Researchers find malaria turning up in Alaska birds
6,000 mosquitoes are rounded up and sent to California for study.

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(09/23/12 18:58:43)

A new study reports that a form of malaria, generally considered a tropical disease, is being contracted by birds as far north as Fairbanks.

The report was published in the science journal PLOS ONE on Wednesday.

"It is predicted that malaria parasites will spread to both higher altitudes and latitudes with global warming," it says.

That may not be as alarming as it sounds. Avian malaria cannot be transmitted to people.

"While the parasites are related, they are not the same and it would be stretch to predict human malaria in the near future in Alaska," said Karsten Hueffer, a specialist in microbiology and infectious diseases with the Alaska Institutional Development Award Biomedical Excellence based at the University of Alaska Fairbanks.

Nonetheless, a press release from San Francisco State University announcing the publication of the paper asserts that the data may "provide clues as to how malaria might spread in humans as a result of global warming."

The paper is titled "First evidence and predictions of Plasmodium transmission in Alaskan bird populations."

Hueffer called the study "important in that it shows transmission of avian malaria in Alaska quite convincingly."

That transmission, the report's authors warn, could prove devastating to northern bird species that have not encountered the disease and have no resistance to it.

Claire Loiseau, a post-doctoral fellow at San Francisco State who oversaw collection of samples and lab work and is the lead author of the report, is currently working in the tropics.

Several Alaskans collaborated with California-based scientists in the study, including Sue Guers of the Alaska Bird Observatory in Fairbanks and Bruce Seppi with the Bureau of Land Management in Anchorage.

Co-author Ravinder Sehgal, associate professor of biology at San Francisco State, told the Daily News that the research was part of an ongoing project that has been under way for three years that recently expanded to include bugs as well as birds.

In 2010 and 2011, Loiseau and her associates collected birds in Alaska and tested their blood for the Plasmodium parasites that cause the disease.

"This year we became interested in identifying the mosquito vector," Sehgal said. "We started getting mosquitoes in Coldfoot in July.

"It wasn't very hard to do."

Some 6,000 mosquitoes were captured and taken to California where they are now being examined, Seghal said.

Etymologist Anthony Cornel of U.C. Davis is currently identifying each of those 6,000 bugs to determine its species.

"You have many, many species of mosquitoes in Alaska and we don't know which one is doing the transmitting," Seghal said.

After a mosquito's species is determined, it is being submitted to a quick molecular diagnostic test for the parasite. The technology was developed in the past 10 years, Seghal said, and has made it possible to do tests more
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Millions of birds fly to Alaska from southern climates every summer and some have been shown to carry malaria parasites.

Previous studies, however, only examined migratory birds, Sehgal said. For the first two years of the study, Loiseau's group tested non-migratory Alaska birds -- known as "residents" -- and young birds that had been born in Alaska but had not yet left the area -- called "hatch year birds."

Sehgal said birds in Fairbanks, Denali and Anchorage had the parasite and that some of the infected birds were birds that had never left Alaska. Samples were also taken in Coldfoot, just above the Arctic Circle, but no parasites were found at that latitude.

Sehgal noted that penguins brought from malaria-free Antarctica to zoos in warmer climates have contracted the disease and died.

"We think that some of the birds that have never been exposed to it in the far north may also die from it," he said. He mentioned snowy owls and gyrfalcons as examples.

"The only thing is, we don't know," he said. "This would have to be tested."

Hueffer wrote in an email that the paper does not report a change in transmission. "Nothing is known about this issue in the past. The transmission might have been going on for decades or centuries. The interesting part is that transmission could not be detected north of Fairbanks and, that is where the potential change in the future (or currently, we just don't have the data) comes in."

Sehgal said tests conducted in the Canadian Arctic in the 1960s showed that resident birds in that area had never had the disease. "They may have come in contact with (migratory) birds that had it, but there was never transmission," he said. "That has to be done by mosquitoes." That's why the researchers pushed to collect the insects this year.

The Anopheles genus of mosquito, which can transmit malaria to humans, is not native to most of Alaska according to a map prepared by the Centers for Disease Control and Prevention.

Loiseau's team also prepared an estimate of how global climate change might effect the spread.

"We developed a predictor model based on predictions of temperature change up to 2080," said Sehgal. "It seems to get above the Arctic Circle, but doesn't reach the Arctic Ocean."

A map included in the report says that the part of the state south of a rough line from the north coast of the Seward Peninsula to Tok Junction as being suitable for Plasmodium transmission at this time. A narrow band reaching to Coldfoot is designated as suitable for transmission now and in the future and the area north of the Continental Divide is given as unsuitable.

"But we don't have any way to verify those models on the ground," Sehgal said.

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