Redescription of Cipó Canastero *Asthenes luizae*, with notes on its systematic relationships

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Cipó Canastero *Asthenes luizae* is a recently described furnariid from Alto da Boa Vista, Serra do Cipó (19°17'S, 43°34'W), Minas Gerais, south-east Brazil (Vielliard 1990). This area occupies less than 10 km², of *campos rupestres*, a distinctive landscape of the Espinhaço highlands, comprising many endemic herbs and shrubs growing on and among rocky outcrops (Fig. 1) (Menezes & Giulietti 1986, 2000, Collar *et al.* 1992, Eiten 1992, Giulietti *et al.* 1997, Gottsberger & Silberbauer-Gottsberger 2006). The species was known only from the type locality for eight years following its description, which led some authors to consider it threatened (Pearman 1990, Collar *et al.* 1992, Andrade 1998, BirdLife International 2000, 2004). Nevertheless, *A. luizae* was found in other areas north of the type locality, all in the Central Brazilian hills and tablelands (Endemic Bird Area 073; Stattersfield *et al.* 1998), including three protected areas: Serra do Cipó National Park, Pico do Itambé State Park, and Rio Preto State Park (Andrade *et al.* 1998, Cordeiro *et al.* 1998, Vasconcelos 2002, Vasconcelos *et al.* 2002, Bencke *et al.* 2006). Consequently, the species was not treated as threatened in the recent revision of the threatened fauna of Brazil (Machado *et al.* 2005).

The species' original description was based on two males, an adult and immature (Vielliard 1990), housed in Frederico Lencioni's private collection. Currently, the holotype is deposited in the Museu de Zoologia da Universidade de São Paulo (MZUSP 73831), but the paratype remains in Lencioni's collection (no. 568). An additional adult male, deposited in the Coleção Ornitológica do Departamento de Zoologia da Universidade Federal de Minas Gerais, Belo Horizonte (DZUFMG 2855), was collected *c.*170 km north of the species' known range, but it proved impossible to determine whether small plumage differences from the holotype represent individual or geographical variation (Vasconcelos *et al.* 2002). Morphology and measurements of female and juvenile plumages are still undescribed.

Unfortunately, the original description of *A. luizae* is not very precise. Plumage coloration was not described with reference to a catalogue, and no details were given as to the extent of rufous in the tail, an important character for assessing systematic affinities within Synallaxinae. Thus, our aim here is to redescribe *A. luizae* using the holotype and ten specimens obtained in March 2000–September 2006 from the following localities, all in the Espinhaço range: Alto da Boa Vista (type locality), Santana do Riacho municipality; Serra do Barro Preto (18°36'S, 43°53'W), Gouvêa municipality; Três Barras (18°30'S, 43°26'W), Serro municipality; Serra Resplandecente (17°02'S, 43°20'W), Itacambira municipality; and Campina do Bananal (16°51'S, 43°02'W), Botumirim municipality. Specimens are deposited in the Coleção Ornitológica do Departamento de Zoologia da Universidade Federal de Minas Gerais, Belo Horizonte (DZUFMG), and in the Museu de História Natural de Taubaté, Taubaté (MHNT). Unfortunately, the paratype could not be analysed. Table 1 presents collection data for the analysed specimens of *A. luizae*. We also provide data on the plumage and measurements of females and a juvenile, and discuss the species' taxonomic relationships.

Plumage descriptions were based on Munsell *Soil color charts* (2000). External topographic anatomy nomenclature follows Meyer de Schauensee (1982) and Clark (1993). Measurements were taken using electronic digital callipers. Measurements taken were: bill-

width (at anterior edge of nares), bill-depth (at anterior edge of nares), nares to tip, culmen from base (at skull), wing-chord (unflattened), tarsus, tail and total length. Where possible, specimens were weighed using pesolas.

Specimens of other species of *Asthenes* were studied in the following institutions: American Museum of Natural History, New York (AMNH), Academy of Natural Sciences of Philadelphia, Philadelphia (ANSP), Field Museum of Natural History, Chicago (FMNH), Louisiana State University Museum of Zoology, Baton Rouge (LSUMZ), Museo de Historia Natural 'Javier Prado', Lima (MJPL), Museu de Zoologia da Universidade de São Paulo, São Paulo (MZUSP), US National Museum of Natural History, Washington DC (USNM), and Zoological Museum, University of Copenhagen (ZMUC).

Redescription of holotype.—Upperparts, from forehead to rump, very dark greyish brown (10YR 3/2). Uppertail-coverts dark greyish brown (10YR 4/2). Lores pale yellow (2.5Y 8/2) with apex of feathers black (5YR 2.5/1). Fine superciliary pale yellow (2.5Y 8/2), becoming light grey (10YR 7/1.5) posteriorly. Ear-coverts black (5YR 2.5/1) with fine stripes white (2.5Y 8/1). Malar light grey (10YR 6.5/1). Chin white (2.5Y 8/1). Throat feathers black (5Y 2.5/1), basally red (2.5YR 4/8) and stripes white (2.5Y 8/1). Sides of neck and breast greyish brown (10YR 5/2), becoming light grey (10YR 7/2) in centre of breast. Belly light grey (10YR 7/2). Flanks and thighs greyish brown (10YR 5/2). Undertail-coverts brown (10YR 5/3).

Tail graduated, with 12 rectrices, appearing in dorsal aspect mostly very dark greyish brown (10YR 3/2), with fringes rufous (7.5YR 4/6), and, from below, mostly rufous with very dark greyish brown in the centre. The three outermost pairs of rectrices are rufous, inconspicuously washed very dark greyish brown at the base of proximal webs. On each successively longer rectrix the amount of very dark greyish brown increases, whilst the amount of rufous decreases. In the fourth outermost pair, rufous concentrates principally on the feather's tip, on both margins of the proximal web (narrow and inconspicuous on the inner margin) and on distal web, becoming very dark greyish brown at the feather's base. The fifth outermost pair is almost entirely very dark greyish brown, with rufous narrow and inconspicuous external margins only on the distal web. Central rectrices are entirely very dark greyish brown.

Upperwing-coverts very dark grey (10YR 3/1), finely and inconspicuously fringed yellowish red (5YR 5/8). Alula very dark greyish brown (10YR 3/2) with fine fringe white (10YR 8/1) on distal margin. Remiges very dark greyish brown (10YR 2.5/2); primaries have inconspicuous narrow fringes light brownish grey (10YR 6/2) on distal margin. Underwing-coverts yellowish red (5YR 5/6). Bend of wing white (10YR 8/1).

Soft-part colours noted in the original label are: irides brown and tarsus black.

Description of female from type locality.—This female (DZUFMG 5331) has the forehead, crown, nape and hindneck very dark greyish brown (10YR 3/2), becoming very dark grey (10YR 3/1.5) on mantle, scapulars and rump. Uppertail-coverts dark grey (10YR 4/1.5). Lores white (2.5Y 8/1) with feather apex black (5YR 2.5/1). Sides of neck and breast grey (10YR 5.5/1), becoming light grey (10YR 7/1) in centre of breast. Belly light grey (10YR 7.5/1). Flanks and thighs greyish brown (10YR 5/1.5). Superciliary, auriculars, malar, chin, throat and undertail-coverts similar to holotype.

Tail similar to holotype, but with very dark brown (10YR 2.5/2) over same regions that in the holotype are very dark greyish brown (10YR 3/2). Central rectrices very dark brown with very narrow and inconspicuous rufous margins on distal web.

Upperwing- and underwing-coverts, alula and bend of wing similar to holotype. Remiges very dark grey (10YR 2.5/1); primaries have inconspicuous narrow fringes light

brownish grey (10YR 6/2) on distal margin; secondaries with inconspicuous fringes light brownish grey on both margins.

Soft-part colours: irides dark brown, tarsus grey, upper mandible black, lower mandible grey with black tip.

Plumage variation in adults.—Mantle, scapulars and rump are very dark grey (10YR 3/1.5) in all except the holotype, which has these parts very dark greyish brown (10YR 3/2), and no evident contrast with the head in the latter specimen. Uppertail-coverts vary from dark greyish brown (10YR 4/2) (MZUSP 73831), dark grey (10YR 4/1.5) (DZUFMG 5327–5332, MHNT 4825), to very dark grey (10YR 3/1.5) (DZUFMG 2855, 5325). Throat feathers with a reddish base are more frequent in the anterior part of the gular patch, being very inconspicuous and almost absent in two specimens (DZUFMG 2855, 5328). The significance of this variation is unknown, as these two specimens represent both sexes and were collected at different sites (Table 1). Those collected at Três Barras possess a blacker gular patch and narrower white stripes in the throat (Fig. 2). Except the holotype, all have the neck- and breast-sides grey (10YR 5.5/1), becoming light grey (10YR 7/1) over the central breast, and belly light grey (10YR 7.5/1).

All have the rectrices similar to DZUFMG 5331, admixed very dark brown and rufous, except the holotype, which has these feathers very dark greyish brown and rufous. Some specimens have the three outermost pairs of rectrices inconspicuously washed very dark brown at the tips (DZUFMG 2855, 5325, 5327, 5331, 5332, MHNT 4825). In the fifth outermost pair, the rufous appears as narrow and inconspicuous external margins only on the distal web (DZUFMG 5325, 5328, 5330, 5331, MZUSP 73831, MHNT 4825), or on both webs (DZUFMG 2855, 5327, 5329, 5332). The central rectrices are entirely very dark brown, sometimes with very narrow and inconspicuous rufous margins to the distal web (DZUFMG 5331, 5332), or on both webs (DZUFMG 2855, 5328, 5329). The significance of this variation is also unknown as each of these characters was found in birds in fresh plumage from different localities.

All specimens have the remiges very dark grey, except the holotype, which has these feathers very dark greyish brown. Most specimens (DZUFMG 2855, 5325, 5328–5332, MHNT 4825) possess inconspicuous light brownish-grey fringes on both margins of the secondaries.

Based on those adults analysed, we found no differences between the sexes, and we also found no evidence of geographical variation, except the darker gular patch in those from Três Barras (Fig. 2). In comparing DZUFMG 2855, from Campina do Bananal, to the holotype, it is impossible to know if the observed differences between them (Vasconcelos *et al*. 2002) pertain to geographic or individual variation. Based on the additional specimens gathered recently, we conclude that the holotype is in worn plumage, with many degraded feathers, thereby probably explaining the browner tones compared to other specimens, including the adult female from the type locality (DZUFMG 5331). Two other worn specimens (DZUFMG 5327, 5332), albeit less so than the holotype, exhibit slightly paler central rectrices compared to the rest of the series.

We found small variation in soft-part colours of adults. All have dark brown irides and a black upper mandible. Tarsi vary between greenish grey (DZUFMG 5327–5330), grey (DZUFMG 2855, 5325, 5331) and dark grey (DZUFMG 5332, MHNT 4825). Most specimens possess the lower mandible grey with a black tip (DZUFMG 2855, 5325, 5327, 5329–5332, MHNT 4825), with only one (DZUFMG 5328) having a grey lower mandible with a black tip and base.

TABLE 1
Collection data for specimens of Cipó Canastero *Asthenes luizae* utilised in this study. Localities are presented from south (type locality) to north.

Registration number	Locality	Elevation	Sex	Age	Date
MZUSP 73831 (holotype)	Alto da Boa Vista, Serra do Cipó	1,100 m	Male	Adult	14 December 1985
DZUFMG 5331	Alto da Boa Vista, Serra do Cipó	1,320 m	Female (ovary 7.0 × 2.6 mm)	Adult (skull 20% pneumatised)	1 May 2005
DZUFMG 5332	Serra do Barro Preto	1,300 m	Male (testes 5.7 × 4.1 mm)	Adult (skull 35% pneumatised)	18 September 2006
DZUFMG 5328	Três Barras	1,230 m	Female (ovary 5.0 × 2.2 mm)	Adult (skull 30% pneumatised)	24 April 2004
DZUFMG 5329	Três Barras	1,230 m	Male (testes 1.7 × 1.0 mm)	Adult (skull 30% pneumatised)	24 April 2004
DZUFMG 5330	Três Barras	1,230 m	Female (ovary 6.0 × 3.5 mm)	Adult (skull 30% pneumatised)	24 April 2004
DZUFMG 5327	Serra Resplandecente	1,250 m	Female (ovary 7.5 × 4.2 mm)	Adult (skull 25% pneumatised)	4 September 2003
DZUFMG 2855	Campina do Bananal	1,320 m	Male (testes 2 × 1 mm)	Adult (skull 25% pneumatised)	1 March 2000
MHNT 4825	Campina do Bananal	1,250 m	Female (ovary 6.0 × 2.5 mm)	Adult (skull 25% pneumatised)	22 March 2003
DZUFMG 5325	Campina do Bananal	1,300 m	Female (ovary 6 × 3 mm)	Adult (skull 10% pneumatised)	23 March 2003
DZUFMG 5326	Campina do Bananal	1,270 m	Male (testes 0.9 × 0.6 mm)	Juvenile (skull 5% pneumatised)	23 March 2003

Description of juvenile.—The most noteworthy plumage difference compared to adults is that the chin and throat are light grey (10YR 6.5/1) (Figs. 1–2). The breast and belly are similar to adults, but washed inconspicuously greyish-brown (10YR 5/2) and brown (10YR 5/3). Soft-part colours are: irides dark brown, tarsus greenish grey, upper mandible black, lower mandible light grey with a black tip.

It is noteworthy that none of the specimens, including those considered adults on plumage, had the skull completely pneumatised. All adults had skull ossification of 10–35%. The juvenile had the skull 5% pneumatised (Table 1).

Measurements and mass.—Although the number of adults analysed is still small, it appears that there are no differences in measurements and mass between the sexes (Table 2). There is little evidence of strong size dimorphism in Furnariidae (Remsen 2003). Juvenile measurements fall within the same range (Table 2).

Systematic relationships.—As noted by Vuilleumier *et al.* (1992), in the original description, Vielliard (1990) did not present any evidence why *A. luizae* belongs within *Asthenes*. Pearman (1990) compared songs of *A. luizae* with *Asthenes m. modesta*, *A. humilis robusta*, *A. wyatti graminicola*, *A. d. dorbignyi* and *A. b. baeri*, and concluded that the song of *A. luizae* most recalled *A. d. dorbignyi*. He also concluded, based on plumage and vocalisations, that the closest relatives of *A. luizae* were possibly *A. dorbignyi* and *A. patagonica*.

TABLE 2
Morphometrics (see text for details of measurements) and body mass of Cipó Canastero *Asthenes luizae*. Values are mean ± SD, with range and *n* in parentheses.

Age and sex	Bill-width	Bill-depth	Nares to tip	Culmen	Wing-chord	Tarsus	Tail	Total length	Body mass
Adult males	3.10 ± 0.10 (2.98–3.19, 4)	3.87 ± 0.18 (3.63–4.05, 4)	11.50 ± 0.51 (10.85–11.96, 4)	18.61 ± 0.69 (17.69–19.16, 4)	69.95 ± 0.78 (69.43–71.09, 4)	24.69 ± 1.43 (23.25–26.67, 4)	86.78 ± 5.03 (79.74–91.66, 4)	188.00 ± 7.21 (182.00–196.00, 3)	30.50
Adult females	3.16 ± 0.23 (2.90–3.41, 6)	3.78 ± 0.07 (3.69–3.88, 6)	11.37 ± 0.60 (10.70–12.01, 6)	18.89 ± 0.77 (17.55–19.77, 6)	68.85 ± 1.68 (66.17–71.25, 6)	25.32 ± 0.50 (24.74–26.22, 6)	89.65 ± 2.91 (86.16–93.50, 6)	196.17 ± 7.83 (184.00–205.00, 6)	28.25 ± 2.66 (25.00–31.50, 4)
Juvenile male	3.01 (1)	3.78 (1)	11.11 (1)	19.23 (1)	70.52 (1)	24.60 (1)	90.41 (1)	189.00 (1)	24.00 (1)

In a recent phylogenetic analysis of nest architecture in Furnariidae, Zyskowski & Prum (1999), based on incomplete data for *A. luizae*, grouped the species in the same operational taxonomic unit as *A. pudibunda*, *A. cacto-*

Figure 1. Juvenile (left) and adult Cipó Canastero *Asthenes luizae* in the *campos rupestres* of the Espinhaço range (Raphael Dutra)

Figure 2. Gular patches of Cipó Canasteros *Asthenes luizae*, from left to right: adult male from Campina do Bananal (DZUFMG 2855), adult male from Três Barras (DZUFMG 5329), and juvenile male from Campina do Bananal (DZUFMG 5326) (Carlos Henrique de Faria Vasconcelos)

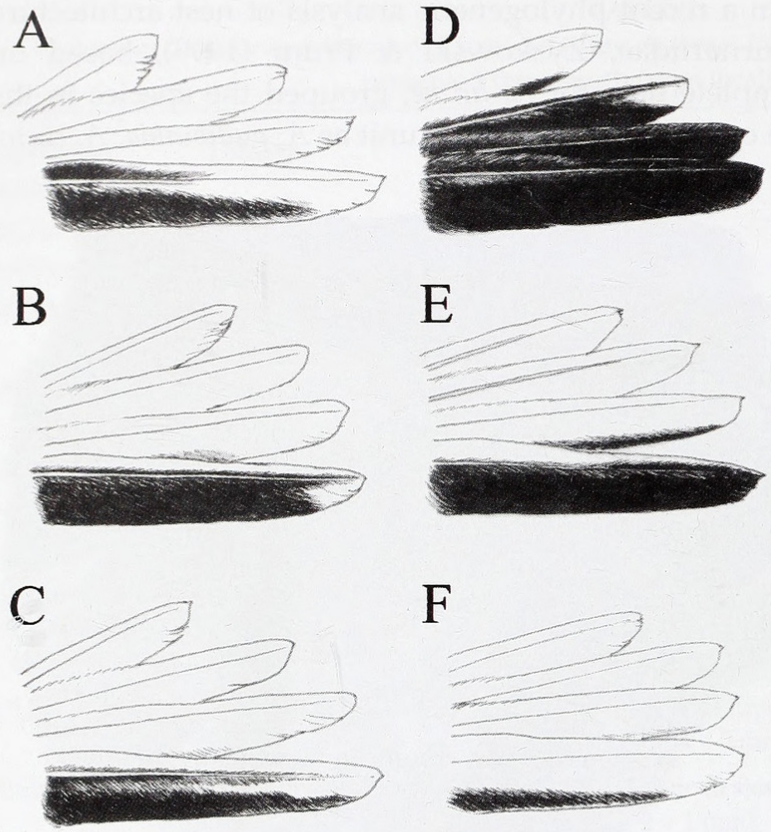

Figure 3. Tail patterns of different *Asthenes*: *A. luizae* (A); *A.* (*dorbignyi*) *huancavelicae* (B); *A.* (*d.*) *usheri* (C); *A.* (*d.*) *dorbignyi* (D); *A. berlepschi* (E); *A. baeri* (F) (Jon Fjeldså)

rum, *A. humicola*, *A.* (*dorbignyi*) *huancavelicae*, *A.* (*d.*) *arequipae*, *A.* (*d.*) *dorbignyi*, *A. berlepschi*, *A. steinbachi*, *A. baeri* and *A. patagonica*. However, based on morphological and nest architecture data, it appears that *Asthenes* is polyphyletic (Vaurie 1980, Narosky *et al.* 1983, Fjeldså & Krabbe 1990, Zyskowski & Prum 1999, Remsen 2003, de la Peña 2005), and this has now been confirmed molecularly (M. Irestedt *in litt.* 2007). Based on Pearman's (1990) and our field observations, *A. luizae* is a terrestrial species that forages usually on the ground and carries the tail cocked, a character common to many *Asthenes* (Vaurie 1980, Fjeldså & Krabbe 1990, Remsen 2003). Furthermore, the nest constructed mainly of sticks (Studer & Teixeira 1993, Remsen 2003, Gomes 2006) and plumage details place *A. luizae* within a group comprising *A. pyrrholeuca*, *A. berlepschi*, *A. steinbachi*, *A. baeri*, *A. patagonica* and the *A. dorbignyi* complex (Fig. 3; see Fjeldså & Krabbe 1990, Remsen 2003). Diagnostic plumage characters comprise the total absence of stripes, the distinctive gular patch from pale orange to black (albeit absent in some populations or plumages), more or less rufous-brown vent, and fairly long, graduated tail with rounded tips, blackish brown with distinctive rufous-brown sides. The distribution of rufous-brown in the tail (Fig. 3) is almost identical in *A. luizae* and some other taxa in this group, notably *A.* (*dorbignyi*) *huancavelicae*, *A.* (*d.*) *usheri* (with white outer rectrices) and two unnamed taxa in the central Peruvian Andes (see Pl. XXXVII in Fjeldså & Krabbe 1990), as well as *A. pyrrholeuca* and *A. baeri* of the Southern Cone. *A steinbachi* (north-west Argentina) has even more rufous in the tail, but other forms have less (Bolivian and north-west Argentine forms of *A. dorbignyi*, and *A. berlepschi*), or only a thin lateral stripe (unnamed form in southern Peru and *A. patagonica* of southern Argentina) (Fjeldså & Krabbe 1990, Narosky & Yzurieta 2003).

Furthermore, known juvenile plumages of other *Asthenes* generally possess a scaly pattern on the breast, although this is most obvious in forms with a pale creamy breast, and is not apparent in the darkest and greyish forms (e.g. a dark grey unnamed form from Peru and *A. luizae*).

As most traits shared by *A. luizae* and other populations occur in separate geographical areas from Patagonia to the Peruvian Andes, they may be plesiomorphic within the group, and therefore are not informative as to the closest relative of *A. luizae*. On geographical grounds we might assume that *A. luizae* is most closely related to *A. baeri* of the Chaco (see Silva 1995). With its dark and greyish coloration, *A luizae* comes close to *A. patagonica* and an unnamed form in southern Peru, but both these latter possess almost all-black tails, and we therefore assume that melanisation has occurred independently in these three popula-

tions. Finally, we must stress that, in the absence of any phylogenetic analysis, it is impossible to determine the precise evolutionary relationships of *A. luizae*.

Postscript

An additional adult male *Asthenes luizae* (DZUFMG 5673) in worn plumage, collected at Campina do Bananal on 4 January 2008, also shows differences in the tone of the upperparts compared to the rest of the series, confirming that the holotype's different coloration could be related to its degraded feathers.

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