Report

On Visit to the Coringa – Herald Nature Reserve
30 July – 10 August, 2001

with regard to the releasing of parasitoids and ladybird predators of the pest scale *Pulvinaria urbicola* on *Pisonia grandis.*

Pisonia trees killed by scale on the edge of the forest

Dan Smith and Dan Papacek

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Authors

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Itinerary

North East Herald was visited on the Australian Customs vessel DR. Mitchell with Mark Hallam and team from 30 July. He was joined by Dan Smith, Dan Papacek and other Environment Australia team members including Stephanie Pidcock from 6 August. South West Herald was visited on 9 August and all returned to Cairns on 10 August.

Objectives

1. Collect and rear small wasp parasitoids (mainly *Coccophagus ceroplastae* and *Euryischomyia flavithorax*) and the ladybird *Cryptolaemus montrouzieri* on the mainland in preparation for release on NE Herald.
2. Release these on NE Herald with the aim of achieving establishment.
3. Investigate possible methods of ant control.
4. Briefly reassess levels of the pulvinaria scale on the Pisonia coming out of the winter and also presence of the scale on SW Herald Islet.

Methods and Results

Parasitoid rearing/collecting/releasing : A large quantity of the scale hosts – pink wax, Florida wax and green coffee scale on citrus, lillypilly, umbrella tree and gardinia were collected during July and emerging *C. ceroplastae* and *E. flavithorax* wasps were collected and stored for transportation to NE Herald. The small wasp *Metaphycus* sp (as also recorded from *P. urbicolae* in the Capricorn-Bunker studies) was also collected. The first consignment of a total of about 1000 parasitoids was air freighted to Mark Hallam in Cairns on the 30 July just prior to the first embarkation. These were released into three 2m long sleeve cages over a Pisonia scale infested branch along transect 1 and 5 on 31 July.
The second consignment of a further 1000 parasitoids were collected from 31 July – 5 August and accompanied Smith and Papacek to the island on 6 August. They were released into two of the sleeve cages on 7 August. The third sleeve cage (in transect 1) had heavy ant activity and was removed and relocated nearby and fresh parasites released. All of the sleeve cages were removed on the 9 August prior to embarkation for SW Herald and Cairns. The release sites were located in transect1 (two sites) and in transect 4 (one site).

In addition some live parasitised *P. urbicolae* scale – mainly from Pisonia (sent to Nambour from Heron Island on the 1st August by Rod McKenzie of Qld National Parks and Wildlife) was left in an ant proofed tub in transect 1 between the two sleeve cage sites. The reason for the staggered releases (on 31 July and on 7 August) and for the use of the scale with unemerged *C. ceroplastae* was to ensure a better chance of

establishment for this species. It may be that the male larva of this species (as is common in many *Coccophagus* spp) is hyperparasitic on the female larva and for males to be produced there must first be female larvae present in the scale.

***C. montrouzieri* rearing/releasing:** A total of about 40 000 ladybird adults were reared and donated by the Bugs for Bugs Insectary at Mundubbera. The normal commercial cost of these is $8000. About 1000 were sent up to Cairns for the first embarkation and the bulk were taken out on 6 August. A release was made into a sleeve cage on 31 July but because of heavy ant presence the cage was removed on inspection on 7 August. All subsequent releases were made into the open in noticeably infested areas in transects 1, 2, 3, 4 and 6. All of these release areas were treated with ant bait on 7 and 8 August. Ants (*Tetramorium* sp.) were noticeably aggressive to the ladybirds with up to 6 ants attacking one ladybird. Beetles were evident at release sites on 8 and 9 August feeding on the scale.

Ant control: Ants (mainly *Tetramorium* sp. and some *Monomorium* sp) were very active at scale infested sites and possibly poised a threat to the establishment of both parasitoids and ladybirds. Three ant baits were broadcast on the ground at each release site – Amdro ® (7.3 g/kg hydramethynnon), Presto Ant Bait ® (0.01 g/kg or 10 ppm fipronil) and a second fipronil bait based on crushed nutrigrain and fipronil at 100ppm. Amdro is currently being used for the fireant *Solenopsis invicta* in Brisbane and controls also Singapore ant *Monomorium destuctor* and the coastal brown ant *Phediole megacephala.* Presto is based on a fish meal and is being used against the yellow crazy ant *Anoplolepsis gracilipes* in Christmas Island and in the Cairns region. The baits were distributed at a rate of 2.5 kg/ha. The approximate areas treated were transect 1 – 2000m^2 , transect 2 – 750m^2, transect 3 – 750m^2, transect 4 – 1500m^2 and 750m^2 and transect 6 – 750m^2 for a total of about 6500m^2 or 0.65 ha. Baits such as these usually take up to a fortnight to give full effect but encouragingly, areas in transit 1 and 4 treated on 7 August had up to 90% ant reduction in just 24 hours. The ant bait applications sufficed at the least to ward off the heavy predation on the beneficials observed on 7 August. The total vegetated area of NE Herald is about 25 ha. Ant bait application over such an area would be difficult but not impossible. Once the natural enemies are well established such action may well not be necessary. As the scale is reduced, so will the ants.

Scale levels: To gauge any changes in scale levels since the last visit in March 2001 (Smith and Papacek 2001), scale and ant leaf counts were done in transects 2, 4, 6 and 8 at 60m rather than 30m intervals (see Appendix 1). Total live scale numbers in transect 2 was 1183, in transect 4 – 512, in transect 6 – 838 and transect 8 – 517. This compares with transect 2 – 1024 (or 512 for a similar sample size) transect 4 – 145 (73), transect 6 – 592 (296) and transect 8 – 992 (496). There has then been in 4 months over winter a two-fold increase in transects 2 and 6, a seven fold increase in transect 4 and populations are the same in transect 8. Some tree death was evident in some of the more heavily infested areas in transects 1, 2, 6 and 8 especially on the northern edges of the forest.

Recommendations

As temperatures increase in spring – summer so will the potential for rapid increase of the scale. The fate of the Pisonia forest lies on NE Herald with the introduced beneficials. The ladybird releases were substantial and the beetles were feeding and doing well on departure on August 9. The strong expectation is that they will greatly multiply and start to have a major impact on the scale within the next 4 months. Because of the shorter life span of the parasitoids and the infrequency (because of distance and location) of visitation to the island, the logistics of establishing the parasitoids were not as simple. Satisfactory releases were made of 3 species, however, and there is a good expectation of establishment. *Coccophagus ceroplastae* is considered the most important of the beneficials to establish but is possibly also the most difficult. If the parasitoids establish this time, they could be expected to have a major impact also within the next 4-6 months.
Because of the critical importance that both ladybirds and parasitoids have established and begin to make a major impact on the scale.

- Reassessment of the situation is highly advisable by early December.
- The provision should also be made to take out further ladybirds and parasitoids at this time.
- More ant baits particularly Amdro and Presto should be taken out and used if the need indicates.
- Further scale assessments at least at a similar level as in transects 2, 4, 6 and 8 should be conducted in December with a complete reassessment (as in March 2001) in March 2002.
- If all the releases in August have been successful, then the fresh material could be considered for use on other islets like SW Herald (or Coringa). Pulvinaria activity was observed to be continuing on SW Herald mainly on herbaceous *Achyranthes aspersa*. Fresh scale stocks were obtained from NE Herald on this occasion and it is anticipated that cultures will be developed at Nambour on butternut pumpkins and allow for greater production of *C. ceroplastae* in particular (the scale has transferred to the pumpkins successfully since returning to Nambour).
- The progress of the scale control could be further assessed in the ‘normal’ yearly visit to the islands in March 2002.

There is the danger (in deferring the December 2001 visit to March 2002) that if the parasitoids fail to take this time, the Pisonia forest will suffer serious damage in the intervening eight months. If the parasitoids are not established this time it is vital that renewed effort be made as soon as possible.

Reference

Smith, D. and Papacek, D. F. (2001). Report on the levels of the scale insect *Pulvinaria urbicola* and its natural enemies on *Pisonia grandis* in the Coringa – Herald National Nature Reserve 16-23 March 2001.
Report to Environment Australia April 2001.

Treating with ant bait

Branch cage for release of parasitoids

Cryptolaemus montrouzieri attacking Pulvinaria scale

C. montrouzieri **being attacked by** ***Tetramorium sp.***