

Reporting of (Sand?) Martin *Riparia (riparia?)* from Durgapur Barrage, West Bengal, India

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Durgapur is an industrial town of Bardhaman district in West Bengal, India harboring some heavy industries like Durgapur Steel Plant, Alloy Steel Plant, Durgapur Thermal Power Station, Durgapur Projects Limited etc. River Damodar flows from North West to South East direction of this town. Over the river Damodar, a dam has been constructed in 1955, locally known as Durgapur Barrage. This river demarcated the geographical division of two districts of West Bengal namely Bankura on the right bank and Bardhaman on the left bank. Two canals run towards these two districts supplying water for irrigation chiefly in winter months. A river cliff was created naturally, containing vertical sand walls (somewhere with slope) in the downstream position of Durgapur Barrage (Lower right bank of river Damodar).

Note on Martins: Swallows and Martins are slender and slim bodied birds with long and pointed wings. They have small bill with wide gap; legs are short and weak. Tail is more or less forked. Long tailed species are known as Swallows and short tailed Martins. They hawk day flying insects in swift, agile, sustained flight, sometimes high in the air. While flying in the open air they catch most of their food. They are gregarious, often roost and feed communally (Moller 1987). Nests in holes, tunnels walls and cliffs with muds (Kumar *et al.* 2005). *Riparia riparia* (Linnaeus, 1758) which is commonly known as Sand Martin (British) or Bank Swallow (American) belongs to order Passeriformes and family Hirundinidae; forms a superspecies with *R. paludicola*, *R. congica* and *R. diluta*. Until recently considered conspecific with last, but the two differ in plumage and voice, and occur in separate breeding colonies in wide area of sympatry (full extent of which not yet clear, IBC 2014). This taxon is considered a subspecies of *Riparia [riparia or diluta] (sensulato)* by some authors (Avibase 2014). Similar to Pale Martin (*R. diluta*) but with white throat and half collar; brown breast band; darker brown upperparts; and deeper forked tail. Similarly, Pale Martin *Riparia diluta* (Sharpe & Wyatt, 1893) is probably a resident in this subcontinent (Pakistan East to West Uttarpradesh, mainly winters in Pakistan, North West India and Sri Lanka). Very similar to Sand Martin, but upperparts are paler and greyer, the breast band is less clearly defined, the throat is greyish-white and grades into the pale grayish-brown ear coverts and the tail fork is shallower (Inskipp *et al.* 2011; Robson 2000). According to IUCN Red List range distribution where Sand Martin (*Riparia riparia*) is extant (Least concern, non breeding) in Indian Subcontinent include parts of Assam and North Eastern states along with geographic fractions of Bangladesh, China and Myanmar but the Pale martin (*Riparia diluta*) has

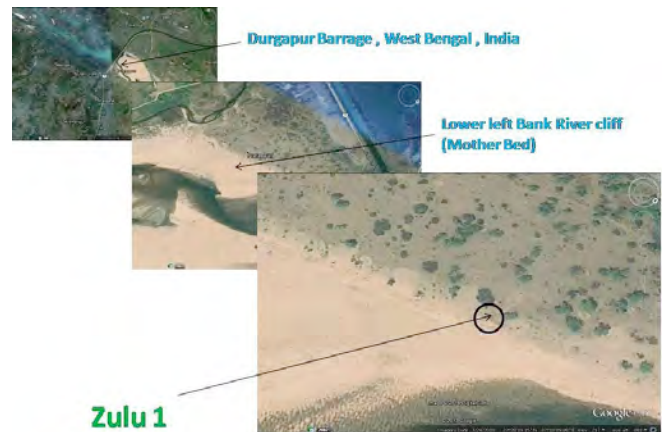


Fig 1. GIS view of observed site (Zulu 1) of *Riparia* Sp. around Durgapur barrage area West Bengal, India

not yet been assessed (Bird Life International 2012, 2014).

As per documented evidence by ITIS (2014 a, b), globally Sand Martin includes six subspecies which are *Riparia riparia eilata* (Shirihai & Colston, 1992), *Riparia riparia ijimae* (Lonnberg, 1908), *Riparia riparia innominata* (Zarudny, 1916), *Riparia riparia riparia* (Linnaeus, 1758), *Riparia riparia shelleyi* (Sharpe, 1885) and *Riparia riparia taczanowskii* (Stegmann, 1925) whereas Pale Martin *Riparia diluta* (Sharpe & Wyatt, 1893) also includes six subspecies namely *Riparia diluta diluta* (Sharpe & Wyatt, 1893), *Riparia diluta fohkienensis* (La Touche, 1908), *Riparia diluta gavriloovi* (Loskot, 2001), *Riparia diluta indica* (Ticehurst, 1916), *Riparia diluta tibetana* (Stegmann, 1925) and *Riparia diluta transbaykalica* (Goroshko, 1993). In Pale martins there is confusing subspecies variation, compared with nominate (i.e *R. diluta*, wintering in West), resident *R. indica* is smaller and with very shallow tail fork, and wintering *R. tibetana* comparatively large and as dark as Sand (although lacks prominent breast band).

In Sand Martin, both sexes are alike, body length ranges from 12 to 14 cm, with a wing span of 25–29 cm. They weigh about 10–19 grams. Sand Martins live in low areas along rivers, streams, ocean coasts, or reservoirs. Though in the past Sand Martins were most commonly found around natural bluffs or eroding streamside banks, more and more often these species populate human-made sites, such as sand and gravel quarries or road cuts (Cornell Lab

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Fig 2. *Riparia* sp. (Indv 1) observed on Damodar barrage on 27.12.2013



Fig 3. *Riparia* sp. (Indv 2) observed on Damodar barrage on 27.12.2013

2014). Sand Martins almost exclusively eat flying or jumping insects, such as bees, wasps, ants, butterflies or moths. They catch insects while flying, usually at a height of 50 ft above water or open ground. They only occasionally take insects from the ground or from the surface of water. They can feed singly or in large groups. A Sand Martin colony may range from 10 nests to nearly 2,000. Male Sand Martins use their small, conical bills as well as their feet and wings to dig burrows that will lead to a nest chamber. Clutch size is about 2-6 eggs, incubation period and nesting period ranges from 13-16 days and 18-24 days respectively (Garrison 1999). Sand Martins are resident as well as winter migrant, locally common; recorded from Assam (Gogoi, 2011), Gujrat (Parekh, 2013, 2014; Mishra, 2013), Bihar, Manipur, Maharashtra in India; Thailand (Ericsson, P 2003), China (Hornbuckle, 2012), Singapore (Chua, 2009), Nepal (Jha & Subba, 2013), Bangladesh and Maldives (Kumar *et al.* 2005). This Least concern species is native to around 205 countries worldwide as well as Vagrant in 7 countries only, though the population trend is decreasing at present (Bird Life International 2012). While records of pale martins from this subcontinent were documented by Saikia (2013, 2014a,b) from Runn of Kutch, Gujarat and Jodhpur, Rajasthan; Sen (2013) from Kaziranga National Park, Assam, India and Sen (2012) from Asan Barrage, Uttarakhand, India. There are only

isolated records of Sand martins and Pale martins during winter from West Bengal according to Kumar *et al* 2005 and Inskipp *et al.* 2011.

Sighting of Martins (*Riparia* sp) in Durgapur Barrage:

On the morning of 27th December 2013, during regular pre-designed water bird surveys and bird counts (from 6.30 hrs to 12.30 hrs) at lower right bank (Fig 1) of Durgapur Barrage, West Bengal at 11.05 hrs a *Riparia* sp. [Indv 1] was observed among flying flocks of birds and photographed during flight (near Zulu 1) in the open sky at a distance of 30+ feet (inward direction) towards the river Damodar standing from the adjacent river bank (Fig. 2). Again, after few moments, second (Indv 2) and third one (Indv 3) were photographed in Zulu 1 [23°28'20.74"N, 87°18'9.60"E] (Fig. 2&3). At Zulu 1, we observed that after flying for about 15-20 minutes on adjacent open river water, they suddenly took rest for a while. Indv 2 sat on the nest hole for 2 minutes and started flying. During this time it didn't enter into the nest. While Indv 3 also sat on the edge of the sand wall near Zulu 1 (in a distance of about 8-10 feet) for only 20-30 seconds and flew away. We also observed that due to presence of unnecessary human activities (mostly walking, bathing and boating) they were facing problems during entering into nests (i.e due to fear perhaps). Birds were observed using Olympus binocular (8X21 RCII) and photographed by CANON Power Shot camera (SX 510 HS). The birds were identified in field following "Pocket Guide to the Birds of the Indian Subcontinent" (Grimmett *et al.* 2011, though online databases like Oriental Bird Club Images, The Cornel Lab of Ornithology, IUCN Red List, Avibase, Internet Bird Collection etc were also consulted at later stage during report preparation). Through the investigation, it was revealed that the number of individuals (*Riparia* sp) near Zulu 1 was about 10-15. These birds were observed flying in loose flocks (2-3 in number) of 3-5 birds each with some other birds (Barn swallows, Wire tailed swallows, Swifts, Plain Martins etc, number of flying birds were approximately 80-100) across the Damodar river cliff. We tried to observe intensely each and every individual of these martins, some of which showed fuller breast bands and diffused breast bands.

Validation of the *Riparia* sp.: Water Birds in Durgapur Barrage have been monitored by the authors since 2009. Recently range extension of Wire Tailed Swallows (*Hirundo smithii*) has been reported from Durgapur Barrage (Gupta *et al.* 2013). While studying the nesting behavior of Wire Tailed Swallows, we observed these individuals of *Riparia* sp which is a rare occurrence in this riverine landscape region (i.e Durgapur Barrage). However, there are past records of all Martin species from West Bengal and eastern India (Ali and Ripley 1987, Kumar *et al.* 2009, Grimmett *et al.* 2011). The taxonomy and nomenclature of sand martins have been reviewed by Dickinson and Dekker (2001a), Loskot and Dickinson

(2001) and Loskot (2006). But there are difficulties to separate the subspecies of both in Sand Martins and Pale Martins as documented by Dickinson and Dekker (2001b). Sand Martins (riparia group) and Pale Martins (diluta group) show diagnostic differences in the coloration of the upper parts and breast-band, further differ in the degree of tarsal feathering, bill shape, depth of the tail fork, throat colour and alarm calls as documented by Goroshko 1993 (but due to various difficulties we were unable to these examine ancillary attributes to make a conclusive identification as well as validation of these *Riparia* species).

The two groups have widely overlapping breeding ranges in central Asia, yet colonies consist of either only one of the groups (Gavrilov & Savtchenko 1991, Goroshko 1993) or both groups but no mixed pairs. A wide zone of overlap in breeding range was reported by Gavrilov & Savchenko (1991) and these authors urged the recognition of *R. diluta* as a separate species. From our observations it was revealed that the adult individual (Indv 1, Fig 2) seems to constitute fuller breast band while Indv 2 (Fig.3) and Indv 3 (Fig.4) brown upper parts and half collars. These birds technically and ethically can be grouped as either *Riparira riparia* or *Riparira diluta*. More over as per Goroshko 1993, The two groups (Sand martin/ Pale martin) appear to have different habitat preferences in the zone of overlap: Sand Martin nests closer to rivers or other fresh water sources, whereas nesting colonies of Pale Martin are in arid steppe. As per our record we observed these individuals sharing the niche constituting both river water and nests at the vertical sand wall of river cliff region in the closest proximities of river Damodar. Conclusively we have to depend in these secondary evidences to validate the identity of these *Riparia* individuals and on the basis of this unique combination of these characteristics mentioned above we finally propose this as a *Riparira riparia* (Sand Martin). Total visiting population count, nesting success, nest survivability pattern, feeding ecology, environmental and anthropogenic influence over this species etc is under progress. It is very difficult to estimate the actual population of birds here in a stretch of about 500 meters river cliff (Mother Bed) due to mixed flight with other swallows/martins. Similar problems regarding the taxonomic identification between Pale Martins and Sand Martins were also recorded by Das (2011) in earlier studies. This observation is the first in Durgapur Barrage, West Bengal in modern times.

Note on Conservation: The Barrage premises suffer from severe threat largely from uncontrolled picnic activities, filling-up of aquatic habitats, illegal sand digging in river bed, severe pollution load (source of which chiefly includes domestic as well as industrial sewage disposal), reducing water storage capacity in the reservoir, less attention to environmental problems (mostly anthropogenic), resource over-



Fig 4. *Riparia* sp. (Indv 3) observed on Damodar barrage on 27.12.2013

extraction, improper waste management, invasion by exotic species and proliferating open cast mining activity (lower right bank) in the vicinity. Several conservation measures such as restoration of natural vegetation, controlled fishing, increasing plant diversity in banks, restricted picnic activity, diversion and treatment of sewage, mass awareness regarding environmental problems of barrage, intensive research on ecological aspects etc are recommended to protect the Durgapur Barrage's eco-health and to conserve its avifaunal wealth with other life forms. Effective management practices and conservation measures will lead the Durgapur barrage not only into a favorable habitat for water birds but may also develop into a model place for birdwatchers, naturalists, tourists, and researchers, since the water birds are of immense importance for their esthetic, sporting, and ecological values.

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