

Working Document 2(part1): Reference Document Maturity Stages of Dab and Flounder

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Reference Document Maturity Stages of Dab (*Limanda limanda*)

1 Introduction

This document contains the descriptions and reference pictures for the sexual maturity stages of dab (*Limanda limanda*). The descriptions as well as the reference pictures were discussed and created by WKMSSPDF 2012.

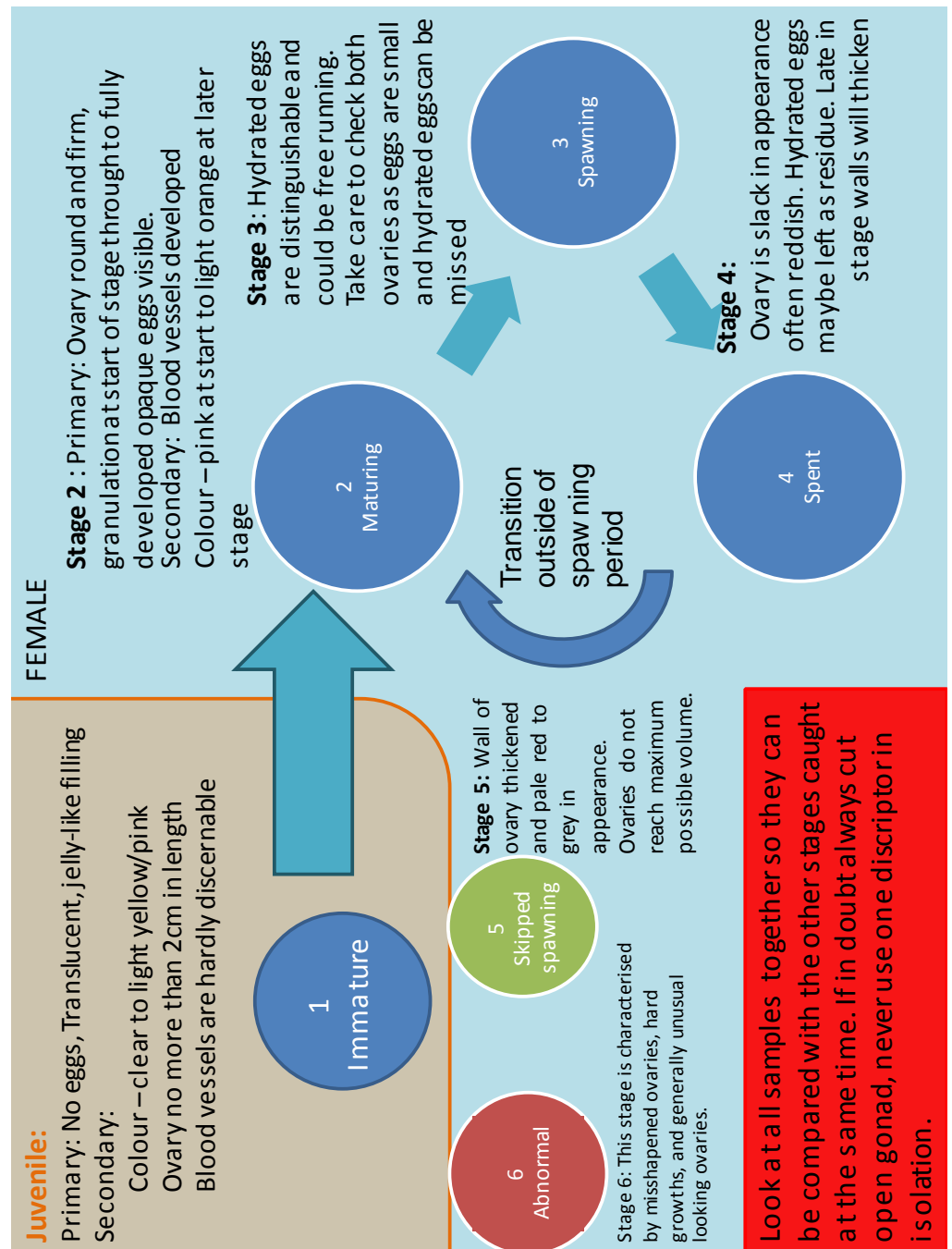
It should be mentioned that reliable macroscopic maturity staging of fish can only be done in the period from two months before the spawning season until the end of spawning. Outside that period, histological samples should be taken to identify the maturity stage. The description of the stages focuses thus primarily on this period.

In general, sexual maturity development in fish is as follows: after the juvenile stage, of which the duration varies by species, fish will mature. In the maturation cycle, the gonads mature (stage 2), the fish will spawn (stage 3) and after that will be spent (stage 4). The next year, this cycle repeats itself.

Incidentally, if the condition of the fish is low, it might decide to skip a spawning season (stage 5), or the gonads of a fish do not develop in a normal way (stage 6).

Chapter 2 describes the sexual maturity stages of female fish, chapter 3 contains maturity scales for males.

2 Female



2.1 Stage 1 - Juvenile

Primary:

- no eggs
- translucent
- jelly-like filling

Secondary:

- colour – clear to light yellow/pink
- ovary less than 2 cm in length
- blood vessels are hardly discernible

No picture available

2.2 Stage 2 – Maturing

Primary:

- ovary round and firm
- granulation at start of stage through to fully developed opaque eggs (eggs filling up with yolk) readily visible

Secondary:

- blood vessels developed
- colour – pink at start to light orange at the end of the stage



pictures: ovary in the fish NED2010_dab_121013_003_2.jpg (upper) and ovary cut open outside the fish NED2010_dab_121013_003_5.jpg (lower)

2.3 Stage 3 – Spawning

Primary:

- one to many hydrated eggs distinguishable
- occasionally running under light pressure

NB: check both ovaries as eggs are small and hydrated eggs can easily be missed



pictures: ovary in the fish NED2010_dab_121009_013_2.jpg (upper) and ovary cut open outside the fish NED2010_dab_121009_013_5.jpg (lower)

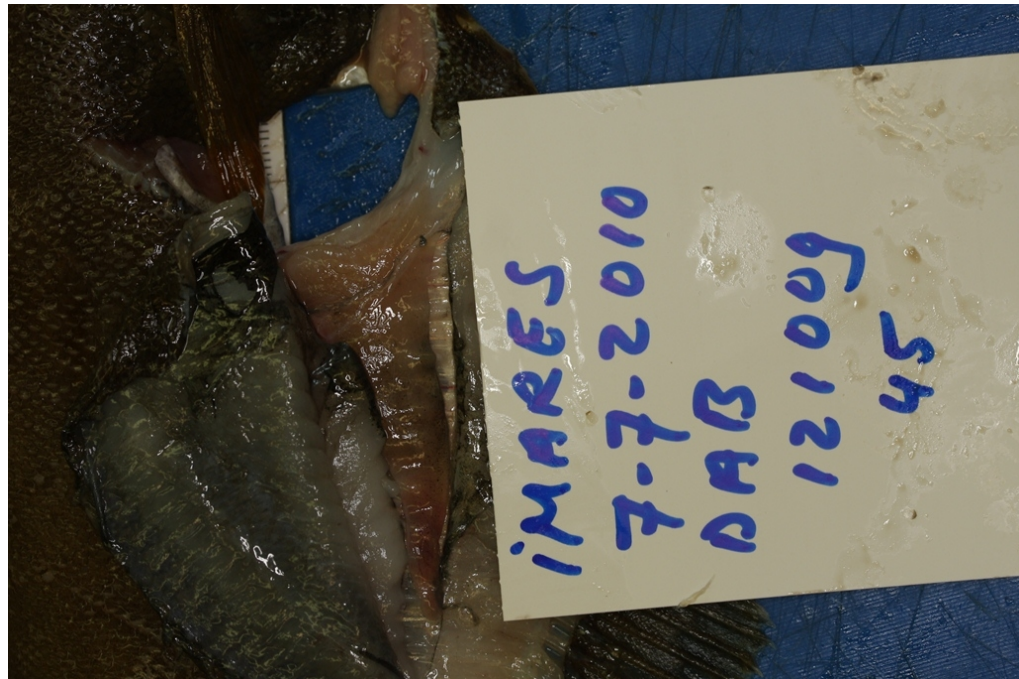
2.4 Stage 4 - Spent

Primary:

- ovary slack in appearance
- hydrated eggs may be left as residue

Secondary:

- colour – often reddish



pictures: ovary in the fish NED2010_dab_121009_045_2.jpg (upper) and ovary cut open outside the fish NED2010_dab_121009_045_5.jpg (lower)

2.5 Stage 5 - Skipped spawning

Primary:

- wall of ovary thickened
- ovary pale red to grey in appearance
- ovary does not reach maximum possible volume

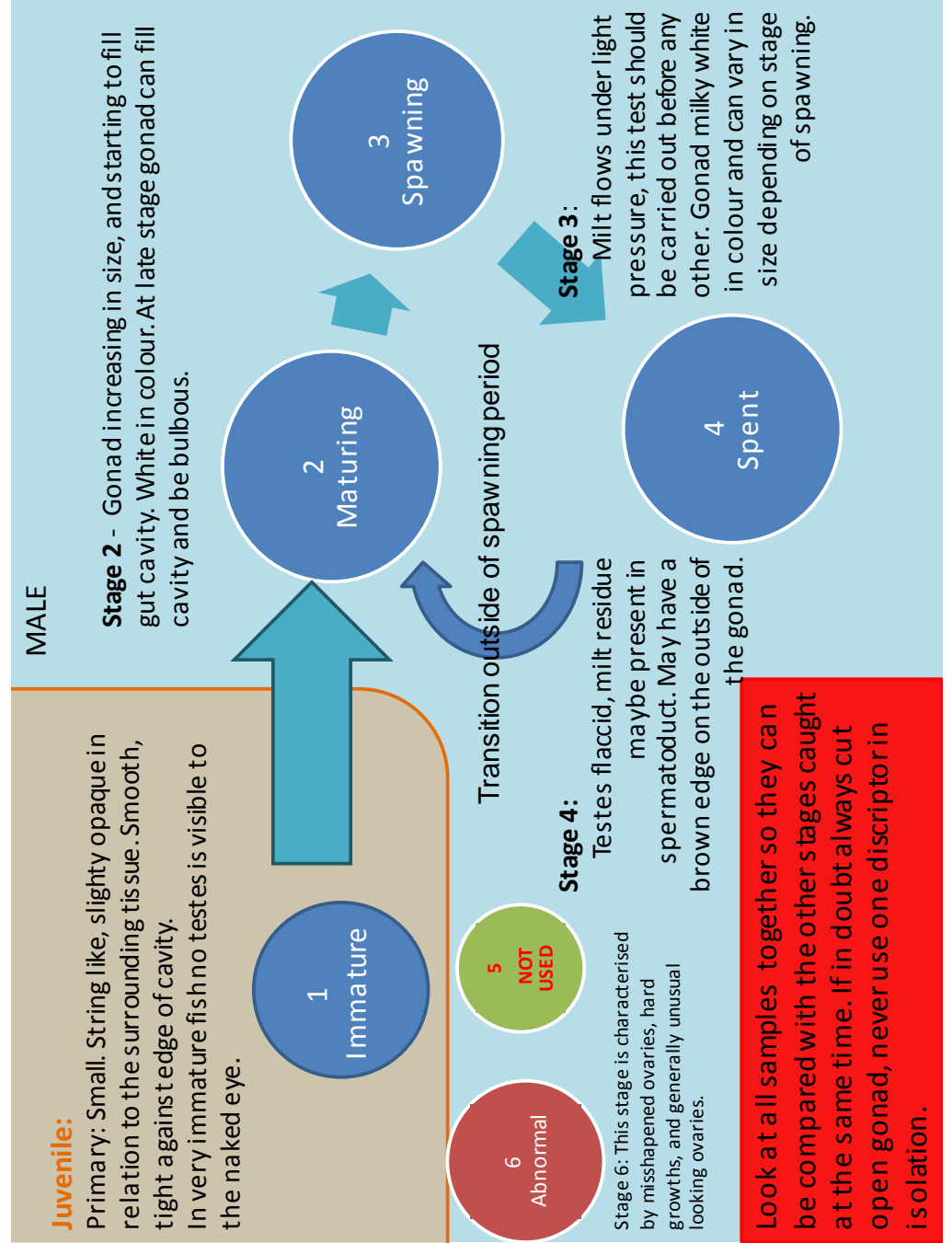
No picture available

2.6 Stage 6 – Abnormal

This stage is characterised by mis-shapened ovaries, hard growths, and generally unusual looking ovaries. For example: stony gonads, both sexes present in the gonad etc.

No pictures available.

3 Male



3.1 Stage 1 – Juvenile

Primary:

- small
- stringlike
- slightly opaque in relation to the surrounding tissue
- smooth, tight against the edge of cavity

NB in very immature fish no testes is visible to the naked eye

No picture available

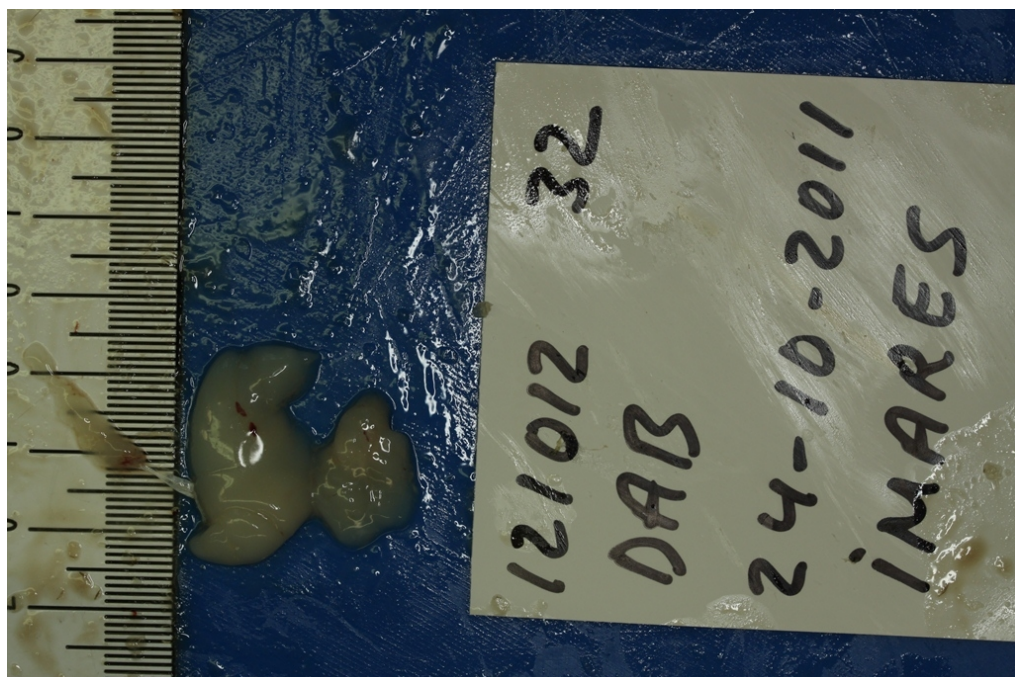
3.2 Stage 2 – Maturing

Primary:

- testis increasing in size
- testis starting to fill gut cavity
- at late stage testis quite bulbous and fills cavity

Secondary:

- colour - white



pictures: testis in the fish NED2011_dab_121012_032_2.jpg (upper) and ovary cut open outside the fish NED2011_dab_121012_032_5.jpg (lower)

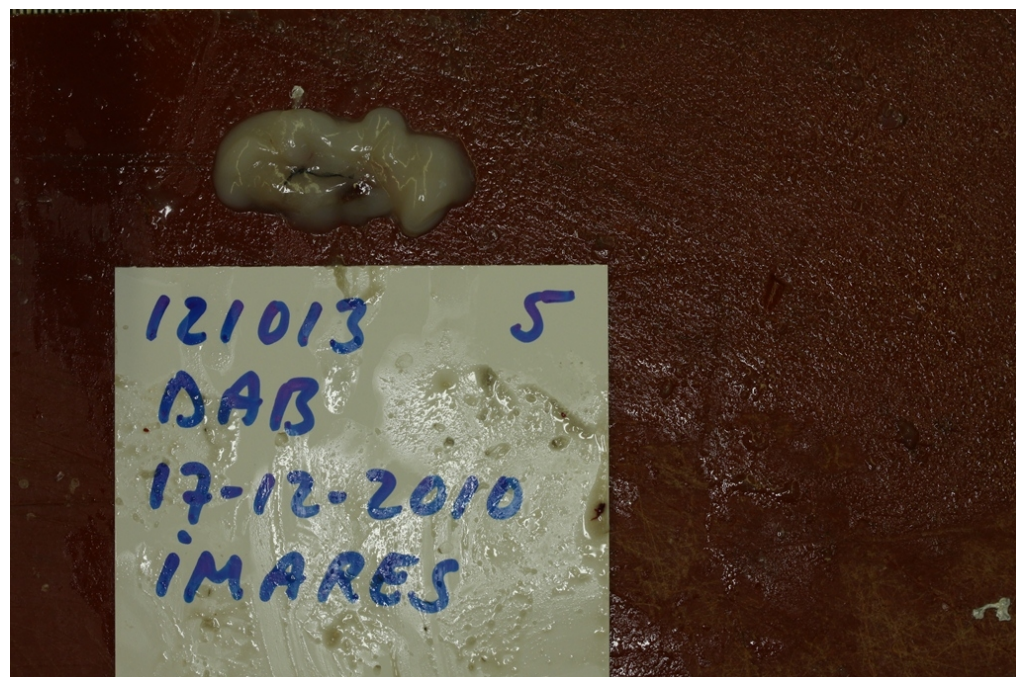
3.3 Stage 3 – Spawning

Primary:

- milt flows under light pressure, this test should be carried out before any other
- size can vary depending on stage of spawning

Secondary:

- colour - milky white



pictures: testis in the fish NED2010_dab_121013_005_2.jpg (upper) and ovary cut open outside the fish NED2010_dab_121013_005_5.jpg (lower)

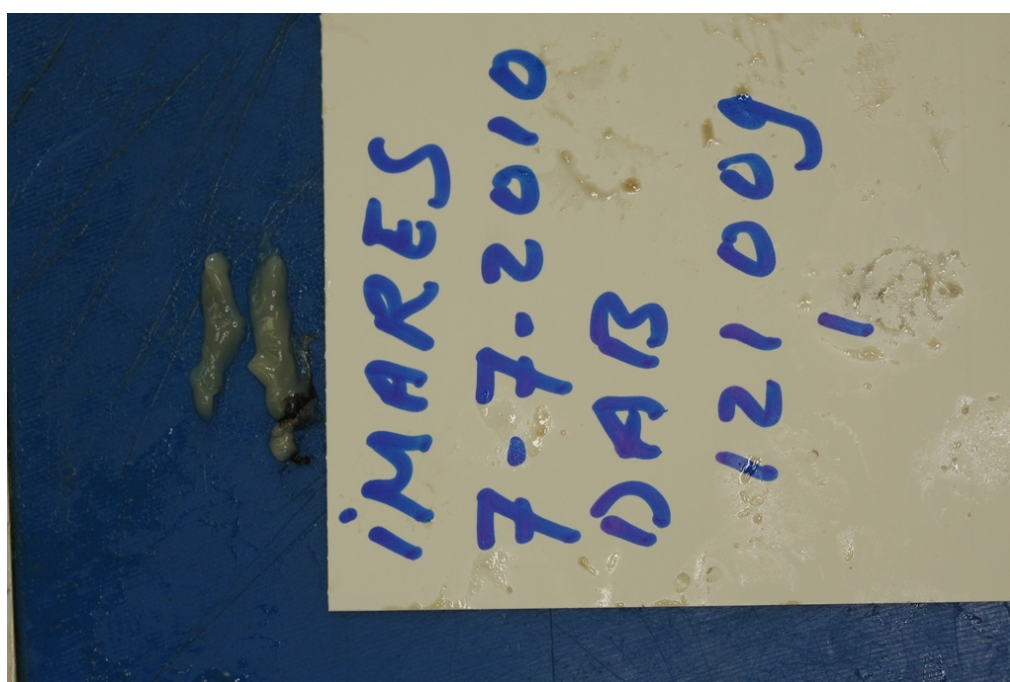
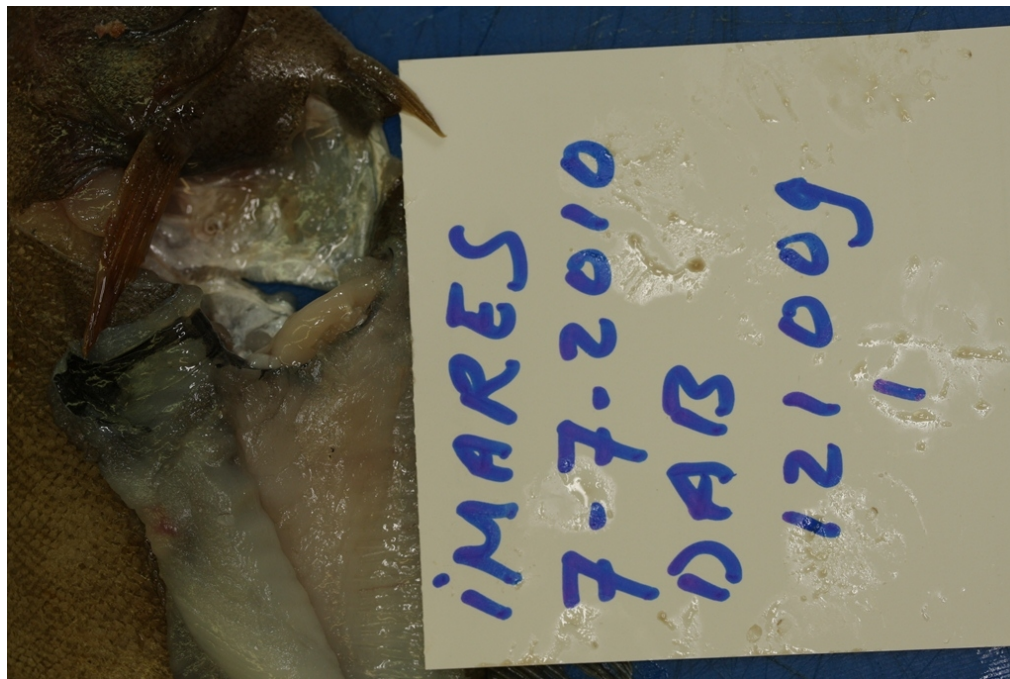
3.4 Stage 4 – Spent

Primary:

- testis flaccid
- milt residue may be present in spermatoduct
- at late stage testis contract

Secondary:

- colour - may have a brown edge on the outside of the gonad



pictures: testis in the fish NED2010_dab_121009_001_2.jpg (upper) and ovary cut open outside the fish NED2010_dab_121009_001_5.jpg (lower)

3.5 Stage 5 – Skipped spawning

This stage is not used for male fish.

3.6 Stage 6 – Abnormal

This stage is characterised by mis-shapened testes, hard growths, and generally unusual looking testes.

No pictures available.

Reference Document Maturity Stages of Flounder (*Platichthys flesus*)

1 Introduction

This document contains the descriptions and reference pictures for the sexual maturity stages of flounder (*Platichthys flesus*). The descriptions as well as the reference pictures were discussed and created by WKMSSPDF 2012.

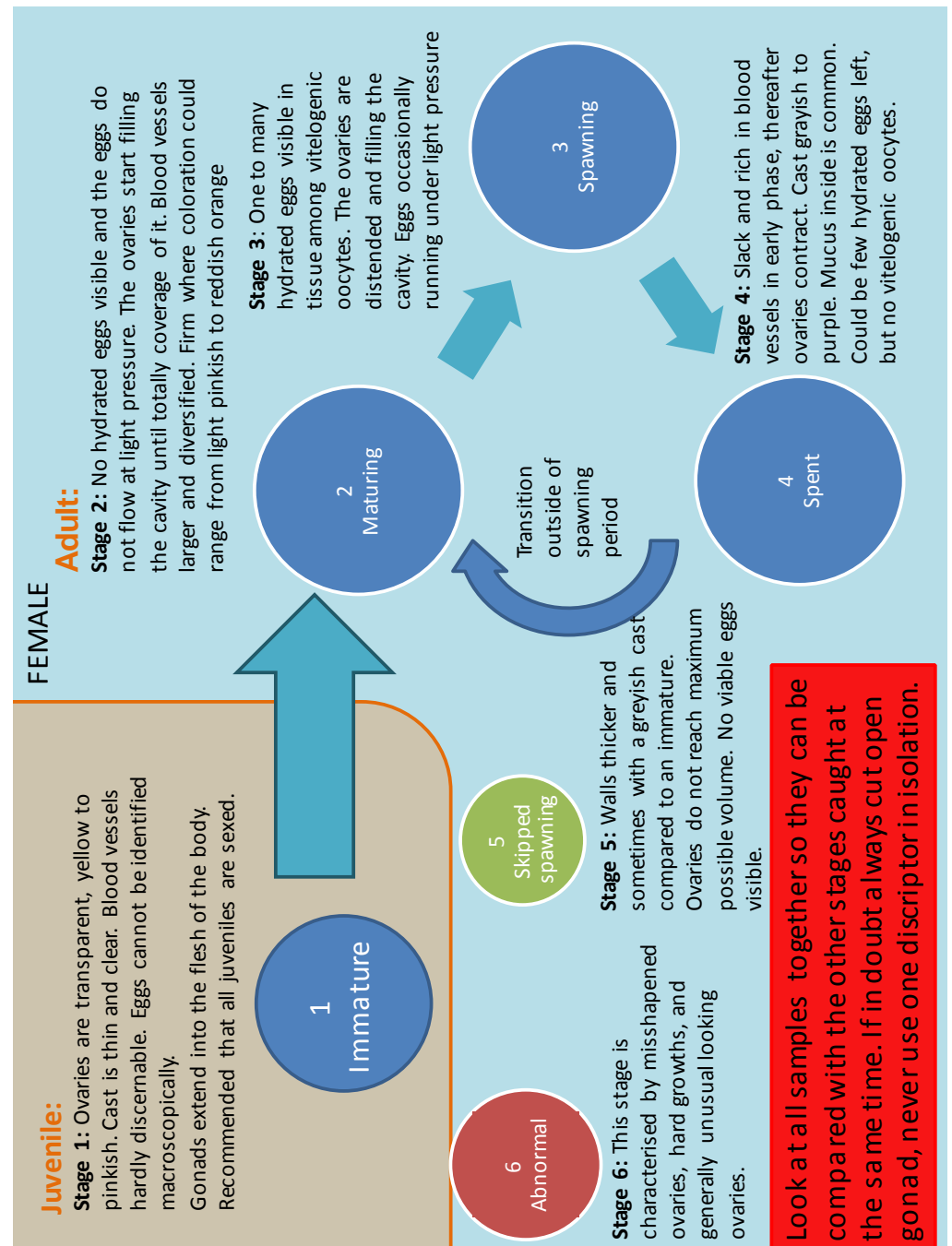
It should be mentioned that reliable macroscopic maturity staging of fish can only be done in the period from two months before the spawning season until the end of spawning. Outside that period, histological samples should be taken to identify the maturity stage. The description of the stages focuses thus primarily on this period.

In general, sexual maturity development in fish is as follows: after the juvenile stage, of which the duration varies by species, fish will mature. In the maturation cycle, the gonads mature (stage 2), the fish will spawn (stage 3) and after that will be spent (stage 4). The next year, this cycle repeats itself.

Incidentally, if the condition of the fish is low, it might decide to skip a spawning season (stage 5), or the gonads of a fish do not develop in a normal way (stage 6).

Chapter 2 describes the sexual maturity stages of female fish, chapter 3 contains maturity scales for males.

2 Female



2.1 Stage 1 - Juvenile

Primary:

- no eggs
- transparent
- cast thin and clear

Secondary:

- colour – yellow to pinkish
- blood vessels are hardly discernible



pictures: ovary in the fish SWE2011_FLE_13_2.jpg (upper) and ovary cut open outside the fish SWE2011_FLE_13_6.jpg (lower)

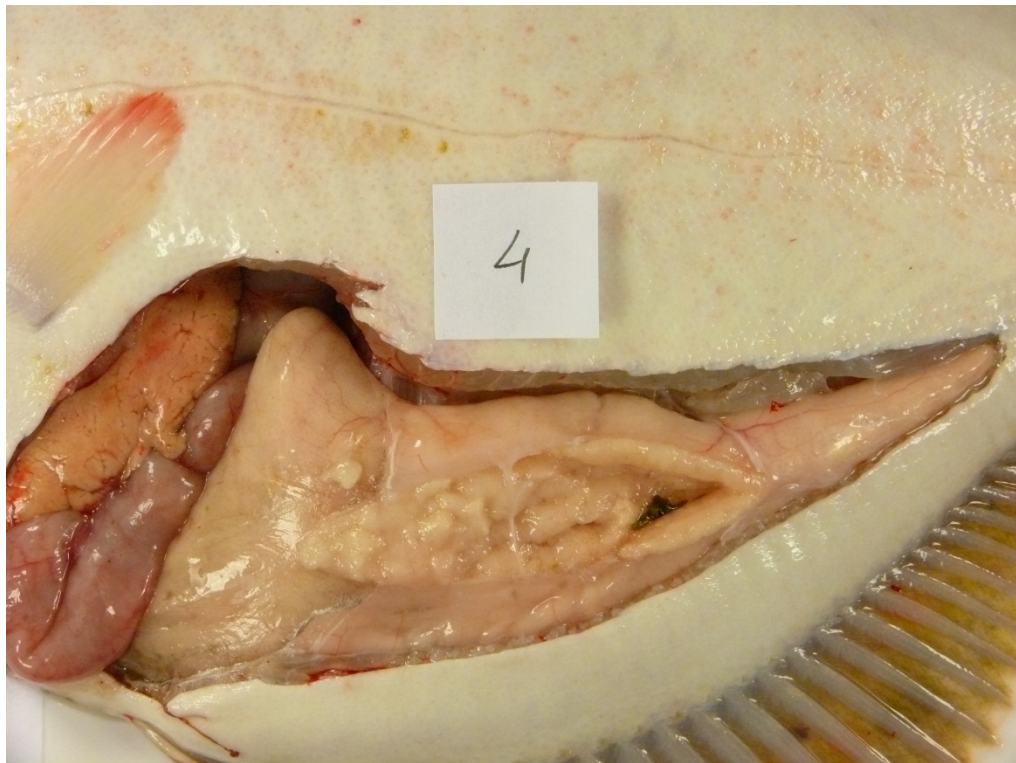
2.2 Stage 2 – Maturing

Primary:

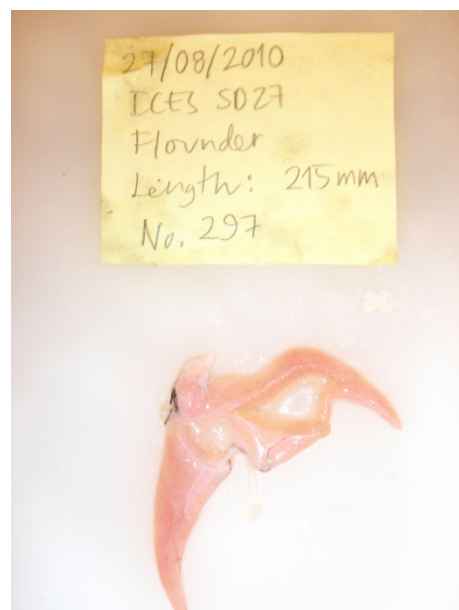
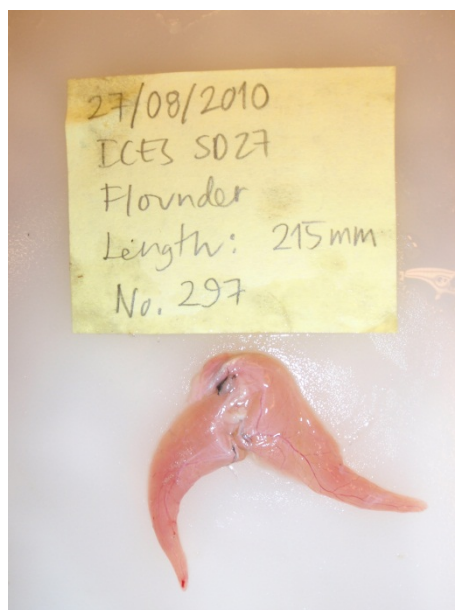
- ovary firm
- ovary starts filling the cavity until totally coverage of cavity
- granulation at start of stage through to fully developed opaque eggs (eggs filling up with yolk) readily visible
- no eggs flow at light pressure

Secondary:

- blood vessels developed and diversified
- colour – light pinkish to reddish orange



picture: POL_FLE_Female_G4_fot4_c STAGE 2



pictures: ovary in the fish SWE2010_FLE_297_1.jpg (upper) and outside the fish SWE2010_FLE_297_5.jpg (lower left) and ovary cut open SWE2010_FLE_297_6.jpg (lower right)

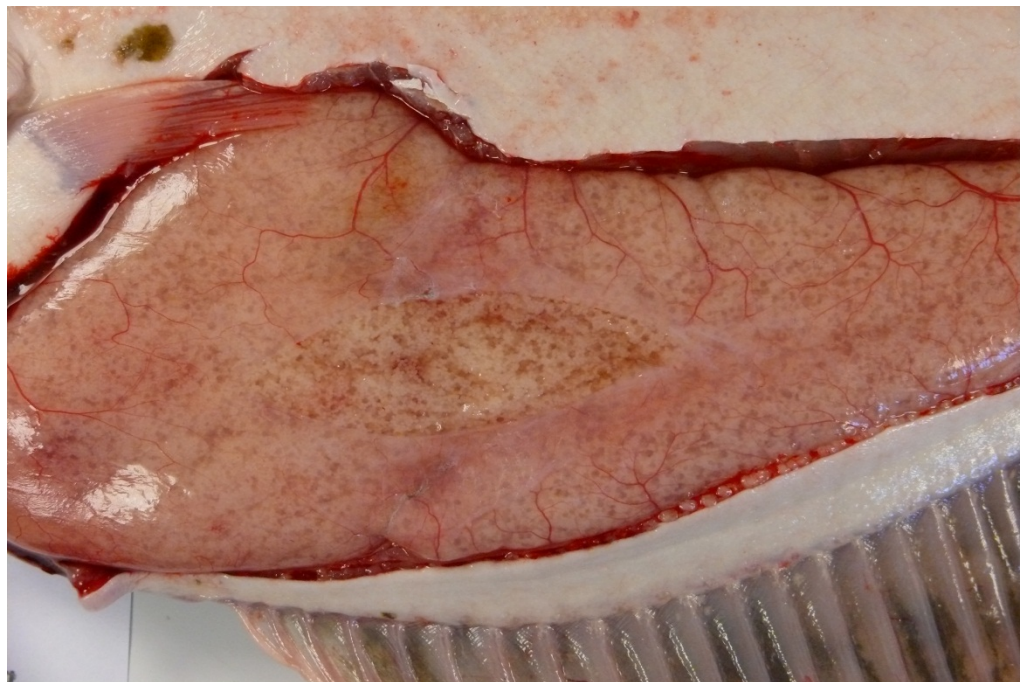
2.3 Stage 3 – Spawning

Primary:

- one to many hydrated eggs distinguishable
- occasionally running under light pressure
- ovary distended

Secondary:

- colour - reddish to orange



pictures: ovary in the fish FLE_Female_G5_fot16_a.jpg (upper) and ovary cut open in the fish FLE_Female_G5_fot16_c.jpg (lower)

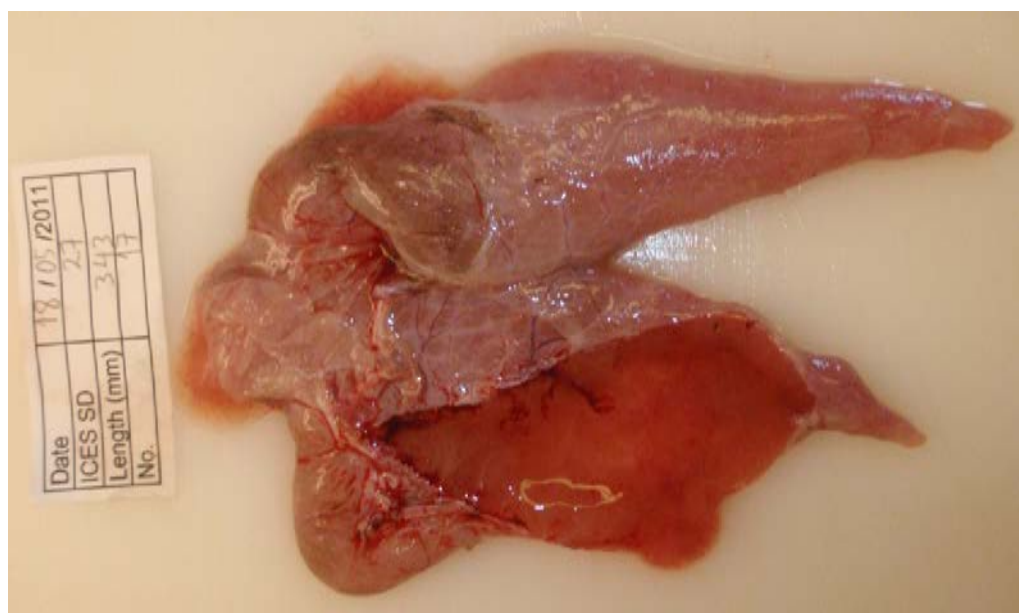
2.4 Stage 4 – Spent

Primary:

- ovary slack in appearance, soft at pressure
- hydrated eggs may be left as residue
- ovary rich in blood vessels

Secondary:

- colour – greyish to purple cast
- mucus inside is common
- size of ovary decreasing during spawning



pictures: ovary in the fish SWE2011_FLE_17_2.jpg (upper) and ovary cut open outside the fish SWE2011_FLE_17_6.jpg (lower)

2.5 Stage 5 – Skipped spawning

Primary:

- wall of ovary thickened
- ovary does not reach maximum possible volume, can be contracted up to 50 % of spawning length
- no eggs visible

Secondary:

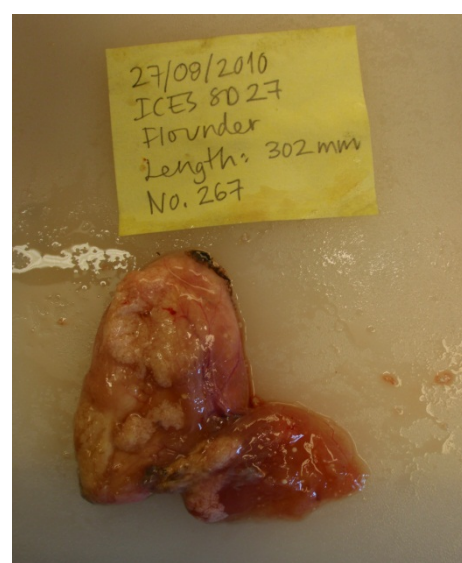
- colour - sometimes with a greyish cast, otherwise similar to immature



picture: NED2009_flo_151015025b.jpg

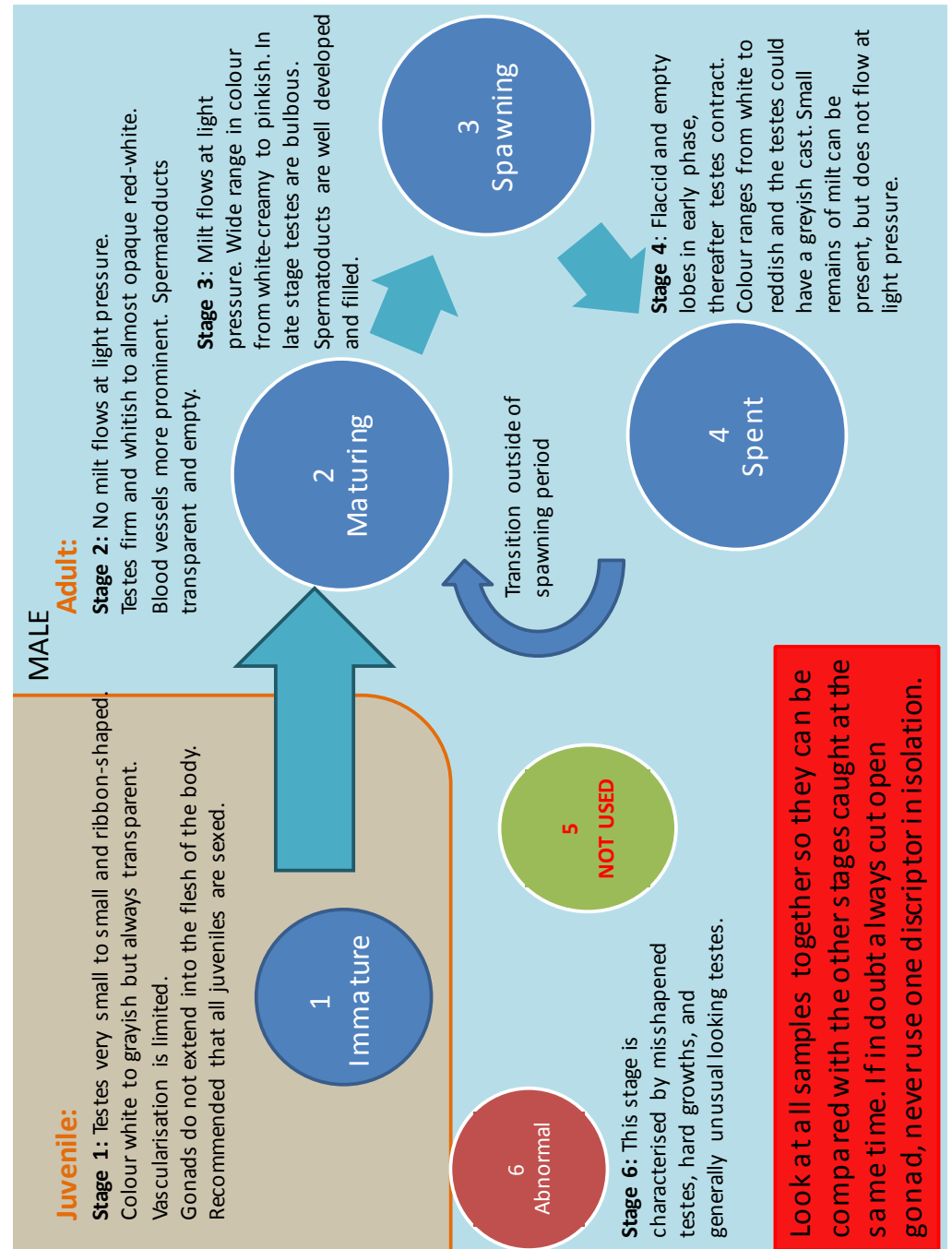
2.6 Stage 6 – Abnormal

This stage is characterised by mis-shaped ovaries, hard growths, and generally unusual looking ovaries. For example: stony gonads, both sexes present in the gonad etc.



pictures: ovary in the fish SWE2010_FLE_267_2.jpg (upper) and outside the fish SWE2010_FLE_267_5.jpg (lower left) and ovary cut open SWE2010_FLE_267_6.jpg (lower right)

3 Male



3.1 Stage 1 – Juvenile

Primary:

- very small to small
- ribbon-like shape
- transparent
- testis does not extend into the body cavity

Secondary:

- colour – white to greyish
- vascularisation is limited



picture: SWE2011_FLE_14_2.jpg

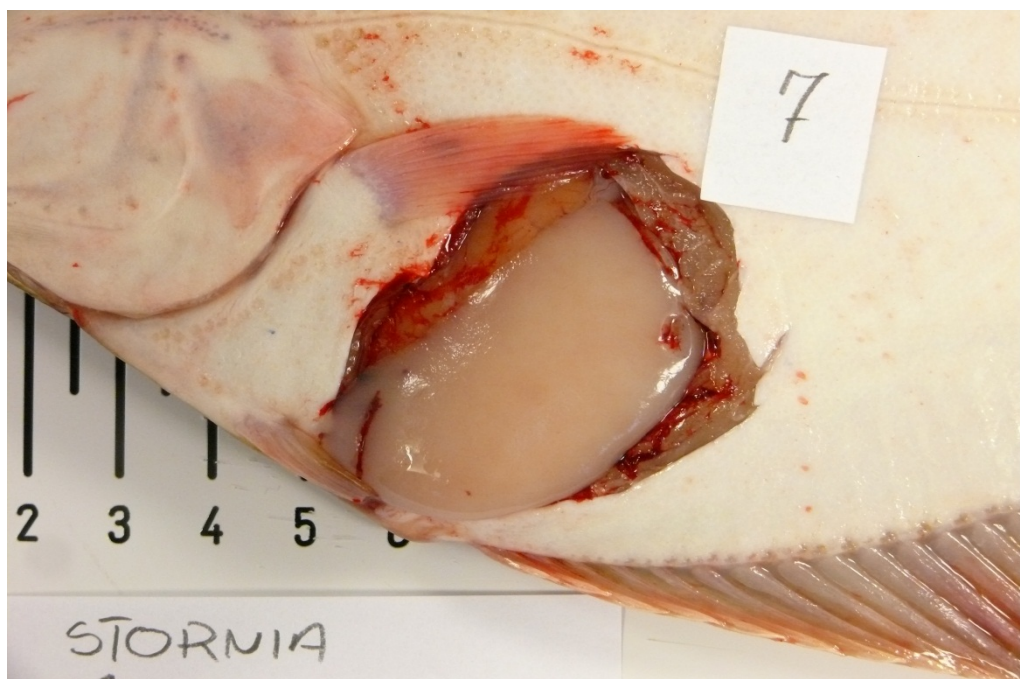
3.2 Stage 2 – Maturing

Primary:

- testis firm
- empty transparent spermatoducts
- blood vessels developing
- no milt flow under light pressure

Secondary:

- colour - whitish to reddish-white, almost opaque



pictures: FLE_Male_G3_fot53_b.jpg (upper) and FLE_Male_G4_fot7_b.jpg (lower)

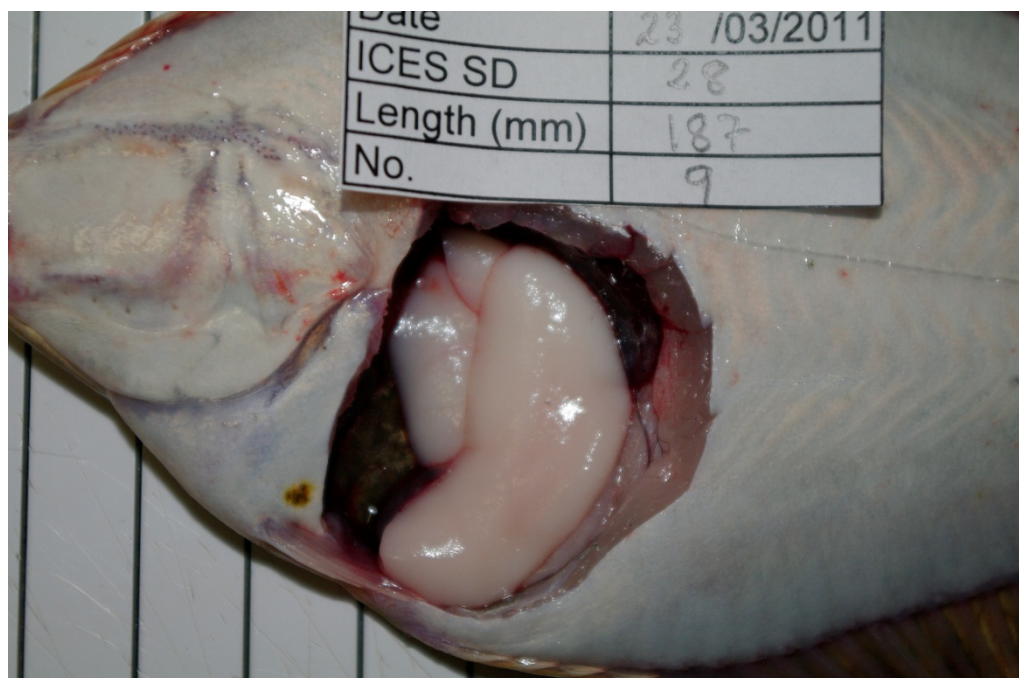
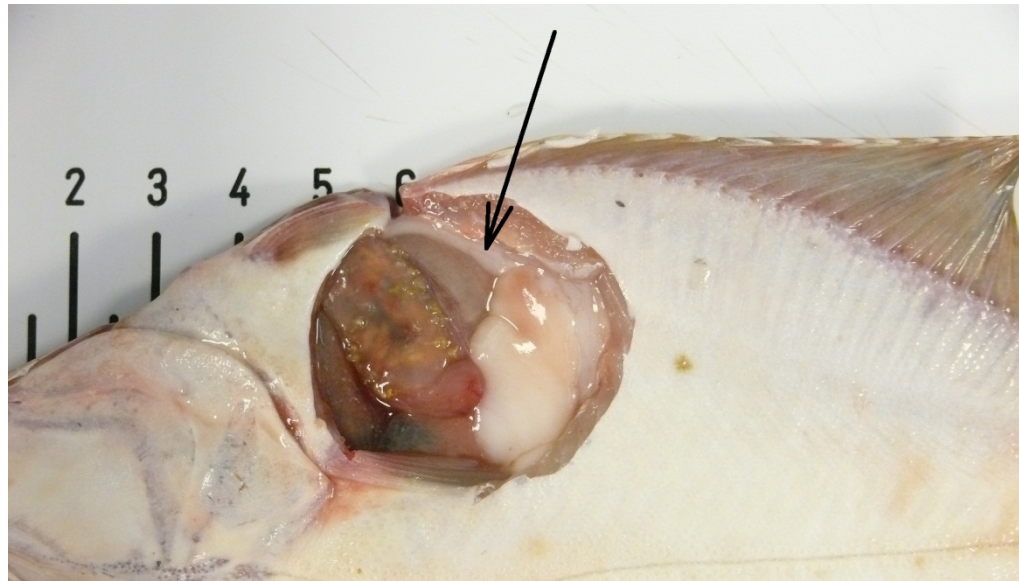
3.3 Stage 3 – Spawning

Primary:

- milt flows under light pressure, this test should be carried out before any other
- spermatoducts are filled and well developed
- size can vary depending on stage of spawning, at late stage bulbous

Secondary:

- colour - wide range of colour, creamy to pinkish



pictures: FLE_Male_G7_fot30_b.jpg (upper) and ovary cut open outside the fish SWE2011_FLE_5009_4.jpg (lower)

3.4 Stage 4 – Spent

Primary:

- testis flaccid
- milt residue may be present in spermatoduct
- at late stage testis contract

Secondary:

- colour - range from white to reddish, potentially with greyish cast



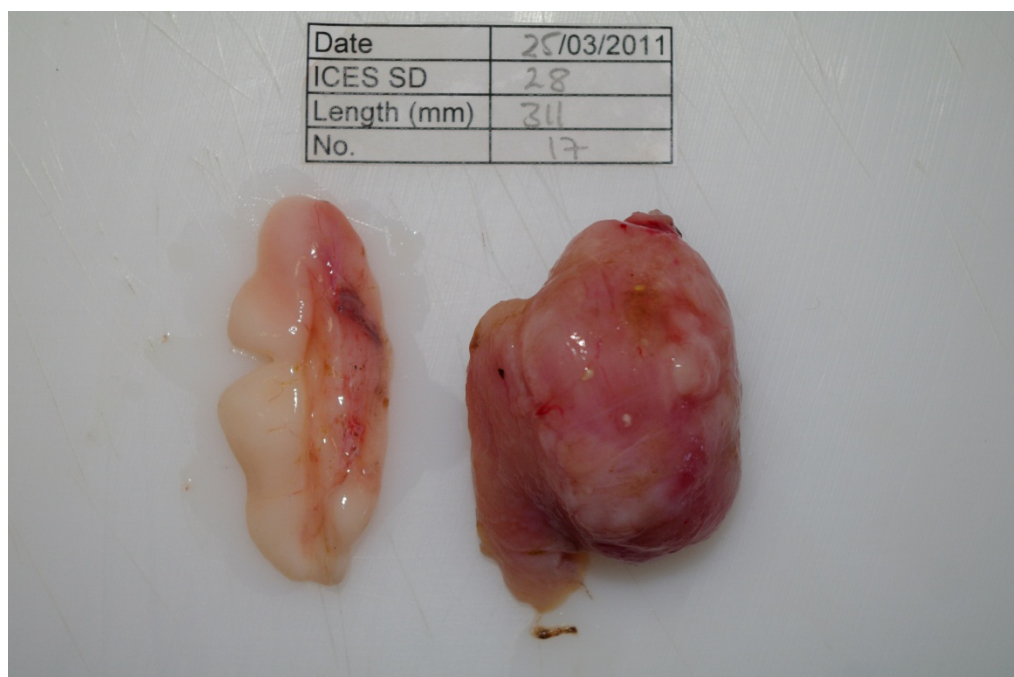
picture: SWE2011_FLE_22_2.jpg

3.5 Stage 5 – Skipped spawning

This stage is not used for male fish.

3.6 Stage 6 – Abnormal

This stage is characterised by mis-shaped testes, hard growths, and generally unusual looking testes.



pictures: testis in the fish SWE2011_FLE_ 5017_3.jpg (upper) and outside the fish SWE2011_FLE_ 5017_5.jpg (lower)