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Association of the Exotic Banded Elm Bark Beetle with the Dutch Elm Disease Pathogen

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Introduction

- European elm bark beetle (*Scolytus multistriatus*), has been the vector of *Ophiostoma novo-ulmi*, the Dutch elm disease (DED) pathogen in Colorado's American elm (*Ulmus americana*) trees.
- Recently, the exotic banded elm bark beetle (*Scolytus schevyrewi*), was found in association with DED trees in Colorado



Project Objectives

- Verify the presence of *O. novo-ulmi* in elms with symptoms of Dutch elm disease and colonized by *S. schevyrewi* and *S. multistriatus*.
- Determined if *S. schevyrewi* and *S. multistriatus* adults emerging from diseased elms carry
- Ophiostoma novo-ulmi*.



Materials and Methods

Verification of the presence of *O. novo-ulmi* in symptomatic American elms:

- Disks were removed from each log segment and wood chips placed on cycloheximide and streptomycin malt agar.



Determining if *S. schevyrewi* and *S. multistriatus* adults carry propagules of *Ophiostoma novo-ulmi*:

- S. schevyrewi* and *S. multistriatus* were reared from log sections from four American elm trees.
- Logs were left outdoors for 2-4 wks after harvesting to ensure *S. schevyrewi* infestation.
- Log segments placed in rearing cages and checked at 2-3 day intervals
- At ISU, each beetle was cut into four pieces; at CSU, beetles were not cut into pieces.
- Beetles were placed on elm sapwood agar amended with cycloheximide and streptomycin (CESA).



Results

- Dark-stalked synnemata of *Pesotum ulmi*, an asexual state of the DED pathogen formed on elm wood chips from the four trees.
- Both beetles (*S. schevyrewi* and *S. multistriatus*) infested with DED pathogen formed synnemata within two weeks of plating.
- The number of emerged *S. schevyrewi* were greater than *S. multistriatus*.

Table one: Success of Isolation of the Dutch Elm Disease Pathogen from the Banded Elm Bark Beetle and the European Elm Bark Beetle

Lab Tree	<i>Scolytus schevyrewi</i>		<i>Scolytus multistriatus</i>	
	Number of Beetles	Percent Positive	Number of Beetles	Percent Positive
ISU One	23	8.7	0	0.0
ISU Two	233	91.0	71	91.5
ISU Three	32	84.4	19	68.4
ISU Totals	288	83.7	90	86.7
CSU One	440	30.9	4	0.0
CSU Two	52	63.5	3	66.7
CSU Three	367	44.1	12	58.3
CSU Four	45	4.4	55	0.0
CSU Totals	904	36.8	74	12.2

Conclusion

- S. schevyrewi* adults appear to be efficient transporters of propagules of the DED fungus.
- The large numbers of *S. schevyrewi* emerging from these trees suggest that *S. schevyrewi* may eventually replace *S. multistriatus* as the major vector of *O. novo-ulmi* in Colorado.
- Rapid removal of diseased elms remains the most effective means of managing this disease since the banded elm bark beetle does not infests trees in the early stages of disease induced wilting.

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