

ENQUIRING MINDS

EQM EP 8 SEG 2

SACHA: Did you know that bees and ants are considered to be social insects? Let's join Bec and Alex as they get up close and personal to these critical insects.

BEC: Did you know that honeybees do a dance to tell others where their food is? Or that ants lived alongside dinosaurs? Bet you didn't know that spiders actually have 48 knees. There are so many cool facts about invertebras and the good thing is they're pretty much everywhere so you can check them out on a regular basis. Now Alex lives on the edge of bushland so he gets to see a whole heap of not so creepy but really crawly creatures every day. Hi, Alex.

ALEX: Hello.

BEC: Hi, you like all kinds of animals.

ALEX: Yeah.

BEC: What's your sheep's name?

ALEX: This one's Lolly and that one's Harry.

BEC: What other animals do you like, Alex?

ALEX: I have a hermit crab, a frog, a spider.

BEC: So can you take me to see some of your animals?

ALEX: Yep.

BEC: Awesome, let's go.

ALEX: Okay.

BEC: So Alex, what's in here?

ALEX: A hermit crab.

BEC: Whereabouts is he? This shell looks a bit empty.

ALEX: He's under here.

BEC: Hiding away. Do you ever see him being active or running around?

ALEX: Sometimes.

BEC: What's over here in this container? This looks curious.

ALEX: A frog.

BEC: He's very sweet. And I notice there's another container over here, what's in here?

ALEX: A spider.

BEC: What kind of spider?

ALEX: A bird-eating spider.

BEC: I might check it out. Wow, a bird-eating spider. There's a bit of a theme we're going from amphibians to arachnids here, you kind of like the invertebrates?

ALEX: Yeah.

BEC: Well you know what? I know someone who is really knowledgeable about invertebrates and they have plenty of them, do you want to go and see?

ALEX: Yeah.

TANYA: I started really loving insects when I was born, as far as I know. I have no memory of not loving them. When I was a child I'd go out and catch insects and play with them. We'd bring earwigs home to play with them in my house. I've just loved it. It drove my mother crazy. I'd bring home all sorts of things so as far as I know I've always loved insects.

BEC: Hi, Tanya.

TANYA: Hello.

BEC: This is Alex.

TANYA: Hi, nice to meet you.

ALEX: Hello. What do you like about studying insects?

TANYA: Oh, there's so many things to love about studying insects. They're so, so interesting. There's millions of species, most of which we don't know anything about. And there's so many different types of insects. There's insects that are predators, there's insects that eat plants, all sorts of cool things, they're really fascinating creatures.

ALEX: Can we see some?

TANYA: Yeah, come on, we'll go take a look.

ALEX: What type of grub is that?

TANYA: Well it's a rhinoceros beetle larva and the males have a horn on their head that they use to fight for females.

BEC: Have a hold.

TANYA: If you look at the back of it you can see all the dirt that it's been eating, it's right there in its gut, and then these little tubes that are running along the side of it those are how it breathes so the air goes into these little holes in these tubes.

ALEX: It tickles.

BEC: So where do you find these larvae?

TANYA: These guys are from Queensland so they live in the ground, they just bury themselves in the dirt and that's what they eat.

BEC: They're really beautiful.

TANYA: Yeah, they're some of my favourites.

Being a scientist is like being a detective so you have to ask questions and find the answers to questions.

These guys are burrowing cockroaches and they are the heaviest species of cockroach in the world. You've got to be a little careful with them because

they're quite fragile even though they're huge. They will feel a little bit prickly but they can't bite and they can't hurt you.

ALEX: Are these like bush cockroaches?

TANYA: Yep, these are native Australian cockroaches so these aren't the ones that will get into your house. You will never see a giant cockroach scuttling under your fridge. They live under the ground, they bury themselves into the dirt and they eat eucalypt leaves.

BEC: These insects are quite unique, they have like relationships with their young and stuff, don't they?

TANYA: Yeah, unlike a lot of insects they look after their babies. So they give birth to 10 to 15 little baby cockroaches that are born alive, so they're not in eggs, and then once those hatch they actually will take care of them. So these little babies hiding underneath the mum's case there, actual parental care which you don't you see all that often in insects.

ALEX: What sort of subjects did you like at school?

TANYA: I liked all the sciences but of course I really, really loved biology. So anything that talked about living things, plants, animal, those were my favourites. My favourite thing about university was having the freedom to study all sorts of different things. So I took marine biology and learned about whales and seals and fish and things, I also took entomology which was insects, I had the opportunity to study biochemistry and chemistry and sort of a large range of things and then from that you can kind of pick the thing that you really like the most. So it turned out for me to be insects.

So these are baby leafy stick insects and these have a really interesting life

cycle where the eggs look exactly like seeds and they get picked up by harvester ants which take those seeds back to their nest that way the egg is completely protected from predators, it's in the perfect humidity, perfect environment to develop and then once the egg hatches it looks like an ant so it mimics the ant species that it's hiding in and once that happens they'll run out of nest and get out of there really quickly.

ALEX: How big do they grow and how long do they live?

TANYA: They can get to be pretty huge. These ones to get to be about that big so they're really, really gigantic insects and they can live to be about a year to a year and a half old. These ones are less than a month so still quite small but you can see it looks just like a leaf and now it's trying really hard to pretend that it's a leaf, see how it's swaying a bit, I'm just a tree, I'm just a branch, don't eat me.

BEC: They're so amazing. They kind of have a tail like a scorpion the way that it sort of curls over.

TANYA: Yeah, I noticed that, a lot people get concerned that they're going to sting because they do that thing with their tail but they're completely harmless. Insects make up the vast majority of life on this planet and so there's so many diversity of forms. You've got big insects, small insects, you have insects that eat other insects, insects that eat plants, I mean the diversity is amazing.

So these are our Argentine ants. Argentine ants are invasive species and they've been spread all across the world by people by accident now. So if you happen to be at a picnic and you drop some food on the ground and little tiny brown ants come to that that's most likely what they are, they're Argentine ants, they're super common in cities now.

ALEX: Why have you got a whole heap of crates?

TANYA: So what we do is we go outside, we scoop up lots of dirt, we put it into these crates so if you look in here there's heaps and heaps of ants and they're all grabbing each other and carrying their larva and all their food across this thing down into the new colony where we've given them new tubes which are very nice for them to live in and some food and so we leave it for a few weeks and all the ants that are in here will have moved into this thing so we don't have to actually go through the dirt picking out ants one by one, they move themselves. These ants do something that is somewhat unusual. What they do is they form massive super colonies. So most species of ants will have one colony with one queen and that's it. But these guys will have hundreds of thousands of colonies and all of the colonies have hundreds of queens and all of those colonies are connected together with a series of trails between them. In Europe we know there's one colony that spans over 6,000 kilometres and there's some evidence that all the Argentine ants in Australia are probably part of one giant super colony.

I'm really interested in what we call swarm intelligence. So understanding how these really, really simple creatures, because an ant's brain is about the size of a pin head, yet as a big group they can build colonies, they can go out and create these giant transportation networks, a lot like road networks that people have, they can do all sort of thing and we don't really understand yet how that is. So you have a whole bunch of really dumb creatures but together they're really clever.

ALEX: I didn't really think they did this type of stuff at university. I really liked putting on the bee suit and going out and looking at the bees. I liked how they all just go out, fly around and then come back.

TANYA: This dance they're doing is actually a symbolic form of language. So when a bee comes back from foraging on a really good food source he will do this little dance and it's sort of a figure 8 and she will be dancing around and wagging her abdomen and the angle of that waggle relative to where the sun is tells the other bees where the food is so they can figure out what direction the food source is and the length of that waggle tells them how far away it is. So they're able to communicate to one another using a symbol of where food sources are.

This is an observation hive. What we've done is taken a colony and we've put it between these two panes of glass that you can see everything that's going on.

ALEX: So Tanya, why are bees so important to us?

TANYA: Well, often we think of bees as just being things that make honey for us but that's not even their most important job. Bees are really important pollinators so they can go and pollinate almost all of the crops that we eat are pollinated by insects and bees in particular. So they're super super important to keeping our food systems going.

ALEX: What do they eat?

TANYA: They eat pollen, so they eat the pollen flowers and they also collect the nectars, the sugary stuff inside of flowers to eat. They use the nectar to make honey. So up here you can look, see those cells how they're kind of shiny, those are full of honey.

There's so much we can still learn from insects. There's about 1.5 million species that we've given names to but there's probably 10 times that number that we haven't even found yet, haven't identified yet and we know very little

about the behaviour and ecology of most species so we don't know even the most basic things about how they reproduce, what they eat, all those things are still waiting to be discovered.

BEC: Hopefully Alex will continue his interest in insects and maybe even discover a new species along the way.

SACHA: Next episode – Bec visits the high-tech world of motion capture and Lockie meets an astronomer who's discovered some pretty cool things in deep space. See you next time in Enquiring Minds. Bye.

VOICE-OVER: If these stories have inspired you then check out our website for activities and loads of information on all of our experts. Plus don't forget to challenge yourself with our Enquiring Minds game.

END OF TRANSCRIPT