Trip Report
Chiapas, Mexico
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A putative new species of *Dendroctonus* bark beetle has been identified in Mexico and Central America. The new species tentatively has been given the scientific name *D. woodii*, though an official description of the species has yet to be published. This species, along with the southern pine beetle (SPB) *Dendroctonus frontalis*, has been implicated in the bark beetle outbreaks that plagued the region in the late 90's and early 00's. Some entomologists believe this new species was a primary factor in the outbreaks, acting in a manner similar to the aggressive SPB. Other entomologists suggest it functions as a secondary bark beetle, and that SPB initiated the infestations and outbreaks. Preliminary field trials indicated the new species was not readily captured in traps baited with the primary attractants used for collecting SPB: frontalin and turpentine. This species has the potential for spread or import into the United States. A cooperative project between the USDA Forest Service, the Texas Forest Service, and El Colegio de la Frontera Sur ECOSUR was developed to study the ecological role of the new species and identify potential pheromones or other attractants that could be used in surveys and management.

In May 2007 I had visited Chiapas with Brian Sullivan of the Southern Research Station. We had established trapping studies to identify potential attractants for the new species, and we examined the within-tree distribution of the *D. frontalis* and the new species. I traveled to Tapachula in Chiapas, MX in August 2007 to continue work on the project. My visit was hosted by Jorge Macías-Sámano of ECOSUR. I primarily worked in the field with one of his graduate students, Benjamín Moreno Castillo. Benjamin's thesis on the new species involves testing attractants in the field and examining the life history.

I arrived in Tapachula on Monday, August 13. On Tuesday I met with Benjamin to gather equipment and plan the field experiments. Benjamin and I went by truck to the field site: Lagos de Montebello National Park.

Lagos de Montebello National Park

We established the trapping study on Wednesday afternoon. There were five treatments:

1. Turpentine only
2. Turpentine and frontalin
3. Turpentine and endo-brevicomin
4. Turpentine, frontalin, and endo-brevicomin
5. Turpentine, frontline, and endo-brevicomin ca. 4 meters from trap.

Benjamin trapping

The frontalin packets used contained only one Eppendorf capsule. The reduced frontalin was an attempt to prevent the spillover attacks on pines near the traps that occurred during the spring trapping study. The endo-brevomin lures were low-release bubblecaps from Synergy. Endo-brevicomin has been shown to greatly increase trap catch of SPB when combined with frontalin and turpentine. The turpentine was released from a glass bottle with a wick.

The initial goal was to establish five replicates, with five traps per replicate. However, one site had flooded and several of the trap collection cups were underwater.

Underwater trap site

Another trap-line had infested trees near the traps that would compromise the collection results. Therefore only two replicates were established. The design was random assignment of the treatments daily, with no treatment replacement at the same site. The treatments were assigned as follows:

Rep 1

day	1	2	3	4	5
position					
1	T	TE	TFE4	TF	TFE
2	TF	TFE	TE	T	TFE4
3	TE	T	TFE	TFE4	TF
4	TFE	TFE4	TF	TE	T
5	TFE4	TF	T	TFE	TE

Rep 2

day	1	2	3	4	5
position					
1	TFE	TFE4	T	TE	TF
2	TE	TF	TFE4	TFE	T
3	TFE4	TFE	TF	T	TE
4	TF	T	TE	TFE4	TFE
5	T	TE	TFE	TF	TFE4

Trap collections were made daily from August 16-20 between 12 and 3 pm. The beetles collected were stored in labeled vials in 70% ethanol. Benjamin will identify all beetles by species and gender.

Wednesday afternoon we got the truck stuck in the mud.

Road where truck got stuck

A radiator hose also blew. We hiked out and spent the night in a cabana just outside the Park. In the morning we fixed the radiator hose and assembled a group of about 15 Park employees to help pull the truck out. The employees were crews that located and treated

bark beetle infestations in the Park. Infested trees were felled, cut into bolts and debarked. We went with one crew and located several trees that had beetles in late-larvae to brood adult stages. We collected 1 m bolts from these trees and hauled them to the Park office. Bolts from one tree were placed in cloth bags and tied shut. Bolts from the other three trees were placed in cages constructed of saran screening. Bolts from three additional infested trees were collected on August 20 and placed in cloth bags.

Beetles emerging from the bolts were collected twice a day and used to identify the cuticular hydrocarbons of the two species. Beetles were submerged individually in a small vial with hexane and left for 20-30 minutes. The beetle was then removed and placed in an Eppendorf capsule with ethanol. The hexane vial was capped, sealed with parafilm, and labeled with collection data. The capsule with the beetle was similarly labeled, so that each vial and capsule could be paired. Fourteen beetles were collected and sampled. The cloth bags were brought back to Tapachula and Benjamin will continue to collect and sample beetles. The vials and capsules will be delivered to Brian Sullivan, who will identify the beetle species and gender and the cuticular hydrocarbons.

After getting the truck stuck once more, and stepping on a poisonous snake, a caged bolt experiment was initiated on August 18. Several pines under attack were felled and bucked into 1 m lengths. The bark was peeled from the bolts and beetles initiating gallery construction were collected and placed in vials. The beetles were examined under a microscope and those identified as the new species were saved. A 7 in. dbh *Pinus maximinoi* was felled and cut into 1 m bolts. A saran screen cage was placed around bolt and secured tightly with duct tape. Thirty beetles were enclosed in two of the cages, and two cages were left empty. The beetles were not separated by gender. The cages were open and closed using Velcro strips. The bolts were placed vertically on the ground in an area with recent beetle activity. The bolts were ca. 50 m apart. The bolts were held upright using 3 trap stands. An unbaited funnel trap was hung from 2 of the stands for each bolt. The traps were checked daily, and a Park employee will collect from the traps every 2-3 days until Benjamin returns. Benjamin will bring the caged bolts to Tapachula to determine if any of the encaged beetles attacked the bolts and constructed galleries. He will also identify any beetles collected in the funnel trap.

Caged bolt experiment

To date, the collections from the caged bolts have yielded:

Bolt 1 (artificially infested):

2 Dendroctonus woodii (female, with ripples on pronotum)

Bolt 3 (artificially infested):

1 Dendroctonus frontalis (female, without ripples, large mycangyum)
1 Dendroctonus parallelocollis (male)
1 Ips sp.

Bolts 2 and 4 (no beetles)

No bark beetles

On August 19 we visited Chinkultic Mayan site. These ruins are just off the road into the Lagos de Montebello. The path into the ruins was underwater, and fortunately we had purchased rubber boots for checking the traps, so we were able to wade through the water.

Chincultik National Park

On August 21 we observed one of the crews treating several infested trees. In addition to felling and debarking the trees, the crews were spraying both the bark and the bolts with deltramethrin. I expressed concern that the chemical treatment could be causing more harm than good, and probably was not an appropriate or necessary treatment within a National Park. I plan to write a treatment recommendation for bark beetle infestations in the National Park for the Park manager.

Spraying bark and bolts with deltamethrin

I returned to Tapachula on August 21. Benjamin and I unloaded all the bolts we had brought back, and then met with Jorge that evening to discuss the trip. I flew back to Texas the next day.

View from Chincultik National Park