



TheScientist.com

MAGAZINE OF THE LIFE SCIENCES EVERY DAY, ONLINE

Please [Login](#) or [Register](#)

- [HOME](#)
- [COMMUNITY](#)
- [CURRENT ISSUE](#)
- [BROWSE ARCHIVE](#)
- [CAREERS](#)
- [VIDEO & MULTIMEDIA](#)
- [SUBSCRIBE](#)



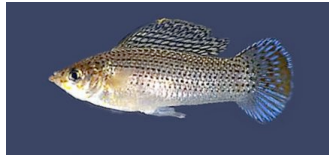
News:

Posted by [Bob Grant](#)
 [Entry posted at 10th April 2009 04:17 PM GMT]
[View comments\(2\)](#) | [Comment on this news story](#)

Researchers have proposed an explanation for how asexual and sexual species can manage to coexist despite having seemingly incompatible reproduction, according to a study published in *Current Biology*.

The Amazon molly (*Poecilia formosa*) is an asexually reproducing species in which females produce only female clones via parthenogenesis. To initiate embryogenesis, however, Amazon mollies require sperm from the males of one of two closely related, but sexually reproducing, species sharing their habitats in southern Texas and northern Mexico -- the sailfin molly (*Poecilia latipinna*) or the shortfin molly (*Poecilia mexicana*).

Ecological theory predicts that such species living as a complex in nature are doomed because population growth in the asexual species should overwhelm the metapopulation with females. That in turn would lead to a shortage of sperm and a collapse of the entire system. The ecological model proposed in the study suggests that with the right mating behavior in males, the arrangement could work.



A male sailfin molly
 Image: USGS

"It's an interesting paper in terms of highlighting this problem," [Laurence Loewe](#), a University of Edinburgh evolutionary biologist, told *The Scientist*. "But I'm not so sure they solved it."

While the model may not completely answer the question of how the mollies defy ecological theory and manage to coexist, it is one of the few solutions yet proposed.

[Hanna Kokko](#), an evolutionary ecologist at Helsinki University in Finland who led the research, based her mathematical model on the idea that if male members of the two sexual species are able to discriminate between females of their own species and females of the asexual species, the complex has a better chance of persisting. Males would mate with their own females more often than



VS

be

; to

ans

[New tool for African genomics](#)

[Life Ascending](#)

[To wake or not to wake?](#)

[Fossil frenzy](#)

[NIH's new rare disease push](#)

[Magneto-ants pump iron](#)

[Tumors spur depression](#)

[Obama names new CDC chief](#)

[Extreme mammals](#)

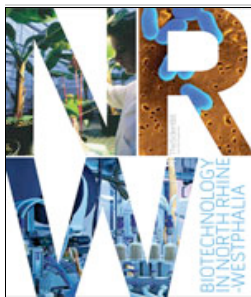
[Q&A: Frog saver](#)

[Will new ESC rules hurt research?](#)

[Nonstip role for petal cells](#)

Advertisement

[Search Jobs](#)



Supplements

[Life Sciences in Ireland](#)

[Life Sciences in the Caribbean](#)

Applied Biosystems

Free Rewards with purchase

Order Today and Earn Reagent Rewards

[Learn More >](#)

the Greater
Phila. Region

[Schizophrenia](#)

[Autoimmunity](#)

Survey Series

[Best Places to Work](#)

[Salary Survey](#)

[Lab Web Site and
Video Awards](#)



The Scientist Daily

Science headlines
delivered daily.
Register today.

Institutions

[For Librarians](#)

[Recommend Us to Your
Librarian](#)

For Advertisers

[Advertise with Us](#)

[Contact Ad Team](#)

[2009 Media Kit](#)

...of providing mates... that their... mates... that...
providing sperm for their asexual cousins. The model additionally suggests that if males are also relatively efficient -- that is, they can continue servicing both sexual and a few asexual females as population numbers rise -- the three species should be able to get along.

And get along they do, though the system does collapse, with molly species going locally extinct on the average of once every four years, Kokko told *The Scientist*. Populations rebuild themselves, though, and the asexually and sexually reproducing species continue their mate sharing, an arrangement that has persisted for as long as 25,000 years. The Amazon molly, likely the result of a hybridization event between its two host species, has already existed for about as long as an asexual species is predicted to hang around, Kokko explained. Asexual species should theoretically accumulate deleterious mutations at a much faster rate than sexually reproducing species due to a lack of gene recombination.

Another important factor in keeping the species complex going may be how the fish species share their watery habitats. Spatially complex structures, such as tree limbs and rock bottoms, may provide molly species with the opportunity to divide up their local habitats and limit interaction between males and asexual females. Kokko said that although her current model does not account for this spatial partitioning, she and her colleagues did address that aspect in a [paper](#) published last year in *Proceedings of the Royal Society B*. That model suggested that the coexistence of asexual and sexual mollies could be explained by habitat partitioning alone.

But all three factors -- male discrimination, male efficiency, and spatial factors -- likely play a role, according to Kokko. "My gut feeling is that the spatial aspect could actually prove quite important," she said. The two sexual species also have broader home ranges, one stretching northward into the US and the other southward into Central America, where the asexual species do not occur. "That would mean there would be a reservoir of sexual species that the asexuals could not endanger," Loewe said.

Kokko and her collaborators are now thinking about how they can test their ecological predictions. She said that they're looking into applying for funding to set up huge tanks outfitted with artificial ecosystems, or mesocosms, to observe the furtive interactions between the fish species. "We would love to have a mesocosm experiment," she said.

Related stories:

- [Early fish had live birth](#)
[25th February 2009]
- [Good golly, miss molly](#)
[July 2008]

Advertisement

Rate this article

Rating: **4.60/5** (10 votes)

Comment on this news story

[Return to Top](#)

comment:

Reference

by anonymous poster

[Comment posted 2009-04-10 23:55:55]

Here's the reference:

[More Entries...](#)

Ads by Google

[YorkBio](#)
[Solutions](#)

Unrivalled
bioanalytical support
to pharma and
related industries.

www.yorkbio.com

"How to go extinct by mating too much: population consequences of male mate choice and efficiency in a sexual/asexual species complex"

Katja U. Heubel, Daniel J. Rankin and Hanna Kokko

<http://www3.interscience.wiley.com/journal/121640075/abstract>

[Return to Top](#)

comment:

This article

by anonymous poster

[Comment posted 2009-04-10 20:24:05]

Anyone have the citation from which this article stems?

[Comment on this news story](#)

[About TS](#) | [Contact](#) | [Advertise](#) | [Editorial Advisory Board](#) | [Privacy Policy](#)
© 1986-2009 *The Scientist*



**DRUG SAFETY STRATEGIES TO
DE-RISK COMPOUNDS**
Part of Drug Discovery & Development Week