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Melanism in *Proceratophrys laticeps* (Anura: Odontophrynidae) from southeastern Brazil

Alexander Tamanini Mônico[1,*], Bryan da Cunha Martins[2], Igor Yuri Fernandes[1], and Esteban Diego Koch[3]

Melanism is a chromatic anomaly resulting from the excessive production of pigments in melanophores related to dark colours (melanin, phaeomelanin or eumelanin) in the dermis and epidermis (Chavin, 1969; Borteiro et al., 2021). The structural organisation of chromatic cells in the dermis normally presents melanophores in deeper layers with the other chromatophores just above composing the colour pattern, which jointly create the colouration pattern (Goda and Kurivama, 2021). The absence of some of the last chromatophores (e.g., yellow pigment in axanthism) can result in darker colourations, being commonly mistaken for melanism due to the melanophores becoming more pronounced (Goda and Kurivama, 2021). In amphibians, although relatively common, records of melanism are rarely reported (van Dijk, 1997; Alho et al., 2010; Sousa et al., 2021), and usually misidentified as axanthism (absence of yellow pigments) (Jablonski et al., 2014).

Melanism is often more frequent in specific climatic conditions, i.e., lower temperatures and lower luminosity, which occur at higher altitudes (Benhan et al., 1974; Alho et al., 2010). Many authors believe that this ensures some thermal advantage in ectotherm taxa, leading to higher heating rates and equilibrium temperatures (Bonato and Steinfartz, 2005, Clusella-Trullas et al., 2007; Kolenda et al., 2017). Lastly, colour pattern has also an important role in intra-specific signalling among amphibians, being both related to sexual selection (Jawor and Breitwisch, 2003) and inter-specific interactions, e.g., when colouration is used for camouflage to prevent predation (Hoekstra and Nachman, 2003; Tattersall et al., 2006).

Endemic to the Atlantic Forest, *Proceratophrys laticeps* Izecksohn & Peixoto, 1981 is a nocturnal medium-sized frog (snout-vent length [SVL] 59.5–75.1 mm in males, 50.3–82.7 mm in females; Prado and Pombal, 2008) that inhabits the leaflitter in forested areas (Haddad et al., 2013). The species occurs in the state of Espírito Santo and the southern coastal region of Bahia state, within the southeastern region of Brazil (Frost, 2022). Species identification is easily confirmed based on characters described by Prado and Pombal (2008), in which the presence of a vestigial rostral appendage, which is smaller than the upper lip width, allows it to be differentiated from all other sympatrically occurring *Proceratophrys* (Ferreira et al., 2019).

Here, we report the first case of melanism in *Proceratophrys laticeps*. The melanic frog was observed on 8 February 2018 at 19:15 h, during nocturnal fieldwork. The site lies within a region of Atlantic Forest mountains in the Estação Biológica de Santa Lúcia, Santa Teresa municipality, Espírito Santo, Brazil (19.9659°S, 40.5372°W; WGS84, 670 m elevation). The individual was a calling male adult (MBML 11294; SVL = 69.4 mm; Fig. 1A, 1B, 1C). We photographed it *in situ*, collected and deposited it within Coleção Zoológica of Museu de Biologia Professor Mello Leitão (MBML) of Instituto Nacional da Mata Atlântica (INMA), Santa Teresa, Espírito Santo, Brazil. During the same fieldwork expedition, we collected another individual with the usual colouration for comparison (MBML 11295; SVL = 48.7 mm; Fig. 1D, 1E, 1F).

Four years later, we returned to the Zoological Collection of MBML and reanalysed the specimens, which were preserved in 70% ethanol. The melanistic specimen remained a very consistent dark colour (Fig. 2A, 2B) while the normal coloured specimen partially lost its yellow colour, turning brown (Fig. 2C, 2D), due to degradation of the staining pigments upon exposure to fixing reagents (formaldehyde and alcohol) and

[1] Instituto Nacional de Pesquisas da Amazônia, Av. André Araújo, Manaus, 69080-971 Amazonas, Brazil.
[2] Universidade Federal do Amazonas, Av. Rodrigo Octavio, Manaus, 69067-005 Amazonas, Brazil.
[3] Instituto Nacional de Pesquisas da Amazônia, Av. André Araújo, Manaus, 69067-375 Amazonas, Brazil.
[*] Corresponding author. E-mail: alexandermonico@hotmail.com

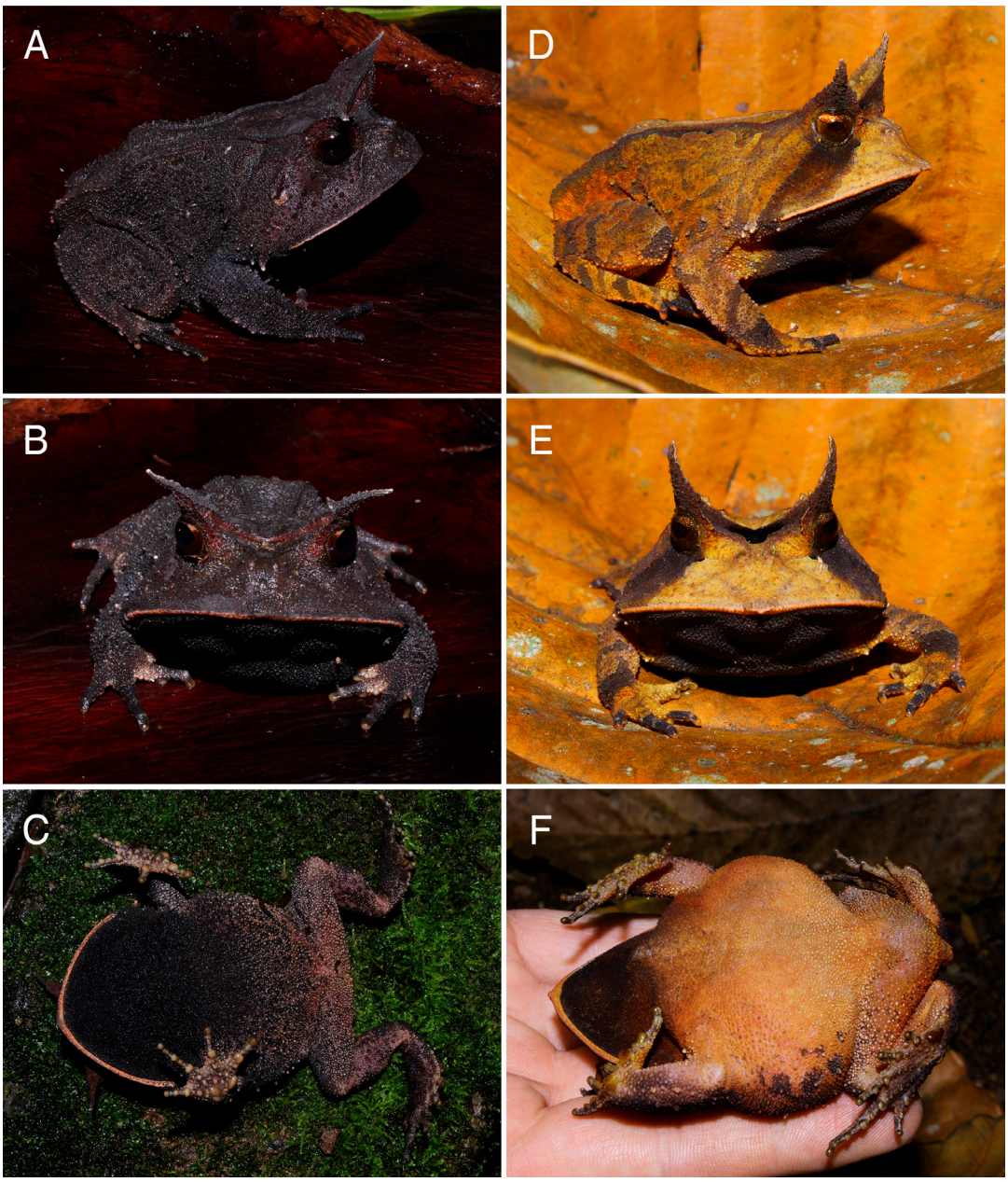

Figure 1. Life colouration in *Proceratophrys laticeps.* (A, B, C) melanistic (MBML 11294) and (D, E, F) typical colour pattern (MBML 11295) in dorsal, frontal, and ventral views, respectively. Photographs by Alexander T. Mônico.

illumination (Hashimoto et al., 2021). To our knowledge, this is the first report of melanism in *P. laticeps* and for the family Odontophrynidae.

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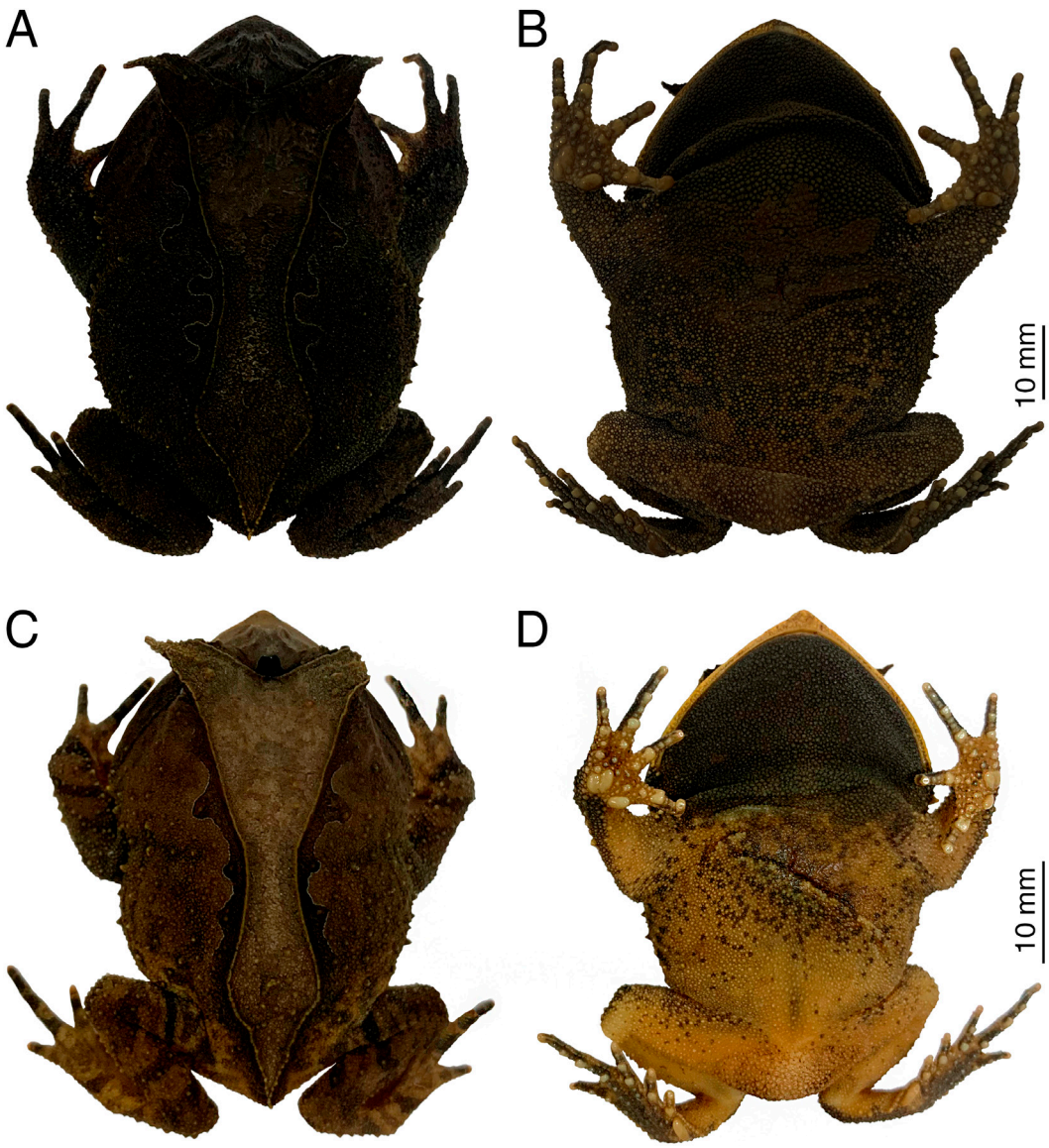

Figure 2. Colouration of fixed specimens of *Proceratophrys laticeps* after four years of preservation in 70% ethanol. (A, B) melanic (MBML 11294) and (C, D) typical colour pattern (MBML 11295) in dorsal and ventral views, respectively. Photographs by Alexander T. Mônico.

Atlântica for to facility the visit to the specimens in the collection. Museu Nacional do Rio de Janeiro (MNRJ), Associação dos amigos do Museu Nacional do Rio de Janeiro and Museu de Biologia Prof. Mello Leitão (MBML, Instituto Nacional da Mata Atlântica) for allowing sampling at the study site.

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