

Department of Agriculture, Fisheries and Forestry

Biocontrol of *Cylindropuntia* spp.

Specifically targeting
Coral cactus
(*Cylindropuntia fulgida* var. *mamillata*)

Small state. Great opportunity.
Add a plan for the future. Queensland Government

Cylindropuntia spp.

Identifying these cactus

- cylindrical segments
- papery sheath on spines



- 33 species worldwide
- southwestern and southern USA and Mexico
- 8 naturalised species in Australia

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C. rosea (white spined Hudson pear)




C. tunicata (brown spined Hudson pear)

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C. leptocaulis (Christmas cactus)

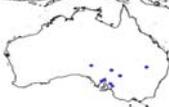



C. kleiniae (Pencil cactus)

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C. spinosior (Snake cactus)

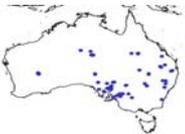



C. prolifera (Jumping cactus)

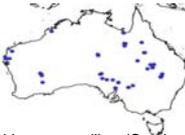
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Photo: Kate Detchon



C. imbricata (Rope cactus)

C. fulgida var. *mamillata* (Coral cactus)

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Dactylopius tomentosus biotypes

What are biotypes?

'Strains' of the same insect that can not be identified as being different but can be separated by their

- ability to feed and lay eggs on different cactus
- survival and development on different cactus

Dactylopius tomentosus biotypes

7 biotypes were collected from USA and Mexico

- 'imbricata' (*C. imbricata*; Americas 1925)
- 'rosea' (*C. rosea*; Mexico 2009)
- 'cholla' (*C. fulgida* var *fulgida*; Sth Africa, 2011)
- 'leptocaulis' (*C. leptocaulis*; USA, 2012)
- 'acanthocarpa' (*C. acanthocarpa*; USA, 2012)
- 'acanthocarpa X echinocarpa' (Hybrid?; USA, 2012)
- 'cylindropuntia spp.' (undet. *Cylindropuntia* species; USA, 2012)

Dactylopius tomentosus

'cholla' biotype

- Sent from South Africa off *C. fulgida* var. *fulgida*
- Originated from Mexico off *C. cholla*



female and egg mass



male

Host specificity trials

'Cholla' biotype does not

- feed on plants other than *Cylindropuntia* cactus
- survive on plants other than *Cylindropuntia* cactus
- lay eggs on plants other than *Cylindropuntia* cactus

Conclusions of host specificity trials:

- Insect is **SAFE** to release as biocontrol agent

Efficacy Trials

Aim: to determine if

- Coral cactus plant can support a colony of the 'cholla' biotype over multiple generations and long period of time
- does 'cholla' biotype the reduce the growing ability of the cactus or even kill the plant

Efficacy Trials

Egg mass transferred to a potted Coral cactus plant and allowed to develop to maturity.

This trial was monitored every fortnight

- number individuals
- life stages
- which generation it had reached
- how many insects were feeding
- how the feeding of the insects affected the plant

