

AUREOBASIDIUM PULLULANS

Selected for resilience under challenging agricultural conditions

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INTRODUCTION

Aureobasidium pullulans is a yeast-like fungus used as antifungal and antibacterial microbial pest control agent. Its ability to colonize plant surfaces, to compete for space and nutrients, and to persist under variable conditions makes it a strong agent for integrated pest management, organic production, and residue-conscious crop protection programs. These characteristics have enabled the successful use of *Aureobasidium pullulans* in organic plant protection products such as BOTECTOR and BLOSSOM PROTECT.

The effectiveness of biological control agents (BCAs) is influenced by environmental conditions, competition with other microorganisms and the genetic

variability of pathogens (Villavicencio-Vázquez et al., 2025). Factors such as UV radiation, temperature extremes, humidity, and pH can reduce microbial survival and activity on plant surfaces (i.e. persistence), thereby limiting their performance under field conditions (Umer et al., 2021). Therefore, biological resilience, defined as the ability of a microorganism to withstand and adapt to environmental stresses, is a key determinant of its persistence on the leaf surface.

Long-term persistence ensures that sufficient populations remain biologically active, allowing continuous competition with pathogens and sustained preventive protection. As a result, resilient microorganisms

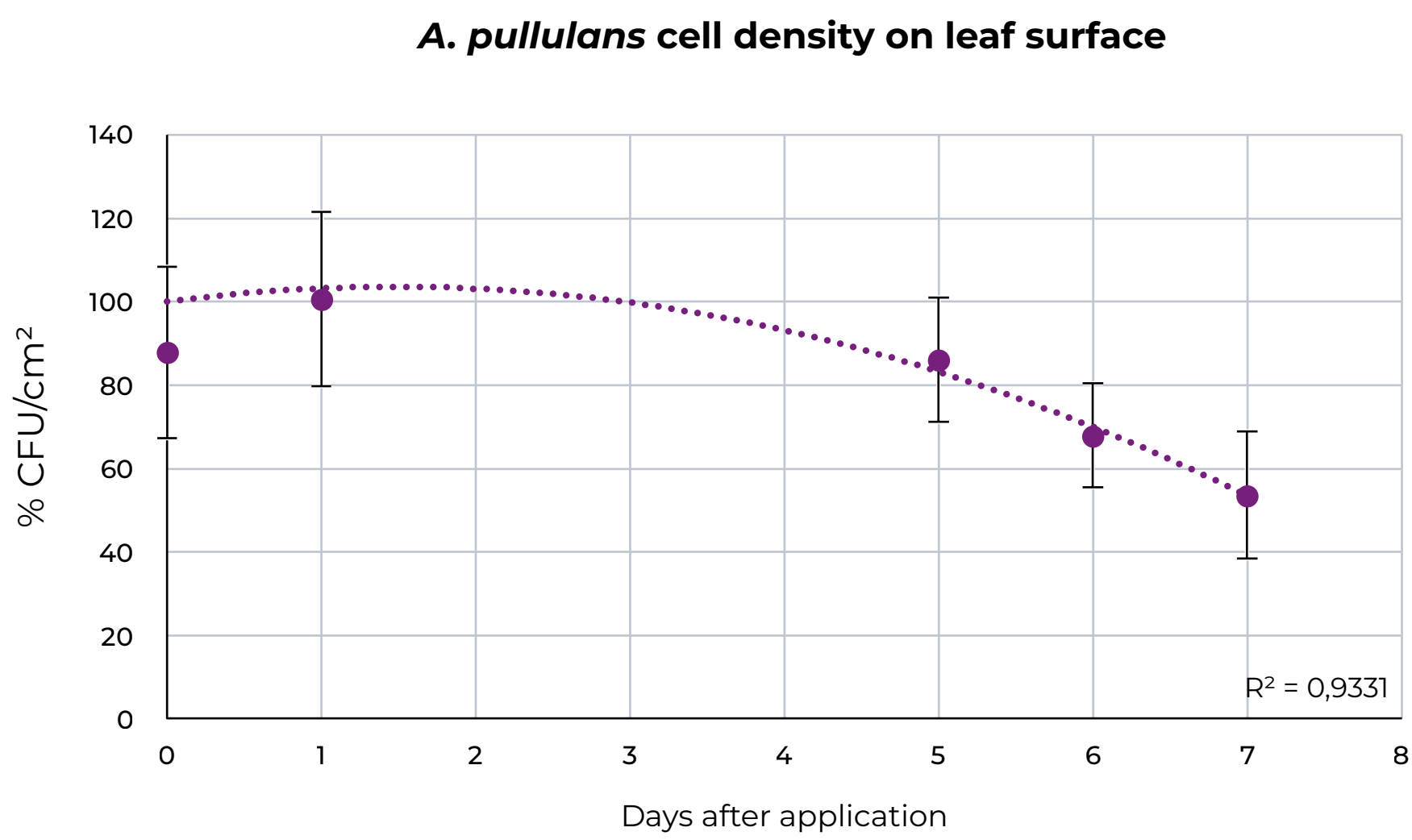
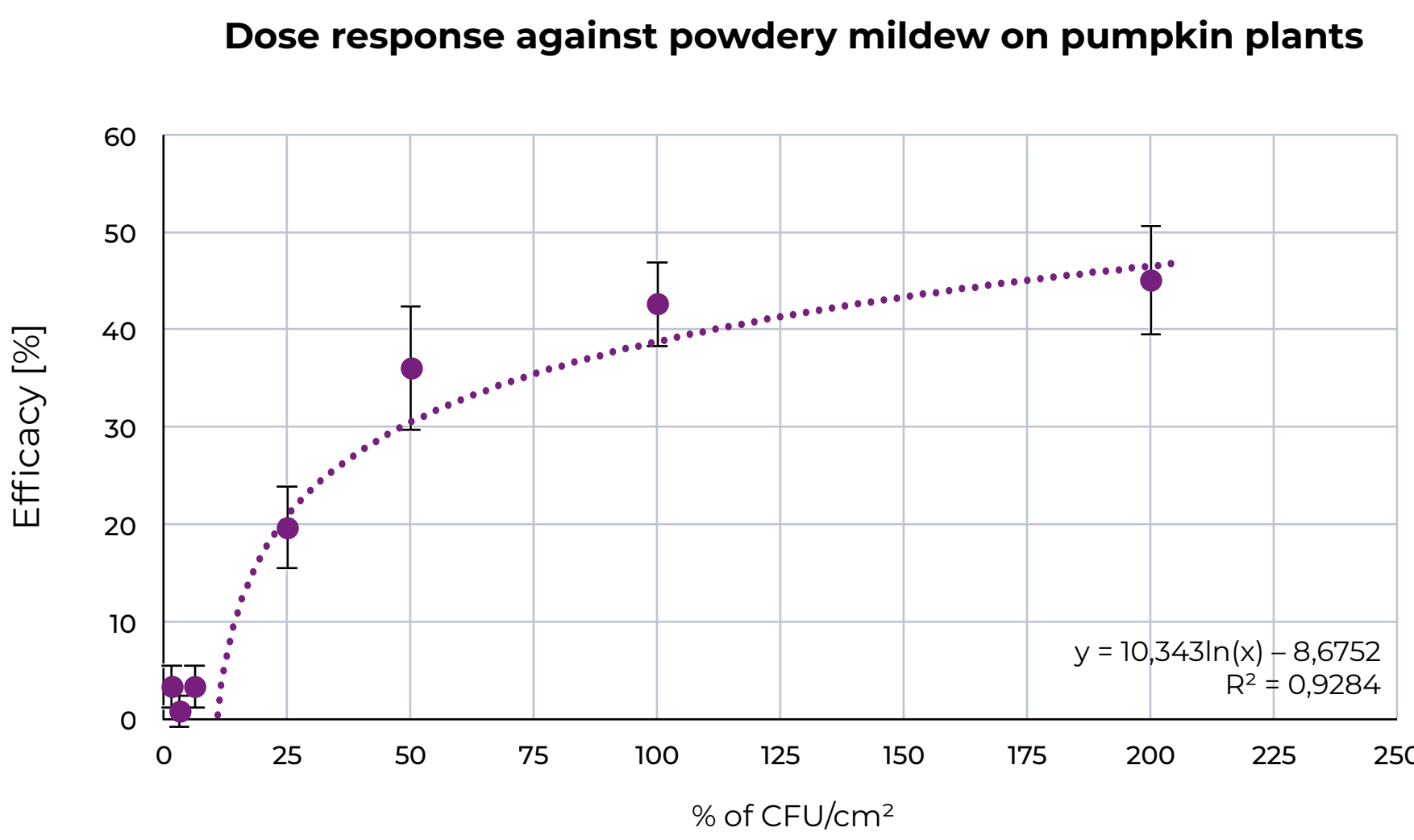
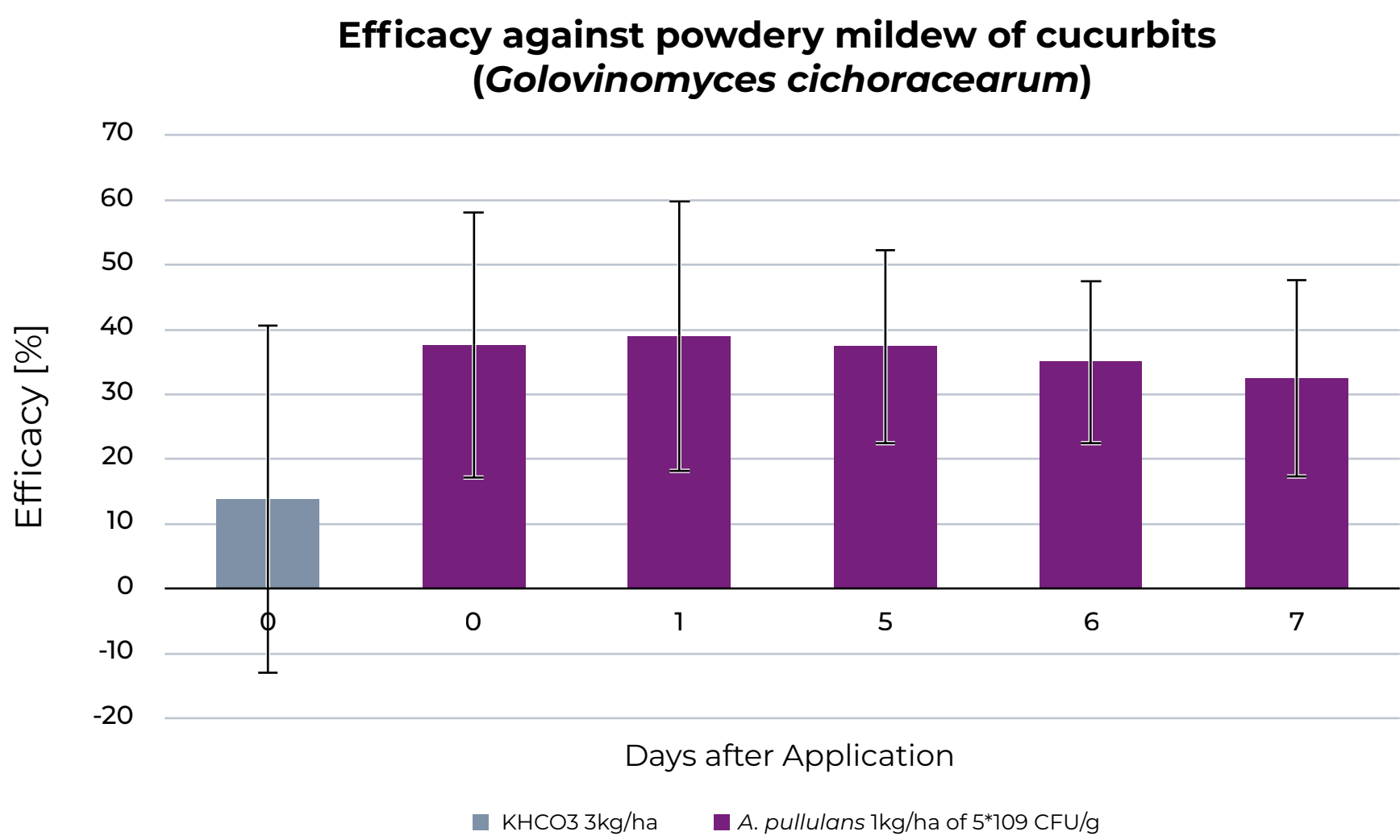
are more likely to provide consistent and long-lasting disease control across diverse environmental conditions, preserving its efficacy over time. Hence, resilience, persistence, and efficacy are closely interconnected characteristics that determine the success of a biological control agent in the field.

This poster explores the resilience and persistence of the yeast-like fungus *Aureobasidium pullulans*, strains DSM 14940 and DSM 14941 (CF10 and CF40, respectively). Placing particular emphasis on the environmental factors affecting persistence, such as temperature, pH, and UV radiation and on how prolonged survival on plant surfaces supports consistent biological efficacy.

DATA

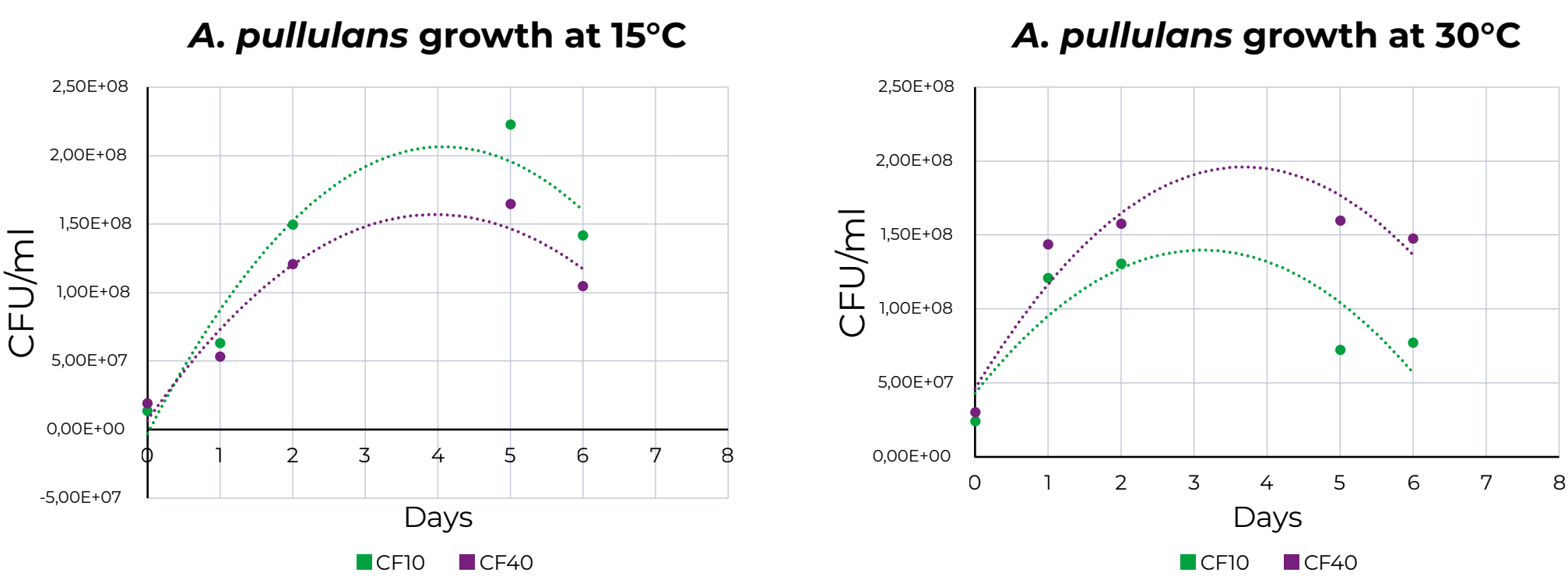
LONG PERSISTENCE AND LASTING EFFICACY

A. pullulans remained on the leaf surface for at least 7 days at CFU levels sufficient to provide enough efficacy inhibiting pathogens growth.



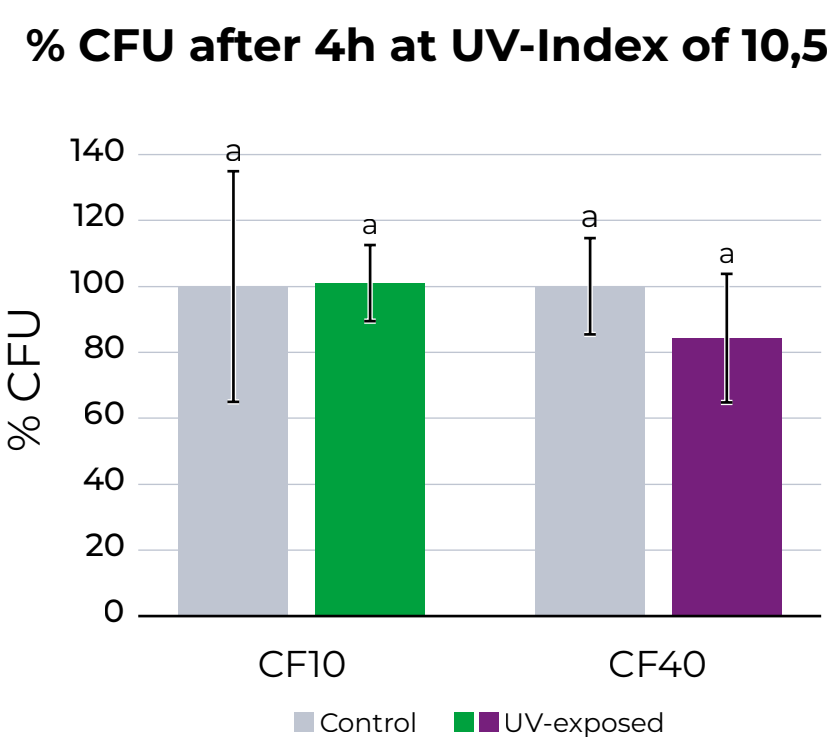
WIDE TEMPERATURE RANGE

Both strains working together to cover a broad range of temperatures



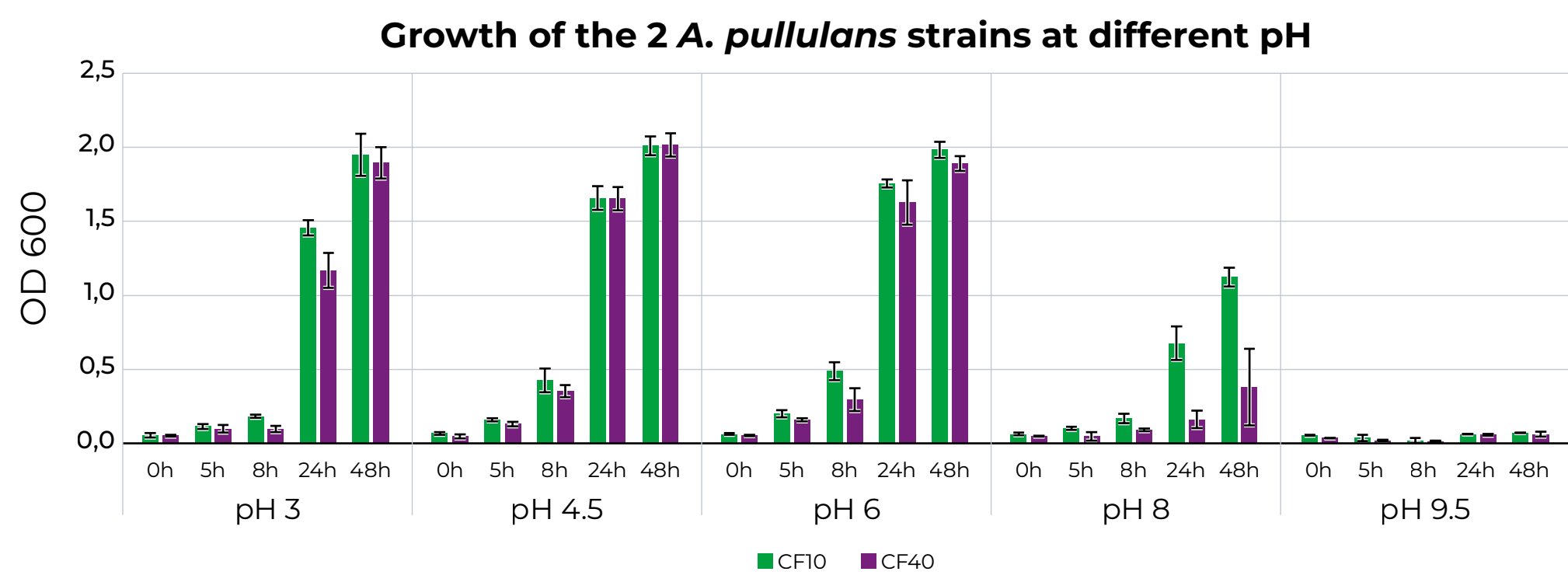
HIGH UV-STABILITY

A. pullulans defies high UV radiation, maintaining strong growth even under conditions comparable to the Californian summer.



BROAD PH ADAPTABILITY

Both *A. pullulans* strains exhibited robust growth across the acidic pH range (3.0–6.0) and demonstrated effective adaptation mechanisms at less favorable pH levels.



CONCLUSIONS

PERSISTENCE & EFFICACY

Aureobasidium pullulans remains viable on leaf surfaces for at least seven days at populations sufficient to sustain pathogen inhibition and provide 33 to 40% control of powdery mildew on pumpkin leaves.

TEMPERATURE

CF10 and CF40 complement each other across different temperatures: CF10 performs better at low temperature (15°C), while CF40 grows faster and remains more stable at higher temperatures (30°C).

UV EXPOSURE

Both strains maintained viable cell counts after four hours of environmentally relevant UV-A and UV-B exposure, demonstrating good tolerance to solar radiation under the tested conditions.

pH

Both strains grow well under acidic to slightly acidic conditions. Under alkaline conditions, *Aureobasidium pullulans* can acidify the environment toward a pH that better supports its development.

References:

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