



Description of the complex advertisement call of *Pseudophilautus popularis* (Manamendra-Arachchi & Pethiyagoda, 2005) (Amphibia: Rhacophoridae)

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In Sri Lanka, the family Rhacophoridae consists of 72 species and 67 of them belong to the genus *Pseudophilautus* (Laurent) (Meegaskumbura *et al.* 2010; Meegaskumbura & Manamendra-Arachchi 2011; Meegaskumbura & Manamendra-Arachchi 2005). *Pseudophilautus popularis* (Manamendra-Arachchi & Pethiyagoda 2005) is a small frog where males would attain snout-vent-lengths between 17.7–21.3 mm and gravid females attaining lengths around 23.0–25.6 mm. It is found in elevations approximately up to 1070 m above sea level (asl). It is a widely distributed species found in many localities within the wet zone. As the name suggests, it is commonly encountered near anthropogenic habitats and forest edges (Manamendra-Arachchi & Pethiyagoda 2005, Karunarathna & Amarasinghe 2010). *Pseudophilautus popularis* perches on low vegetation, generally on shrubs 0.2–1.5 m above the ground. Here, I describe the complex advertisement call of *P. popularis*.

The study site selected was a home garden in the Colombo district of the Western province of Sri Lanka, approximately 500 m away from the Kottawa town (6°50'42.21" N 79°57'28.65" E, 31 m asl). The vegetation comprised garden shrubs of 0.5–1.5 m height. The temperature was measured by a Brannon mercury thermometer (-20–100°C, ± 0.5°C). Measurements of the animals were taken using a VXB Bearing electronic LCD digital vernier Caliper (0–150 mm, ±0.02 mm). The vocalizations were recorded during the months of February, April, October and November 2010 (mean = 27.75 ± 1.97°C), using Creative ZEN[®]Mozaic EZ. Calls were recorded 0.5 m away from all animals that are included in this study. Animals were later caught measured and subsequently released to its same habitat. The following software was used for sound analysis: Windows Movie Maker (Vista), Syrinx 1.0.0.1 and Wavesurfer 1.8.8. All calls were edited with a sampling rate of 44100 Hz and 16 bits per sample in the mono pattern. The audio spectrogram was achieved at hamming window function with 512 band resolution and peak frequency details were acquired through Fast Fourier Transformation (FFT, width 512 points) in the spectrum section plot. Spectral parameters were analyzed without applying any filtering. Time and frequency measurements were taken from the oscillogram and spectrogram respectively. The following time parameters were measured: duration of one call (DC) and call interval (time between the end of one call and the beginning of the following) (IC). The number of prominent pulses in a note (NP) and the pulse rate (The number of pulses per second, PR) was also recorded. The number of notes in a call and the note rate was also recorded in some instances. This was achieved by expanding the spectrum and the oscillogram. The measured frequency parameters were lower frequency (F1), upper frequency (F2) and peak frequency (F3).

The advertisement call of *P. popularis* (figure 1a) consists of a pulsed single note (“creek”) with a time duration ranging between 47–78 ms (68 ± 5 ms (mean ± Standard deviation), n = 61 calls, 15 males), and IC ranged from 1.563–52.230 s (8621 ± 8250 ms, n = 60). F1 ranged between 2494–3668 Hz (2934.41 ± 168.29 Hz, n = 61) and F2 ranged between 3030–5714 Hz (4938.24 ± 406.93 Hz; n = 61). F3 was between 3281–4070 Hz (3764.82 ± 142.63 Hz; n = 61). Each note consisted of 5–13 prominent pulses (8.13 ± 5; n = 61) and the PR was 119.99 ± 21.07 s⁻¹ (78.13–178.08 s⁻¹; n = 61).

Additionally two different notes were recorded: A short single note (“click”) and a long iambic multi note call (“trill”) emitted in a staccato pattern were observed to be given occasionally in between advertisement calls. These two notes, especially the “click” note, are given out very rarely. The functions of these calls are unknown and are currently under study.

The short single note (“click”) (figure 1b) has a relatively shorter time duration which is 17 ms (18 ± 2.5 ms, n = 4) and a relatively lower peak frequency ranging only between 3281–3402 Hz (3349 ± 51.72 Hz, n = 4). The upper and lower frequencies were: 2776–2978 Hz (2874.82 ± 113.74 Hz, n = 4) and 3753–4547 Hz (4106.93 ± 342.34 Hz, n = 4).

The DC of the long iambic multi note call (“trill”) (figure 1c) was 381 ± 688 ms (75–2333 ms, n = 10), Number of