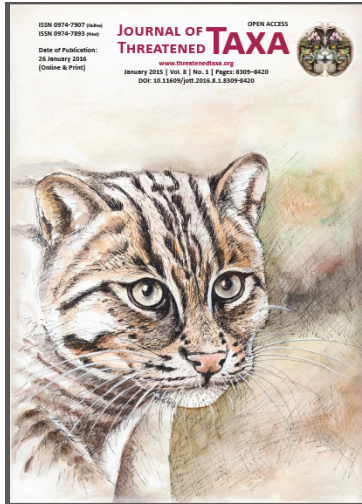


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SHORT COMMUNICATION

**NEW LOCALITY RECORD OF THE TRAVANCORE BUSH FROG
RAORCHESTES TRAVANCORICUS BOULENGER, 1891 (AMPHIBIA:
ANURA: RHACOPHORIDAE) FROM PERIYAR TIGER RESERVE, KERALA,
INDIA**

K.P. Rajkumar, T.S. Prasad, Sandeep Das, R. Sreehari, P.S. Easa & K.A. Sreejith

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NEW LOCALITY RECORD OF THE TRAVANCORE BUSH FROG *RAORCHESTES TRAVANCORICUS* BOULENGER, 1891 (AMPHIBIA: ANURA: RHACOPHORIDAE) FROM PERIYAR TIGER RESERVE, KERALA, INDIA

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Abstract: *Raorchestes travancoricus* is a rare and endemic rhacophorid from southern Western Ghats. The frog was listed in the Extinct category of the IUCN Red List until June 2015, even after its rediscovery in 2004. In June 2015, the *R. travancoricus* was reassessed to Endangered category. All published reports of the species are restricted to disturbed habitats outside protected areas and the current study report the presence of the species from eight different localities from a protected area the Periyar Tiger Reserve.

Keywords: Amphibia, Bush Frog, Periyar, Raorchestes.

Raorchestes travancoricus was listed in the Extinct category of the IUCN Red List (Biju 2004) until June 2015 even after the rediscovery of the frog from Vandiperiyar in 2004. It was reassessed as Endangered B2ab(iii) based on the area of occupancy as restricted to 30km² (IUCN SSC Amphibian Specialist Group 2015). The current status is based on the presence of the species in three locations, Vagamon, Vandiperiyar, and Periyar Tiger Reserve. We here report the presence of the

species from eight different localities in Periyar Tiger Reserve (PTR), all through direct visual sighting. All the current reports of the species are restricted to disturbed habitats outside protected areas. Presence of this 'rare' species in several marshy grassland ecosystems, locally called 'vayals', in the Tiger Reserve indicates the need for a sound management strategy for the habitat, which holds the only known population of *Raorchestes travancoricus* within a protected area.

The Travancore Bush Frog *Raorchestes travancoricus* (Boulenger, 1891) is one of the least known rhacophorids of the Western Ghats. *R. travancoricus* was initially described as *Ixalus travancoricus* based on a single female specimen collected by H.S. Ferguson from 'Bodanaikanur' (Bodinayakkanur), presently in Tamil Nadu close to the Kerala border (Biju & Bossuyt 2009). Since there were no reports since the description *R. travancoricus* was listed Extinct in the IUCN Red List

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Conflict of Interest: The authors declare no competing interests.

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(Biju 2004). Later, Biju & Bossuyt (2009) reported the rediscovery of *R. travancoricus* based on the sighting of a male frog from Vandiperiyar, 70km southwest of the type locality in 2004, and two male frogs from Vagamon in 2006, both in non-protected areas. In this study, we report eight records of *R. travancoricus* from Periyar Tiger Reserve. We also present a preliminary analysis of the call of the species.

Raorchestes travancoricus was observed from Periyar Tiger Reserve on four occasions in the Uppupara region in Azhutha Forest Range in August and September 2014. A single male was first found calling 1m high on *Ageratina adenophora* (Sticky Snakeroot / Crofton weed) in a marshy grassland ecosystem (vayal) at 18.00hr in Uppupara Thannithotti Vayal on 26 September 2014 (Images 1 & 2). A total of 36 individuals were sighted and a single male specimen was collected and morphometric measurements were taken to the nearest 0.1mm with a Mitutoyo digital vernier calliper using a binocular microscope. The specimen is deposited in the wildlife museum of Kerala Forest Research Institute, Peechi. The identity was confirmed from the yellowish-pink colouration with distinct brown lines on the dorsum, dark brown streak on each side of the snout. Small snout vent length (SVL 26.49mm), snout oval in dorsal view, head wider (HW 8.0mm) than the head length (HL 7.71 mm), snout length (SL) 3.8mm. Skin of snout region, between eyes, upper eyelids, side of head and anterior and posterior parts of back shagreened. Loreal and tympanic region light brown with a prominent streak on each side of the snout from the extreme tip of the snout to the lower level of the supra-tympanic fold. The minimum distance between upper eyelids (IUE) 3.69mm and maximum width of upper eyelid is (UEW) 1.69mm. Eye length (EL) 3.45mm. Nuptial pad absent, body slender, canthus rostralis indistinct, loreal region acutely concave, tympanum indistinct, supratympanic fold indistinct. Fore limb (FLL 5.57) shorter than hand (HAL 5.1mm), fingers without lateral dermal fringe. Subarticular tubercles prominent, rounded and single. Supernumerary tubercles weakly developed. Hind limbs moderately long (Thigh length TL 12.2mm, Shank length SHL 11.9mm, Tarsus length Tal 6.7mm, Foot length Fol 9.41mm). Dorsal part of forelimb and hind limb shagreened, webbing reduced, subarticular tubercles rather prominent, rounded and simple. Upper and lower parts of flank shagreened to sparsely granular. Chest, belly and posterior surface of thighs granular.

Call description

The calls were recorded using ZOOM H4nSP Handy



Image 1. Calling male *Raorchestes travancoricus* on *Chrysopogon nodulibarbis* grass clump



Image 2. *Raorchestes travancoricus* on *Ageratina adenophora* (Sticky Snakeroot/Crofton weed) in a marshy grassland ecosystem

Recorder from Uppupara in Periyar Tiger Reserve and the calls were analyzed by using the software Raven v1.4 software (Cornell Laboratory of Ornithology, Ithaca, NY, USA) (Bee et al. 2013a,b; Thomas et al. 2014). The waveform and frequency of the call described is given in Fig. 1 and Fig. 2, respectively (Audio 1). Call duration was 2.2 second with two distinct notes and the first note was relatively shorter (0.6 second). The second note was long and 1.1 second in duration. The dominant frequency of both the notes was about 2.7kHz (Fig. 2) and compared to the second one the first note was relatively lower in amplitude (Fig. 1). Though the dominant frequency was within the range of its published sister taxa *R. graminirupes* (Bee et al. 2013b), the duration of both notes of *R. travancoricus* is relatively much longer than that of both notes of *R. graminirupes*.

The previous report of occurrence of the species is also close to the present area (Biju & Bossuyt 2009).

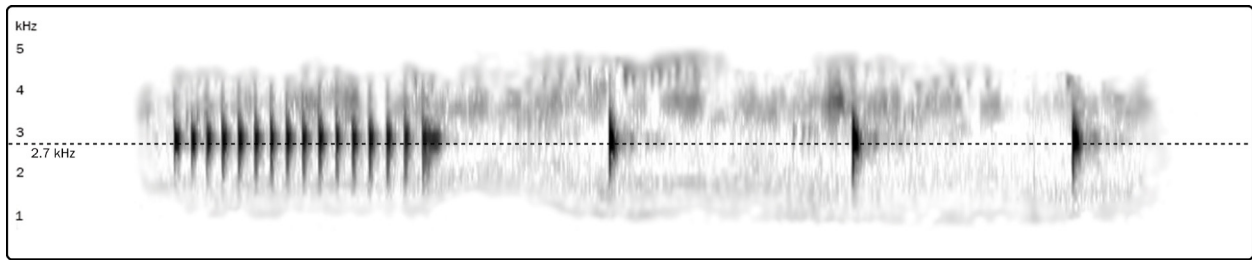


Figure 1. Waveforms of *Raorchestes travancoricus* male advertisement call (3 sec)

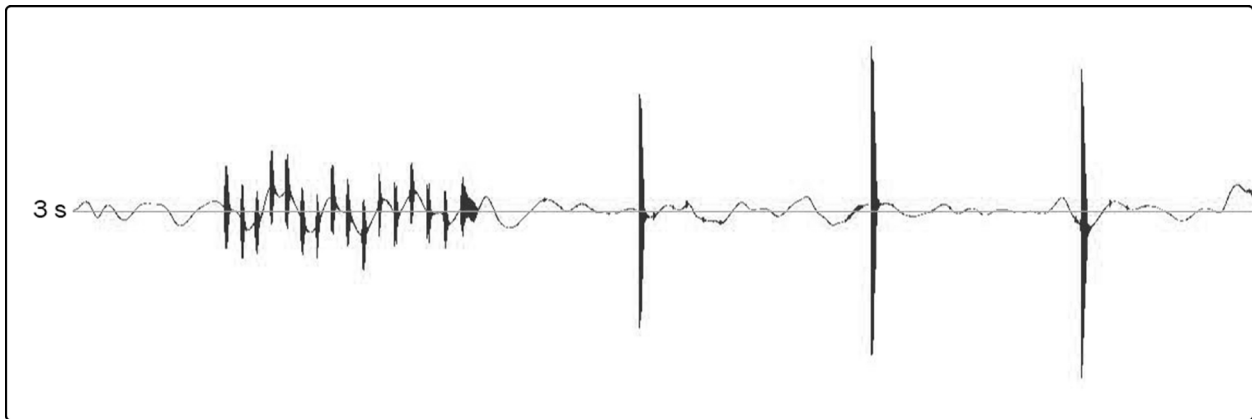


Figure 2. Spectrogram of *Raorchestes travancoricus* male advertisement call (3 sec)

Further investigation on the same day from 18.00hr to 01.00hr resulted in the sighting of 19 individuals from 20 10x10m quadrats laid randomly in the 1.21 acre vayal. Out of them 12 males (gender confirmed by presence of single subgular vocal sac) were found calling, sitting 1–2 m high from the ground on grass clumps present in the vayals. An amplected pair was found moving through grass, entered deep inside a grass clump (*Chrysopogon nodulibarbis*) and was then not followed to avoid disturbance. Random searching in the adjacent areas in different habitats resulted in 36 encounters, all of them on grasses or bushes in vayals and open grasslands. However, not a single encounter was observed in the surrounding evergreen forest patches, suggesting that this species is a vayal specialist.

R. travancoricus was also observed from seven other localities in Periyar Tiger Reserve, viz., Gavi, Upper Manalar, Eravangalar, Mangaladevi, Kumarikulam, Moolavaika and Chokkampatti during the herpetofaunal survey by the authors and the range of the species extends further south of Vandiperiyar, and increasing the altitudinal range up to 1800m. Even though the species was observed from the above seven locations in Periyar Tiger Reserve, detailed survey was carried out only at Uppupara. The details of locations of sightings of

Table 1. Distribution range of *Raorchestes travancoricus* from southern Western Ghats

Location	Altitude (m)	Latitude	Longitude
1. Bodanaikanur, TN	350	9.97°N	77.48°E
2. Vandiperiyar, Idukki	800	9.87°N	77.17°E
3. Vagamon, Idukki	900	9.57°N	77.08°E
4. Uppuppara, PTR	1188	9.47°N	77.08°E
5. Gavi, PTR	1179	9.43°N	77.13°E
6. Upper Manalar, PTR	1495	9.55°N	77.33°E
7. Eravangalar, PTR	1340	9.57°N	77.28°E
8. Mangaladevi, PTR	1234	9.59°N	77.21°E
9. Moolavaiga, PTR	1315	9.40°N	77.32°E
10. Kumarikulam, PTR	1209	9.49°N	77.28°E
11. Chokkampatti, PTR	1802	9.28°N	77.27°E

TN - Tamil Nadu; PTR - Periyar Tiger Reserve

the species is summarised in Table 1 and the locations in PTR plotted in the Image 3. A detailed survey in similar habitats of Periyar Tiger Reserve is suggested to explore the possibility of more populations of the species to gauge its current distribution. Future research is required to understand the habitat preference and distribution

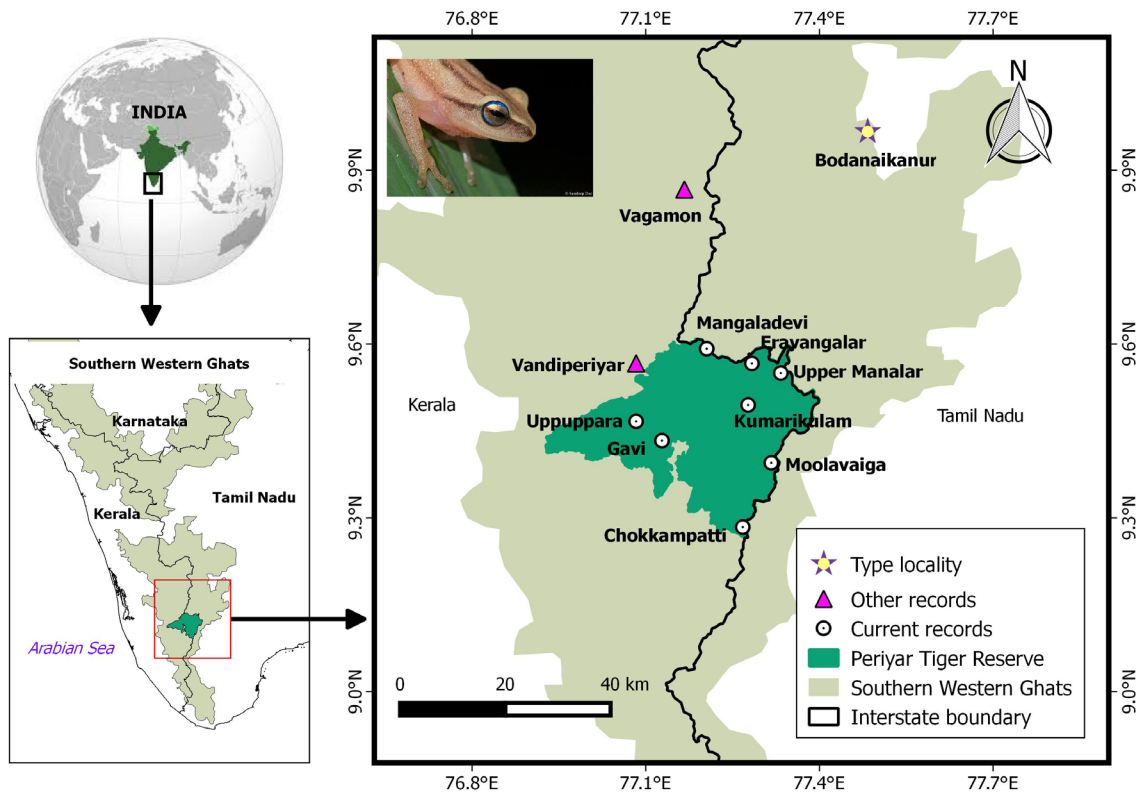


Image 3. Distribution map of *Raorchestes travancoricus* including the type locality

of this species. By reporting marshy grasslands in PTR as new localities for *R. travancoricus*, the current study also highlights the importance of conservation and management of the vayal ecosystem in Periyar Tiger Reserve.

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