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NOTE

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Mating behavior of the Yellow-throated Marten *Martes flavigula* (Mammalia: Carnivora: Mustelidae)

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Martes flavigula Boddaert, 1785, commonly known as the Himalayan Yellow-throated Marten, is the biggest marten in the old world and has distinctive blends of black, white, golden-yellow and brown, comparatively brief fur and lengthy tail. It is differentiated from eight other known races of the species by the lack of a bare skin above the hind foot plantar pad, a big hair mat between the forefoot plantar and carpal pads, and its longer, luxuriant winter coat (Pocock 1941).

Yellow-throated Marten has a broad distribution in tropical Asia (including the Greater Sundas) and expands to the Palaearctic north-east (Corbet & Hill 1992). It is frequently said to be a voracious predator. For example, Pocock (1941: 336) cited local reports given to J.M.D. Mackenzie (in Wroughton 1916) that “three or four will attack an unarmed man”. There is, however, no specific verifiable proof to support such extreme reports although Yellow-throated Marten is known, however, to feed on a broad range of vertebrates, invertebrates, fruit, honey, and food waste both on the ground and in trees (Heptner et al. 1967; Parr & Duckworth 2007; Zhou et al. 2011).

It is listed as Least Concern on the IUCN Red List due to its wide distribution, evidently relatively stable

population, occurs in a number of protected areas, and no major threats (Abramov et al. 2008). But in India, this species is regarded threatened. Yellow-throated Marten is under protection in the Indian Wildlife Protection Act 1972 Schedule II (Part II).

The species occurs in the Himalaya of Afghanistan, Pakistan, India, Nepal, and Bhutan, the Korean peninsula, southern China, Taiwan, and eastern Russia. The southern range of Yellow-throated Marten stretches across Bangladesh, Myanmar, Thailand, the Malay Peninsula, Laos, Cambodia, and Vietnam (Chutipong et al. 2016). In northeastern India, it has been reported in Arunachal Pradesh, Manipur, Himalayan region in West Bengal, and Assam. In the Sunda Shelf it occurs in Borneo, Sumatra, and Java (Proulx et al. 2005).

The Yellow-throated Marten has comprehensive and temporary home-ranges. In a single, 24 hour cycle, it patrols the land actively, and is known to cover 10–20 km. It hunts mainly on the ground, but can skillfully climb trees, jumping between branches 8–9 meters away (Heptner & Sludskii 2002). It restricts its operations to treetops after snowfall till March. Estrus cycle takes place twice a year from mid-February to late March and from late June to early August. The males fight each other for

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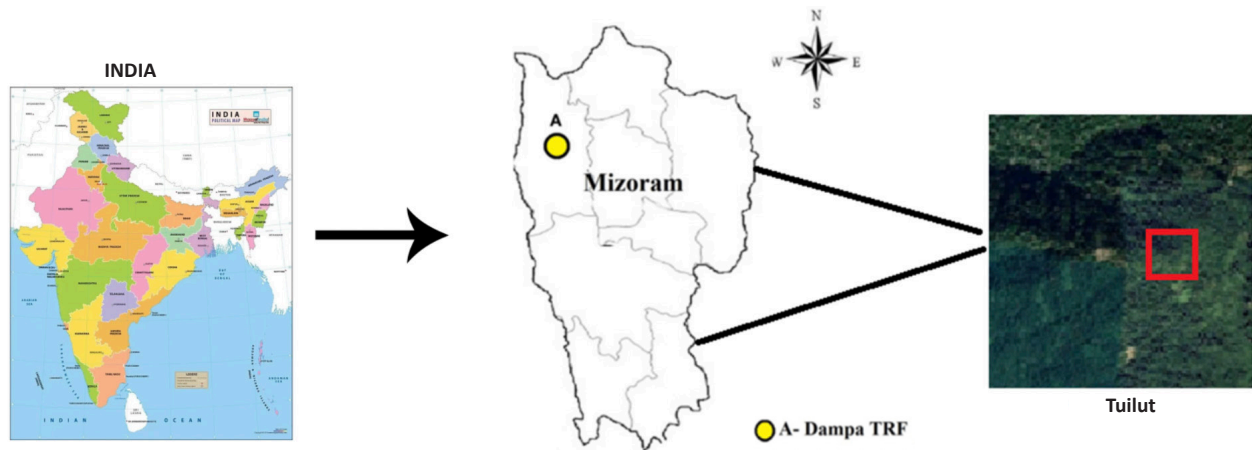


Figure 1. Map of study area.

access to female during these phases. Typically, litters consist of two or three kits and rarely four (Heptner & Sludskii 2002). No previous observation is available on mating behaviour of Yellow-throated Marten in India, and this is a first report.

The present opportunistic study was carried out in Dampa Tiger Reserve (DTR) on mating behaviour of *Martes flavigula* during November 2018 during an ongoing primate survey on transect line at Tuilut anti-poaching camp of Teirei range. DTR covers 500Km² as core and 488Km² as buffer area. Its geographical location is measured 23.341°N and 92.127°E, 800–1100 m. Annual rainfall of the area is 2,000–2,500 mm and the minimum temperature is 3.5°C and the maximum temperature is 35°C.

Natural vegetation on the upper slopes of the reserve is tropical type with evergreen at lesser altitudes. The forest is widely split into three kinds: tropical moist deciduous, tropical wet evergreen, and subtropical montane (Champion & Seth 1968; Forest Survey of India 2002) (Figure 1). The map was extracted from Google images as well as Google Earth pro (v.6.0).

Using a video camera (Sony HXR-MC1500P), the mating behaviour was registered on 25 November 2018 for around four minutes. The video was recorded slowly to determine the frequency of mating behaviour during winter. The information was recorded over a time scale of three minutes. One episode of mating was consisted of three minute duration. The three minutes duration was split into six intervals of 30 second each. Mating was classified into unsuccessful and successful category. These categories were recorded in each interval during mating (Thurman & Broghammer 2001; Gupta & Pati 1992).

On 25 November 2018 at 05:35h, two martens were

observed mating on *Sterculia villosa* tree (locally named Khau-pui) (Image 1). The plant height was about 23m and the girth at breast height (GBH) was 117m. We recorded the activities from a distance of about 15–20 m.

During mating, the copulation was observed 14 times (36, 41, 48, 62, 70, 77, 85, 92, 107, 127, 145, 151, 194, 196 secs) successively (Supplementary Video 1–3). During mating, female was on her stomach (Image 2), and facing her head forward. The male did not look around and laid over the female (Figure 2). We observed four consecutive couplanting rhythms between 60 sec to 90 sec followed by three time during 30 sec to 60 sec, two consecutive coupling rhythms were noted between 120 sec to 210 sec and no copulation was observed between 0 sec to 30 sec (Figure 3). During the copulation, an interruption (Image 3 and Supplementary Video 1–3) from another male *Martes flavigula* was recorded.

The initiation of mating is a complex behaviour in Yellow-throated Martin that depends on the temporal and spatial orientation of mating individuals. Pre-mating orientation is essential, for mate selection and successful copulation (Rymer et al. 2007). Breeding pattern in martens vary on spatial changes. In the northern hemisphere, females were found active during February to September (Pearson & Baldwin 1953; Nellis & Everard 1983) and in the southern hemisphere female breeds actively during August to February (Gorman 1976). Khan (2008) stated that Small Asian Mongooses breed primarily in Bangladesh from March to July, but it is not evident whether females breed when offspring are there in the group. A recent incidence of mating of Indian Grey Mongooses *H. edwardsii* was reported in an open place and the individuals immediately vanished into the nearby bushes (Murali et al. 2012).

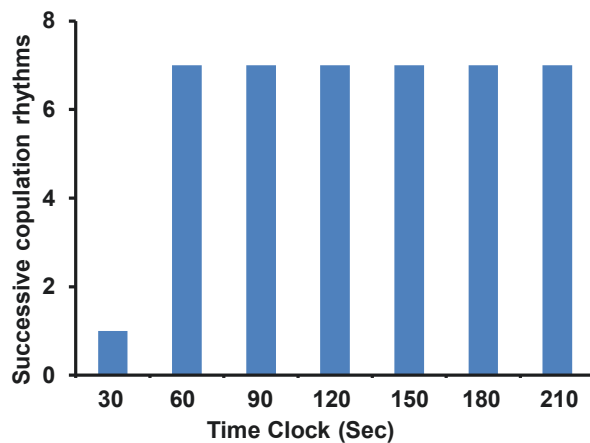


Figure 2. Copulation pattern of *Martes flavigula* at different time intervals.

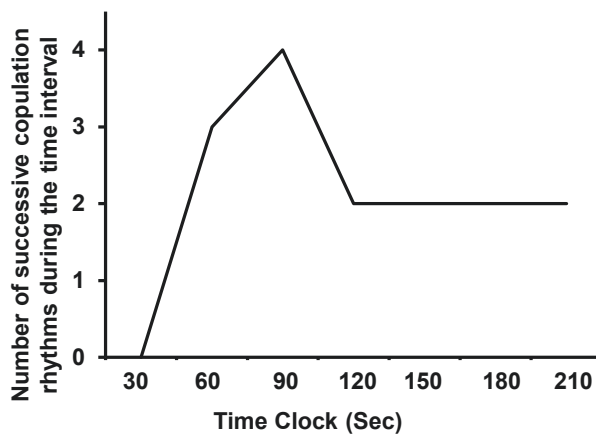


Figure 3. Consecutive couplings of *Martes flavigula* at different time intervals.



Image 1. Mating behavior of Yellow-throated Marten *Martes flavigula* was observed on the tree, namely *Sterculia villosa* (locally named Khau-pui).



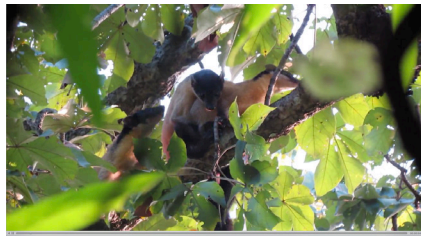
Image 2. Copulation, of *Martes flavigula* on *Sterculia villosa* tree.

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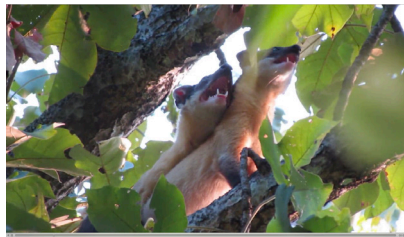
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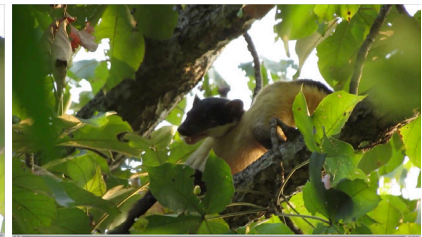
Image 3. Coupling activity of *Martes flavigula* interrupted by another male.



Supplementary Video 1. Video shows copulation of *Martes flavigula* and *flavigula*. interruption by another male.

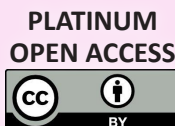


Supplementary Video 2. Copulation of *Martes*



Supplementary Video 3. Copulation of *Martes flavigula*.

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