



BIOVEXO – Biocontrol of Xylella and its vector in olive trees for integrated pest management

D1.3 Protocol for optimised production of onion extract

Due Date:	30/04/2021
Submission Date:	30/04/2021
Dissemination Level:	<i>(also see next page)</i>
Lead beneficiary:	DOMCA SAU
Main contact:	José Manuel García Madero José Manuel de la Torre Ramírez

Project acronym: BIOVEXO	Project Number: 887281
Start date of project: 01.05.2020	Project duration: May 2020 – April 2025



The BIOVEXO project has received funding from the Bio Based Industries Joint Undertaking (JU) under grant agreement No 887281. The JU receives support from the European Union's Horizon 2020 research and innovation programme and the Bio Based Industries Consortium. www.BIOVEXO.eu

1 Publishable Summary

The objective of BIOVEXO is to develop an environmentally sustainable and economically viable plant protection solution combining *Xylella*-targeting biopesticides (X-biopesticides) with biopesticides combatting the insect vectors transmitting the disease (V-biopesticides) and to make them for ready use in integrated pest management.

The antimicrobial properties of some natural occurring products are well-known since ancient times. Among all, the *Allium* genus is especially important and very used since centuries both for the characteristic flavor and the health benefits. The antimicrobial properties of members of *Allium* are due to the presence of organosulfur compounds (OSCs), also responsible for the pungency of these vegetables. In this activity (task 1.3) of the BIOVEXO project, the main goal was to obtain an onion (*Allium cepa*) extract, rich in these OSCs which have been proposed as good candidates to combat *Xylella fastidiosa*.

The amount and concentration of the different derivatives belonging to this family of OSCs vary depending on the conditions during the harvest and the extracting process used. In this part of the project, an optimisation of the extraction process has been done. The conditions during the maceration (see Figure 1) step have been modified and the concentration of the most active OSCs has been monitored with the aim of obtaining extracts with the highest concentration, considering the limitations of an industrial process.

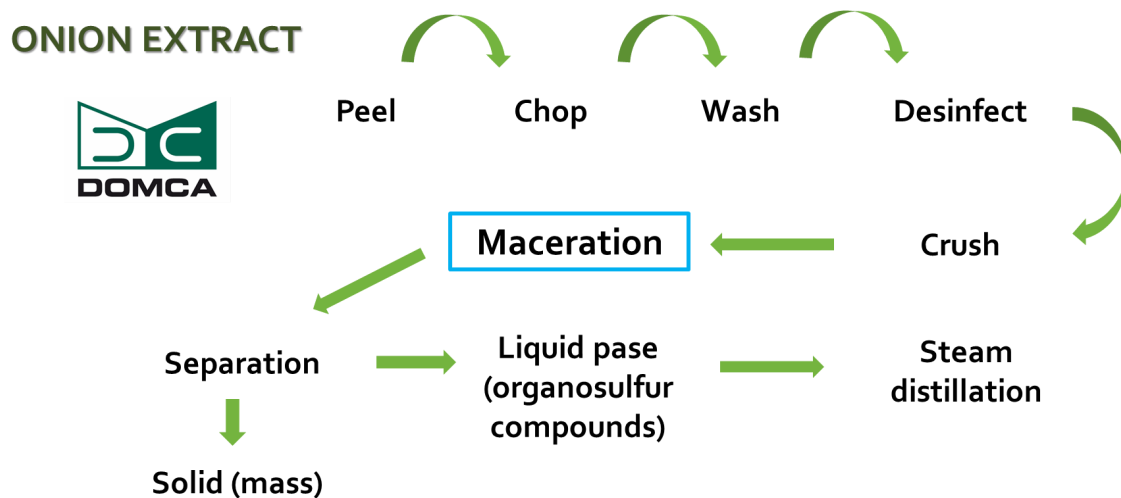


Figure 1. Scheme of the extraction process. © DOMCA 2021

The conditions evaluated during the maceration step were: temperature, time, pH and ratio liquid/solid. The results have shown that when increasing the temperature, the total amount of OSCs extracted

D1.3 Protocol for optimised production of onion extract

slightly increased, like when the time macerating increased, but in both cases the ratio of the compounds extracted changed a little bit with time and temperature due to the reactivity of the molecules extracted. Comparing basic, neutral and acidic media for the maceration, no significant differences appear in the number of total compounds extracted but again, the profile of the OSCs obtained changed and this could affect the antimicrobial properties.

To evaluate the total amount of OSCs and the concentration of thiosulfonates and thiosulfonates in the extracts obtained (essential oils), two chromatographic methods have been optimised:

- HPLC-UV to quantify the amount of OSCs during the maceration step (this method allows to analyse water fractions directly).
- GC/MS to analyse the OSCs composition of the extract when it is concentrated after the distillation.