



Toxic effects of pesticides used in vineyard on cells, embryos and larvae of rainbow trout (*Oncorhynchus mykiss*)

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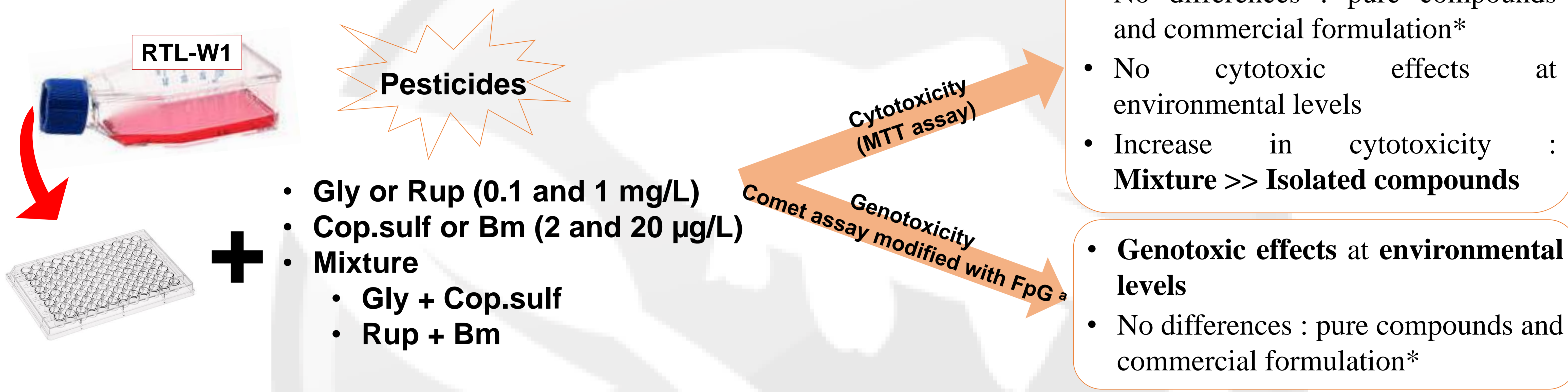
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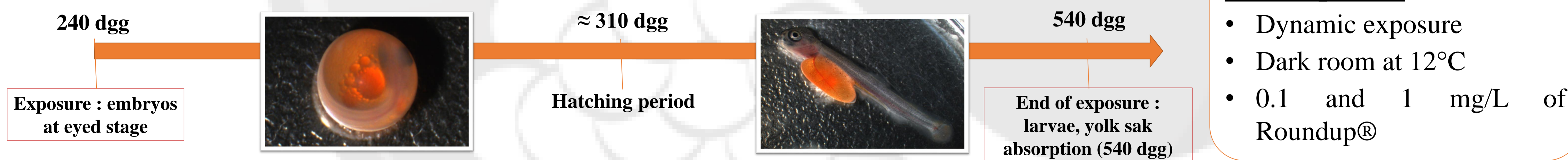
Introduction

A several part of pesticides used in viticulture, can be found in the aquatic environment by the action of runoff rain water and leaching of treated crops. In order to evaluate toxic impacts of pesticides on fish, some toxicity tests were carried out on early life stage (ELS) as well as, on a cell line (RTL-W1, liver cell line) of rainbow trout (*Oncorhynchus mykiss*). Bioassays were exposed to further pesticides at environmental concentrations of pure compounds: **glyphosate** (Gly), **copper sulfate** (Cop.sulf) and their respective commercial formulations: **RoundUp®** (RU), **bordeaux mixture** (Bm).

Screening of the toxicity on RTL-W1



Toxicity of RoundUp® on ELS (*Oncorhynchus mykiss*)

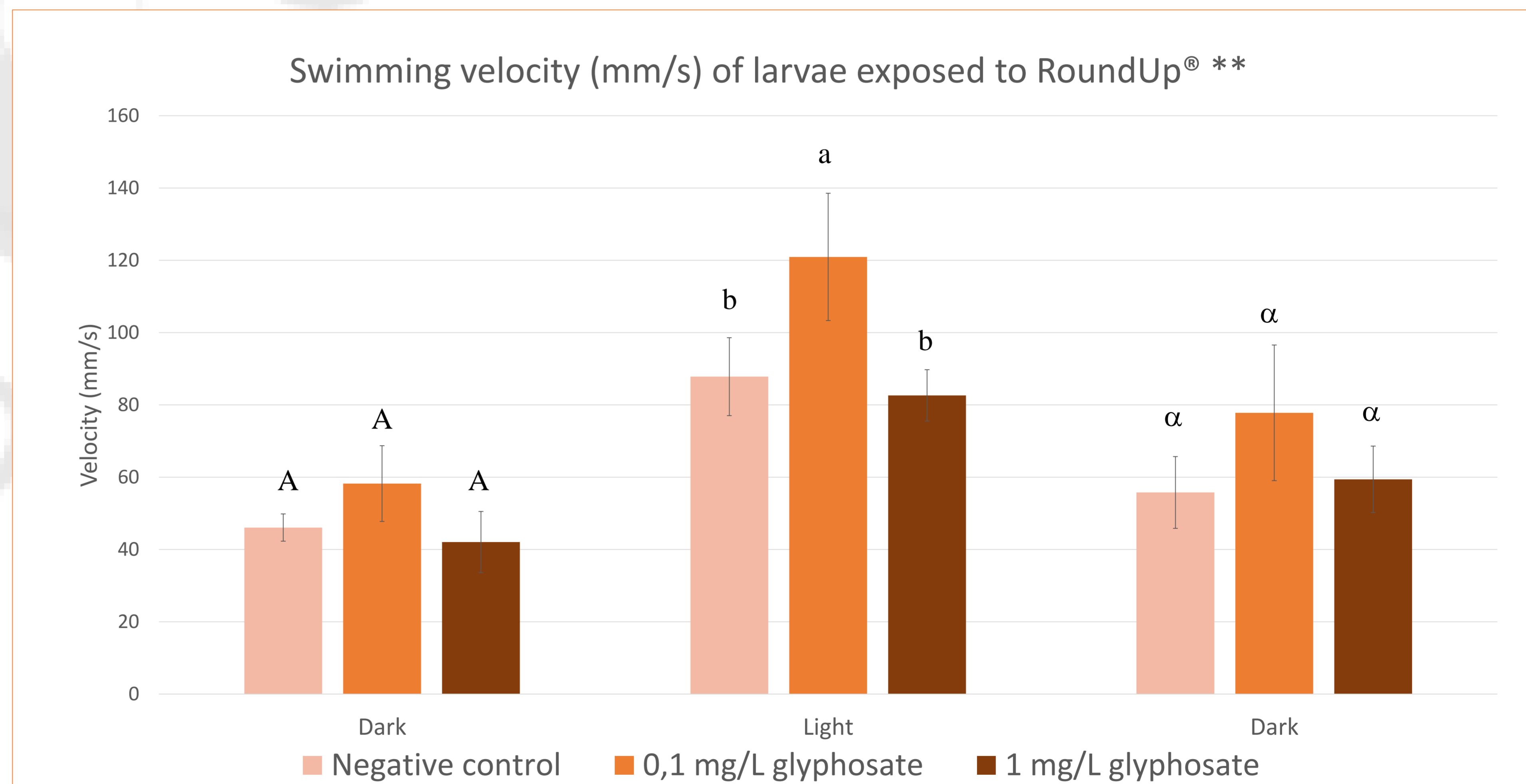


Results & Discussion

- No acute toxicity or abnormalities
 - Environmental concentrations
- No genotoxic effects
 - Repair mechanisms ?

• Photomotor response

- Increase in the swimming velocity at lowest concentration (0.1 mg/L of glyphosate from RoundUp®) **
- Avoidance behaviour^c



Conclusion

This study showed the importance to take into consideration toxic effects of mixture compounds which can be more toxic than isolated compounds as demonstrated on RTL-W1 with a mixture of pesticides at environmental concentrations. But also to include the changes in behaviour to investigate the hazard potential of chemicals as an integrative response, able to interact with ecological parameters as food intake, predator escape or reproduction.

References

- Kienzler, A., et al. (2012). Toxicology in Vitro, vol 26, issue 3, pp.500-510.
- Le Bihanic, F., et al. (2014). Environmental Science and Pollution Research, vol 21, issue 24, pp.13720-13731.
- Ren, ZM., et al., (2012). Procedia Environmental Sciences, vol.13, pp.1122-1133.

* No statistical differences (n=3, Kruskal Wallis, p<0.05)

** Different letters refer to significant differences within treatments (mean ± SD, n=3, Kruskal Wallis, p<0.05)

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