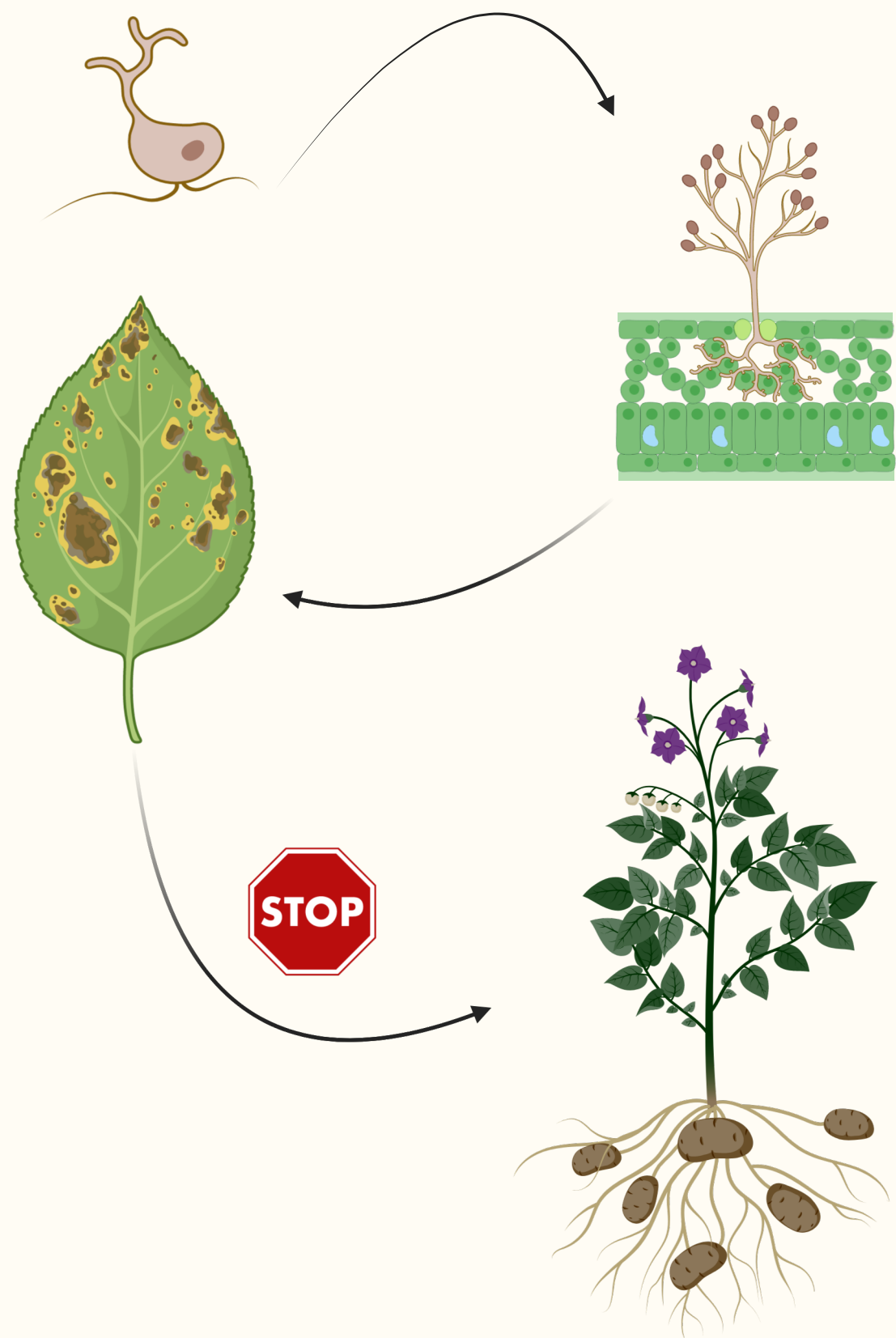
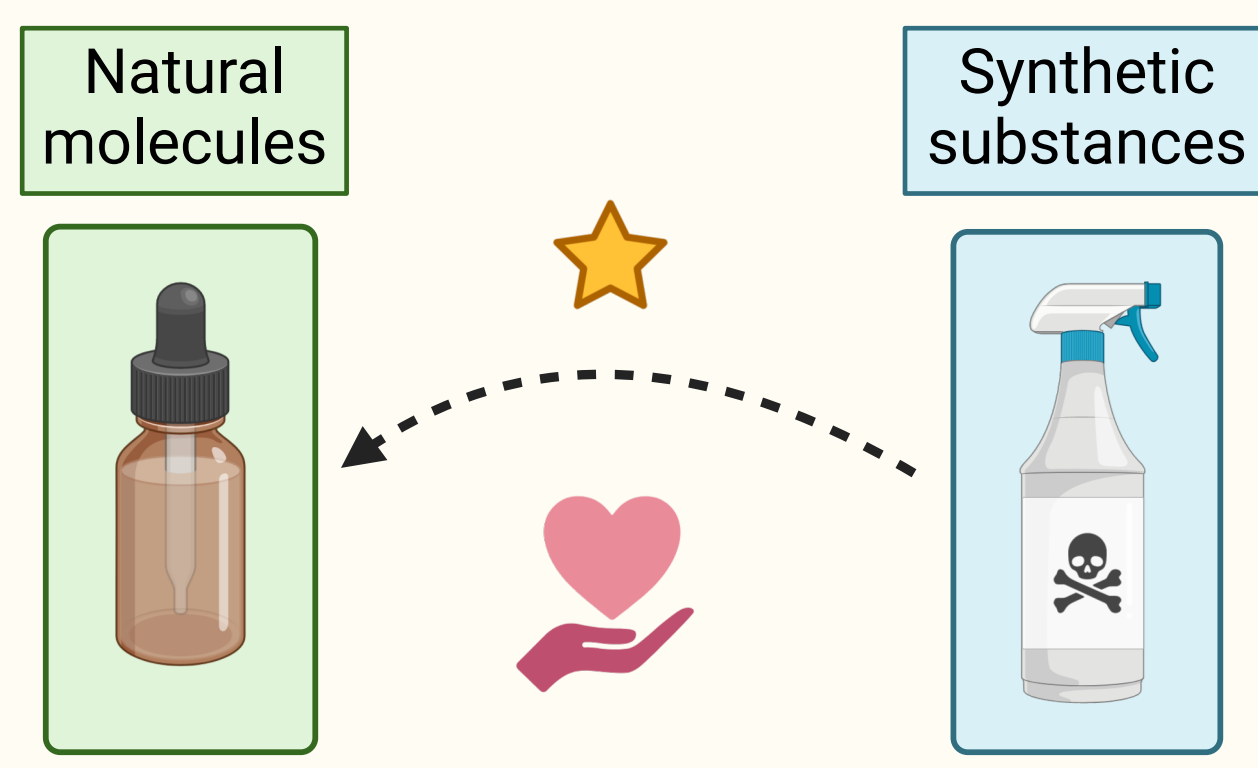


## CONTEXT

*Phytophthora infestans* is an oomycete responsible for late blight disease which causes huge damages on potato crop

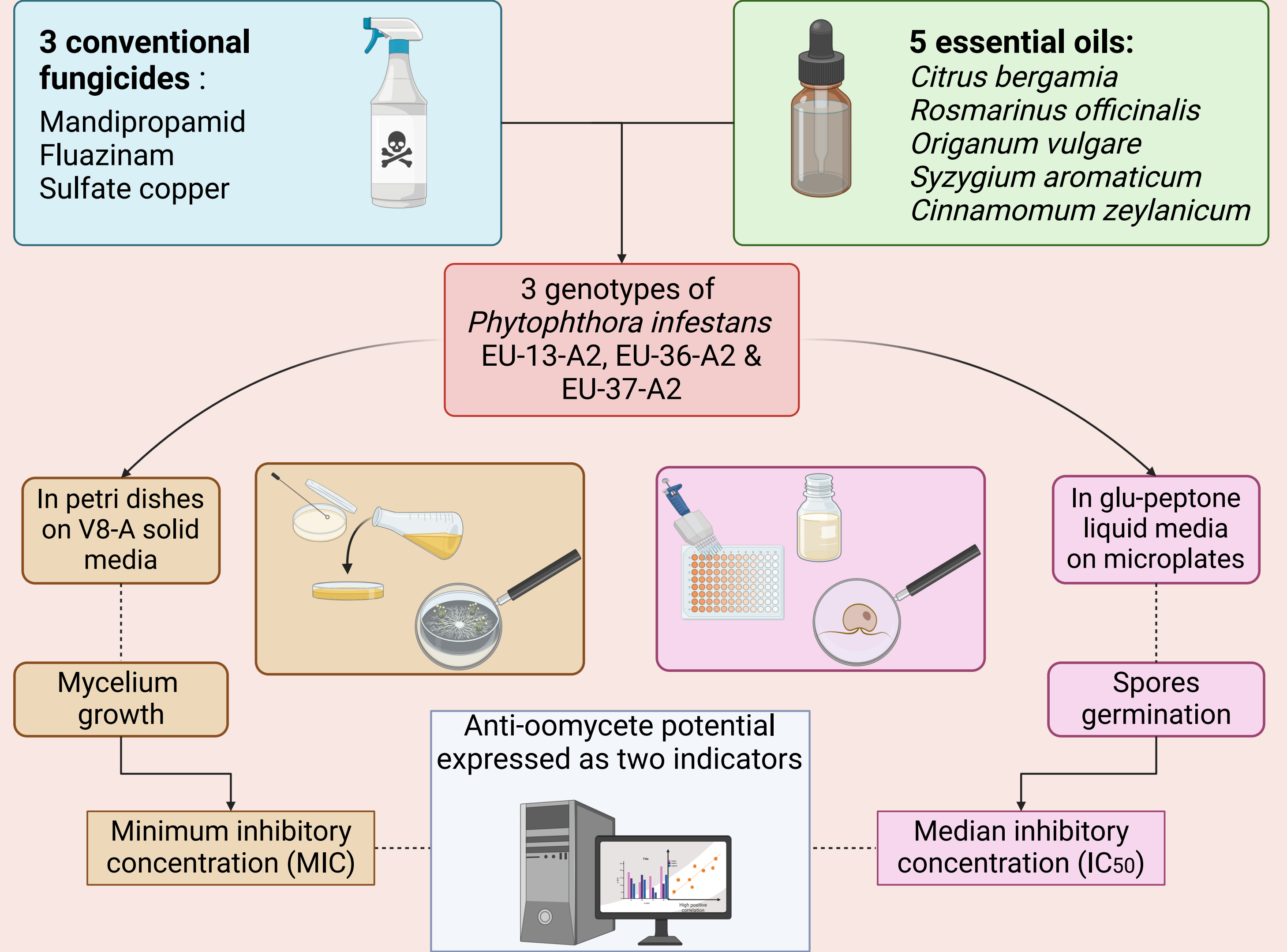


The management of this disease still heavily relies on the use of synthetic fungicides that harm soils, aquifers and biodiversity



Plant secondary metabolites such as essential oils seem like a promising and more sustainable alternative for crop protection

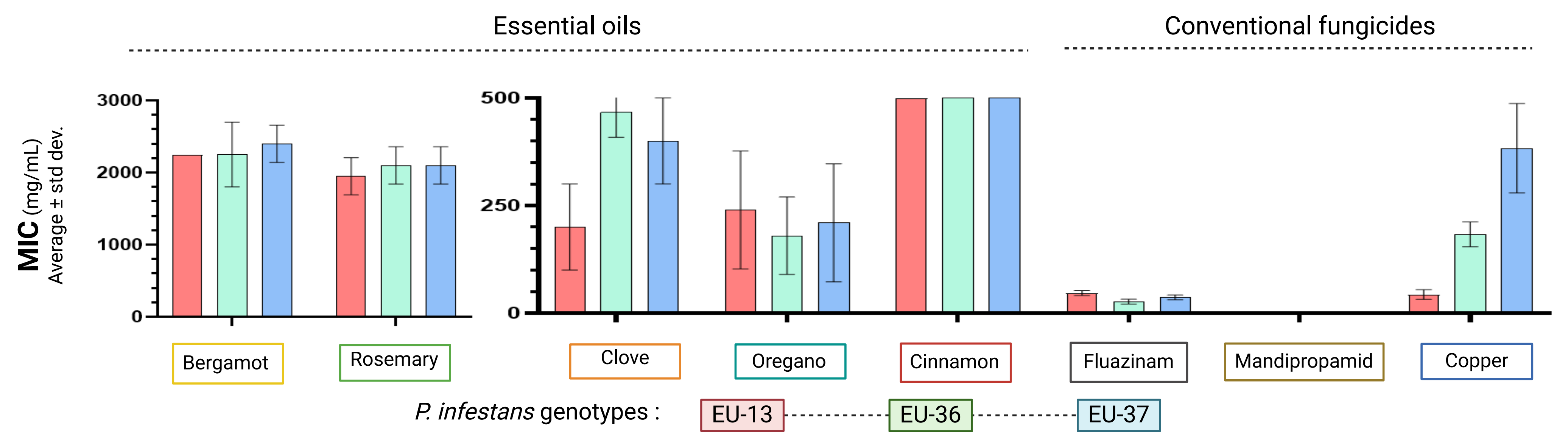
## MATERIAL & METHOD



## RESULTS

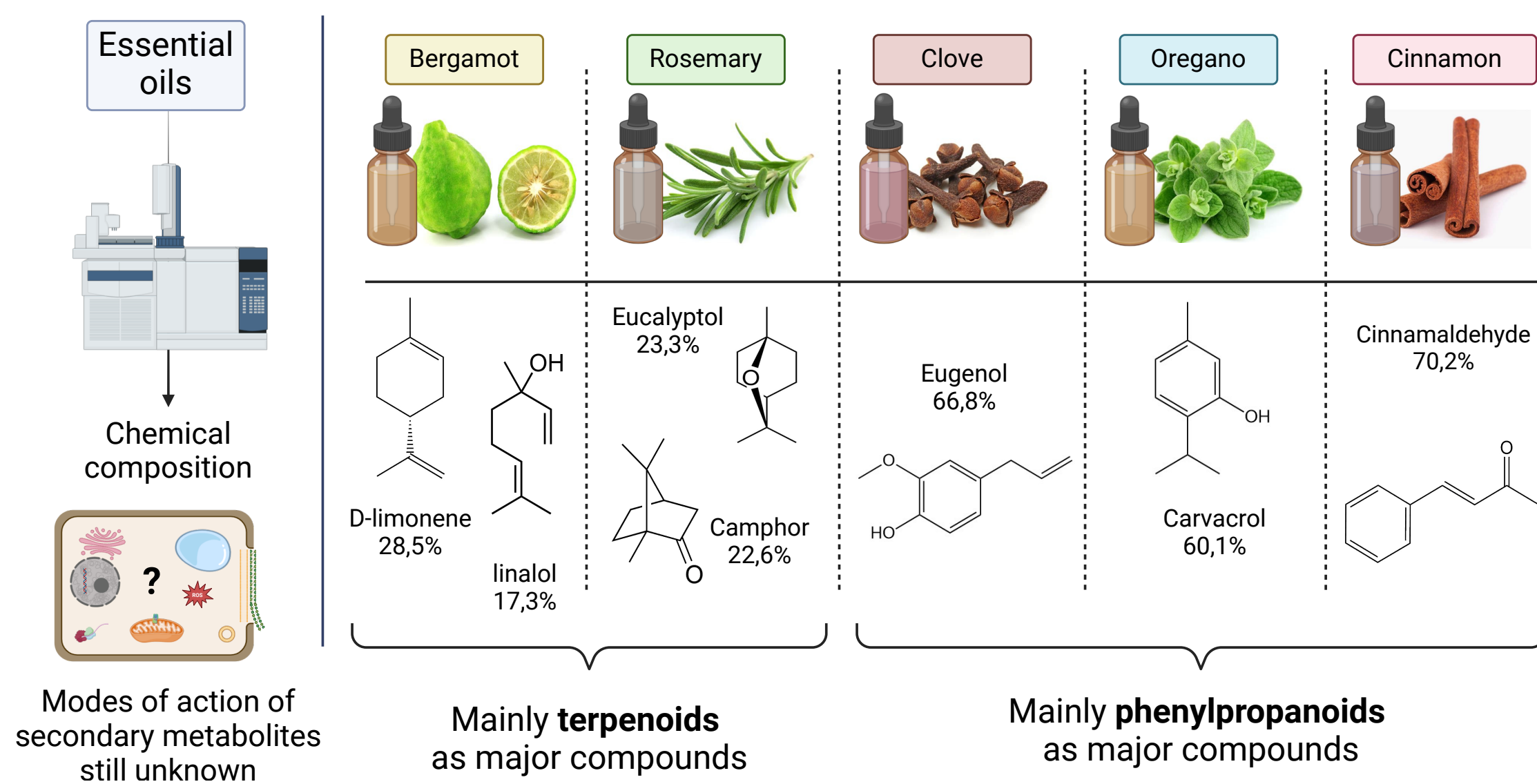
Anti-oomycete potentials of the 5 essential oils and 3 fungicides are expressed as minimum inhibitory concentration (MIC) for mycelium development whereas activities against spores germination are described as median inhibitory concentrations (IC<sub>50</sub>).

Minimum inhibitory concentrations of different substances towards mycelium growth of *P. infestans* genotypes in Petri dishes

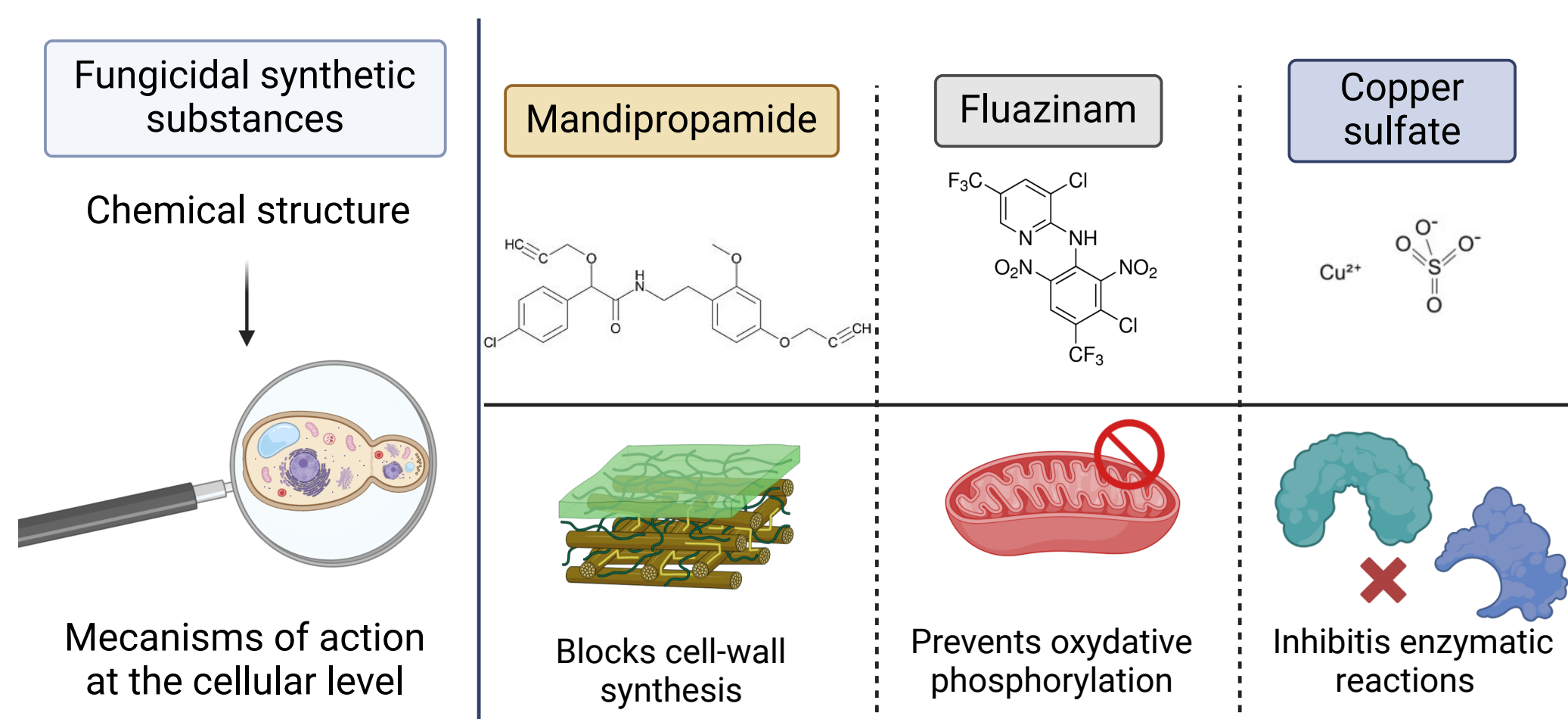


Median inhibitory concentrations of different substances towards spores germination of *P. infestans* genotypes on microplates

<i>P. infestans</i> genotypes	Essential oils					Conventional fungicides		
	Bergamot	Rosemary	Clove	Oregano	Cinnamon	Mandipropamid	Fluazinam	Copper
EU-13	9100 [7500 ; 13000]	9810 [7920 ; 12060]	500 [400 ; 600]	1620 [990 ; 1890]	130 [90 ; 200]	0.010 [0.03 ; 0.21]	0.35 [0.1 ; 1.3]	6 [1 ; 23]
EU-36	9900 [6300 ; 15300]	2160 [1080 ; 3330]	100 [60 ; 140]	270 [180 ; 360]	120 [50 ; 280]	0.012 [0.02 ; 0.32]	0.25 [0.05 ; 3.2]	14 [2 ; 27]
EU-37	4400 [3500 ; 5580]	5940 [4770 ; 7560]	400 [300 ; 600]	360 [180 ; 540]	80 [50 ; 130]	0.015 [0.06 ; 0.20]	0.29 [0.01 ; 6.2]	80 [30 ; 220]



Essential oils contain either terpenoids or phenylpropanoids as major compounds. Their modes of action on Oomycetes are still unclear unlike fungicidal substances that usually target one specific and well known cellular mechanism.



## CONCLUSION

Conventional fungicidal substances target one specific metabolic pathways whereas complex mixtures of VOCs contained in essential oils are thought to be more versatile. Oils containing terpenoid have much higher MIC and IC<sub>50</sub> than those containing phenylpropanoid. Therefore, they show lower inhibiting activities against the three genotypes of *P. infestans*. Although late blight control still heavily relies on fungicidal molecules for which effective concentrations stay lower than secondary metabolites', these represent a potentially efficient and surely more sustainable alternatives as new strategies for integrated pest management.

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