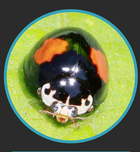
Mortality of native and invasive ladybirds: the effect of single and dual infections

INVASIVE LADYBIRDS

Harmonia axyridis is considered **one of the worst invasive species**. It is an Asian-native ladybird that has undergone a rapid increase in its global range, with **negative effects on native ladybird communities** and on wine grape production.

INVASIVE ASIAN LADYBIRD *HARMONIA AXYRIDIS*



NORTH AMERICAN-NATIVE LADYBIRD *OLLA V-NIGRUM*

STUDYING MORTALITY IN LADYBIRDS

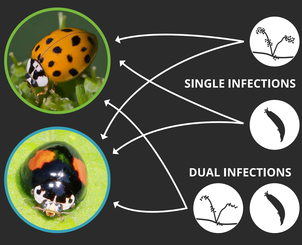
In this paper, we studied the **effects of fungal infections on the survival of 2 ladybirds**: the invasive Asian ladybird *Harmonia axyridis* and the North American-native ladybird *Olla v-nigrum*.

For both ladybird species we assessed survival after single and dual infections with different fungi.

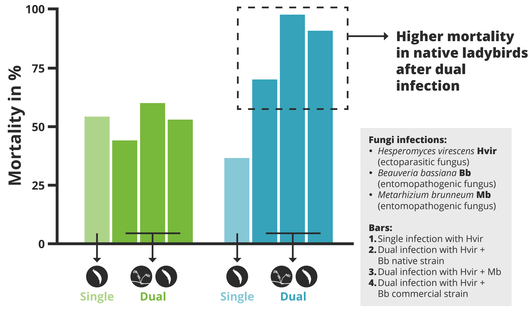
LADYBIRD INFECTED WITH THE FUNGUS *HESPEROMYCES VIRESCENS*

DUAL INFECTION KILLS MORE NATIVE LADYBIRDS

We found that **single infections cause mortality in both ladybird species**, but that **dual infection increased mortality only in the North American-native ladybird species**. In the invasive ladybird we did not find increased mortality.



MORTALITY WITH SINGLE & DUAL INFECTIONS

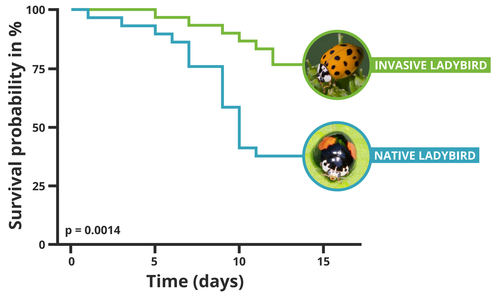


Fungi infections:
- *Hesperomyces virescens* **Hvir** (ectoparasitic fungus)
- *Beauveria bassiana* **Bb** (entomopathogenic fungus)
- *Metarhizium brunneum* **Mb** (entomopathogenic fungus)

Bars:
1. Single infection with Hvir
2. Dual infection with Hvir + Bb native strain
3. Dual infection with Hvir + Mb
4. Dual infection with Hvir + Bb commercial strain

CHANCE OF SURVIVAL AFTER DUAL INFECTION

Ladybirds infected with *Hesperomyces virescens* and (native) *Beauveria bassiana*



WHAT DOES THIS MEAN?

Our results (better survival of invasive ladybirds) are in line with the "enemy release hypothesis." This theory predicts that **invasive species that enter a new area have a higher chance of surviving natural enemies compared to native species**. This makes controlling invasive species very difficult.

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