1998 Entomology Project Report
Laboratory Services Division
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1998 Washington State Port-Area Light Trap Survey

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BACKGROUND

The recent introduction of several important exotic insect pests into the United States has been linked to the movement of maritime shipping or cargo. Examples include the Asian gypsy moth, *Lymantria dispar* L., and Asian longhorned beetle, *Anaplophora glabripennis* Motschulsky, which have been introduced on shipping (carriers or containers) and wooden pallets, respectively. The timely detection of exotic pests introduced through these pathways can be very difficult, particularly if an effective survey attractant such as a pheromone lure or enticing food bait is not known. Light traps, using either blacklight or mercury vapor lights to attract night-flying insects, are one method known to attract and collect many types of beetles and moths.

1998 SURVEY OBJECTIVE

Test portable mercury vapor light traps in Western Washington port areas as a detection tool for introduced pests.

METHODS

Intersecting-panel traps were assembled from 1/4" thick , clear plexiglass and fitted with light socket/rain shields and aluminum light trap funnels from BioQuip®. An additional, larger rain shield, cut from rigid plastic and approximately 16" diameter was also added to the top. Catch bins, attached to the bottom of the funnels, were made from plastic food storage containers with a round hole cut in the snap-top lid. Both the catch bin and funnel were attached to the light trap panels with elastic cords. Lights used in the traps were 160 watt, 120 volt AC self-ballasted mercury vapor bulbs with conventional medium base, also from BioQuip®. Traps were suspended from tree limbs by light rope attached to a top ring, and were hung at about chest height (as in Figure 1.). Trap sites in port areas were selected which had a relatively open immediate area and near by areas of varied vegetation.

Figure 1. Plexiglas Light Trap

During overnight operation, the catch bins were "charged" with 1-2 lbs. of dry ice wrapped in several layers of newspaper to immobilize insects collected. In the morning, catch bins were removed from the traps, placed in ice chests with additional (unwrapped) dry ice during transport, and eventually held in a standard freezer for several hours to ensure specimens were killed before mounting and identification.

The survey timing consisted of one overnight sample per week, at two sites per port area in Seattle, Tacoma, and Olympia (6 trap sites total), from early June to late August. Specimens collected were prepared as appropriate by taxonomic group, and identified in the WSDA Olympia entomology lab or sent to expert diagnostic resources as needed. Bark beetles were identified by J. LaBonte, Oregon Dept. Agriculture, whose assistance is appreciated.

RESULTS

No previously unknown exotic species were found in this survey.

Thirty-seven insect species in the major potential economic pest groups, the bark beetles and defoliator moths, have been identified and are presented in tables 1 and 2. However, as of this report date, many identifications remain to be completed for less economic insect groups (e.g. Coccinellidae and other small beetles).

Table 1. Bark Beetles (Coleoptera: Scolytidae) Collected in the 1998 Port Area Light-Trap Survey.

Genus	species	describer	King Co.	Pierce Co.	Thurston Co.	Totals
Gnathotrichus	sulcatus	(LaConte)			1	1
Pithyopthorus	sp.				2	2
Xyleborinus	saxeseni	(Ratz.)	6		7	13

This paper is intended as a survey and methods report only. Mention of a proprietary product does not constitute an endorsement or recommendation for its use by WSDA or USDA.

RESULTS (Cont.)

Table 2. Moth Species (Lepidoptera) Collected in the 1998 Port-Area Light Trap Survey.

Family	Genus	species	common name	King Co.	Pierce Co.	Thurston Co.	Totals
Crambidae	Herpetogramma	pertextalis		12		2	14
Gelechiidae	Recurvaria	nanella	lesser budmoth	5	9	8	22
Gracillariidae	Caloptilia	stigmatella		2			2
Lymantriidae	Orgyia	antiqua badia	Western rusty tussock moth	17			17
Oecophoridae	Decantha	stonda				1	1
Plutellidae	Plutella	xylostella	diamond back moth	4	2	2	8
Tortricidae	Acleris	variegana	garden rose tortrix			1	1
Tortricidae	Ancylis	sp. A		1	9	13	23
Tortricidae	Ancylis	sp. B			1		1
Tortricidae	Archips	fuscocupreanus	apple tortrix	5	1	2	8
Tortricidae	Archips	rosanus	European leafroller	6	2	5	13
Tortricidae	Argyrotaenia	franciscana	"orange tortrix"	7	5	6	18
Tortricidae	Cacoecimorpha	pronubana	carnation tortrix		1	3	4
Tortricidae	Choristoneura	lambertiana	sugar pine tortrix (complex)			130	130
Tortricidae	Choristoneura	rosaceana	oblique-banded leafroller	8	4	2	14
Tortricidae	Clepsis	consimilana		5	8	5	18
Tortricidae	Cnephasia	longana				5	5
Tortricidae	Croesia	holmiana	golden leaf roller		1		1
Tortricidae	Cydia	pomonella	codling moth	3			3
Tortricidae	Dichrorampha	gueneeana		2		1	3
Tortricidae	Ditula	angustiorana	apricot moth	3	4	8	15
Tortricidae	Epinotia	albangulana			4	1	5
Tortricidae	Epinotia	solandriana		1			1
Tortricidae	Epinotia	subviridis			10	4	14
Tortricidae	Eulia	ministrana				1	1
Tortricidae	Grapholita	lana ?			1		1
Tortricidae	Pandemis	cerasana	barred fruit tree tortrix	1		2	3
Tortricidae	Pandemis	heparana	dark fruit tree tortrix			3	3
Tortricidae	Pandemis	sp.		1			1
Tortricidae	Proteoteras	aesculana		5	1		6
Tortricidae	Rhyacionia	buoliana	European Pine Shoot Moth	1			1
Tortricidae	Spilonota	ocellana	eye-spotted bud moth		1	5	6
Yponomeutidae	Swammerdamia	pellicaria		2			2
Yponomeutidae	Zelleria	haimbachi	pine needle sheathminer		3	53	56
			Total Specimens	91	67	263	421
			Total Species	20	18	23	34

DISCUSSION

As shown in the above species lists, the species of insects collected varied considerably from port area to port area. Species collected also varied considerably from site to site within the port areas. This is likely an indication of the limited attraction distance of the relatively low-watt bulbs used. The limited attraction distance of light traps is a generally recognized limitation of light traps, as is the varying degree of attraction to light in different insects. Within these limitations, the traps used in this survey did provide valuable species information.

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New research on light trap technology has developed hardware and strategies which may increase attraction overall. A new light bulb, with specific light frequencies for attracting insects, has recently been developed in China. Likewise, a trapping strategy using very high wattage mercury vapor lights (1,000 - 5,000 watts) interspersed with very low wattage black lights (7 - 15 watts) is showing promise for collecting beetles which are minimally attracted to light traps. These strategies were not tested in this survey, but should be evaluated for exotic detection surveys.

The use of dry-ice was found to be a very efficient and safe method to rapidly immobilize specimens, which prevented escape and also provided undamaged specimens for identification.

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