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Mydas Flies Podcast and Scientist Interview

Eremomidas arabicus

Cresting a red sand dune, you come upon an unexpected sight in the desert: a shimmering expanse of fresh water. This oasis is no mirage, but a lake accidentally created by waste water from a desalination plant serving the growing city of Al Ain. The lake has brought change to the creatures, like the mydas fly, that are adapted to life in this stark and beautiful landscape. Ari Daniel Shapiro reports this cautionary tale from the United Arab Emirates.

Transcript

Ari: From the Encyclopedia of Life, this is One Species at a Time. I'm Ari Daniel Shapiro.

One place you don't expect to hear waves lapping against the shore is in a desert. But inside the United Arab Emirates, about 5, 10 miles from the border with Oman, there's a lake nestled into the red sand dunes. Just a few years ago, this part of the desert was dry. Dave Clark is a hydrologist with the US Geological Survey.

Clark: You see local families out here and they're all just enthralled.

Ari: They're pleased or they're weirded out?

Clark: You know, I think everybody's pleased. No, 'cause it's water in the desert, so everybody's pleased. But it's definitely water that's had a human touch to it. People have had their hand in this water, maybe literally.

Ari: This water comes from the Persian Gulf. After going through a desalination plant on the coast, it gets pumped 150 miles inland, to the nearby city of Al Ain. The residents drink it up, bathe with it, and then flush it down their drains.

Clark: It goes to the sewage treatment plant, and they treat it, and they bring it back into town. And they water the parks and the gardens and things like that, and that percolates down into the groundwater.

Ari: And then it ends up here?

Clark: It ends up here.

Ari: You might expect all this water to be a good thing. And it is, for some – I'll get to that in a minute. But the organisms that evolved in the harsh, arid conditions of the desert – aren't faring so well. Like the insects.

Howarth: For them, the encroachment is, is in fact a death sentence.

Ari: Brigitte Howarth is an ecologist at Zayed University in Dubai. She studies insects adapted to the desert. Take the mydas fly, or Eremomidas arabicus, that Howarth spotted for the first time in October 2010.

Howarth: We were walking amongst the dunes, and I saw something really large land. This fly was at least 2, 2.5 centimeters big.

Ari: Like, how big was that?

Howarth: Half the size of a finger. I mean, really, quite a long individual, landed. And then this fly started to move backwards. And it left this incredible track – I mean, you'd recognize that anywhere in the sand dunes now.

Ari: Howarth shows me a photo on her iPad. It looks like a tiny tractor's plowed a soft crescent into the sand.

Howarth: I just couldn't believe the fact that I was so lucky to see this happening in front of me. And all of a sudden, this, this fly started to dip its abdomen into the sand. This fly eventually disappears almost completely – only its head and the very tip of its little wings stick out of the sand. And so, it's about an inch deep in the sand, and it's egg laying. And then it came back up again, and it did this three or four times.

Ari: The mydas flies rely on dry, loose sand to lay their eggs. But the lake is flooding more and more of the sand. Howarth hasn't spotted any mydas flies yet this year, and she's concerned that as the lake continues to swell, their habitat might disappear altogether. These flies depend on the sand dunes – it's an ecosystem going back millions of years.

Howarth: Just because the sand dunes look on the surface to be fairly barren doesn't mean that they are. They are full of life.

Ari: The wind blows the sand off the top layer of the dunes to create a kind of granular fog in the air. But underneath that shifting surface, the world's more stable. So if the dunes are dry

enough and warm enough to allow mydas fly eggs to hatch, Howarth knows that a raft of other organisms will probably be in good shape too. Like the giant Arabian longhorn beetle.

Howarth: Anthracocentrus arabicus – beautiful name.

Ari: Or the ghaf tree that plunges its taproot down into the sand as far as 100 feet in search of water. Or reptiles, like the toad-headed agama.

Howarth trains her eye on the lake. It's risen 35 feet in the last year alone. She's concerned that this new source of water, and the development pressures of a growing human population, don't bode well for the dunes.

Howarth: With every species that we lose, it's like rolling the dice. The whole ecosystem could crash down.

Ari: And yet, despite the trouble this lake's causing the organisms that evolved out here – all this water's become a magnet for a different kind of ecosystem. Dave Clark.

Clark: If I look through the binoculars, there's, like, 7 different kinds of herons. There's greater cormorants. There's ferruginous ducks, which are another very rare worldwide species – there's about 15 of them out here.

Ari: This year, three types of birds bred at this lake. They've never been able to breed before in the United Arab Emirates. But the lake – full of water and food – has changed all that. And new lakes like this one are appearing in other parts of the UAE, too.

Clark: Every year, we find two or three or four or five birds that have never been seen before in the UAE. So it's one of the few places in the world that the number of birds is actually increasing, instead of decreasing.

Ari: There are fish appearing in these lakes as well. Fish eggs cling to the feet and legs of the herons. So as these birds shuttle between old and new lakes – the eggs fall off and hatch. That's how you get fish in a desert.

Out here, one ecosystem is leaking into another. A new web of creatures is replacing the one that came before – and if the lake level keeps rising, it might happen so quickly that we'll never know what was here in the first place.

Our series, One Species at a Time, is produced by Atlantic Public Media in Woods Hole, Massachusetts. I'm Ari Daniel Shapiro.

Meet the Scientist

Meet Brigitte Howarth, the scientist featured in the Mydas Flies podcast:

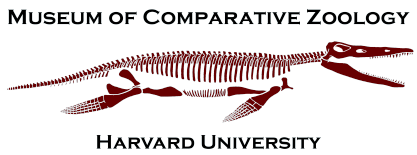
Where do you work?
Department of Natural Sciences and Public Health, Zayed University; And Al Ain Chapter of the Emirates Natural History Group.

What do you study?
Baseline studies of United Arab Emirates and Northern Oman invertebrates, and further studies started during my PhD studies which investigated the mimicry of the Syrphidae (hoverflies) which resemble Hymenoptera (bees and wasps).

What are three titles you would give yourself?
Ecologist, behavioral entomologist, bibliophile.

What do you like to do when you are not working?
When I'm not earning a living at Zayed University, I'm either out on field trips, or learning to play the guitar (classical).

What do you like most about science?
Every time I am privileged to observe a behavior or interaction out in the field that is new to me, I'm in awe of the adaptations and evolution of organisms to their environment. Ecology has taught me that we know very little about these interactions and can only hazard a guess at how much we don't see or know about - we have barely scratched the surface and biodiversity is rapidly decreasing at an exponential rate with tens of thousands of species being lost every decade before they have even been recorded, let along studied.



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