



## Community Spotlight

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### The tale of two fish: A case study on vicariance and allopatric speciation By Demian Alexander Willette



*Sardinella hualiensis*  
Taiwan sardinella  
Tamban/Tunsoy



*Sardinella tawilis*  
Freshwater sardinella  
Tawilis

#### Module Description:

This case study is based on real-world research ([Willette et al. 2014](#)) investigating the origin of a lake-confined sardine, the only member of the fish genus *Sardinella* occurring in a freshwater environment. This case study guides students through evidence that suggests the most likely sister species to the lake species *Sardinella tawilis*, the sister species being the marine fish *Sardinella hualiensis*. This conclusion is reached by examining morphological, meristic, and genetic data, yet is challenged by prevailing oceanographic and geographic features, including the physical distance that separates current populations of these two species by hundreds of kilometers and a land barrier.

#### Teaching Setting:

This mini-case study was developed for and used in an upper division biology course with 14 students (sophomore/junior standing) about 4 weeks into the semester and after students had received a full lecture on biogeography. Students had also read a chapter on Biogeography from the [SimUText Ecology textbook](#) and completed the first page and a half of the handout as a pre-class activity.

#### Citation:

Willette, D. A. (2019). [The tale of two fish: A case study on vicariance and allopatric speciation](#). [SimBio FMN \(2019\)](#), QUBES Educational Resources. [doi:10.25334/Q4ZB3M](#)

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## Related Materials and Opportunities:

This resource was developed by the author during the [SimBio Faculty Mentoring Network \(2019\)](#). If you are unfamiliar with [SimBio](#), they produce software that uses sophisticated interactive simulations to teach biology in an inquiry-driven learning style. Their [SimUText Ecology textbook](#) allows instructors to create custom collections of interactive chapters and/or virtual labs for their classes. Faculty participants in the SimBio FMN utilized the SimUText in their courses and also produced mini-case studies to reinforce the learning objectives of the text. The FMN environment provided faculty with opportunities for group-learning and sharing effective strategies for implementing their case studies. The SimBio FMN recently wrapped up, and participants are busy publishing their mini-case studies as [Open Educational Resources](#) on QUBES. Here are a few that have already been shared:

- [Designing an agroecosystem to feed a Mars colony](#)
- [Interpreting and constructing climate diagrams](#)
- [Competition under the Sea: Exploring the competitive interaction between native and non-native seagrasses in the Caribbean](#)
- [Investigating biomes with BiomeViewer](#)
- [Investigating primary productivity](#)
- [Island frogs](#)
- [Plant defenses and bioprospecting mini-case study](#)

Check back later too - once all mini-case studies are published on QUBES, they will be archived on the [SimBio FMN \(2019\) Overview page](#).

FMNs are a great way to receive support and guidance before, during, and after implementation of a new teaching module or technique. If you are interested in participating in an FMN, check out the [current list of Fall 2019 FMNs](#). Please [subscribe to the QUBES newsletter](#) or check out the [QUBES blog](#) to receive updates about Fall 2019 FMNs and application deadlines.

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