



Construction of a germination chamber and standardization of methods for assessing the herbicidal activity of novel compounds

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The search for novel compounds with herbicide activity depends on suitable bioassays that must be standardized and reproducible. In general the amount of the new compound to be tested is very small and assays in greenhouse or in the field are impracticable. So, miniaturization of the bioassays is required for the first step of screening for phytotoxic activity. In general, some seeds such as lettuce and duckweed are used for testing the bioactivity of new compounds because they germinate easily and uniformly and grow rapidly. The use of weeds is more difficult for several reasons, but they are the target species in the field. Therefore, in the effort to find new compounds with herbicidal activity we developed a germination chamber and standardized methods for enabling bioassays with different weed species. The germination chamber was built in stainless steel with interior dimensions of 0.8 x 1.0 x . The interior was coated with mirrored steel plates. The chamber contains lighting panel, cooling system and controllers of temperature and relative humidity. The lighting panel provides a lighting of 520 $\mu\text{mol photons m}^{-2} \text{s}^{-1}$. For the bioassays, 1-3 seeds were placed in pots with 200 mL capacity containing 12 g of perlite as substrate and 70 mL of nutrient solution. The volume of nutrient solution added daily was standardized for each species. The test compound is dissolved in the nutrient solution at different doses. The plants are grown for varying periods, up to 50 days depending on the weed species, until the development of true leaves, allowing assessment of photosynthetic parameters. We have successfully standardized methods for *Ipomoea grandifolia*, *Bidens pilosa*, *Euphorbia heterophylla*, *Amaranthus hybridus*, *Alternanthera tenella*, *Digitaria horizontalis*. Besides biometric and photosynthetic parameter, several physiological and biochemical processes have been evaluated in these plants aiming the elucidation of the mode of action of the herbicidal compounds.

Palavras-chave: weed growth, bioassay, miniaturization, phytotoxic activity

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