



On the roosting and mating of *Saccolaimus saccolaimus* (Chiroptera) in Bangladesh

Saccolaimus saccolaimus is an emballonurid bat and the only species from the genus *Saccolaimus* that occurs in South and Southeast Asia. It is medium-sized (FA 63.0–68.0 mm) and has a body covered with chocolate brown to black fur with whitish speckles on the dorsum (Nanayakkara *et al.*, 2012). The muzzle of the bat is nearly hairless, ears are of moderate size and fluted, the tragus faces outwards, the tail projects a little from the uropatagium and is stout (Srinivasulu *et al.*, 2010), and a distinctive feature is the gular sac which is prominent in males and less so in females. A foul odour is often associated with these bats (Yapa & Ratnavira, 2013). Khan (2001) recorded 31 species of bats from Bangladesh including *S. saccolaimus* but did not specify distribution. Srinivasulu & Srinivasulu (2012), however, report 37 species from Bangladesh. No account of roosting or mating behaviour of this species has come from Bangladesh although it has been listed as occurring in the country (Khan 1982, 2001, 2010; Sarker & Sarker, 2005; Ahmed *et al.*, 2009). Here we report our observations of roosting and mating behaviour in *S. saccolaimus*, a first for the country.

During field work on 12 September, 2014 we opportunistically observed a roost of *S. saccolaimus* in a large hollow of a *Terminalia bellirica* tree at Modhupur National Park, Tangail District, Bangladesh (24°41'48.45"N, 90°06'13.33"E). The tree was about 15 m tall and the hollow about 5 m above ground. The opening was large, nearly 0.5 m long and half as wide but it narrowed considerably at one end (Fig. 1). We observed roosting and mating behavior of this species by naked eye. Observation was carried out for around 25 minutes during midday. As the hollow was dark, a torch light was used to get a clear view.

We did not capture any specimen for identification because there was a mating pair and an infant. Identification was determined by good quality photographs (body colour, size, shape of mouth and lips). Duration of mating times was counted using a digital stopwatch and photographs were captured using a Canon EOS 7D digital SLR camera with a 75-300 mm lens.



Figure 1: Roosting tree hollow of *S. saccolaimus*

We found a total of six individuals, including one pup, in the roost. The pup was on the lap of its mother during the entire observation. It held on to its mother's body tightly when the mother moved about in the hollow. Individuals stayed close to each other at the roost. Among the five adults we observed a mating pair. The group tended to cluster nearer the narrower end of the tree-hole where it was darker within. We were observing and illuminating the bats from a 5 m distance but they did not appear to be bothered. Although the bats noticed us they did not try to exit the hollow (Fig. 2). We saw a male actively pursuing the female with the infant for around 5 minutes (Fig. 3) and the mother moved all over the hollow to try to avoid the suitor. Three times the male got hold of the female from the back but she broke free. After further chasing the male did finally hold the mother down firmly with the thumb of its forelimb; the male then proceeded to mate with her, thrusting multiple times (Table 1). The mating commenced at 1249

h and ended at 1307 h and, during this period, the male thrust into the female 15 times; while thrusting, the male vibrated its body and made a 'trit-trit-trit...' sound. In between coitus the pair was quiet and calm and it was interesting that the pup held on to the mother while all this was going on. The three adults nearby ignored the mating pair. After mating, the male let go of the female.

Table 1: Copulation duration of *S. saccolaimus*

Numbers of penetration	Intervals (in seconds)	Duration (in seconds)
4 th	–	14
5 th	48	11
6 th	14	21
7 th	23	18
8 th	38	13
9 th	67	30
10 th	51	13
11 th	238	14
12 th	45	2
13 th	15	10
14 th	81	2
15 th	70	22

Roost numbers vary from three to several hundred in various parts of the range of *S. saccolaimus* (Compton & Johnson, 1983; Bonaccorso, 1998; Churchill, 1998; Payne & Francis, 1998; Murphy, 2002) although normally roosts are occupied by about five individuals (Boonsong & McNeely, 1977; Phillips, 1980). Our record supports this. Both sexes of this species occupy the same tree hollows and stay together most of the year (Boonsong & McNeely, 1977; Phillips, 1980) and this is consistent with our observations in Bangladesh.

Female *S. saccolaimus* give birth to one young during the tropical wet season in Australia but the exact periods of mating and parturition are unknown in that country (Hall, 1995). In the Northern Territory of Australia pregnant females have been recorded between January and March (McKean *et al.*, 1981; Churchill, 1998) and pups recorded in April (Churchill, 1998). Phillips (1980) noted females in an advanced stage of pregnancy in the months of September, October, and November in Sri Lanka. We observed mating by this species in September but, intriguingly, the female was also carrying a pup. Further studies are needed to ascertain the

roosting behaviour and breeding biology of *S. saccolaimus* in Bangladesh.

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PLATE 10



Figure 2: Roosting *S. saccolaimus* in tree hollow



Figure 3: Mating pair of *S. saccolaimus*; note pup clinging to female's anterior