



Seasonal Field Parasitism of *Halyomorpha halys* and Co-occurring Non-target Species in China

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KNOWLEDGE FOR LIFE

Yang et al. 2009: *Trissolcus japonicus*
causing average annual parasitism of 50% in
Chinese fruit orchards



Alternative host in the lab:
Erthesina fullo
Dolycoris baccarum
Plautia crossota

➤ ecological host range of *Trissolcus japonicus* in China?



➤ seasonal parasitism by different species?

➤ Influence of host trees on parasitism?

Study sites

Xishan and Yanshan
mountain ranges.

North China Plain

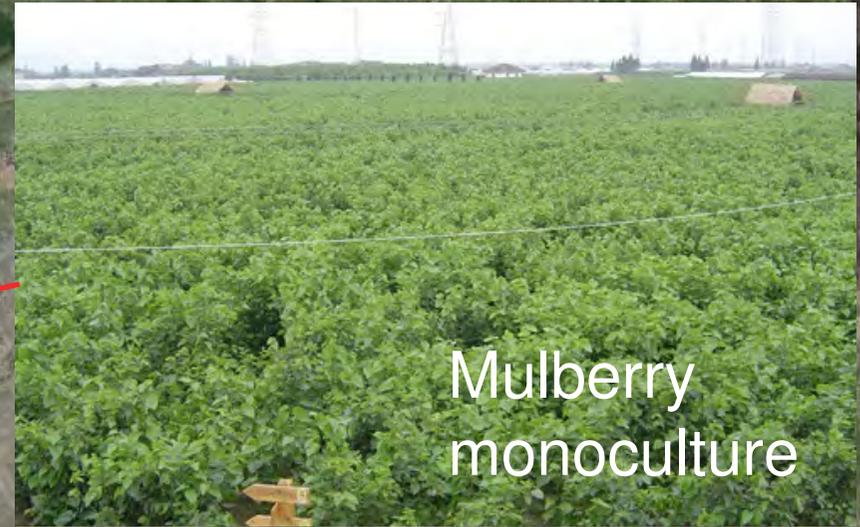
N40°18' E116°13'10"
Beijing



Study sites

Shengsangyuan

40°1'8"116°13'10" Lengquan



mulberry

peach



Haidian

Beijing Beijing

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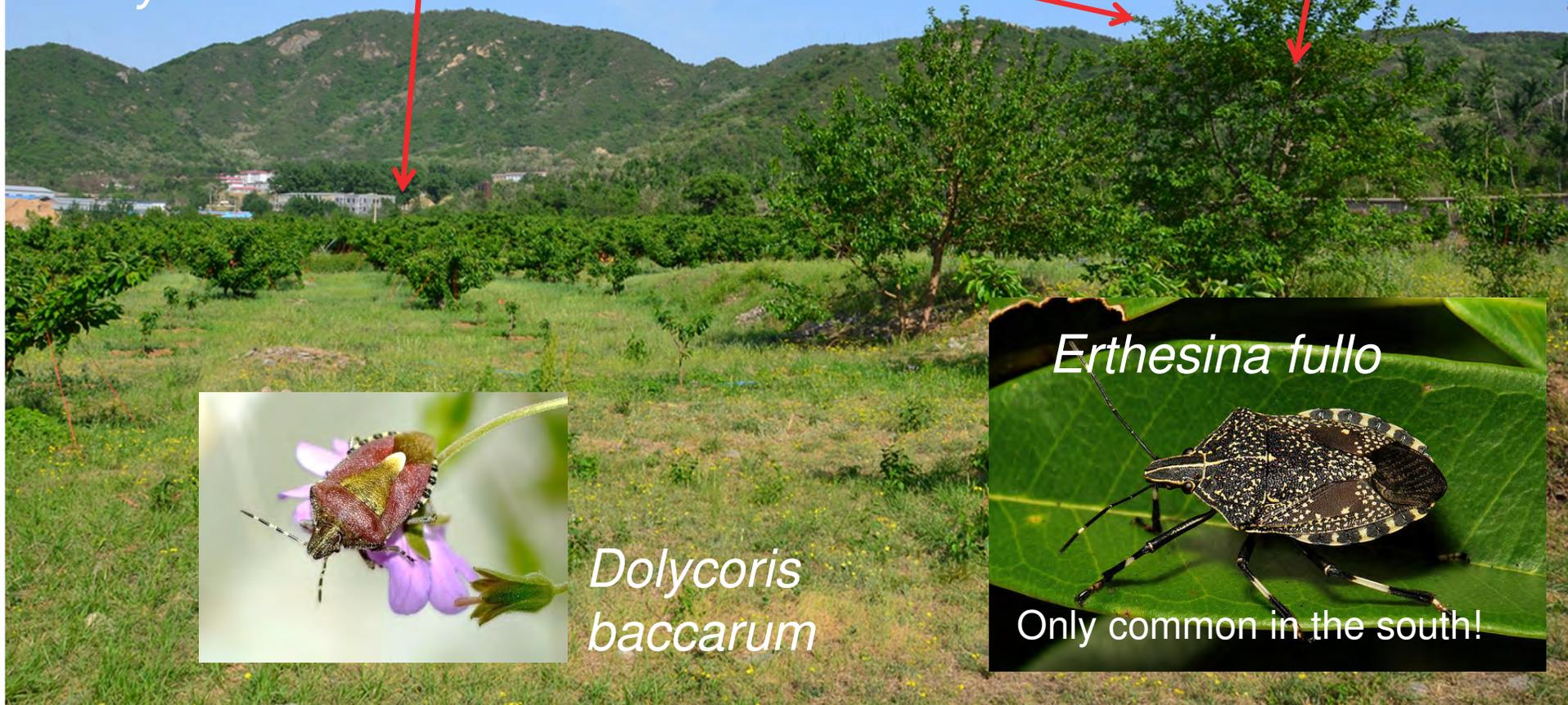
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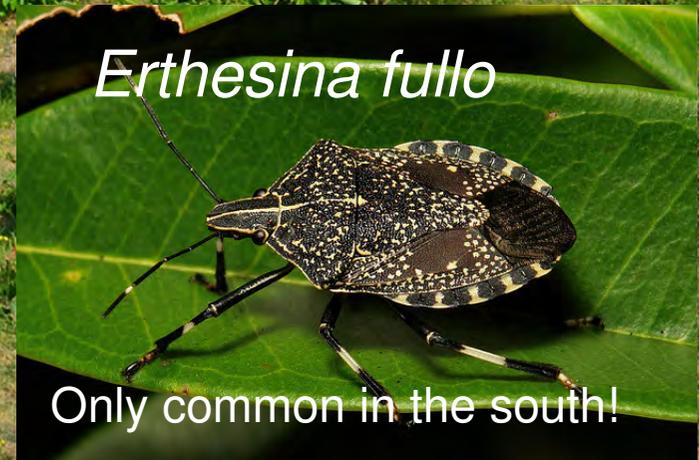
Halyomorpha halys



Plautia fimbriata



Dolycoris baccarum



Erthesina fullo

Only common in the south!

Methods

- Collection of egg masses from natural host plants
- Extremely time consuming, often with little success
- Numbers for most species too low to define parasitoid complex



Methods



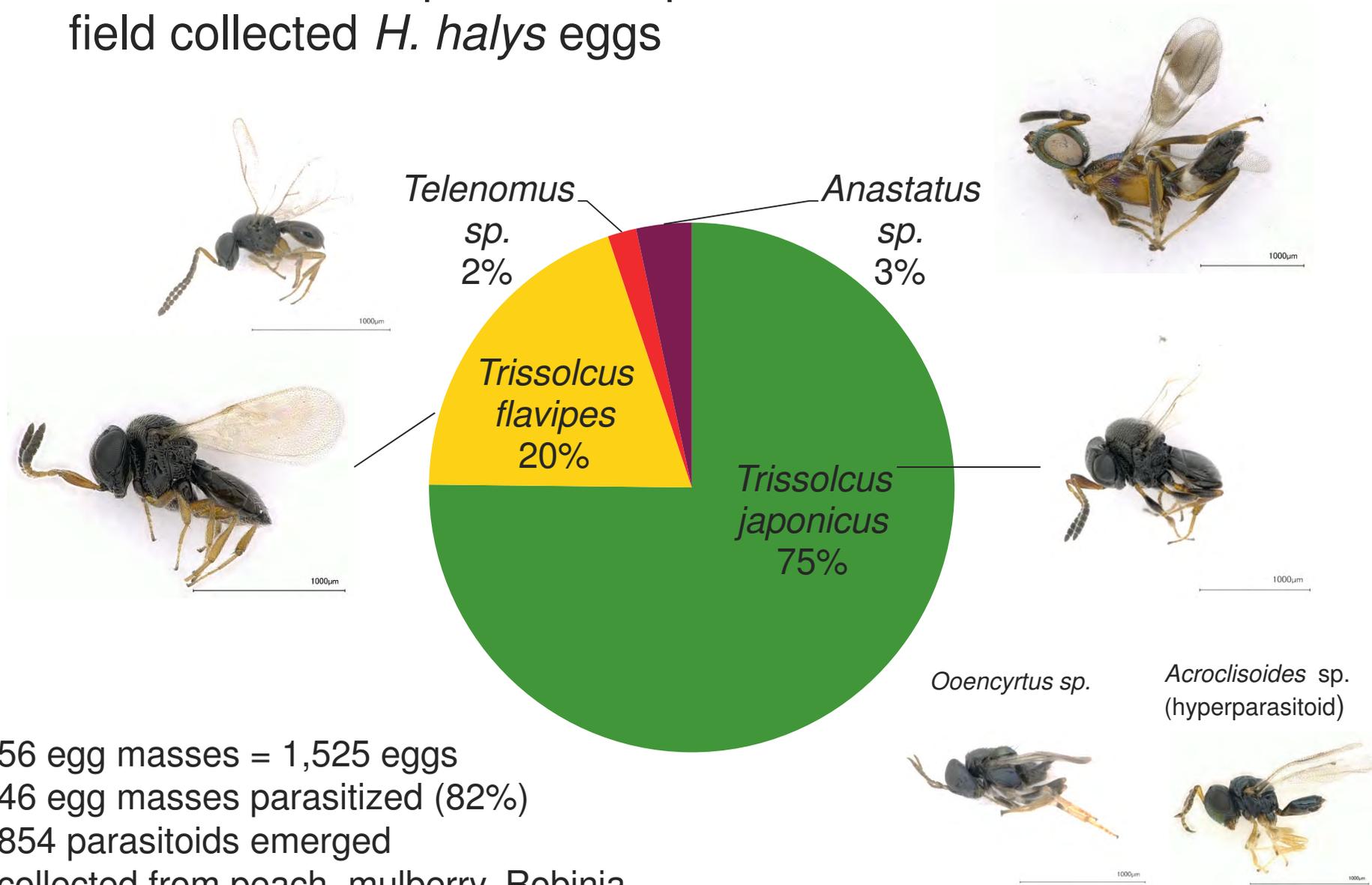
- Exposure of sentinel egg masses of *H. halys*, *D. baccarum* and *P. fimbriata* from laboratory colonies at CABI-MoA Joint laboratory (Beijing)
- Egg exposure from mid-May to September
- Exposed egg masses were recollected after five days
- Rearing of parasitoids in the lab





Results

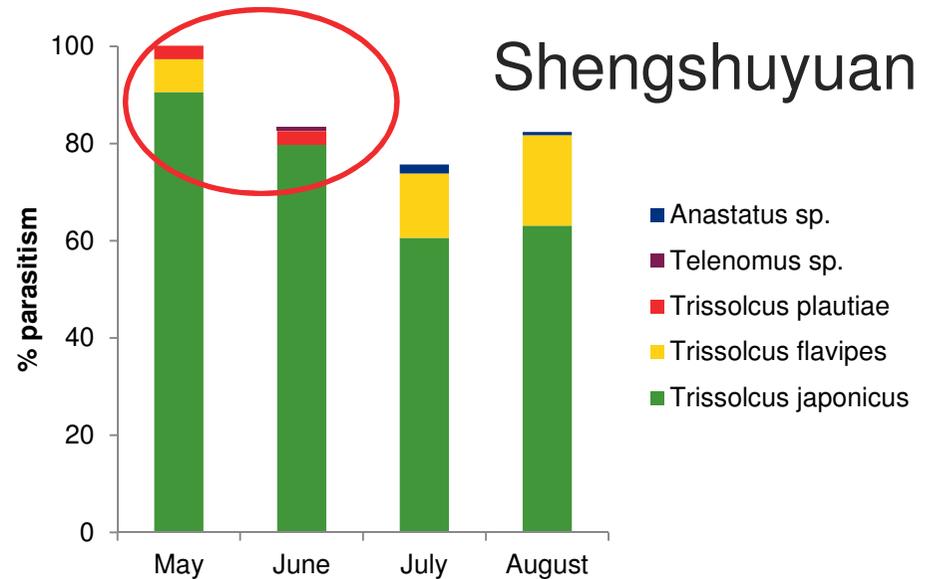
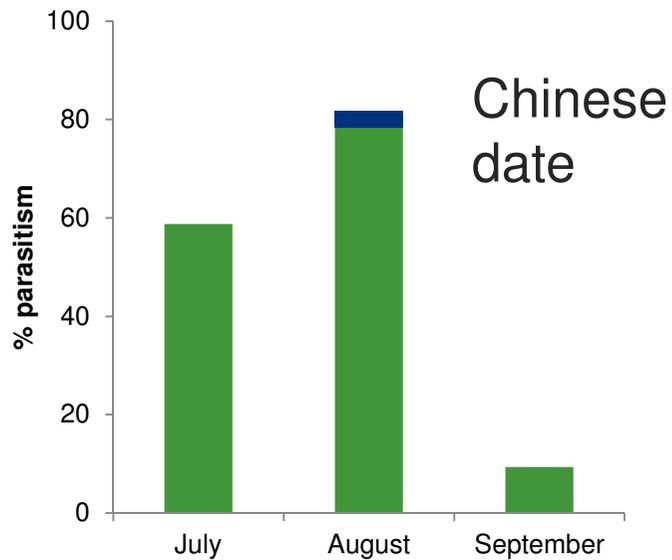
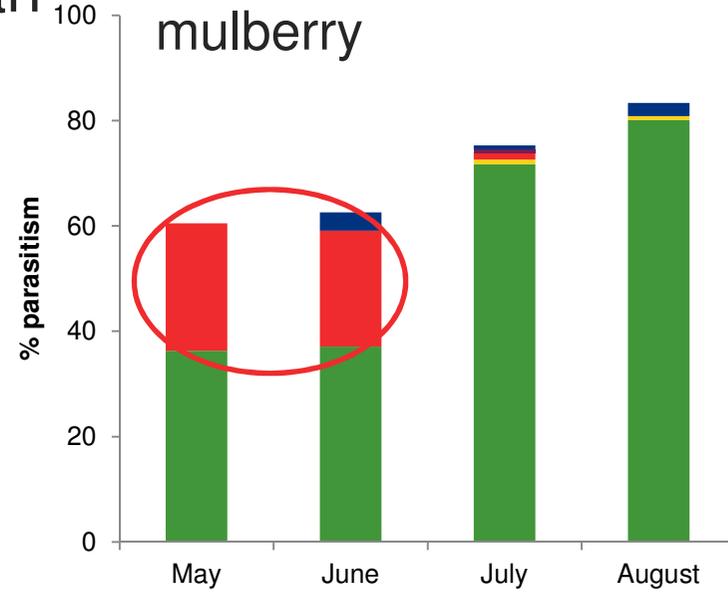
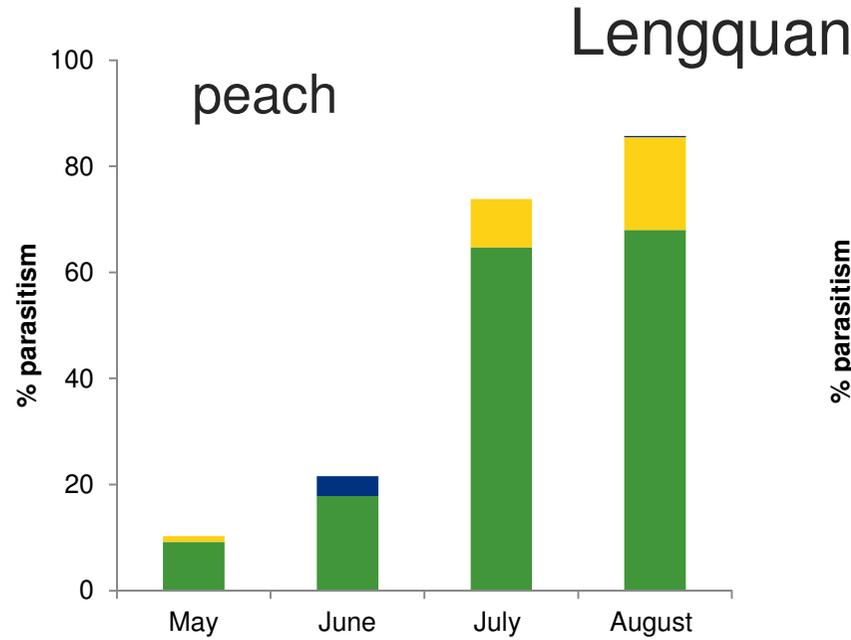
Parasitism and species composition:
field collected *H. halys* eggs



56 egg masses = 1,525 eggs
46 egg masses parasitized (82%)
854 parasitoids emerged
collected from peach, mulberry, Robinia

Results

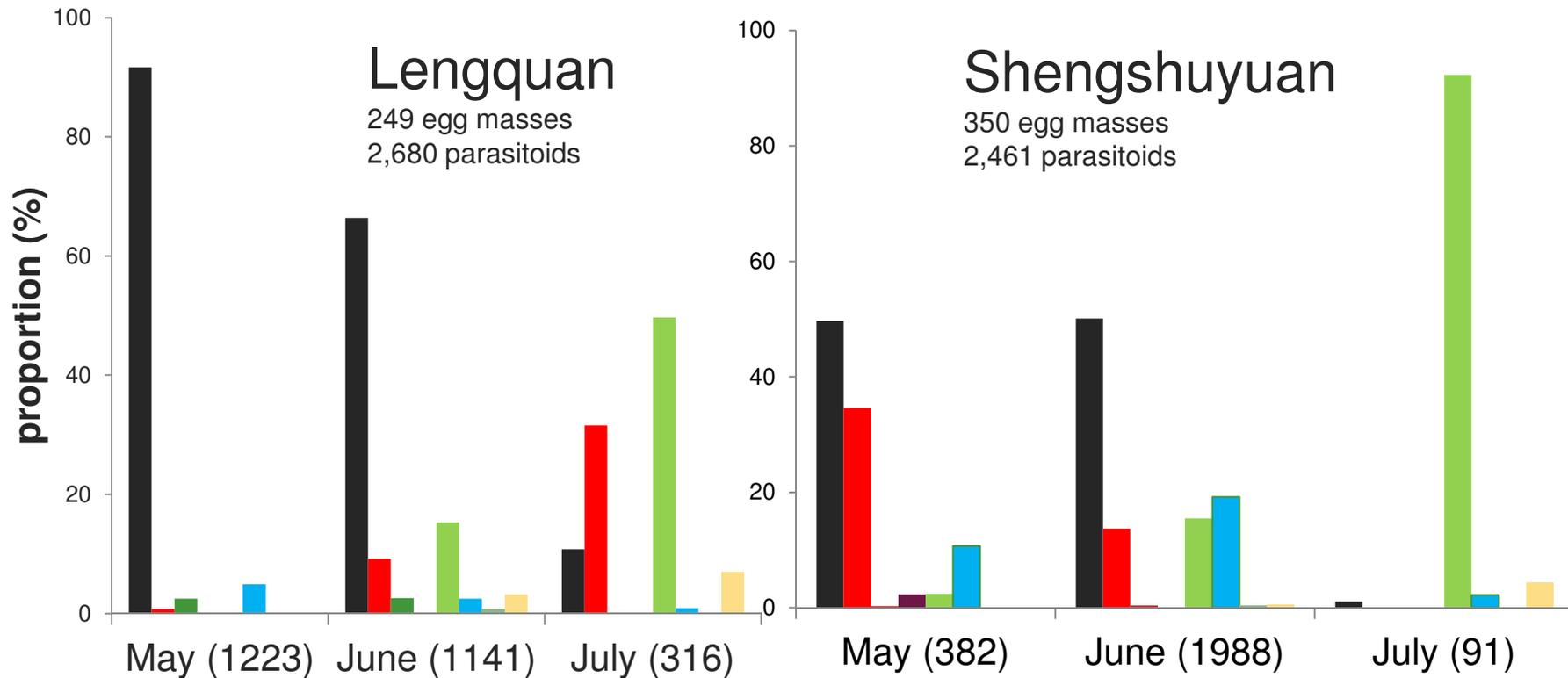
Parasitism of exposed *H. halys* eggs



- Anastatus sp.
- Telenomus sp.
- Trissolcus plautiae
- Trissolcus flavipes
- Trissolcus japonicus

Results

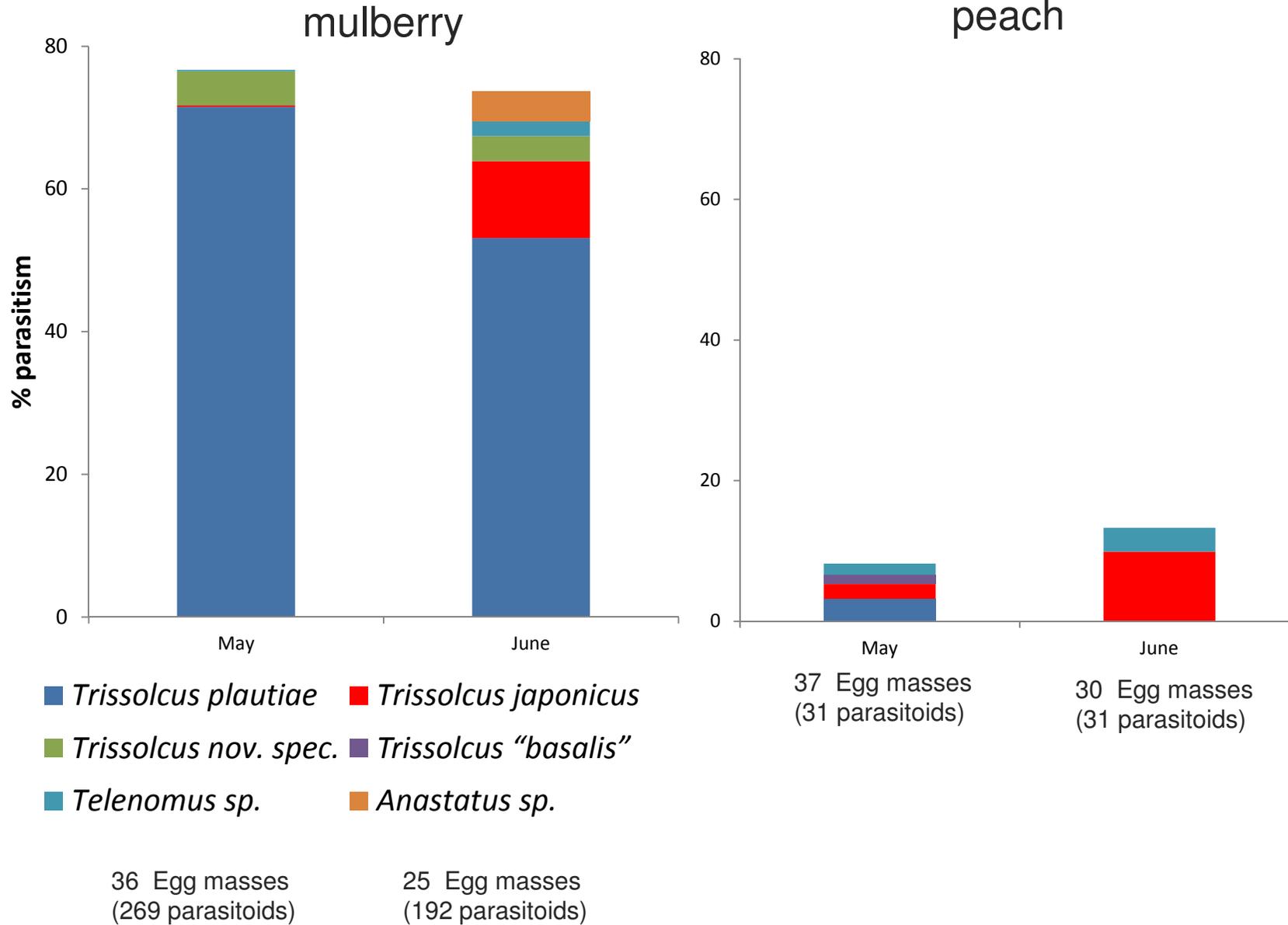
Parasitism and species composition:
field collected *Plautia fimbriata* eggs
(all from mulberry trees)



- Trissolcus plautiae*
- Trissolcus japonicus*
- Trissolcus "dark"*
- Trissolcus flavipes*
- Anastatus sp.*
- Telenomus sp.*
- Ooencyrtus*
- Acroclisoides*

Results

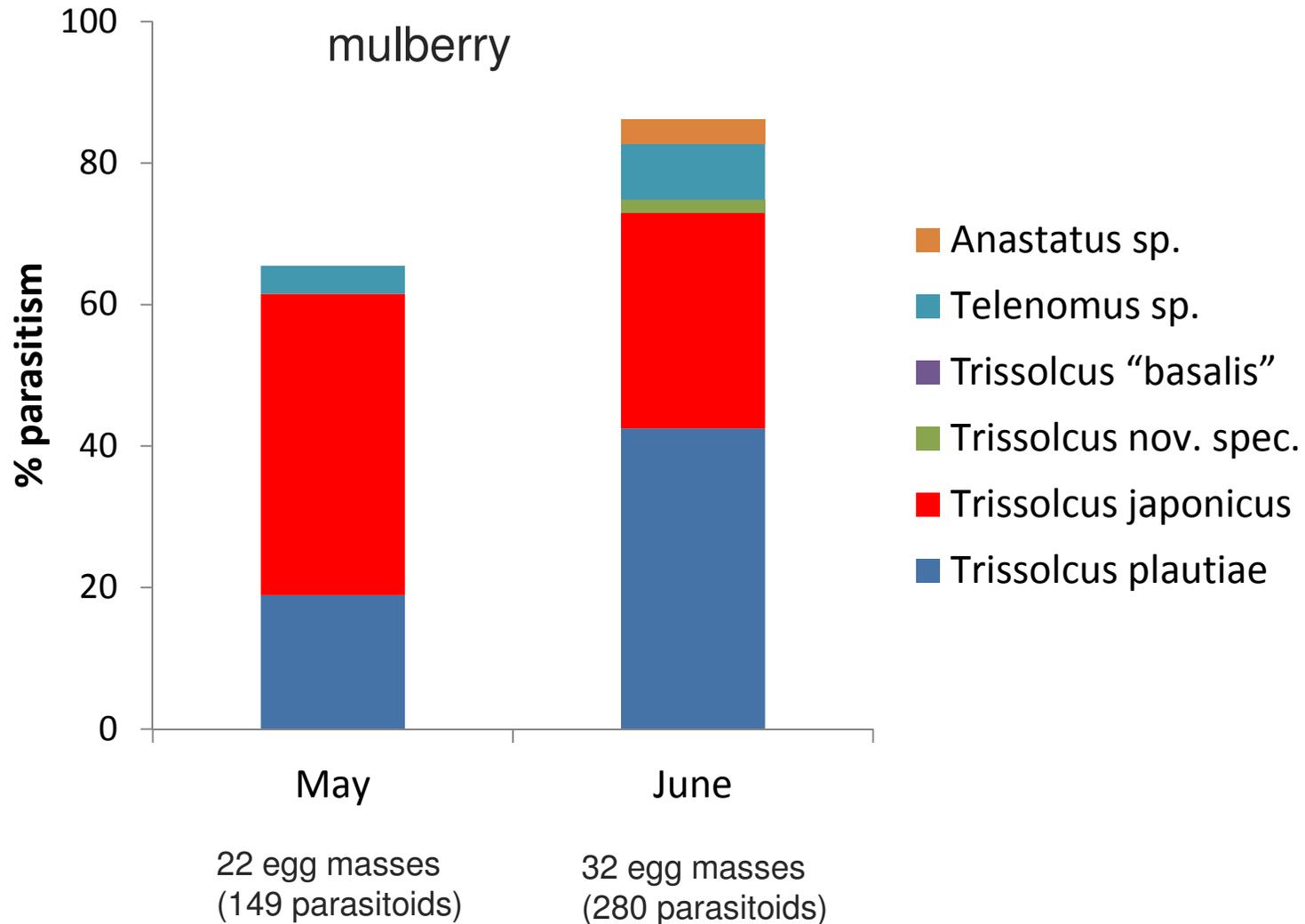
Parasitism of exposed *P. fimbriata* eggs: Lengquan



Results



Parasitism of exposed *P. fimbriata* eggs: Shengshuyuan

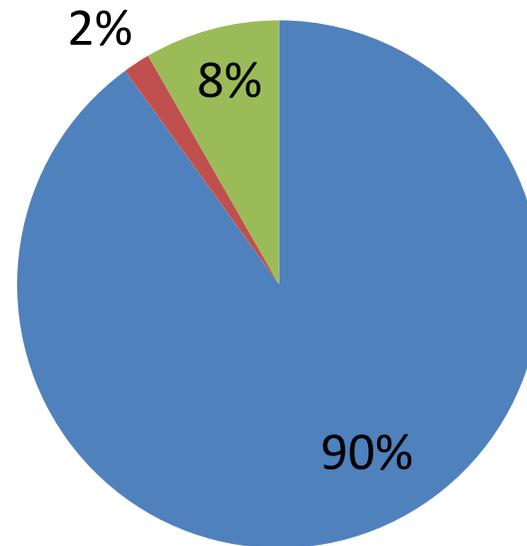


Results

Parasitism of field collected *D. baccarum* eggs

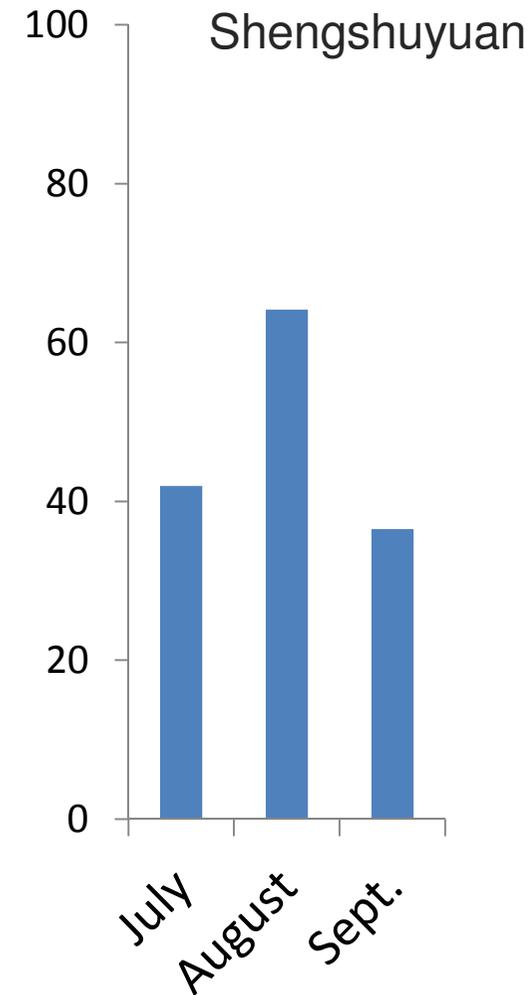
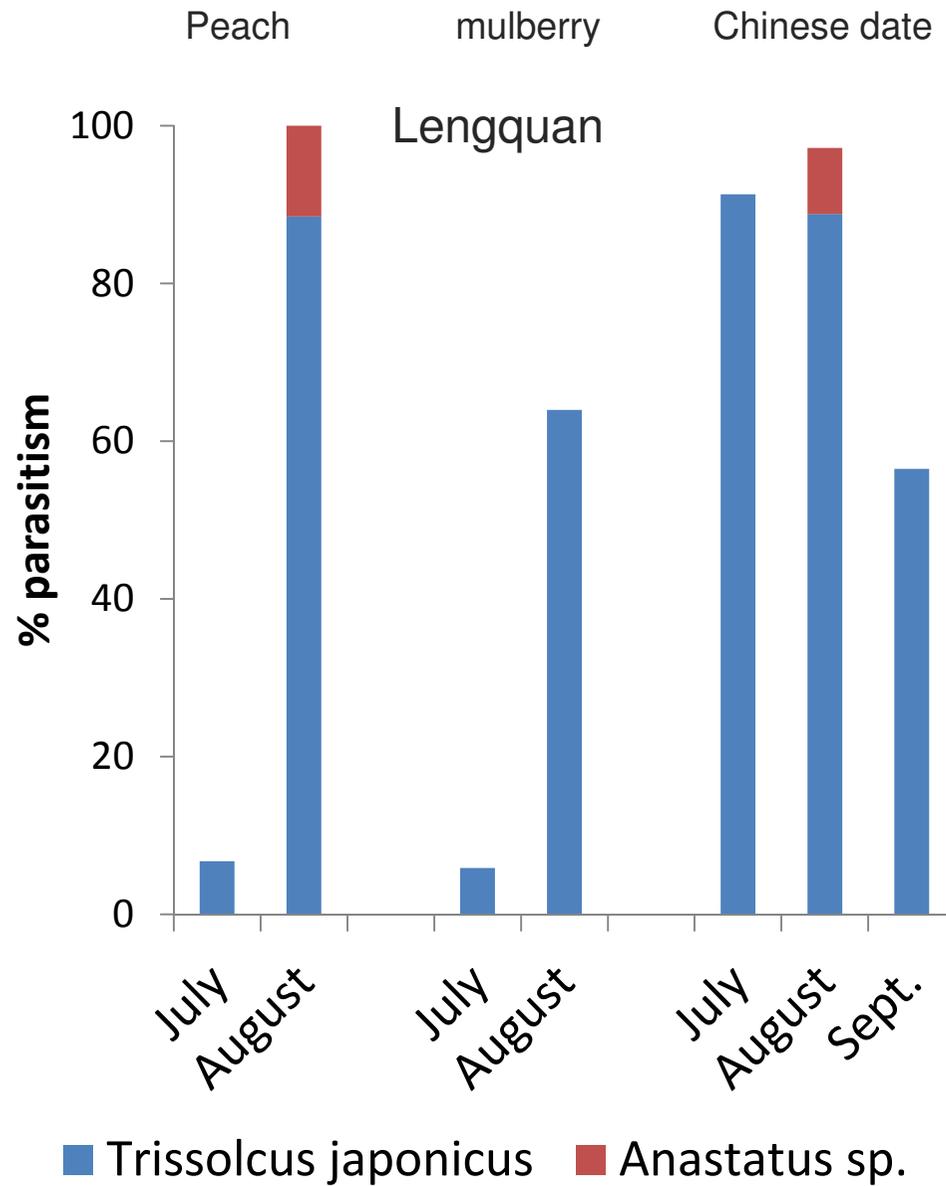
- 18 egg masses from weedy hosts
- only 5 parasitized
- 120 parasitoids emerged

■ *Trissolcus japonicus* ■ *Telenomus* sp. ■ *Ooencyrtus* sp.



Results

Parasitism of exposed *D. baccarum* eggs



86 egg masses

38 egg masses

Conclusions and work in 2014



- *T. japonicus* most dominant species throughout the season, likely not much influenced by host plant
- Ecological host range of *T. japonicus* contains other species, e.g. *Plautia* and *Dolycoris*
- *T. japonicus* is an oligophagous species, non-target attacks likely, risk-benefit analysis needed
- *T. flavipes* less abundant, but maybe having a less broad host range
- *Anastatus* of minor importance in controlling *H. halys*
- 2014: exposure of egg masses at natural sites, exposure of additional non-target species, including the predatory species *Arma chinensis*



CABI-MoA Joint Laboratory

Tara Gariepy, Dave Gillespie, Peter Mason

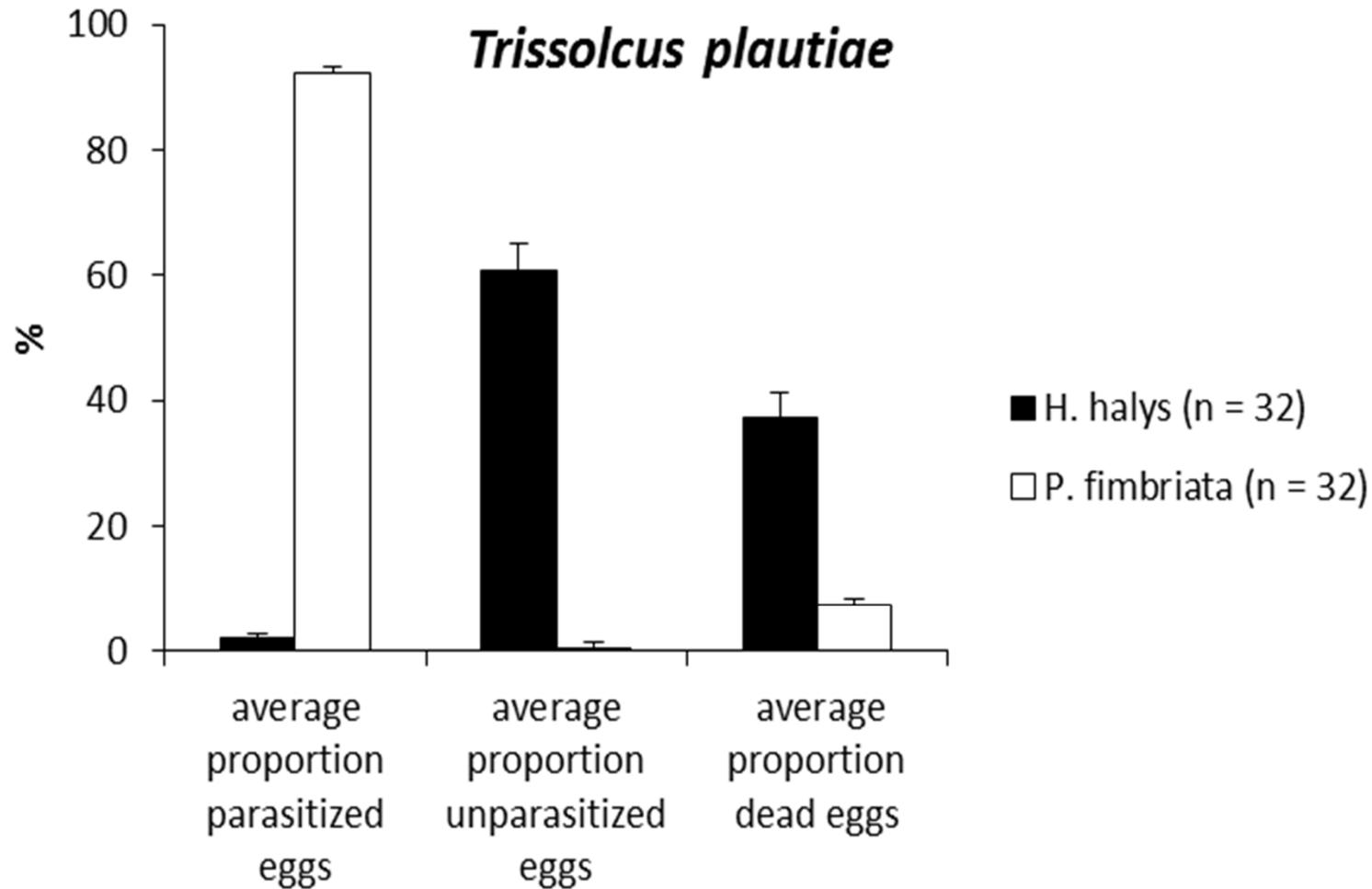
Elijah Talamas, Matt Buffington, Kim Hoelmer, Marie-Claude Bon

Funded by: Agriculture and Agri-Food Canada



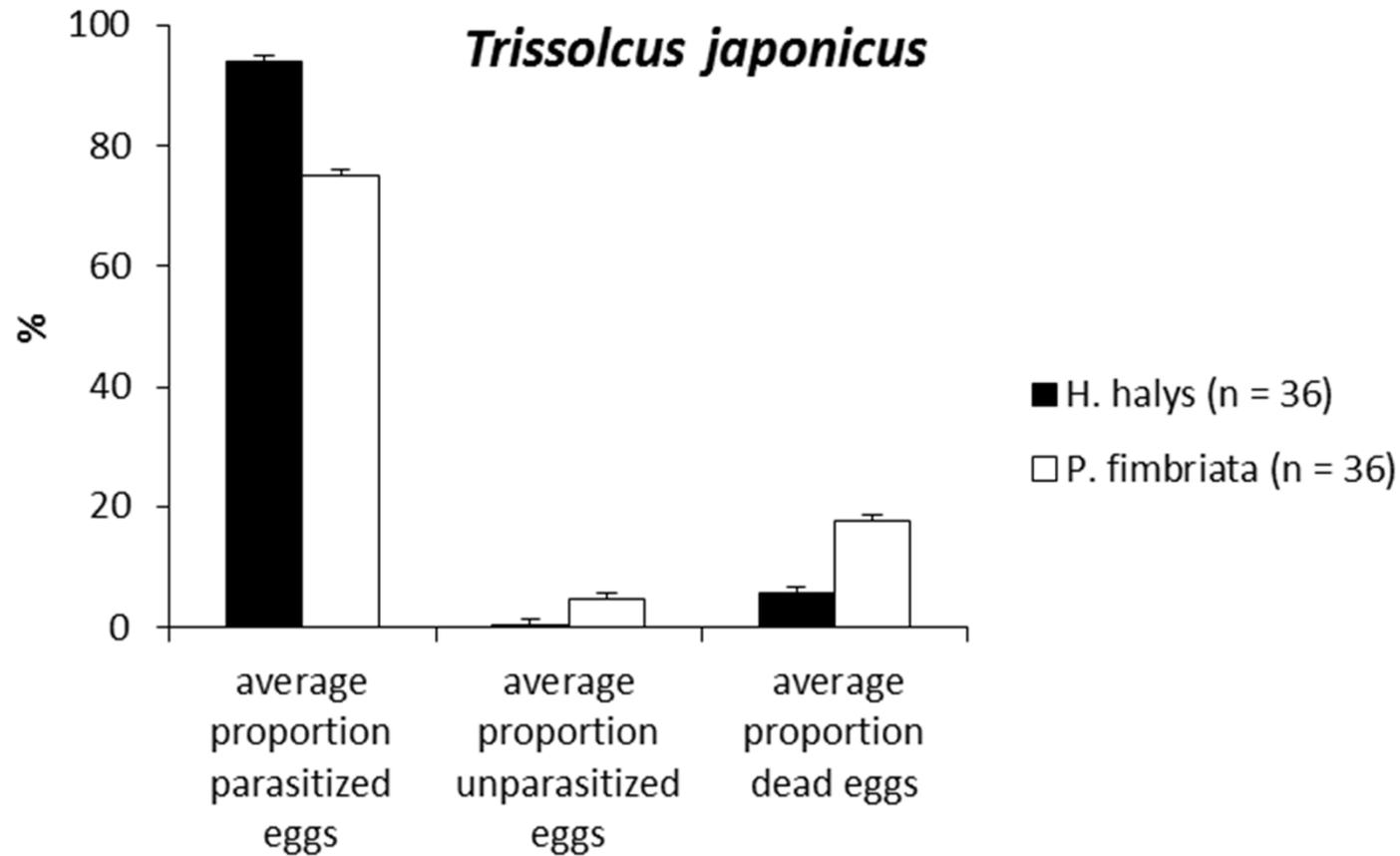
Thank you!

Results – laboratory no-choice tests



Parasitism and egg mortality in no-choice tests with *Trissolcus plautiae* when exposed for 24 hours to either *H. halys* or *P. fimbriata* eggs .

Results – laboratory no-choice tests



Parasitism and egg mortality in no-choice tests with *Trissolcus japonicus* when exposed for 24 hours to either *H. halys* or *P. fimbriata* eggs