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Intelligence

Research sheds light on how the red swamp crayfish infiltrated Japanese waters

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By Responsible Seafood Advocate

How has this invasive species thrived, even in much colder habitats?



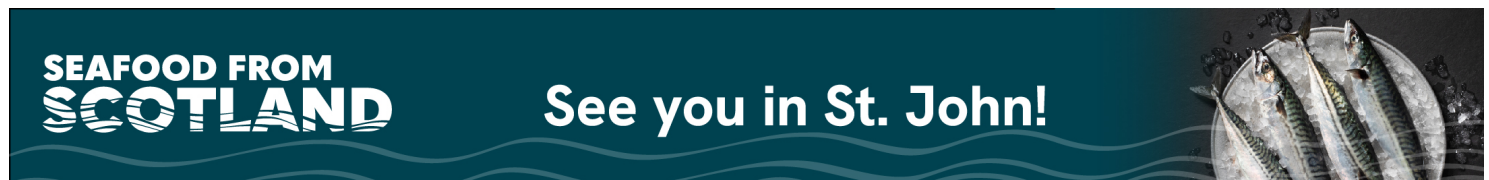
A group of researchers in Japan has discovered genes that may help the red swamp crayfish produce protective proteins and adapt to the cold. Photo by Mike Murphy, via Wikimedia Commons.

Researchers from Japan have identified genes that allow the red swamp crayfish to develop cold tolerance and spread globally as an invasive species.

The red swamp crayfish (*Procambarus clarkii*) has successfully colonized habitats much colder than their original habitats of the southern United States and northeastern Mexico. Factors allowing the species to thrive, and develop a resistance to cold waters, have been thus far elusive.

A group of researchers from Japan – including Dr. Daiki Sato, assistant professor in the Graduate School of Science of Chiba University, and Professor Takashi Makino from Tohoku University – sought to study the genetic factors allowing this remarkable adaptability. Their study was published in the Aug. 18 issue of the journal *iScience* (https://urldefense.proofpoint.com/v2/url?u=https-3A_usw2.nyl.as_t1_177_c1xzw9ynxzna9wyvocpy4w2wm_3_f5ff01d7dbab1196b0e83f9c4660e5ffd662f4f1d3e323fe5f0ebbd193daf60&d=DwMF-g&c=euGZstcaTDllvimEN8b7jXrwqOf-v5A_CdpqnVfiiMM&r=rtRjQmh6QHjzFvooyJx_CQs4B8PpwJlrJdAKUdiqkw&m=ZwfQYJ_jfu-Zw28jMngry52xXcUS38dzNQpYHwd5vEz1kAi4ZEIUAmPqeH-yall&s=qmuaCwKQajMhMS2CJ4ei2ReHnQLAEa-1tNnd8imuLQ&e=).

“Although the red swamp crayfish has been a well-known and notorious invasive species in Japan for quite some time, nobody has examined its genomic and transcriptomic characteristics that contribute to its invasiveness yet, thus motivating us to pursue this study,” said Prof. Makino. “We feel our study has far-reaching ecological implications.”



(<https://events.seafoodfromscotland.org/>).

The researchers compared differences in cold tolerance and related genetic characteristics, as well as the effects of natural selection by comparing changes in gene sequences among the samples.

Their results provide insights into the molecular mechanisms adopted by invasive species to develop cold resistance and contribute to our understanding of invasive species and how to prevent their spread and protect global biodiversity.

Read the full study. ([https://www.cell.com/iscience/fulltext/S2589-0042\(23\)01344-5?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS2589004223013445%3Fshowall%3Dtrue](https://www.cell.com/iscience/fulltext/S2589-0042(23)01344-5?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS2589004223013445%3Fshowall%3Dtrue)).

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