

THE AMERICAN BIOLOGY TEACHER



About Our Cover

This striking specimen is likely a type of ivory-spotted (also called "ivory-marked") beetle (or borer) in the genus *Eburia*, in the Cerambycidae (longhorn beetles), a wide-ranging and numerous family with >20,000 known species. The specimen shown may be *E. brunneicomis* or *E. blancaneui*, both of which are recorded as found in the tropical Central American nation of Belize, where this photograph was taken.

The extremely long antennae are particularly diagnostic. Some of these insects are pests, with wood-boring larvae; others mimic bees, ants, or wasps. Without precise species identification, we cannot report the habits of this particular organism. *ABT* readers are encouraged to contact us with a more informed identification if possible.

This digital image was recorded with a Nikon D300 camera using an 18–200 mm zoom lens set for 210 mm at f20 1/100th second ISO 320 with VR image-stabilizing technology.

The photographer is *ABT* Editor William F. McComas, Parks Family Professor of Science Education at the University of Arkansas College of Education and Health Professions (mccomas@uark.edu).

Contents

Feature Articles

Using Mollusk Phylogeny To Teach Evolution

New phylogenomic tools have made it possible to construct a robust phylogenetic tree of mollusks
Susan Offner 432

Inquiry & Investigation

Macromolecules Inquiry: Transformation of a Standard Biochemistry Lab

Students use their knowledge of the macromolecules in food to determine the characteristics of specific biological indicators
Elizabeth Unsworth 438

Using Plants to Explore the Nature & Structural Complexity of Life

Understanding biological organization requires layering an understanding of complexity over a conception of size
Ava R. Howard 444



Modeling Evolution in the Classroom: The Case of Fukushima's Mutant Butterflies

Using Avida-ED, students witness evolution in action while developing hypotheses and designing experiments
Amy Lark, Gail Richmond, Robert T. Pennock 450
Available online at <http://www.nabt.org/websites/institution/index.php?p=730>

Tips, Tricks & Techniques

The Electron Transport Chain: An Interactive Simulation

Students use everyday objects as hydrogen ions and electrons and play the roles of proteins to show how this process in cellular respiration produces ATP
Chris Romero, James Choun 456



Oh, Behave! Behavior as an Interaction between Genes & the Environment

Students construct models that demonstrate that behavior, like other traits, is influenced by both genes and the environment
Emily G. Weigel, Michael DeNieu, Andrew J. Gall 460

Make Your Own Working Models of Heart Valves!

These simple working valve models operate using exhaled air instead of blood
Margaret L. Hudson 466

Learning about Vertebrate Limb Development

Students replicate the staining experiment done by Dr. John Saunders that led to the discovery of the apical ectodermal ridge
Jennifer O. Liang, Matthew Noll, Shayna Olsen 471

The Cell Cycle: An Activity Using Paper Plates to Represent Time Spent in Phases of the Cell Cycle

The outcome of this two-part lesson is a combination of science, math, and writing skills that encourages peer discussion and critical thinking
Yvette D. Scherer 478

Departments

Guest Editorial • Coming To a State Near You • Bob Melton	428
Letters to the Editor	429
Classroom Media Reviews • Remy Dou, Department Editor	481