



## BEERAD – Assessment of the effects of ionizing radiation (IR) in bees

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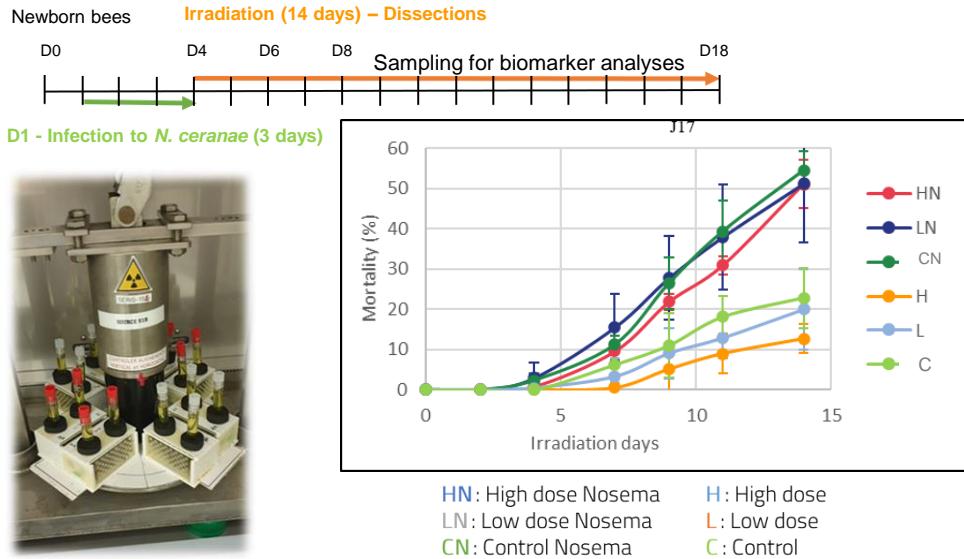


### Lab experiments

2022: combined effects of IR + pathogens

Infection to *N. ceranae*

14 days of irradiation to  $^{137}\text{Cs}$  (15  $\mu\text{Gy}/\text{h}$  and 15 mGy/h)

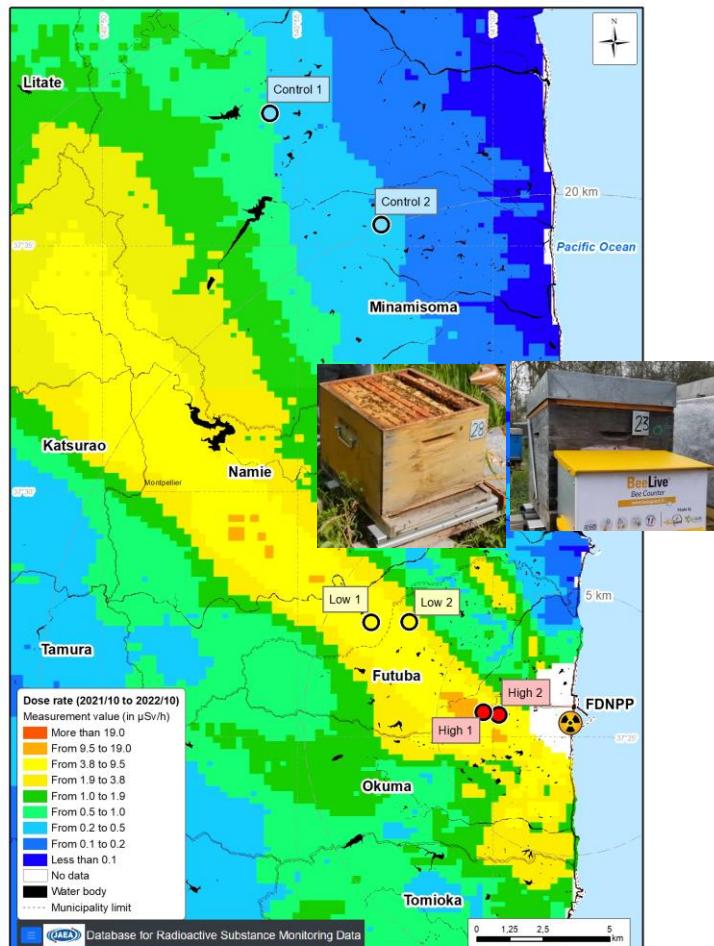


Protocol of laboratory irradiation experiment on bees infected with *N. ceranae* and results of cumulated mortality

### Field experiments

2022: exploration of sites

2023: start of experiment: hives April 2023 -> October 2024 (6 hives/site, connected scales+counters+biomarkers+ $^{137}\text{Cs}$  analysis in bees/honey)



Map of 1m air dose rate in the area of Fukushima NPP; circles=location of sites selected and their ground dose rates (JM Métivier, IRSN – ArcGIS)

2023: Analysis of all biomarkers

Effects of IR on emergence (irradiation of small hives in flight cages to see the effects on the number of newborn bees)

Effects of IR on behavioural responses (cognitive performances)

2024-2025: Extrapolation to other pollinating insects