

The identification of the Red-naped Shaheen *Falco peregrinus babylonicus*, its separation from *F. p. calidus*, in the field, and its status and distribution in north-western India

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Bhatt, N., & Ganpule, P., 2017. The identification of the Red-naped Shaheen *Falco peregrinus babylonicus*, its separation from *F. p. calidus*, in the field, and its status and distribution in north-western India. *Indian BIRDS* 13 (4): 85–92.

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Manuscript received on 28 March 2017.

Introduction

Three subspecies of the Peregrine Falcon *Falco peregrinus* occur in India: The resident Black Shaheen *F. p. peregrinator*, the migratory Tundra Peregrine Falcon *F. p. calidus*, and the Red-naped Shaheen *F. p. babylonicus* (Naoroji 2006). The Red-naped Shaheen is a winter visitor to western India, mainly in Gujarat and in the Delhi area, straggling eastwards to the Gangetic Plains and northern Madhya Pradesh—visiting, mainly, desert and semi-desert areas (Rasmussen & Anderton 2012). It breeds mostly in Central Asia, from eastern Iran to Mongolia (White *et al.* 2017).

We present here the results from our study of its status, and distribution, in north-western India. We also attempt to describe how it may be separated, in the field, from the wintering *calidus* subspecies.

Taxonomy

The taxonomy of the Red-naped Shaheen is complex, and unresolved. Rasmussen & Anderton (2012) treat it as a subspecies of the Barbary Falcon *F. peregrinoides peregrinoides*, which they consider is a separate species from the closely related Peregrine Falcon. Other authorities, however, consider *peregrinoides* a race of *Falco peregrinus*, and not a separate species (see Table 1). Grimmett *et al.* (2011) give only *F. (peregrinus) peregrinoides* for the Barbary Falcon, including the Red-naped Shaheen in the given taxon. That this is certainly a taxonomy in flux is best shown by the fact that the Barbary Falcon was treated as a separate species by Dickinson (2003), but subsequently, it became a subspecies of the Peregrine Falcon in Dickinson & Remsen (2013). For the different treatment meted to the Red-naped Shaheen in various works, see Table 1.

A recent DNA study suggests conspecific status with other peregrines (White *et al.* 2013b). Another recent authoritative monograph on Peregrine Falcons treats the Red-naped Shaheen as a subspecies of *Falco peregrinus* (White *et al.* 2013a). Forsman (2016) states that, 'pending further genetic studies and given the extensive apparent hybridisation with Peregrine, Barbary Falcon is treated as a subspecies of Peregrine.' Praveen *et al.* (2016) also treat the Red-naped Shaheen as a subspecies of the Peregrine Falcon in their India Checklist. While Clark & Shirihai (1995), and Clark & Davies (2000) suggested the merging of the Barbary Falcon, and the Red-naped Shaheen into one form, since they had similar plumages, White *et al.* (2013a) examined both forms, and showed that there were differences, and that isolated breeding specimens, though superficially similar, were distinct.

A comprehensive study of falcons, based on multiple molecular techniques (Fuchs *et al.* 2015), strongly supports treating *F. peregrinoides* as a full species. Though Fuchs *et al.* (2015) do not provide taxonomic recommendations for *babylonicus*, the Ornithological Society of the Middle East (OSME 2016) treated the Red-naped Shaheen as a subspecies of *F. peregrinoides*, further qualifying that though more studies on molecular relationships are required.

Due to the aforementioned complex taxonomic status of the Red-naped Shaheen, we treat it here as a subspecies of the Peregrine Falcon, fully aware that this might change in the future.

Henceforth, in this note, we refer to the Red-naped Shaheen as *F. peregrinus babylonicus*, the migratory Peregrine Falcon as *F. p. calidus*, the Barbary Falcon as *F. p. peregrinoides*, and the resident Black Shaheen as *F. p. peregrinator*.

Methods and observations

We carried out extensive surveys in the Little Rann of Kachchh, and in the Greater Rann of Kachchh (both in Gujarat) from 2006 to 2017. We also visited the Desert National Park, Tal Chappar, Jorbeed (near Bikaner), and various other locations in the states of Gujarat and Rajasthan. Details of our sightings of *babylonicus*, and those of other observers, from north-western India between 2008 and 2017, are given in Table 2.

A few images, given below, are cross-referenced in Table 2. Though we have thoroughly searched for records of *babylonicus* from north-western India, it is possible that we may have missed

Table 1. Red-naped Shaheen: Taxonomic treatment

<i>Falco peregrinoides babylonicus</i>	<i>Falco peregrinus babylonicus</i>
Ferguson-Lees & Christie (2001)	Kazmierczak (2000)
Rasmussen & Anderton (2012)	Ali & Ripley (2001)
	Forsman (2006, 2016)
Oriental Bird Club / Images	Naoroji (2006)
	White <i>et al.</i> (2017) (website)

Table 2. Photographic records of *babylonicus* from north-western India between 2008 and 2017

Sr No	Place	Date	Observer	Remarks
1	Okhla Bird Park, Delhi	01 January 2008	Arya (2008)	Adult
2	Little Rann of Kachchh, Gujarat	18 November 2008, 18 January 2009	Author's sighting (PG) [126]	Ganpule 2011
3	Greater Rann of Kachchh, Gujarat	02 December 2008	Francis (2008)	Adult
4	Banas River, near Ranthambhore, Rajasthan	02 December 2009	Khandal (2009) [128]	Adult with a Juvenile
5	Greater Rann of Kachchh, Gujarat	11 December 2009	Mishra (2009) [130a,b]	Juvenile
6	Greater Rann of Kachchh, Gujarat	December 2009	Shurpali (2009)	Juvenile
7	Little Rann of Kachchh	05 February 2012	Author's sighting (PG) [120]	Adult
8	Tal Chappar, Rajasthan	25 January 2012	Poonia (2012)	Adult
9	Little Rann of Kachchh, Gujarat	30 December 2012	Mori (2017)	Juvenile
10	Greater Rann of Kachchh, Gujarat	05 December 2014	Soumen Mahato, Jugal Tiwari: FB	Adult
11	Little Rann of Kachchh, Gujarat	07 December 2014, then seen till February 2015	Vihol (2014) [132]	Juvenile
12	Little Rann of Kachchh, Gujarat	21 December 2014, 25 January 2015	Author's sighting (PG & NB) [121]	Adult
13	Little Rann of Kachchh	22 December 2014	Mori: FB	Adult
14	Dhanauri Kalan, Uttar Pradesh	28 January 2015	Arya (2015) [123]	Adult
15	Mansarovar Lake, Sariska, Rajasthan	15 February 2015	Singh (2015)	Adult
16	Near Dantiwada, North Gujarat	01 March 2015	Nirdosh Gupta (<i>pers. comm.</i>)	Juvenile
17	Little Rann of Kachchh, Gujarat	20 November 2015, then regularly seen till February 2016 in the same area	Author's sighting (NB) [124a,b]	Adult
18	Little Rann of Kachchh, Gujarat	20 December 2015	Author's sighting (NB) [122]	Adult
19	Gurdaspur, Punjab	December 2016	Sandeep Beas: FB	Adult
20	Greater Rann of Kachchh, Gujarat	04 January 2016	Tiwari (2016) [129]	Juvenile
21	Greater Rann of Kachchh, Gujarat	04 January 2017	Jaysukh Parekh (<i>pers. comm.</i>)	Juvenile
22	Greater Rann of Kachchh, Gujarat	11 January 2017	Jainy Maria (<i>pers. comm.</i>) [125]	Adult
23	Barabanki, Uttar Pradesh	February 2017	Atul Singh Chauhan: FB	Juvenile

Abbreviations: FB=<https://www.facebook.com> group, Raptors of India; INW=<http://indianaturewatch.net>; OBI=<http://orientalbirdimages.org>.

some personal records of birdwatchers who have not shared their images on birding forums. Some of the individuals mentioned in Table 2 have been photographed multiple times by several bird photographers. We have carefully browsed through all the photographs available on websites like INW (indianaturewatch.net), and OBI (orientalbirdimages.org), various birding groups on Facebook, and other birding forums, and ensured from the locality, and plumage, that there are no definite new individuals which we have not covered in Table 2. Some individuals, posted on these websites as *babylonicus*, are misidentified, and so we have not included them in Table 2. We have also not included records of birds that could be *babylonicus*, but whose photographs are of too poor a quality to decipher finer details, or for which, only a single image is available. We prefer to err on the side of caution in such cases. We have excluded sighting records from 'eBird' (<http://ebird.org/content/india/>), since photos were not posted along with the bird lists, and field identification is quite difficult, especially of juveniles. We have included only those sightings which are well documented through photographs, and where identification is beyond any doubt.

Identification

Adult *babylonicus* is quite easily separated from *calidus*, since

the rufous wash on the cheeks, nape, and the underparts is quite apparent, and is a diagnostic feature for identification. However, some birds may show very limited rufous on the cheeks and nape, which may lead to confusion if seen from a certain angle. Some *babylonicus* show limited rufous on the nape, and are not 'red-naped' in the true sense. Such individuals have a darker nape, showing faint rufous nape feathers. On the other hand, some adult *calidus* may show a paler nape area, most often being pale white, or greyish, but sometimes even pale buffish-white, leading to more confusion, and the risk of misidentification (Andrea Corso, *pers. comm.*). Hence, it is advisable to get good views, from all angles, to confirm the identification, as the distinctive rufous cheeks are usually seen only when viewed closely.

There are two basic colour forms in *babylonicus*: Dorsally, the colouration ranges from dark (blackish) to an almost pale cerulean bluish-grey—with a wide range of intermediate colours. The pale bluish and large birds are said to occur in north-western China and Mongolia (the eastern part of its range), while the darker birds occur from Turkmenistan, eastwards to the adjacent Central Asian countries, and pale and small birds occur in Iran and Afghanistan (the western most part of its range) (White *et al.* 2013a). All types of forms are seen in the winter in north-western India, which is also confirmed by museum specimens (White *et al.* 2013a). The photographs of adult birds published in this paper

[120–127] show well the variability, with dorsal colour ranging from blue, to dark bluish-grey, pale grey, dark grey and black. Ventrally, it is pale creamy to dark rufous, with only faint barring on the belly and flanks. Some individuals may show prominent barring (mostly female or first adult birds) (Andrea Corso, *pers. comm.*), but this is uncommon and most adult birds seen in the study area have plain rufous underparts with narrow, sparse

barring. Some of the palest birds are a solid peachy-buff with only slight, barely perceptible, markings on the flanks and thighs, and if markings are present in the centre of the breast, they are usually spots or tear drops, rather than bars, except in the darkest individuals (White *et al.* 2013a). A few darker individuals noted here had somewhat prominent underpart markings, which are more pronounced on the flanks and thighs [see 124a].



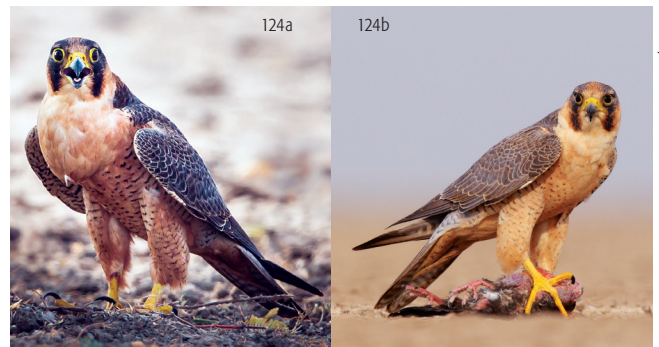
120. Adult *babylonicus*. Note rufous nape and cheeks. Dark bluish-grey upperparts and rufous underparts with very less barring. Little Rann of Kachchh. 05 February 2012.



123. Adult *babylonicus*. Note pale grey upperparts and rufous underparts with almost no barring. Also note rufous cheeks. This individual lacks any blue tones on the upperparts and the upperpart colour is similar to a pale *calidus*. 28 January 2015. Dhanauri Kalan, Uttar Pradesh.



121. Adult male *babylonicus*. Note pale bluish-grey upperparts and rufous nape and cheeks. This individual had rufous underparts with almost no barring. The bluish tones on the upperparts are prominent. 21 December 2014. Little Rann of Kachchh.



124a,b. Adult *babylonicus*. This adult female was seen in the same area for more than two months. Note the blackish upperparts and the rufous underparts with noticeable barring on the belly and flanks, which is usually not seen in adult *babylonicus*. Such darker individuals of *babylonicus* are impossible to separate from *pelegrinoides* without DNA analysis and measurements, and it is not possible to determine the subspecies. Little Rann of Kachchh. 24 November 2015.



122. Adult male *babylonicus*. Note the very extensive rufous head, nape and the moustache. The underparts are plain and washed with rufous, with faint barring on the flanks. The upperpart colour is darker greyish-blue. 20 December 2015. Little Rann of Kachchh.

125. A dark adult *babylonicus*. Greyish-black upperparts. Rufous cheeks, barring on the flanks and thighs. Note that the scapulars have started moulting (in early January) and new feathers are seen, indicating start of body moult. A hint of pale supercilium is seen above the eye. 11 January 2017. Greater Rann of Kachchh.



Swadeepsinh Jadeja

Anand Arya

L: Jaiy Maria

R: Nirav Bhatt

Pics: Nirav Bhatt

Jaiy Maria



Prasad Ganpule

126. Adult *babylonicus* in flight. Rufous underparts with barring on the flanks. Compact structure with pretty obvious short tail. Plain, pale rufous lesser coverts. The barring on the primaries and secondaries is quite prominent. 18 January 2009. Little Rann of Kachchh.



J. Pranay Rao

127a,b. Adult. The upperparts are typical pale blue-grey seen in adult *babylonicus*. But note the underparts; the heavy barring without any rufous. However, a faint rufous wash on the cheeks and on forehead is apparent. This could be first adult plumage or possibly an intergrade with another subspecies, or simply a very well-marked old female. The breeding origin of such birds is unknown. Winter 2010. Hyderabad.

These features give it a very distinctive appearance, and birds in adult plumages are fairly easily identified from *calidus*. Although some adult *calidus* can show pale pink to rufous wash on the underparts in adults (*pers. obs.*), this is faint and does not extend on to the head, cheeks and nape, thus separating it from *babylonicus*. Further, the faint salmon-pink wash observed in adult *calidus*, is typical of very fresh plumage and quickly is lost due to abrasion and sun-bleaching (Andrea Corso, *pers. comm.*).

The separation of adult *babylonicus* from typical *peregrinator* is also relatively straight forward; *peregrinator* shows a deeper rufous wash on the underparts, has a more 'hooded' appearance with a very small (or absent) cheek patch (due to its very broad moustache) and is dorsally dark grey or black, as against prominent rufous cheek patch, a distinct moustachial stripe and reddish crown in *babylonicus*. The underparts in *babylonicus* are usually less intensely coloured than *peregrinator*, and the upperpart colour in *peregrinator* is darker. Similarly, a juvenile *peregrinator* can be separated from *babylonicus* by a hooded appearance, broader moustache mark and, usually, a dark rufous wash to the underparts. However, there is extensive plumage variation in populations of southern and northern *peregrinator* in India (White *et al.* 2013a). The separation of juvenile and adult *peregrinator*, which are not 'typical', from *babylonicus*, is beyond the scope of this work.

The problem of separating the juvenile of a *babylonicus* from that of a *calidus*, by plumage, is well known, and White *et al.* (2013a) state that even museum specimens of *babylonicus* are sometimes mistakenly labelled '*calidus*.' This is reflected in the

field too, when identification of some juveniles is often quite difficult. This is especially problematic with pale and sparsely streaked juvenile *calidus*, which are quite similar to juvenile *babylonicus*. Naoroji (2006) states that 'some exceptionally pale *calidus* juveniles may show thin, scattered brownish streaking below'. Even the head pattern—broad pale supercilium, narrow dark moustache contrasting prominently with a wide pale cheek patch—and the dorsal colour in many pale juvenile *calidus* closely matches juvenile *babylonicus*. It is well known that the juvenile *calidus* is very variable, with underparts varying individually in ground colour, from buffish white to yellowish ochre, and the dark streaking on the breast may be heavier or finer (Forsman 2006, 2016). Both species occur in the Little Rann of Kachchh, and their separation becomes difficult.

The various texts do not give details regarding separation of juvenile *calidus* from *babylonicus*, except general identification pointers. Based on our experience of *calidus* and *babylonicus* in Gujarat, and studying photographs of both, the following features are useful in the identification of juvenile *babylonicus*:

1. Upperparts: Usually pale brownish, with rufous edges to the feathers. But this latter is variable, ranging from dark brownish to blackish. Frequently, the pale tips and fringes to the upperpart feathers are completely worn (or very faint) in winter.
2. Size and structure: In general, *calidus* is usually much larger and bulkier than *babylonicus*. However, this is difficult to judge in the field without direct comparison. This is usually apparent in male *babylonicus* as it is quite small in size. The female *babylonicus* may be as large as a male *calidus*, and hence this is not very conclusive unless both are seen together. But in general, *babylonicus* is more slim and compact. Further, *calidus* is usually appreciably longer in the tail and wings, with a narrower and longer 'hand' (being a very long distant migrant), although to detect such differences in their jizz requires great experience (A. Corso, *pers. comm.*).
3. Underparts: The base colour of the underparts is pale rufous to creamy but may become whitish by first winter. Many of the juveniles seen in north-western India in the winter have whitish or only pale cream underparts. The underpart streaking is also very variable, with very fine and sparse streaking in most individuals, but a few show slightly thicker streaking, which usually forms lines on the breast and belly. Importantly, the streaking is usually concentrated into the central area, with the throat and upper breast, and the lower belly and thighs often remaining unmarked and whitish. Often, a rufous hue is seen on the upper breast and belly.
4. Plumage and moult: By winter, most *babylonicus* show more worn plumage than *calidus*. This is due to the fact that *calidus* is an Arctic breeding bird while *babylonicus* is a more southern breeder. Though the breeding season varies, *babylonicus* usually breeds from early February to April (White *et al.* 2013a), with the young fledging by the end of May. The juveniles of the northern breeding *calidus* usually fledge in August (Dixon *et al.* 2012). Hence, there is a difference of almost three to four months in their breeding periods. This is also confirmed by the fact that most records of *babylonicus* here are between mid-November till the end of February, while *calidus* is seen in Gujarat till mid-May, indicating that *babylonicus* returns early to its breeding area. This difference in moult timings is important in separating the two. Further, most *babylonicus* breed in dry, desert-like conditions and the feather edges

quickly abrade. By December, most *babylonicus* show worn plumage, with abraded tips to dorsal feathers, which are bleached due to wear, and the head and mantle feathers are also frequently moulted to adult-like plumage; correspondingly, *calidus* are in relatively fresh plumage. Thus, in November–December, *calidus* have less wear to the plumage, especially dorsally, compared to *babylonicus*. Many *babylonicus* show adult feathers on mantle and head by the end of January, thus showing a more advanced moult than *calidus*. The general state of the plumage in winter is an important feature in separating the two, a difference not reported in the main reference texts. The difference in moult timing is used in separating adult *peregrinus* from *calidus*, as *peregrinus* moults all primaries after breeding while *calidus* completes its moult in winter, post migration; the moult is suspended during migration, and is completed in late winter (Forsman 2006, 2016). Hence, this feature can be used also in separating *babylonicus* from *calidus* in early winter.

5. Bare parts: Cere, orbital skin, and eye ring pale yellow to darker yellow. Feet yellow in juveniles. Fledging *babylonicus* have bluish cere and eye ring, which turns yellow post fledging. By autumn, the cere and eye ring are pale yellow to yellow in *babylonicus*, while *calidus*, being a late breeder, shows a grey cere till late winter. Though the colour/s of bare parts is also based on diet (carotenoids), the difference in the breeding periods of *calidus* and *babylonicus* makes this feature very important. This is considered to be diagnostic in separating juvenile *pelegrinoides* from juvenile Peregrines (Clark & Shirihi 1995). Shirihi *et al.* (1998) state that *pelegrinoides* tends to acquire stronger yellow pigment in bare parts earlier (as early as September), but this is correlated with the timing of breeding. While this particular feature is not given in the reference texts for *babylonicus*, it should apply for separating *babylonicus* from *calidus*, especially in early winter, November–December, since both taxa are morphologically quite similar. An overwhelming majority of juvenile *calidus* that we have seen in Gujarat had a grey cere till the end of December, while all juvenile *babylonicus* had a pale yellow or yellowish cere in the same period. This is also seen in many photos of first winter juveniles posted on the Internet on many birding websites. While *calidus* may show a pale yellowish cere by January, this can be used for separation in early winter. Another useful feature is the eye ring, which in *babylonicus* looks thicker, with more bare skin in front of the eye. This is usually not seen in *calidus*. However, close views and good photos are needed to confirm these features.
6. Head pattern: The head patterns of juvenile *calidus* and *babylonicus* are surprisingly similar. Many *calidus*, especially pale-plumaged birds, are difficult to separate from *babylonicus*, as they show prominent white supercilium, white cheek patch, and pale forecrown. However, *babylonicus* frequently shows at least some rufous to the moustache, cheeks, and eyeline, with the supercilium being tawny in colour. However, pale *calidus* can sometimes show a light brownish wash on the moustache.
7. Tail pattern: Rather variable, but most *babylonicus* show a more prominent sub-terminal tail band. This is usually not seen in *calidus*. However, there is much overlap between the two and many *calidus* indeed show wider sub-terminal dark bars (at least the last two).

Table 3. Wing length of *babylonicus* and *calidus* after White *et al.* (2013a)

Species	male (in mm)	female (in mm)
<i>babylonicus</i>	269-298 (n=14)	314-330 (n=7)
<i>calidus</i>	296-323 (n=28)	330-364 (n=21)

The identification features described above are useful in the identification of most *babylonicus*. However, there are a few individuals of *calidus* that are extremely similar in plumage to *babylonicus* and are best left unidentified. A critical study of a large number of individuals is needed to verify whether the above mentioned features can be consistently applied for separating the two species. Clark & Shirihi (1995) noted that *pelegrinoides* and Peregrines are very similar in proportions. Looking at the proportions of museum specimens of *calidus* and *babylonicus* given in White *et al.* (2013a), there is indeed an overlap in measurements. However, the overlap in wing lengths of *babylonicus* and *calidus*, is minimal and this feature might be useful in separating the two. The wing lengths for both are given below in Table 3.

The morphometric measurements given in Abdulali (1969) also fall within the ranges for both the subspecies given above. The ratio of wing length to tail length can also be useful as *babylonicus* looks shorter-tailed, and its wing-to-tail ratio is larger than *calidus*. However, measurements of live specimens will help ascertain whether this can be applied to separate the two. In general, *calidus* clearly appears longer-tailed in the field, a difference mostly noticed in adults, as juveniles of both taxa have longer tails than adults, therefore making it harder to tell the differences in the field visually.

The juveniles of *babylonicus* shown here [128–132] represent the wide variation seen in juvenile plumages, with differences in upperpart colour, streaking on underparts, and head pattern. The *calidus* juveniles given here [133–136] are atypical individuals, similar to *babylonicus*, and difficult to separate. Some birds are impossible to assign to any subspecies without measurements, and are best left unidentified.

Finally, a comment on the juvenile *babylonicus* shown



128. Juvenile *babylonicus*. This individual was seen with an adult, presumably its parent, which was typical adult *babylonicus* with bluish grey upperparts and rufous nape. Note the rufous tinged underparts with sparse streaking, the yellow cere and eye ring. Rufous wash on the cheek and whitish supercilium. A few adult-type feathers are seen on the mantle in December, indicating early moult, and further, the plumage is already rather abraded and sun-bleached, indicating an early fledging. Note the slim structure, looking much slimmer and compact than *calidus*. 20 December 2009. Banas River, near Ranthambhore, Rajasthan.

Jugal Tiwari



129. Juvenile *babylonicus*. Note the slim structure and the plumage. Mantle already shows adult-type feathers in early January, indicating advanced moult. This individual had whitish, almost unstreaked breast. The rufous on the cheeks is noticeable. The yellow cere and eye ring and the banding on the tail is also typical of *babylonicus*. 04 January 2016. Greater Rann of Kachchh.

Vaibhav Mishra

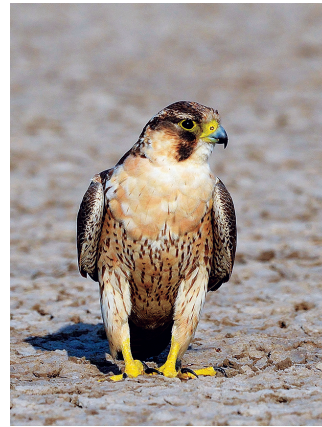


130a,b. Juvenile *babylonicus*. This is a rather dark individual, showing almost blackish upperparts. The plumage looks much worn in early November, with the fringes almost non-existent. The underparts are rufous, showing somewhat heavier streaking. Note that thighs are finely streaked. The yellow cere and eye ring are seen here. The moustache looks entirely black, with the cheeks showing only a faint rufous tinge. This individual is very unlike the juvenile birds seen here, as the upperparts are darker than usual. 7 November 2009. Greater Rann of Kachchh.

John Holmes



131. Juvenile *babylonicus*. Note the streaking on the underparts, which is concentrated in the middle, leaving the upper breast and the lower belly and thighs largely unmarked. This type of streaked breast is typical of *babylonicus*. Note the rufous wash on the nape. May 2005. Near Urumqi, Xinjiang, China.



132. Juvenile female *babylonicus*. Dark brownish upperparts. Streaked underparts (forming lines) with prominent rufous wash. The upper breast has already moulted into adult like plumage. Thighs are finely streaked. The cere and eye ring are dark yellow. This is a juvenile which is in moult. This bird was seen in the area from December 2014 till February 2015. 1 February 2015, Little Rann of Kachchh.

Falgun Shah



133a,b. Juvenile *calidus*. This individual is similar to a juvenile *babylonicus*. The underparts are thinly streaked. However, note the fresh plumage (the fringes to the mantle feather are not at all worn) in late December, indicating late breeding. The face markings are poorly defined and the grey cere and eye ring, along with the bulkier build are indicative of a juvenile *calidus*. Dick Forsman helped us in identification of this bird and gave detailed explanation for the bird with emphasis on state of plumages in December. We consider this bird as a putative *calidus*. December 2012. Bangalore.

Kiran Poonacha



134a (02 January 2011) & **134b** (16 December 2010): Juvenile *calidus*. A very different bird from those seen in Gujarat. Note the very sparsely streaked breast, with arrow-head markings on the flanks. The upperparts are greyer than brown – with a grey wash on the upperparts (which turned to pale brown later). Upperpart feathers with ochre fringes. The head markings are similar to *babylonicus*, with thin moustache and white supercilium. But note absence of any rufous on the head and underparts. Note also here the very fresh plumage with “scaly” effect due to wide pale fringing all over the upperparts. Such birds are said to inhabit the Russian Arctic, east up to the Taimyr Peninsula. This individual was very large in size (approaching a Saker Falcon *Falco cherrug*), and hence could be sexed as a female. It was seen in the same area for two months. Little Rann of Kachchh.

L: Prasad Ganpule

R: Nirav Bhatt



Dhairya Dixit

135a,b. Juvenile *calidus*. A pale individual with sparsely streaked breast. Note the head markings; white supercilium and forehead, thin moustache and hint of brownish wash on the moustache and eye line. The upperparts are light brownish and the plumage is looking very fresh, with no abrasion to the fringes of the mantle feathers. The underparts and cheeks are white, with no hint of rufous. 8 November 2015. Little Rann of Kachchh.



Saptagiri Oleti

136. Juvenile Peregrine Falcon. One of the most contentious individuals seen here. Expert opinion is divided regarding its identification. The slight rufous wash on the moustache and the head pattern points to a juvenile *babylonicus*. But note the sparsely streaked breast, which is similar to the bird in **134** the whitish colour to the underparts, the bulkier build, white supercilium, condition of the plumage, the arrow-head markings on the flanks, and the grey cere in late November, which indicates a *calidus*. This individual is probably a *calidus* (intergrade with a close clinal taxon?). However, such individuals are impossible to identify to the subspecies level with certainty unless trapped and measured, and hence are best left unidentified. 27 November 2010. Little Rann of Kachchh.

in figure 149 in White *et al.* (2013a); this individual was photographed in the Little Rann of Kachchh, and is given as a dark juvenile *babylonicus*. It is, in our opinion, most probably a juvenile *calidus*; the typical head pattern (lacking rufous wash on the moustache and cheeks), white base colour to underparts, the coarse streaking, arrowhead markings on the flanks, the greyish cere, and the rather bulky appearance point in that towards a *calidus*.

Discussion

Historically, *babylonicus* has been recorded in Gujarat; Ali (1954) collected two specimens from the northern edge of the Little Rann of Kachchh, and reported two more sightings from Kachchh. Dharmakumarsinhji (1955) noted that it was rare in Saurashtra, but seen more commonly than *peregrinator* in winter, when it preferred open country. This is not true now as

babylonicus is no longer seen in Saurashtra and all recent records are from Kachchh. In fact, *peregrinator* breeds in the Girnar Hills near Junagadh in Saurashtra (Mori & Joshi 2017), and is more commonly seen in the surrounding areas now. Naoroji (2006) mentioned *babylonicus* as an uncommon winter visitor to north-western India, with a sight record from Kachchh.

Looking at the above records, it can be said that *babylonicus* is a rare, but regular, winter migrant to north-western India. It prefers desert and semi-desert areas, as the maximum number of records from Gujarat, are from desert areas of the Greater- and Little Rann of Kachchh. A few birds were seen in a specific area for more than two months in the Little Rann of Kachchh, indicating that they remain in the same area in the winter months. Interestingly, regarding the juvenile *babylonicus* which was seen during December 2014–February 2015 [132], an adult *babylonicus* was also seen in the same area from December 2015 till February 2016. We feel that it could be the same individual owing to similar size and structural similarities in the two birds but, without ringing or other details, we cannot be sure. Also, both *calidus* and *babylonicus* occupy the same habitat in the Little Rann of Kachchh, and have been often sighted in the same location at different times (*pers. obs.*, NB).

F. pelegrioides is not known to occur in India. Its distribution is from northern Africa, to the Middle East, and Arabia (Forsman 2016). It was seen in a study in the Middle East and Africa, that upperpart colour in *pelegrioides* also ranged from light bluish to dark (blackish), similar to *babylonicus* (Corso 2001). It should be noted that some dark *babylonicus* seen here are extremely similar to *pelegrioides*, and it is not possible to identify such individuals to the subspecific level. While *pelegrioides* is known to be partially migratory (White *et al.* 2013a), only further research will confirm whether some birds seen here are indeed of this subspecies. This would require trapping, physical examination, and DNA analysis.

Ideally, a study of breeding birds is essential in proving the variation seen in *babylonicus*. The identification of juveniles should be researched in the areas where it is resident and/or moves only to the adjacent plains and valleys so that the breeding origin of these birds is known and details of plumage variation in adults and juveniles can be studied. The moult strategy in adults is also of interest as a few individuals seen here had started body moult (of mantle feathers) in late December and early January. The breeding origin of the birds wintering in India should also be studied by tagging the individuals. This will reveal where the birds wintering in India come from as it seems likely that birds from the entire breeding range of *babylonicus* winter here. This will also help in understanding the movements and migration routes of these birds.

As *babylonicus* is rare in India and very few individuals are photographed and even lesser number of individuals studied for a longer period of time in the winter, there is very less data regarding the variation and identification of juvenile *babylonicus* in the reference texts. The identification pointers presented here are based on a preliminary study and mainly intended to help birdwatchers distinguish *babylonicus* from the more common *calidus* during their winter migration to India. However, in juvenile plumage, unless the bird exhibits typical plumage characteristics of either *babylonicus* or *calidus*, it is best to abstain from subspecific identification. Further research will help clarify taxonomical and morphological differences in this taxon, along with its habitat preferences in the winter.

Acknowledgements

We thank Dick Forsman, Arend Wassink, Andrea Corso, Igor Karyakin, J. Pranay Rao, and Hyder Jaffer for helping in the identification of a few individuals, and for their comments. We thank Jainy Maria, Jaysukh Parekh, Nirdosh Gupta, and Bharat Kapdi for sharing their sightings. We thank Jainy Maria, Swadeepsinh P. Jadeja, Anand Arya, Dharmendra Kandhal, Falguna Shah, Jugal Tiwari, Vaibhav Mishra, Dhairya Dixit, Kiran Poonacha, Saptagirish Oleti, J. Pranay Rao, and John Holmes for the photographs.

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