



D1.1- List of pathogens targeted according to selected plants



Project No: 101099462

Project Acronym: SafeWax

Project Duration: 48 months

Project Coordinator: TECHNION

E-Mail: bpokroy@technion.ac.il
esegal@technion.a.cil

DELIVERABLE 1.1

Title: List of pathogens targeted according to selected plants.

Date: 26.6.2023

WP Number	1
Dissemination Level	PU
Deliverable Type	R
Lead Beneficiary	TECH
Contributing Beneficiaries	UniBo, TECH





DOCUMENT CONTROL SHEET

Additional authors and contributors

Name	Organization
Michal Leshem	Technion
Ester Segal	Technion
Claudio Ratti	University of Bologna
Elena Baraldi	University of Bologna

Document history

Version No.	Date	Comments
1	4/5/2023	1 st draft based on meetings
2	29/5/2023	Draft with added technical details
3	14/6/2023	Draft with added information on fungi
4	26/6/2023	Final version

Document distribution history

Version No.	Date	Distributed to
1	4/5/23	TECH and UniBo participants: E. Segal, M. Leshem, H. Abu-Hamad, C. Ratti, I. Polishchuk,
2	29/5/23	TECH and UniBo participants: E. Segal, M. Leshem, C. Ratti, E. Baraldi, I. Polishchuk, B. Pokroy
2	14/6/23	TECH
4	26/6/2023	TECH and UniBo participants: E. Segal, M. Leshem, C. Ratti, E. Baraldi, I. Polishchuk, B. Pokroy

Approval history

Version No.	Name	Date
4	Ester Segal, TECH, Coordinator	26/6/23





Disclosure Statement

This document is elaborated by consortium partners of the SafeWax Horizon Europe project, funded by the Horizon Europe research and innovation program under grant agreement No. 101099462. The content of this document, the information contained herein, and the views expressed are those of the authors and do not necessarily reflect the official opinion of the European Union. Neither the European Union institutions and bodies nor any person acting on their behalf may be held responsible for the use, which may be made of the information contained

This document is issued for public use by the consortium formed for the implementation of the SafeWax project as followed:

No.	Organization name	Short name	Country
1	Technion-Israel Institute of Technology	TECH	IL
2	Alma Mater Studiorum - Universita Di Bologna	UNIBO	IT
3	Eurofins Agrosience Services Regulatory France	EAS	FR
4	BASF SE	BASF	DE
	Institute Francais de La Vigne ET Du Vin	IFV	FR



Executive Summary

The purpose of the *SafeWax* coatings is to protect grapevines and other relevant crops against fungal pathogens. Thus, this deliverable defines the target fungal microorganisms which will be studied in the framework of the *SafeWax* project. These microorganisms will be used throughout the project to screen and assess the antifungal efficacy of the developed *SafeWax* formulations and coatings in lab experiments. Specifically, the list includes fungal species such as *Botrytis cinerea*, known to pose a major problem in the cultivation of grapevines around the world, as well as other prevalent pathogens that are known to affect commodity crops. This list may be further expanded as the project progresses to include additional strains or fungal species.

Table 1. List of pathogens targeted fungal microorganisms, which will be studied in the framework of the *SafeWax* project.

Fungal pathogen	Details	Strain and Source
<i>Botrytis cinerea</i> (<i>B. cinerea</i>)	<i>B. cinerea</i> is an extremely polyphagous and ubiquitous pathogen and the causal agent of one of the major diseases of the grapevine, where it may cause significant losses in terms of quantity and quality. (Elad et al., 2007).	Strain: B0-5-10
<i>Fusarium culmorum</i> (<i>F. culmorum</i>) <i>Fusarium graminearum</i> (<i>F. graminearum</i>)	<i>F. culmorum</i> and <i>F. graminearum</i> are important pathogens responsible for head blight disease as well as seedling blight, root rot and foot rot, that cause significant yield loss in several crops worldwide. They affect pre-harvest wheat and other small grain cereals, and produce mycotoxins such as deoxynivalenol, nivalenol and zearalenone, which are a potential health hazard for both humans and animals. (Leplat et al., 2013; Wagacha & Muthomi, 2007).	Strains: F820 (<i>F. culmorum</i>) and F913 (<i>F. graminearum</i>) Source: Wheat
<i>Alternaria alternata</i> (<i>A. alternata</i>)	<i>A. alternata</i> is responsible for different diseases, such as black rot, black spot or moldy core, during the postharvest shelf-life	Strain: M907 Source: Potato





D1.1- List of pathogens targeted according to selected plants

	of many different horticultural products in many areas of the world. It can infect many fruits, but also seeds, leaves, stems and flowers, reducing agricultural production either directly by infecting the fruit or indirectly by impairing plant photosynthesis. Furthermore, <i>A. alternata</i> produces mycotoxins, e.g. alternariol, which endanger human health. (Troncoso-Rojas & Tiznado-Hernández, 2014).	
<i>Aspergillus niger</i> (<i>A. niger</i>)	<i>A. niger</i> is one of the most common fungi reported from foods, with broad global distribution. It is more prevalent in warmer climates, both in the field and stored foods. It is the producing agent of black molds on plant surfaces and is a major cause of the deterioration of seeds. It is most commonly responsible for postharvest decay of fresh fruit, and is also an important pollutant species in dried fruit, some vegetables, and several crops. (Plascencia-Jatomea et al., 2014)	Strain: M788 Source: Soybean

* The fungi included in the list are from the “MYCOBO (DISTAL) Collection” at the Department of Agricultural and Food Sciences, University of Bologna.

References:

Elad, Y., Williamson, B., Tudzynski, P., & Delen, N. (2007). Botrytis spp. and diseases they cause in agricultural systems—an introduction *Botrytis: Biology, pathology and control* (pp. 1-8).

Leplat, J., Friberg, H., Abid, M., & Steinberg, C. (2013). Survival of *Fusarium graminearum*, the causal agent of *Fusarium* head blight. A review. *Agronomy for Sustainable Development*, 33(1), 97-111.

Luciano-Rosario, D., Keller, N. P., & Jurick II, W. M. (2020). *Penicillium expansum*: biology, omics, and management tools for a global postharvest pathogen causing blue mould of pome fruit. *Molecular Plant Pathology*, 21(11), 1391-1404.

Plascencia-Jatomea, M., Susana, M., Gómez, Y., & Velez-Haro, J. M. (2014). Chapter 8 - *Aspergillus* spp. (Black Mold). In S. Bautista-Baños (Ed.), *Postharvest Decay* (pp. 267-286). San Diego: Academic Press.

Troncoso-Rojas, R., & Tiznado-Hernández, M. E. (2014). Chapter 5 - *Alternaria alternata* (Black Rot, Black Spot). In S. Bautista-Baños (Ed.), *Postharvest Decay* (pp. 147-187). San Diego: Academic Press.

Wagacha, J. M., & Muthomi, J. W. (2007). *Fusarium culmorum*: Infection process, mechanisms of mycotoxin production and their role in pathogenesis in wheat. *Crop Protection*, 26(7), 877-885.

