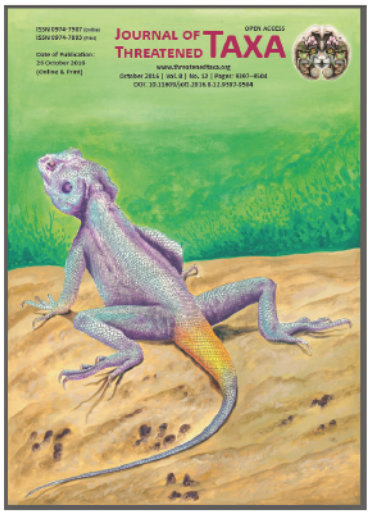

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NOTE

RANGE EXTENSION OF THE ENDANGERED SALIM ALI'S FRUIT BAT *LATIDENS SALIMALII* (CHIROPTERA: PTEROPODIDAE) IN THE ANAMALAI HILLS, TAMIL NADU, INDIA

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Range extension of the endangered Salim Ali's Fruit Bat *Latidens salimalii* (Chiroptera: Pteropodidae) in the Anamalai Hills, Tamil Nadu, India

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Latidens salimalii is the only species in the genus *Latidens,* and is endemic to India (Bates & Harrison 1997). It is the only fruit bat to be protected under Schedule I of the Indian Wildlife (Protection) Act, amended in 2006, and is listed as Endangered by the IUCN (Molur & Vanitharani 2008). It was first collected in the High Wavy Mountains in Tamil Nadu in 1948, and misclassified as the Greater Short-Nosed Fruit Bat *Cynopterus sphinx*, but was later recognised as a new genus and species by Kitti Thonglongya and named after Indian ornithologist Salim Ali in 1972 (Thonglongya 1972). The High Wavy Mountains were the only known location of this species until 1999, when its presence was recorded in the Kalakkad-Mundanthurai Tiger Reserve, Tamil Nadu (Ghosh et al. 1999).

Since then, *Latidens salimalii* has been reported from a few more localities in the southern Western Ghats of India; the Kalakkad-Mundunthurai Tiger Reserve, the Kardana Coffee Estate, Meghamalai, and the High Wavy Mountains in Tamil Nadu (Molur et al. 2002; Vanitharani et al. 2004, 2005) (Fig. 1). There is a report from Uppinangadi in Karnataka, which was described as unverified by Molur & Vanitharani (2008), and another unconfirmed report from the Periyar Tiger Reserve in Kerala (Molur et al. 2002).

This cave roosting species has been found at altitudes of 800–1,100 m, and was thought to occupy an area of about 1,100km^2, based on the location of known roosts (Vanitharani et al. 2004; Molur & Vanitharani 2008). It has been found in montane tropical evergreen forest and coffee and cardamom plantations (Molur et al. 2002; Vanitharani et al. 2004). Based on remains in their day-roosts, *L. salimalii* is thought to feed on *Prunus ceylanicus*, *Ficus glomerata, F. macrocarpa, F. beddomei, Elaeocarpus serratus, E. tuberculatus, E. oblongus, Diospyros ovaliflora* and *Dichapetalum gelonioides* (Singaravelan & Marimuthu 2003; Vanitharani et al.

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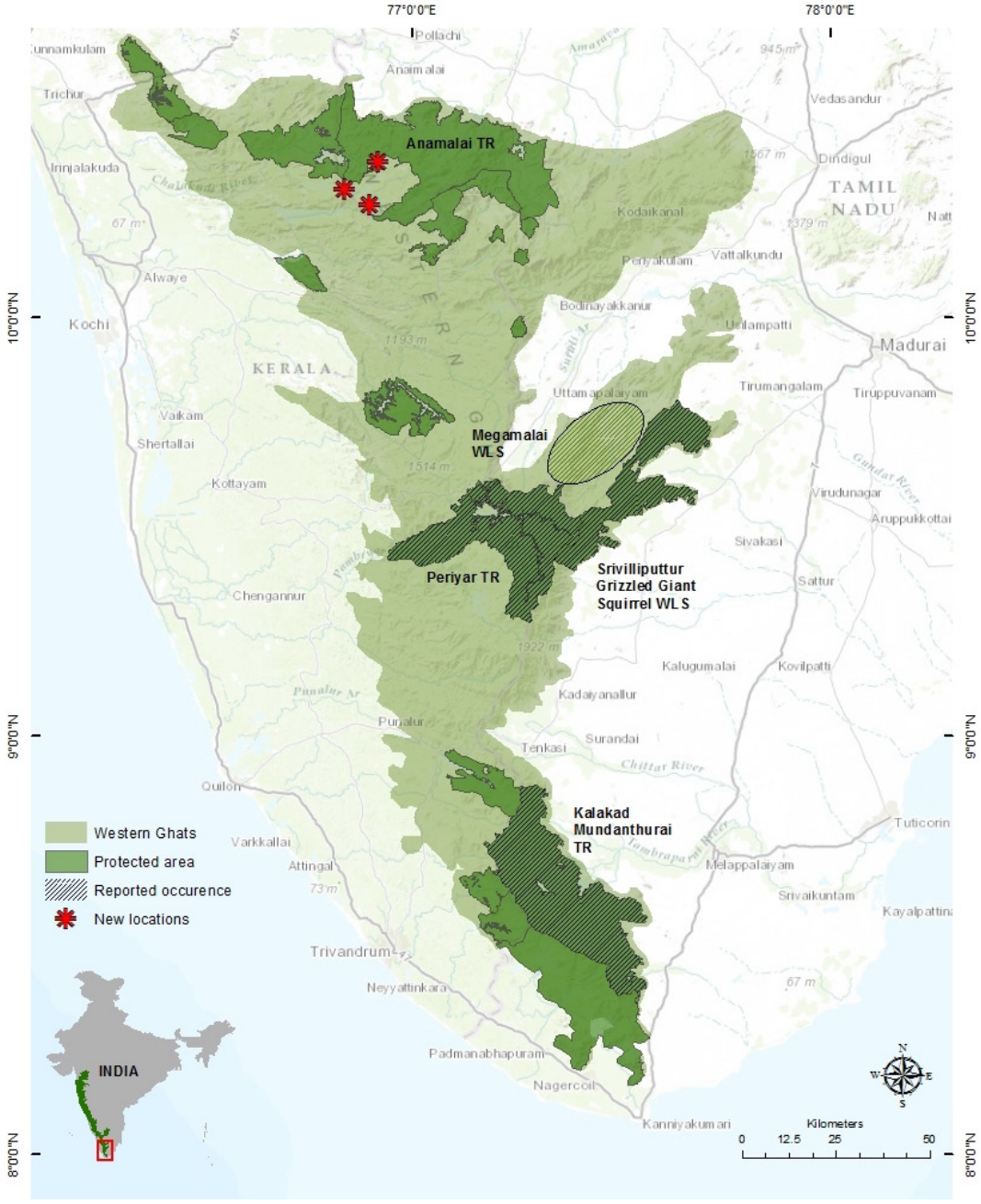

Figure 1. Location of the Anamalai Tiger Reserve, new locations for *Latidens salimalii* and previously reported locations. Map by R. Raghunath.

2004; Agoramoorthy & Hsu 2005).

The study was conducted in the Valparai plateau in the state of Tamil Nadu in the southern Western Ghats, an area of approximately 220km^2 (10.2–10.4^{0}N & 76.8–77.0^{0}E), and in the adjacent Anamalai Tiger Reserve (958km^2, 10.12–11.07^{0}N & 76.0–77.56^{0}E) (Fig. 1). The vegetation is classified as mid-elevation tropical wet evergreen forest of the *Cullenia exarillata—Mesua férrea—Palaquium ellipticum* type (Pascal 1988; Raman et al. 2009). The Valparai plateau is an agricultural landscape dominated by tea plantations interspersed with shade grown coffee plantations, eucalyptus plantations, tropical rainforest fragments, streams, and riverine vegetation (Mudappa & Raman 2007). The site is adjacent to the Anamalai Tiger Reserve in Tamil Nadu, Eravikulum National Park, Vazhachal Reserve Forest and Parambikulam Tiger Reserve in Kerala. Elevation ranges from approximately 800–1600 m, and the

Table 1. Locations of *Latidens salimalii* found in the Anamalai range.

Site ID	Date of capture	Latitude	Longitude	Sex	Age	Weight (g)	Forearm (mm)	Reproductive status	Notes
1	17.v.2009	76.837109	10.305527	M	J	68.5	68.3	NSA	Lots of parasites
2	12.ii.2012	76.897300	10.268458	M	A	52	69.8	NSA	Lots of parasites
3	11.xii.2014	76.91542	10.37059	F	A	60	68.8	PL	

Site 1 - Candura; Site 2 - Sangli Road; Site 3 - Anali; NSA - Bat does not appear to be currently sexually active, i.e. testes are not swollen; PL - Bat has previously lactated.

average annual rainfall is 3500mm, of which about 70% falls during the southwest monsoon (June–September) (Raman et al. 2009).

EKF caught bats across the Valparai plateau using ground level mist nets from 2008 until 2010. From 2011–2014, CFRW caught bats in mist nets and harp traps in forest fragments, coffee, tea and cardamom plantations, along rivers, and at roosts in tunnels and caves. CFRW caught from February to May in 2011–2013, and from November to December 2014 inside the Anamalai Tiger Reserve with appropriate permits. All bats caught were identified using the most up to date guides and then released on site within 15 min of capture (Bates & Harrison 1997; Srinivasulu et al. 2010). Bats were caught in accordance with Natural England protocol, and their welfare was of the highest priority at all times (http://www.naturalengland.org.uk/Images/wmlg39_tcm6-35872.pdf). Forearm measurements were taken to the nearest 0.1mm using dial calipers. Bats were weighed in cotton bags using spring balances, with weights to the nearest 0.5g.

One individual of *L. salimalii* was caught by EKF in 2009 and two by CFRW, in 2012 and 2014 (Table 1). All three sites were riparian locations bordered on both sides by forest. Site 1, Candura, is an abandoned vanilla plantation separated by a river and a reservoir from the Vazhachal Reserve Forest, now a naturally regenerating site with some restoration efforts. Site 2, Sangli Road forest fragment, is a large (102.8 ha) forest fragment less than 1km from the Vazhachal Reserved Forest, with a small stream running through it. The bat was caught in a mist net set over the stream. Site 3, Anali, is located inside the Anamalai Tiger Reserve, within 1km of the border with a tea plantation. The bat was caught in a mist net set over a small river.

All bats caught fitted the recorded characteristics of *L. salimalii*; most notably all showed the single pair of upper incisors that distinguishes *Latidens* from all other species of fruit bat known from the Indian subcontinent (Bates & Harrison 1997; Srinivasulu et al. 2010). The forearm measurements (68.3–69.8 mm) were similar to those recorded for this species in the High Wavy Mountains (66.0–69.0 mm) (Bates & Harrison 1997; Srinivasulu et al. 2010). Unlike the other fruit bats in the area (*Cynopterus brachyotis* and *Rousettus leschenaultii*), *L. salimalii* has no external tail (Image 1) (Bates & Harrison 1997; Srinivasulu et al. 2010). It is also smaller than *R. leschenaultii* (forearm 75.0–86.0 mm), but larger than *C. brachyotis* (forearm 57.3–63.3 mm) (Srinivasulu et al. 2010). The underside of the wings and interfemoral membranes had some fur in all individuals.

Finding this species in the Anamalai Tiger Reserve and Valparai plateau is not unexpected, given the relative proximity of this location to the Meghamalai Wildlife Sanctuary and the similarity in habitat type and altitude to the other locations where *L. salimalii* has been found. However, it is important to note the presence of an endemic, Endangered, Schedule I species in a new locality. Two of the locations are on private lands, where the forest fragments are not legally protected, although imminent destruction of these forests is unlikely. Despite being reported as roosting in colonies of hundreds (Vanitharani et al. 2004; Molur & Vanitharani 2008), we caught only three individuals during seven years of seasonal mist-netting and harp trapping in the area, so it is likely that it is not locally common. That we mostly caught it over water is likely to be due to it flying lower when coming to drink, and thus being easier to catch than when foraging.

L. salimalii is described as being threatened by hunting for local consumption in traditional medicine, human disturbance of roosting sites and tree cutting in coffee estates (Molur et al. 2002; Singaravelan & Marimuthu 2003; Vanitharani et al. 2004). As all other fruit bats in India are listed as vermin, it is likely that few people are aware of the protected status (Schedule I) of *Latidens salimalii*. Local education on the status of *L. salimalii* where it is found may be beneficial; but a deep change in the way that bats are viewed overall in India may be needed to protect these rare endemics.

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Image 1. Photographs of all three bats caught. Note the lack of external tail. Photo credit: Bat one by EKF, bat two by CFRW, bat three by A. Satish Kumar.

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