

Hooked on catfish

Lucia Rapp Py-Daniel is a field biologist with eyes for only one animal. Over the past three decades, she has made trip after trip into the heart of the Amazon basin from her base in Manaus in Brazil, looking at new and outlandish species of catfish and gathering specimens for research. She tells **Adrian Barnett** how she braves turbulent rivers and months in the rainforest in pursuit of her passion – even on one occasion having to eat her specimens

Why catfish?

Simply because I find them extremely interesting. They are rarely brightly coloured, they are not very mobile and they stay still much of the time. But they are so different. They have so many different structures and anatomies. Some of the shapes are so strange. I cannot just look at them, I have to ask myself always: “Why is it like this?” They are a puzzle I will never finish.

Do you remember the first one you saw?

My first fish love was so weird that I did not know it was a catfish. It was a very unusual catfish, a *Planiloricalia*, with its slender body covered by bony plates. I was mesmerised by it. It was a type of fish largely missing from the textbooks. All the regular stuff I’d learned about fish did not apply.

What’s the most impressive catfish you’ve collected?

It would have to be the spoon-faced whiptail. It’s a very difficult fish to collect. It has a very flat body – so flat that when you see the thing at the bottom of the net, you think: “No, its artificial!” It has a very round head and a round snout. It looks like a shovel. It’s very weird. It has this very long, thin tail that can sometimes be more than five times as long as the fish. The tail is very easy to break, and the fish can regenerate it very easily. The fish is almost blind, with tiny eyes. I have collected this fish only twice and both times it was such a thrill.

How did you get interested in fish? Are there biologists in your family?

There are no scientists in my family. It sounds corny, but the study of life just called me. I didn’t know exactly what

I wanted to study at university, but I had a feeling for animals and I had a professor who got me interested in fishes and why their shapes vary so much. Now here I am, so many years later, still working at the same puzzle.

I never owned fish as a child. I have never had a fish tank. I hate fish tanks. I hate to see living fishes in aquariums. I think it is not fair. I think fishes have to be in their natural water. In a fish tank I feel they are not happy. They are not in their proper place.

My family used to say that I had this obsession with water. “She likes to be in boats. To be on the river. To go to the water.” It’s true. If I am in a place where there is water, I have to go to it. I have to wet my feet in it, see if there are any fish. I think this is because I am a *carioca*: I was born and grew up in Rio de Janeiro, near the beach. But fish are wonderful. They are so much more varied than the birds and hairy animals that lots of biologists study. If my work can make people love fishes and understand them better, then this is a good thing.

What are you trying to do on your field trips into the Amazon?

To find out what’s there – that’s pretty much the point. Especially if we are going to a place we’ve never been to before, and there are many of those. Most of the big rivers have cataracts, and each time you go above these, the fish community changes. Sometimes this can be really drastic. It is an abrupt change of fauna, and as you go further up it continues to change. I would love to look more at this.

There’s so much variety. You have these tiny creeks, *igarapés* as we call them, and you might find up to 60

Lucia Rapp Py-Daniel is research coordinator in the department of aquatic biology at Brazil’s National Institute for Amazonian Research in Manaus. She is a world authority on catfish, in particular armoured catfish, and author of some 300 scientific papers. She has been working in Amazonia since 1977

different species in a creek that is no wider than a table. There are only about 220 fish species in the whole of Europe and 350 in the whole Mississippi.

How long do the trips last?

Ideally two weeks. More than three weeks is difficult because there are limits to how much formalin preservative you can carry, and how many bottles and buckets. And food and coffee. More than three weeks and you start to run out of everything, including patience.

How do you live when you’re on an expedition?

We make structures out of tarpaulins and small trees. Usually I take a tent, which is very warm inside but easy to set up and you surely wake up early. I’ve also worked from big boats, which you can sleep and work on. Sometimes, when we don’t have room for the camping gear in the boats, we stay in local people’s houses. They often have very little but are very generous. Usually they are very friendly. They enjoy helping us in the field and they get excited about the fish.

What do the local fishermen think of you catching the fish but not eating or selling them?

They know what we are trying to do. We’ve worked with the best ones for many years. We are generally looking for species that you cannot eat. Though once, when we were on the Rio Tapajos and in the field for a long time, we had to fish to eat. All the fishes that were coming into our nets were new species, and we were eating them! At least in the scientific paper we could describe them as tasting good. ▶





Does it ever get dangerous?

Well, all of it is in the Amazon basin, so things can happen. Sometimes it can be really dangerous when you go up rapids with really strong currents. Once my canoe nearly turned over. It was close to Manaus, where the rivers are very big and the storms can be powerful. We were coming back across the wide Rio Solimões and we met a really bad storm. The rain was so hard we couldn't open our eyes, and the waves were very high. If you tried to head for shore, you would turn over the canoe immediately. Two other boats tried to go to shore and they capsized. So we had to carry on in this terrible rain, and because the canoe was open we were pushing out the water all the time to stay afloat. We didn't have any lifejackets because we'd left them out to

make more space for equipment – that was bad. And all the time I was thinking, "What am I going to do if we turn over? What equipment am I going to save? How am I going to save the fishes? How am I going to swim in this crazy water?" You don't think about your life. You think about the equipment and the specimens. We finally found a place where the water was calmer. So I'm still here, still thinking about fishes.

Presumably you need local people to see you through a situation like that.

Sure. When we first get there the locals might be suspicious, because to them we always look like gringos. But when they get used to us, they enjoy it. We sometimes get help from the Brazilian army. I have been to some places on the Rio Negro where the only way we could

"I have never seen that net so full of fish. There must have been 5000 fish in it"

get around was with the army. Some of them are incredible. One of them, Corporal Nanildo, was the best boatman I know. He was very skilled. He got us to places no other person could. There were many rocks, and strong currents. It is difficult to drive a canoe in such rapids. Many people had lost boats and even their lives there. Sometimes he would get the canoe to sit and he would wait for the perfect movement of the water to go up the cataract in all this white water and rocks.

Do you ever get sick?

So far I have been very lucky. I have never had a bad injury or been very sick, but I have seen colleagues of mine getting really bad in the field. When you are in the middle of nowhere and you keep wondering what kind of

medication to give to this colleague and you keep trying different stuff – it can be really bad. Or if you don't have any water to drink, and you have to drink some horrible-looking water that you don't feel comfortable drinking, but you have to so you think: "Forget about it – let's see what's going to happen."

What's the most impressive thing that has happened to you in your fieldwork?

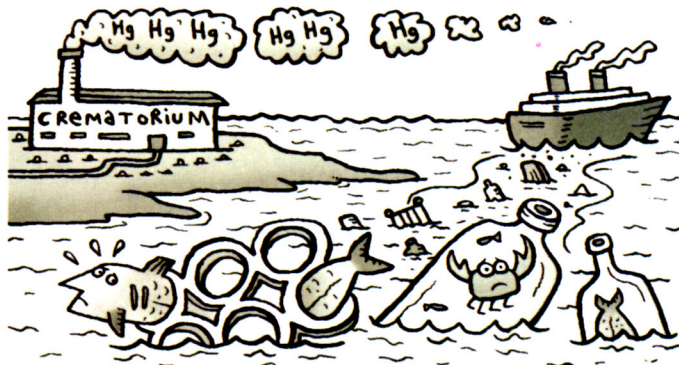
One of the most amazing things happened during the CalAmazon project, which began in 1991 with money from the US National Science Foundation and was organised by my former adviser, John Lundberg. The aim was to sample the bottom of the deepest parts of the big rivers in the Amazon. I spent 22 days on it, and every time we pulled the trawling net through the water, we came up with lots of different fishes. It was amazing. Once we were in a place in the Tocantins and I have never seen that net so full of fish. There must have been 5000 fish in that net. I put at least 20 buckets full of fish alive back into the water, and we still had buckets of specimens.

Apart from fish, do you come across any other remarkable creatures during your work?

Yes. You cannot always see what's coming. You can pull the net in and get a great surprise. There might be a caiman in the middle of it – the South American cousin of the crocodile. You have to pull the thing out. You have to think about keeping the fish, not killing the caiman, not destroying the net and not getting injured. All at the same time. It can happen a lot. Sometimes the caiman jumps into the canoe and then you have to jump out of the canoe. It can be frightening.

Is there a species that you haven't seen that you really hope to see?

There are some big catfishes that I have never been able to see alive, such as the jaú, which is very big. Also some freshwater stingrays. These are not catfish, of course, but stingrays are marvellous and the Amazon has many species. They are very beautiful. I would also love to see the juveniles of some catfish species. Usually we collect just adults and we have no idea what the juveniles look like. Catfish can be very different when they are young. ●



Westminster diary

Tam Dalyell on a mouthful of quicksilver, and waste disposal on the high seas

MERCURY pollution from crematoria might seem a ghoulish topic, but you never know where the next pollutant is coming from. Dental fillings are now reckoned to be the largest single source of mercury emissions in the UK (*New Scientist*, 15 January, p 5). The government has given crematoria until 2012 to halve their emissions. I asked Rosie Winterton, the minister for dentistry and pharmacy issues, for the view of the Department of Health (DOH).

Winterton replied that mercury emissions from all UK sources have declined significantly over the past 20 years. However, as more and more people retain their teeth into old age, mercury emissions from

vaporising amalgam are likely to increase. This is a matter for the Department for Environment, Food and Rural Affairs, which is devising a filter for crematorium chimneys to remove the mercury pollution. This should prevent it from getting into the environment and being converted into organic mercury compounds that can pose a health hazard.

I think mercury emissions from crematoria should be monitored. But don't panic about your filling. Amalgam remains in an inorganic form in filled teeth and is relatively inactive. Winterton pointed out that dental amalgam containing mercury has been used worldwide for more

than 150 years and dentists have filled billions of teeth in that time. The DOH has no evidence to suggest that mercury-based dental fillings pose a serious health hazard.

ARE people who sail the seas now any messier than their predecessors? Probably not, but there is a lot of maritime carelessness, and as research by Dutch marine biologist Jan van Franeker showed, marine litter – especially plastics – can give life in the sea a terrible time (*New Scientist*, 8 January, p 11).

The issue was recently tackled in Parliament, which implemented a European Union directive on facilities for ship-generated waste and cargo residues, through the Merchant Shipping and Fishing Vessels (Port Waste Reception Facilities) Regulations 2003.

These regulations aim to be even-handed with seagoing ships. When a ship enters port it must say how much garbage is aboard, land it (unless it has sufficient storage capacity aboard) and pay a fee irrespective of the quantity landed. With all ports applying this fee, there is no financial incentive for dumping garbage at sea.

David Jamieson, the logistics and maritime minister, says that the directive is in its early stages and the government expects it to reduce the litter being dumped at sea by shipping. He adds that the Maritime and Coastguard Agency is studying the research closely. ●

ENIGMA 1331

Three into two

Susan Denham

There are four football teams in our league, each playing each other once in a season. At the end of the season I worked out the league table (with teams in alphabetical order) and consistently replaced digits by letters in some of the entries to give the table on the right. Unfortunately I was a bit confused and the points for Albion were based on two points for a win (and one for a draw) whereas the others were

	Won	Drawn	Lost	Goals for	Goals against	Points
Albion			J	U	S	T
Borough			T	W	O	
City		T	H	R	E	E
District				N	O	W

based on the correct three points for a win. Which team was top of the league and which was bottom? And which of those two teams (if either) won when they played each other?

£15 will be awarded to the sender of the first correct answer opened on Thursday 14 April. The Editor's decision is final.

Send entries to Enigma 1331, *New Scientist*, Lacon House, 84 Theobald's Road, London WC1X 8NS, or to enigma@newscientist.com (with postal address). The winner of Enigma 1325 is Vit Zikmund of Ceske Budejovice, Czech Republic.

Answer to 1325 Sum letters
The numbers were 86, 44 and 22.