



PHOTODEGRADATION OF PROFOXYDIM IN NATURAL WATERS.

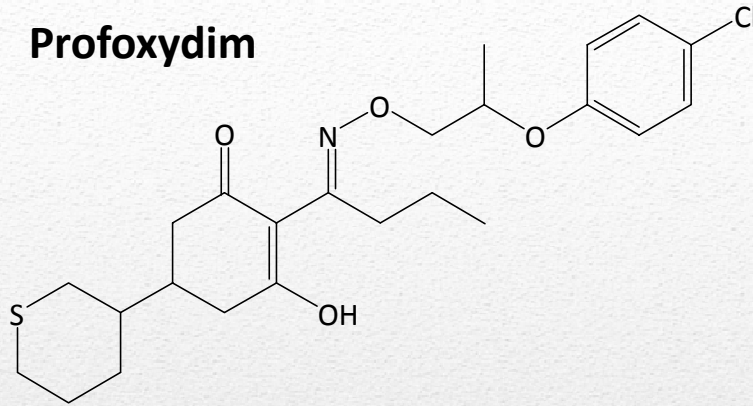
COMPARATIVE STUDY OF THE PHOTOLYTIC BEHAVIOUR OF THE ACTIVE SUBSTANCE AND ITS FORMULATION AURA®

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INTRODUCTION

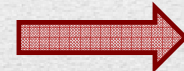
Profoxydim



Applied in rice fields for post-emergence control of grass weeds



Low rate of application
(75-200 g (a.i.) Ha⁻¹)



Aura[®] + additive (0.5% Dash HC[®])

Application in flooded
rice fields



SURFACE WATER

High polarity and solubility
Low volatility



GROUND WATER



PHOTODEGRADATION



OBJECTIVES

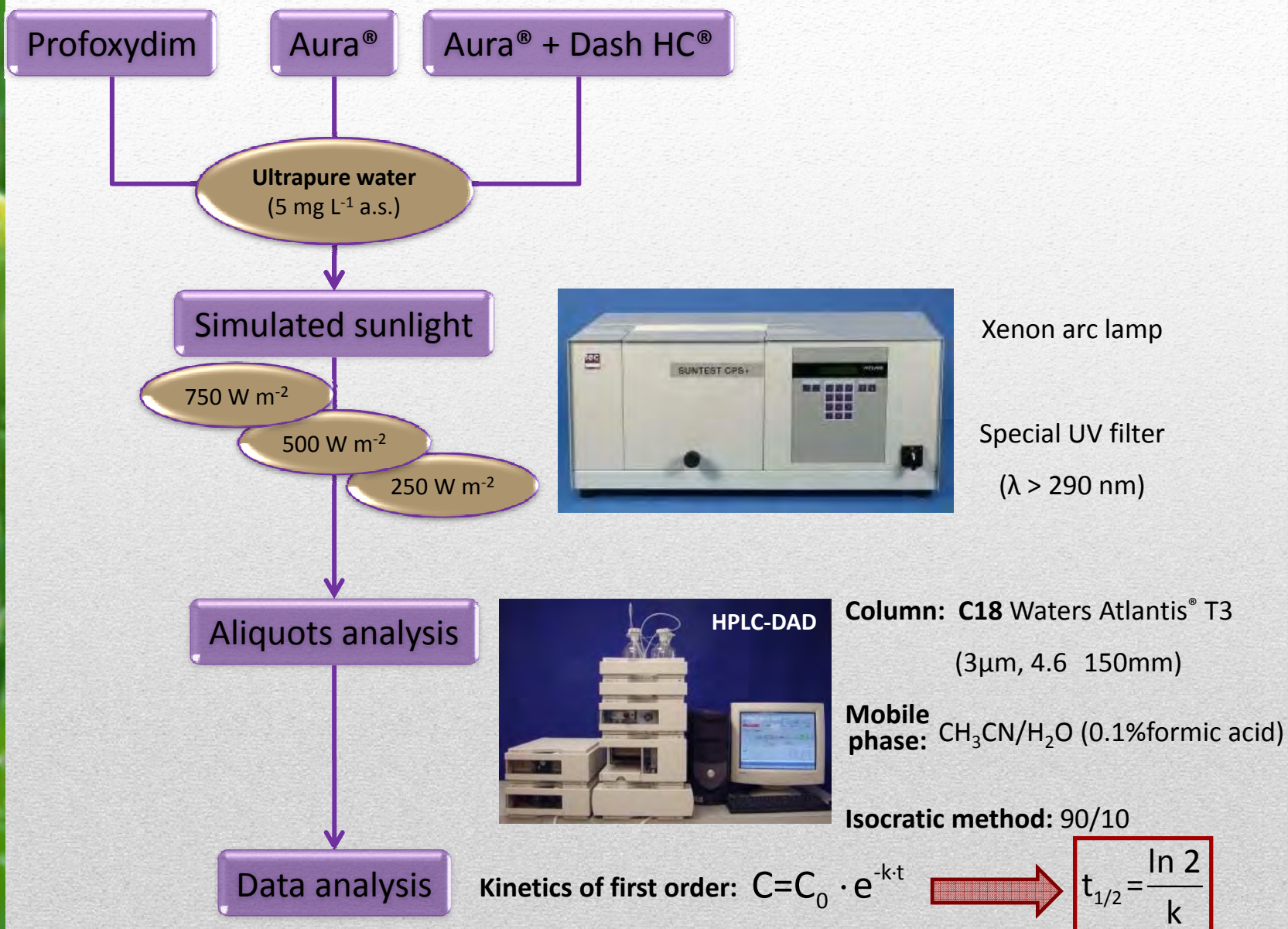
1. Determine the **photodegradation kinetics** of **profoxydim** as analytical standard and its commercial formulation (**Aura[®]**) **with/without** the addition of the **additive Dash HC[®]** under laboratory conditions
2. Investigate the **photolytic behaviour** of the herbicide **profoxydim** in different types of water (ultrapure, river, ground and mineral) **under natural and simulated sunlight**



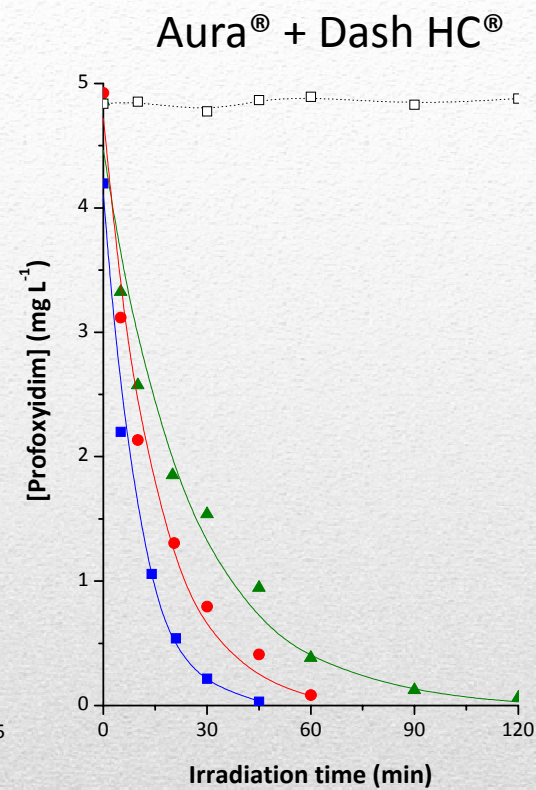
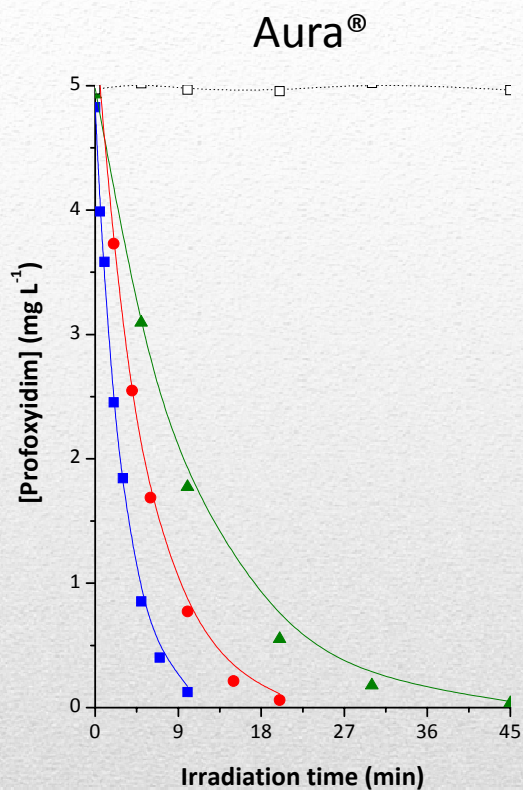
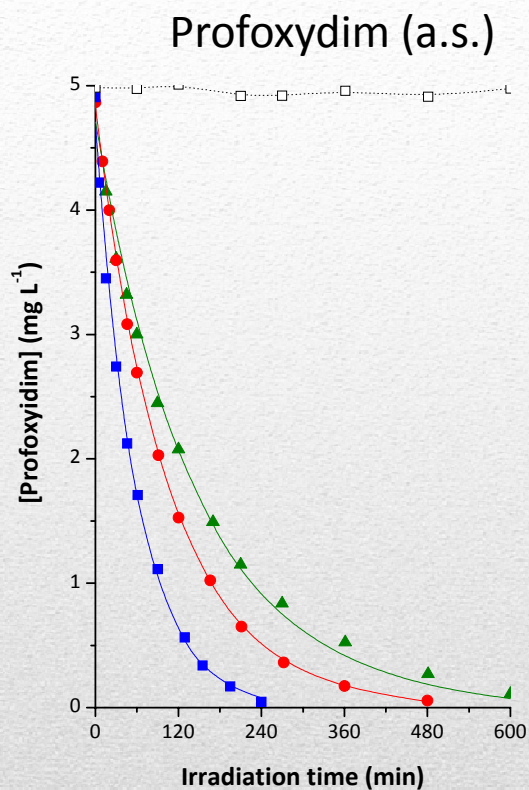
OBJECTIVES

1. Determine the **photodegradation kinetics** of **profoxydim** as analytical standard and its commercial formulation (**Aura[®]**) **with/without** the addition of the **additive Dash HC[®]** under laboratory conditions
2. Investigate the **photolytic behaviour** of the herbicide **profoxydim** in different types of water (ultrapure, river, ground and mineral) **under natural and simulated light**

EXPERIMENTAL: Photolysis kinetics of Profoxydim, Aura[®] and Aura[®]+Dash HC[®]



RESULTS: Photolysis kinetics of Profoxydim, Aura[®] and Aura[®]+Dash HC[®]



(- -) 750 W m⁻², (- -) 500 W m⁻², (- -) 250 W m⁻², (- -) control

t_{1/2} (min): Profoxydim (a.s.)

41,28 (- -)

84,14 (- -)

99,66 (- -)

t_{1/2} (min): Aura[®]

2,07 (- -)

3,69 (- -)

6,96 (- -)

t_{1/2} (min): Aura[®]+Dash HC[®]

7,68 (- -)

9,66 (- -)

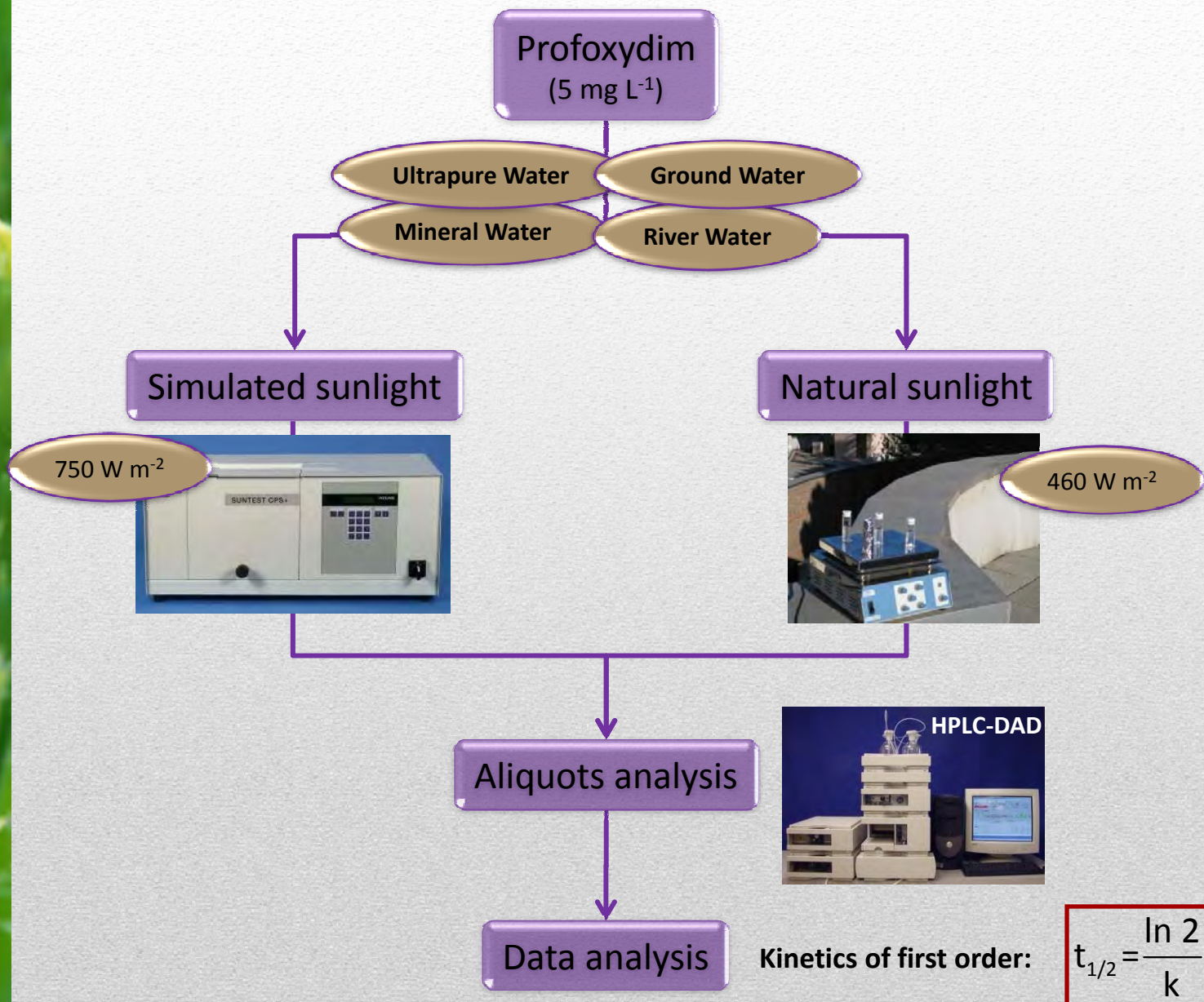
16,07 (- -)



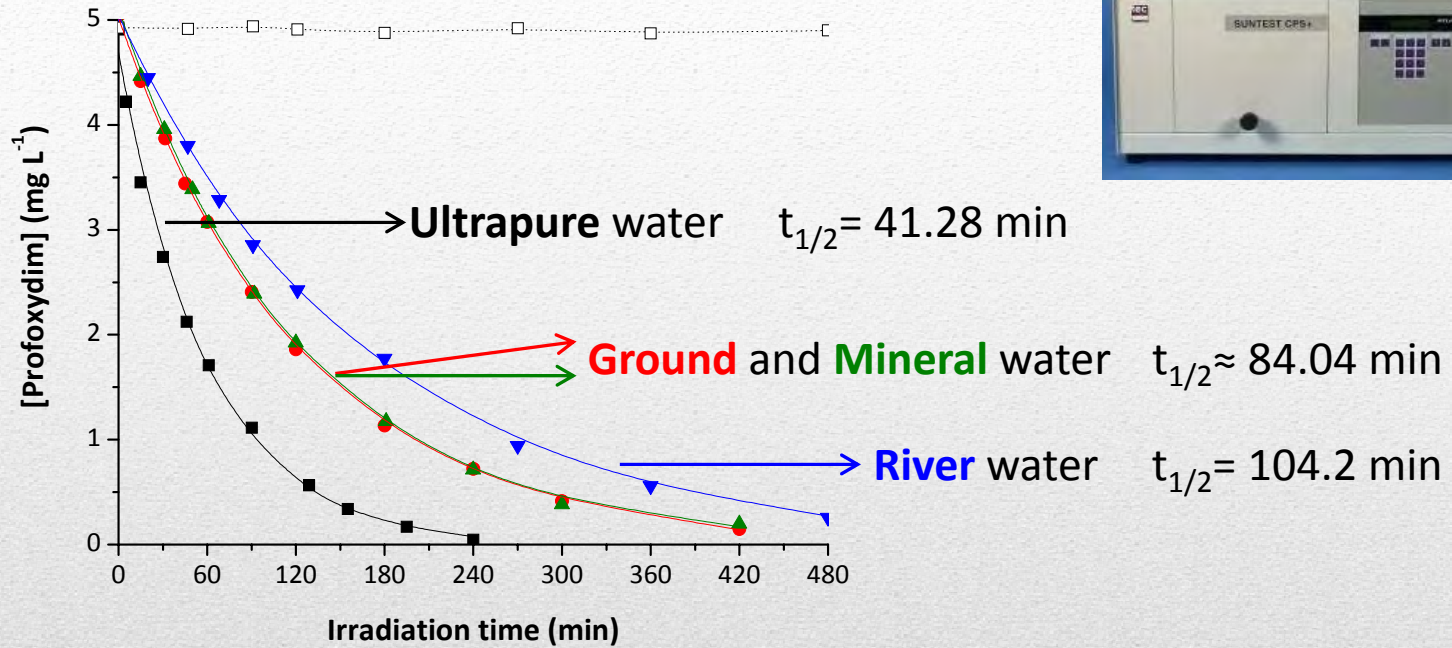
OBJECTIVES

1. Determine the **photodegradation kinetics** of **profoxydin** as analytical standard and its commercial formulation (**Aura[®]**) with/without the addition of the adjuvant **Dash HC[®]** under laboratory conditions
2. Investigate the **photolytic behaviour** of the herbicide **profoxydim** in different types of water (ultrapure, river, ground and mineral) **under natural and simulated sunlight**

EXPERIMENTAL: Photolysis kinetics of Profoxydim in natural waters



RESULTS: Photolysis kinetics of Profoxydim in natural waters (simulated sunlight)

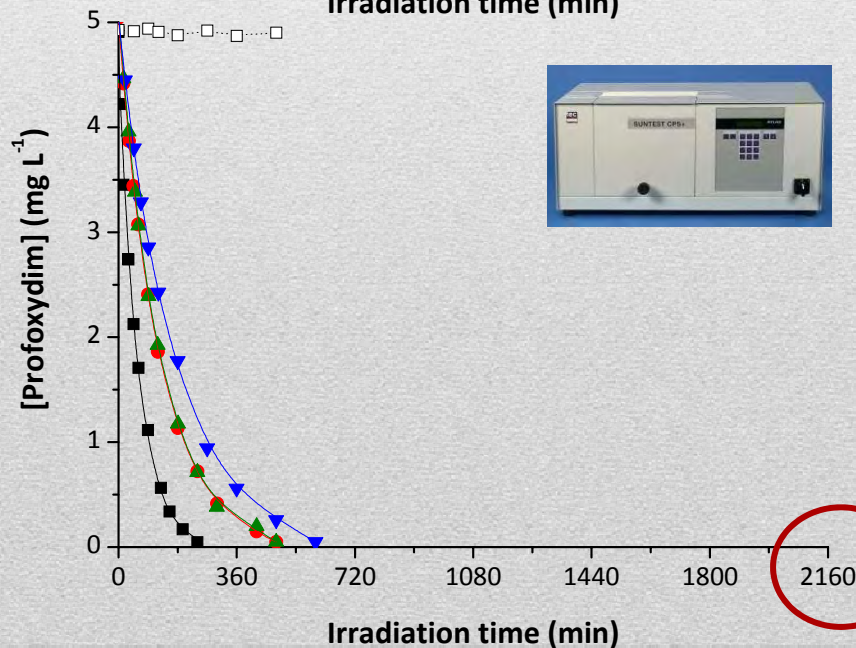
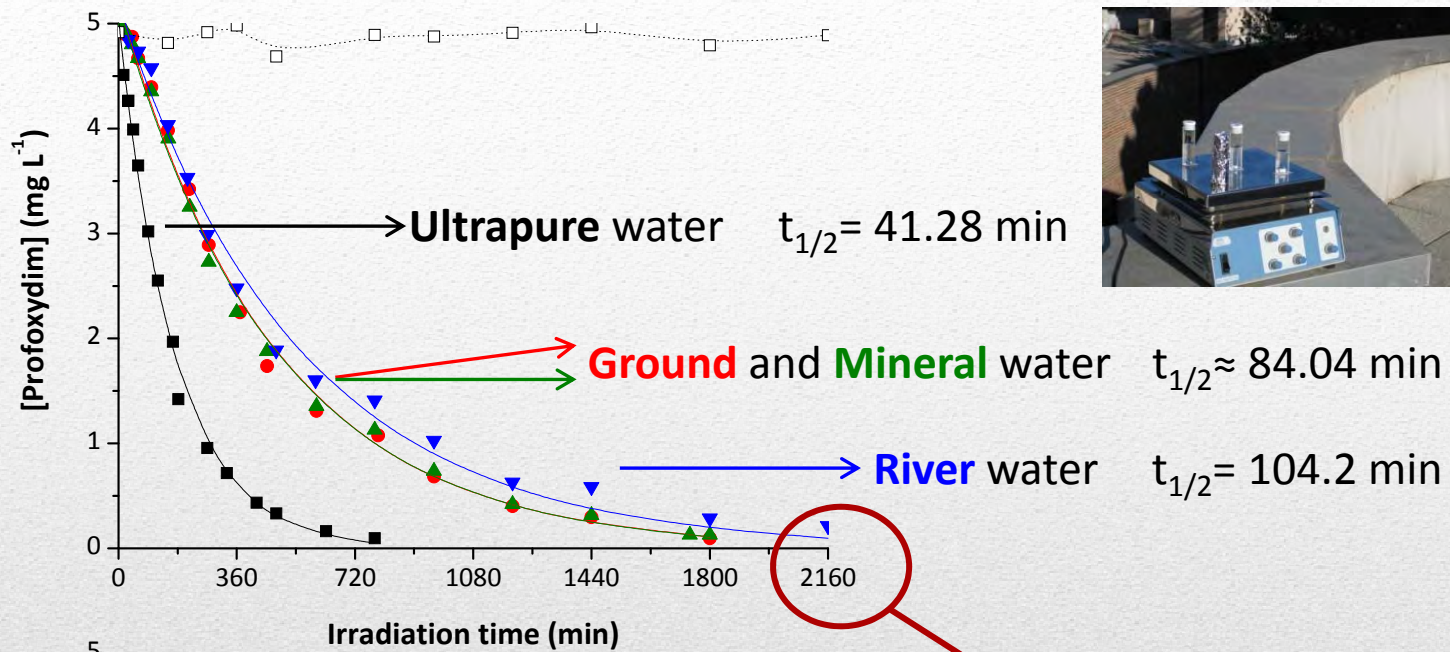


Increase in $t_{1/2}$:
 ultrapure < mineral ≈ ground < river



Increase in TOC:
 ultrapure < mineral ≈ ground < river
 0.005 mgL⁻¹ 0.486 0,814 2.865 mgL⁻¹

RESULTS: Photolysis kinetics of Profoxydim in natural waters (sunlight)



VARIABILITY AND LOWER INTENSITY OF NATURAL SUNLIGHT

CONCLUSIONS

1. Rates of photolysis of profoxydim showed a strong dependence on irradiation intensity of light source.
2. Photodegradation rate of profoxydim as commercial formulated Aura was higher than analytical standard.
3. Photodegradation rate of profoxydim in natural waters were slower compared to ultrapure water, probably due to content of TOC.



THANKS FOR YOU ATTENTION !