Diapause is not selected as a bet-hedging strategy in insects: a meta-analysis of reaction norm shapes

How a species would cope with a rapidly changing climate by avoiding phenological mismatch bears practical importance. Employing a meta-analysis of a number of studies reporting reaction norms of diapause, the authors discussed the use and role of evolutionary strategies (mean timing, phenotypic plasticity and bet hedging) in the environmental predictability (such as fighting against increasing climatic variability and temperature) of organisms.

Overall the manuscript is well-written and discussed. In addition to discussing the coping strategies of organisms in a rapidly changing climate, the study put forward some interesting discourse, such as the relation between plasticity and diversified bet hedging—both marking the two extremes of a continuum of strategies. Contents of the manuscript should pave the way for some interesting follow up works.

I have no major issues with the manuscript. Some minor comments:

- Figure 3: A, B, C, D missing in the panels
- Figure 3-top right panel: provide units
- Line 134: technically ordinal days, not Julian
- Line 50: Where is the fourth strategy?
- Line 65: one instead of on
- Line 133: also temperature increase?
- Figure S2: y-axis unit (hour)
- Figure S3: y-axis unit (ordinal)
- Day length predictability: the higher the SD, the less the predictability. Better write clearly.
- Concepts of phenotypic plasticity, bet-hedging (both risk spreading and conservative), and reaction norms can be elaborated more for better understanding of the readers.
- Unfortunately, most studies are concentrated in northern latitude. Had the cases in the southern latitude or near the equator (representing hotter and drier condition) be added, the story could have been interesting.
- Did the meta analysis consider obligatory or facultative diapause? Although the concept of facultative diapause is a loose one, a little bit of description and defining the inclusion criteria in the study based on the separation could be better. When you are drawing a

conclusion on the diapause, telling specifically which diapause you are referring to makes things clearer.

- Bet hedging is generally a more appropriate explanation for those conditions having temporal variation in resource availability or unfavorable living condition, and that generally increase the geometric mean fitness by reducing variance among the individuals. One such interesting case is the phenomenon of prolonged diapause. In such cases, individuals from the same cohort emerge in different years. Although out of the scope of the study, if insects considered in the meta-analysis represents such cases, a separate explanation might add an interesting element.