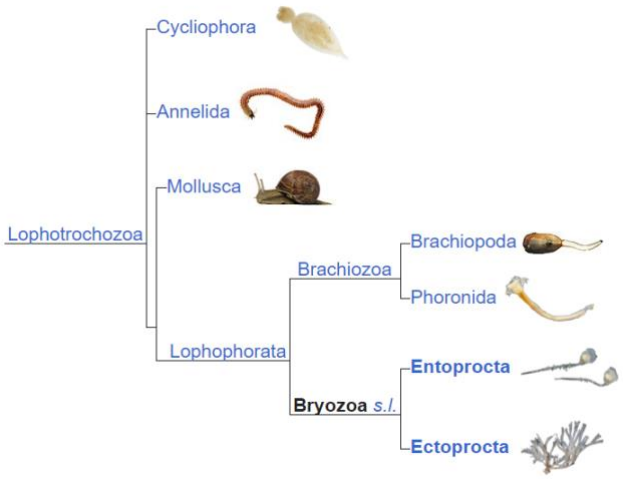
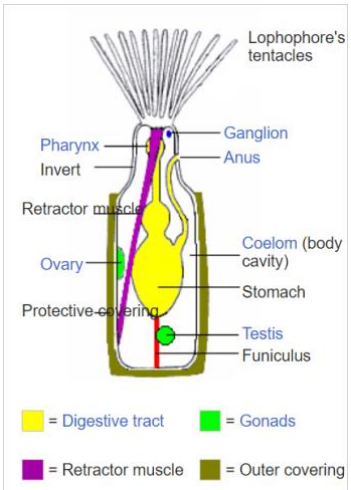
General recommendations for Bryozoa Phylum

Bryozoa are a phylum of simple, aquatic inverterbrate animals, nearly all living in sedentary colonies. They are the only major phylum of exclusively **clonal** animals, composed of modular units known as **zooids**. Because they live in colonies, colonial growth allows them to develop unrestricted variations in form.





Counts of formally described species range between 4,000 and 4,500. The Gymnolaemata and especially Cheilostomata have the greatest numbers of species, possibly because of their wide range of specialist zooids.

Class	**Phylactolaemata**	**Stenolaemata**	**Gymnolaemata**	
Order	**Plumatellida**	**Cyclostomatida**	**Ctenostomatida**	**Cheilostomata**
Environments	Freshwater	Marine	Mostly marine	
Colony shapes	Gelatinous masses or tubular branching structures	Erect or encrusting		Erect, encrusting or free-living
Exoskeleton material	Gelatinous or membranous; unmineralized	Mineralized	Chitin, gelatinous or membranous; unmineralized	Mineralized

Operculum ("lid")	none	none (except in family *Eleidae*)	None in most species	Yes (except in genus *Bugula*)

Guidelines

Sampling

After collection (by hand, dredge/trawl, brushing), specimens are maintained in ambient seawater containers. At this step, specimens are identified with:

- sampling date
- station number
- name species / taxon
- "GENOME" label (to indicate that this specimen will follow the ATLASea cold chain)

Photography

Ideally, images should be taken in the highest quality resolution (macro lens recommended) and where no voucher specimen parts are retained the pictures will serve as voucher and should include identifying features.
Specimen will be photographed in a glass container with sea water.
Water should be clean and changed between each specimen.
If possible, discuss with the taxonomist to find out the important morphological elements to see, and therefore to photograph.

Take a general photo of the colony.

Take closer look of the colony.

One picture is taken with a **scale**, the **code identifier** (e.g. ATLASea QR code, specimen **MNHN-IB** barcode) and the station label with the specimen.

Dissection for DNA barcoding and Genome Sequencing

A bryozoan colony is a group of physically connected individuals (= zooids) derived by budding from a single founding individual, and thus all zooids share a single genotype. The colony is thus the 'specimen' (= genetic individual).

1. Surface contamination (including remains of substrate) and attached epibiotic organisms must be removed from the sample surface using fine forceps and brushes. Be careful, it's fragile and may break into pieces.
2. Replicate samples of zooids (at least 10 pieces) for whole genome sequencing can thus be taken from the same colony.
   If colonies are too small to yield sufficient replicates, more than one colony can be sampled, but different colonies must be treated as separate specimens (i.e. different genetic individuals). Individual zooid bodies (polypides) cannot generally be removed from the colony matrix, so samples are pieces of colony including polypides plus the surrounding 'skeletal' material (calcareous, membranous, gelatinous, or chitinous)

3. Dissect tissue from the **distal** (youngest) parts of a colony, that is towards **colony margins** (if encrusting) or towards **branch tips** (if erect); these regions are the youngest and most active, are generally not yet brooding, and may have a lower level of external colonization by other species. Live zooids must predominate within the colony sections sampled; moribund or senescent 'empty' zooids may be frequent in colonies, and often have just a dark speck – the 'brown body', a product of zooid regression – in the polypide space.
4. Sections of encrusting colonies might be 5-10mm square, comprising several tens of zooids. Cut each piece into smaller pieces before putting them in separate tubes (with unique identification labels). Put around **300 mg** per tube. Prepare at least **10 tubes**.
5. Ensure that all tissues from the same individual are correctly identified on the log sheet.
6. Weight the tubes and scan the barcode on the log sheet.
7. Tubes should be flash-frozen in a liquid nitrogen.

Backup/Biobanking:

1. Dissect at least 1 and up to 10 pieces in separate tubes (with unique identification labels).
2. 10 tubes by specimen
3. Tubes should be flash-frozen in a liquid nitrogen.

Voucher & Taxonomic Assignation samples:

Voucher will be storage at MNHN.

1. Keep the leftover organism, as many parts/tissues as possible or another individual from the same population and checked by a taxonomist as belonging to the same species.
2. Place the barcode **MNHN-IB** identifier and the station label with the organism in tube/container.
3. Put 75-80% ethanol in the tube/container. There must be 10 times the volumes of specimen in alcohol.
4. Put the tube/container with the others specimens in the ATLASea barrels for shipment to the MNHN..