



Relative Nematicidal effects of Polysulfide-based formulations versus Velum Prime

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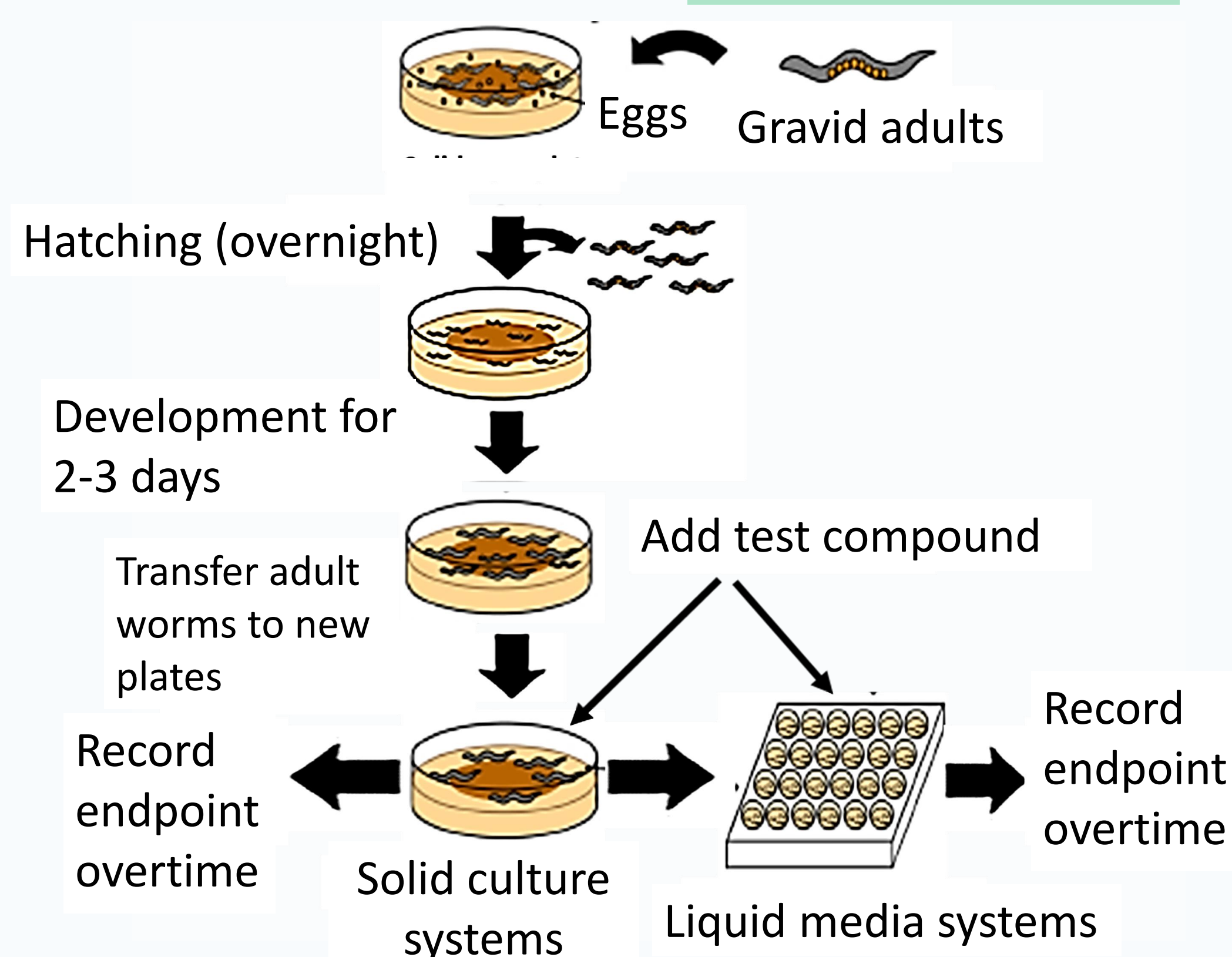
1. Introduction

- Plant-pathogenic nematodes cause an estimated **\$80-118 billion/year** in crop losses ^[1].
- In Cameroon, root-knot nematodes are particularly a problem in banana production causing ~19% yield losses ^[2].
- This *burden* is accentuated by a lack of effective and safe methods for the control of these crop pests, with many *nematicides* having been banned due to unacceptable residue load on the environment and non-target toxicity.

- Sustainable alternatives are therefore much needed.**

This study compared the nematicidal effects of a pure garlic oil (98% Polysulfide; NATUREX, Sigma), a garlic juice concentrate (2.8% Polysulfide; CLAIL0021, Ecospray) and a SDHI (Velum Prime, Bayer) individually and in various combinations using *Caenorhabditis elegans* and *remanei* as model nematodes.

2. Methods



- Survival assays in solid or liquid media were carried out to assess the nematicidal effects of these formulations individually and in various combinations.

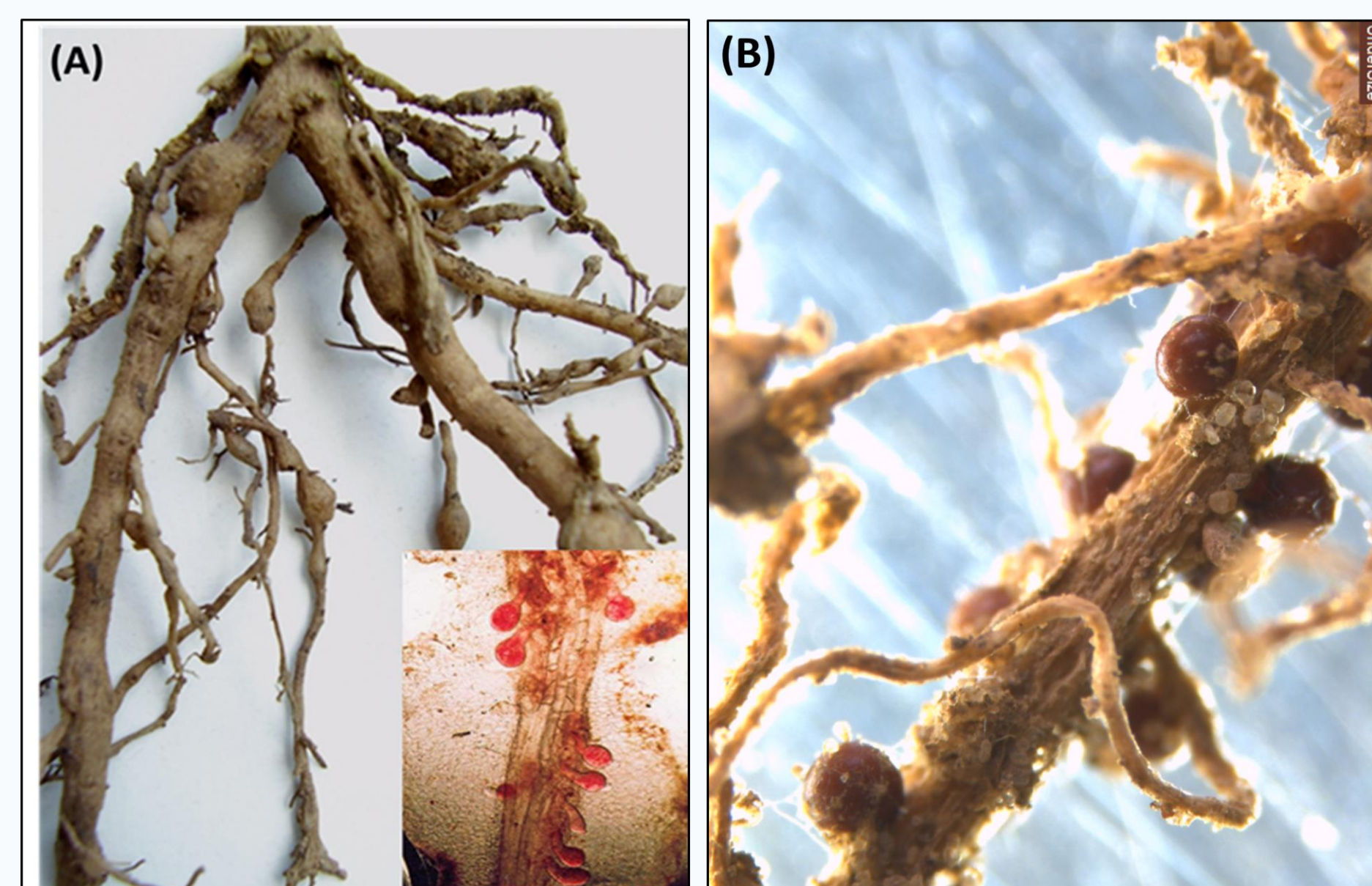


Fig. 1. (A) Root-knot nematodes form galls within roots of plant host that sap-out nutrients. (B) Potato cysts nematodes form cysts which contain several eggs on potato roots

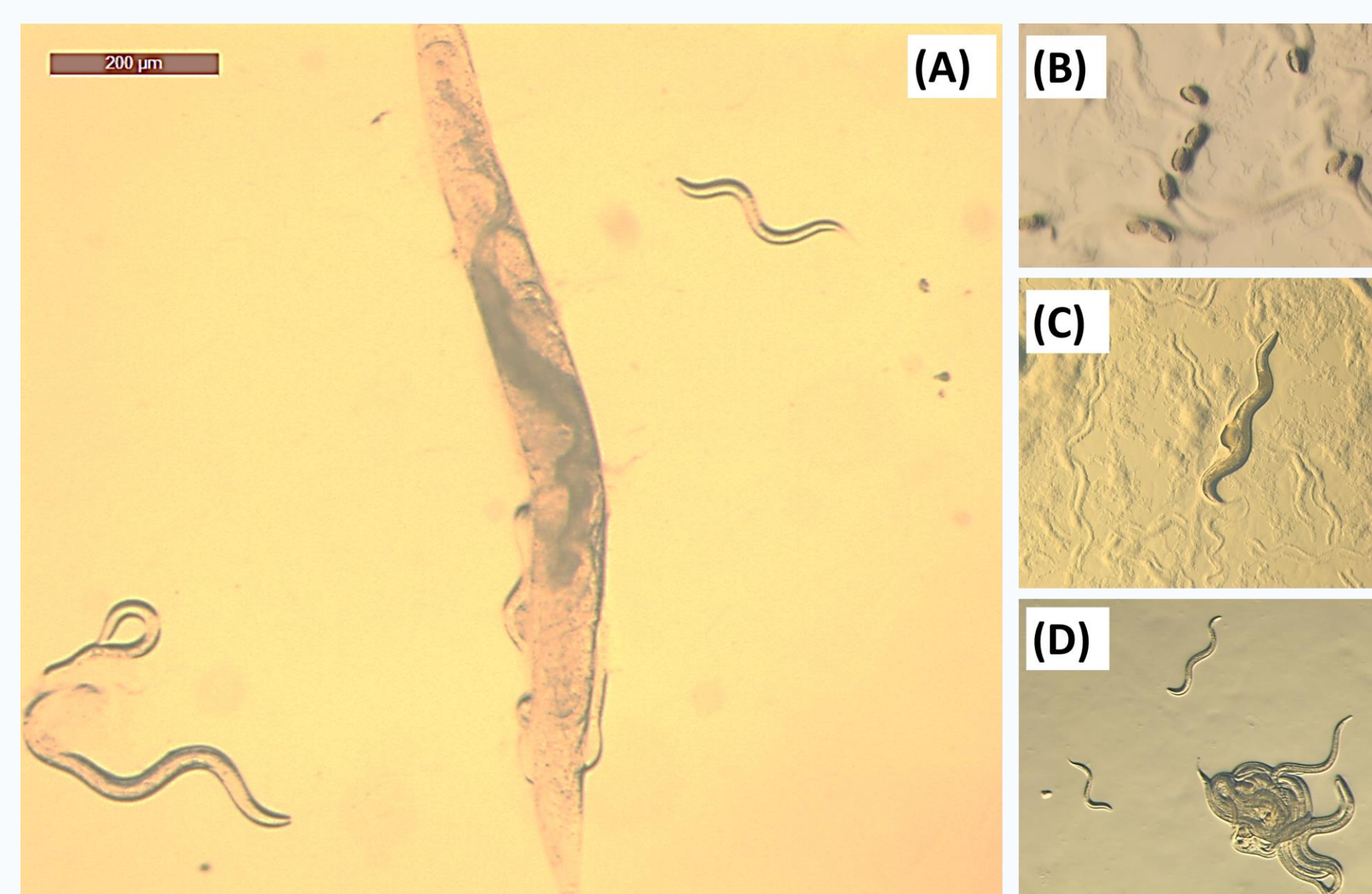


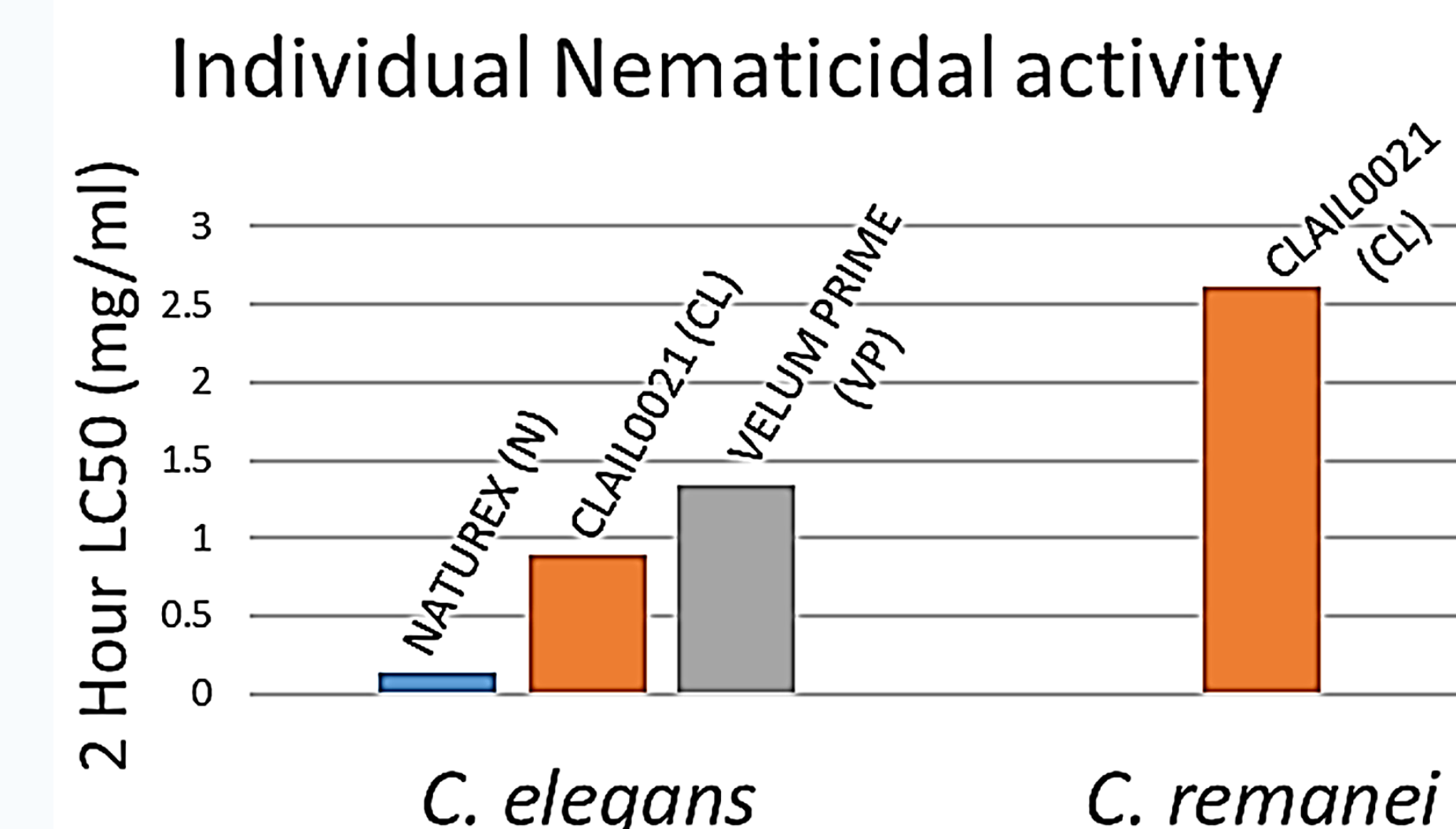
Fig. 2. *Caenorhabditis* culture plates. (A) Eggs sometimes hatch into L1's within the body of older females. (B) Fun fact at peak reproduction, *C. elegans* lay ~3egg/hour. (C) *C. remanei* female carrying eggs. (D) Worms form clusters on starved plates, also notice the absence of track marks on this plate as opposed to in (C) which still has a bacteria lawn.



Fig. 3. Field trial against PCN in Hilborough. (A) Notice the unequal distribution of the crop canopy with less vigorous plants (B) occurring in heavily infested areas of the field. (C) Murree, Stella and I feeling accomplished at the trial site.

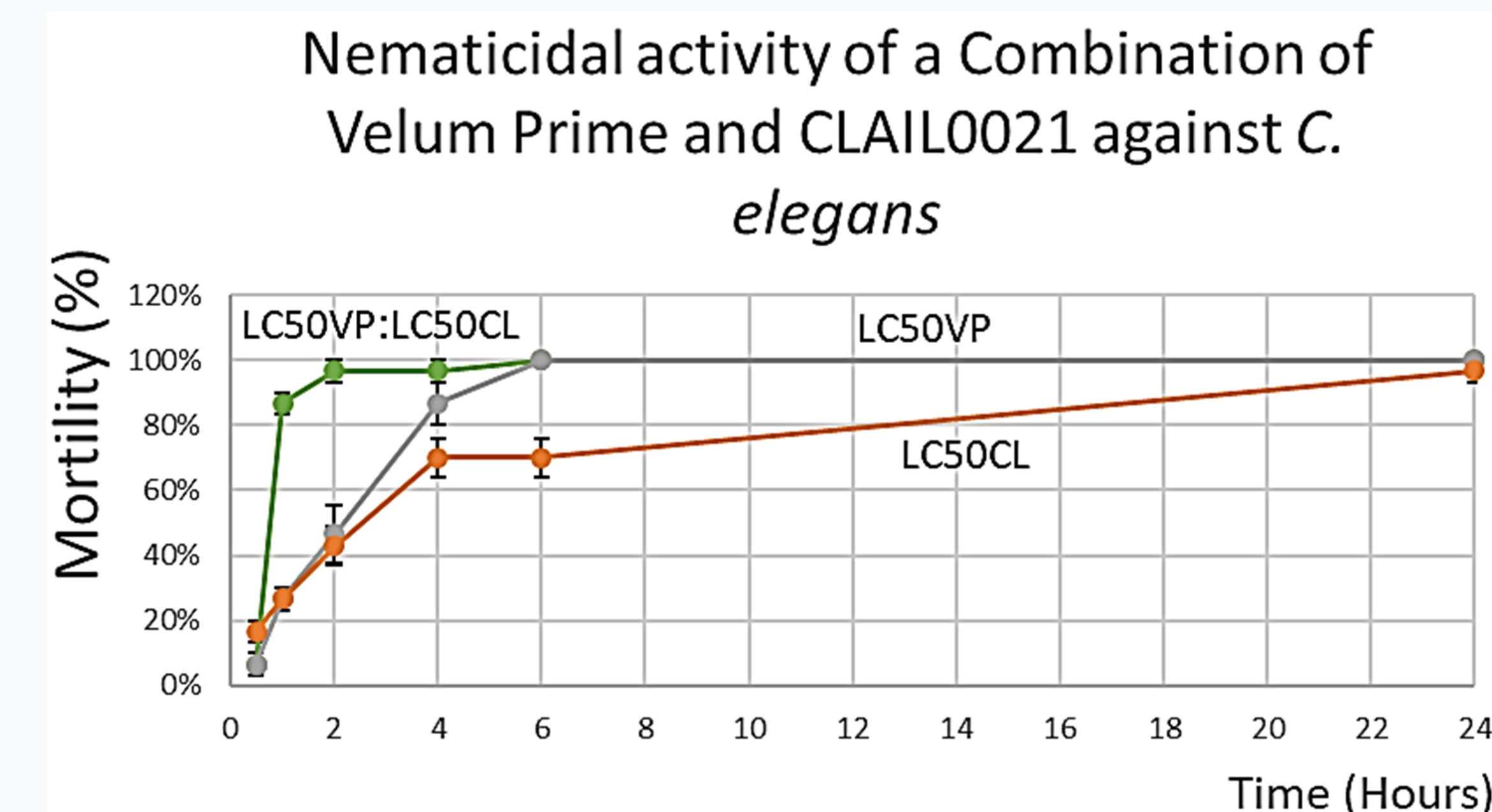
3. Results

Parameter (LC50)	Value (mg/ml) ± Std Error	
	<i>C. elegans</i>	<i>C. remanei</i>
NATUREX (N)	0.13 ± 0.2	
CLAIL0021 (CL)	0.89 ± 0.01	2.61 ± 0.3
VELUM PRIME (VP)	1.34 ± 0.14	



- All compounds displayed a dose-dependent nematicidal activity.

- Polysulfide-containing compounds being more effective at lower doses.



- A Combination of equal parts of the LC50 concentration of Velum Prime and CLAIL0021 showed ~100% mortality within 2 hours.

4. Conclusion & Recommendations

- Naturex which contains the highest % of polysulfides was found to be **7X** and **11X** more effective than CLAIL0021 and Velum Prime respectively.
- Improved activity was observed when **CLAIL0021** and **Velum Prime** where used in **combination** and data from a recent field trial supports this. **Could this be Synergy?** This has to be investigated further.
- Polysulfide-based nematicides may therefore constitute greener alternatives to chemical-based nematicides if properly explored and may result in improved activity when used in combination with other compounds.

Acknowledgement & References



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