

BIObus: Journeys of Discovery



The BIObus is the field research vehicle of the Biodiversity Institute of Ontario (BIO). Its mission is to help answer a pressing question: how many species live on our planet? Since 2008, the BIObus has been visiting biodiversity hotspots across North America to collect insects and other invertebrates in an effort to document the small and often overlooked cohabitants of our planet. This quest has carried researchers to 21 of Canada's National Parks and numerous locations in the United States where they've collected more than 10,000 species. The BIObus serves as a flagship for learning and public engagement in biodiversity science. During its journeys, using an innovative technique called DNA barcoding, the BIObus has greatly enhanced our understanding of North American biodiversity.



BIObus.ca



BIObus_Canada



BIObus.Guelph



What is a DNA barcode?



DNA barcodes are unique genetic signatures that can be used just like the barcodes on consumer products, but to identify species. Barcoding requires only a tiny piece of tissue, because DNA is found in every cell of every organism. This technique enhances our ability to identify species from all life stages (such as eggs and larvae) and in all forms (such as processed foods and partial remains). It also highlights the existence of cryptic species.

What happens next?

When the BioBus returns from the field, each specimen is photographed and barcoded at the Canadian Centre for DNA Barcoding (CCDB). This and other information about the specimen is added to the Barcode of Life Data Systems (BOLD), an online workbench that provides tools for the management and analysis of DNA barcode data. The International Barcode of Life (iBOL) project is using BOLD to create a barcode library that contains records for every known species.

*Supported by Ann McCain Evans and Chris Evans,
by the Ontario Ministry of Research and Innovation
and by Genome Canada through the Ontario Genomics Institute.*

Why does species identification matter?

Earth is home to many millions of species, but 250 years of traditional study has described fewer than 2 million of them. It is impossible to properly utilize or protect the resources of our planet without a knowledge of the full diversity of life that surrounds us. Fortunately, DNA barcoding is speeding up the pace of species identification and discovery.

Better knowledge of our planet's diversity may be vital to our own survival. Many life-saving medications, such as penicillin and taxol, come from the natural world, as does our food supply. Pollinators are required to produce one third of our crops, but they are in decline while many invasive insect pests are spreading. Meeting these challenges will require rapid and accurate species identification. DNA barcoding can address these and other challenges, like detecting market substitution in seafood, monitoring the health of aquatic ecosystems and tracking the spread of disease vectors in the face of global climate change.



Who will use all this information?

doctors entomologists hikers **biologists**
students parasitologists florists pharmacists
microbiologists **health workers** teachers
farmers ecologists **integrative pest managers**
border officials environmental scientists
exterminators botanists **conservationists**
pathologists zoologists **taxonomists** foresters
food inspectors paramedics horticulturists
fisheries managers **researchers** veterinarians
water authorities geneticists ecotoxicologists
beekeepers birders **forensic scientists...**

anyone with an interest in **biodiversity!**

Where can I learn more?

Blog: dna-barcoding.blogspot.ca
BIO: biodiversity.ca
BOLD: boldsystems.org
CCDB: ccdb.ca
BIObus: biobus.ca
iBOL: ibol.org

international
**BARCODE
OF LIFE**



Making every species count