

Invertebrate diversity

Lecture: Tuesday & Thursday, 8:45 – 10:00 (Room CC-301)

Lab: Alternate Wednesdays or Thursday, 13:30 – 17:30 (Room SP-380-5)

Website accessible on moodle via your portal.

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The animal kingdom spans an extraordinary diversity of forms, including specialisations that are often bizarre, and its innumerable species occupy all conceivable ecological niches. Comparative anatomy, embryology and molecular biology show a striking unity among animals, suggesting that this diversity is made up of variations on a series of basic themes, some of them common to all living organisms.

Much of our present understanding of biological processes has been derived from research on invertebrates. A basic knowledge of the systematics and characteristics of the various groups of animals is therefore essential to a valid perspective of biology. This course is intended as an introduction to the unicity (common origins and diversification) of invertebrates and to their functional systems. We will examine the evolutionary processes at work through time that underlie animal life as we know it. The course will involve lectures including active learning exercises, online quizzes, labs with group work, field trips within Montreal and independent reading and viewing of materials in the library. Students must keep up with reading and assignments during term.

Grading scheme

<i>Taxon page:</i>	20% (or 20%)
Portrait of a minor taxon, in the style of the Encyclopedia of Life. To be done in pairs. Possibility of publishing to EOL. Due march 20 th .	
<i>Participation:</i>	10% (or 10%)
Do at-home preparation and online assignments before class and participate in in-class active learning exercises. Must keep up during term.	
<i>Lab notes:</i>	10% (or 10%)
Detailed record of lab work, due at the end of the lab. Mark includes lab participation.	
<i>Lab exam:</i>	20% (or 0%)
Identification of organisms & structures seen in the lab. April 10 th .	
<i>Final exam:</i>	40% (or 60%)
Essay questions demanding reflexion and synthesis on all material covered.	

Resources

Textbook:

- Pechenik, J. 2009. Biology of the Invertebrates, Sixth Edition (2005 Fifth and 2000 Fourth editions also OK)

Other assigned viewing:

- PBS. 2002. The Shape of Life, documentary miniseries (DVDs).
- Russel, BJ. 1976. Invertebrates video series: Coelenterates, Flatworms, Molluscs, Annelids, Nematodes, Arthropods, Echinoderms. Biomedia Associates. (DVD)
- David Attenborough. 2005. Life in the Undergrowth, BBC.
- Marty Stouffer. 2008. A Multitude of Mollusks. Wild America, Season 4, episode 4

Additional resources

- Hickman, CP, Roberts, LS, Larson, A. 1995. Integrated Principles of Zoology, Ninth Edition.
- Hickman CP, Roberts, LS, Keen, SL, Larson, A, Eisenhour, DJ. 2009. Animal Diversity, Fifth Edition.
- Ruppert, EE, Fox, RS, Barnes, RD. 2004. Invertebrate Zoology: a Functional Evolutionary Approach, Seventh Edition.
- Barnes, RSK, Calow, P, Olive, PJW, Golding DW, Spicer, JI. 2001. The Invertebrates: a Synthesis, Third Edition & Second Edition.
- Anderson, DT. 1998. Invertebrate Zoology.
- Cooke. RA, Stewart, B. 1999. A Colour Atlas of Medical Parasitology.(CD).
- Carolina Biolab series. 2003. Realistic Lab Activities: Anatomy and Physiology of the Squid, Earthworm, Crayfish and Sea Star (CD).

Preparation for each lecture:

Red indicates readings in the textbook, **green** shows videos to be viewed (either in the library or online) and **blue** are assignments due. There will be an assignment on moodle based on these materials to complete before the lecture.

- 1: Jan. 7 – diversity
Jan. 9 – origins **BI 7-15** & **Explosion of Life**
- 2: Jan. 14 – sponges **BI 79-91** & **Origins**
Jan. 15 & 16 – Review of invertebrate diversity lab manual
Jan. 16 – cnidarians **BI 101-124**
- 3: Jan. 21– platyhelminthes **BI 149-170**
Jan. 23 – annelids **BI 295-325**
- 4: Jan. 28 – nematodes **BI 431-444**
Jan. 29 & 30 – Anatomy and lifestyle: worms lab manual & **BI 325-328**
Jan. 30 – molluscs I **BI 215-255**
- 5: Feb. 4 – molluscs II: **BI 256-265** & **Multitude of Mollusks**
Feb. 6 – arthropods I: trilobites & crustaceans **BI 350-351** & **373-391**
- 6: Feb. 11 – arthropods II: anatomy **BI 341-350** & **392-396**
Feb. 12 & 13 – Body plan variations: molluscs lab manual & **BI 265-271**
Feb. 13 – arthropods III: on land **BI 352-372** & **Invasion of Land**
- 7: Feb. 25 – insectarium visit **Taking to the Air**
Feb. 27 – bees **Supersocieties**
- 8: Mar. 4 – echinoderms **BI 497-518**
Mar. 5 & 6 – Form and function: echinoderms lab manual & **BI 518-520**
Mar. 6 – chordates **BI 539-548** & **Bones, brawn, brain**
- 9: Mar. 11 – feeding **The first hunter** & **Redpath museum visit on your own**
Mar. 13 – respiration **Ultimate animal**
- 10: Mar. 18 – osmoregulation and excretion **BI 2-6** & **The conquerors**
Mar. 19 & 20 – Compost biodiversity lab manual
Mar. 20 – mechanics of movement **Taxon page due** & **Life on the move**
- 11: Mar. 25 – nervous systems **Survival game**
Mar. 27 – sex **BI 555-566**
- 12: Apr. 1 – embryology **BI 567-577**
Apr. 2 & 3 – Lifecycles lab manual
Apr. 3 – phylogeny **BI 16-31**
- 13: Apr. 8 –Review and questions
Apr. 10 – Lab exam