



Population and roosting behaviour of Barn Swallows *Hirundo rustica* wintering in Jamshedpur, Jharkhand, India

Sushant Kumar Verma

At & P.O. - Harharguttu, Near TRF Colony, Jamshedpur, Jharkhand 831002, India
Email: vermasushant2008@gmail.com

The Barn Swallow *Hirundo rustica* is the most widespread species of swallows in the world (Turner et al. 1989). It breeds from the central and eastern Himalaya to Japan and Korea and winters across tropical Asia from India and Sri Lanka east to Indonesia and New Guinea (Turner et al. 1989). Its preferred habitat during breeding season is open country with low vegetation. Sinclair et al. (2002) found that they become cosmopolitan during winter avoiding dense forests and deserts. Winter roost-sites are typically in reed-beds close to rivers and lakes (Curry-Lindahl 1963; Nutall 2000). In addition to reed-beds, maize or sugarcane fields are also used for roosting (Cramp 1988). Medway (1973) found that in western Malaysia Barn Swallows roosted extensively not only in *Phragmites* beds, but also on overhead wires in 26 towns. Similar observations were made by George (1965) in Mumbai (India), where he found that besides using sugarcane plantations and mangrove swamps as their traditional roosting place, thousands of Barn Swallows also roosted on overhead wires in certain crowded parts near the city. In Honshu, the Barn Swallow is more an urban bird, with the Red-rumped Swallow *Cecropis daurica* replacing it in rural landscape (Turner et al. 1989). Their gregarious roosting behaviour helps to reduce predation risk (Bijlsma & van den Brink 2005) and to conserve energy (Rudebeck 1955).

The Barn Swallow *Hirundo rustica* is a non-breeding winter visitor to Jamshedpur, Jharkhand (India). There is lack of information about the roosting behaviour of Barn Swallows wintering in Jamshedpur, hence the present study.

Methods

The roosting pattern of Barn Swallows was studied from September 2006 to April 2008. This study was carried out on a major communal roosting area in Jamshedpur, India (22°46'20.12"N & 86°11'32.66"E) in a commercial area adjacent to Tatanagar Railway Station. The approximate population of *H. rustica* during the entire roosting period was determined by random counting. For random counting, the average number of Barn Swallows settled on 1m wire was determined which was then multiplied by the total length of wire. Ten such samplings were done on every fifteenth day of each month throughout the study period.

Roost was watched for five days in each month to record presence and activities of predatory birds. Monitoring was done for four hours after the birds settled on wires.

Mean roosting time (relative to sunset) for each month was calculated to trace out any fluctuation in relation to available time period between sunset and the end of twilight. Sunset time is defined here as the time when the upper arc of the sun was on the true horizon.

Results

First appearance of Barn Swallows was noted in early September in both years of the study. Seasonal increase in number was observed from September to a peak in December (Fig. 1). Departure of birds starts from late March and continues to middle of April. Roosting time relative to sunset was significantly late in February and March. A correlation exists between roosting time and cloud cover. Birds roosted early in the evening (around 13 to 17 minutes after sunset) when the weather was cloudy. Almost in all evenings when the sky was clear birds roosted much late (24 to 28 minutes after sunset). Mean time of roosting in minutes after sunset for each month is given in Table 1. Time interval between roosting of the early and last bird usually spanned 10 to 17 minutes. It was noted that 10 to 12 roosting swallows occupied 1m of electricity wire (Image 1). Such occurrence was more or less uniform across the entire roost colony which enabled me to extrapolate total population from random samples. A uniform spacing of about 8cm was noted between two individual roosting swallows (Image 2). No patterns could be observed in the direction of facing of birds during roosting. On seeing any predator like Barn Owl or cat, large numbers would fly off and settle at the same place after a while.

Discussion and Conclusion

The non-breeding winter visitor *Hirundo rustica* exhibits gregarious, communal roost outside the breeding season in Jamshedpur, Jharkhand (India). The site of roosting remained highly illuminated with artificial lights throughout the night. Possible reasons for selection of such sites for roosting by Barn Swallows may be: (a) presence of artificial lighting to ward off predatory birds, especially owls (b) higher thermal gradients in urban agglomerates for generating warmth, and (c) availability of insects attracted towards artificial lights being substantial food source. However, availability of food insects appears to be a low priority factor for urban roosting of *H. rustica*. A concomitant increase in the number of predatory birds indicates the risk of predation. As communal roosting benefits individuals as a means of reducing predation risk due to improved vigilance for predators (Pulliam & Caraco 1984; Bijlsma & van den Brink 2005), *H. rustica* also resorts to

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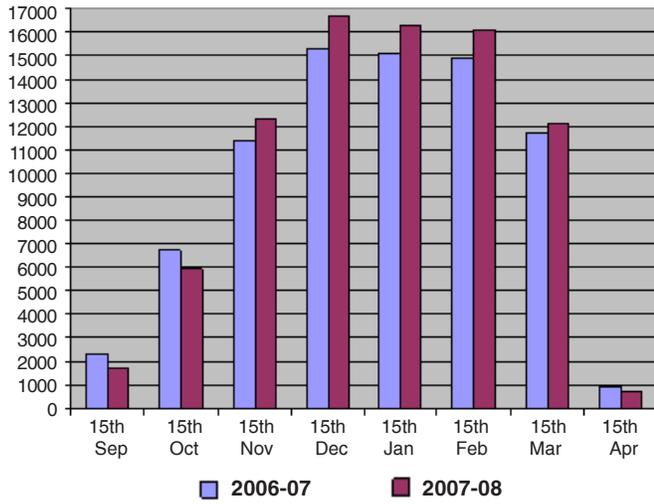


Figure 1. Monthly population of Barn Swallows during study period

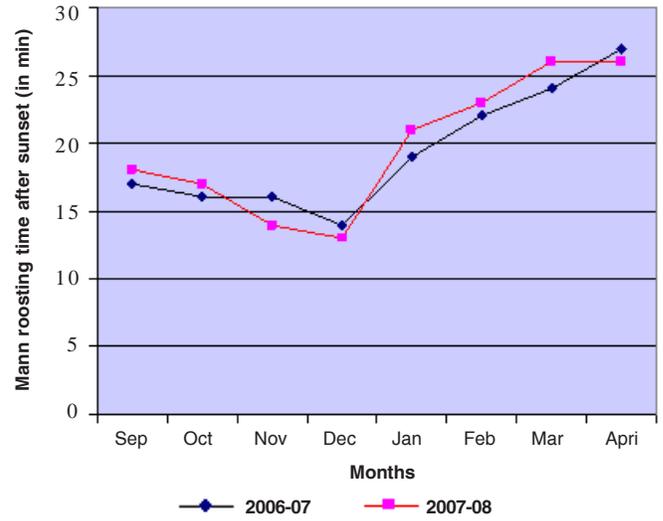


Figure 2. Graph illustrating month-wise roosting time after sunset (in min.) of *H. rustica*



Image 1. *Hirundo rustica* roosting gregariously in overhead wires at commercial part of the town Jamshedpur.

Table 1. Mean and \pm SD of month-wise roosting time after sunset (in min) of *H. rustica*

Month	Mean roosting time after sunset (in minutes)	
	2006-2007	2007-2008
September	17 \pm 0.86	18 \pm 1.43
October	16 \pm 1.32	17 \pm 1.24
November	16 \pm 1.22	14 \pm 1.10
December	14 \pm 1.03	13 \pm 0.84
January	19 \pm 1.09	21 \pm 0.65
February	22 \pm 0.72	23 \pm 0.88
March	24 \pm 0.98	28 \pm 1.03
April	27 \pm 1.01	26 \pm 1.21

communal roosting.

It was observed that Barn Swallows roosted significantly later (relative to sunset) in February-April than in September-January. Giller (1955) reported that roosting time of *H. rustica* may be influenced by rain and low temperature. Similar observations were made by Loske (1984). Early roosting in cloudy weather and during the months of February-April and late roosting in clear weather and during the months of September-January proves that availability of light is an important factor.

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Image 2. Roosting pattern of Barn Swallow *Hirundo rustica*. Pictures taken at the Station Road, Jugsalai, Jamshedpur.

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