

Feature

In the pink

The Darwin anniversaries are set to create record tourist visits to the Galapagos Islands this year and the discovery of a new 'rosada' species of land iguana there can only add to the attraction. But managing the numbers is a growing problem. **Nigel Williams** reports.

"In 2009 we are predicting the Darwin effect will encourage more visitors to Ecuador and could see the Galapagos islands join Macchu Picchu at the top of the continent's 'must-visit' list," says tour operator The Adventure Company.

The company reflects the views of many in the tourist industry that believes the Galapagos Islands are likely to attract increased numbers of visitors this year, which sees two important anniversaries for Charles Darwin. And the new description of a 'pink' land iguana is only likely to boost tourist interest.

When Darwin visited the Galapagos and made key observations that were to help him in writing the *Origin of Species*, he observed both marine and land iguanas but did not encounter a rare pink, black-striped iguana, now called 'rosada', which surprisingly remained unseen until 1986.

The new study is reported in the *Proceedings of the National Academy of Sciences* (published online). Land iguanas are among the most spectacular representative species of the Galapagos Islands. They once lived in many areas of the archipelago but are now restricted as a result of human — and domestic animal — encroachment.

Two species of Galapagos land iguanas are currently recognised: *Conolophus pallidus* and *C. subcristatus*, with the former only occurring on Santa Fe, whereas *C. subcristatus* is present on Fernandina, Isabella, Santa Cruz, Plaza Sur and Baltra.

Charles Darwin visited the Galapagos in 1835. During the five weeks of his stay in the archipelago, he did not explore Volcan Wolf — the northernmost volcano on Isabella. He noticed and commented on both marine and land iguanas, but did not encounter a distinct form of land iguana that occurs only on the Wolf volcano.

Surprisingly this form remained unrecorded despite many other visits by scientists to the volcano.

Now, a team of researchers led by Gabriele Gentile, at the Tor Vergata University in Rome, with colleagues from Ecuador and the US, has carried out a genetic study of the rosada iguana in comparison with its better-known neighbours. The most surprising result, the researchers



Under pressure: Tourists are vital to the survival of the Galapagos's fauna but protecting the fragile environment is a growing challenge. (Photo: Morales/Photolibrary.)



Overlooked: Researchers have identified a new 'pink' species of land iguana in the Galapagos. (Photo: Gabriele Gentile.)

report, was the deep divergence of the rosada lineage at the base of the *Conolophus* clade. "The species alters the current thinking about the timing of diversification of land iguanas, which was previously supposed to have occurred in the Pleistocene era," the researchers write.

"In addition to the taxonomic implications, this form, which we recognise as a good species, is very important because it carries substantial evolutionary legacy, being basal to all other land iguana remnant populations."

Land iguanas have also suffered from hunting and the introduction by man of alien species, such as dogs, cats, rats, goats, donkeys, cattle and pigs, which has led to the loss of several indigenous species.

All iguanas from the Galapagos are a source of conservation concern, Gentile says. Humans have strongly and severely impacted both marine and land iguanas. Tourism may be a fundamental source of benefits for the islands, he says, but some initiatives that are being planned, such as the construction of a jet airport on Isabella and a relaxed fishing policy, could accelerate the decline of the archipelago.

"Available data indicate that the population size of the pink iguana is very small," says Gentile. An urgent conservation program is needed, he argues. This newly recognised species based on currently available data would be assigned to the 'critically endangered' category of the International Union for the Conservation of Nature (IUCN).

Q & A

Clement Kent

Clement Kent was born in Washington, D.C., and studied mathematics as an undergraduate at the University of Toronto. For twenty years, he worked in the computer industry, including stints as Vice President of Research and Development as well as Chief Technical Officer at software firms. He currently is a Ph.D. student in Ecology and Evolutionary Biology at the University of Toronto co-supervised by Marla Sokolowski and Joel Levine.

Why did you change careers?

Although computing is certainly fast-paced and varied, I found myself reading science journals in the evenings for intellectual stimulation. Looking at advances in modern biology, I realized that there were opportunities for people with strong computer skills, and that I could combine my vocation with my avocation there. Many of my colleagues were surprised, but not a few were envious! I think burnout is a real risk in the computer field and people need to move to new challenges to stay fresh.

Why did you become a theoretical biologist?

As an undergraduate I worked hard at pure math, but was interested in its applications — I thought I'd become an astronomer, but I was always fascinated by biology. My only undergrad biology course, which seemed accessible to a mathematician who could program computers, was 'Models in Ecology' by Prof. Jyri Paloheimo. He mixed bifurcation and chaos theory with practical fisheries management models; I owe him a great intellectual debt.

What advice would you give someone thinking about switching to biology from math or physics?

Do it! It's fun, but be prepared for some hard work. Unlike math and physics, success in biology requires learning a large number of disparate facts about how organisms work. Don't be discouraged; look to role models like Seymour Benzer, Robert May, Albert Barabasi to see how it can be done. One of the best things about modern biology is the explosion of data, which