

Biannual monitoring of pyrethroid and neonicotinoid susceptibility in Danish pollen beetle (*Meligethes aeneus* F.) populations

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Monitoring 2014 and 2015

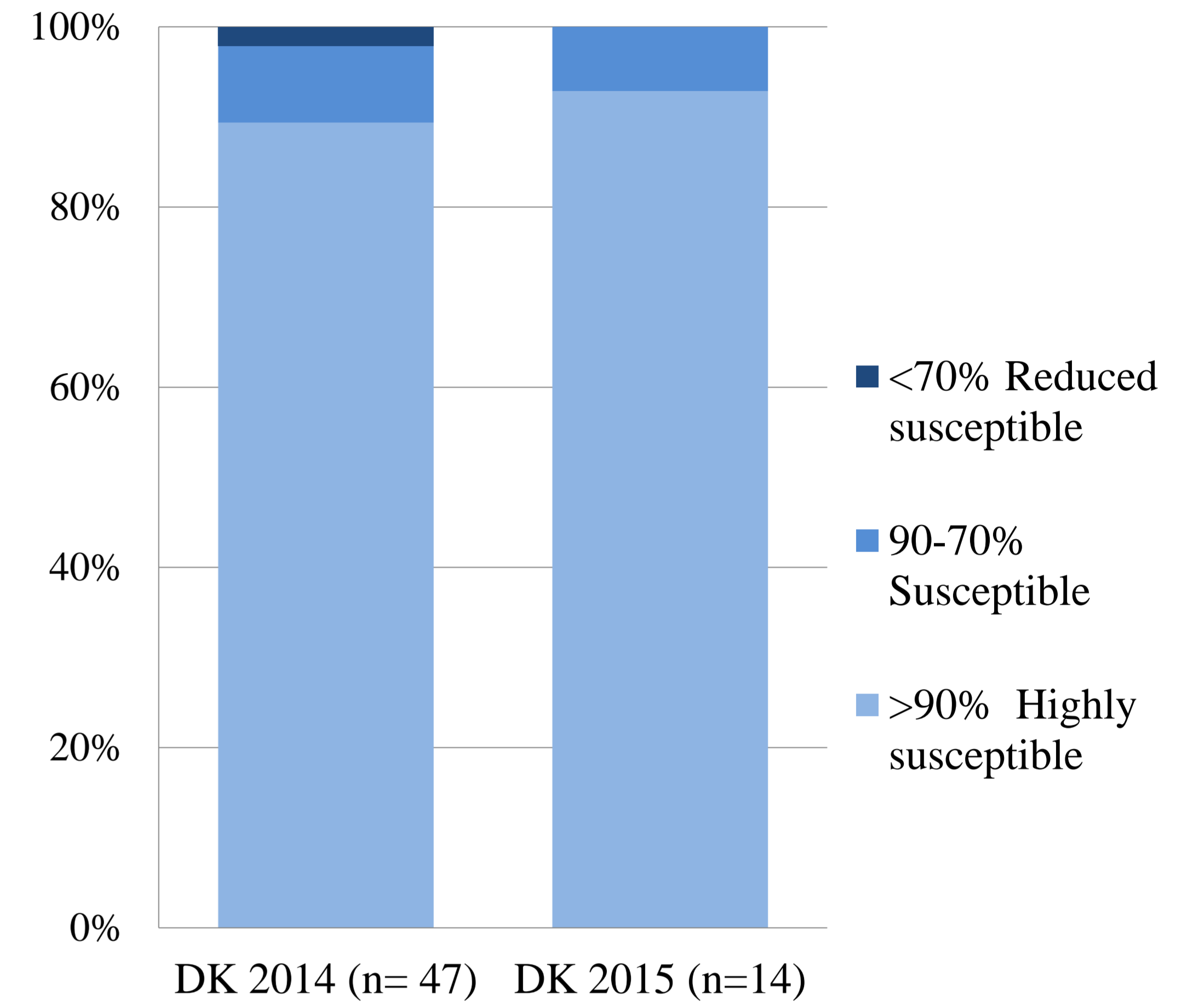
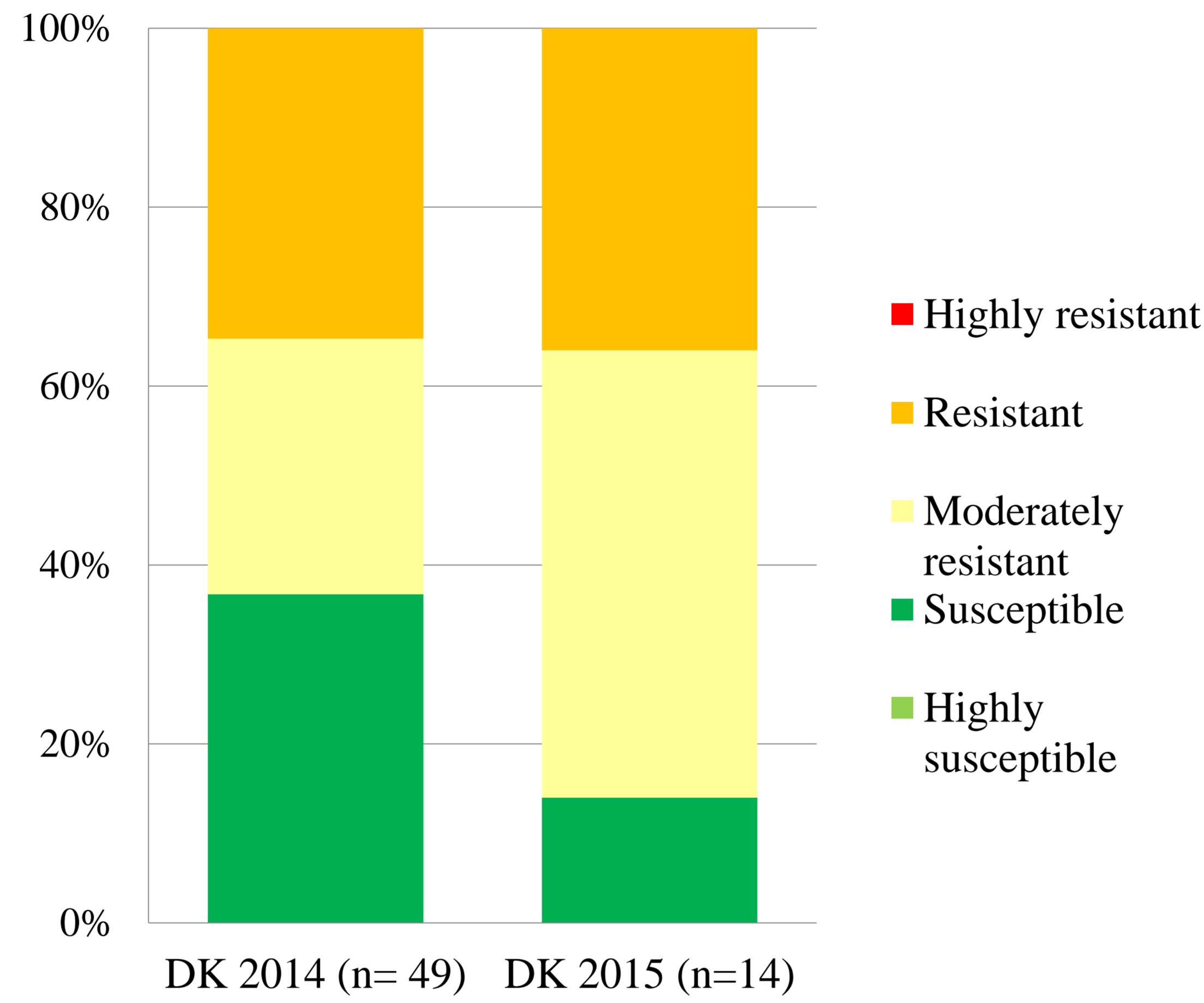
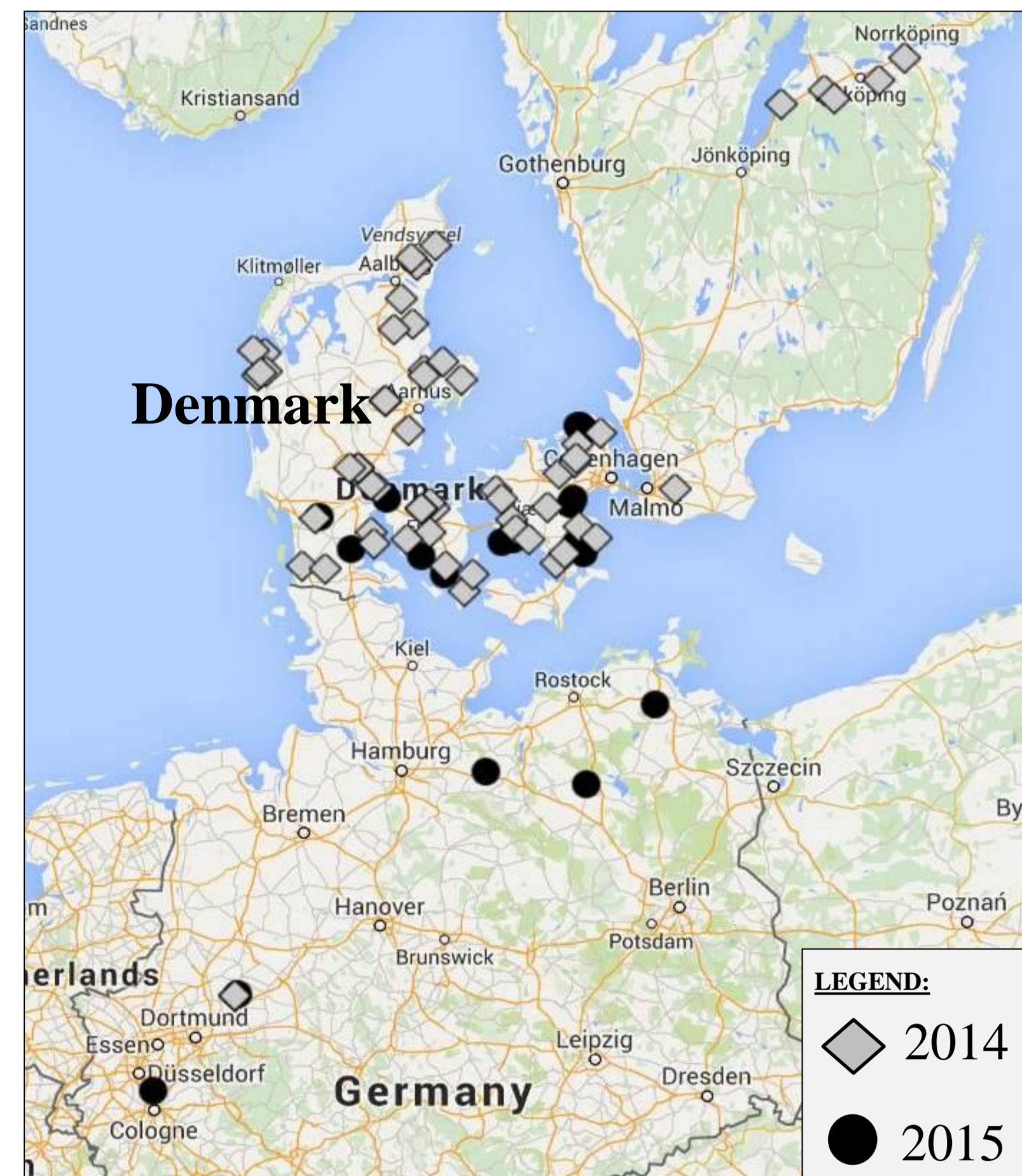
- Beetles were collected from oilseed rape fields at growth stages BBCH 50 to 69
- Beetles were stored at least 24 h in climatic chambers at 4-6°C
- IRAC Adult-Vial-Test methods no. 11 Version 3, with the active ingredient λ -cyhalothrin and IRAC Adult-Vial-Test methods no. 21 Version 3.4 for thiacloprid

Results for the Adult-Vial-Test with λ -cyhalothrin (IRAC # 11):

- In 2014 the majority of the tested populations in Denmark were classified as resistant
- In 2015 the 14 tested populations were dominated by moderately resistant populations

Results for the Adult-Vial-Test with thiacloprid (IRAC # 21):

- Both years were dominated by highly susceptible populations in Denmark

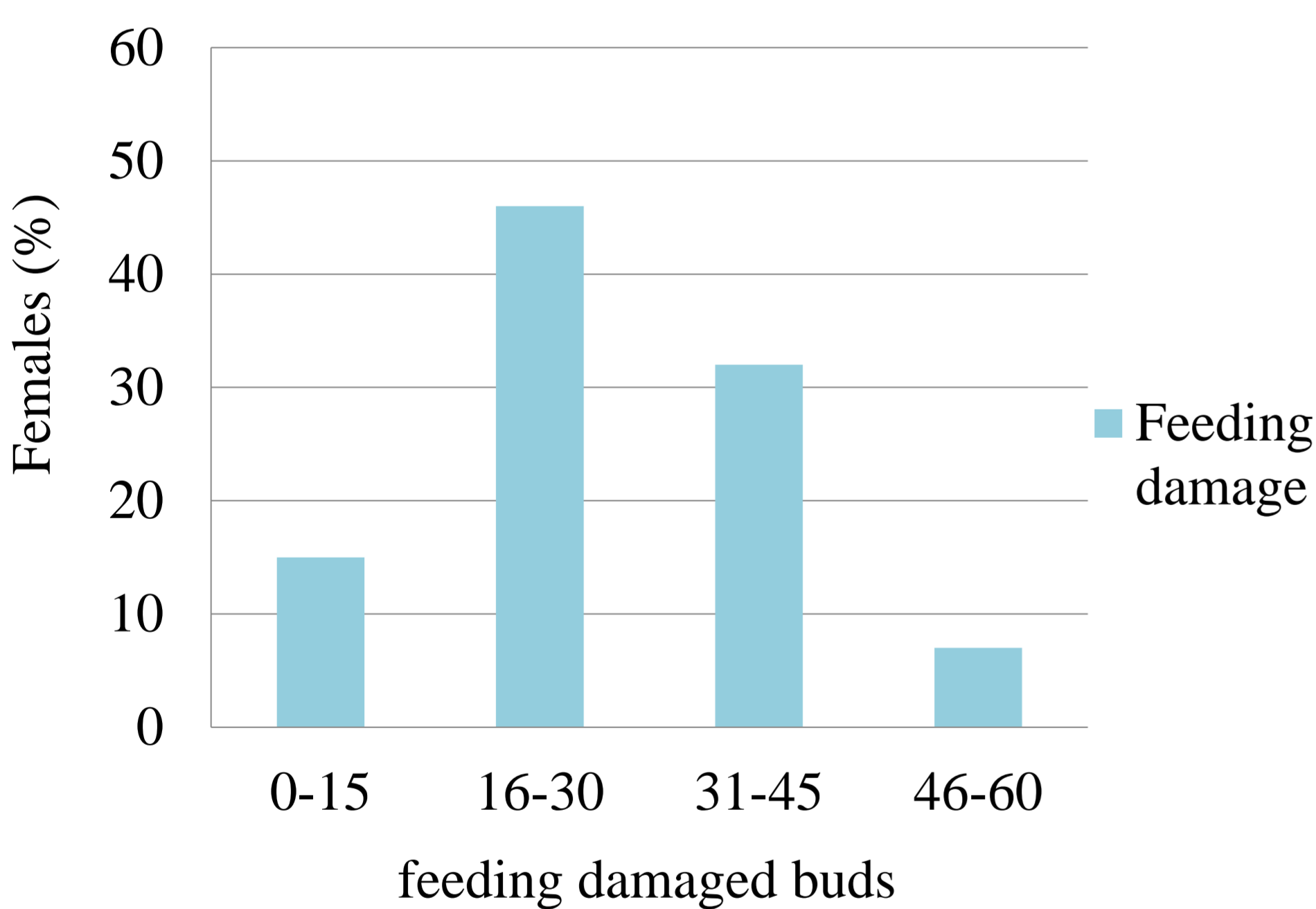


Biological studies in 2015

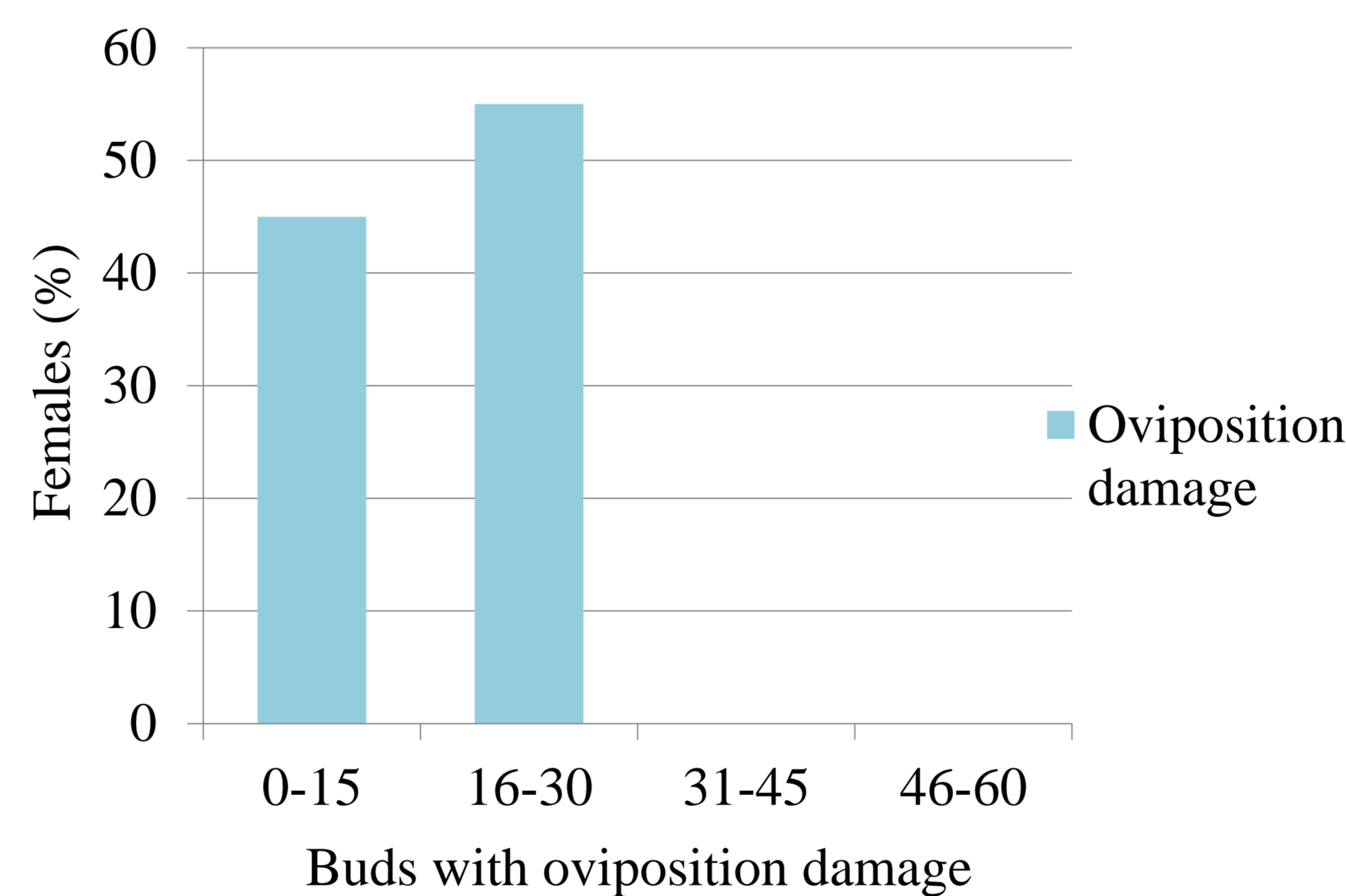
- Beetles were sexed with a modified method based on (Ruther and Thiemann, 1997)
- Inflorescences with a minimum of ten buds with a size of 2-3 mm for oviposition and smaller buds for feeding were chosen (Ferguson et al., 2014)
- In total 69 paired pollen beetles were used from different geographic regions
- After 24 h the oviposition was examined for a total of four days



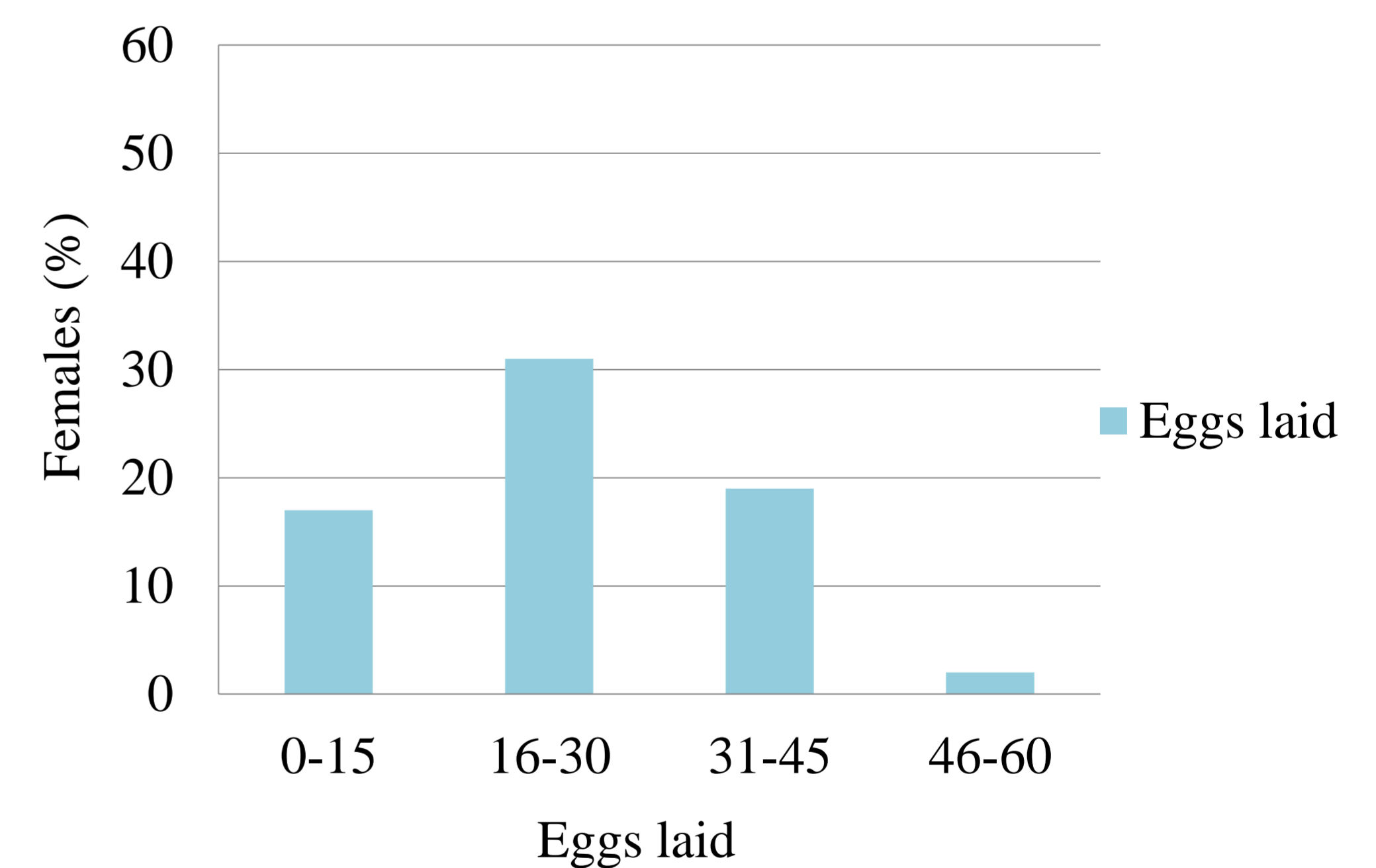
Feeding damaged buds in 4 days



Oviposition damaged buds in 4 days



Eggs laid in 4 days



Discussion

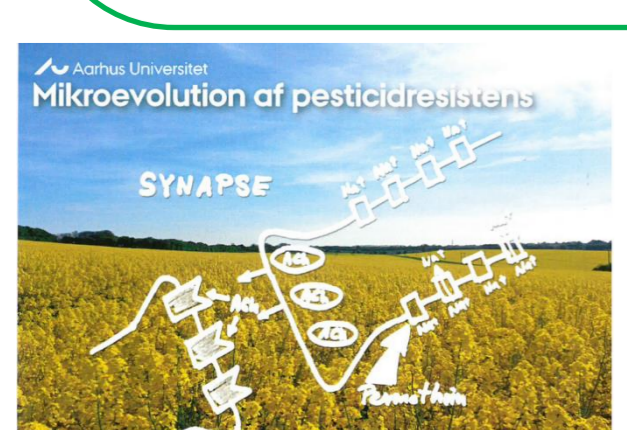
- Denmark cultivated in 2014 an area of around 164 000 ha with oilseed rape
- This monitoring was assigned to understand the spread of resistance to λ -cyhalothrin and the status of the susceptibility level to thiacloprid in Denmark
- In 2013 the IRAC pollen beetle resistance monitoring showed that resistant populations dominate in most European countries
- In Denmark 49 populations were tested and resistant beetle populations dominated the monitoring in 2014, and in 2015 the moderately resistant populations dominated
- The susceptibility towards thiacloprid is stable in Denmark and susceptible populations dominated in this biannual monitoring

Acknowledgements:

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References:

Ferguson et al. (2014). *Pest Manag Sci* **71**, 459-66.
Ruther, J., and Thiemann, K. (1997). *Entomologia Experimentalis et Applicata* **84**, 183-188.



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