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**RANGE EXTENSION OF *RAORCHESTES CHROMASYNCHYSI*  
(BIJU AND BOSSUYT) (AMPHIBIA : ANURA : RHACOPHORIDAE)  
IN WESTERN GHATS, INDIA**

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The family Rhacophoridae (Amphibia : Anura) is represented by eight genera *Chiromantis*, *Ghatixalus*, *Kurixalus*, *Polypedates*, *Rhacophorus* and *Theloderma* (Dinesh *et al.*, 2009) *Pseudophilautus* and *Raorchestes* (Biju *et al.*, 2010) in India. The genus *Raorchestes* Biju, Shouche, Dubois, Dutta and Bossuyt (earlier *Philautus*) is a group of frogs known for direct development (Patil and Kanamadi, 1997; Krishnamurthy *et al.*, 2002; Biju, 2003; Gururaja and Ramachandra, 2006), and in India this group is represented by 44 species of which 31 species are endemic to the Western Ghats (Dinesh *et al.*, 2009; Biju *et al.*, 2010; Dinesh *et al.*, 2010).

Taxonomy and systematics of *Raorchestes* (earlier *Philautus*) was considered to be convoluted due to less morphological differences and varied colour patterns. In the recent studies on the systematics and phylogeny of the genus, Biju and Bossuyt (2009) described the endemic taxa *Raorchestes chromasynchysi*, commonly called confusing green frog, from Kurichiyarmala (1 f 35' N, 75°58' E and an altitude of 1200 msl), Wayanad District (Western Ghats), Kerala (Fig. 5), collected during September 1997 and July 2002.

During one of our expeditions in the Western Ghats on 22<sup>nd</sup> November 2007, we could collect six individuals of *R. chromasynchysi*, from Kemmanugundi, Bhadra Wildlife Sanctuary (BWLS), Chikkamagaluru, Karnataka (Fig. 5) and here we report the same with additional notes on sexual dimorphism and its range extension in Western Ghats.

We could determine the specific identity of these individuals as *R. chromasynchysi* based on the following diagnostic characters. A small to medium sized frog with a slender body; head length subequal to head width; snout slightly pointed and protruding; tongue with a free pointed papilla; canthus rostralis sharp; loreal region vertical, marginally concave; tympanum distinct; supratympanic fold distinct; forelimb shorter than hand; webbing in fingers absent; palmar tubercle and subarticular tubercle distinct; super-numerary tubercles present; nuptial pad absent; tibia length sub-equal to thigh; webbing moderate (I 1-2 II 1-2 III 1-2 IV 2-1 V); super-numerary tubercles present; skin on the dorsum smooth to sparsely granular but belly finely granular on the ventral side.

**SEXUAL DIMORPHISM**

*Females* : Larger (up to 34.8 mm in SVL) than males; skin colour uniformly green (Fig. 1) on the dorsum with different shades of the green depending upon the humidity of the surrounding area; colouration on hand faint yellowish green, forelimb and ann greenish without any crossbars; lateral sides of the body greenish with yellow granulations; upper surface of the thigh and tibia green, tarsal and metatarsal faint yellowish green; anterior part of thighs, front of thighs (groin) with brown and yellow blotches; posterior part of the thighs dark brown bordering yellow colour. Ventral side of the throat, hand, arm, belly, thigh and tibia creamish yellow; hand, tarsal and foot with brownish granulations.

**Males** : Smaller (up to 28.2.8 mm in SVL) than females; skin colour in males variable (Figs. 2, 3 and 4), in the dry spell overall body colouration is yellowish brown; dorsum between the interorbital space with an inverted triangular black patch and a dark brown 'X' shaped mark on the back, starting from the back of the orbit, intersecting behind the shoulders and extending into the region of groin; lateral sides of the body yellowish; fore and hind limbs with cross bars; anterior part of thighs, front of thighs (groin) with brown and yellow blotches; posterior part of thighs dark brown. Ventral side of the hand, arm, belly, thigh and tibia creamish yellow; throat, hand, tarsal and foot with brownish granulations.

Our field studies of the past three years suggest that activity of this frog is less during non-breeding season, during which individuals were located below the small boulders along the perennial water sources and occasionally below the leaf litter with high moisture content. But in the breeding season this species is found calling on the shrubs of *Melastoma malabathricum* above 5 feet from the ground level and on the big boulders of the streams after 19 hrs in the late evening. The other sympatric shrub frogs observed

in the breeding season are *R. charius*, *R. luteolus*, *R. tuberothumerus* and two other un-identified species of *Raorchestes*. Colour change in this species is very common, females are known to change colour in different shades of green, but males are generally brownish (Fig. 2) and they tend to change colour in different shades of yellow green.

#### RANGE EXTENSION

Biju and Bossuyt (2009) located this species in a small area of about 30 km<sup>2</sup> on an isolated mountain at the type locality Kurichiyarmala. Our present observation from BWLS extends the range of the species by about 218 km (aerial distance) north of the type locality and it is more likely that, this species is available in the high altitude forest stretches of BWLS and Wayanad region.

The specimens studied are deposited in the faunal depository of the Western Ghat Regional Centre, Zoological Survey of India, Calicut (ZSI/WGRC/V/A/ 690 and 712).

#### ACKNOWLEDGEMENTS

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**Table-1.** Morphometric data (in mm) of *Raorchestes chromasynchysi* Biju and Bossuyt.

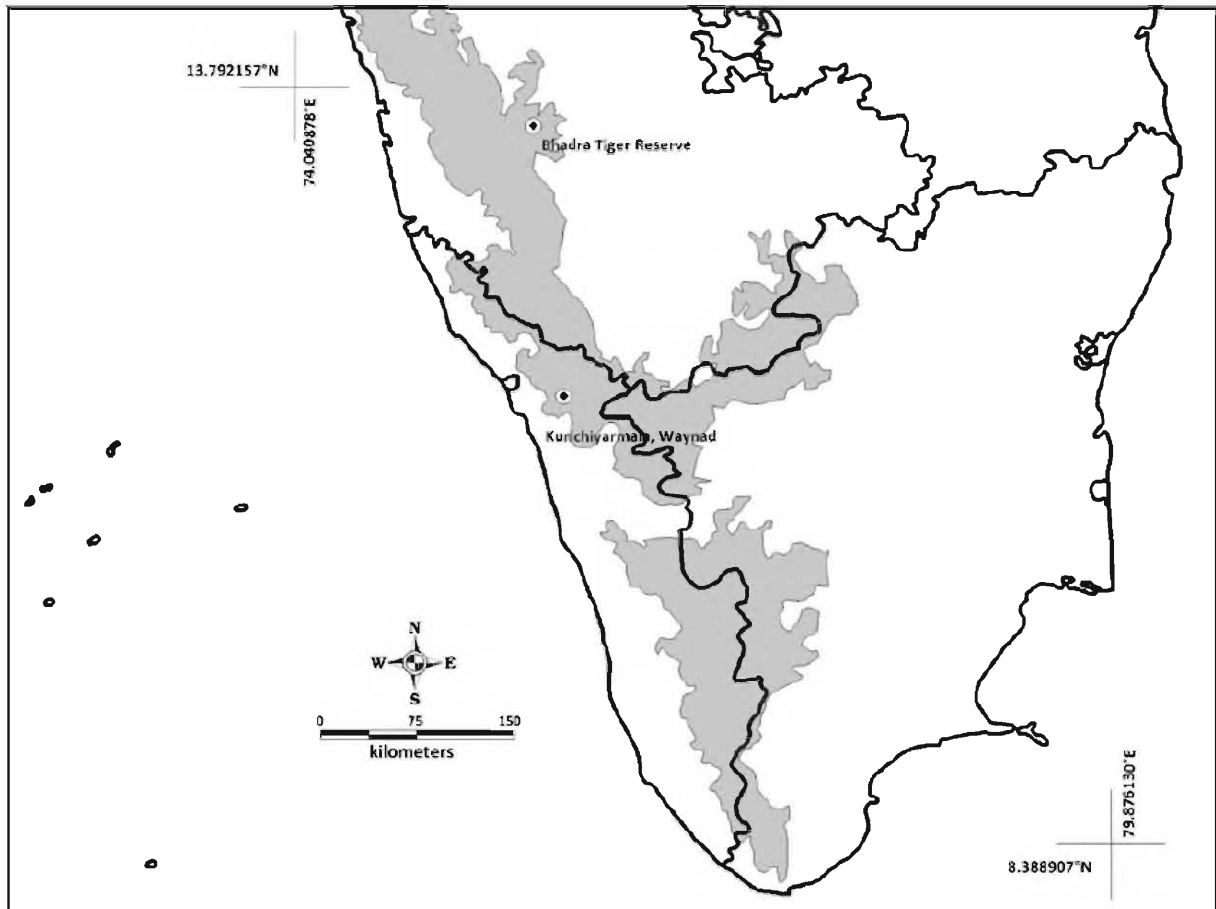
Reg. No	Sex	SVL	HW	HL	IUE	UEW	SL	EL	FLL	HAL	TL	ShL	FOL	HeTo
*4433†	M	23.3	8.9	9.0	2.9	2.0	3.3	3.5	5.1	6.6	12.4	12.7	9.7	2
*4434†	M	18.0	7.2	7.3	2.7	1.8	2.7	2.9	4.2	4.5	9.8	10.5	7.3	2
*4436†	M	21.8	8.4	8.8	2.6	2.0	3.3	3.1	4.3	6.5	10.7	11.8	8.6	2
*4435†	M	20.2	7.8	8.0	3.2	1.7	3.0	2.9	4.6	5.4	10.5	11.2	8.5	2
*4437†	M	25.0	9.6	9.3	3.0	2.2	3.6	3.8	5.3	7.6	12.2	13.4	9.9	2
*4438†	M	23.5	8.5	8.6	2.7	1.8	3.4	3.6	5.0	6.6	12.1	12.1	9.6	2
*4439†	M	23.4	8.6	9.1	3.4	1.9	3.5	3.8	5.9	6.9	11.9	12.4	10.3	2
*4440†	M	27.6	10.6	10.5	3.4	2.2	4.1	3.9	6.2	8.3	14.3	14	11.7	2
<b>Mean±SD</b>		<b>22.9±2.9</b>	<b>8.7±1.0</b>	<b>8.8±0.9</b>	<b>3.0±0.3</b>	<b>2.0±0.2</b>	<b>3.4±0.4</b>	<b>3.4±0.4</b>	<b>5.1±0.7</b>	<b>6.6±1.2</b>	<b>11.7±1.4</b>	<b>12.3±1.1</b>	<b>9.5±1.3</b>	
*4441†	F	29.7	11.0	11.4	3.6	2.1	4.4	3.8	6.7	8.1	13.7	15.2	11.5	2
*4442†	F	27.7	10.3	10.3	3.4	2.3	3.8	4.0	5.8	7.2	12.8	14.7	11.0	2
<b>Mean±SD</b>		<b>28.7±1.4</b>	<b>10.6±0.5</b>	<b>10.8±0.8</b>	<b>3.5±0.1</b>	<b>2.2±0.1</b>	<b>4.1±0.4</b>	<b>3.9±0.1</b>	<b>6.2±0.6</b>	<b>7.6±0.6</b>	<b>13.2±0.6</b>	<b>14.9±0.4</b>	<b>11.2±0.4</b>	
#V/A/712a‡	F	29.5	11.2	10.3	4.0	2.7	4.7	4.6	6.6	8.3	16.4	16.1	13.8	2
#V/A/712b‡	F	28.7	11.1	9.9	4.5	2.6	4.5	4.3	6.6	8.6	16.8	15.8	11.8	2
#V/A/712c‡	F	20.2	8.3	8.3	3.4	1.9	3.4	3.6	5.1	6.1	10.7	11.2	8.3	2
#V/A/712d‡	F	28.0	11.0	9.1	4.3	2.6	3.9	4.5	6.6	8.0	16.3	15.3	12	2
#V/A/690b‡	F	34.8	13.1	11.2	4.5	3.2	5.0	5.4	9.0	8.9	18.2	18.4	14.1	2
<b>Mean±SD</b>		<b>28.2±5.2</b>	<b>10.9±1.7</b>	<b>9.8±1.1</b>	<b>4.1±0.5</b>	<b>2.6±0.5</b>	<b>4.3±0.6</b>	<b>4.5±0.6</b>	<b>6.8±1.4</b>	<b>8.0±1.1</b>	<b>15.7±2.9</b>	<b>15.4±2.6</b>	<b>12.0±2.3</b>	
#V/A/712e‡	M	28.2	10.1	9.5	3.5	2.6	4.5	4.0	6.3	8.0	14.1	14.1	11.6	2
#V/A/712f‡	M	25.9	10.1	8.9	3.5	2.5	4.0	4.9	6.3	7.7	13.9	13.8	10.4	2
#V/A/690a‡	M	23.9	8.9	7.9	3.2	2.5	3.8	4.1	6.2	7.1	12.9	12.8	10.2	2
<b>Mean±SD</b>		<b>26.0±2.2</b>	<b>9.7±0.7</b>	<b>8.8±0.8</b>	<b>3.4±0.2</b>	<b>2.5±0.1</b>	<b>4.1±0.4</b>	<b>4.3±0.5</b>	<b>6.3±0.1</b>	<b>7.6±0.5</b>	<b>13.6±0.6</b>	<b>13.6±0.7</b>	<b>10.7±0.8</b>	

\*prefix BNHS (Bombay Natural History Society); #prefix ZSI/WGRC/V/A (Zoological Survey of India/Western Ghat Regional Centre/Vertebrata/Amphibia); † data from Biju & Bossuyt, 2009; ‡ present observation

**Table-2.** Collection localities of *R. chromasynchysi* in Western Ghats.

Sl. No.	Collection localities	Latitude (N)	Longitude (E)	Altitude (msl)
1.	Kurichiyarmala, Wayanad, Kerala	11°35'	75°58'	1200 m
2.	Bhadra Wildlife Sanctuary, Chikmagalur, Karnataka	13°31'	75°45'	1485 m

**Figure 1.** *Raorchestes chromasynchysi*  
Female with green dorsum**Figure 2.** *Raorchestes chromasynchysi*  
Male with brown dorsum**Figure 3.** *Raorchestes chromasynchysi*  
Male with green dorsum**Figure 4.** *Raorchestes chromasynchysi*  
Male with greenish brown dorsum



**Figure 5.** Map showing collection localities of *Raorchestes chromasynchysi* in the Western Ghats. Shaded areas indicate Western Ghats