

“Forensic Entomologists Hunt Down Insects to Help Catch Criminals” Excerpt Transcript

Excerpt from [October 17, 2014](#) episode of Science Friday.

Following the trail of insects can lead forensic entomologists to clues about a crime scene. Anne Perez, a forensic entomologist at Saint Joseph's College, discusses how blowflies and beetles that have collected on a corpse can inform investigators about trauma, time of death, and if a body might have been moved.

EXCERPT # 1

IRA FLATOW: This is science Friday. I'm Ira Flatow here at Notre Dame's DeBartolo Performing Arts Center in South Bend, Indiana.

[LAW & ORDER SOUND EFFECT]

Ah, yes.

AUDIENCE: [LAUGHTER]

IRA FLATOW: You know it seems like TV detectives-- TV detectives, get it?-- can collect evidence from anything left at the crime scene-- a scrap of paper or even a reflection caught in someone's eye. My next guest looks for clues that might elude even the best prime time investigator. To help piece together a crime scene she examines the insects-- the insects found in the area-- and it's not your average bug collection. Anne Perez is a forensic entomologist and instructor at St. Joseph's College in Rensselaer Indiana. Welcome to Science Friday.

ANNE PEREZ: Thank you so much for having me.

IRA FLATOW: You know I guess people, when I watch the crime shows they're not looking at the insects a lot there, but they're showing up a little bit more on there, aren't they?

ANNE PEREZ: Yeah you see them every once in a while on TV.

IRA FLATOW: What kind of insects are they looking for, what's going on at the crime scene?

ANNE PEREZ: So primarily I've got two different boxes up here, you've got two groups-- two orders that are there, and they're beetles and flies. But mostly what you're going to see people collecting on TV, or what you'd be training people to collect are going to be flies, and usually the maggots. So a fly goes through its lifecycle from an adult fly to laying eggs, or maybe even laying live larvae. And those larvae are what are actually eating a corpse, using the corpse as a nutrient source. So that's usually what gets collected but even so they go. And once they've gotten enough nutrients from the body they crawl away from the body and go pupariate. They have this cocoon stage, if you're familiar with a chrysalis or a cocoon for a butterfly. So they go through this puparial stage and then will go through metamorphosis and come out as an adult fly. So you'll collect them any of those stages but usually the maggots are what you're going for.

IRA FLATOW: The maggots-- so many ways to go with that sentence. But-- so you can tell by the stage they're in how long the body has been there or their time of death?

ANNE PEREZ: Yeah, so there are flies that are really good at sensing a body very soon after death. So these are flies that a lot of people are familiar with. They're these iridescent green and blue flies that you'll see hanging around your trash. They're really good at eating any kind of decomposing organic matter. Or these flesh flies that look like flies in little pinstriped suits. So within minutes on a good day-- and for an insect a good day means not a lot of rain, not a lot of wind, and pretty warm-- on a good day they'll be there in minutes. And so that kind of starts the biological clock. So if I can pick a maggot off of a dead body and I can age that maggot, then I can tell you you've been dead for at least as long as that maggot is old.

IRA FLATOW: Which in a maggot year is what?

ANNE PEREZ: So it depends on the species of fly. So you've got very species-specific developmental rates. And so for these iridescent green flies you can be a maggot in really warm times for a week, little bit less than a week.

IRA FLATOW: So if it's still there you've been dead just a week.

ANNE PEREZ: In really, really warm times. If it's cold you're there longer.

IRA FLATOW: Wow. What about other insects, do they then come once the maggots are done with you? Is something--

ANNE PEREZ: So--

IRA FLATOW: --creepy crawlies are coming?

ANNE PEREZ: Yes, so there are lots-- there are hundreds of species that can be found in a dead body throughout decomposition, and there can be hundreds of thousands of individuals on a dead body at any one time. And so the first ones that are there are usually the flesh eaters, the soft tissue eaters. And then after that you have some things that are really good at eating those maggots. There's like a beetle called a maggot tiger and it's observed in nature to just eat maggots. So things that eat those maggots, things that can eat the adult flies, and then a little bit later after all that soft tissue is gone you've got insects coming in that are better at eating things that are harder to digest like hide and hair and cartilage, things like that.

IRA FLATOW: What kind of bugs are doing that dirty work?

ANNE PEREZ: Mostly beetles, those are the beetles' jobs, later on. There's a lot of beetles that eat maggots and there a lot of beetles-- called hide beetles, very creative-- that can come in and eat that harder to eat stuff.

EXCERPT # 2

IRA FLATOW: How do you practice this? I mean, how do you study it, right, you have to practice your trade.

ANNE PEREZ: You do and it's very hard to get human bodies for this type of research. It's--

IRA FLATOW: I can imagine.

ANNE PEREZ: You need accredited facilities and as all good scientists know, you want a lot of replication. So it's even harder to get them in large numbers. So instead--

IRA FLATOW: You don't create them do you? No. OK. It's another TV show. It's a movie.

ANNE PEREZ: So we use pigs as surrogates for human decomposition. They have actually been directly compared to humans and haven't been found to significantly differ-- and their rate of decomposition-- we're talking within certain weight classes, or the insect fauna that are attracted. And so a 50 pound pig does a pretty good job of being a surrogate for the average size male.

IRA FLATOW: Wow.

AUDIENCE: [LAUGHTER] [APPLAUSE]

IRA FLATOW: Wow, fascinating, Dr. Perez. Thank you very much. Dr. Anne Perez is a forensic entomologist and an instructor at St. Joseph's College in Rensselaer Indiana.

AUDIENCE: [APPLAUSE]

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