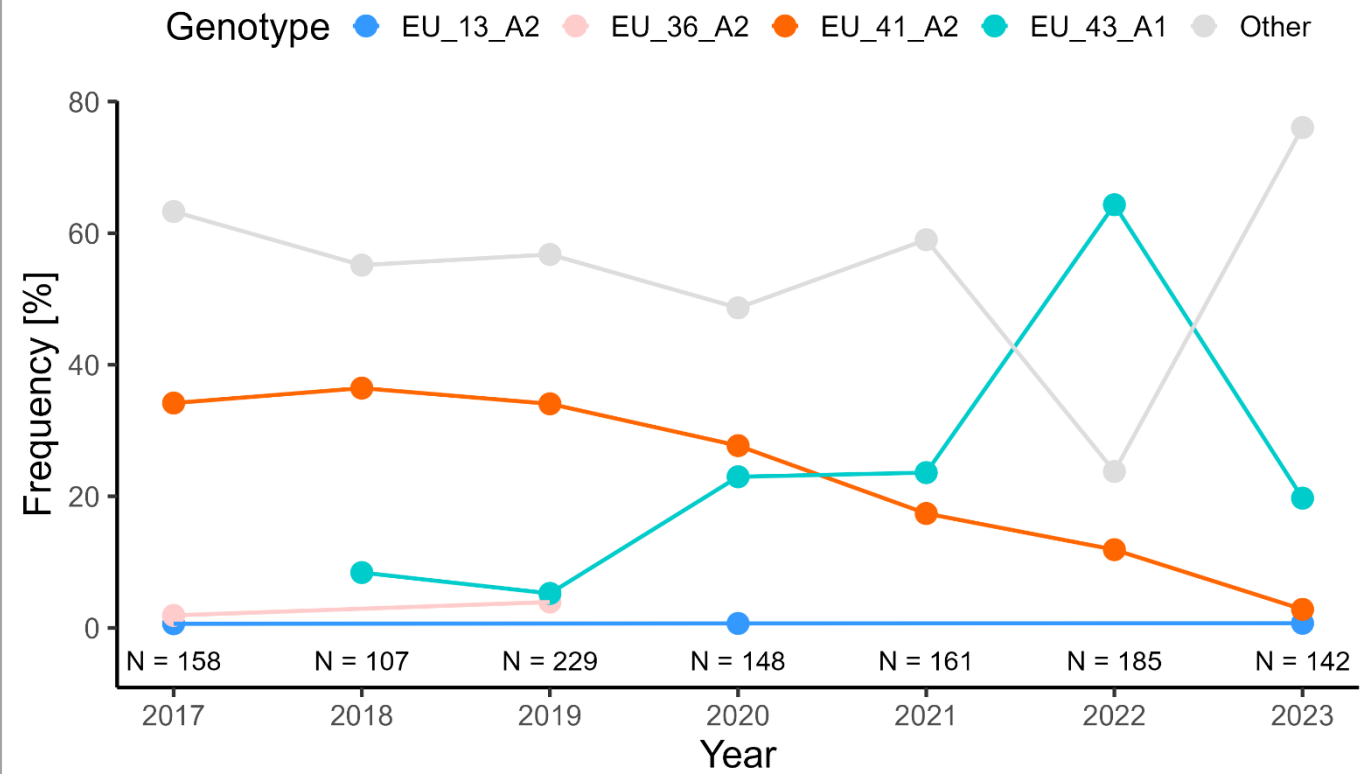
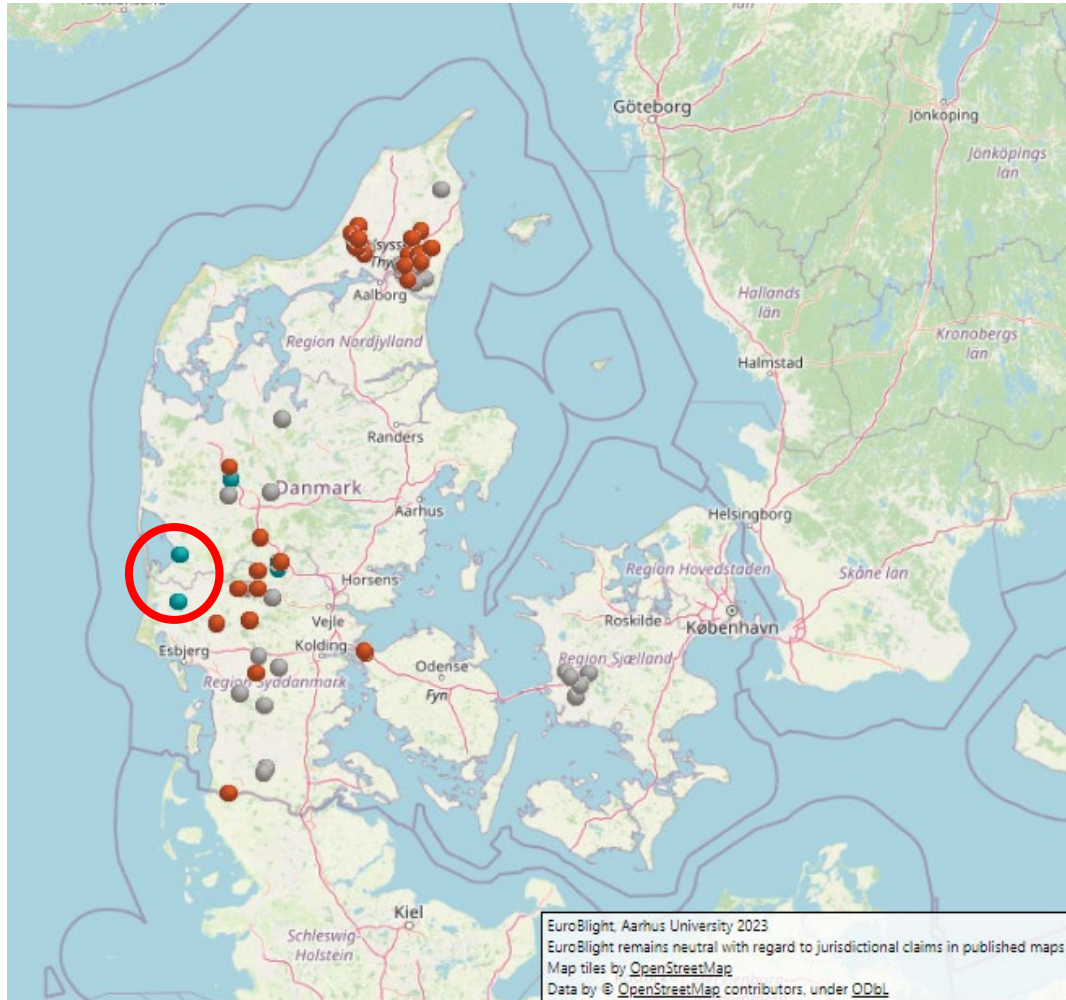


PHENOTYPIC TRAITS OF THE THE EU43 *PHYTOPHTHORA* *INFESTANS* CLONAL LINEAGE

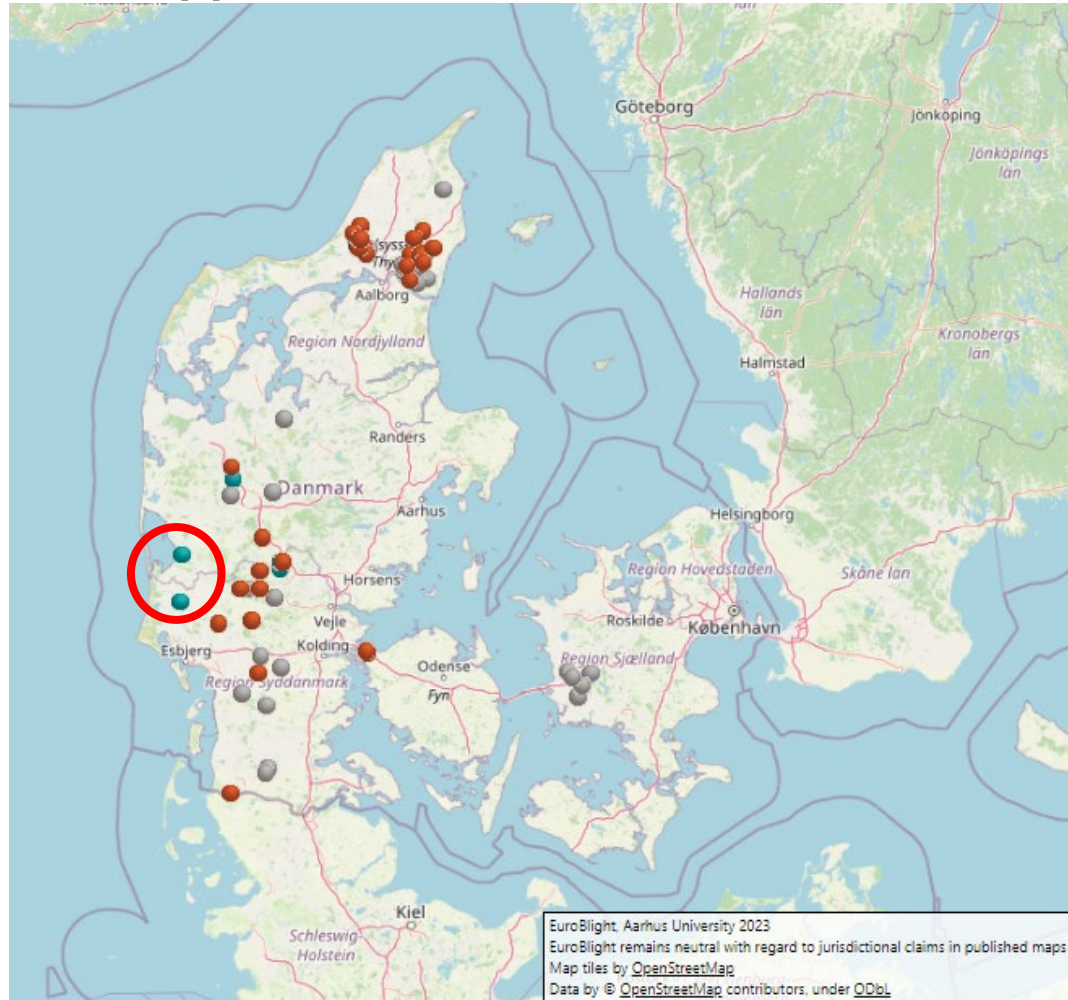
Isaac K. Abuley, Laura F. Meno, Clarissa Grell,
Steve Bicko, Kim Hebelstrup & Jens G. Hansen

THE EU43 EMERGED FOR THE FIRST IN 2018 AND SPREAD QUICKLY IN DENMARK

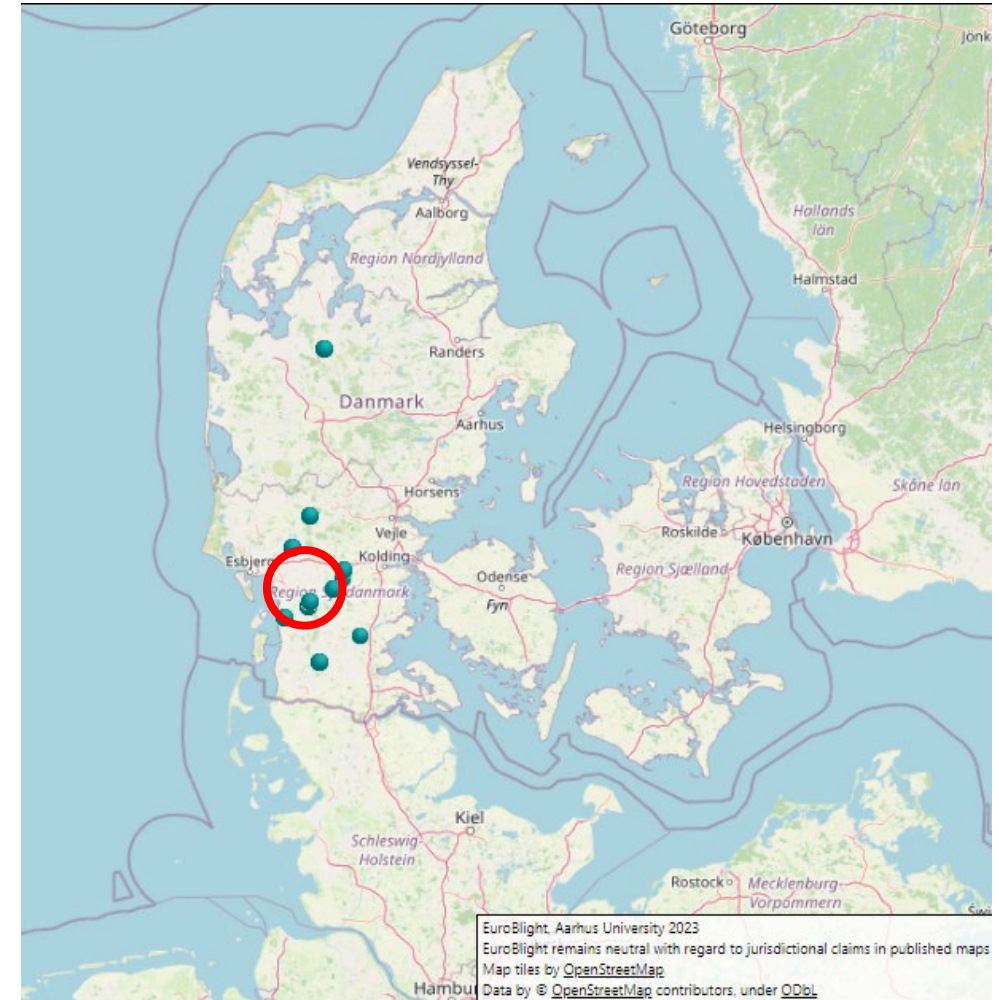


JUST A YEAR AFTER THE EMERGENCE OF THE EU43, REDUCED EFFICACY AGAINST MANDIPROPAMID WAS REPORTED IN SOME FIELDS IN DENMARK

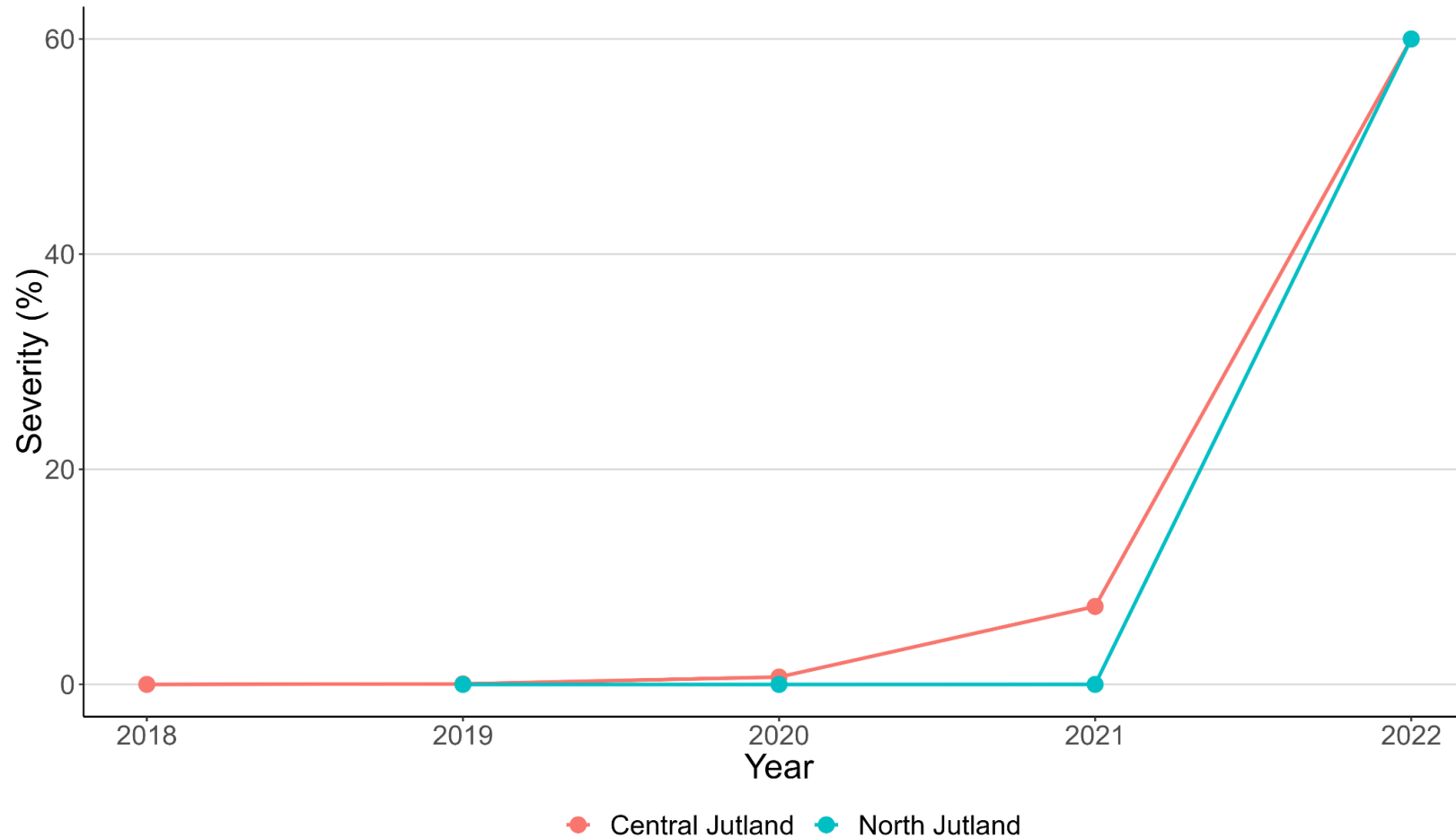
EU43 appeared for the first time in 2018



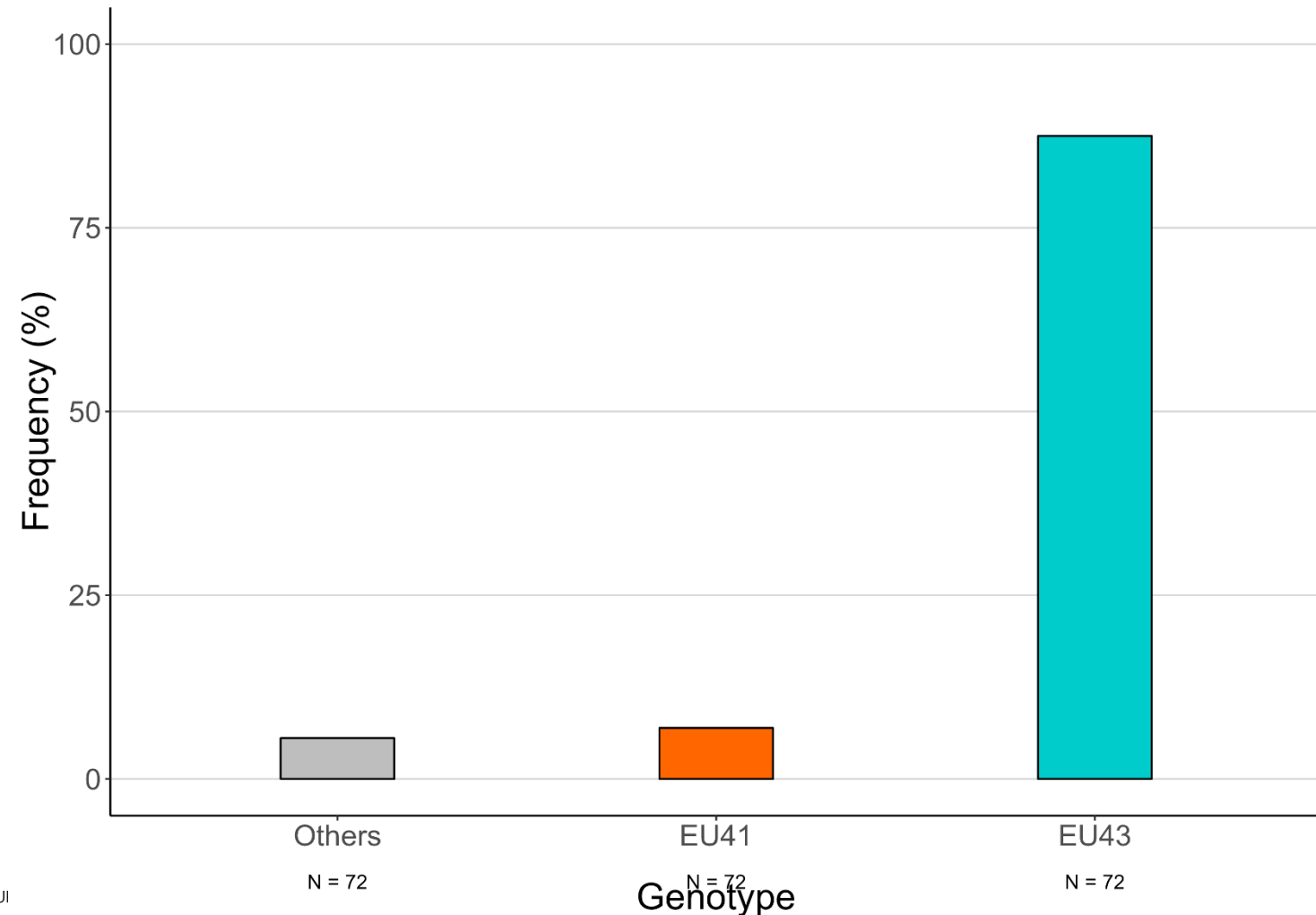
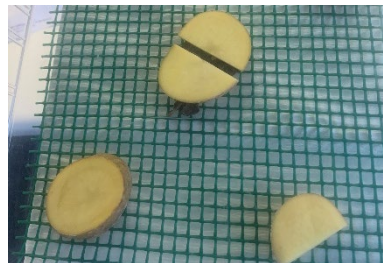
Indication of loss of efficacy reported in 2019



SEVERITY OF LATE BLIGHT WHEN MANDIPROPAMID WAS USED AS COVER SPRAY HAS INCREASED

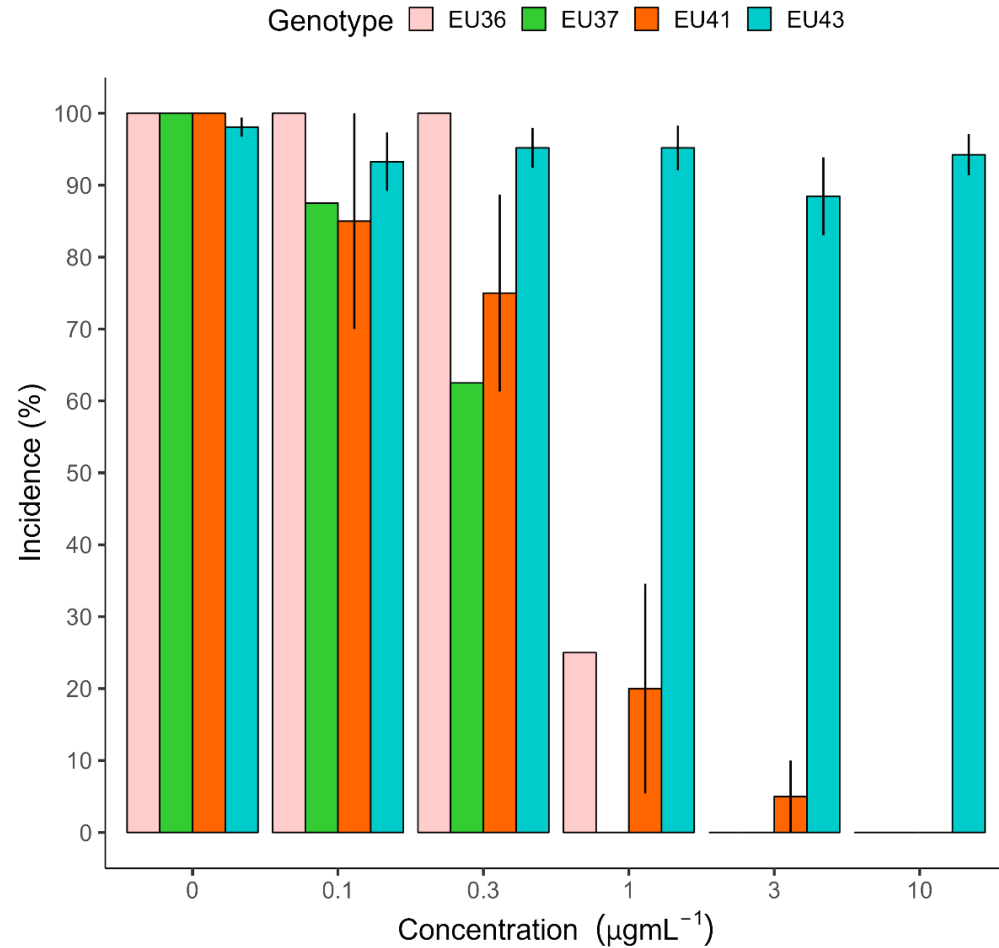


MOST OF THE ISOLATES SAMPLED FROM “PROBLEM FIELDS” BELONGED TO THE EU43 CLONAL LINEAGE.

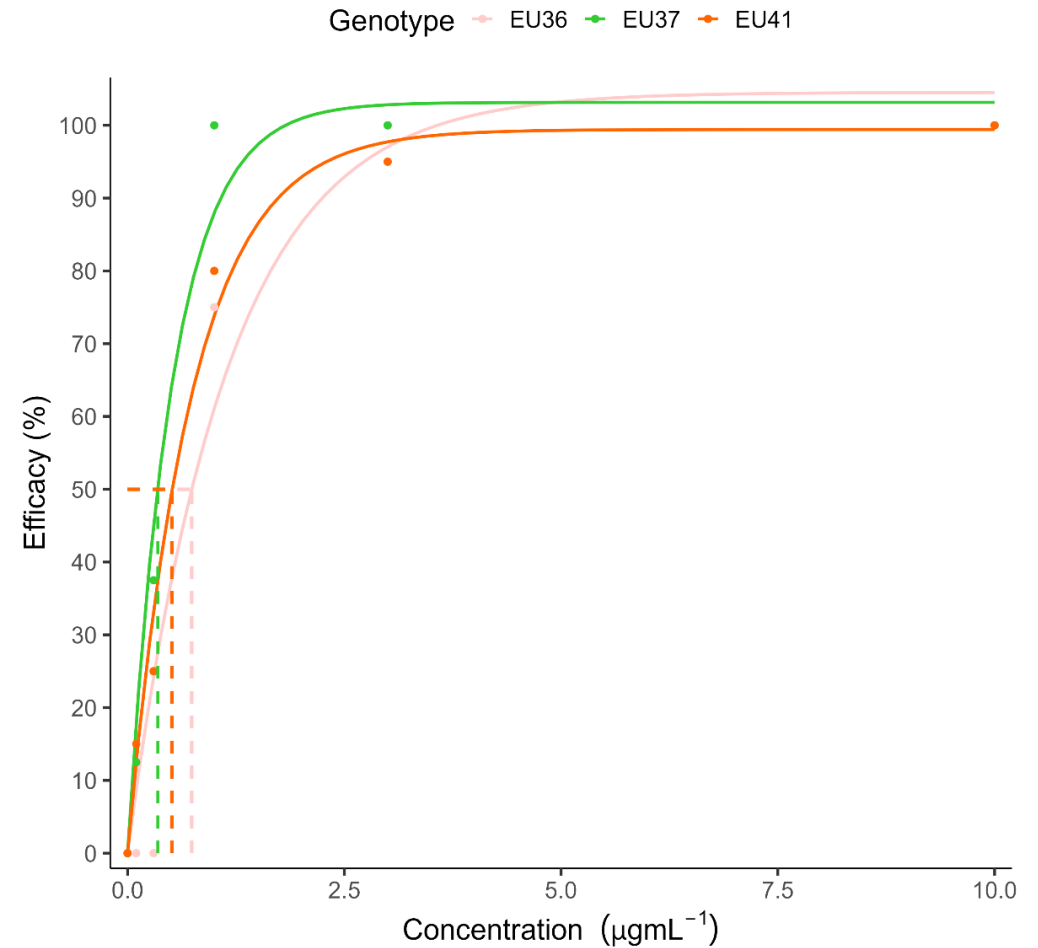


EU43 SHOW COMPLETE RESISTANCE AT ALL TESTED CONCENTRATIONS

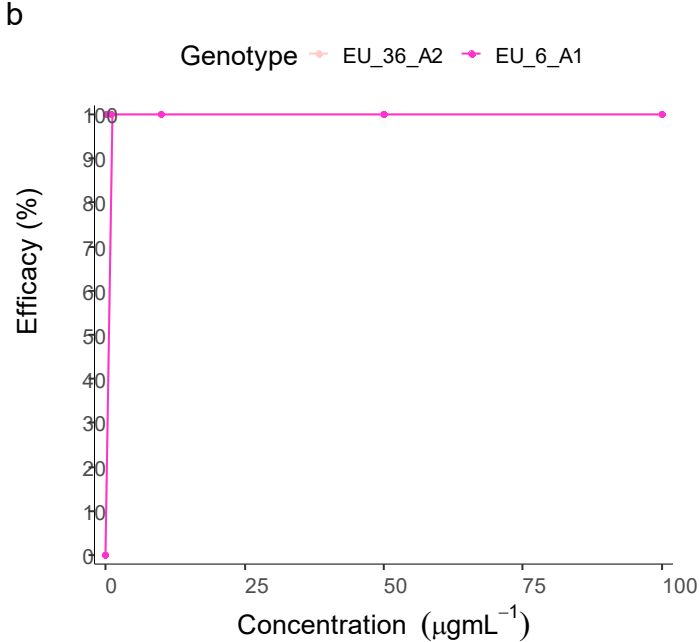
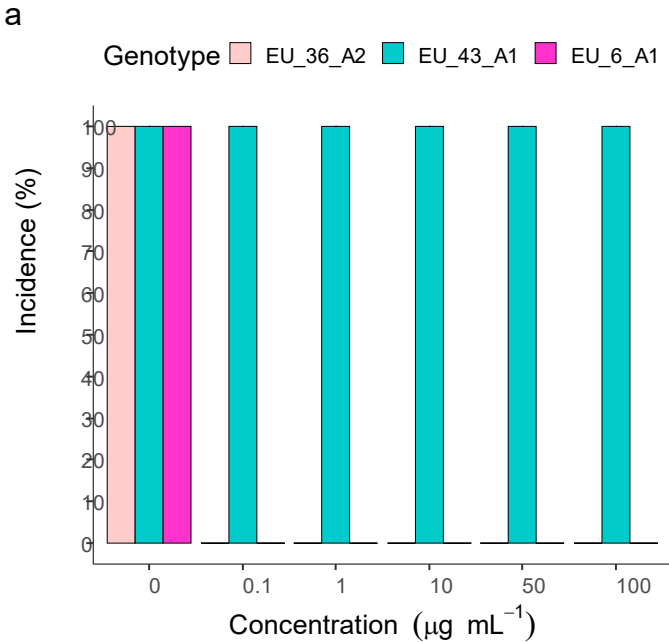
a



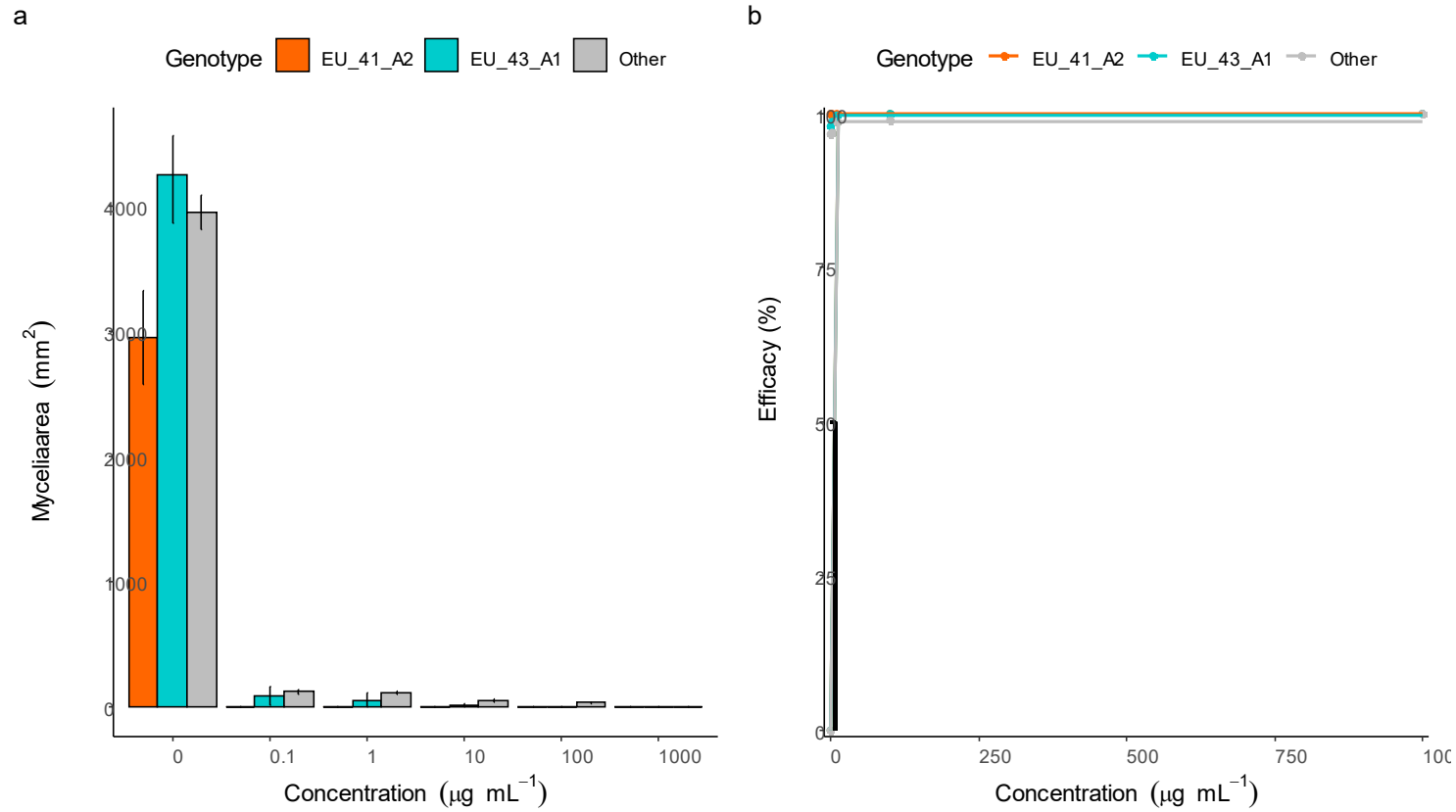
b



FURTHER TEST SHOWED EU43 INFECTING AT UPTO 100PPM

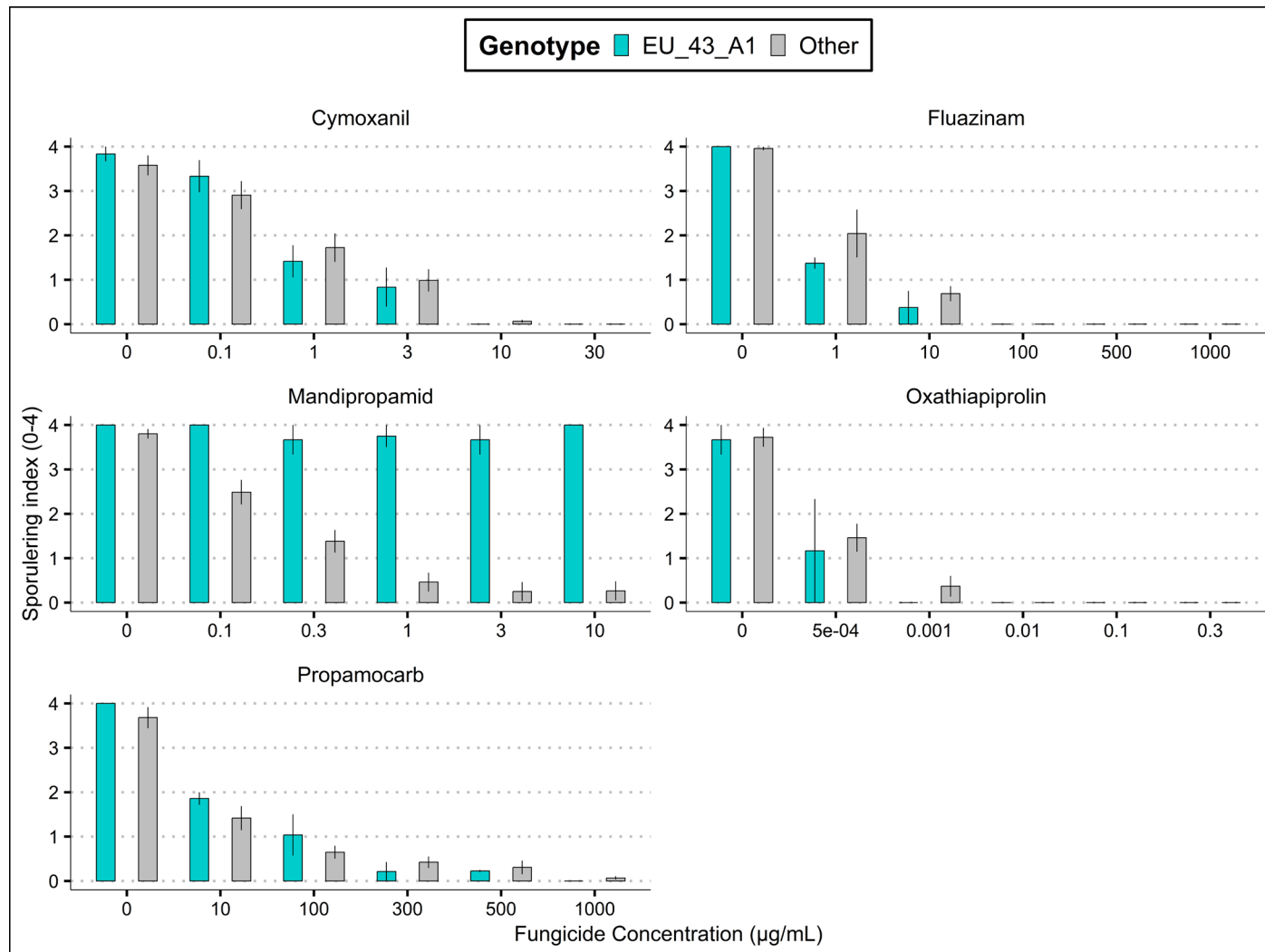


IN CONTRAST TO MANDIPROPAMID, EU43 WAS VERY SENSITIVE TO FLUAZINAM



FUNGICIDE SENSITIVITY STUDY IN 2023:

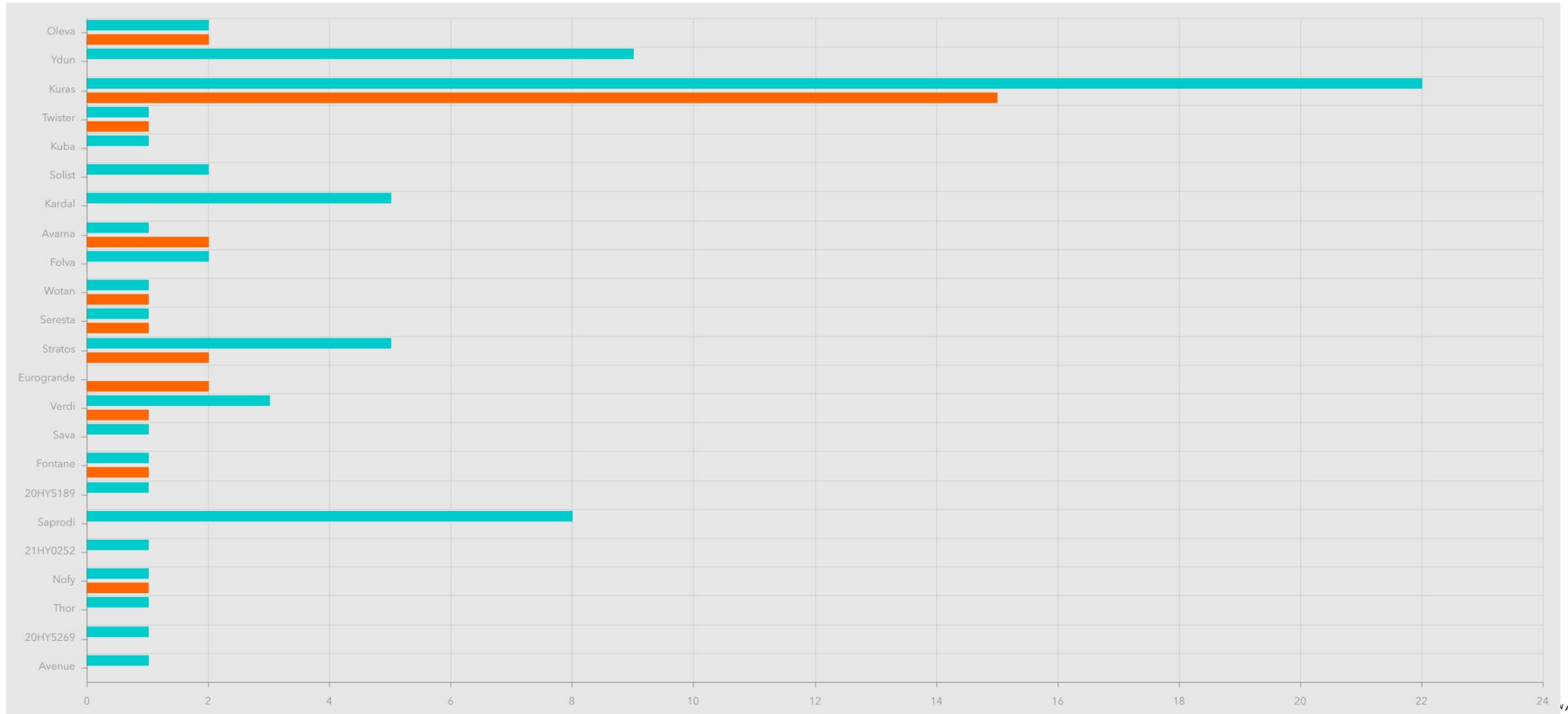
Genotype	Active ingredient	EC50 (µg/mL) *
EU_43_A1	Cymoxanil	0,59
Other		0,91
EU_43_A1	Propamocarb	9,1
Other		6,1
Other	Fluazinam	1
EU_43_A1		0,1
Other	Mandipropamid	0,165
EU_43_A1		>10
EU_43_A1	Oxathiapiprolin	0,000256
Other		0,000287



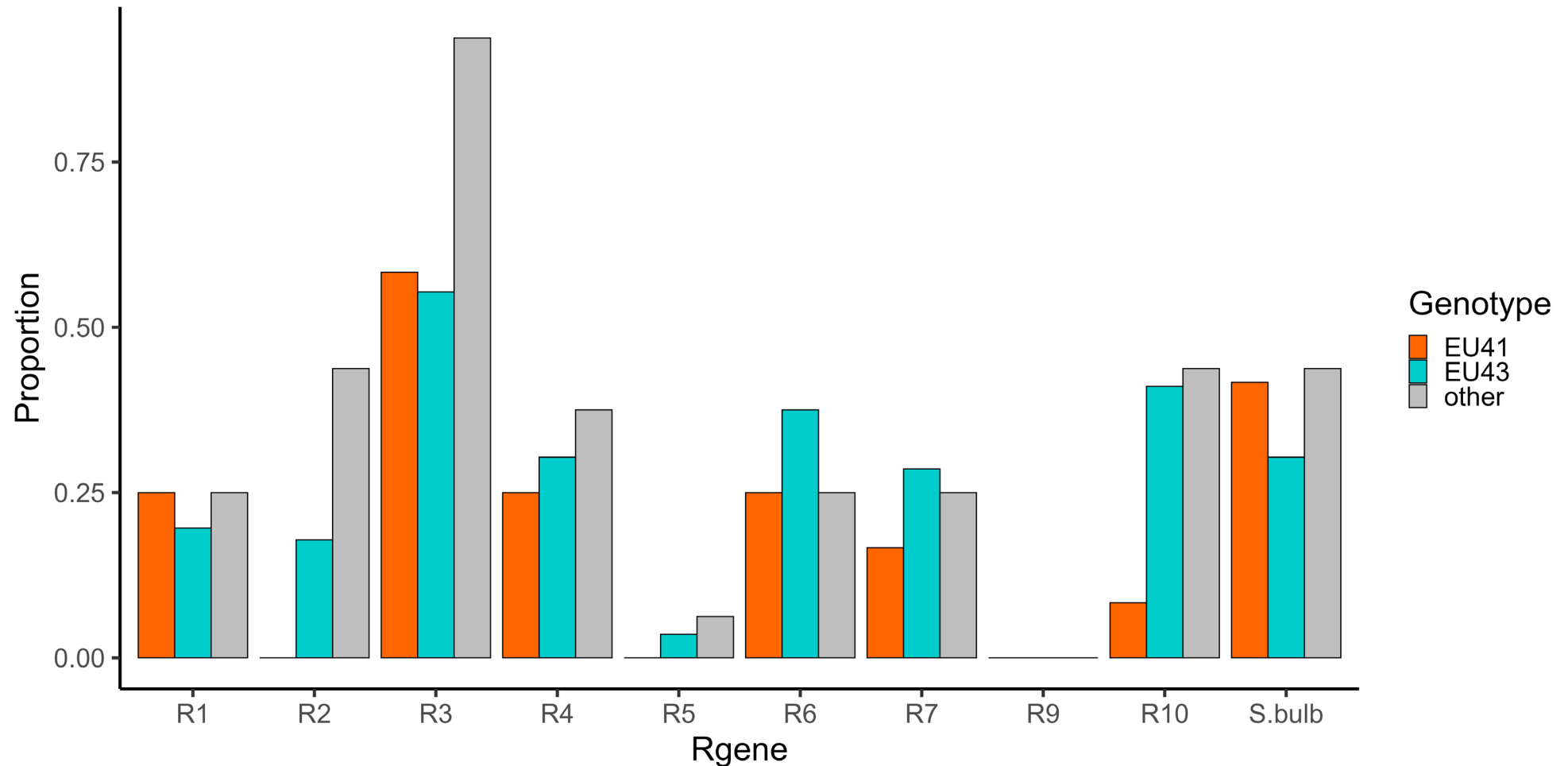
Conclusion: Except EU43 and mandipropamid, all tested isolates were sensitive to the fungicides

AGGRESSIVENESS TRAITS (SPORANGIA PRODUCTION, LATENT PERIOD, LESION SIZE)

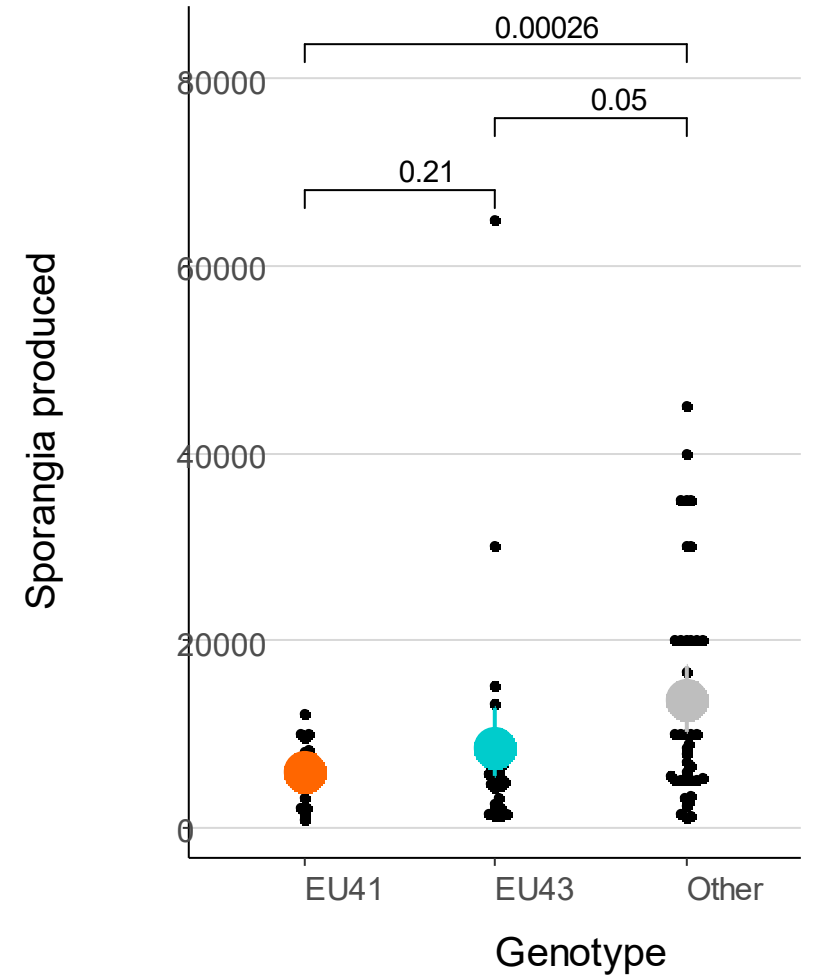
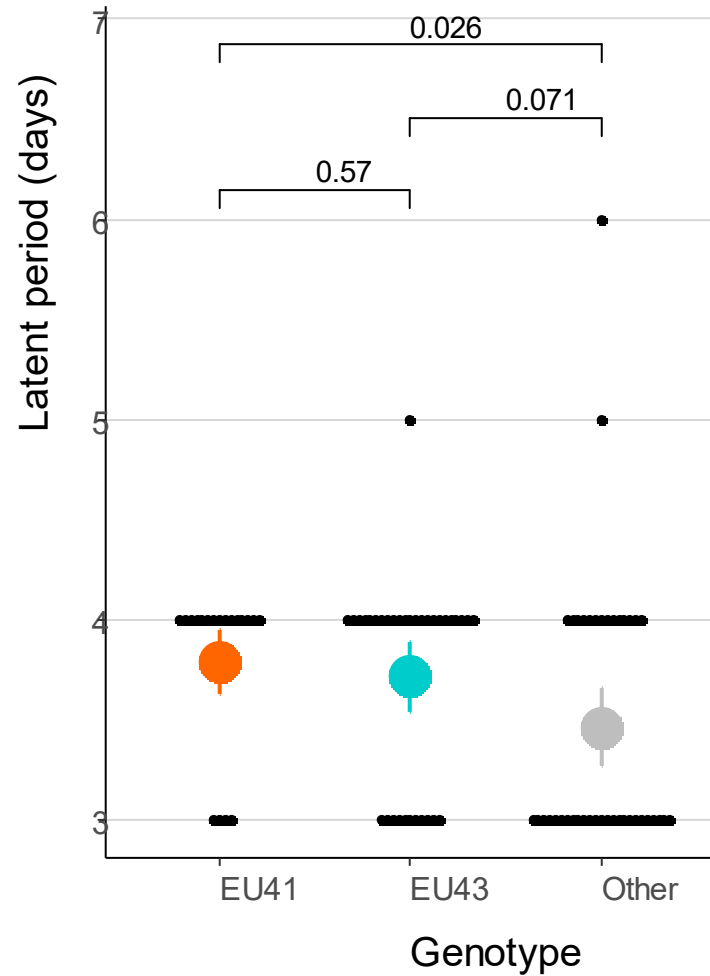
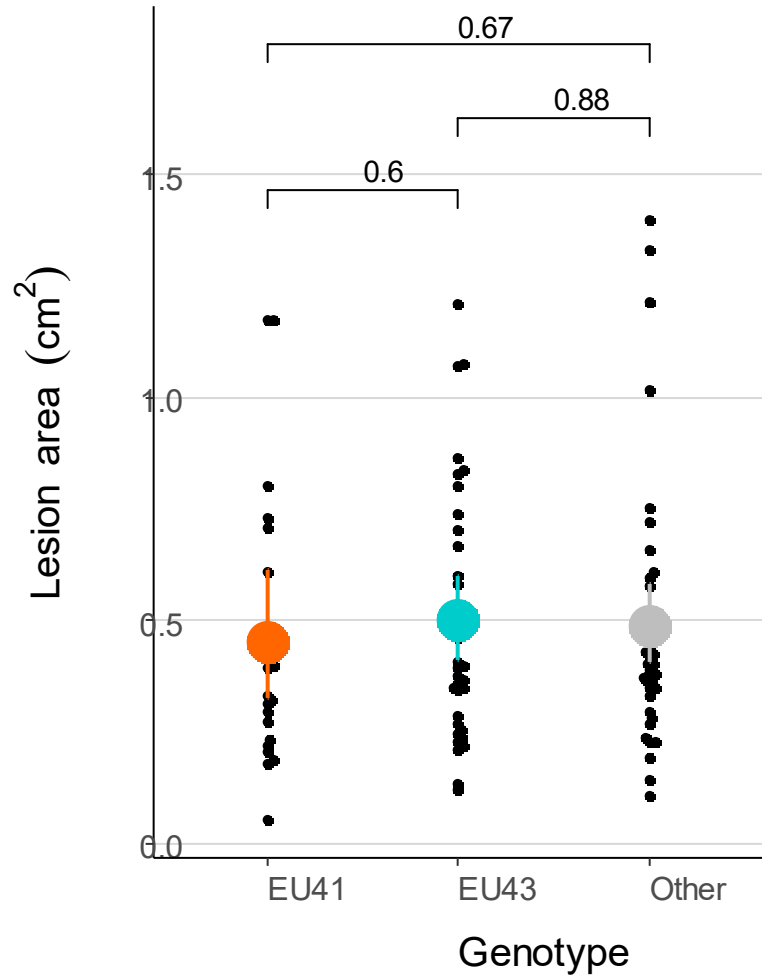
THE ISOLATES FROM WHICH EU43 WAS SAMPLED FROM 2018-2023



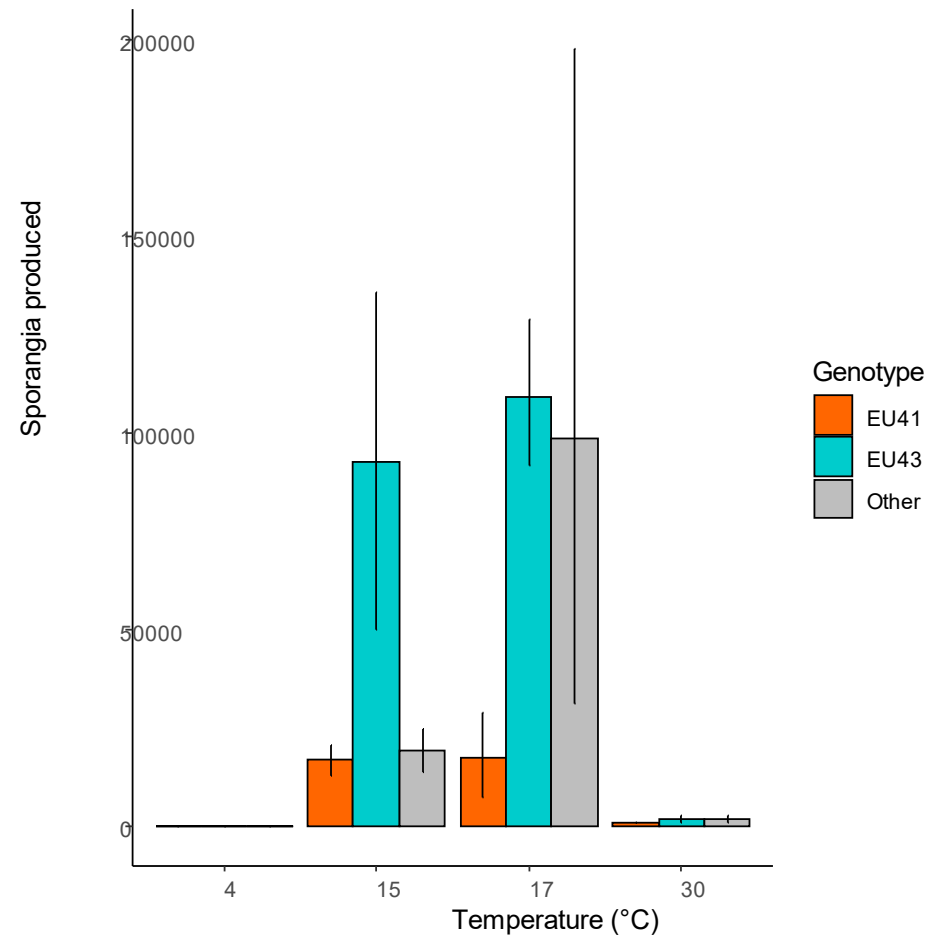
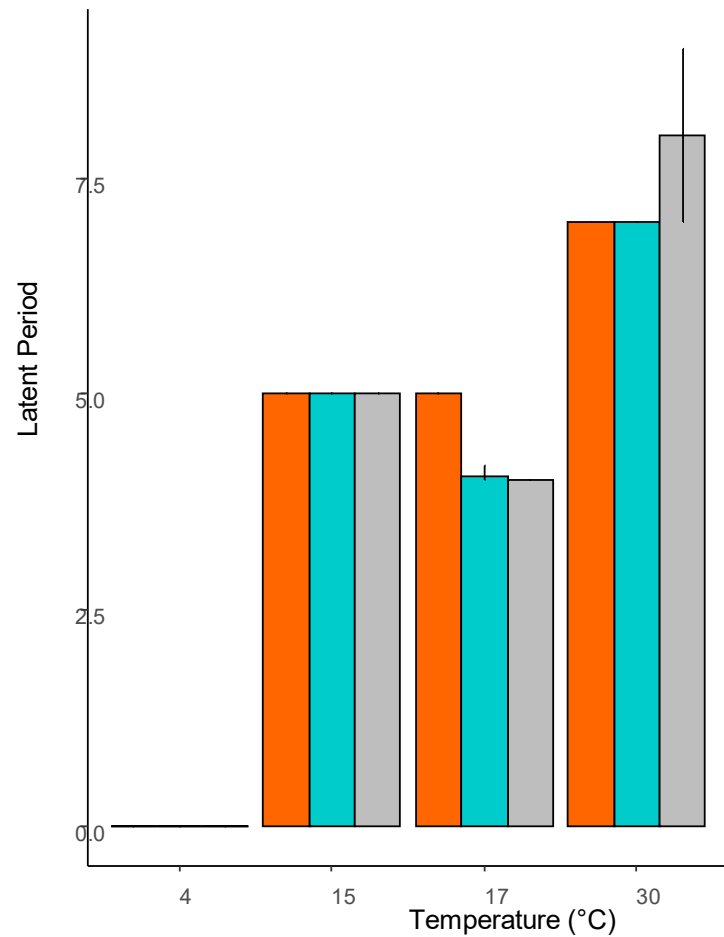
VIRULENCE OF EU43 (N = 14), EU41 (N = 3), AND “OTHERS” (N = 4).



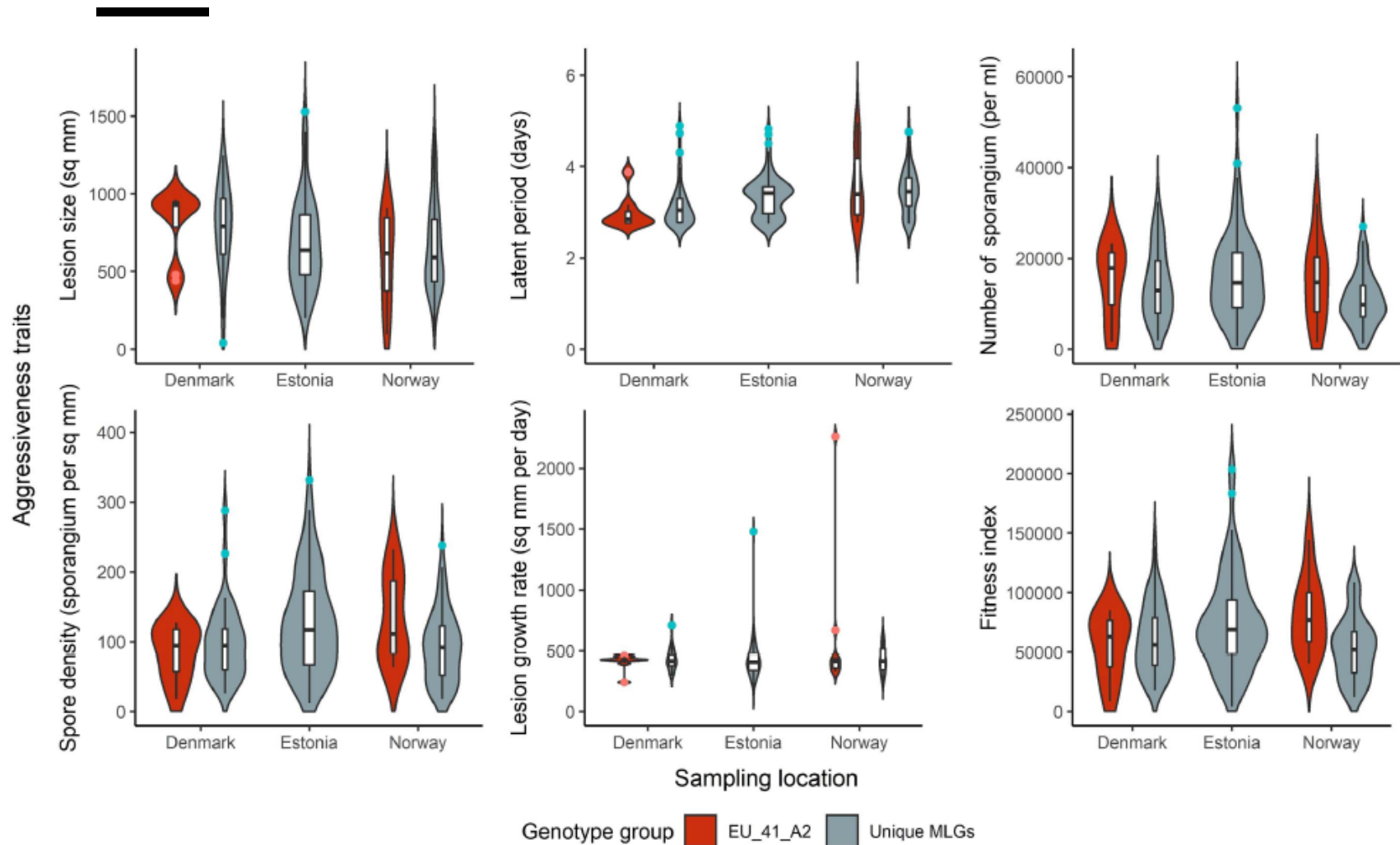
COMPARISONS OF LESION SIZE, LATENT PERIOD, AND SPORANGIA PRODUCTION OF EU41, EU43, AND "OTHER" GENOTYPES



THE EFFECT OF TEMPERATURE ON LATENCY AND SPORE PRODUCTION



A REVIST TO THE AGGRESSIVENESS STUDIES ON EU41



No marked difference in aggressiveness
Huge variation within genotype

Puidet et al. 2022 (Phytopathology)

CONCLUSION

- Fungicide resistance (to CAAs) is most significant trait of the EU43 genotypes we have tested.
 - This is the only trait that the EU43 genotypes is markedly different from other clones/genotypes
- The aggressiveness traits (Sporangia production, latent period, and lesion size tested did not differ significantly for EU43 compared to the EU41 and “Others”
 - Thus, we can conclude based on the present data that the EU43 is does not have superior aggressiveness traits compared to the other clones
- EU43 is multi-virulent, breaking most R-genes except R9, but
 - The EU41 and “Other” genotypes were equally multi-virulent.
 - Interestingly, we found EU43 isolates that overcome *S. bulboscastanum*.
 - We are doing a follow-up (Whole plant) experiment to confirm this.

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