



18 February 2017

Re: Resubmission of manuscript *Effects of landscape XXXX XXXXXX* (YYY(2016)2727.R1)

Prof. Barbara XXXX,

Editor of XXXXXX,

Dear Prof. XXXX,

Thank you very much for giving us the opportunity to revise our manuscript YYY(2016)2727.R1 titled "*Effects of landscape XXXXX*" by XXX, XXXX and XXX. We have revised the manuscript following comments raised by the reviewers.

Appended to this letter, we have made point-by-point responses to comments raised by the reviewers in blue italics. We appreciate your time and that of the reviewers for considering our manuscript and look forward to your response.

Kind regards,

XXXXXX XXXX

Our responses to reviewers are written in italics and the revised text is listed in blue font.

Reviewer(s)' Comments to Author:

Reviewer: 1

Referees Comments

Please find below my comments on the revised manuscript titled “Effects of landscape XXX XXXXXX”.

I believe the authors have done a commendable job addressing the comments from the other reviewers and myself, however I still have a number of suggestions below – many of which are editorial – that could improve the manuscript further. Once these have been addressed I believe the manuscript will be suitable for publication barring any final suggestions from the journal editors and I therefore recommend minor revisions.

L38: effects of what on what? Please describe your as precisely as possible.

We revised this sentence to clarify it now read “Habitat effects on bee richness and abundance were...” line 38.

L45-46: I think if you touch such management recommendations, which might not be expected for this journal, I feel that you should be more precise describing in the abstract which modest changes in farmland management you suggest to enhance bee populations. I do not think this is directly clear from the preceding points.

We clarified (lines 46-47): “Farmers can enhance bee populations by maintaining small patches of flowering plants in their fields.”

L173. You define here the category of natural or semi-natural habitats. I would recommend to use the abbreviation SNH for semi natural habitats rather than SEM. Many publication in this area use SNH whereas SEM usually means “standard error of the mean”. I realised this reading through the figure legends and think this could improve clarity for the reader.

We replaced “SEM” with “SNH” throughout the whole document as suggested.

L220-221: how where these categories defined? I think that you either need a reference here to justify this separation or explain how these categories came along.

We assigned size classes considering similarity in size of the same classes and taxonomic groupings. Our samples in the genera of Ceratina, Heriades, Lasioglossum and Tetragonula were small compared to other genera and whose size data gave small standard errors (0.07) even some small- and medium-sized bees were slightly different in values. We have clarified these points (lines 222-223):

“Each classes were apparently distinguishable even some bees in small and medium size classes were slightly different in values.”

L353 Similar to first my comment. Try to be clearer about which effects of what on what.

We clarified (lines 356-357): “The influence of local and landscape factors on bee richness and abundance differed among traits.”

L371 if “suffer” stands alone it has a very anthropocentric connotation which I think is not appropriate to apply to bees. Consider change the wording, maybe e.g. “suffer in terms of abundance or diversity”

We replaced “suffer” in the sentence with ... “thus, their richness and abundance were more likely to decline in human-altered habitats relative to larger bees” ... (lines 372-375):

“Small-sized bees, mostly non-eusocial bees, are limited in accessing resources in larger managed fields as their foraging ranges are quite short (Greenleaf et al., 2007; Bommarco et al., 2010) thus, their richness and abundance were more likely to decline in human-altered habitats relative to larger bees (Gathmann & Tscharntke, 2002; Jauker et al., 2013).”

L447 consider changing “short fliers” into e.g. “short distance flying species” or “species with short home ranges”

We replaced “short fliers” with “short-distance flying species” (lines 457) as the Reviewer suggested.

L456-457 This sentence is a bit odd. Could it be reformulated? Actually I do not understand what it means exactly.

We modified this sentence to increase clarity (lines 458-462):

“...many of the bees in our study area may not have benefited from the mass flowering of the focal crops (in this case mangos) because of the crop’s short flowering periods, and therefore were temporally insufficient to support a large wild bee community relative to a collection of non-crop flowers (Corbet, 2000; Mandelik et al., 2012).”

L459-461 If this information is important (and I believe it is) it should be somehow mentioned as well in the results section (and even methods) that you found a considerable amount of diptera. Otherwise it should be noted as “personal observation” to clarify that it was not systematically observed and rather an anecdotal observation during field work.

We found large numbers of diptera (and small amounts of other insects) feeding on mango flowers as discussed here. However, we did not count the amount of diptera as we designed this study focusing on richness and abundance of bees. To clarify this, we included “based on personal observations” (lines 464-466):

“Based on personal observations, we also found that flies (order Diptera) were prevalent on mango flowers, consistent with other studies (Singh, 1996; Dag & Gazit, 2000; Huda et al., 2015; Sritongchuay et al., 2016),...”

L486 I do not think that orchards can be “highly managed”, consider changing into “intensively” or “orchards with high management intensity”

We replaced “highly managed” with “intensively managed” lines 491 as the Reviewer suggested.

L489 insert “that” after suggests

We inserted “that” as suggested.

L503-504 Again, this is a very interesting and as well important note about your study. However, I don’t think that the end of the conclusions it the very appropriate place to mention that some farmers spray off-field vegetation. This is more of a result, or a fact, rather than a conclusion based on your results.

We moved this point to the discussion (lines 485-490):

“However, these flowering plants may not maintain bee communities in some orchard sites and adjacent fields owing to farmers favouring chemical use for removal of these ‘weeds’ before and after crop stimulation because they also use resources that are necessary for crop growth (e.g. water and nitrogen) and can cause high financial losses (Oerke, 2006). Furthermore, based on our interviews with the mango farmers, some applied herbicide outside crop fields in order to clear their land.”

L851-860 Table2

The legend is well written but needs to refer to the column header as well (Model, K,AICc, ...) well to explain what these parameters represent.

Similarity to the comment upon the first revision, I think that the presentation of the models could still be improved, maybe by restricting this table to the top-n models used as well for the presentation of the estimates?

We reduced Table 2; in the revised table we include only the null model and top-ranked models ($AIC_c \leq 6$) with the coefficients of estimated variables presented in Table 3. We also edited the header of Table 2 (lines 858-860) as indicated below:

“K is the number of parameters in the model; ΔAIC_c is the difference in AIC_c values: differences between 0–2 = substantial support, 4–7 = considerably less support, and >10 = essentially no support (Burnham & Anderson, 2002); w_i = Akaike model weights.”

XXXXXX, January 19th 2017

Reviewer: 2

Referees Comments

The authors have made appropriate revisions in response to the previous round of reviewers comments and I think the manuscript has been strengthened.

A couple of minor edits suggested below:

Line 33: either “more abundant”, “more abundant” or “more species rich” would be a better expression here instead of “richer”

We modified “richer” to “more species rich” as suggested line 33.

Line 63: I think you could remove the word “native” in this sentence, as it implies a similar meaning to “wild”

We removed “native” as suggested.

Line 70: “homogenous” should be “homogeneous”

We corrected the word to “homogeneous” as suggested.

Line 110: “richer”- see comment above

We replaced “richer” with “more species rich” as the Reviewer suggested.

Line 379-382: This is a counter-intuitive result that I think needs a clearer explanation, as it may be confusing to many readers. I suspect that the high correlation between urban & semi-natural habitats is because this particular urban area is a low-density urban area with lots of open or unmanaged semi-natural areas that would be good bee habitat, perhaps similar to a regional farming town? (the authors suggest this later at lines 405-407). However, this may not be immediately obvious to a reader whose idea of urban areas is central New York City, for example. In fact, the text at lines 400-407 may be better if moved up to line 382 to convey this more clearly. Also I would suggest including just a few extra words in the Methods where the authors describe the land use types (line 172) to state whether the urban areas are predominantly high, low or medium density urbanised areas.

Our study region included the outer suburbs of Bangkok where development is increasing, but can still be classified as relatively lower to medium density urban with significant amounts of open, undeveloped/unmanaged land or abandoned agricultural land.

As the Reviewer suggested, we moved the section and revised it as follows: “Urban landscapes in our study were likely to support a higher richness of small-sized bees. This may be because specific habitat characteristics might have more impact on bees than direct effects of urbanisation (Kearns & Oliveras, 2009). Heavily urbanised lands primarily diminish suitable nesting sites and alternative floral resources as much of the land is covered by concrete and other artificial materials (Ahrne´ et al., 2008; Potts et al., 2010; Geslin et al., 2016). However in our study area, the urban areas were primarily low to medium density which also contained considerable amounts of open, unmanaged lands which may have contained resources for these smaller bees such as from weeds and other non-crop plants (Williams & Winfree, 2013).”

to lines 385-394.

We also inserted “low to medium density urban” lines 174.