

Ants' genome project might unlock mysteries

David Perlman, Chronicle Science Editor
Tuesday, February 1, 2011

PRINT E-MAIL SHARE COMMENTS (16)

FONT | SIZE: - +



Photo credit: Alex Wild

Argentine ants attack a native seed-harvesting ant in California in 2006.

IMAGES



View Larger Images

MORE NEWS

Chaos in Cairo as Mubarak backers, opponents clash 02.02.11

EU: Egyptian democratic reforms must begin now 02.02.11

Punxsutawney Phil predicts an early spring 02.02.11

Map to an ant's world

He and evolutionary biologist Neil D. Tsutsui of UC Berkeley led the group that mapped the genes of the Argentine ants; they also joined scores of other scientists in the other projects.

The new genome map for the Argentines, Tsutsui said, provides "a huge resource for understanding the evolution of their social behavior, the roots of their influence on their worldwide ecology and, of course, the potential for discovering benign new targets to control their disruptive invasions."

The Argentine ants devastate other insect communities vital to pollination and biodiversity and have resisted all efforts to exterminate them. They form huge colonies of genetically identical ants. In [California](#), one colony stretches from San Diego to Oregon. Its members attack and eat every other insect in their surrounding regions, including ants much larger than they are, like the red harvesters.

Red harvesters are extremely large, aggressive ants that can bite. Fire ants not only bite humans, but have evolved to kill small animals. The peaceable leaf-cutters are the most social of all ants. They collect pieces of leaves to nourish the fungus they cultivate inside their nests.

Researchers believe they'll learn to understand these ant groups' behaviors and evolutions by studying their genomes.

'Important new tools'

[Brian Fisher](#), an entomologist at the [California Academy of Sciences](#) and an international expert on ant biology, expressed enthusiasm for the genome projects, saying they could ultimately lead to the development of environmentally benign ant control and new approaches to human health.

"Understanding these ant genes in minute detail will give us important new tools of all kinds," he said. "For example, we know that ants are chemical factories - they talk to each other with chemicals; they make chemicals for resisting bacteria and fungi; they produce antimicrobial chemicals and others that detoxify poisons.

"Knowing their genome, I believe, means that eventually those genes enabling Argentine ants to resist diseases may lead to ways for improving human resistance to all kinds of human diseases."

Smith cautioned that knowing the genome of the ant species does not mean that scientists will quickly find "magic bullets" for controlling the pests, let alone improve human health.

Argentine ants, those nasty invaders of homes around the world, have yielded their innermost secrets to an international team of biologists who have deciphered their genetic code, revealing new clues to their evolution, their social lives - and perhaps to their ultimate defeat as pests.

3

31

share

Led by scientists at [San Francisco State University](#) and [UC Berkeley](#), scores of gene hunters joined in what amounted to an [Ant Genome Project](#) - a smaller-scale version of the Human Genome Project that was completed a decade ago.

This week, four groups of biologists and ant geneticists are announcing that they have completed draft sequences for the [Argentine ant](#), the huge red harvester ant, the vicious stinging fire ant and the peaceful, fungus-farming leaf-cutter ant. Their reports appear in the [Proceedings of the National Academy of Sciences](#) and PloS, the [Public Library of Science](#).

Homeowners around the world are probably most familiar with tiny brown Argentine ants, which year after year and time after time invade their cupboards and countertops looking for morsels of food.

"We now have blueprints for understanding the genetic basis of behavior in the Argentine ants," said Christopher D. Smith, a molecular biologist at San Francisco State. "We've found the genes for determining their development as queens and worker ants, for how queen ants produce chemicals that prevent ant larvae from developing into adults, and for their resistance to toxic chemicals."

Galleries

1-3 of 21



Oscar through the years



Take a bow: SAG Awards, Golden...



Super Bowl week



Kim K.'s Sexy Superbowl Ad

The reality star heats things up in her hot...



PREVIEW

MOST READ MOST E-MAILED MOST COMMENTED

1. Century-old Claremont Hotel files for bankruptcy
2. Punxsutawney Phil Did Not See His Shadow; Winter To End!
3. Sweet Lou joining the champs
4. Reporters, including CNN's Cooper, beaten in Egypt
5. California ranks near bottom in kids' health care
6. Halle Berry challenging ex over custody of their daughter
7. All your problems, instantly solved

FROM OUR HOMEPAGE



Bankruptcy for Claremont

Oakland hotel is one of five high-end resorts that hits the skids after ill-fated purchase.

Comments & Replies (85)



Violence, mayhem in Cairo

Pro-govt supporters ride on horses, toss firebombs at protesters.

Comments & Replies (956)

Photos | Live coverage

"In reality, the genome is really just information and now we have to put it into action by manipulating the ants to confirm if a target gene does what we think it does," he said.

E-mail David Perlman at dperlman@sfgchronicle.com.

This article appeared on page **A - 1** of the *San Francisco Chronicle*

PRINT E-MAIL SHARE

3 31 share



Subscribe to the San Francisco Chronicle and get a gift:

- Sunday + a \$15 gift card
- Fri-Sun + a \$15 gift card
- Mon-Sun + a \$25 gift card

Select an offer

Read More

From SFGate.com:

Ants' genome project might unlock mysteries

Argentine ants, those nasty invaders of homes around the world, have yielded their innermost secrets to an international team of biologists who have deciphered their genetic code, revealing new clues to their... [More >>](#)

California Academy of Sciences: Your...



Scientists find 5 new Parkinson's genes

(02-01) 16:10 PST LONDON, United Kingdom (AP) -- Scientists have identified five new genes linked to Parkinson's disease in a large genetic analysis of the illness, according to a new study. After reviewing nearly 8...

Ex-SC governor, Argentine lover hit Uruguay resort

(01-26) 16:23 PST BUENOS AIRES, Argentina (AP) -- A week after divorced South Carolina Gov. Mark Sanford left office, he and his Argentine lover he called his "soul mate" were spotted frolicking on the beach... [More >>](#)

Powered by one spot



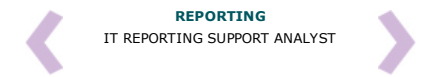
Swank living in Atherton

This roomy 7-bdrm has a pool, tennis court and solarium. Asking \$7.9M. Take a Walk-Through.

Comments & Replies (10)

Top Jobs

PROVIDED BY **hotjobs** by monster



REPORTING
IT REPORTING SUPPORT ANALYST



More Jobs >

REAL ESTATE



Remodeled among the redwoods

Situated on more than an acre loaded with redwood trees, this single-story home was built in '57...

Founder of Zappos sells in Hillsborough
A precious find on Cumberland Street
Remodeled El Cerrito home near BART station

Featured Property



545 Oak Ave San Anselmo, CA 94960
SAN ANSELMO
\$5,988,000
6 Beds, 7.1 Bath
Bradley Real Estate
More Properties

Search Real Estate >

CARS



1997 Honda Civic Hatchback

"A silly little car!" Some say that about my 14-year-old Honda Civic, a modest classic that stands unobtrusively in the shadow of the great marques.

Honda's quarterly profit falls on strong yen
Chrysler 200 replaces Sebring sedan
Photo: Car gallery. Add your photos

Featured Vehicle



2011 Ford Fiesta
\$15,560
Serramonte Ford
Details | Similar Cars

Search Cars >

From Around the Web:

Argentine ant genome sheds light on a successful pest

2/1/2011 — ScienceDaily: Latest Science News

New quartet of ant genomes sequenced

1/31/2011 — ScienceDaily: Earth & Climate News

Newly decoded ant genomes provide clues on ant social life, pest control

1/30/2011 — EurekAlert! - Breaking News

Seeking social genes: Researchers compare insect genomes to hone in on genes associated with ...

2/1/2011 — ScienceDaily: Latest Science News

New quartet of ant genomes advanced by international collaborative

1/31/2011 — EurekAlert! - Breaking News

ADVERTISEMENT

Related Topics: Argentine ant, San Francisco State University, Genome project, Public Library of Science, Proceedings of the National Academy of Sciences, University of California, Berkeley, California Academy of Sciences, Red harvester ant, Brian Fisher, Leafcutter ant

Add Your Comment

New to the site?

To use commenting, you need to sign up.

Register

Already a member?

Please log in. (Forgot Password?)

Username
Password

Remember Me

Sign In

Most Popular Comments



candy_apple_red 9:10 AM on February 1, 2011

No ants were harmed in this project. Wait...MANY ants were harmed in this project.

REPLY (8) (1) POPULARITY: 7

Report Abuse

1 reply



soldog 11:48 AM on February 1, 2011

The queen obviously hasn't created a defense to "LYSOL".

Seems to melts their exoskeletons and the smell of it keeps them from coming back (along that route).

REPLY (6) (1) POPULARITY: 5

Report Abuse

4 replies



open_carrie 9:30 AM on February 1, 2011

Stepping on them seems to work.

REPLY (4) (2) POPULARITY: 2

Report Abuse

[View Comments \(16\)](#)



Gallery: Oscar though the years



Collector, socialite John Traina dies



All your problems, instantly solved



New Academy of Sciences at 2



SF gallery defies Jeff Koons' bark

[Home](#) [News](#) [Sports](#) [Business](#) [Entertainment](#) [Food](#) [Living](#) [Travel](#) [Columns](#) [Buy & Sell](#) [Jobs](#) [Real Estate](#) [Cars](#) [Site Index](#) [\[return to top\]](#)

Advertising Services: [Advertise with us](#) [Place a Classified](#) [About Our Ads](#) [Public Notices](#) [Local Businesses: Business Directory](#)

Reader Services: [Home Delivery](#) [Subscribers](#) [E-Edition](#) [Mobile](#) [RSS Feeds](#) [Newsletters](#) [Feedback](#) [Buy Photos](#) [FAQ](#) [Corrections](#) [Get Us](#)

Company Info: [Contact Us](#) [Hearst Corp.](#) [Privacy Policy](#) [Terms and Conditions](#) [Work for Us](#) [Chronicle in Education](#) [Events & Promotions](#) [Submissions](#)

© 2011 Hearst Communications Inc.

HEARST newspapers