Fin clips for genetics

Onboard the DF Nansen, genetic samples are usually taken from species with a large geographical range, and that are commercially important in a larger region. The results are used to study population genetics and connectivity. The results can also be used to study migration, sexual maturity and other biological processes. We might also take genetic samples for species identification for taxonomically challenging species.

Normally the genetic sample taken onboard is a fin clip, which is what is described in this procedure. However, we might occasionally take a muscle sample (example sharks or rays) or a defined part of an invertebrate for genetic studies. The general procedure is nevertheless the same.

Critical factors

- During sampling of numerous fish, consider laying the fish on ice so that the samples taken are kept cold. Vials must be placed in the freezer as soon as sampling is completed.
- Use ethanol absolute (or at least 96%) for preservation. **Do not use methylated ethanol**
- The amount of tissue needed for a DNA extraction is small (5-10 mm) and it is important to have good quality material (i.e. well dehydrated tissue) to ensure DNA quality.
- **Clean the sampling tools properly between individuals to avoid cross contamination**

Equipment

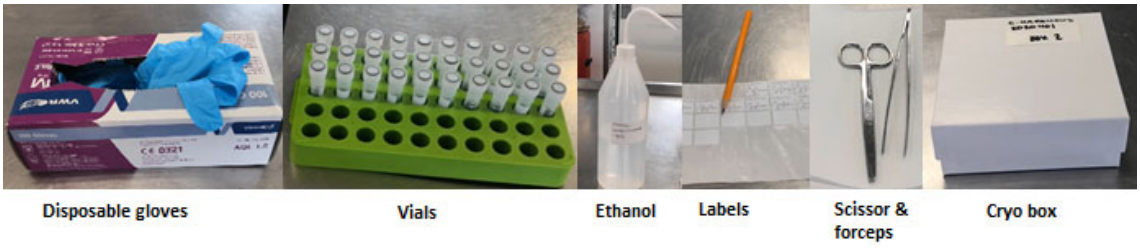


Figure 1. Equipment necessary for taking genetic samples

Procedure

1. Prior to sampling, prepare the labels. **Write labels for tubes and boxes with pencil** instead of permanent markers as pencil is resistant to water/ethanol leakage. The same applies to laboratory notebooks. Tubes can be marked by:
    a. with a paper label written in pencil and stuck on the outside of the vial,

b. writing directly on the vial using ethanol proof pen (usually used for numbering),

c. with a waterproof paper label inside the vial (when requested)

Label all vials with:

- *Genetic sample #ID (running number for each box, 1 to 81)*
- *Species*
- *station number*
- *Survey number (if space)*

2. Eppendorf tubes/vials must have **screw cap** to prevent ethanol leakage and they must be tightly screwed.

3. Prepare eppendorf tubes prior to sampling by filling them with 96% ethanol. Alternatively, add ethanol to each tube just before sampling. It is important to have as much ethanol as the tube allows to ensure the dehydration of the tissue.

4. The scissors, scalpel and forceps must be cleaned between each specimen. This is done by wiping the tools with clean tissue paper, before plunging in ethanol

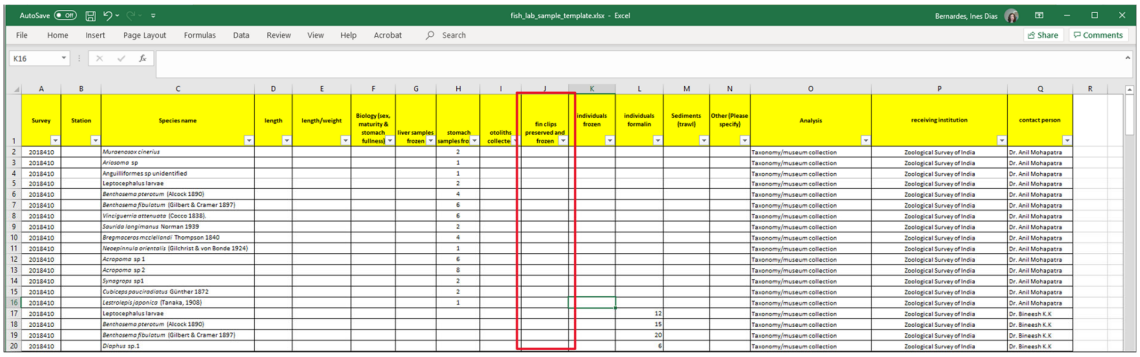
5. The sample required is small. For fish, 4-8 filaments about 5-10 mm long from the right-side pectoral fin is sufficient.
6. Place the fin clip in the vial and shake or turn the vial to ensure saturation of the tissue.

7. The amount of tissue should be no more than about 30% of the volume, with size about 5-10mm.

8. Place vials in correct (running) order in a cryo box, and label the box with:
    - *box number (running number for each survey)*
    - *date*
    - *survey number*

- *station number*
- *species names*

9. Ethanol-fixed samples (96% ethanol) should be stored preferably in the freezer but alternatively they can be placed in the fridge.
10. Register in the biological samples log (samples overview from the lab[1]) the samples ID # for each species, as well as under the genetic tab in the same document



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Survey	Station	Species name	length	length/weight	Biology (sex, maturity & stomach fullness)	liver samples frozen	stomach samples fro	otoliths collecte	fin clips preserved and frozen	individuals frozen	individuals formalin	Sediments (trawl)	Other (Please specify)	Analysis	receiving institution	contact person	
2	2018410		*Muraenesox cinereus*					2							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
3	2018410		*Ariosoma* sp					1							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
4	2018410		Anguilliformes sp unidentified					1							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
5	2018410		Leptocephalus larvae					2							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
6	2018410		*Benthosema pterotum* (Alcock 1890)					4							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
7	2018410		*Benthosema fibulatum* (Gilbert & Cramer 1897)					6							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
8	2018410		*Vinciguerria attenuata* (Cocco 1838).					6							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
9	2018410		*Saurida longimanus* Norman 1939					2							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
10	2018410		*Bregmaceros mcclellandi* Thompson 1840					4							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
11	2018410		*Neoephinnula orientalis* (Gilchrist & von Bonde 1924)					1							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
12	2018410		*Acropoma* sp 1					6							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
13	2018410		*Acropoma* sp 2					8							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
14	2018410		*Synagrops* sp1					2							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
15	2018410		*Cubiceps pauciradiatus* Günther 1872					2							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
16	2018410		*Lepidopus japonicus* (Tanaka, 1908)					1							Taxonomy/museum collection	Zoological Survey of India	Dr. Anil Mohapatra	
17	2018410		Leptocephalus larvae									12			Taxonomy/museum collection	Zoological Survey of India	Dr. Bineesh K.K.	
18	2018410		*Benthosema pterotum* (Alcock 1890)									15			Taxonomy/museum collection	Zoological Survey of India	Dr. Bineesh K.K.	
19	2018410		*Benthosema fibulatum* (Gilbert & Cramer 1897)									20			Taxonomy/museum collection	Zoological Survey of India	Dr. Bineesh K.K	
20	2018410		*Diaphus* sp.1									6			Taxonomy/museum collection	Zoological Survey of India	Dr. Bineesh K.K	

[1] Log can be found in the wiki, in the fish lab information page, under Log Forms:
Link to log template onboard Nansen
Link to log template onshore