

Battisti review 2 2018

Considerable text has been added to increase introductory information on diapause. However, I find much of the new text in the introduction hard to understand. Word choice could be more specific. For example:

Ln 100: I am not clear what constitutes a 'signal'. Is this an environmental cue or physiological consequence of poor nutrition? Both of these and more?

Other places in this passage word choice leads to personification of the organisms or makes it seem as though organisms are making informed decisions (rather than physiological responses to biotic or abiotic cues) which I doubt they are. For example:

Ln 102: "if any unfavourable condition can't be measured or predicted using any signal, a genotype can increase the fitness of the organisms employing the tactic of "risk-spreading..." In this sentence the measurement or prediction of a signal sounds like an active decision making process. The second clause "a genotype can increase the fitness of the organisms" is awkward and I don't quite understand. A genotype could be an individual or group of identical individuals (clones). Who are 'the organisms' in this sentence and how does an individual increase the fitness of those organisms?

Ln 115: The verb 'splitting' makes it sound as though the group is actively deciding on this strategy. Is this an accepted term in the field of diapause?

Ln 116: please define 'fine grained', choose another adjective, or otherwise clarify.

Ln 117: The entire passage starting "Whether current or parent generation is in control of diapause also determines the outcome of a diapause type" down to Ln 131 is confusing to me. The authors repeatedly state that parents or off spring are 'in control' of diapause and 'the fate' of individuals or groups. I do not know how parents can 'control the fate' of their off spring diapause in anyway. The parents are dead by the time PPM larvae go into diapause and I don't see how they would control it in any case.

Are the authors invoking a genetic mechanism of the parents that off spring inherit? Maternal effects or other plasticity? A very clear and specific description of how diapause and extended diapause are controlled is needed here.

Also the use of density dependent and density independent would not be accessible to any readers who are not trained ecologists and perhaps needs more explanation for a multidisciplinary journal. For example a climate scientist or someone from a different discipline would be very interested in this work but may not follow some of the jargon. This passage needs to be completely rewritten.

Ln 132: Be consistent with the common term 'the winter pine processionary moth' throughout. I am not sure if this is an accepted common name for the two species but in any case I believe it

should be plural : the winter pine processionary moths. Some places it is singular with the definite article 'the' implying one species.

Ln 156: This topic sentence indicates the mechanisms of prolonged diapause induction and maintenance in the winter pine processionary moth are unknown but two sentences prior it says "variation in the length of pupal diapause occurs to match the local conditions for optimal development". I understand this is referring to normal diapause but what are the cues that cause diapause to begin and end even in individuals that diapause for one year? It sounds like these are known and would be helpful context.

Ln 159: after the sentence ending 'at both ends of the scale' it would be helpful to know how adverse cold or heat affect ppm fitness or survival before we hear about other potential factors like soil moisture and food quality

Ln 166: we review all the available evidence sounds like a review paper. Rephrase to indicate you analysed data.

Ln 343 says minimum winter temperature but the authors analyzed average temperature of the cold period not minimum.

Ln 374-380 I think this new text has similar problems to the new introductory text in that it personifies the ppm and I don't think the authors can say ", they would have evolved a fixed life cycle using a fixed number of years with prolonged diapause". This is a possibility but we cannot say for certain. Is there another lepidopteran that has evolved this diapause cycle? Specific examples of how one or two different Leps have responded to different predictability of climate would help make the point.

Ln 453 This needs rewritten: "likely because different avoidance mechanisms (such as disease, intraspecific competition, predation, parasitism) of lower and upper lethal thresholds, respectively" first because this, in the conclusion, is the first we have heard that high and low temperatures may negatively affect pupae in different ways. IN addition disease, intraspecific competition, predation, parasitism are not avoidance mechanisms of the pupae they are risks or harmful agents to the larvae.