MINISTRY OF AGRICULTURE AND LANDS
RESEARCH & DEVELOPMENT DIVISION
CROP & PLANT PROTECTION UNIT

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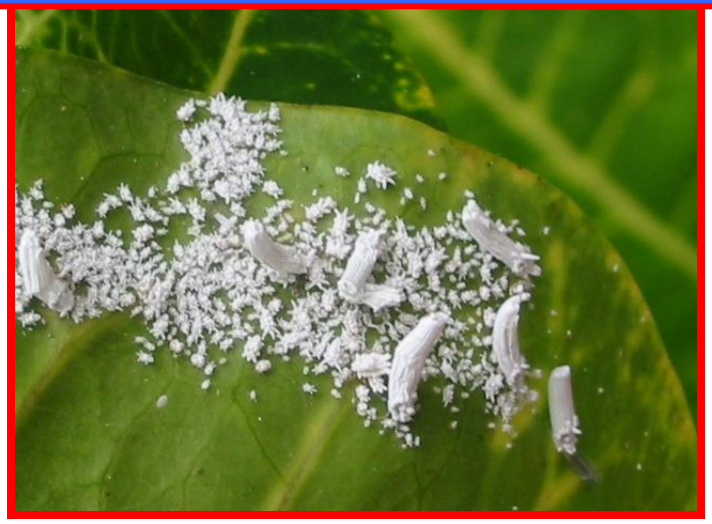
3. DEVELOPMENT OF A MANAGEMENT PROGRAMME FOR ORTHEZIA PRAELONGA



3.1 Survey for natural enemies of Ensign Scale (*Orthezia praelonga*) in Jamaica

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3.1.1 Background

In the latter 1990's residents in the Kingston and St. Andrew areas complained about "whiteflies" that were affecting their plants. After investigations by personnel from the Ministry of Agriculture the pest was initially identified as the ensign scale, *Orthezia insignis* however this has been subsequently confirmed to be *Orthezia praelonga* (Hemiptera; Sternorryncha; Ortheziidae)

The ensign scale was determined to be widely distributed across Jamaica during two surveys (Alam, 1996; Chung 1998). It was found to be associated with at least 22 plant species across the island, including many ornamentals, fruit trees and other food crops (Alam, 1996; Chung 1998).

The ensign scale colonizes host plants and ingests large volumes of sap during feeding along with injecting toxins into the plants killing the plants. Nutrients are also lost, which reduce the proper development of the plant. In addition honeydew is produced on the hosts, which encourages the growth of sooty-mould affecting the photosynthetic ability of the plant (Figure 1). Attempts at chemical control have had limited results, providing only short-term results. The use of biological control is favoured which has been proven to be effective in the long run, is environmentally friendly and cost effective.

There existed the need to determine what natural enemies are attacking the pest and their potential for controlling it. A ladybird beetle was frequently observed in ensign scale colonies in some infested areas. In order to determine how widespread it was as well as to identify other natural enemies, an island wide survey was initiated in infested areas. This report contains findings on the survey to date and other interesting findings that took place during the survey.

A **B**

Figure 1: Plant hosts infested with *O. praelonga*, Ixora (A) and Croton (B)

The objectives of the studies carried were:

1. To identify the levels of a predator ladybird beetle. and other natural enemies of the ensign scale
2. To determine their distribution
3. To identify the effect of each natural enemy on the ensign scale population.

3.1.2 Accomplishments

During the year a survey for natural enemies of *Orthezia praelonga* was conducted in highly infested areas of St. Catherine, St. Thomas and Kingston. Lists of infested areas along with the names of Extension Officers were obtained from Mrs. Young (RADA, Training). Assistance was received from extension officers in finding suitable properties to visit. On each visit a fact sheet was given and other information shared on the biology and behavior of the insect to each property owner and RADA officer present.

At each location the plant hosts were scouted for adult lady bird beetles (Figure 2A). Two infested shoots were collected from each coordinate of the host plant and taken to the laboratory

for examination for the presence or absence of the predator larvae (Figure 2B). Plant hedges (bougainvilla etc.) were sampled from the top, middle and bottom at every metre along the hedge. The presence or absence of other natural enemies was also recorded.

A

B

Figure 2: Adult ladybird beetle predator (A) and Larvae of predator feeding on the eggs of *Orthezia praelonga* (B).

The ladybird beetle was tentatively identified as *Scymnus* sp. in 2005, however specimens sent to CARINET were identified as *Hyperaspis pantherina*. The description of *H. pantherina* available describes six black spots on the elytra which is absent in the local specimens. Hence, the actual species of the beetle has not been rectified.

A total of 27 properties were visited in three parishes, St. Catherine (15), St. Thomas (6) and Kingston (6). The levels of predation of eggsacs dissected were as low as 0 % and as high as 20 % in some locations (Table 1). There were 22 hosts infested in the three parishes visited they included ornamentals (11 species), some food crops (7 species) and weeds (4 species) (Table 2). Other natural enemies found included general predators such as lacewing (*Chrysopa* sp.) (Figure 3).

Figure 3: Predator Lacewing adult in the middle of infestation of *O. praelonga*

Table 1: The total number of eggsacs dissected and percentage eggsacs with predator in three parishes infested with *Orthezia praelonga* from July to December, 2006

Parish/Locations	**Number of Properties Visited**	**# eggsacs dissected**	**Range of Predation (%) of eggsacs**
ST. CATHERINE	**15**		
Independence city		157	0 - 20 %
Edge Water		147	0 – 20 %
Ensom City		397	0 – 6.8 %
Claremont H.S		43	0 %
ST. THOMAS	**6**		
Prospect		1091	0 – 20 %
KINGSTON	**6**		
Havendale		42	0 %
Old Hope Road		21	0 – 12.5 %
TOTAL	**27**	1893	

Table 2: Hosts infested with *Orthezia pralonga* in three parishes surveyed from July to December, 2006

Hosts Infested	**Parishes**		
	St. Catherine	**St. Thomas**	**Kgn St. Andrew**
Ornamentals			
Bougainvillea	X	X	X
Croton (*Codiaeum* sp.)	X	X	
Ixora	X		X
Periwinkle	X		
Aralia (*Aralia* sp.)	X		
Purple bell shaped flower	X		
Alamanda (*Alamanda* sp.)	X		
Cat Tail	X		
Crossandra (*Crossandra* sp.)	X		
SunFlower		X	
Frangipani		X	
Other crops			
West Indian cherry	X	X	X
Lime	X		
Mango (*Mangifera indica*)	X		
Orange (*Citrus* sp.)	X		X
Chinese thyme	X		
Gungo			X
Citrus sp.		X	
Weeds			
Spanish needle	X		
Pussley	X		
Duppy Gun	X		
Broom Weed	X		

During the survey it was observed that the infestations disappeared after heavy rainfall in all three parishes. This was also the report made by RADA officers and home owners visited during the survey. It is possible that the humid environment created by heavy rainfall is favourable for the growth of entomopathogens of the *O. praelonga* present in the environment. In 2005 two entomopathogens were detected, *Colletotrichum gloeosporoides* and *Metarhizium anosiplae*.

3.1.3 Impact

The survey gathered to date has identified a species of predator larvae that can be used for bio-control of the *O. praelonga*. The augmentation of this predator in infested areas may reduce the present level of infestation of the pest as well as provide a long term solution that present chemical treatments have been unable to do. Bio-control is also an environmentally friendly method which is not harmful to man or animals.

3.1.4 Additional information

The natural enemy survey began in 2005 where a total of 28 locations were visited from two parishes, six from St. Catherine and 22 from Kingston & St. Andrew 1088 eggsacs were dissected of which 12.22% were predated on by *Scymnus* larvae The level of egg predation ranged from 25 – 100%. The ranges of predation levels were higher for 2005 when compared to 2006 in Kingston. Other natural enemies detected in 2005 included a predatory fly, the pupa of which was found inside the shell remains of an ensign scale. Lacewing eggs were also detected on several leaves.

3.1.5 Documentation/ Publications

Presentation

- Sherwood, M.A., Status and Management of the Ensign Scale, *Orthezia insignis* in Jamaica. JSAS/R&D Seminar, September 29, 2004.

Factsheets/Posters

- Management of Ensign Scale (*Orthezia insignis)*: A community Approach by M. Sherwood
- Presented poster at the Scientific Research Council Annual Conference; "The rearing of the lady bird beetle, *Cryptolaemus montrouzieri* in Jamaica" by M. Sherwood
- Prepared poster for public information at local Agricultural shows 'Proposed programme for Biocontrol of the Ensign scale, *Orthezia insignis"*.by M. Sherwood