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Dear Dr.Chris Foote,

We are writing to submit a revision of the Nature Note “*Floral phenology of an Andean bellflower and pollination by Buff-tailed Sicklebill hummingbird*” for consideration at *Ecology and Evolution.* Thank you, and to the anonymous reviewers, for your considerate and thoughtful feedback on the two previous submissions.

We have carefully incorporated the suggestions of the reviewers in this revised version. First, we have taken the suggestion of reviewer #2 and trimmed the Introduction. We chose not to rearrange the Introduction, as suggested by reviewer #3; we believe the idiosyncratic floral morphology of *Centropogon* provides a visual ‘hook’ to interest the reader. We have also added some brief text emphasizing the low visitation rates of *E. condamini*, as requested by reviewer #3.All further edits are relatively minor, as detailed in the following ‘Response to Reviewers’.

We appreciate the encouraging comments and feedback, and we are confident that the resulting manuscript is substantially strengthened following these revisions. In the following text you can find all reviewer comments and our responses with line-specific references to the revised manuscript.

We look forward to your response in anticipation that our work will make a constructive contribution to *Ecology and Evolution*.

Kind regards,

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David Guevara-Apaza,

Jill Jankowski,

Quentin Cronk

This document is the ‘Response’ to the reviews sent to the authors of “Floral phenology of an Andean bellflower and pollination by Buff-tailed Sicklebill hummingbird” on April 28, 2022. We thank the EIC, AE, and the anonymous reviewers for their thoughtful and constructive comments that have substantially improved the manuscript. Our responses to each reviewer’s comments are shown in bold below. We hope that our responses will clarify any remaining discrepancies.

**Reviewer #2**

(1) I believe that the only point that I would suggest changing is the size of the introduction, I believe it is possible to synthesize it in order to express ideas more directly.

**Thank you for the suggestion. We agree, and have re-reviewed the Introduction, trimming 26 words (from 875 to 849 words). We believe any remaining text serves the purpose of framing the study and providing necessary background information and is written as concisely as possible.**

**Reviewer #3**

(1) The structure of the introduction is a bit unusual because I would have started with the different flowering phenologies of hummingbird-pollinated plant species in relation to the different foraging strategies of hummingbirds. The authors may adapt that.

**Although divergent phenologies and foraging strategies are part of the work presented here, we have chosen not to rearrange the Introduction. We believe the idiosyncratic floral morphology of *Centropogon* is compelling and is the visual ‘hook’ that has garnered interest in the pollination of this clade.**

(2) The authors unfortunately do not mention the very low visitation frequency at the flowers of *C. granulosus* in the discussion and also do not compare their observations to already published results. It would also be interesting to add information on the proportions of flowers that turned into fruit per inflorescence. Based on these results further research questions can be developed.

**To our knowledge, visitation rates in *Centropogon* have not been published elsewhere (e.g. in other focused studies of this *C. granulosus*, Stiles 1985, Ornithological Monographs).**

**It is indeed a remarkably low visitation rate and probably reflects the rarity of *Eutoxeres* and its wide foraging range. We further address this in comment #11 below.**

(3) Remove “what is apparently” at line 51.

**Agreed and amended.**

(4) Remove line 56-57.

**Agree, as this statement is re-iterated at the end of the Introduction.**

(5) Line 67: Not the entire genus but the Centropogon granulosus clade.

**Agreed and changed. We’ve referred to the “*Centropogon granulosus*” clade as “the eucentropogonids” following Lagomarsino et al 2014 (Am. J. Bot).**

(6) Line 69: Add reference.

**Agreed. We’ve added a reference (Hinkelmann & Boesman 2020) at line 66 which states the geographical distribution of *Eutoxeres*.**

(7) Line 133: One individual?

**Correct. We’ve added some brief text (italics below) to clarify that one inflorescence per plant was used in the pollination exclusion experiment.**

**Line 129: “An additional ten inflorescences (*one per individual plant*) were marked with cardstock tags tied to the stem and monitored as controls.”**

(8) Based on what background did you define these categories [of floral development]? Are there comparative studies?

**We defined these developmental stages based on qualitative and quantitative characteristics of floral form, as defined in Table A2. To our knowledge, no other study as characterized floral development in *Centropogon*.**

(9) I am very surprised about the very low visitation rate of Eutoxeres, the sole pollinator of *C. granulosus*. Did you measure how many of the flowers produced per inflorescence develop to fruit? Probably only a low proportion.

**Despite the low visitation rate by *Eutoxeres*, all flowers visited in the control treatment set fruit (see: Figure 4). This is perhaps the fitness advantage promoting the evolution of specialization to *Eutoxeres* pollination – visits are infrequent but highly effective in transferring intraspecific pollen. Whether this is comparable to visitation rates in other trapliners is yet to be investigated. See also our response to comment #11.**

(10) Line 237: replace “is a visitor” with “is the main visitor”.

**We disagree that adding the word “main” confers any additional meaning to this sentence. The following sentences in this paragraph adequately convey that *Eutoxeres* is the sole and primary pollinator of *Centropogon*.**

**“As predicted from its extreme bill curvature, Buff-tailed Sicklebill (*E. condamini*) is a visitor to *C. granulosus*, and these visits are necessary for developing fruit. No other hummingbirds were observed legitimately probing these flowers. Covering flowers with wire cages excluded hummingbirds while allowing invertebrates to access the flowers freely -- however none of these flowers produced fruits. Therefore, we conclude that Buff-tailed Sicklebill is the sole pollinator of *C. granulosus*.”**

(11) You do not mention the very low visitation rates of the flowers of *C. granulosus* or put it into relation to other hummingbird-pollinated species in the discussion. Please add a few lines on that topic.

**Thank you for the suggestion. Whether this visitation rate is low relative to other traplining species is beyond what we can discuss because the foraging patterns of traplining hummingbirds are effectively unknown. Further, we *a priori* expect these rates to be lower than territorial hummingbirds, because in part, visitation frequency is how we define these groups.**

**However, we have added some brief text (italics below) at Line 294 that emphasizes the low visitation rate of *E. condamini*. This paragraph also mentions the low visitation rate, and states that a comparison with other hermit hummingbirds is hindered by a lack of data on these other species:**

**Line 290: “Nonetheless, the visitation rates support the notion that Buff-tailed Sicklebill is a trapliner. More specifically, this species appears to exhibit ‘traveling exploitation’ (sensu Sargent et al. 2021). We make this designation based on the observations that (1) these hummingbirds have not been recorded defending static territories, and (2) individual food plants are visited 1-2 times per day for brief periods (seconds) of foraging. *This is perhaps the fitness advantage promoting the evolution of specialized pollination in* C. granulosus*: Sicklebill visits are infrequent but highly effective in transferring intraspecific pollen, as suggested by the pollinator exclusion experiment.* While the behaviours exhibited by E. condamini are in accordance with the those documented for White-tipped Sicklebill in Costa Rica (Stiles 1985), the fine-scale daily movements of *Eutoxeres* (and Hermits generally) have not yet been studied — at present, comparative analyses are constrained by our limited knowledge of these rarely seen pollinators.**

(12) As far as I know the males of some hummingbird species are highly territorial while the females are not and there are hummingbird species that are territorial s long competition from other hummingbird species is not too high.

**We have pointed the reader to Sargent et al 2021 (*Integrative and Comparative Biology*) where this caveat is reviewed at length.**

**Line 264: “Because hummingbird species generally adhere to a single foraging mode (Feinsinger & Colwell 1978; Stiles 1985; but see Sargent et al. 2021), phenological types may be effective filters of the local pollinator community, further promoting floral specialization in the eucentropogonids.”**