at nest building have also been recorded in Sri Lanka (Perera & Perera 1997), and Pakistan (Karim 1985). However, the Rann of Kachchh, in western India, is the only regular and large breeding site in Asia (BirdLife International 2017). The credit for the discovery of Greater Flamingos breeding in the Indian Subcontinent goes to Late Shri Maharao Khengarji of Kachchh, who reported it breeding in the Great Rann of Kachchh, Gujarat in October 1893 (Lester 1894; Khengarji 1904). Since then, several ornithologists have visited their breeding colony at 'Flamingo City' in the Great Rann of Kachchh (McCann 1939; Ali 1945; Ali 1960; Shivraj Kumar et al. 1961; Ali 1974; Bapat 1991; Tere 2005) and it is considered as a regular breeding site. The Greater Flamingos have been recorded nesting at several sites, other than 'Flamingo City', but within the Rann (Himmatsinhji 1993; Vaidya 1987; Tere 2005; Parasharya & Tere 2006; Parasharya et al. 2010). Besides the Rann of Kachchh, Greater Flamingos were recorded breeding at a few more sites around Ahmedabad in Gujarat state. About 5,000–6,000 Greater Flamingo, and 70–80 nests, along with young ones were recorded at Thol Bird Sanctuary, c.30 km north to Ahmedabad, on 21 June 1981 (Thakker 1983). Thol Bird Sanctuary is a man-made freshwater wetland. Greater Flamingos also attempted to nest at Shahwadi (a domestic sewage pond), Ahmedabad, in May 1990 (D'Souza & Christian 1990), and July 1992 (Tatu 1997). However, both nesting attempts at Shahwadi had failed. At Sambhar Lake, Rajasthan, the Greater Flamingo, along with a few Lesser Flamingo *Phoeniconaias minor*, bred successfully during 1995 and 1996 (Kumar 1996).

Here for the first time ever, we report successful breeding of Greater Flamingo at a new site along the Gulf of Khambhat in Gujarat, western India.

Study site

Several salt pans are distributed on the eastern, northern, and western edges of the Gulf of Khambhat, Gujarat. These pans vary in size. Observations were made in a salt pan on an active colony of the Greater Flamingo on 15 June, 29 July, 28 August, and 30 September 2018. Information about the colony between these dates was inquired from a friend who works on the site. The exact location of the colony is not revealed to avoid potential risk of disturbance to the nesting birds from enthusiastic bird photographers.

Description of colony: a small colony was formed on a small, elongated island within the salt pan. The island was raised slightly above the water surface c.20–40 cm and made up of left over gypsum covered with fine mud. The island was less than three meters wide and approximately 180–200 m long. It was divided in three sections [187] but from some angles, only two sections were visible [188]. The southern and middle islands were 50 m apart whereas the middle and northern islands were about five meters apart, and appeared as a continuous stripe. The island on southern side was about 60 m long, the middle island about 50 m long, and island on northern side was about 40 m long. The water depth surrounding the island was around 1.0 to 1.5 m and the islands were at a distance of about 200 to 300 m from the bund of the pan. No human activity was seen around. As the south-western monsoon had not yet set in on 15 June, the ambient mid-day temperature was around 40°C.



187. Nesting island was divided in three sections.



188. Nesting island with only two sections.

Observations

On 15 June, when we approached the saltpan, there were about 500 Greater Flamingos widely distributed in the saltpan and busy feeding. 200 additional flamingos were clumped in a small area. On closer observations through binoculars, we realized that only some birds were standing; most of them were sitting on nest mounds. Moreover, there were some young ones moving around the nest mounds.

On confirmation of an active colony of Greater Flamingo, we were excited and tempted to go closer to observe the colony in more detail. To reach closer to the colony, we went on the eastern bund of the saltpan, but the sunlight was against us. We could take a few record shots of the colony and observe the nesting activity. The southern island had 75 nests, the central island had 40 nests, and northern island had 85 nests. Altogether there were 200+ active nests on which the adults were sitting in incubating posture or standing in nest-guarding posture [189].



189. Flamingos incubating and guarding nests.

There were light grey chicks standing at the edges of islands or between two islands [190]. At least 70–80 chicks could be seen on one side of the islands and between islands. There could be some more out of view on the other side of the islands. The chicks were very small in size, probably of 7–15 days age. The size difference was quite distinct [191]. All the chicks were present only near the islands, and not away in the water as a separate crèche.



190. Light-grey chicks between two islands.

One white egg of a Greater Flamingo was observed in a shallow depression on a dry bund [192]; probably it was deserted after it was laid.



191. Mark distinct size difference of chicks.



192. An abandoned flamingo egg.

On 29 July 2018, we observed 300+ chicks that we estimated to be between 45 and 60 days old. They were swimming freely, away from the colony. There were also some younger chicks close to the nests. About 35 adults were incubating and 80+ were standing near the nests on the southern island, whereas only three adults were incubating on northern island. The central island had no adults or chicks. Some 500+ adults were foraging in the pan.

On 28 August 2018, there was no bird activity on the island; no bird was seen incubating, indicating that either the chicks had hatched or the adults had deserted their nests. Hence, incubation activity is estimated to have terminated in mid-August. About 50+ adults were standing near southern island with young ones that were three to four weeks old. Other, older chicks were either swimming in deep water or standing at the edge of the bund. No flight movement of adults or young ones was seen.

On 30 September 2018, the nesting island was without any adult or young flamingo. The colony looked totally deserted with some eggs on the ground [193]. The young one seen near the colony during August visit also had moved away. There were 800 adult flamingos with 50+ fledglings (slightly smaller than the adults) in the same pan, besides Black-winged Stilt *Himantopus himantopus*, Avocets *Recurvirostra avosetta*, Little Stint *Calidris minuta*, and Black-necked Grebe *Podiceps nigricollis*. In the adjoining pans too, a small number of fledged individuals were foraging along with adults [194]. Taking a head count of the number of fledglings seen in the entire area, it appeared that some fledglings might have dispersed from here.



193. Deserted colony, with eggs that have rolled out of nests.



Both: IR Gadhi

194. Fledglings with adults.

On the same day, based on information of a saltpan employee, we explored the peripheral bunds of the salt works and came across about 150 washed out nests of Greater Flamingo on the lower section of one of the main bunds. The nests were washed out, possibly during the monsoon [195] and small pieces of eggshells were scattered around. There were no intact eggs or large pieces of broken eggshell. We saw two or three dried bodies of small chicks on the ground [196]. In fact, during our first visit of 15 June 2018, we had observed 200+ adults in this area but did not realize the reason for such a congregation. So it is possible that a number of birds may have attempted to have successfully bred here too.



BM Parasharya

195. Washed out nests on main bund.



BM Parasharya

196. Small dead chick, and pieces of egg-shells around.

Discussion

Although the Gulf of Khambhat is of international importance for both flamingo species during their non-breeding period, based on the counts (Jadhav & Parasharya 2004; Tere 2005), our observations of the first successful breeding of Greater Flamingo in the gulf has added an additional ecological value to the area for the life cycle of the species.

The timing of nesting of Greater Flamingos in 2018 at this colony is quite unusual when compared to that in the Rann of Kachchh, where they usually initiate nesting after the onset of the south-western monsoon, normally during September–October (Ali & Ripley 2001), however, there are exceptions (Tere 2005). Elsewhere, the Asian and sub-Saharan populations too breed irregularly following the rains, often in large mixed colonies with Lesser Flamingo (Brown & Root 1971; McCulloch & Irvine 2004; Tere 2005).

During our first visit to the colony in mid-June, we initially judged the chicks to be between 7 and 15 days old, with an incubation period of 27–30 days (Martos & Johnson 1996), we predict that nest building and egg-laying might have started in the last week of April 2018. As some adults were incubating eggs on our second visit at the end of July 2018, it was possible that if the colony had not been disturbed, the breeding activity would have extended for at least several more weeks. However, our third visit at the end of August confirmed that they had already terminated incubation. From counts of young made during our visits, we calculate that in this breeding attempt, at least 300 flamingo chicks fledged successfully. It is also possible that some young may have fledged and dispersed to the nearby feeding site that we only discovered in September.

The safety of the colony, against ground predators and human beings, are the two pre-requisites for successful breeding of flamingos (Martos & Johnson 1996). As this small colony was in the middle of a saltpan, and as the water depth was at least 1.0 m, it was not accessible to any terrestrial predator and might have been safe for the flamingo. Moreover, we did not observe any human movement or vehicular traffic on the bunds during our visits and it is likely that the birds were not disturbed by people.

Flamingos typically use saline lagoons and saltpans for feeding and nesting (del Hoyo et al. 2018). As the entire area around the colony that we describe is surrounded by saltpans, it is likely that this ensures an ample food supply; and the site was

also safe from ground predators and human disturbances which encouraged the flamingos to nest there in 2018.

We are proposing to the saltpan owners that they provide a larger island and manage the water depth in the pan to deter terrestrial predators and keep out visitors from the area. Hopefully, these measures will encourage the Greater Flamingo to breed here regularly and on a larger scale in the future.

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