



FIRST RECORD OF LEUCISM IN *Hylocharis chrysura* (SHAW, 1812) (AVES: TROQUILIDAE) IN SOUTHERN BRAZIL

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Abstract: Leucism is the most frequent mutation in birds, leading to a partial or total depigmentation of covering structures. Here we report the first record of partial leucism in the Gilded Hummingbird *Hylocharis chrysura* (Apodiformes: Trochilidae) in the south of Brazil. This record contributes to important information about plumage variability in this species and the behavior associated with this mutation.

Keywords: depigmentation; Gilded Hummingbird; mutation; plumage.

The *Hylocharis chrysura* occurs in Paraguay, Argentina, Bolivia, Uruguay, and Brazil (Olmos 2015). This species is considered one of the most common trochilid at the Brazilian state of Rio Grande do Sul, being specially abundant in the central, southern, and western regions (Belton 2004, Bencke *et al.* 2010). Individuals have a bright brilliant gold-green coloration, golden tail, and red beak with a black distal portion (Ridgely *et al.* 2015). Although there is evidence of sexual dimorphism, with records of slightly fainter females (Olmos 2015, Ridgely *et al.* 2015, Uría & Montaldo 2015), such difference is subtle and only observed under optimal light conditions.

Anomalies in bird plumages might be caused by different factors such as hybridization, hormonal unbalance, and abnormal incorporation of pigments into the feathers growth (Guay *et al.* 2012). Pigment incorporation might lead to seven different mutations: albinism, leucism, schizochromism, melanism, progressive greying, carotenism, and dilution (van Grouw *et al.* 2011; Guay *et al.* 2012; van Grouw 2013).

Leucism is characterized by total or partial lack of melanin and carotenoid pigments in feathers.

The absence of pigment cells in some or all areas of skin causes them to develop without pigment. In addition, leucistic birds usually have eyes, feet, and beak with typical coloration (*e.g.*, without abnormal chromatism) (van Grouw 2012, 2013). The spots in leucistic birds are usually irregular, bilaterally symmetrical and the number of white feathers does not change with the age. The most common parts being affected are head, tips of the wings, feet and the belly. The progressive greying is considered other factor that may cause similar patterns of depigmentation, but related to the aging of the animal. The progressive greying initially affects scattered feathers while the skin (beak and feet) is generally unaffected and is more common in birds living in urban areas (van Grouw 2012, 2013). However, birds with progressive greying can presents white feathering after successive change of feathers. The progressive greying has hereditary origin (*e.g.*, mutation), but can be related to a disease (*e.g.*, vitiligo) or food deficiency. In this last case, when the external factor is removed the feathers pigmentation returns to the typical coloration (van Grouw 2012, 2013). This chromatic anomaly is considered common in *Turdus merula*

(Passeriformes: Turdidae), *Passer domesticus* (Passeriformes: Passeridae) and *Corvus monedula* (Passeriformes: Corvidae) (van Grouw 2013).

Leucism is quite a common feature of order Passeriformes, but it is unusual for the family Trochilidae. Few reports of leucism for Trochilidae species have been made so far in Brazil: *Eupetomena macroura* (Apodiformes: Trochilidae) recorded by Guimarães & Sad (2016), and *Chlorostilbon lucidus* (Apodiformes: Trochilidae) recorded by Andriola & Marcon (2017) and Santos *et al.* (2017). In the specimen of *E. macroura* the leucistic feathers were located in the neck and head forming circumferences of varied sizes. In both cases of *C. lucidus* the specimens (males) presented partial leucism, with the leucistic feathers extended from the forehead until the pileum. However, the behavior of both species was not reported (Guimarães & Sad 2016, Andriola & Marcon 2017, Santos *et al.* 2017).

On October 08, 2017, we observed an adult leucistic *H. chrysura* in a rural area of São Sepé municipality, in the central region of Rio Grande do Sul state, Brazil (30°14'56.2" S, 53°35'22.4" W). The municipality of São Sepé is located in the Brazilian Pampa biome, and the studied area is characterized by outcrops of the Crystalline Shield (or “*Serra do Sudeste*”) originally covered by a mosaic of natural grasslands and seasonal forests (IBGE 2004). The

region suffers intense anthropic pressure due to the activities of forestry and agriculture. However, the local landscape is currently characterized by a mosaic of fragmented native vegetation and cultivated lands, such as soybean and no native pastures. The absolute mean temperature range is -1–36°C and the annual mean rainfall range is 1,500–1,600 mm (Wrege *et al.* 2011).

The sex of the individual was not determined due to the light conditions during the photography section. The individual had a depigmented pileum and typical coloration in the rest of the body (Figure 1), similar to that previously record for the specimens of Trochilidae (Andriola & Marcon 2017, Santos *et al.* 2017). During the observation, the bird vocalized normally, perched on the top of a dried branch in the edge of a riparian forest. It also exhibited territorial defense behaviors, performing aerial chases and other displays toward conspecific individuals. Its behavior did not change with the presence and approach of the observer (S. D. Pereira, personal observation). Four individuals of the same species were also vocalizing perched on branches in the surrounding area.

The same hummingbird was monthly detected from November 2017 to January 2018, totalizing 40 min of observation. In all observations, it displayed the same described behavior, except for



Figure 1. *Hylocharis chrysura* individual with partially leucistic in the pileum area and typical coloration in the other body parts (a, b) recorded in the municipality of São Sepé, Rio Grande do Sul state, Brazil. Photo: Samanta Dullius Pereira.

December 2017, when it was observed in another tree (approximately 5 m from the previous point).

Behavioral observations of birds with chromatic anomalies are scarce in the literature, being specifically absent for hummingbirds. The few behavioral reports available are very variable, as follows. For cases of albinism, the individuals with chromatic anomaly were persecuted by individuals with normal staining, as reported by Mallet-Rodrigues (2001) for *Nannopterum brasilianus* (Suliformes: Phalacrocoracidae) and Sousa *et al.* (2009) for *Coragyps atratus* (Cathartiformes: Cathartidae). However, for cases of leucism this does not seem to occur as often: i) an individual of *T. rufiventris* (Passeriformes: Turdidae) with total leucism presented normal behavior, including interactions with co-specifics individuals without chromatic anomalies, as well as engaged in nesting activity (Junior *et al.* 2008); ii) an individual of *P. domesticus* with partial leucism presented behavior typical for the species and interacted socially with the group (Corrêa *et al.* 2011); iii) an individual of *Ortalis guttata* (Galliformes: Cracidae) with extensive leucism interacted socially with the group, without suffering persecution (Düpont *et al.* 2014).

Indeed, we found just one study reporting detrimental effects possibly associated with leucism occurrence: an individual of *Paroaria coronata* (Passeriformes: Thraupidae) did not interact socially with co-specifics and had a weak response to the technique of attraction by vocalization (*i.e.*, playback), as well as presented a more diffident behavior in human presence when compared to individuals without chromatic anomaly (Corrêa *et al.* 2012). In the present study, we observed that intraspecific interactions involving the leucistic *H. chrysura* were typical of the species, including repertoire of vocalization and territory disputes, most of which it won. In this way, it seems that the chromatic mutation did not affect the behavior, nor the intraspecific relations. However, we failed to observe reproductive behavior and, therefore, we do not know if this chromatic mutation affects sexual selection in *H. chrysura*.

Records of leucism in at least other four bird species were made in the municipality of São Sepé: *P. domesticus* (Corrêa *et al.* 2011), *P. coronata* (Corrêa *et al.* 2012), *Columbina picui* (Columbiformes: Columbidae) (Corrêa *et al.* 2013), and *Vanellus*

chilensis (Corrêa *et al.* 2017). Leucism, as albinism, seems to be more frequent in urban populations rather than in potentially endogamic rural and small populations (Guay *et al.* 2012). Chromatic mutations in birds are uncommon events in nature, and it is important to describe these cases, relating the frequency in different species, the behavior of mutants and variations of the plumage pattern, which is essential for the creation of a database for future studies (van Grouw *et al.* 2011, van Grouw 2012, Corrêa *et al.* 2017). We hope that this report can encourage future investigations about the role of endogamy and other factors in the occurrence of leucism in *H. chrysura*, as well as about the behavioral ecology of trochilids with chromatic anomalies.

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