About cleaning of shells

some general guidelines by
Frank Nolf & Steve Hubrecht

Marine Molluscs

speaker: Frank Nolf

Sequential steps:

- killing and deleting the soft parts
- removing seaweed and lime encrustations
- which methods?
  - depending on the kind of shells
  - watch out for damage
  - if incomplete: risk for mold
  - what about periostracum and operculum?
  - time consuming, a lot of experience is required

Boiling:

- submerge the living animals completely in water
- heat gradually until boiling temperature is reached:
  * small species: 1-2 min.
  * larger animals: 2-5 min.
- let it cool down slowly

- remove the soft parts with a scalpel or other dissection instruments
- rinsing, rotating, shaking or hosing the animal with a nozzle to wash away all animal remains
- brush out both outside and interior of the shell
- remove the operculum and stick it on cotton wool
- let the shells dry completely
- apply a thin layer of mineral oil


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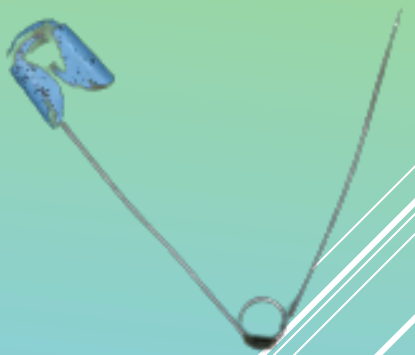
№199








KROON OIL
HANDY OIL
Universal Lubricant
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Freezing:

- interesting method in case of shining shells
- remove any remaining moisture to avoid cracks
- store in a closed plastic box in a freezer room during 2-3 days
- when the animal comes out → remove it with tweezers under running water
- pay attention: shells become fragile

Alternative methods:

- for large shells (especially from the Indo-Pacific):
  * bury in sand or garden soil to let them being consumed by ants
  * hanging on a hook (*Cassis*, *Strombus*, …)
- for small species (Terebridae, …):
  * microwave oven
  * ultrasonic bath


BRANSON
General Purpose Cleaner-Concentrate

Alcohol-method:

- use ‘denaturated alcohol’ (ethanol - water + ether or ethylacetate)
- alternative: isopropanol (at least 40%)
- submerge in a closed container during a few days
- do it immediately during fieldwork or afterwards at home

- then two options are possible:
  * let the mollusk dry up (advantage: operculum stays in the right place)
  * or remove it with a dissecting needle (less chance for mildew afterwards)
  note: the latter method is preferable in case of larger animals

Formalin-method:

- useful when the alcohol-method fails
- use 30% formalin (commerical product) and dilute to 7-10%
- problems:
  * highly toxic, mutagenic and possibly carcinogenic
  * harmful to skin, eyes and lungs (use gloves, ventilate well, …)

- formalin is rather acid: neutralise it with borax and bicarbonate to avoid damage of the shells under prolonged immersion
- eventually cover up a white deposition with mineral oil
- duration of process: max. 2-3 days
- advantages: very efficient (complete denaturation of all the proteins) and operculum stays in its original place

Bleach-method:

- bleach or clorox is a solution of sodium hypochlorite, also available as tablets
- replaces the cooking process: duration of immersion is 2-3 weeks
- disadvantage: protect skin with plastic gloves; watch out for clothes!
- periostracum and operculum are completely damaged!

Cleaning of bivalves:

- Boiling – freezing – alcohol-method

- Boiling:

  * after cooling: remove the soft parts with a scalpel and a brush
  * tie valves together with yarn or let them dry in ‘butterfly’ condition

- fragile shells (a.o. *Pholas*, *Barnea*, …): use alcohol or formalin
- other species (*Pinna*, *Ostrea*, …: crack when boiling): freeze them during a few weeks + open valves with boric acid
- remove soft parts
- apply a thin layer of mineral oil to the hinge
- eventually save the byssus

Preparation van chitons:

- Accessories:
  * pointed blade (for small species), sturdy knife for larger species to remove the mollusks in situ
  * plastic, wooden or glass plates (slides for microscopy)
  * white sewing thread or tape and scissors
  * well-closing tray with flat bottom
  * products: water (aq. dest.), ethanol, isopropanol, glycerin


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Aqua
destillata
PRO/PRE TECHNICKÉ ÚČELY
TOP AIR
2000 ml


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WITHOUT COLORANTS AND FRAGRANCES
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WITHOUT COLORANTS AND FRAGRANCES
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- **Hanselman-method**:

    * during field work: remove the chitons with a small knife and put them on the flat bottom of a plastic box + seawater

    * at home: kill the animals under a jet of water and bind them with sewing thread or tape on a slide and let them swell overnight in a bowl filled with tap water.

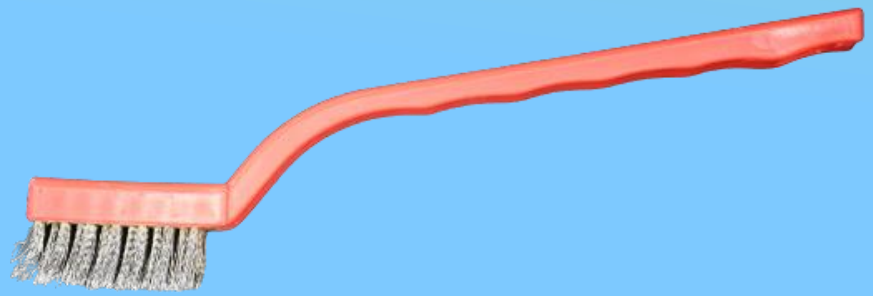
Note: tie *Acanthochitona* sp. lenghtwise so as not to damage the bristles.

* then replace the water by a 50% alcohol solution
* loosen the chitons and bind them again on new slides kept in a mixture of: 1/3 water : 1/3 isopropanol : 1/3 glycerin (2-4 weeks)
* finally: let them dry
* conserve the chitons in a closed plastic box or a zip bag

* problems:
  ° pay care when binding: the chance for curled or injured valves
  ° the presence of glycerin induces water absorption resulting in fungal growth
  ° a chiton collection has to be checked regularly on the presence of insects (‘museum beetle’), dust and mildew
  ° avoid formalin: radulas can no longer be saved and studied!

The outside of the shells:

- some shell collectors prefer to retain the original look of the exterior occupied with seaweed, lime, barnacles, coral remains, …
- other collectors: to study the microsculpture and to make perfect pictures of them a thorough cleaning is needed



- glossy shells (Cypraeidae, Olividae, …): a simple treatment with a soft cloth is sufficient
- periostracum dries out and flakes off!
- after careful washing and drying → apply a film of oil with a small brush → repeat this procedure every few months and then protect the shells from dust

Removing lime:

- from difficult to very hard and especially time consuming
- the best way is to use small knifes or multitool utensils (Dremel, Ferm, Powerplus)
- all other treatments (the use of acid or lye) are harmful for the shiny parts and so complete immersion should be avoided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- **Use of ‘caustic soda’:**

  * after removing the soft parts: immerse the shells in a solution of 1/8 kg of granules in 1/2 L water – stir well with a wooden spoon and let it cool completeley
  * first of all run a test, especially in terms of the timing and concentration of the solution
  * harmful to eyes and skin – use gloves!


Essential POWER
CAUSTIC SODA
THE ORIGINAL AND BEST DRAIN CLEANER


EVER BUILD
CAUSTIC SODA
Unblocks Drains & Pipes
CONCENTRATED- Mixes up to 5 Litres
Ideal for Heavy Duty Cleaning

- store shells in the solution for max. 12 hours
- rinse very well and remove the fragmented lime with a small knife or a drill and a stainless steel (no cupper!) brush
- pay attention: periostracum, operculum and glossy parts are completely corroded
- **avoid this procedure: more detriments than advantages!**

- **The use of acids:**
  muriatic acid (hydrochloric acid) and acetic acid are also not recommended, but a treatment with a brush immersed in an acid solution for a few seconds followed by a direct rinsing under a jet of tap water could be very efficient: glossy parts of the shells had to be protected and the use of plastic gloves is recommended!
- a film of mineral oil can eliminate eventual damage and certainly never use varnish!

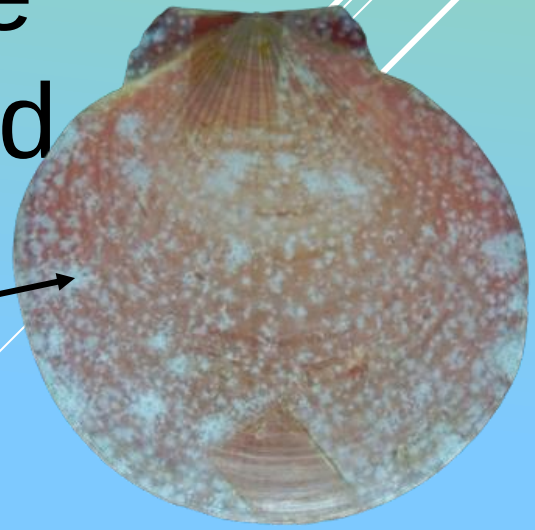

CORROSIVE
Acetic Acid
Glacial
EMD


Zoutzuur
INHOUD: 1000ml
DE PAREL


nowchem
When smarter chemistry matters
Hydrochloric
Acid 32%
32% Hydrochloric Acid Solution
Batch
15 Litres

Mildew:

- due to insufficent removal of soft parts or by keeping the collection in humid conditions: mildew growth → white dots, a white tinge, flakes or cristals of calciumbutyrate → irreparable damage
- shield the shell collection from dust and check the collection regularly for eventual presence of mildew



Tip:

- **Epitoniidae, Terebridae, a.o.:** if you want to observe the operculum clearly or easily to remove it, keep the mollusk in distilled water for about 48 hours (change the container regularly) followed by an immersion in alcohol. In this way the animals don’t have a chance to retreat!

shells before treatment with multitool utensils and bleach

shells after treatment with multitool utensils and bleach

Cleaning of land- and freshwater shells

speaker: Steve Hubrecht

Specific challenges and opportunities:

1. land- and freshwater snails often have very thin shells and are fragile to handle
2. the periostracum (proteinaceous outer shell layer) is often an integral part of the shell and cannot be removed (e.g. with bleach or peroxide) without destroying or at least damaging the shell

3. landsnails often have a very constricted mouth which makes removal of the animal and/or cleaning of the interior of the shell nearly impossible
4. on the other hand, landsnails never have coral, tubeworms or barnacles, eventually algae (*Pleurococcus*) → a quick brush with soapy water is enough to remove all dirt
   attention: freshwater snails from high hardness water may have calcareous deposits over the whole shell → difficult to remove

Live large shells and/or with wide mouth:

1. Preparation of snails:

* aestivating (dormant) landsnails sometimes with a mucus sealed aperture (epiphragm) and snails withdrawn in the shell need to be reactivated again

* wrap them in a wet paper towel or place them in a container with wet paper towels for a day or so until they become active again: snails are more easily removed when they have fastened

2. * boiling: the animals should be placed in a pot of cool water and warmed to boiling gradually
   * leave boiling for 30 sec to one minute depending on size
   * the meat can then be hooked out with a pin or flushed out with some water pressure: this works best when the snails are kept warm

* do not boil too many snails at the same time
* remove any coagulated mucus with a brush and wash with clean water
* save the operculum - if any present - in the aperture with a plug of cotton
* some colours can change with boiling: some green becomes bronzy or dirty gray

3. freeze/thawing: perform several cycles if necessary and then flush out the animals with a waterjet (best for colour preservation!)

4. microwave: put snails in a zipper bag for a short time (trail and error) → snails are often ejaculated from shells or otherwise flush out under a stream of water

5. the use of an oven at 150°C: leave for about 5 minutes and then flush out
attention: dry heat can be very damaging on some colours, e.g. pink

6. * finalization: remove any coagulated mucus with a brush and wash with clean water → dry
   * save the operculum - if any present - in the aperture with a plug of cotton
   * mineral oil application if desired

Large dead snails or snails with residual animal parts:

- in summer: dead snails may be left outside in the shade for flies to eat out the interior
- soak shells for 24 hrs in soapy water and flush out any residues; repeat if necessary
- dry the shells and save the operculum - if any present - with a plug of cotton
- mineral oil application if desired

Small snails and/or snails with constrained mouth:

- kill and start preserving snails in 70% alcohol
- after some days (or longer) wash in soapy water and dry
- preserve again in 95% ethanol to dessicate and preserve further
- store in a dry environment and if available use a dessicator

Freshwater mussels:

- any live animal can be removed by boiling or freezing/thawing
- clean the shell of any mud, algae or animal remains with a relatively soft brush
- shells can be closed using tissue and thread/elastic band or kept open (butterfly style) or loose valves to show the nacreous interior
- if desired, shells can be coated with mineral oil
- large thin shelled bivalves are prone to cracking and can be treated with vaseline (petroleum jelly) or paraffin.