General recommendations for Mollusca Phylum

Molluscs, the largest marine phylum, encompass approximately 23% of all known marine organisms. Distinguished by their diverse forms, molluscs exhibit a remarkable array of species, such as snails, slugs, gastropods, clams, bivalves, squids, cephalopods, and other distinct subgroups that are often overlooked. While the majority of mollusc species inhabit oceanic environments, ranging from seashores to the abyssal zone, a significant portion also contribute to freshwater fauna and terrestrial ecosystems.

Mollusk Class	Examples	Estimated Number of Living Species	Habitat
Gastropoda	Snails, slugs, abalone, conch, limpets, sea hares, and sea butterflies	70,000	land, sea, and freshwater
Bivalvia	Clams, oysters, scallops, and mussels	20,000	sea and freshwater
Polyplacophora	Chitons	1,000	sea
Cephalopoda	Squid, octopus, ammonites, nautiluses, and cuttlefish	900	sea
Scaphopoda	Tusk shells	500	sea
Aplacophora	Small deep sea marine mollusks that resemble worms	320	sea
Monoplacophora	Deep sea mollusks with a cap like shell	31	sea
Conchifera, Rostroconchia, and Helcionelloida	Extinct	Extinct	Extinct

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).

A lot of Mollusc (Bivalva, Cephalopoda, Gasteropoda) are CITES.

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 can be photographed on the support or in the container.

Bivalvia
Take picture of both sides of the shell.
After opening or after mission, take picture of the inside of the two valve.
Gastropoda
Take picture of the opening side and from behind the shell.
Cephalopoda
Take picture of both side of the specimen
Polyplacophora/Chitons
Keep the specimen in the container.
Take picture of the specimen from above, plates visible (unfolded animal).

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

Dissection for DNA barcoding and Genome Sequencing

1. Rinse and brush specimen in filtered sea water (FSW).
2. Whenever feasible, organisms should be sampled and preserved while they are still **alive**.
3. Anesthezied specimen with MgCl2 or 1% ethanol.
4. Isolate the individual:
    - For **Gasteropoda**, gently break the shell (when they have) with a vice.
    - For **Bivalvia**, open the shell with a knife (or let it open the shell in FSW)
5. **Avoid gut**. Recommended tissues are listed below.
6. Dissect at least **10 pieces** (approx. **300 mg** each). Cut each piece into smaller before putting them in separate tubes (with unique identification labels).
7. Ensure that all tissues from the same individual are correctly identified on the log sheet.
8. Weight the tubes and scan the barcode on the log sheet.
9. Tubes should be flash-frozen in a liquid nitrogen charged dry shipper and stored in a -80°C freezer.

Recommended tissues to sample
Bivalvia

- muscle adductor
- mantle
- muscle from foot

Gastropoda

- muscle from foot
- muscle from tentacle

Nudibranchs:

- foot
- mantle

- Avoid gonads.

For **spiralled individuals** : Avoid apex of the spiral due to the presence of the the digestive tissues and gonadal tissue in this portion.

Polyplacophora/Chitons

- a section of the posterior body
- only flesh (when it can be extracted from the shell)

Cephalopoda

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 every parts of the shell even if it's broken.
2. If there is leftover tissus, keep muscle form foot or mantle.
3. Place the barcode **MNHN-IM** identifier and the station label with the shell/tissus in tube/container.
4. If there is only shell left put 75-80% ethanol in the tube/container. Otherwise, put the shell and the tissus in 96% ethanol. There must be 10 times the volumes of specimen in alcohol.
5. Put the tube/container with the others specimens in the ATLASea barrels.