

## COMPOSITION COMPRISING A BOTANICAL EXTRACT AS INSECTICIDAL AGENT (WO/2023/174908)

### Summary

This invention converts a promising botanical extract, notably derived from *Sextonia rubra*, into a ready-to-use larvicidal product for mosquito breeding sites. The technology is based on an Emulsifiable Concentrate (EC) formulation, dilutable into an Oil-in-Water (EW) emulsion, enabling homogeneous dispersion in water and enhanced field performance (stability and persistence).

The formulation prioritizes bio-based ingredients and non-VOC solvents, addressing key challenges related to user safety, environmental acceptability and regulatory compliance.

<b>Description of the invention</b>	<p>The invention relates to:</p> <ul style="list-style-type: none"> <li>an oil-phase composition of the EC type, comprising: <ul style="list-style-type: none"> <li>a botanical extract (preferably a <i>Sextonia rubra</i> wood extract containing rubrenolide and/or rubrynnolide),</li> <li>one or more bio-based non-VOC solvents (esters of aliphatic monocarboxylic acids, e.g. vegetable oil esters or methyl esters),</li> <li>at least two bio-based non-ionic surfactants,</li> <li>an anti-foaming agent,</li> <li>and an oil-in-water emulsion (EW) obtained by simple dilution of the EC, spontaneously forming a stable microemulsion.</li> </ul> </li> </ul> <p>Beyond formulation development, the patent reports advanced validation data including:</p> <ul style="list-style-type: none"> <li>efficacy against a wild <i>Aedes aegypti</i> strain (Cayenne) resistant to conventional insecticides,</li> <li>semi-operational field tests over several weeks demonstrating residual activity,</li> <li>selectivity data on non-target aquatic organisms and human cell lines,</li> <li>long-term stability of the extract and absence of repellence on oviposition — a key criterion for breeding-site treatments.</li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>Field-compatible formulation: homogeneous dispersion in water, simple dilution-based use</li> <li>Free of petroleum-based VOC solvents: improved HSE and environmental profile</li> <li>Predominantly bio-based ingredients (target &gt;98% renewable origin)</li> <li>Enhanced performance: stability, persistence and efficacy demonstrated under semi-operational conditions</li> <li>Improved selectivity compared to crude extract (based on non-target organism assays)</li> <li>Realistic industrial scalability: simple mixing and solubilization processes using commercially available formulation ingredients</li> </ul>
<b>Applications</b>	<ul style="list-style-type: none"> <li>Public health / vector control: treatment of mosquito breeding sites (local authorities, mosquito control operators)</li> <li>Deployment in areas facing resistance to conventional insecticides</li> <li>Formulation platform adaptable to other lipophilic botanical extracts (subject to regulatory approval)</li> </ul>
<b>Mots-clés</b>	Emulsifiable concentrate, microemulsion, bio-based formulation, non-VOC, surfactants, larvicide, <i>Aedes aegypti</i> , <i>Sextonia rubra</i> , rubrenolide, rubrynnolide, vector control
<b>TRL</b>	TRL 5/6: validated formulation, demonstrated stability, semi-operational efficacy and selectivity/innocuity data available.
<b>Partnership / License</b>	License / option
<b>Development stage</b>	<p>Technology already structured as a formulated product, with performance data close to real-use conditions (persistence, semi-field trials).</p> <p>Next steps include industrial optimization, full regulatory studies, and large-scale field trials</p>