

CONCLUSIONS

From the present study on the phytotoxicity of *Chenopodium murale* towards different crops, following conclusions were drawn

1. The weedy nature of *C. murale* is supported by extensive vegetative growth, high reproductive potential and wide adaptability to various environmental conditions.
2. The rhizosphere soil of *C. murale* is inhibitory towards growth of winter as well as summer season crops.
3. All the weed parts (above- and below-ground) when retained in soil reduce the early growth of crop (15 days) more than later growth (30 days).
4. Greater phytotoxicity is observed when whole plant of *C. murale* is retained in soil compared to individual parts.
5. Root exudates of *C. murale* collected in agar-agar or sand medium are inhibitory towards growth of *Triticum aestivum*.
6. Different parts of *C. murale* exhibit differential phytotoxicity. The leaves are more phytotoxic compared to other parts studied.
7. Growth of crops in soils amended with different parts of *C. murale* is significantly reduced.
8. The phytotoxicity of aqueous extracts, rhizosphere soil and soils amended with different parts of the weed is found to be directly related to the amount of total phenolics present in them.
9. Even the residues of *C. murale* (collected after completion of life cycle) are inhibitory for summer or winter season crops when amended or mulched in soils.

10. Lower concentrations of residue mulch (0.5%) have promotory effect, while their higher concentrations or residue amended soils are inhibitory for growth of crops.
11. Allelochemicals released by the weed inhibit nodulation of legume crops.
12. The presence of weed in soils also cause changes on total chlorophyll, protein and carbohydrate contents of test crops.
13. Soil texture influences the phytotoxicity of *C. murale* and it is maximum in sandy soil.
14. Addition of activated charcoal to the soils amended with different parts of *C. murale* confirms the involvement of organic compounds (phenolics) in the phytotoxicity of the weed.
15. The soils amended with different parts of *C. murale* either alone or alongwith activated charcoal are rich in organic matter and various macro- and micronutrients.
16. Nitrogen fertilization in the weed-amended soils confirms that allelochemicals affect the growth of other plants due to nitrogen-immobilization or its conversion into insoluble form.
17. During decomposition of *C. murale*, phytotoxicity is maximum at 15 days time interval and later declines gradually.
18. The release of phenolic allelochemicals from various parts of *C. murale* is dependent on time.
19. In various amended soils, the nutrients are not limiting and hence not responsible for growth inhibitory effects on crops. However, interference of allelochemicals with uptake and transport of nutrients to crops may be affected leading to indirect effects on crop growth.
20. Different phenolic acids viz. vanillic, benzoic, protocatechuic, ferulic, *p*-coumaric and syringic acid are present in different parts of *C. murale*. However, in roots and residues, benzoic acid is absent.