

Basic reporting

The article meets the requirements of the journal regarding the necessary standard sections and their presentation. Figures and tables correspond to the content of the article and the additional file data presented, which were properly attached to the article itself. The authors have formed the research objectives, but there is no clear research hypothesis. The article contains properly formatted references to other sources of research that are relevant to the main focus of the article. In general, the submitted publication should be assessed as a self-sufficient publication component, which, however, requires some correction and improvement. In particular, to actualize the purpose and objectives of the research, the authors of the article used the statement of the invasiveness of this weed species from the position of a quarantine weed with high adaptive potential. This is a specific type of weed that has a fairly wide range of biological and allelopathic adaptations to form a dominant vitalistic tactic in the lower and middle tier of the agrocenosis of the respective crop. However, in my opinion, it is necessary to detail the levels of crop losses and the corresponding economic or environmental losses by adding materials from such studies as: Riemens, M.M. and R.Y. van der Weide. 2008. Biology and Control of *Galinsoga parviflora*, overview of literature survey. Wageningen: Plant Research International. Note 576, 32 pp. Damalas C.A. 2008. Distribution, biology, and agricultural importance of *Galinsoga parviflora* (Asteraceae). Weed Biol. Manag. 8: 147–153. Mostafa I, Abd El-Aziz E, Hafez S, El-Shazly A. Chemical constituents and biological activities of *Galinsoga parviflora* cav. (Asteraceae) from Egypt. Z Naturforsch C J Biosci. 2013 Jul-Aug;68(7-8):285-92. PMID: 24066513. Paula, D. F. d., Silva, E. M. G. d., Silva, L. B. X. d., Lima, A. d. C., Billu, P. B., Reis, M. R. d., & Mendes, K. F. 2022. Sustainable Control of *Galinsoga parviflora* with Oxyfluorfen, Flumioxazin, and Linuron Application in Two Soils Cultivated with Garlic. Sustainability, 14(24), 16637. <https://doi.org/10.3390/su142416637>

The digital detailing of the herbological potential of weeds will be appropriate both in the global dimension and in the application to the provinces of China. This will increase the scientific interest and future citation of the article.

The statement in line 58 “released by a certain plant” should also be modernized by adding “by root exudates, transpiratory secretions and the results of the decomposition of their residues in the soil” (which would be fully consistent with the classics of allelopathic research (Willis, Grodzinsky)). Tape 67 on radish can also be supplemented by Tsytsiura Y., Sampietro D. Allelopathic Effects of Annual Weeds on Germination and Seedling Growth of Oilseed Radish (*Raphanus sativus* L. var. *oleiformis* Pers.). Acta Fytotechnica et Zootechnica. 2024. Vol. 27. no. 1. P. 77-97.

Trifolium repen(s) is omitted in tape 71.

Lines 75 and 76, in my opinion, should be supplemented with other regions of the world, since alfalfa and oats are also cultivated in other parts of the world (and are among the main crops by share in crops) with a temperate climate and in conditions of unstable moisture where this weed species is a real threat to feed quality.

After tape 81, it should be noted what these studies will allow to achieve in the agrotechnological direction from the point of view of weed control in agrocenoses.

Results. The description of the data should still be more specific, in particular, the concepts of more or less are concepts of a more general nature of the analysis, and a ratio could be used to detail the effects. The same applies to the SAE score. This will allow us to move away from the general effects of the description to the specifics and real indication of allelopathic effects.

Discussion. It would be desirable to add the authors' assessment of the level of complementary allelopathic action of the total extract from the whole plant in comparison with individual parts, again using the approaches of coefficient analysis. In particular, there is no clear explanation for the effects of an increase or decrease in test parameters in comparison of individual plant parts before its use as whole plant extracts. In addition, the analysis of the isolated allelopathic substances in the discussion is presented only in separate groups and does not have specifics on the main dominant chemical compounds

for all parts of the plant. I will not be specific, but there are a number of publications on the allelopathic potential of the compounds presented in Figure 5. Because the whole picture of the potential of *G. parviflora* in terms of the formation of adaptive allelopathic effects in agrocenosis is not entirely clear. It would be desirable to add the results of the study of this weed species on related test objects to ensure the search for analogies and resulting explanations. This creates a somewhat mosaic impression of the results, but they are presented in the tables and are quite interesting and relevant. Also, in my opinion, it would be desirable for the authors to add, if possible, a brief description of the changes in the structure of allelopathically active substances in different parts of plants and the specifics of the impact of this fact on the adaptive component of the allelopathic potential of *G. parviflora*.

References. In general, it covers the general aspects of the introduction and discussion of the results, but could be improved by adding the references I provided in the previous sections of the review. Images and Tables. Figures have not been inappropriately manipulated. However, the captions in small print are difficult to read in the general pdf version of the article. If possible, increase the font size to the maximum allowable level according to the design requirements, which will significantly improve the perception of the article. In addition, the authors may consider converting Figures 1-4 to color as well. Raw data have not been inappropriately manipulated

Comment on language and grammar issues. I am not a native speaker, but the basic terminology and indicator indicators for allelopathic analysis are presented correctly, as well as the biochemical and biospecies components. The text sometimes contains too short and simple sentences that could be combined with a general abbreviation of both, but this is my personal opinion.

Experimental design

Original primary research within Aims and Scope of the journal. Methods should be described with sufficient information to be reproducible by another investigator. In particular, the authors used a modified method of forming allelopathic extracts through laboratory-controlled germination of collected seeds of a segetal species that had previously grown to the seed stage in the agrocenosis of the base recipient. And according to the process scheme, everything is correct. However, I have some methodological questions as to why the option of direct field selection of the relevant parts of the plant during the flowering phase, which for most species is the period of maximum allelopathic activity and is recommended for the selection of plant material, was not used (Fujii, Y., & Hiradate S. (2007). *Allelopathy: New Concepts And Methodology*. CRC Press.; Zhang Z, Liu Y, Yuan L, Weber E, van Kleunen M. Effect of allelopathy on plant performance: a meta-analysis. *Ecol Lett*. 2021 Feb;24(2):348-362. doi: 10.1111/ele.13627. Epub 2020 Oct 21. PMID: 33085152., Shan, Z., Zhou, S., Shah, A., Arafat, Y., Arif Hussain Rizvi, S., & Shao, H. (2023). Plant Allelopathy in Response to Biotic and Abiotic Factors. *Agronomy*, 13(9), 2358. <https://doi.org/10.3390/agronomy13092358> and others). Therefore, it is advisable to indicate in line 89 which phenological phase or life stage of the plants was reached on day 45. Given the acceptability of this method, I wonder why the weed seeds were sampled from alfalfa crops and not from both test crops and then proportionally mixed to form a test sample. The use of controlled germination conditions according to the basic research (Weidenhamer, J.D. (2008). *Allelopathic Mechanisms and Experimental Methodology*. In: Zeng, R.S., Mallik, A.U., Luo, S.M. (eds) *Allelopathy in Sustainable Agriculture and Forestry*. Springer, New York, NY. https://doi.org/10.1007/978-0-387-77337-7_6) forms certain differences in the plant's allelopathic portfolio, which requires appropriate adjustments for the subsequent practical use of the results. In addition, this species is characterized by certain features of the period of biological dormancy of seeds. Did the authors take this fact into account?

Tape 110 was used ISTA, 1985, although ISTA (2020) could be used with the procedure. International rules for seed testing. Chapter 5: The germination test. International Seed Testing Association (pp. 5-58).

In line 119, please provide an explanation or reference for the 21 days (methodology). In line 120, brief information on determining the wet and dry weight of the selected plant samples is desirable.

Tapes 176 and 177 are questions about taking into account the periods of biological dormancy of test weed seeds and the impact of this indicator on overall seed germination (Qasem, R.J. (2020). Weed Seed Dormancy: The Ecophysiology and Survival Strategies. IntechOpen. doi: 10.5772/intechopen.88015).

The grading system of SAE could be based on the grading system (0-0.25 Non-allelopathic (NA); 0.26-0.5 Moderately allelopathic (MA); 0.51-0.75 Highly allelopathic (HA); 0.76-1.0 Extremely allelopathic (EA)) according to Smith, O.P. (2013). Allelopathic Potential of the Invasive Alien Himalayan Balsam (*Impatiens glandulifera* Royle). A thesis submitted to Plymouth University in partial fulfillment for the degree of Doctor of Philosophy. 388 pp).

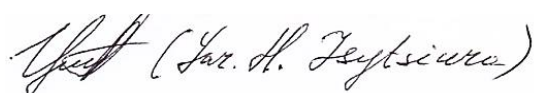
It is also necessary to indicate why these two components were evaluated for herbicidal activity from the general list of components identified during the analysis (a brief scientific justification is needed, since there are a number of interesting components from the list presented that deserve special attention in further research).

Validity of the findings

All underlying data have been provided; they are robust, statistically sound, & controlled. The conclusions are based on the main results of the research, but I would recommend that they be somewhat more specific: In line 357, indicate the interval of concentration change or the dynamic gradient of its change; in lines 358-359, give the gradient assessment I mentioned in terms of a ranked series of allelopathic intensity of different parts of the plant; I would rephrase the conclusion in lines 360-361 in relation to certain weed species groups, since in this context the statement does not correspond to the test sample of the assessment objects. It should also be specified which components were evaluated from the point of view of herbological control.

Additional comments

The article makes a positive impression and contains novelty and is based on modern methodological research approaches. I recommend it for publication after the authors have made the corrections and main areas of improvement noted by me in accordance with the above sections of the review. I believe that research in the field of allelopathy in general and the authors' research presentation in particular is a general perspective of innovative agricultural technologies from the standpoint of controlling and improving the quality of products and the environment. Therefore, I wish the authors fruitful work and high knowledge-intensive results in this area.

 (Yar. H. Feptsivara)

31/01/2025