VETPHARMA
CHEMO

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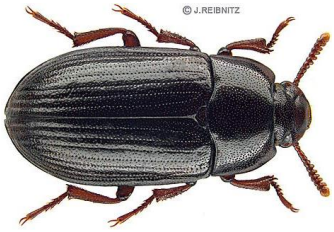
CAPT 7

The ecological and efficient way to monitor and control darkling beetles in poultry-rearing facility



Biology: Darkling beetle *Alphitobius diaperinus* (Panzer 1797)

- Is a known worldwide insect pest of poultry-rearing facilities[1,2],
- Damages poultry housing structures by chewing holes in isolation materials, increasing heating energy costs (4000$/yr[1,2]),
- Transmit many pathogens causing diseases and decreasing animals' growth [1,2],

Control: Two standard methods are applied to control pests in poultry rearing facility:

	Insecticides	**Traps (Capt7)**
Treatment period	No animals in the building (fallowing)	Possible all the time
Resilient effect	Only few active molecules are resilient	Yes (as present during rearing)
Risk for health	Dangerous	Safe
Set-up	Need equipment & Time	Quick & easy to handle
Efficacy	Only few molecules affects both adults and larvae	Capture both adults and larvae
Risk of resistance	Almost certain (as selection of survivors which will build up a new resistant population)	Almost impossible (as based on natural hiding behavior, essential for beetles' survival)
Ecology	More and more regulations against active molecules	Supported "way to go green"

[1] Dunford & Kaufman, 2006, http://edis.ifas.ufl.edu/pdffiles/IN/IN66200.pdf
[2] Geden & Hogsette, 2001, http://www.ars.usda.gov/sp2userfiles/place/60360515/downloads/lincoln.pdf

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Origin and how it works: Capt7 is born of an extensive **2 years' research** project carried out specifically on darkling beetles thanks to a collaboration with the **farmers' co-op Vivadour** from South-West of France.

Capt7 **naturally attracts** the darkling beetles due to its openings' shape and physically **avoids their escape** due to its patented pit-fall trap structure

Capt7 is **reusable** as it is made of strong plastic and as it is easily emptied thanks to its hinge. Its size (30 cm (12 in) long and 60 cm (24 in) circumference) allowed to capture and store huge amount of darkling beetles.

Test results in lab and field

At the opposite of the commercial insect traps currently used by some farmers, the Capt7 was **specifically designed to capture darkling beetles** (Fig. 1). And this specificity is widely demonstrated by the field results; the Capt7 being 2 to 4 times more efficient in capturing darkling beetles (Fig. 2). This results was confirmed with more than 15 replicates carried in different poultry-rearing facilities in the South-West of France.

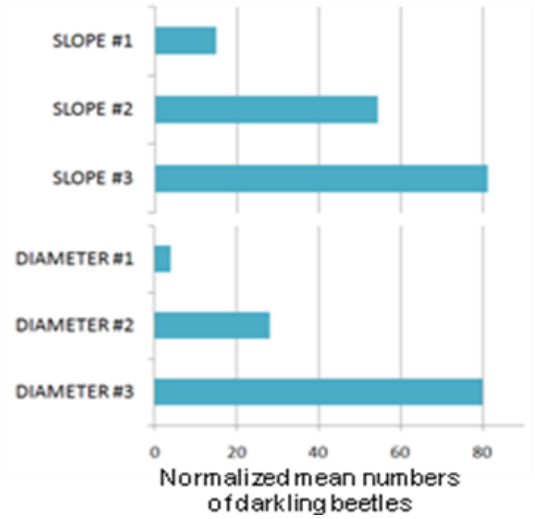

Fig. 1: Lab experiments of traps' design based on 100 darkling beetles

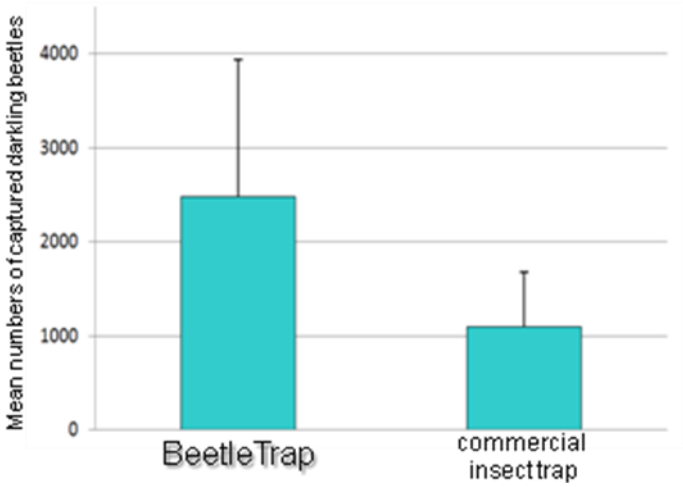

Fig. 2: Field experiments of traps' capture

As demonstrated in lab and field experiments (Fig. 3 & 4), adding **attractant** within the Capt7 optimize darkling beetles' capture as it speeds up the first captures.

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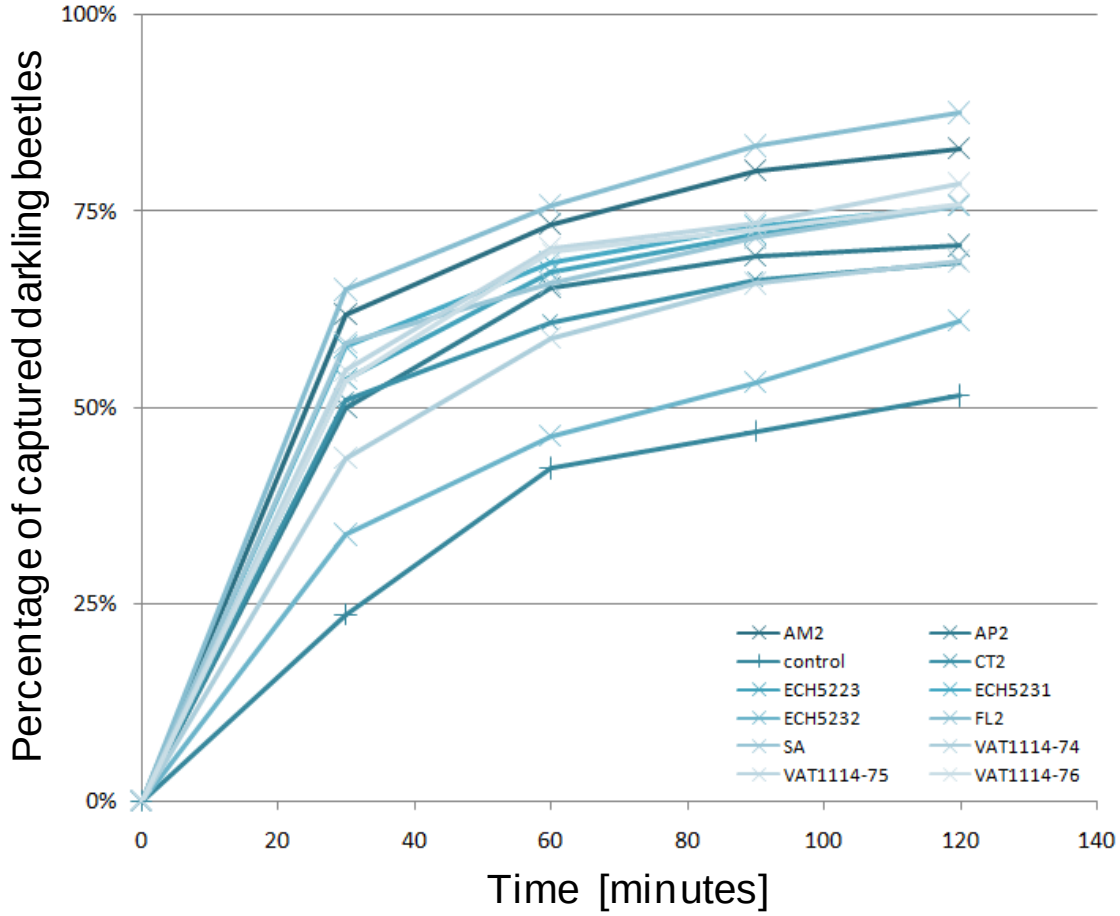

Fig. 3: Lab experiments on attractants' selection

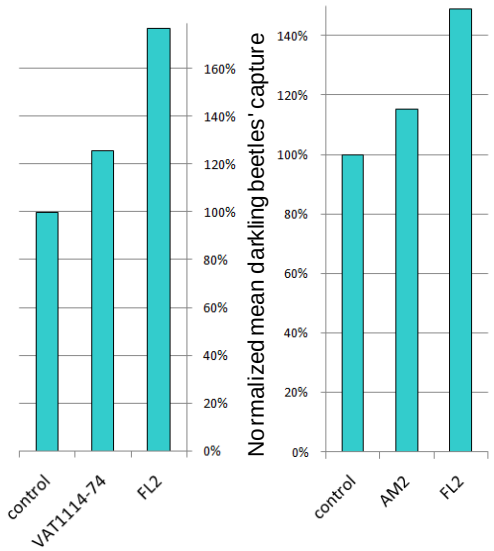

Fig. 4: Field experiments on attractants

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Fig. 5: Field captured darkling beetles with Capt7

Instructions of use

1. Open the trap
2. **Pour 20-30g of the attractant powder** into the trap
3. the trap is **easy to close** thanks to its hinge
4. Put the Capt7 just **below a chicken feeder** where the darkling beetles tend to aggregate.

Or you can also place it in the straw and the **poultry will make it move** all over the facility, allowing the capture of darkling beetles in every nook of the building.

One trap per 75-100 m² seems to be an adequate concentration. However, this density depends mostly on the darkling beetles' population level and the method chosen: population control via **mass trapping** or just **population monitoring** in complement to other methods of control.

Traps must be **emptied** each **20 days**; this frequency can be modified depending on rearing facility's infestation and farmer's availability. It has to always be emptied **at the end of the rearing period**, but it can be done at any time during the rearing period.

The **attractant** provided **quickly attracts** the first beetles. These beetles release **pheromones** that **attract** other beetles of the same species; performance of the trap is optimal when some beetles are trapped in. However, it is not advisable to let the beetles die and degrade, as this degradation would counteract the attracting effect and would chase free beetles away.

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Conclusion:
The Capt7 is an **easy and green method** to efficiently **monitor** and **control** the populations of **darkling beetles** within the poultry-rearing facilities.