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Conservation of Sacred Indian flying fox (Bat) at sacred landscape of Pudukottai district, Tamil Nadu, India

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ABSTRACT

The involvement of the local people in conserve the roosts habitat of the Bat sacred flying fox, *Pteropus giganteus* at sacred landscape of Madhukaatu Kali sacred grove from Tamil Nadu was reported here for the first time. Totally 431 bats were recorded roosted on two giant trees namely *Acacia leucophloea* and *Pogamia pinnata* in front of the deity Kali. In this sacred landscape, Bats were devoted to the deity Kali, worshipped by the local people from the surrounding villages believing that Bats are serving as forest guard in protecting the grove. So hunting and poaching were strictly prohibited. Due to this, the sacred flying fox are conserved in nature. Furthermore, it needs an environmental awareness program for the local people to focus on the importance of sacred landscape for Biodiversity Conservation in sustainable manner.

Key words: Sacred landscape, Indian Flying Fox, Conservation, India

Bats are Chiropterans, the only true flying mammals, comprises of about 1116 species belonging to 202 genera and 18 families in the world (Wilson and Reeder, 2005), of which, 117 species belonging to 39 genera and 8 families have been reported from India (Talmale and Pradhan, 2009). Bats are among the most diverse and gregarious of all mammals occurs in almost all the geographical areas of the world, except for the Arctic, Antarctic, extreme desert areas and a few isolated oceanic islands (Mickelburgh *et al*., 1992; Hustson *et al*., 2001). It is likely that at least 44 % of species in the family Pteropodidae are threatened by various factors that are largely anthropogenic in nature. Population trends for most species are decreasing or unknown. The flying fox, *Pteropus giganteus* (Brünnich, 1782) is considered as sacred while IUCN (2013) assessed the status least concern due to the decreasing its population.

Sacred groves are small groves that vary in size from a few hectares to a few kilometers protected by local communities as being the sacred residences of local deities and sites for religious cultural rituals, have served as valuable storehouses of biodiversity. Sacred groves are distributed over a wide ecosystem and help in the conservation of rare and endemic flora as well as fauna (Mohanta *et al*., 2012). In India, there are about 14,000 sacred groves were recorded and nearly 125 sacred groves were reported from Pudukottai district of Tamil Nadu harbor which acts as repositories of rare fauna and flora. In this paper, the people's attitude towards the conservation of sacred flying fox, *Pteropus giganteus* in sacred groves through valuable religious belief system was discussed in detail.

An intensive field survey on sacred groves of Pudukottai district of Tamil Nadu, India was carried out during the period 2011 to 2012. During the survey, Bats were noticed at Madhukaatu Kali sacred grove which covers an area of about 7 hectares with tropical dry evergreen forest, located 7 km away from Thirumayam on the way to Virachalai village. Due to the ecologically unique features of Bats in sacred landscape, further research was carried out to assess the status of Bat community and roost habitat at Madhukaatu Kali sacred groves (Figure 1).

Figure 1. View of Madhukaatu Kali Sacred Grove.

The composition and population of bat community was estimated by using the Project PteroCount format of south Asian Bat monitoring Programme. Bat identification was done based on the morphometric measurements given in Bates and Harrison (1997), Srivasulu *et al*. (2010).

From the study area, dense population of bat communities were observed in undisturbed conditions and all the bats were identified as Indian Flying fox, *Pteropus giganteus* belonging to the family Pteropodidae. Totally 431 bats were recorded roosted on two giant trees namely *Acacia leucophloea* and *Pogamia pinnata* in front of the deity Kali (Figure 2). The roosting tree species, *A. leucophloea* is about 25m in height and 137cm in diameter at

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gbh (girth at breast height) with partially closed canopy harbors 192 bats while *P. pinnata* is about 20m in height and 180cm in diameter at gbh with closed canopy harbors 239 bats respectively. The Bats were devoted to the deity Kali and considered as sacred. The vegetation type of this grove is tropical dry evergreen forest and the associated tree species include *Benkara malabarica*, *Catuneregam spinosum*, *Celastrus paniculatus*, *Diospyros melanoxylon*, *Diospyros ferrugenea*, *Grewia rhamnifolia*, *Memecylon umbellatum*, *Maytenus emarginatus*, *Morinda pubescens* var. *pubescens*, *Wrightia tinctoria* etc., climbing herbs such as *Dioscorea oppositifolia*, herbs include *Arisaemia leshnaultii*, *Habenaria* sp., *Sansieveria roxbhurgiana* were recorded very close to the roosting habitat.

Roosts are often considered the most important habitat component and roost switching appears to be essential for most species (Taylor, 2006). Knowledge about habitat use of the bats is of primary importance to establish conservation practices for endangered species

Figure 2. Sacred Flying Fox roosted on *A. leucophloea* and *P. pinnata*

(Stebbings, 1988). Using this knowledge, one can manage nature reserves to increase the extent of these habitat types, and protect them (Carmel and Safriel, 1988). In India, the status of roosting trees of *P. giganteus* have been well documented previously by several workers in Gujarat (Muthu Andavan *et al*., 2008), Karnataka (Chakravarthy and Yeshwanth, 2008; Chakravarthy *et al*., 2008), Kerala and Tamil Nadu (Reginald *et al*., 2008), Maharastra (Korad and Gaikwad, 2008).

Sacred groves are protected because of the importance given by the local people upon individual animal species (Decher, 1997). Similarly, the conservation of various fauna were reported earlier include the protection of bushbuck (*Tragelaphus* scriiptus) by Efutu people of the town of Winneba (Gordon, 1992), two primate species such as *Cercopithecus campbelli*, *Colobus polykomos* by villages of Boabend and Fiema in Brong-Ahafo region of Ghana (Fargey, 1992; Laidler, 1982), bat species such as *Eidolon helvem*, *Glauconycteris poensis*, *Hipposideros* abae, *H. cyclops* from Shai Hills Resource Reserve, Ghana (Decher, 1997). The animal species in the sacred groves are believed to be associated with the local deities and strong taboos to protect them from being killed (Fargey, 1992; Laidler, 1982). In this sacred grove, the bats were considered as sacred animal and worshipped by the local people residing in and around the villages. They believed that bat community is serving as forest guard protecting the grove and also have the religious belief that the Goddess Kali would punish if anybody hurt or kill the bats in this grove. So hunting and poaching were strictly prohibited. The people do not collect even fuel wood and fallen trees from this grove. Due to this fear, the sacred flying fox are conserved in nature. During Adi festivals (July-August) or any *pooja* (festival), local people offering fruits especially Gujava (*Psidium gujava*), Mango (*Mangifera indica*), Jambos (*Syzygium cumini*) to the bats for eating and believing that their family would get happiest and cheerful life if the Bat ate the fruits. At the same time, due to this sacred nature, the cultivable land owners from the surrounding villages of this grove do not have any conflict with this fruit-eating Flying fox for damaging the crops. To support this study, Marimuthu (1988) also reported that the Bats are considered as sacred animal and worshipped by local people at sacred groves of Madurai district. Thus, sacred beliefs centered on certain wildlife species ensured that conservation principles became part of their way of life (MF & W, 2012).

It is concluded that the sacred landscapes are most ecologically significant with the participation of local people through valuable beliefs in conserving endangered fauna to protect them from disappear. Furthermore, it needs an environmental awareness program to focus on the importance of sacred landscape to the local people for Biodiversity Conservation in sustainable manner.

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