Probable breeding of Little Bittern *Ixobrychus minutus* at Nalsarovar Bird Sanctuary, Gujarat, western India, with notes on identification of juveniles

Rajni Trivedi & B. M. Parasharya


**Introduction**

The Little Bittern *Ixobrychus minutus* is a widely distributed species in Europe, Africa, and South Asia. The nominate subspecies is found in central- and southern Europe, northern Africa, eastern to western Siberia, and through Iran to north-western India; it winters in Africa. In the Indian Subcontinent, the Little Bittern is a resident (breeding) only in Kashmir and Baluchistan, but is widely recorded as a migrant elsewhere in India, and Pakistan. In India, there are isolated sightings from the northern states like Rajasthan, Delhi, Punjab, Uttaranchal, and Uttar Pradesh, extending up to Assam. Its records from the south-western states are from Maharashtra, Karnataka, and Kerala (Grimmett et al. 1998; Ali & Ripley 2001; Grimmett et al. 2011; BirdLife International 2018; Martinez-Vilalta et al. 2018). None of the field guides show records of the species from Gujarat. However, from Gujarat there are at least four published records in recent past (Bhatt 2003; Trivedi 2015; Bendre 2017; Sudhir 2017; Magiawala 2018), with photographic support.

In India, the species is resident in Kashmir and Assam, with scattered records elsewhere (shown as single cross on map), including some that imply possibly breeding records, mainly from the plains. Sight records of the species are still scanty in the country; the species is recorded from several north-western and southern states (Grimmett et al. 1998; Ali & Ripley 2001). Though Grimmett et al. (1998) proposed the possibility of it breeding in plains, there is, as yet, no breeding record from any other states of Indian Subcontinent except Kashmir, and Baluchistan. In this paper, we provide evidence of its breeding at Nalsarovar Bird Sanctuary, Gujarat, western India.

**Study area**

We observed the Little Bittern at a marsh near Vekaria village (22.82°N, 72.06°E), at north-eastern end of Nalsarovar Bird Sanctuary, Gujarat, India. This marsh was spread over c. 3000 m² and was 50–100 cm deep. *Typha angustata*, *Cyperus* sp., *Ipomea aquatica*, and *I. carnea* comprised the main emergent vegetation, interspersed with *Prospis juliflora*. Thorns of *P. juliflora* made it difficult to enter the marsh to check the nest. Adjoining the marsh were paddy *Oryza sativa* fields, in early stage of growth during September. The Nalsarovar Bird Sanctuary and its surrounding area is a shallow depression forming a natural lake. This freshwater lake gets inundated after the south-western monsoon. The entire lake is covered by aquatic vegetation (Rathod & Parasharya 2018).

**Methods**

In this marsh we observed the activities of the Little Bittern, and the Yellow Bittern *I. sinensis* from July to September 2017, from a distance of about 20 m. We also shot photographs and circulated them among experts, for confirmation of our identifications.

**Observations**

We first noticed an adult Little Bittern landing in the middle of the marsh on 22 July 2017. When we saw both the sexes of Little Bittern entering the marsh regularly, we began to wonder, at a particular point, whether they were nesting. However, due to the water’s depth, and the interspersed growth of *Prospis*, it was not possible to search for a nest. However, we observed both the sexes of the bittern in the marsh regularly from July to September. Kasam Sama Sidani (RT’s field assistant) is familiar with the adults of bitterns in the marsh, as he lives in front of the marsh (at Vekaria village). Kasam, who kept a watch on the activities of the bitterns daily, informed us about its presence from late July to October 2017. A few photographs of the adults in marsh [16] and the juveniles [17–20] could be taken only on 08 and 09 September 2017.
Some Yellow Bitterns were also breeding in the same marsh. A pair on nest [21], and a damaged nest in Typha [22], probably of Yellow Bittern, were photographed on 21, and 24 August 2017, respectively. In flight, the adult Little Bittern could be clearly distinguished from the Yellow Bittern by its black (not brown) back, and white to grey buff (not yellow buff) wing patch. During the study period, at least to ten pairs of Yellow Bitterns and two or three pairs of Black Bitterns *I. flavicollis* were simultaneously breeding in the same patch of marsh. RT managed to take several photographs of two juvenile Little Bitterns on 08 and 09 September 2017; they looked quite different from the juveniles of the Yellow Bittern [XX8]. Otherwise dark plumaged, the Little Bittern juveniles had a distinctly light cream coloured patch on their wings. We reviewed images of Yellow and Little Bittern on www.orientalbirdimages.org to differentiate juvenile plumages of these sympatric bitterns. We also compared our photographs of juvenile Little Bittern with photographs of juvenile Yellow Bittern [23] we had from central Gujarat. A comparison of the juvenile plumage and soft body part colouration of Yellow and Little Bittern is given in Table 1, as no other work covers this feature comprehensively. Based on the review, we suspected these two juveniles to be of the Little Bittern based on the following characters: Black on forehead, crown, and nape prominent; dark brown stripes on ventral side of the neck (absence of orange tone); and a wing panel that was light cream / whitish with few light brown streaks (not brown splashes). To confirm our identification, several images were sent to Krys K., administrator of www.orientalbirdimages.org. Confirming our identification as juvenile Little Bittern, he wrote, “I would agree with your diagnosis of this bird as a juvenile Little Bittern. Note in particular the contrast between the back [17] and the wing. The pale wing panel [18, 19] is fairly characteristic of this species, compared to the otherwise similar juvenile of Yellow Bittern. This panel is also less streaked [XX4]. The streaking on the underparts [XX5] also lacks the orange tones of juvenile Yellow Bittern” (Krys K., in litt., e-mail dated 03 January 2018).
In our study, a pair of Little Bittern was observed during July to September 2017, engaged in breeding activity. Though the nest of Little Bittern could not be located, its young ones, with feathers in the sheath, that started roaming around, could be photographed, and led us to suspect its breeding. Our observations indicate that the species must have bred during south-west monsoon; the period preferred by other Ardeids in north-western India (Parasharya & Naik 1990; Ali & Ripley 2001). This timing is in contrast to its reported breeding period of May to July in Kashmir (Ali & Ripley 2001; Martínez-Vilalta et al. 2018).

A pair of Yellow Bitterns on nest, a damaged nest, and an adult with crimson facial skin could be photographed as evidence of the species breeding in the same marsh. There were at least eight to ten pairs of Yellow Bitterns in this marsh during July to September 2017, all showing some evidence of breeding. Our several photographs of juveniles (see 23, taken on 11 April 2017 at Vaso, Kheda District), and adults in breeding plumage (see XX6, taken on 21 August 2017 at Nalsarovar), with soft part colour changes, suggest that the Yellow Bittern breeds in central Gujarat during March–September. There is a photograph of a nestling Yellow Bittern, taken by Viral Patel and Punjak Maheria at Vandhay Lake, Kachchh, on 01 May 2016 (Patel & Maheria 2016). The age of the chick (hardly five to six weeks, with down on head still present) suggest that the adults might have nested in early March. So, summer breeding of Yellow Bittern is also evident for the Kachchh region of Gujarat, India. Though both the species of bitterns bred in the same small marshy area in Nalsarovar, nothing is known about the distance between the nests of the two species, or niche specifications. The fact is that other aquatic birds also utilize the same marshy area for breeding during south-west monsoon.

Specific documentation on the breeding evidences of Yellow Bittern, Black Bittern, and Cinnamon Bittern *I. cinnamomeus* in Gujarat is not published separately. However, their breeding status has been mentioned in several works (Khacher 1996; Mukherjee et al. 2002; Mistry & Parasharya 2016) and updated periodically (Parasharya et al. 2004; Ganpule 2016). This breeding record of the Little Bittern adds to the information we have on the breeding bitterns of Gujarat, including the extension of its breeding range.

All the sightings of the Little Bittern are from well-irrigated areas with a dense growth of aquatic plants. Hence, the species is likely to be recorded from other similar habitats in the state. The presence of the species during August, at the wetlands of Kheda (WildArt 2018), and during August and during September/October at Surat (Bhatt 2003; Bendre 2017) suggests that its breeding is possible at those sites also. However, additional records are needed to determine its status.

There is evidence of the Little Bittern being rather nomadic, and turning up in odd places to breed in the rains, but not staying very long. In Delhi, there were regular sightings and suspected breeding, of the species between 1964 and 1968 between June and August (Ganguli 1975), then a single sighting in Badli (north Delhi) in 1988 with nothing since (Harvey et al. 2006). Just six records of the species in Gujarat in past eighteen years, with a single instance of breeding, suggests that it may be nomadic and breeding occasionally at suitable habitats in Gujarat; quite far from its known breeding range in Baluchistan or Kashmir. Focused monitoring of the Little Bittern population will help to determine its status in Gujarat.

The distribution of the Little Bittern, in Gujarat, has not been shown in recent works (Hancock & Kushlan 1984; Kazmierczak 2000; Grimmett et al. 2011; Rasmussen & Anderton 2012). Now this needs to be updated.

**Discussion**

In the past, the Little Bittern was photographed in Gujarat on 15 April 2009 (Trivedi 2015), 05 September 2017 (Bendre 2017), and 13 October 2017 (Magiawala 2018). Though the bird could not be photographed there, it’s sighting at Gavier Lake; Surat was also on 01 September 2002 (Bhatt 2003). Considering the published records, editorial remarks in Bendre (2017) concluded that the sighting data was insufficient to determine its status, but, at the same time suspected that the species may be a passage migrant in Gujarat.

An unpublished photograph of the species, on a wetland in Kheda District by Team WildArt (WildArt 2018; Manjit Jadeja, verbally on 20 July 2018) was on 26 August 2012. All published and unpublished records suggest that the species was present at suitable sites in Gujarat during the south-west monsoon, exactly during the period of the present breeding record at Nalsarovar. In our study, a pair of Little Bittern was observed during July to September 2017, engaged in breeding activity. Though the nest of Little Bittern could not be located, its young ones, with feathers in the sheath, that started roaming around, could be photographed, and led us to suspect its breeding. Our observations indicate that the species must have bred during south-west monsoon; the period preferred by other Ardeids in north-western India (Parasharya & Naik 1990; Ali & Ripley 2001). This timing is in contrast to its reported breeding period of May to July in Kashmir (Ali & Ripley 2001; Martínez-Vilalta et al. 2018).

A pair of Yellow Bitterns on nest, a damaged nest, and an adult with crimson facial skin could be photographed as evidence of the species breeding in the same marsh. There were at least eight to ten pairs of Yellow Bitterns in this marsh during July to September 2017, all showing some evidence of breeding. Our several photographs of juveniles (see 23, taken on 11 April 2017 at Vaso, Kheda District), and adults in breeding plumage (see XX6, taken on 21 August 2017 at Nalsarovar), with soft part colour changes, suggest that the Yellow Bittern breeds in central Gujarat during March–September. There is a photograph of a nestling Yellow Bittern, taken by Viral Patel and Punjak Maheria at Vandhay Lake, Kachchh, on 01 May 2016 (Patel & Maheria 2016). The age of the chick (hardly five to six weeks, with down on head still present) suggest that the adults might have nested in early March. So, summer breeding of Yellow Bittern is also evident for the Kachchh region of Gujarat, India. Though both the species of bitterns bred in the same small marshy area in Nalsarovar, nothing is known about the distance between the nests of the two species, or niche specifications. The fact is that other aquatic birds also utilize the same marshy area for breeding during south-west monsoon.

Specific documentation on the breeding evidences of Yellow Bittern, Black Bittern, and Cinnamon Bittern *I. cinnamomeus* in Gujarat is not published separately. However, their breeding status has been mentioned in several works (Khacher 1996; Mukherjee et al. 2002; Mistry & Parasharya 2016) and updated periodically (Parasharya et al. 2004; Ganpule 2016). This breeding record of the Little Bittern adds to the information we have on the breeding bitterns of Gujarat, including the extension of its breeding range.

All the sightings of the Little Bittern are from well-irrigated areas with a dense growth of aquatic plants. Hence, the species is likely to be recorded from other similar habitats in the state. The presence of the species during August, at the wetlands of Kheda (WildArt 2018), and during August and during September/October at Surat (Bhatt 2003; Bendre 2017) suggests that its breeding is possible at those sites also. However, additional records are needed to determine its status.

There is evidence of the Little Bittern being rather nomadic, and turning up in odd places to breed in the rains, but not staying very long. In Delhi, there were regular sightings and suspected breeding, of the species between 1964 and 1968 between June and August (Ganguli 1975), then a single sighting in Badli (north Delhi) in 1988 with nothing since (Harvey et al. 2006). Just six records of the species in Gujarat in past eighteen years, with a single instance of breeding, suggests that it may be nomadic and breeding occasionally at suitable habitats in Gujarat; quite far from its known breeding range in Baluchistan or Kashmir. Focused monitoring of the Little Bittern population will help to determine its status in Gujarat.

The distribution of the Little Bittern, in Gujarat, has not been shown in recent works (Hancock & Kushlan 1984; Kazmierczak 2000; Grimmett et al. 2011; Rasmussen & Anderton 2012). Now this needs to be updated.
Table 1. A comparison of the juvenile plumage and soft body part colouration of Yellow Bittern I. sinensis and Little Bittern I. minutus

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Body Part</th>
<th>Colouration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Iris</td>
<td>Yellow</td>
</tr>
<tr>
<td>2</td>
<td>Lower mandible</td>
<td>Yellow</td>
</tr>
<tr>
<td>3</td>
<td>Upper mandible</td>
<td>Black, continues with black forehead and crown</td>
</tr>
<tr>
<td>4</td>
<td>Head</td>
<td>Buff brown forehead with slight grey on crown (not on forehead)</td>
</tr>
<tr>
<td>5</td>
<td>Orbital skin</td>
<td>Greenish yellow</td>
</tr>
<tr>
<td>6</td>
<td>Plumeage on head, upper neck &amp; back</td>
<td>Very light brown. Feathers with light buff or cream colour edges</td>
</tr>
<tr>
<td>7</td>
<td>Ventral side of neck</td>
<td>Alternate white and light orange-brown stripe</td>
</tr>
<tr>
<td>8</td>
<td>Sides of the neck</td>
<td>Light buff, without scaly feathers</td>
</tr>
<tr>
<td>9</td>
<td>Wing panel</td>
<td>Buff or dark cream with dark brown splashes</td>
</tr>
<tr>
<td>10</td>
<td>Upper wing coverts</td>
<td>Greater coverts on secondaries buff or dark cream with brown central vein (&quot;Rachis&quot;). Median and lesser coverts light brown with narrow buff margin. Appear as brown scaly feathers</td>
</tr>
<tr>
<td>11</td>
<td>Abdomen</td>
<td>White</td>
</tr>
<tr>
<td>12</td>
<td>Tibia</td>
<td>Covered with feathers, cream with small light brown marking</td>
</tr>
<tr>
<td>13</td>
<td>Tarsal feet</td>
<td>Light green</td>
</tr>
</tbody>
</table>

Yellow Bittern [23] | Little Bittern [18 & 19]

Acknowledgements

We are grateful to Krys K. for confirming identification of the juvenile Little Bittern, and pointing out distinguishing characters. We thank Kasam Sama Sidani for his assistance in the field observations. We are grateful to Vishal Misty for sparing his photograph of juvenile Yellow Bittern for this note. We thank an anonymous reviewer for positive comments, compelling us to review our own data and images for inclusion in this paper.

References


[1] Rachis: The typical feather consists of a central shaft (rachis), with serial paired branches (barbs) forming a flattened, usually curved surface—the vane.