

Title: Uptake and toxicity of clothianidin to monarch butterflies from milkweed consumption

General comments for the authors

This paper reports the effects of milkweeds treated with granular clothianidin on monarch butterfly larvae from hatch to pupation, and the effects upon larval survival, larval growth, pupation success, and adult mass. The manuscript is well written, and the research is timely, relevant, and fills a critical knowledge gap. However, before it can be published the manuscript needs additional details and clarification in the methods, further discussion, and interpretation based on the specific use of the product tested, and revise some of the statements provided since they are highly speculative given the sample size evaluated and can lead to misinterpretation.

Minor comments:

- Subscript 50 in LC_{50} thorough the document.
- In the context of the paper the authors measured a concentration and not a dose since they cannot measure the amount consumed how much the caterpillar consumed and different tissue might have different concentrations of clothianidin. I suggest changing “dose” to “concentration” throughout the text.
- Line 28: clarify here that the concentration provided is the average for all instars.
- Line 29: clarify here what you considered for total mortality. Larvae to pupation?
- Line 30: it will be good to add the specific rate of decline in larval growth in the abstract.
- Line 50: seed treatments are also heavily used in soybeans in the US Midwest.
- Line 85: consider changing “winter” to “overwinter”.
- Lines 87-88: consider including soybeans in this statement.
- Line 109: indicate why swamp milkweed was selected. Where the plants grown in a greenhouse to insure no pesticide drift? Please clarify.
- Line 116: consider changing “out of doors” to “outdoors”.
- Line 131-133: the authors should clarify what they mean by unwanted plants.
- Line 281-282: is not clear what the authors meant by “was not proportional to clothianidin exposure”. Clarify.
- Line 315: consider changing the termed “depresses”.
- Line 350: specify if this study was aerial, granular or seed treatment.
- Line 382: considering changing “eve during the transfer from larvae to adults” to “during metamorphosis”.
- Lines 387-388: this sentence is confusing. What do you mean by “the toxicity by which is unknown”?
- Line 391: specify if the exposure was topical or bay feeding.
- Line 446-447: this statement is not clear and speculative, please revise.