

The fish that love to live in trees

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SOMETHING fishy is happening in the mangrove forests of the western Atlantic. A fish is living in the trees.

The mangrove killifish (*Kryptolebias marmoratus*) is a tiny fish that lives in ephemeral pools of water around the roots of mangroves. When these dry up the 100-milligram fish can survive for months in moist spots on land. Being stranded high and dry makes it hard to find a mate, but fortunately the killifish doesn't need a partner to reproduce. It is the only known hermaphrodite vertebrate that is self-fertilising.

Now biologists wading through muddy mangrove swamps in Belize and Florida have discovered another exceptional adaptation. Near dried-up pools, they found hundreds of killifish lined up end to end, like peas in a

pod, inside the tracks carved out by insects in rotting logs. "They really don't meet standard behavioural criteria for fish," says Scott Taylor of the Brevard County Environmentally Endangered Lands Program in Florida, who reports the findings in an upcoming issue of *The American Naturalist*.

The insect tracks provide the perfect hideaway in dry times, though they can get pretty crowded. So the normally territorial fish tame their aggression. "They put up with each other and just deal with surviving," says Philip Molloy, an ecologist at Simon Fraser University in British Columbia, Canada.

Log-dwelling also presents the challenge of living in the open air. But earlier this year, Patricia Wright of the University of Guelph in Canada and her colleagues showed that killifish



Killifish chill out

cope by undergoing drastic physiological changes. They remodel their gills to retain water and nutrients, and add new proteins to their skin to excrete nitrogen waste. Throughout these modifications, they maintain a fairly constant metabolic rate, and the changes are even reversible when the fish return to water (*Journal of Experimental Biology*, DOI: 10.1242/jeb.002238 and DOI: 10.1242/jeb.002568).

The rotting logs may help explain how killifish occupy such a large range, stretching from southern Brazil to central Florida. Self-fertilisation makes it easy for individuals to colonise new places, and dead logs are good rafts for getting around, says John Avise, an evolutionary biologist at the University of California at Irvine. "They might be washed ashore in a rotting log and start a new population." ●

Centenary Conference: "WHAT MAKES US HUMAN?"

Organised by The Galton Institute, to be held in Darwin Lecture Theatre, University College London, 7-8 November, 2007.

Programme includes the following speakers:

- David Weatherall (the Galton Lecturer)
- Simon Fisher (Oxford)
- David Galton (Wolfson Institute Medicine, Barts and the London)
- John Harris (School of Law Manchester)
- John Hobcraft (York)
- Steve Jones (UCL)
- Reinhard Merkel (Hamburg School of Law)
- Robert Plomin (Inst. Psychiatry, KCL)
- Lee Silver (Princeton University)
- Faraneh Vargha-Khadem (UCL)
- Lewis Wolpert (UCL)

Topics covered: the genetics of mind, the genetics of language, regulation of the new genetic technologies, the demographic transition, legal rights of the embryo, social and ethical dimensions of genetics.

Admission is free with ticket from: betty.nixon.t21@btinternet.com

Mexican skiffs wreak havoc on loggerheads

IN MARCH 2006, the entire Hawaiian swordfish fishery was shut down for the season – 120 boats consigned to port after their hooks snagged their 17th loggerhead turtle of the year.

Now it turns out that a dozen Mexican fishermen, sailing six tiny boats with outboard motors, posed an even greater threat, drowning 700 loggerheads in a year.

This shock finding comes from a team led by Hoyt Peckham of the University of California, Santa Cruz, who has been monitoring turtles off Mexico's Pacific coast. Given that small-scale fisheries are common throughout the developing world, it suggests that strategies to save sea

turtles and other marine life may need to take them into account.

The loggerheads nest in Japan, and spend several decades roaming the northern Pacific. Using radio-tracking, Peckham and his colleagues discovered that juveniles congregate just off the Baja California peninsula, where they feed on swimming crabs.

But this hotspot overlaps with the fishing grounds of two coastal fleets made up of six small skiffs that set long lines on the sea floor with hooks to catch sharks, plus up to 70 boats that catch halibut using gill nets. From surveys with local fishermen, the researchers calculate that in 2005 the gill nets killed at least 299 turtles and the long lines more than 680

"Small-scale fishing fleets are common in developing countries so plans to save sea turtles may need to take them into account"

(*PLoS ONE*, DOI: 10.1371/journal.pone.0001041). That is catastrophic, as the US National Marine Fisheries Service estimates that the loss of just a few dozen large juveniles per year would "appreciably increase" the population's risk of extinction.

Under a project called GLOBAL, for Global Bycatch Assessment of Long-Lived Species, researchers are looking to see if similar disasters are unfolding elsewhere. But in Mexico, at least, there is some good news. Peckham and his colleagues worked hard to stress the value of conservation – even bringing over fishermen from Japan, who told their Mexican colleagues of crashing turtle populations on the nesting beaches.

Last month, the long-line fleet agreed to use alternative fishing gear. "That was the most powerful conservation action I'll probably be able to make in my career," Peckham says. Peter Aldhous, San Francisco ●