

Novel lipophilic analogues from 2,4-D and Propanil herbicides: Biological activity and kinetic studies

Porciuncula L.M.

Teixeira A.R.

Santos M.F.C.

D'Oca M.G.M.

Santos L.S.

Nachtigall F.M.

Orth E.S.

D'Oca C.R.M.

This work describes the synthesis of new lipophilic amides and esters analogues of classical organochlorides herbicides by incorporation of long-chains from fatty acids and derivatives. The new fatty esters and amides were synthesized in 96?99% and 80?89% yields, respectively. In general, all compounds tested showed superior in vitro activity than commercial herbicides against growth *L. sativa* and *A. cepa*, in ranges 86?100% of germinative inhibition. The target compounds showed, significantly more susceptible towards acid hydrolysis than 2,4-dichlorophenoxyacetic acid (2,4-D). The kinetic and NMR studies showed that the incorporation of lipophilic chains resulted in a decrease in half-life time of new herbicides compounds (1.5 h) than 2,4-D (3 h). These findings suggest the synthesis of new lipophilic herbicides as potential alternative to traditional formulations, by incorporation of long fatty alkyl chains in the molecular structure of 2,4-D, resulting in superior in vitro herbicidal activity, best degradation behavior and more hydrophobic derivatives. © 2020

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2,4-D

Fatty acids

Organochlorides herbicides

Propanil

Renewable resources

2,4 dichlorophenoxyacetic acid

fatty acid ester

propanil

sulfuric acid

triethylamine

acid hydrolysis

aminolysis

Article

carbon nuclear magnetic resonance

catalysis

chemical structure

controlled study

esterification

germination

herbicidal activity

hydrolysis

in vitro study

kinetics

lettuce

lipophilicity

monocot

onion

plant growth

priority journal

proton nuclear magnetic resonance

rate constant

reaction analysis

reaction time

stoichiometry

synthesis

ultraviolet visible spectroscopy