

Ventera™ Bio

A new class of natural peptide
biopesticides

Steve Trim (Co-founder and CSO)

www.venterabio.com

Transforming natural toxins into the
next generation of safe, targeted crop
protection agents.

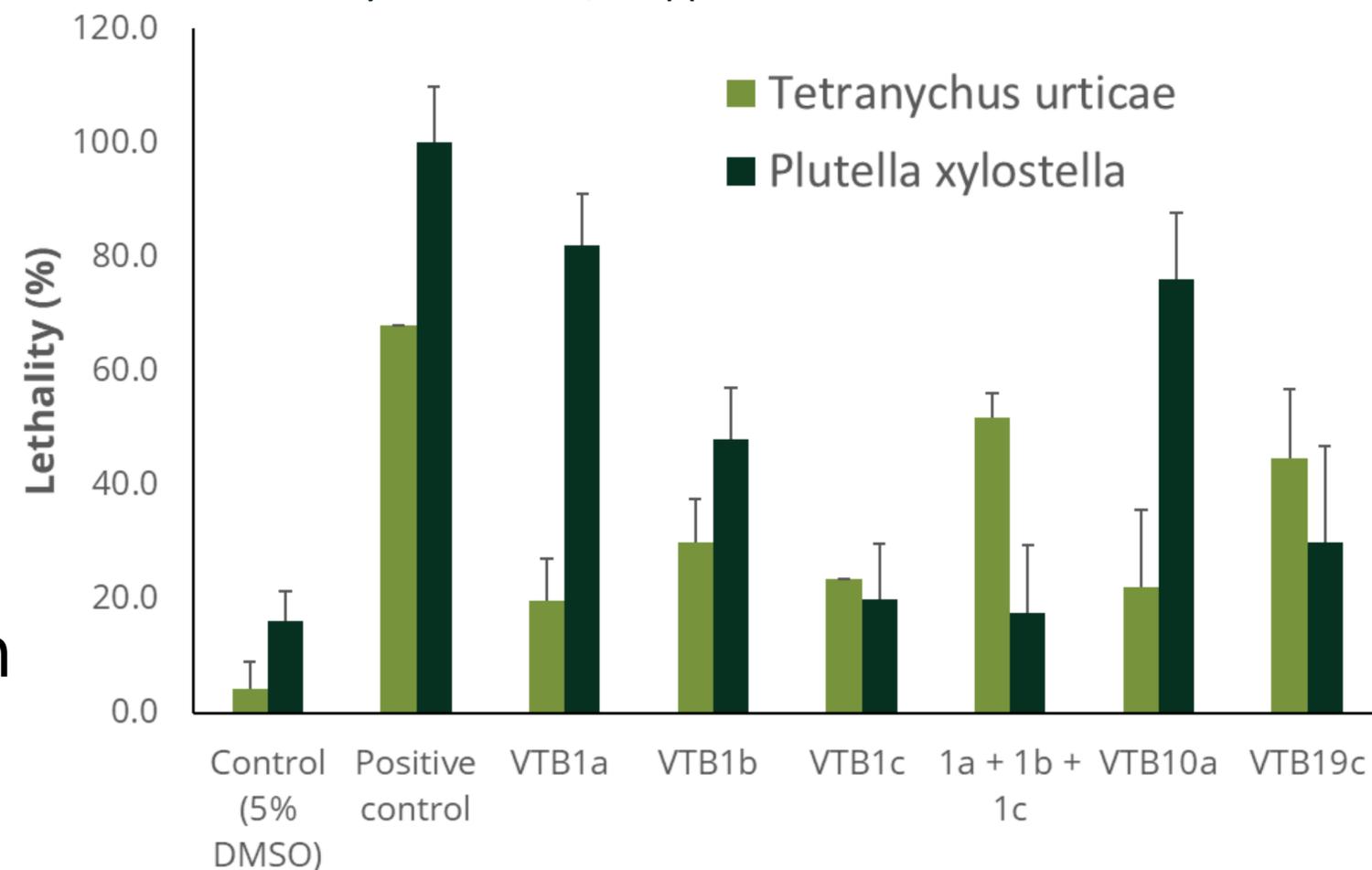
OUR INNOVATION – SHORT BIOPESTICIDE PEPTIDES

- ❖ Peptides are often viewed as having poor bioavailability/stability
- ❖ Venom peptides are different – they evolved to kill pests and be stable in the venom gland such that they are active immediately
- ❖ Reduction to short stable (15-22 aa) SiLo™ peptides improve bioavailability, selectivity and ecotoxicology profiles
- ❖ SiLo™ peptides don't need fusion to anything, complex formulations or bespoke production techniques

NO NEED FOR FUSION PROTEINS

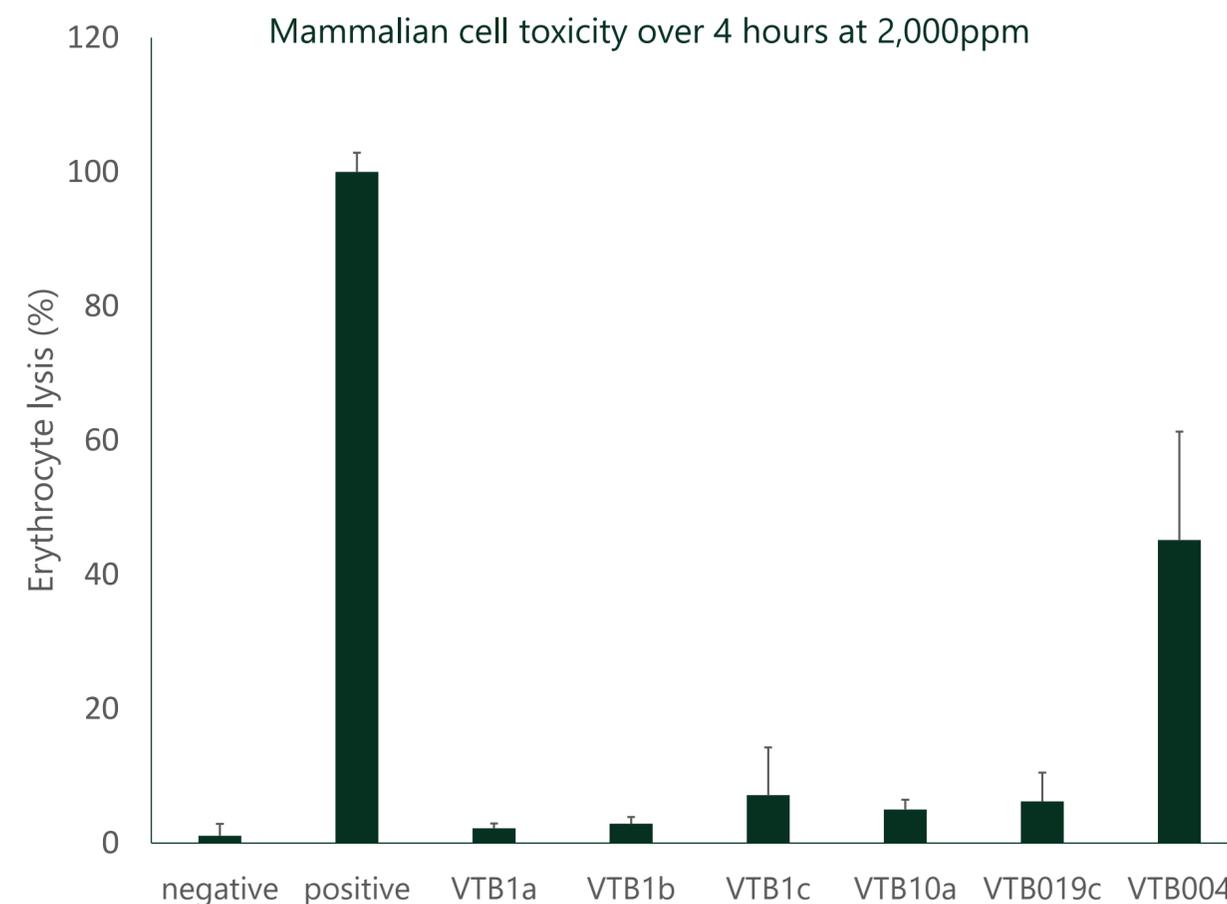
- ❖ External validation in Leaf dip assay
- ❖ SiLo™ peptides in 5% DMSO vehicle only
- ❖ Sequence variation changes selectivity profile
- ❖ Mixtures add a new dimension to further tune the desired profile

Effect of SiLo™ peptides on viability of *Tetranychus urticae* and *Plutella xylostella* at 2,000ppm



SEQUENCE BASED TUNEABLE SELECTIVITY

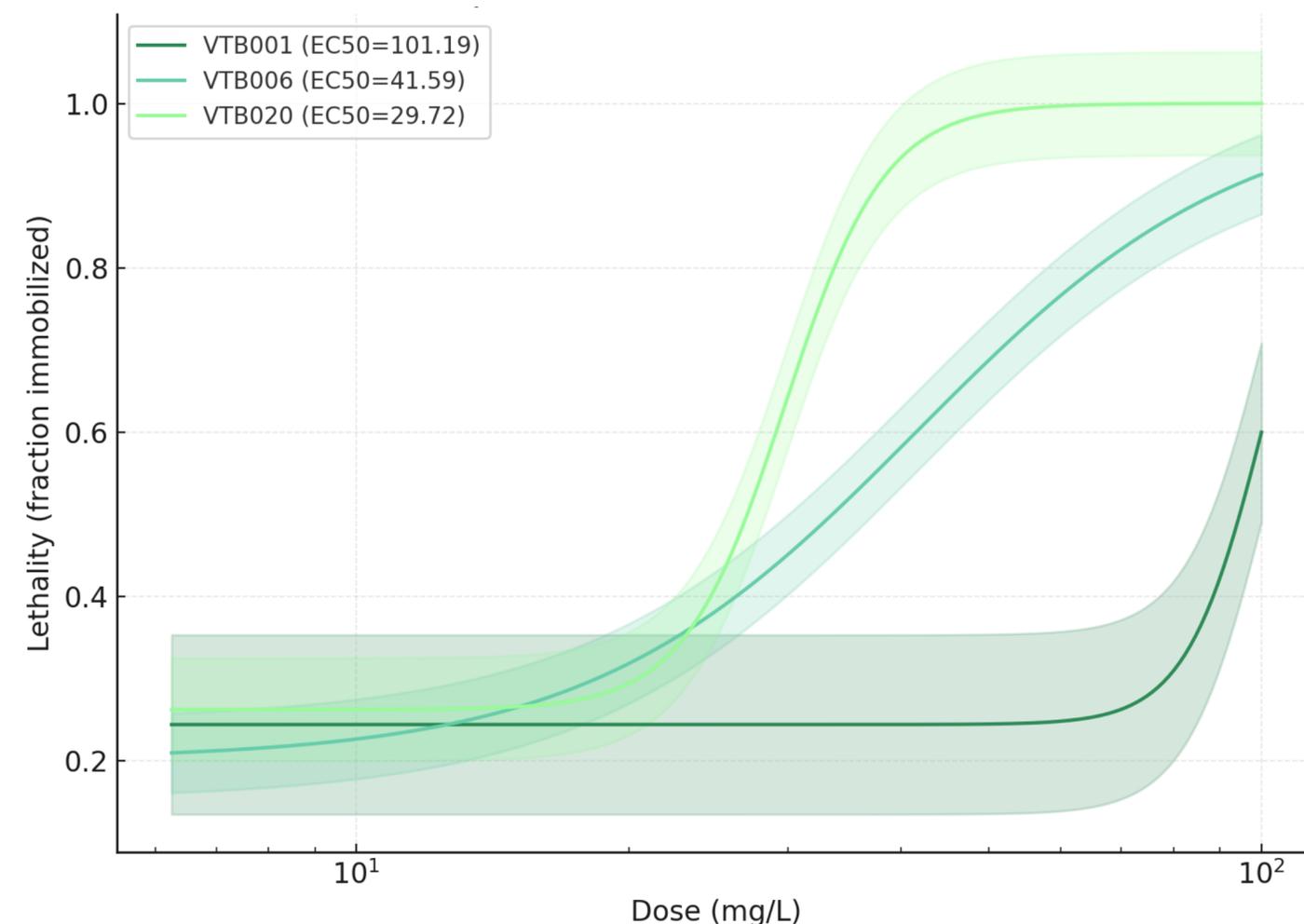
- ❖ 384 well erythrocyte lysis assay at insecticidal concentration.
- ❖ Whole venoms can be toxic to humans and other mammals
- ❖ We have engineered this out of our lead sequences through SAR
- ❖ Our SiLo™ peptides are non toxic to mammalian cells



TUNEABLE ECOTOXICOLOGY PROFILES

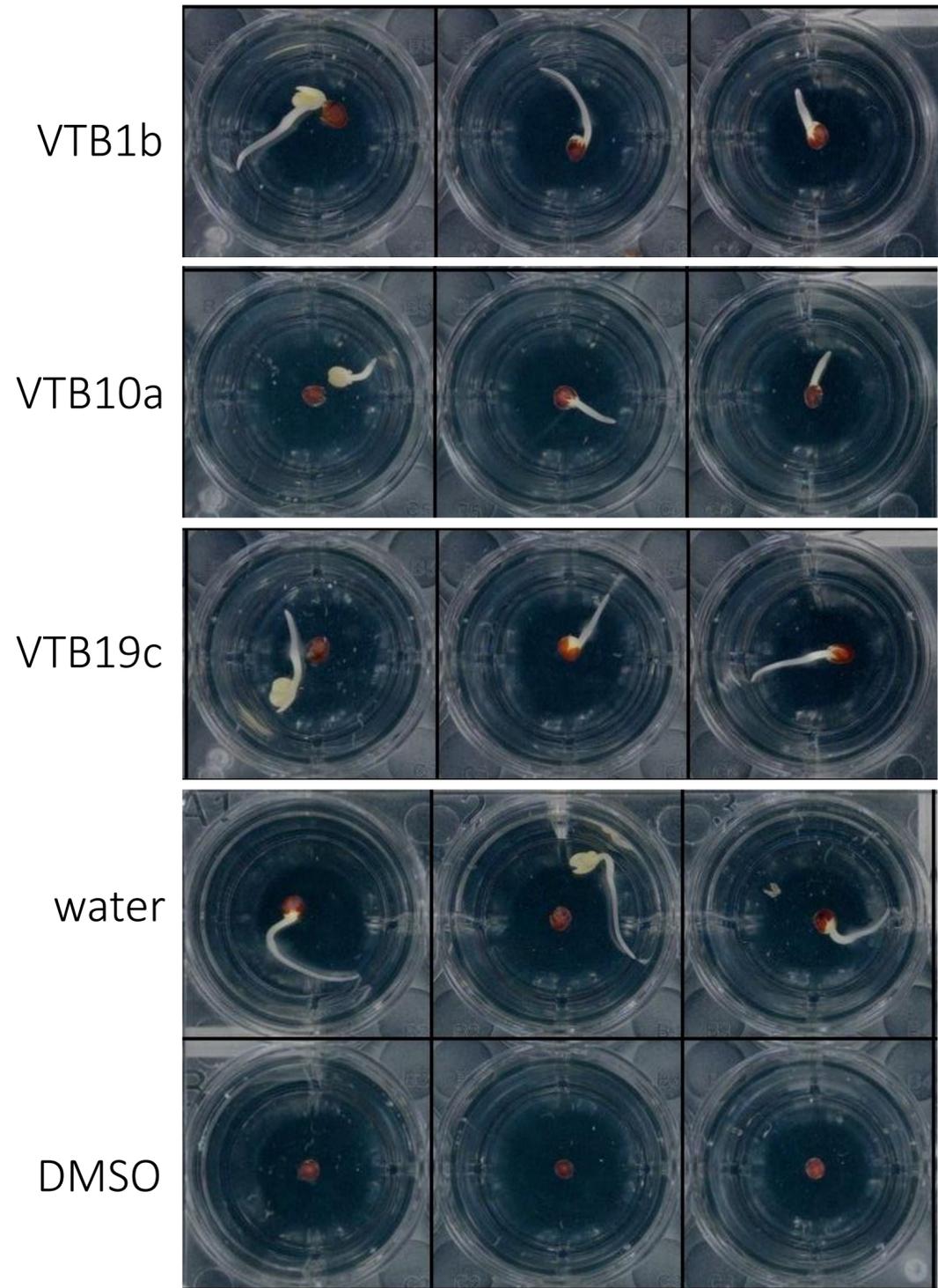
- ❖ Using a plate based *Daphnia* immobilisation assay
- ❖ Incubation with peptides for 48 hrs are per OECD guidelines
- ❖ Strong SAR allows us to use the most active SiLo™ with the minimal effect on the aquatic environment

Effect of venom peptides on *Daphnia* immobilisation



TUNEABLE ECOTOXICOLOGY PROFILES

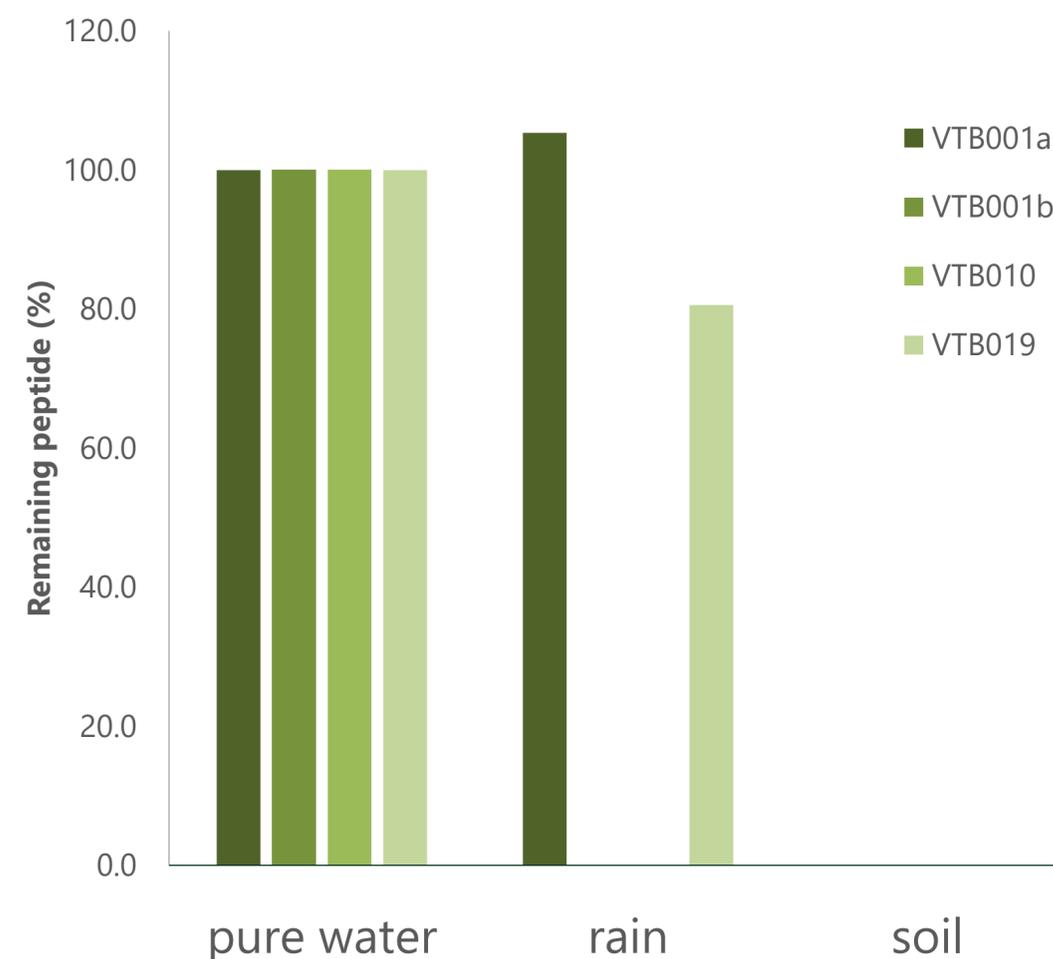
- ❖ Plate-based image analysis (Reshape Biotech) for automated germination testing
- ❖ 48 hrs immersed in SiLo™ solution of 80mg/L has minimal effects on seedling growth
- ❖ No significant difference in germination time detected



THE POWER OF EVOLVED STRENGTH

- ❖ Venoms evolved to be stable in aqueous solution
- ❖ We harness this inherent power
- ❖ The majority of our leads are stable for at least 13 days in pure water
- ❖ This current lead series degrades quickly in soil leaving no run-off risk

4 day stability of SiLo peptides



BENEFITS TO GROWERS

- ❖ Kills pests to protect crops
- ❖ Degrades to natural amino acids when no longer needed
- ❖ Protects biodiversity
- ❖ Expected to be cheaper than live biological control
- ❖ Snake venom proteins have been produced by fermentation in yeast and our sequences share those properties
- ❖ Standard spray application – no need for specialist equipment

Thank You

In summary, we've taken venoms, isolated active proteins and then designed short peptides that are active biopesticides without fusion or complex formulations

We invite interested innovators and collaborators to get in touch.

Come and see our poster

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