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A New Species of *Hyperolius* (Amphibia: Hyperoliidae) from Príncipe Island, Democratic Republic of São Tomé and Príncipe

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?1 Abstract: I describe a new species of reed frog (*Hyperolius*: Hyperoliidae) from the island of Príncipe in the Gulf of Guinea archipelago. The new species is within the *Hyperolius cinnamomeoventris* species complex, which includes four described species: *H. cinnamomeoventris*, *H. veithi*, *H. molleri*, and *H. thomensis*. The new species is sexually monochromatic (males and females have green dorsal coloration) and is thus distinguished from *H. cinnamomeoventris*, which is sexually dichromatic, and from *H. veithi*, in which both males and females are tan with yellow dorsolateral lines. The new species is smaller in size than *H. thomensis*, and differs in coloration from *H. molleri* and *H. thomensis* by lacking a black contour along the edges of the green/yellow band of coloration that extends down the dorsal side of the thigh, by lacking red/orange coloration on the dorsal and ventral sides of the thigh, and in the mitochondrial 16s and cytochrome-b genes. Furthermore, previous work indicates that the new species is distinct from *H. molleri* and *H. thomensis* in analyses of genome-wide single-nucleotide polymorphisms. This new species is the third endemic amphibian described from this small oceanic island. The type material for the closely related *H. molleri* and *H. thomensis* was destroyed or lost; therefore, I designate neotype material for these two species to enable the description of the new species.

Key words: Anura; Gulf of Guinea; *Hyperolius drewesi* sp. nov.; *Hyperolius molleri*; *Hyperolius thomensis*

The islands of São Tomé and Príncipe in the Gulf of Guinea archipelago host seven endemic amphibian species, including two species of reed frogs, genus *Hyperolius* (Rapp 1842) (Hyperoliidae): *Hyperolius molleri* (Bedriaga 1892), found on both islands, and *Hyperolius thomensis* Bocage (1886), restricted to São Tomé (Jones 1994; Drewes and Stoelting 2004; Drewes and Wilkinson 2004; Uyeda et al. 2007). São Tomé and Príncipe arose as volcanoes along the Cameroon Volcanic Line and have never been connected to continental Africa; thus the prevailing hypothesis for the presence of endemic amphibians on these islands is assisted dispersal via vegetation rafts that are swept down major river drainages into the gulf following large rain events (Measey et al. 2007). A recent multilocus phylogeographic study of the island *Hyperolius* and their mainland sister taxon, the *Hyperolius cinnamomeoventris* species complex, indicated that *Hyperolius* dispersed from West-Central Africa in the last several million years and subsequently diversified within the archipelago (Bell et al. 2015a). São Tomé Giant Reed Frogs, *H. thomensis*, and Moller's Reed Frogs, *H. molleri*, are considered distinct species based on differences in body size, coloration, and breeding ecology (Drewes and Wilkinson 2004). In contrast, the populations of *H. molleri* on São Tomé and Príncipe are currently considered a single species, although populations on the two islands are reciprocally monophyletic at mitochondrial and nuclear loci (Bell et al. 2015a,b).

Herein I describe a new species of reed frog from the island of Príncipe, which represents the third endemic amphibian for Príncipe, and designate neotypes for *H. thomensis* and *H. molleri* to enable the description of the new species. The type material of *H. thomensis* was collected on São Tomé Island and housed in the Museu Bocage in Lisbon, Portugal (Drewes and Wilkinson 2004). All herpetological material at the Museu Bocage was destroyed in a fire in 1978 (Almaça and Neves 1987). The type material of *H. molleri* was collected on São Tomé Island, sent to Bedriaga by Adolfo Moller (Universidade de Coimbra), and remained in Bedriaga's private collection (L. Ceríaco, personal communication; Museu Nacional de História Natural e da Ciência). There are no records of Bedriaga's private collection being deposited in a museum after his death, and the material is presumed lost. Additionally, there is a hybrid zone between *H. thomensis* and *H. molleri* on São Tomé that coincides with environmental transitions from agriculture to primary forest (Bell et al. 2015b) and the original type localities for *H. thomensis* and *H. molleri* are vague and/or include sites where hybridization is likely. Therefore, based on previous molecular work I selected neotypes for *H. thomensis* and *H. molleri* from sites outside of the hybrid zone and chose specimens with no evidence of hybrid ancestry (Bell et al. 2015b).

Materials and Methods

My colleagues and I collected specimens during April–May 2001, May 2006, April 2008, April 2012, and April–May 2013. Specimens were fixed in 10% buffered formalin after preserving livers in 95% ethanol or RNAlater (Ambion), and later transferred to 70% ethanol. Specimens and tissue samples were deposited at the California Academy of Sciences (CAS). Comparative material was examined in the holdings of this institution (Appendix).

Measurements were taken with dial calipers (±0.1 mm): snout–vent length (SVL); head length from tip of snout to rear of jaws (HDL); maximum head width (HDW); snout length from tip of snout to anterior corner of eye (SNT); eye diameter (EYE); interorbital distance (IOD); internasal distance (IND); shank length (SHK); thigh length (TGH); forearm length, from elbow to base of thumb (LAL); manus length from tip of third digit to base of thumb (HND); pes length from tip of fourth toe to base of inner metatarsal tubercle (FTL). I followed Myers and Duellman (1982) to describe the webbing formulae.

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TABLE 1.—Measurements (mm) of adult holotype and paratypes of *Hyperolius drewesi* sp. nov and adult neotypes of *Hyperolius molleri* and *H. thomensis*. Mean values are reported ±1 SD; see text for measurement descriptions.

	H. drewesi			*H. molleri*	*H. thomensis*
Measurement[a]	Holotype male (CAS 253051)	Paratype males (n = 16), range; mean	Paratype female (CAS 219205)	Neotype male (CAS 253073)	Neotype male (CAS 251637)
SVL	27.3	24.8–30.9; 27.8 ± 1.5	32.7	26.9	38.6
HDL	5.9	5.8–7.2; 6.4 ± 0.4	7.1	6.3	8.3
HDW	9.7	9.3–11.0; 10.1 ± 0.4	11.7	9.4	13.5
SNT	4.3	3.7–4.4; 4.0 ± 0.2	4.8	4.2	5.8
EYE	2.7	2.7–3.6; 3.0 ± 0.2	3.5	3	3.6
IOD	5.5	5.1–6.0; 5.7 ± 0.2	6.9	5.1	7.9
IND	2.3	2.0–2.5; 2.3 ± 0.2	2.6	2.6	3.5
SHK	13.8	12.9–15.6; 14.3 ± 0.6	15.6	13.1	19.8
TGH	13.5	12.6–15.4; 13.9 ± 0.7	15.4	13.0	18.9
LAL	5.9	5.8–6.8; 6.2 ± 0.3	6.9	5.9	7.3
HND	7.6	7.3–8.5; 8.0 ± 0.4	8.5	7.3	12.1
FTL	12.2	11.4–13.2; 12.4 ± 0.5	13.4	11.6	18.5

[a] SVL, snout–vent length; HDL, head length from tip of snout to rear of jaws; HDW, maximum head width; SNT, snout length from tip of snout to anterior corner of eye; EYE, eye diameter; IOD, interorbital distance; IND, internasal distance; SHK, shank length; TGH, thigh length; LAL, forearm length, from elbow to base of thumb; HND, manus length from tip of third digit to base of thumb; FTL, pes length from tip of fourth toe to base of inner metatarsal tubercle.

I obtained sequence data from two mitochondrial genes for the type specimen of the new species and the neotypes of *H. molleri* and *H. thomensis* (GenBank accession numbers 16s: KP137129, KP137172, KP137217; cytochrome b: KP137243, KP137277, KP137316; Bell et al. 2015b) and calculated uncorrected pairwise distance between the sequences in Geneious v8.0.4.

SPECIES DESCRIPTION

Hyperolius ***drewesi*** sp. n
(Table 1; Figs. 1–3)

Holotype.—CAS 253051 (field no. RCB 0352), adult male, São Tomé and Príncipe, Príncipe Island, Road to Bom Bom Resort, 1.6883°N, 7.4022°E (in all cases, datum = WGS84), 15 m elevation; collected by Rayna C. Bell, Robert C. Drewes, Velma Schnoll, and Andrew Stanbridge on 30 August 2013.

Paratypes.—CAS 219128–29 (field no. RCD 14048–49), two adult males, São Tomé and Príncipe, Príncipe Island, Agua Doutor, 1.6521°N, 7.4161°E, 178 m elevation, collected by Robert C. Drewes and Ricka E. Stoelting, 19 April 2001; CAS 219148 (field no. RCD 14068), adult male, São Tomé and Príncipe, Príncipe Island, Army depot at airport, 1.6685°N, 7.4128°E, 181 m elevation, collected by D. J. Long and F. Penny, 3 May 2001; CAS 219203 (field no. RCD 14125), adult male and CAS 219205 (field no. RCD 14127), adult female, São Tomé and Príncipe, Príncipe Island, Baia das Agulhas, 1.6009°N, 7.3531°E, 14 m

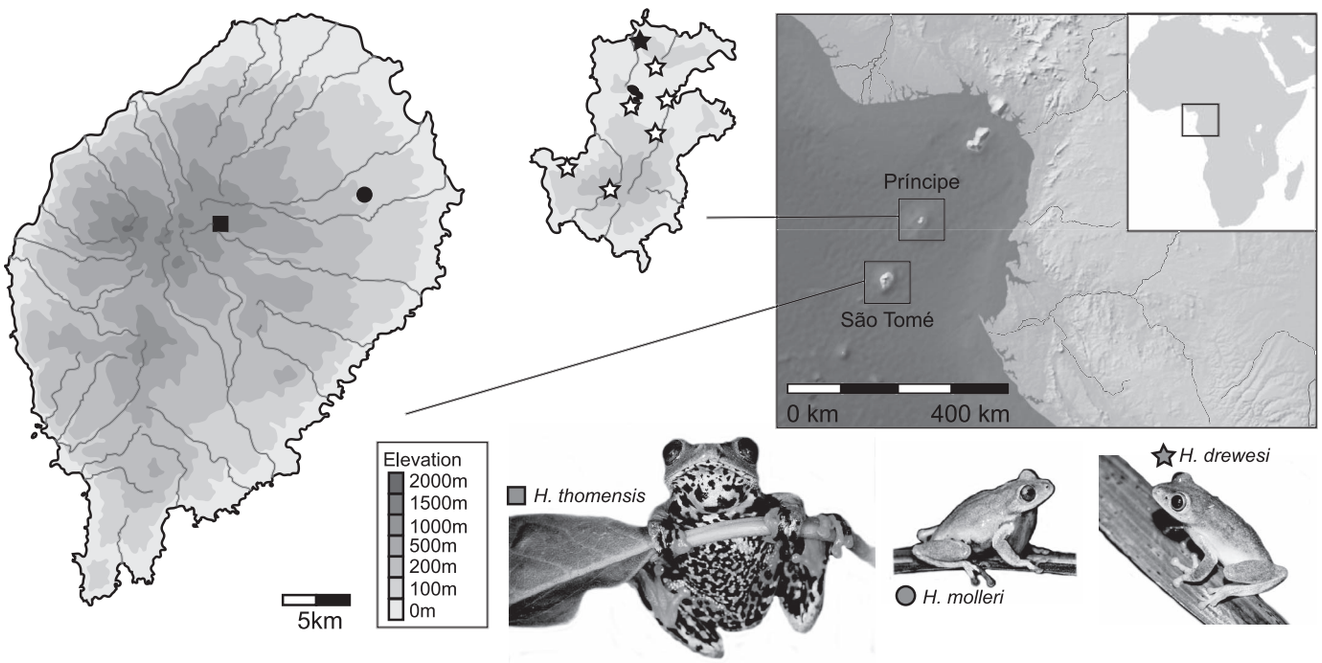

FIG. 1.—Distribution of localities for *Hyperolius drewesi* sp. nov. on Príncipe Island (filled symbol indicates type locality), and neotype localities for *Hyperolius molleri* and *Hyperolius thomensis* on São Tomé Island. Photos by D. Lin (*H. thomensis*) and A. Stanbridge (*H. molleri* and *H. drewesi*). A color version of this figure is available online.

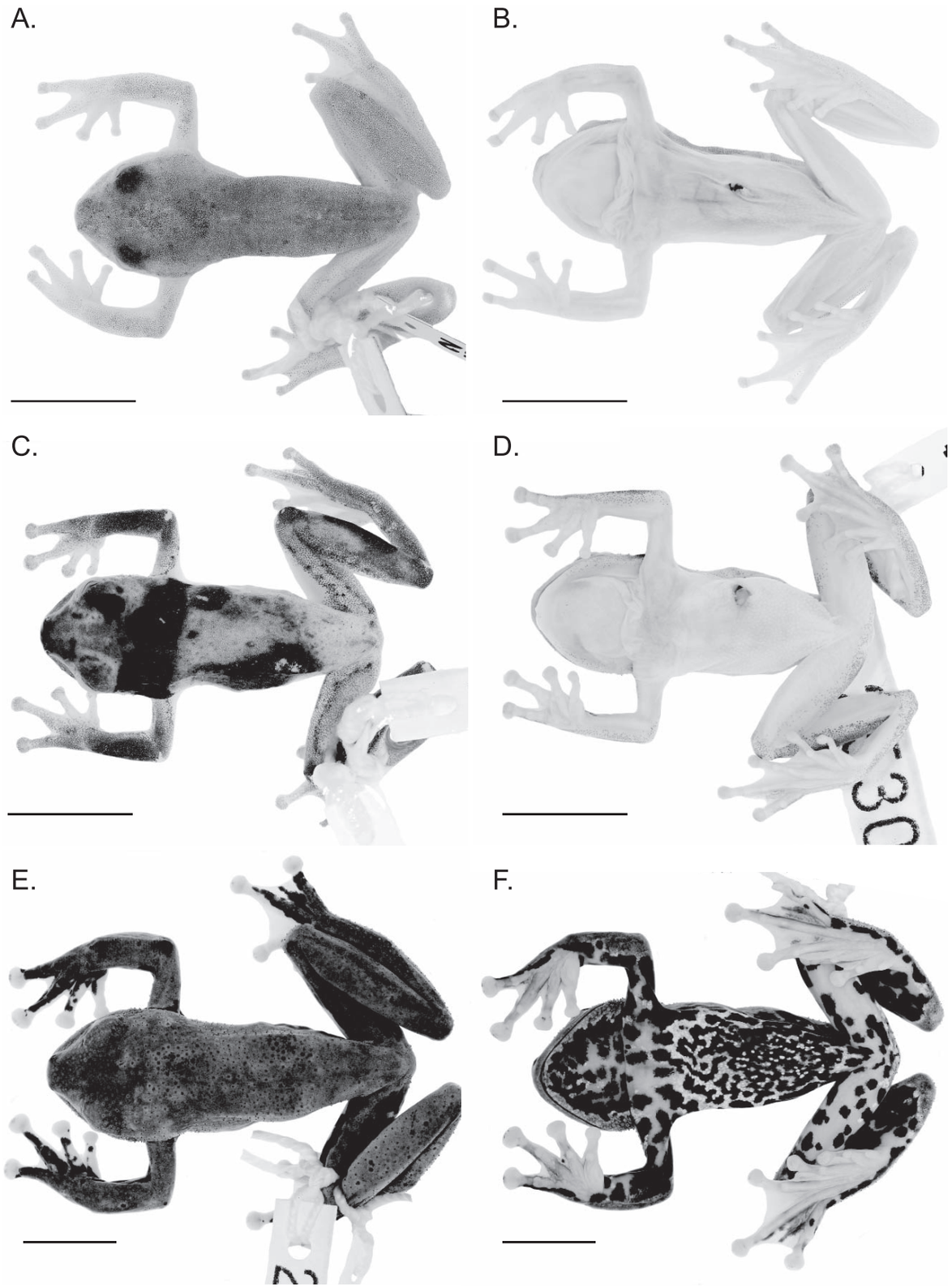

FIG. 2.—*Hyperolius drewesi* sp. nov. holotype (CAS 253051) in dorsal (A) and ventral (B) views; *Hyperolius molleri* neotype (CAS 253073) in dorsal (C) and ventral views (D); *Hyperolius thomensis* neotype (CAS 251637) in dorsal (E) and ventral (F) views. Scale bars = 10 mm. Photos by K. Whitney. A color version of this figure is available online.

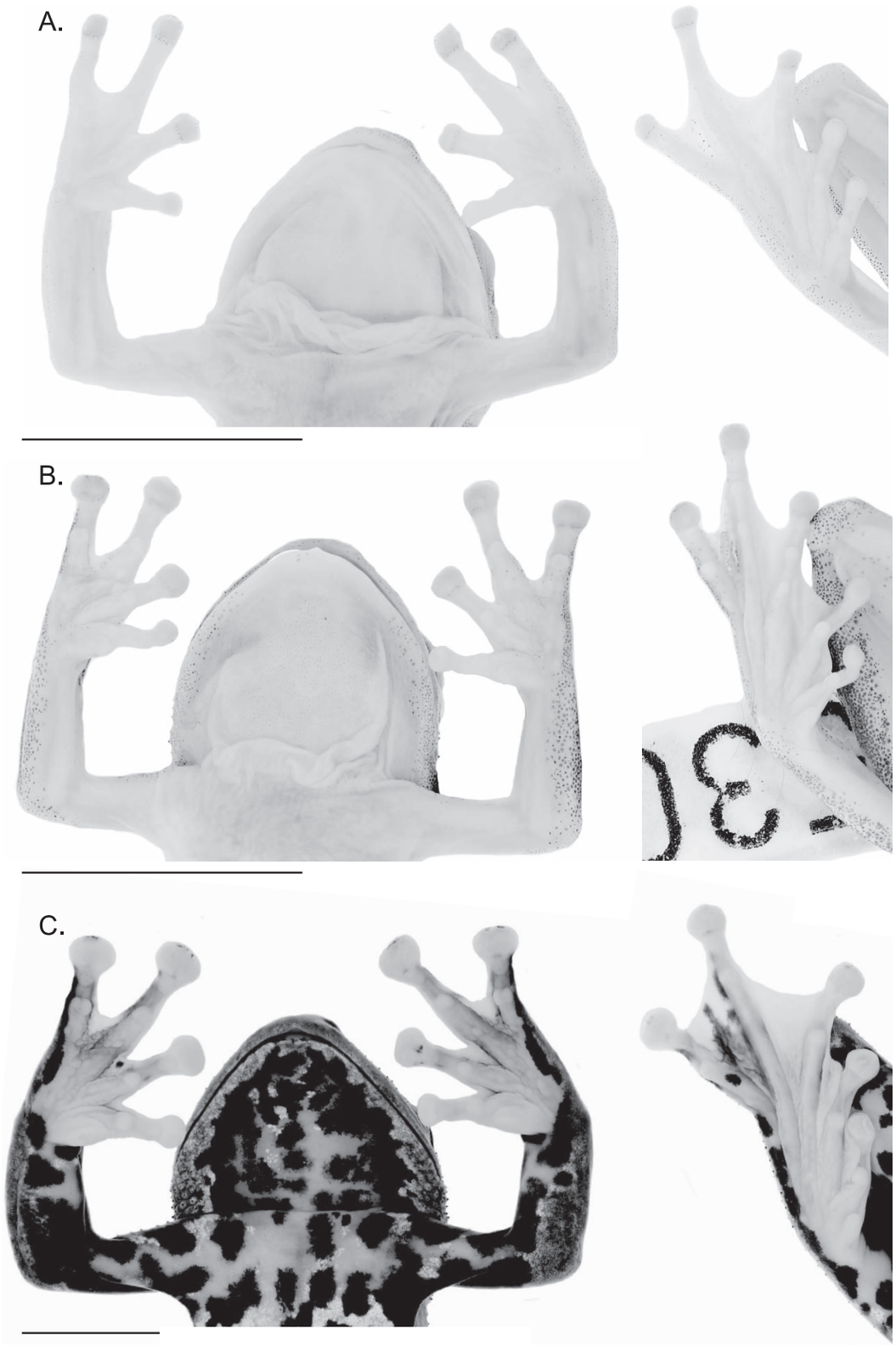

FIG. 3.—Detailed view of hands, feet, and gular regions of (A) *Hyperolius drewesi* sp. nov. holotype (CAS 253051); (B) *Hyperolius molleri* neotype (CAS 253073); (C) *Hyperolius thomensis* neotype (CAS 251637). Scale bars = 10 mm. Photos by K. Whitney. A color version of this figure is available online.

elevation, collected by Robert C. Drewes and Ricka E. Stoelting, 3 May 2001; CAS 233444 (field no. RCD 14484), adult male, São Tomé and Príncipe, Príncipe Island, base camp of Pico de Príncipe, 1.5881°N, 7.3808°E, 620 m elevation, collected by Josef Uyeda, 22 May 2006; CAS 233491–94 (field no. RCD 14402–05), four adult males, São Tomé and Príncipe, Príncipe Island, road along Papagaio River, 1.6259°N, 7.4166°E, 6 m elevation, collected by Robert C. Drewes, Josef Uyeda, and Jens V. Vindum, 22 May 2006; CAS 253047–50, 253052–54 (field no. RCB 348–51, RCB 353–55), seven adult males, same data as holotype.

Referred material.—CAS 219125–27, 219130–34, 219136–42 (field no. RCD 14045–47, 14050–54, 14055–62), 16 adult males, São Tomé and Príncipe, Príncipe Island, Agua Doutor, 1.6521°N, 7.4161°E, 178 m elevation, collected by Robert C. Drewes and Ricka E. Stoelting, 19 April 2001; CAS 219192–96 (field no. RCD 14114–18), five adult males, São Tomé and Príncipe, Príncipe Island, Conceição, 1.6441°N, 7.3978°E, 181 m elevation, collected by Robert C. Drewes and Ricka E. Stoelting, 21 April 2001; CAS 219204, 219206–07 (field no. RCD 14126, 14128–29), three adult males, São Tomé and Príncipe, Príncipe Island, Baia das Agulhas, 1.6009°N, 7.3531°E, 14 m elevation, collected by Robert C. Drewes, Ricka E. Stoelting, 3 May 2001; CAS 238886–91 (field no. RCD 14662–67), six adult males, São Tomé and Príncipe, Príncipe Island, Road to Bom Bom Resort, 1.6892°N, 7.4027°E, 25 m elevation, collected by Robert C. Drewes, 30 April 2008.

Diagnosis.—Multilocus molecular data indicate that *H. drewesi* is in the genus *Hyperolius* and is part of the *H. cinnamomeoventris* species complex, which includes four described species: *H. cinnamomeoventris* Bocage (1866) and *H. veithi* Schick, Kielgast, Rödder, Muchai, Burger, Lötters (2010) from continental Africa, and *H. molleri* and *H. thomensis* endemic to São Tomé Island in the Gulf of Guinea archipelago (Schick et al. 2010; Bell et al. 2015a). *Hyperolius drewesi* is sexually monochromatic (both sexes are green) and differs in color from *H. cinnamomeoventris*, which is sexually dichromatic (females are green and males are tan with bright yellow dorsolateral lines), and from *H. veithi*, which is sexually monochromatic (both sexes are tan with bright yellow dorsolateral lines). *Hyperolius drewesi* differs from *H. thomensis* in male body size (*H. drewesi* SVL 24.8–30.9 mm, *H. thomensis* SVL 36.1–41.2 mm), in the distal portion of the terminal phalanx (*H. drewesi* disc shaped, *H. thomensis* oval/wider in horizontal plane), and in ventral coloration (*H. drewesi* white/translucent, *H. thomensis* marbled black/orange). *Hyperolius drewesi* differs from *H. molleri* by lacking a black contour along the edges of the green/yellow band of coloration that extends down the dorsal side of the thigh (always present in *H. molleri*), by lacking red/orange coloration on the dorsal and ventral sides of the thigh (always present in *H. molleri*), and in the mitochondrial 16s and cytochrome-b genes (below).

Description of holotype.—Habitus moderately slender; head length less than width; snout short, obtusely pointed in dorsal view, round in profile; nostrils lateral, closer to tip of snout than eye, visible in dorsal view; canthus rostralis distinct, slightly constricted behind nostrils; lores concave, oblique; eye diameter less than snout length; interorbital distance greater than width of upper eyelid; pineal body not visible; tympanum indistinct, round, half of eye diameter; tympanic annulus raised relative to tympanum, visible on anterior and ventral margin; vomerine teeth absent; tongue heart-shaped, notched.

Tips of all four fingers expanded with circummarginal grooves; width of Finger III disc ~1.6 times width of phalanx; relative finger lengths I < II < IV < III; metacarpal, palmar, and thenar tubercles absent; subarticular tubercles on Fingers I–IV round, distal tubercle on Finger IV bifid; finger webbing formula I 2 – 2 II 2 – 3 II 2 – 1 IV; ulnar tubercle absent.

Tips of all five toes expanded; width of Toe IV disc ~1.5 times width of phalanx; relative toe lengths I < II < III < V < IV; outer metatarsal tubercle ill-defined, inner metatarsal tubercle distinct, ovoid; plantar surfaces smooth; well-developed subarticular tubercles on toes, round; toe webbing formula I 1 – 1 II ½ – 1 III 0 – 1 IV 1 – 0 V.

Skin on dorsum finely granular; skin on limbs smooth; skin on ventral surface smooth, increasingly granular posteriorly; dorsolateral fold absent; fine dorsal asperities.

Nuptial pad absent; elongated vocal sac openings, located on either side of the floor of the mouth; vocal sac median; small, rounded gular gland occupies less than half of gular area.

Holotype coloration in preservative.—Dorsum light gray, side of head, dorsal surface of forelimb and hindlimb cream with fine black speckling; ventral surfaces cream; dorsal asperities light.

Holotype coloration in life.—Iris gold; dorsum green, dorsal surface of forelimb and hindlimb green; dorsal surface of thigh translucent with thin green medial band extending from dorsum to lower limb; side of head green; dorsal surface of fingers and toes green; ventral surfaces translucent, chest white; dorsal asperities light.

Variation.—The new species is sexually dimorphic. Males with round gular gland that occupies less than half of gular area, vocal sac, and dorsal asperities (all absent in female). SVL of male paratypes 76–94% SVL of female paratype (Table 1). No variation in color or pattern noted among paratypes.

Molecular divergence.—The holotype of *H. drewesi* (CAS 253051) has an uncorrected pairwise distance of 1.5% in the 16s fragment and 1.6% in the cytochrome-b fragment to *H. molleri* (CAS 253073), and an uncorrected pairwise distance of 1.3% in the 16s fragment and 2.8% in the cytochrome-b fragment to *H. thomensis* (CAS 251637). Pairwise distances between *H. molleri* and *H. thomensis* are 1.7% and 2.8% at 16s and cytochrome b, respectively.

Distribution.—The new species was collected at seven localities spanning much of the altitudinal and ecological variation across Príncipe Island (Fig. 1).

Natural history.—We found the species breeding near slow-moving streams and temporary ponds in primary forest and in marginal habitats with high levels of human disturbance. The type locality of the species is next to a small landfill in secondary forest along the road to the Bom Bom Resort. Specimens at all sites were found during visual surveys at night approximately 1–2 m above the ground on leaves and thin branches overhanging streams or small pools of standing water. As in *H. molleri*, females deposit eggs on the surface of leaves overhanging water (Fig. 4G.) The eggs observed at the type locality were white with faint pigmentation on the animal pole and ~2 mm in diameter. ?2

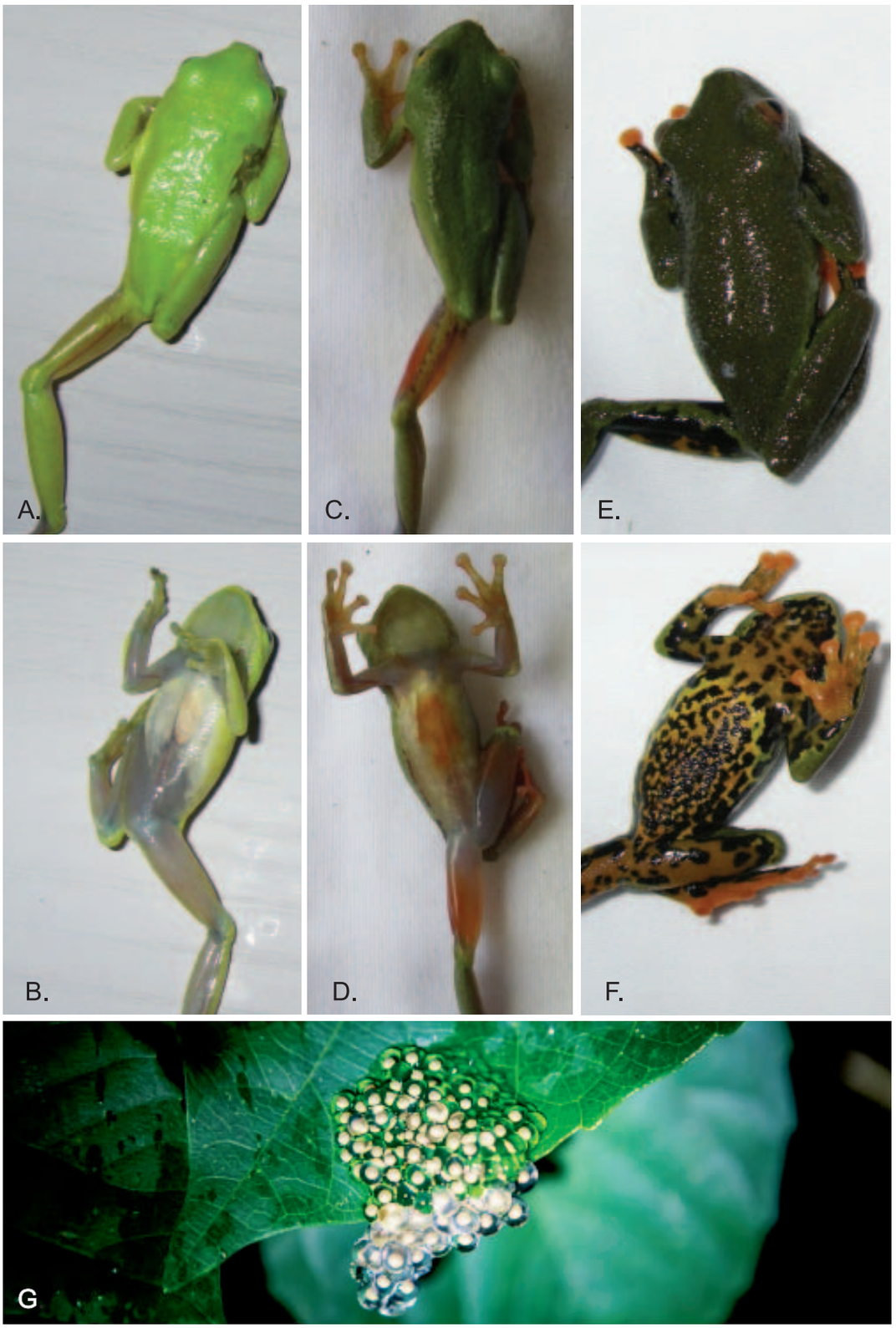

FIG. 4.—Coloration in life of *Hyperolius drewesi* sp. nov. holotype (CAS 253051) in dorsal (A) and ventral (B) views; *Hyperolius molleri* neotype (CAS 253073) in dorsal (C) and ventral views (D); *Hyperolius thomensis* neotype (CAS 251637) in dorsal (E) and ventral (F) views. Egg mass at the type locality of *H. drewesi*. Photos A–F by R.C. Bell; photo G by A. Stanbridge.

Etymology.—The specific name is a patronym for Robert C. Drewes, acknowledging his extensive contributions to herpetological research in Africa and in particular, his contributions to documenting biodiversity in São Tomé and Príncipe. The suggested common name is Drewes' Reed Frogs.

Hyperolius molleri (Bedriaga, 1892)
(Table 1; Figs. 1–3)

Neotype.—CAS 253073 (field no. RCB 0374), adult male, São Tomé and Príncipe, São Tomé, Caxão Grande, 0.29687°N, 6.70376°E, 141 elevation; collected by Rayna C. Bell, Quintino Cabral Quade, and Andrew Stanbridge on 5 May 2013.

Description of neotype.—Habitus moderately slender; head length less than width; snout short, obtusely pointed in dorsal view, round in profile; nostrils lateral, closer to tip of snout than eye, visible in dorsal view; canthus rostralis distinct, slightly constricted behind nostrils; lores concave, oblique; eye diameter less than snout length; interorbital distance greater than width of upper eyelid; pineal body not visible; tympanum indistinct, round, half of eye diameter; tympanic annulus raised relative to tympanum, visible on anterior and ventral margin; vomerine teeth absent; tongue heart-shaped, notched.

Tips of all four fingers expanded with circummarginal grooves; width of Finger III disc ~1.9 times width of phalanx; relative finger lengths I < II < IV < III; metacarpal, palmar and thenar tubercles absent; subarticular tubercles on Fingers I–IV round, distal tubercle on Finger IV bifid; finger webbing formula I 2 – 2 II 2 – 3 II 2 – 1 IV; ulnar tubercle absent.

Tips of all five toes expanded; width of Toe IV disc ~1.7 times width of phalanx; relative toe lengths I < II < III < V < IV; outer metatarsal tubercle ill-defined, inner metatarsal tubercle distinct, ovoid; plantar surfaces smooth; well-developed subarticular tubercles on toes, round; toe webbing formula I 1 – 1 II ½ – 1 III 0 – 1 IV 1 – 0 V.

Skin on dorsum finely granular; skin on limbs smooth; skin on ventral surface smooth, increasingly granular posteriorly; dorsolateral fold absent; fine dorsal asperities.

Nuptial pad absent; elongated vocal sac openings, located on either side of the floor of the mouth; vocal sac median; small, rounded gular gland occupies less than half of gular area.

Coloration in preservative.—Dorsum brown; side of head, dorsal surface of forelimb and hindlimb brown; dorsal surface of thigh cream with black speckling and thin brown medial band with black contour extending from dorsum to lower limb; ventral surfaces cream; dorsal asperities dark.

Coloration in life.—Iris gold; dorsum green, dorsal surface of forelimb and hindlimb green; dorsal surface of thigh red with thin yellow medial band with black contour extending from dorsum to lower limb; side of head green; dorsal surface of fingers and toes translucent and with green/red/yellow wash; ventral surfaces translucent, chest white with red/orange blotch, feet and thighs with red wash; dorsal asperities black.

Hyperolius thomensis Bocage, 1886
(Table 1; Figs. 1–3)

Neotype.—CAS 251637 (field no. RCB 0295), adult male, São Tomé and Príncipe, São Tomé, trail from Bom Sucesso Radio Tower, 0.27568°N, 6.60412°E, 1326 m elevation; collected by Rayna C. Bell and Andrew Stanbridge on 17 April 2012.

Description of neotype.—Habitus moderately slender; head length less than width; snout short, obtusely pointed in dorsal view, round in profile; nostrils lateral, closer to tip of snout than eye, visible in dorsal view; canthus rostralis distinct, slightly constricted behind nostrils; lores concave, oblique; eye diameter less than snout length; interorbital distance greater than width of upper eyelid; pineal body not visible; tympanum indistinct, round, less than half of eye diameter; vomerine teeth absent; tongue heart-shaped, notched.

Tips of all four fingers expanded with circummarginal grooves; width of Finger III disc ~1.8 times width of phalanx; relative finger lengths I < II < IV < III; metacarpal tubercle small and ovoid, thenar tubercle well developed; subarticular tubercles on Fingers I–IV, round, distal tubercle on Finger IV bifid; finger webbing formula I 1 – 1 II ½ – 1 ½ II 1 – ½ IV; ulnar tubercle absent.

Tips of all five toes expanded; width of Toe IV disc ~1.7 times width of phalanx; relative toe lengths I < II < III < V < IV; outer metatarsal tubercle round, inner metatarsal tubercle distinct, ovoid; plantar surfaces smooth; well-developed subarticular tubercles on toes, round; toe webbing formula I ½ – 1 II 0 – 1 III 0 – 1 IV 1 – 0 V.

Skin on dorsum finely granular; skin on dorsal side of limbs granular; skin on ventral surface coarsely granular, smooth on chest and ventral sides of limbs; dorsolateral fold absent; fine dorsal asperities.

Nuptial pad absent; elongated vocal sac openings, located on either side of the floor of the mouth; vocal sac median; small, rounded gular gland occupies less than half of gular area.

Coloration in preservative.—Dorsum, side of head, dorsal surface of forelimb and hindlimb brownish grey; dorsal surface of thigh cream with black blotches and thin brown medial band with thick black contour extending from dorsum to lower limb; ventral surfaces cream with black blotches; dorsal asperities dark.

Coloration in life.—Iris gold; dorsum dark green/brown, dorsal surface of forelimb and hindlimb green; dorsal surface of thigh marbled black/orange with thin green medial band with thick black contour extending from dorsum to lower limb; side of head green; dorsal surface of fingers and toes orange; ventral surfaces orange with large black blotches, chest white with orange wash and black blotches; dorsal asperities black.

DISCUSSION

Among São Tomé and Príncipe's endemic vertebrates, reed frogs are thought to be one of the only lineages that diversified within a single island and also dispersed between islands in the archipelago (Jones 1994; Bell et al. 2015b). Previous work indicates that *H. molleri* and *H. drewesi* represent evolutionarily distinct lineages, as they do not share mtDNA haplotypes and form entirely distinct genetic demes in a Bayesian clustering analysis of genome-wide single nucleotide polymorphisms (Bell et al. 2015b). Divergence between *H. molleri* and *H. drewesi* was previously estimated at ~1,100,00–270,000 yr ago (Bell et

al. 2015a), indicating that although dispersal between São Tomé and Príncipe occurred at least once in the history of this endemic radiation, there is no evidence of regular dispersal between the islands. Furthermore, although the islands are only separated by ~150 km, none of the six other endemic amphibians that occur on Príncipe or São Tomé have successfully dispersed between the islands, providing further indication that such dispersal events are uncommon for amphibians.

Despite the relatively recent divergence between *H. molleri* and *H. drewesi*, the species differ in coloration, which is consistent with the seemingly rapid evolution of color differences within the *H. cinnamomeoventris* species complex (Schick et al. 2010) and across the genus *Hyperolius* (Schiøtz 1999). Sexual dichromatism, which is common in *Hyperolius* (Bell and Zamudio 2012), also appears to have been acquired and lost repeatedly across the genus (Veith et al. 2009), including at least two reversals to monochromatism within the *H. cinnamomeoventris* complex (Schick et al. 2010). Juvenile coloration in *H. molleri* and *H. drewesi* resembles the juvenile coloration in *H. cinnamomeoventris* (phase juvenile), which is retained in adult males of *H. cinnamomeoventris* and in both adult sexes of *H. veithi* (Schick et al. 2010). In contrast, the adult coloration of *H. molleri* and *H. drewesi* resembles the mature female coloration of *H. cinnamomeoventris* (phase female), which is absent in *H. veithi*. Finally, *H. thomensis* exhibit dramatic orange and black ventral coloration that has not been described in any members of the *H. cinnamomeoventris* species complex. Thus, extensive phenotypic variation within this recent radiation indicates that the *H. cinnamomeoventris* group is well suited for studying the heritability of coloration phenotypes and for investigating the evolutionary and ecological contexts underlying sexual dichromatism.

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Resumo: Eu descrevo uma espécie nova de rã (Hyperoliidae:*Hyperolius*) da ilha de Príncipe, no arquipélago do Golfo da Guiné. A espécie nova está dentro do complexo de espécies *H. cinnamomeoventris*, a qual inclui quatro espécies descritas: *H. cinnamomeoventris*, *H. veithi*, *H. thomensis*, e *H. molleri*. Esta espécie nova é sexualmente monocromática (machos e fêmeas possuem coloração dorsal verde) e se distingue de *H. cinnamomeoventris*, a qual é sexualmente dicromática, e de *H. veithi*, ambos machos e fêmeas são marrom pálidos com linhas dorsolaterais amarelas. A espécie nova é menor em tamanho do que *H. thomensis*, difere em coloração de *H. thomensis* e *H. molleri* pela ausência do contorno preto ao longo das bordas da banda verde / amarela de coloração que se estende atrás da coxa, devido a ausência da coloração vermelha / laranja nos lados dorsais e ventrais da coxa, e nos genes mitocondriais 16S e cytochrome-b. Além disso, o trabalho anterior indica que a espécie nova se distingue de *H. molleri* e *H. thomensis* em uma análise dos genes nucleares. Esta espécie nova é o terceiro anfíbio endêmico descrito desta pequena ilha oceânica. Os materiais originais das espécies mais próximas, *H. molleri* e *H. thomensis*, foram destruídos; portanto, eu designei materiais neótipo para estas duas espécies permitindo a descrição da espécie nova.

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APPENDIX

Specimens Examined

Hyperolius molleri.—São Tomé and Príncipe: São Tomé CAS 218850–60, 218862–75, 218877–91, 218974, 218976–93, 219010–26, 219048–50, 219054–59, 219068–69, 233464–68, 233703, 251579–82, 251584–88, 251593–604, 251606–609, 251613–619, 251622–634, 252818, 252821, 253055–72 (158 adult males); CAS 218848–49, 218861, 218876, 218975, 233463, 251583, 251589–90, 251610, 252819 (11 adult females); CAS 218839–42, 219047, 233705, 253074 (7 juveniles).

Hyperolius thomensis.—São Tomé and Príncipe: São Tomé CAS 218926–37, 233470–72, 233475, 251635–36 (17 adult males); CAS 218925, 218934, 233473, 233474, 251605 (five adult females); CAS 233476 (one juvenile).

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