

Split *Piaya cayana* into two species

Description of the problem:

Piaya cayana is a widespread polytypic species found from northern Mexico to Argentina, with as many as 14 subspecies recognized (Fitzgerald et al. 2020). The species is common in forested lowlands and foothills throughout its range. In Middle America, the more typical (i.e. darker) subspecies *thermophila* is found from eastern Mexico south to Colombia, but is replaced at the Isthmus of Tehuantepec by the paler western Mexican subspecies *mexicana* which is found in the western Mexican dry forests from the Isthmus of Tehuantepec north to Sonora and Chihuahua. HBW-BirdLife split *mexicana* from the remainder of *Piaya cayana* with the following rationale: split based on plumage and slight vocal differences, parapatric distribution; citations are Navarro-Sigüenza and Peterson (2004) and Howell (2013, in litt.): "*mexicana* differs from parapatric subspecies *thermophila* of *P. cayana* in its rufous underside of tail feathers with broad black subterminal bar and broad white terminal tip vs all-black underside of tail with broad white terminal tip (3); pale grey vs smoky-grey lower belly and vent (2); much brighter rufous upperparts and paler throat (1); usually greenish-grey vs greenish-yellow orbital ring (Howell 2013) (ns1); longer tail (effect size 2.01; score 2); "somewhat different" song (Howell 2013) (allow 1); and parapatric distribution (3)."

Piaya mexicana was described as a species by Swainson (1827), who gave the following characters (which largely mirror the differences described above): "Closely resembles *C. cayenensis* L. [= *Piaya cayana*], but the tail beneath is rufous, not black; the ferruginous colour of the head and neck is likewise much brighter." This treatment was maintained by authors through the beginning of the 20th century (Ridgway 1916, Cory 1919), until lumped with *P. cayana* (without comment) by Peters (1940). Ridgway expanded on the differences between *mexicana*: "Resembling *P. cayana thermophila*, but colored portion of under surface of rectrices cinnamon-rufous (instead of brownish black) with a dull black area immediately preceding the white tip, general coloration much lighter, and tail relatively much longer." Most authors since Peters (1940) have maintained *mexicana* as a subspecies of *cayana*.

Navarro-Sigüenza and Peterson (2004) use *Piaya cayana* as one of their case studies for contrasting a BSC classification (single species) with a PSC/ESC classification (two species) by splitting *mexicana*, using this rationale: "Populations along the Pacific lowlands from Sonora to the Isthmus of Tehuantepec are long-tailed, pale in coloration of the underparts, whereas the forms of eastern Mexico and Central America are shorter-tailed and darker in color. Although a narrow contact zone is present in eastern Oaxaca between the two forms, only one "hybrid" specimen is known and the differences are maintained even in close parapatry." The reference to the "narrow" contact zone appears to be from Binford (1989), who reported a few specimens intermediate between *thermophila* and *mexicana*: "I have seen definite intermediates from Rio Ostuta (MLZ 45402), Las Tejas (MLZ 54387), and Tehuantepec City (UMMZ 137345 and 137350), but some specimens from the last two localities are *mexicana*. Birds from Tapanatepec, Santa Efigenia, and a point 18 mi south of Matias Romero are close to *thermophila* but very slightly paler, a condition that might represent response to the drier environment rather than intergradation", but noted that the "abruptness and apparent rarity of intergradation suggest that these two forms might be separate species; a detailed study is needed." This, combined with the

unpublished information from Howell (2013) mentioned above, appears to constitute the basis for the HBW-BirdLife split of *mexicana* from the remainder of *P. cayana*.

New information:

Very little. There are no published genetic studies of *Piaya cayana* that include samples of *mexicana*. Harvey et al. (2017) included samples of *P. cayana* from across the Amazon Basin and found that they constituted a single genetic cluster. Johnson (2021) reanalyzed these data, and included one sample of *thermophilae* and one from the Atlantic forest (likely *macroura*) and found that the sample of *thermophilae* was slightly divergent from the rest (a STRUCTURE analysis gave $K=2$, but incompletely differentiated). Although that provides no direct information relevant to *mexicana*, it perhaps indicates that *P. cayana* (s.l.) does not show strong genetic differentiation in the face of biogeographic barriers such as Amazonian rivers, perhaps because the species prefers riverine and edge habitats in the Amazon Basin.

The primary basis for the split comes from the information provided in the introduction, i.e. Navarro-Sigüenza and Peterson (2004) and Howell (2013, in litt.). There appear to be no published analyses of plumage or song from across the distribution of *P. cayana*, or of genetics that includes *mexicana*. In looking through the specimens at the LSUMZ, the differences between the paler and longer-tailed *mexicana* and the darker and shorter-tailed *thermophila* are readily apparent (see photos inserted below), but two issues arise. First, there do appear to be a handful of intermediates from near Tehuantepec, Oaxaca, suggesting some introgression. Second, the paler overall coloration of *mexicana* is found in the other two regions where *P. cayana* is found in arid environments, the north coast of Colombia and Venezuela (ssp. *mehleri/circe*), and eastern Brazil (ssp. *pallescens*). In particular, the plumage similarity of *mexicana* and *pallescens* is striking, as shown in the photos below.

There appear to be no published analyses of vocal differences between taxa. In listening to recordings in the Macaulay Library, I (Oscar) am unable to find consistent differences in songs (a long series of widely spaced strident “pik” notes) or calls (a loud “chik-wraaay”). The song of *mexicana* appears to average higher pitched and more rapid than that of *thermophilae*, but some recordings of songs of *thermophilae* seem to match recordings of *mexicana*. Certainly, a formal analysis is desirable.



The following two photos show the subspecific diversity within *Piaya cayana*. From left to right are: *mexicana* (W Mexico), *thermophila* (E Mexico to Colombia), two *nigricrissa* (Pacific coast of Colombia to Peru), *mesura* (NW Amazon Basin), two *obscura* (southern Amazon Basin), *pallescens* (dry eastern Brazil), *macroura* (SE Brazil, Paraguay, Uruguay, and NE Argentina).



Below is a comparison of the two palest subspecies of *P. cayana*. Despite the similarity in overall color, note the longer tail and paler undertail (with dark subterminal bands) of *mexicana*. The long tail, however, is matched by *macroura* of southeastern South America.



Effect on AOS-CLC area:

Splitting *mexicana* from *cayana* would result in one additional species for the AOS area.

Recommendation:

We recommend a **NO** on splitting *mexicana* from *cayana* based on a lack of published studies on the group, apparent intermediates in the Isthmus of Tehuantepec, and what appears to be repeated evolution of pale plumage coloration elsewhere in the distribution of *P. cayana*. However, an argument could be made that the original lump by Peters (1940) was unjustified, as it was made without comment. However, we prefer waiting until molecular and vocal data on *mexicana* are published or at least morphometrics and color analysis.

If *mexicana* is split from *cayana*, an English name proposal should be drafted to address the new names, preferably in coordination with the SACC.

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