

Short Communication

The Antigua and Barbuda DNA Barcoding Educational Project

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Due to climate change, pollution, invasive species, and other factors, species worldwide are vanishing at an alarming rate. This has important social and economic implications for Caribbean Island nations. In addition, many students in the Caribbean, who may in the future become scientists involved in the conservation effort, need access to the latest training and equipment used in molecular biology.

DNA barcoding is increasingly being introduced into biological science educational curricula, and such projects have been immensely valuable, both in educational terms and in assisting the worldwide conservation effort.^[1,2] “DNA barcodes allow non-experts to objectively identify species – even from small, damaged, or industrially processed material. Just as the unique pattern of bars in a universal product code identifies each consumer product, a ‘DNA barcode’ is a unique pattern of DNA sequence that identifies each living thing” (<https://dnabarcoding101.org/lab/>).

The Antigua and Barbuda DNA Barcoding Educational Project is a collaboration between the American University of Antigua (AUA) and the Antigua and Barbuda Ministry of Education and Sports, which aims to provide local students with high-level educational opportunities in molecular biology, bioinformatics, ecology, and inquiry-based science.

It is based on modern principles of Science, Technology, Engineering, and Mathematics (STEM) education, where students learn through inquiry-based learning while engaging in a project aimed at solving a real-world problem, in this case conserving Antigua’s biodiversity. Students gain knowledge and skills through being involved in an authentic research project, which is multidisciplinary and fosters students’ problem-solving skills.

This project aims to complement the government’s commitment to preparing and encouraging local students for employment in the 21st century STEM careers and is a community outreach project funded by AUA.

This project engages students and teachers in monitoring biodiversity in Antigua using DNA Barcoding techniques. Students collect plant samples, extract genomic DNA, conduct PCR, and input the resulting sequences into bioinformatics databases to determine what species they have. These results are then added to a worldwide publicly accessible database, containing detailed information on species’ location and characteristics.

The first step in the project was conducted on August 31, 2022, at AUA’s central research laboratory, with a professional development workshop attended by 20 Antiguan High School teachers, representing 11 local high schools. The workshop was very successful, with all teachers performing DNA extraction and PCR successfully.

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From October 3, 2022, teachers will select five students from their schools to participate in the project. Students will collect plants from various parts of the island and conduct DNA Barcoding and in so doing will contribute to conserving biodiversity on the island. For further information, please visit our website, which is updated when new data are available.

<http://aua-dna-barcoding.weebly.com>

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Chiovitti A, Thorpe F, Gorman C, Cuxson JL, Robevska G, Szwed C, *et al.* A citizen science model for implementing statewide educational DNA barcoding. *PLoS One* 2019;14:e0208604.
2. Henter HJ, Imondi R, James K, Spencer D, Steinke D. DNA barcoding in diverse educational settings: Five case studies. *Philos Trans R Soc Lond B Biol Sci* 2016;371:20150340.

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