Results SmartDots event 295 Internal Wageningen Marine Research training

Larvae used

During the workshop 56 larvae were identified, 12 fresh larvae under the microscope and 44 images were analysed. The images were analysed in the SmartDots training event <u>295</u>. The 12 fresh larvae were validated from rearing experiments and consisted only of herring and sprat. These larvae were also photographed and added to the images. The remaining 32 images were taken from the ICES Workshop 2 on the identification of clupeid larvae (WKIDCLUP2; event <u>291</u> on SmartDots). These larvae came from various experiments, areas and surveys in the Baltic, North Sea and Atlantic and were al considered to be validated.

The results are presented in three ways: fresh larvae only, images only and a comparison between the fresh larvae and the images of these larvae.

Participants

All participants are from Wageningen Marine Research (WMR) and considered experts, and all provide data for the assessment. The results are presented anonymous, but participants have access to their own results.

To be able to use the identification results for herring larvae and the MIK surveys, results are also presented for small (<=17 mm) and large (>17 mm) larvae, corresponding to mean larvae length found in the samples of the different surveys.

<u>Results</u>

Tables 1 to 3 give the overview of the results of the species identification of all fresh larvae identified under the microscope (Table 1), small (Table 2) and large larvae (Table 3). Table 4 to 6 give the overview of the results of the species identification of all larvae from images in SmartDots. Table A contains the numbers per species which each participant based on the real species should have identified. If a participant did not identify all larvae this is shown in the total number identified. The larvae that were not identified by a participant are not considered to calculate the agreement. Table B shows the quantity per species which was actually identified. The total columns at the end of table A and B are shown for information for the overall estimations of over- or underestimation and agreement. Table C shows the agreement in identification by species.

А		Specie	s compo	ositions	using a	ctual sp	pecies	
	Actual	species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	TOTAL
	Herring	1	8	8	8	8	8	40
	Pilchard	2	-	-	-	-	-	-
	Sprat	3	4	4	4	4	4	20
	Sandeel	4	-	-	-	-	-	-
	Anchovy	5	-	-	-	-	-	-
	Other	8	-	-	-	-	-	-
	Unknown	9	-	-	-	-	-	-
	Total	1-9	12	12	12	12	12	60
		Species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	TOTAL
	Herring	1	6	7	6	7	6	32
	Pilchard	2	1	1	2	1	2	7
	Sprat	3	5	4	4	4	4	21
	Sandeel	4	0	0	0	0	0	-
	Anchovy	5	0	0	0	0	0	-
	Other	8	0	0	0	0	0	0
	Unknown	9	0	0	0	0	0	-
	Total	1-9	12	12	12	12	12	60
		Percen	tage ov	erestima	ation / u	nderest	imation	
	Actual s	species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	ALL
	Herring	1	-25%	-13%	-25%	-13%	-25%	-20%
	Pilchard	2	-	-	-	-	-	-
	Sprat	3	25%	0%	0%	0%	0%	5%
	Sandeel	4	-	-	-	-	-	-
	Anchovy	5	-	-	-	-	-	-
	Unknown	8	-	-	-	-	-	-
	UIKHOWN	Э	-	-	-	-	-	-

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Percentage agreement in species identification per species

Actual	species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	ALL
Herring	1	75%	88%	75%	88%	75%	80%
Pilchard	2	-	-	-	-	-	-
Sprat	3	100%	100%	100%	100%	100%	100%
Sandee	4	-	-	-	-	-	-
Anchovy	5	-	-	-	-	-	-
Other	8	-	-	-	-	-	-
Unknown	9	-	-	-	-	-	-
Weighted mean	1-9	83.3%	91.7%	83.3%	91.7%	83.3%	96 70/
		3	1	3	1	3	00.7 %

Table 1. Species identification of all fresh larvae.

Table 2. Species identification of small (<= 17 mm) fresh larvae comparable to larvae in samples from the herring larvae surveys. A Species compositions using actual species

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	Ţ								
		Actual s	species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	TOTAL
		Herring	1	4	4	4	4	4	20
		Pilchard	2		-	-	-	-	-
		Sprat	3	2	2	2	2	2	10
		Sandeel	4	- 1	-	-	-	-	-
		Anchovy	5	-	-	-	-	-	-
		Other	8	-	-	-	-	-	-
		Unknown	9		-	-	-	-	-
		l otal	1-9	6	6	6	6	6	30
В			Specie	s compo	ositions	as estii	mated p	er partio	cipant a
			Species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	TOTAL
		Herring	1	4	4	4	4	4	20
		Pilchard	2	0	0	0	0	0	-
		Sprat	3	2	2	2	2	2	10
		Sandeel	4	0	0	0	0	0	-
		Anchovy	5	0	0	0	0	0	-
		Other	8	0	0	0	0	0	0
		Unknown	9	0	0	0	0	0	-
		Total	1-9	6	6	6	6	6	30
С	ſ		Percen	tage ove	erestima	ation / u	nderest	imation	
		Actual s	species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	ALL
		Herring	1	0%	0%	0%	0%	0%	0%
		Pilchard	2	- 1	-	-	-	-	-
		Sprat	3	0%	0%	0%	0%	0%	0%
		Sandeel	4	- 1	-	-	-	-	-
		Anchovy	5	- 1	-	-	-	-	-
		Other	8	- 1	-	-	-	-	-
		Unknown	9	-	-	-	-	-	-
D	ľ		Percen	tage ag	reement	in spec	cies ide	ntificatio	on per s
		Actual s	species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	ALL
		Herring	1	100%	100%	100%	100%	100%	100%
		Pilchard	2	- 1	-	-	-	-	-
		Sprat	3	100%	100%	100%	100%	100%	100%
		Sandeel	4		-	-	-	-	-
		Anchovy	5	- 1	-	-	-	-	-
		Other	8	- 1	-	-	-	-	-
		Unknown	9	-	-	-	-	-	-
	Weighte	Unknown d mean	9 1-9	- 100.0%	- 100.0%	100.0%	- 100.0%	100.0%	-

Table 3. Species identification of large (> 17 mm) fresh larvae comparable to larvae in samples from the MIK surveys.

~		Specie	s compo	ositions	using a	ictual s	Decles		
	Antural		Decideral	Deedee 0	Deedee0	Deeder 4	Decider 5	TOTAL	
г	Actual	species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5		
	Plahand	1	4	4	4	4	4	20	
	Pilchard	2	-	-	-	-	-	-	
	Sprat	3	2	2	2	2	2	10	
	Sandeel	4	-	-	-	-	-	-	
	Anchovy	5	-	-	-	-	-	-	
	Other	8	-	-	-	-	-	-	
	Unknown	9	-	-	-	-	-	-	
	Total	1-9	6	6	6	6	6	30	
В		Specie	s compo	ositions	as estii	nated p	er parti	cipant a	nd wh
		Species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	τοται	
г	Horring	1	2	3	2	3	2	12	
	Pilchard		- 1	1	2	1	2	7	
	f nenaru Smuot	2	2	2	2	2	2	11	
	Sprat	3	3	2	2	2	2		
	Sandeer	4	0	U	U	U	0	-	
	Anchovy	5	0	U	U	U	U		
	Other	8	0	0	0	0	0	0	
-	Unknown	9	0	0	0	0	0	-	
L	Total	1-9	6	6	6	6	6	30	
C		Percen	tage ov	erestima	ation / u	nderest	imation		
	Actual	species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	ALL	
Г	Herring	1	-50%	-25%	-50%	-25%	-50%	-40%	
	Pilchard	2		-	-	-	-	-	
	Sprat	3	50%	0%	0%	0%	0%	10%	
	Sandeel	4	-	-	-	-	-		
	Anchovy	5	-	-	-	-	-		
	Other	Ř				-	-	<u> </u>	
	Unknown	ä		-	-	-	-		
D		Percen	tage ag	reement	in spec	cies ide	ntificatio	on per s	pecie
	Actual	species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	ALL	
Г	Herring	1	50%	75%	50%	75%	50%	60%	
	Pilchard	2	-	-	-	-	-	-	
	Sprat	3	100%	100%	100%	100%	100%	100%	
	Sandeel	4	-	-	-	-	-		
	Anchovy	5	-	-	-	-	-	.	
	Other	8		-	-	-	-		
	Unknown	ő	-	-	-	-	-		
ŀ	Weighted mean		- 66.7%	- 83.3%	- 66.7%	- 83.3%	- 66.7%		
L		1-9	3	1	3	03.3 /0	3	73.3%	
			3		3		3		

Tabl A	e 4. Species ide	ntificatio Species	on of all s comp o	images ositions	using a	ictual sp	pecies		
	Actual	snecies	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	τοται	
1	Herring	1	18	18	18	18	18	90	
	Pilchard	2	7	7	7	7	7	35	
	Sprat	3	7	7	7	7	7	35	
	Sandeel	4	3	3	3	3	3	15	
	Anchovy	5	q	9	9	9	9	45	
	Other	8	-	-	-	-	-	-	
	Unknown	9		-	-	-		-	
	Total	1-9	44	44	44	44	44	220	
В	l	Specie	s compo	ositions	as estir	nated p	er partio	cipant a	Ind whole group
		Species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	TOTAL	
	Herring	1	14	18	16	17	17	82	
	Pilchard	2	0	9	7	10	9	35	
	Sprat	3	1	3	11	8	6	29	
	Sandeel	4	2	1	2	0	0	5	
	Anchovy	5	0	8	5	1	9	23	
	Other	8	2	0	0	0	0	0	
	Unknown	9	25	5	3	8	3	44	
	Total	1-9	44	44	44	44	44	220	
С		Percen	tage ov	erestima	ation / u	nderest	imation		1
	Actual	species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	ALL	
	Herring	1	-22%	0%	-11%	-6%	-6%	-9%	
	Pilchard	2	-100%	29%	0%	43%	29%	0%	
	Sprat	3	-86%	-57%	57%	14%	-14%	-17%	
	Sandeel	4	-33%	-67%	-33%	-100%	-100%	-67%	
	Anchovy	5	-100%	-11%	-44%	-89%	0%	-49%	
	Other	8	-	-	-	-	-	-	
	Unknown	9	-	-	-	-	-	-	
D		Percen	tage ag	reement	in spec	cies idei	ntificatio	on per s	species
	Actual	species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	ALL	
	Herring	1	39%	89%	89%	78%	94%	78%	
	Pilchard	2	0%	71%	71%	71%	100%	63%	1
	Sprat	3	0%	43%	100%	71%	71%	57%	1
	Sandeel	4	67%	33%	67%	0%	0%	33%	1
	Anchovy	5	0%	89%	56%	11%	89%	49%	1
	Other	8	-	-	-	-	-	-	1
	Unknown	9	- I	-	-		-	-	
	Weighted mean	1-9	20.5%	75.0%	79.5%	56.8%	84.1%	co 00/	
	ŭ	•	5	3	2	4	1	63.2%	

Table 5. Species identification of all images with small (<= 17 mm) larvae comparable to larvae in samples from the herring larvae surveys.

			o oompo		using u	iciual S	500103		
	Actuals	necies	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	τοται	
	Herring	1	10	10	10	10	10	50	
	Pilchard	2	7	7	7	7	7	35	
	Snrat	2	2	2	2	2	2	15	
	Sandoal	3	2	3	3	3	3	15	
	Anchowy	4	3	0	0	0	3	15	
	Altenovy	5	9	9	9	9	9	45	
	University	0	-	-	-	-	-	-	
	Unknown	9	-	-	-	-	-	-	
	Total	1-9	32	32	32	32	32	160	
В		Specie	s compo	ositions	as estir	mated p	er partio	cipant a	nd whole
	1	Species	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	τοται	
	Herring	1	12	11	10	11	9	53	
	Pilchard	2	0	8	6	8	ě.	30	
	Sprat	3	1	ő	7	5	4	17	
	Sandeel	4	2	1	2	Ő	- 0	5	
	Anchovy	5	2	8	5	1	8	22	
	Other		1	0	0	0	0	22	
	Unknown	0	16	4	2	7	2	22	
		9	10	4	2	1	3	32	
	Total	1-9	32	32	32	32	32	160	
	Total	1-9	32	32	32	32	32	160	
 ح	Total	¹⁻⁹ Percen	32 tage ove	32 erestima	32 ation / u	³² nderest	32 imation	160	
 [Total Actual s	1-9 Percen	32 tage ove	32 erestima Reader 2	32 ation / u Reader 3	32 nderest Reader 4	32 imation Reader 5	160 ALL	
	Total Actual s Herring	1-9 Percen species 1	32 tage ove Reader 1 20%	32 erestima Reader 2 10%	32 ation / u Reader 3 0%	32 nderest Reader 4 10%	32 imation Reader 5 -10%	160 ALL 6%	
	Total Actual s Herring Pilchard	1-9 Percen	32 tage ove Reader 1 20% -100%	32 erestima Reader 2 10% 14%	32 ation / u Reader 3 0% -14%	32 nderest Reader 4 10% 14%	32 imation Reader 5 -10% 14%	160 ALL 6% -14%	
	Total Actual s Herring Pilchard Sprat	1-9 Percen species 1 2 3	32 tage ove Reader 1 20% -100% -67%	32 erestima Reader 2 10% 14% -100%	32 ation / u Reader 3 0% -14% 133%	32 nderest Reader 4 10% 14% 67%	32 imation Reader 5 -10% 14% 33%	160 ALL 6% -14% 13%	
	Total Actual s Herring Pilchard Sprat Sandeel	1-9 Percen pecies 1 2 3 4	32 tage ove Reader 1 20% -100% -67% -33%	32 erestima 10% 14% -100% -67%	32 Ation / u Reader 3 0% -14% 133% -33%	32 nderest Reader 4 10% 14% 67% -100%	32 imation Reader 5 -10% 14% 33% -100%	160 ALL 6% -14% 13% -67%	
	Total Actual s Herring Pilchard Sprat Sandeel Anchovy	1-9 Percen 1 2 3 4 5	32 tage ove Reader 1 20% -100% -67% -33% -100%	32 Reader 2 10% 14% -100% -67% -11%	32 Ation / u Reader 3 0% -14% 133% -33% -44%	32 nderest Reader 4 10% 14% 67% -100% -89%	32 imation Reader 5 -10% 14% 33% -100% -11%	160 ALL 6% -14% 13% -67% -51%	
	Total Actual s Herring Pilchard Sprat Sandeel Anchovy Other	1-9 Percen 1 2 3 4 5 8	32 tage over 20% -100% -67% -33% -100%	32 Reader 2 10% 14% -100% -67% -11%	32 Reader 3 0% -14% 133% -33% -44% -	32 Reader 4 10% 14% 67% -100% -89%	32 imation Reader 5 -10% 14% 33% -100% -11%	160 ALL 6% -14% 13% -67% -51% -	
	Total Actual s Herring Pilchard Sprat Sandeel Anchovy Other Unknown	1-9 Percen 1 2 3 4 5 8 9	32 tage over Reader 1 20% -100% -67% -33% -100% - -	32 Reader 2 10% 14% -100% -67% -11% -	32 Reader 3 0% -14% 133% -33% -44% -	32 Reader 4 10% 14% 67% -100% -89% -	32 imation Reader 5 -10% 14% 33% -100% -11% -	160 ALL 6% -14% 13% -67% -51% - -	
	Total Actual s Herring Pilchard Sprat Sandeel Anchovy Other Unknown	1-9 Percen 1 2 3 4 5 8 9 Percen	32 tage over 20% -100% -67% -33% -100% - - tage age	32 Reader 2 10% 14% -100% -67% -11% - -	32 Ation / u Reader 3 0% -14% 133% -33% -44% - in spec	32 nderest 10% 14% 67% -100% -89% - - - - - - - - - - - - -	32 Reader 5 -10% 14% 33% -100% -11% - - - - - - - - - - - - - - - - -	ALL 6% -14% 13% -67% -51% - - - - - - - - - - - - - - - - - - -	pecies
	Total Actual s Herring Pilchard Sprat Sandeel Anchovy Other Unknown Actual s	1-9 Percen 1 2 3 4 5 8 9 Percen pecies	32 tage over 20% -100% -67% -33% -100% - - tage age Reader 1	32 Reader 2 10% 14% -100% -11% - - - - - - - - - - - - -	32 Ation / u Reader 3 0% -14% 133% -33% -44% - : in spec Reader 3	32 nderest 10% 14% 67% -100% -89% - - cies idel Reader 4	32 Reader 5 -10% 14% 33% -100% -11% - - - - - - - - - - - - - - - - -	ALL 6% -14% 13% -67% -51% - - - - - - - - - - - - - - - - - - -	pecies
	Total Actual s Herring Pilchard Sprat Sandeel Anchoel Other Unknown Actual s Herring	1-9 Percen 1 2 3 4 5 8 9 Percen pecies	32 tage over 20% -100% -67% -33% -100% - - - - tage age Reader 1 50%	32 Reader 2 10% -10% -67% -11% - - reement Reader 2 90%	32 Reader 3 0% -14% 133% -33% -44% - : in spec Reader 3 100%	32 Reader 4 10% 14% 67% -100% -89% - - cies ider Reader 4 80%	32 imation Reader 5 -10% 14% 33% -100% -11% - - - - - - - - - - - - -	ALL 6% -14% 13% -67% -51% - - ON PER S ALL 82%	pecies
	Total Actual s Herring Pilchard Spratel Anchovy Other Unknown Actual s Herring Pilchard	1-9 Percen 1 2 3 4 5 8 9 Percen 1 2	32 tage over -100% -100% -33% -100% - - - tage age Reader 1 50% 0%	32 Reader 2 10% 14% -100% -67% -11% - reement Reader 2 90% 71%	32 Ation / u Reader 3 0% -14% 133% -33% -44% - - - - - - - - - - - - -	32 Reader 4 10% 14% 67% -100% -89% -	32 Reader 5 -10% 14% 33% -100% -11% - - - - - - - - - - - - - - - - -	ALL 6% -14% 13% -67% -51% - - DN PER S ALL 82% 63%	pecies
	Total Actual s Herring Pilchard Sandeel Anchovy Other Unknown Actual s Herring Pilchard Sprat	1-9 Percen 1 2 3 4 5 8 9 Percen 1 2 3	32 tage over 20% -100% -67% -33% -100% - - - - - tage age Reader 1 50% 0%	32 Reader 2 10% 14% -100% -67% -11% - - reement Reader 2 90% 71% 0%	32 Ation / u Reader 3 0% -14% 133% -33% -44% - : : in spec Reader 3 100% 71% 100%	32 nderest Reader 4 10% 14% 67% -100% -89% -	32 imation Reader 5 -10% 14% 33% -100% -11% - - - - - - - - - - - - -	ALL 6% -14% 13% -67% -51% -	pecies
	Total Total Actual s Herring Pilchard Sprat Sandeel Anchovy Other Unknown Actual s Herring Pilchard Sprat Sandeel	1-9 Percen 1 2 3 4 5 8 9 Percen pecies 1 2 3 4	32 tage over 20% -100% -67% -33% -100% - - - - tage age Reader 1 50% 0% 0% 67%	32 Reader 2 10% 14% -100% -67% -11% - reement Reader 2 90% 71% 0% 33%	32 Reader 3 0% -14% 133% -33% -44% - : in spec Reader 3 100% 71% 100% 67%	32 Reader 4 10% 14% 67% -100% -89% - - cies ider Reader 4 80% 71% 67% 0%	32 imation Reader 5 -10% 14% 33% -100% -11% - - - ntificatio Reader 5 90% 100% 100% 0%	ALL 6% -14% 13% -67% -51% - 82%	pecies
	Total Total Actual s Herring Pilchard Sandeel Anchovy Other Unknown Actual s Herring Pilchard Sprat Sandeel Anchovy	1-9 Percen 1 2 3 4 5 8 9 Percen 1 2 3 4 5 8 9 Perces	32 tage over -100% -100% -33% -100% - - - tage age Reader 1 50% 0% 67% 0%	32 Reader 2 10% 14% -10% -67% -11% - reement Reader 2 90% 71% 0% 33% 89%	32 Reader 3 0% -14% 133% -33% -44% - - in spec Reader 3 100% 71% 100% 67% 56%	32 Reader 4 10% 14% 67% -100% -89% -	32 Reader 5 -10% 14% 33% -100% -11% - - ntificatio Reader 5 90% 100% 100% 0% 89%	ALL 6% -14% 13% -67% -51% -	pecies
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Table 6. Species identification of all images of large (> 17 mm) larvae comparable to larvae in samples <u>from</u> the MIK surveys.



All participants thought that the quality of the images was poor to awful. Two participants of this workshop had participated in the WKIDCLUP2 and at that time they were surprised at the quality of the larvae. Most of the images were the same as in WKIDCLUP2 for these two readers, but they appeared of poorer quality. For one reader this could be because another screen with different resolution was used this workshop compared to WKIDCLUP2.

Comparing the results of the fresh larvae to the images, these results do not seem to be as bad as the participants thought themselves (Figure 1). One reader could not identify the larvae from the images, the other four did identify them. For most the larvae that was wrongly identified fresh as pilchard, had a different reading from the images (two actually identified this one correctly as herring from the image).



Figure 1. Fresh versus image larvae identification; closed columns are identifications of the fresh larvae, open columns of the images.

Myotome counts are used to identify the clupeid species from each other. First the modal number of myotomes per larva is determined and then the difference per participant in myotomes relative to this mode is estimated. Comparing the larvae that were counted both fresh and from the images the agreement is rather high, where the readers had a high deviation this was caused by one larva where the count was very different, for the other larvae the counts differed only one or two myotomes from each other.

Table 7. Over/underestimation of the number of myotomes comparing the fresh versus the images of the same larvae.

	Myotome	Myotomes from head to anus microscope vs image									
	Reader 1	Reader 1 Reader 2 Reader 3 Reader 4 Reader 5									
Mean overall	2	0	0	-1	-2						
STDEV overall	0.00	1.41	1.66	3.00	3.55						
Mean small	2	1	0	-1	0						
STDEV small		0.71	0.82	3.39	1.21						
Mean large	2	0	0	-2	-5						
STDEV large		1.71	2.45	2.70	3.56						

Length measurements of the larvae are comparable between participants, with low standard deviations (Table 8). Length measurements between the fresh larvae and images did not differ much (Table 12), results were similar to overall results (Table 9). Reader 1 did not do length measurements on the images.

Table 8. Over/underestimation the larvae length relative to the average length.

	Length									
	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5					
Mean overall	0	0	0	0	0					
STDEV overall	0.72	0.41	0.57	0.57	0.65					
Mean small	0	0	0	0	0					
STDEV small	0.44	0.32	0.40	0.48	0.47					
Mean large	-1	0	0	1	-1					
STDEV large	0.93	0.58	0.86	0.66	0.82					

Table 9. Over/underestimation the larvae length comparing the fresh versus the images of the same larvae.

	Length									
	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5					
Mean overall		0	-1	0	1					
STDEV overall		1.03	0.62	0.55	0.26					
Mean small		-1	-1	0	1					
STDEV small		0.68	0.75	0.57	0.36					
Mean large		1	-1	0	1					
STDEV large		0.84	0.39	0.54	0.08					

Use of images and SmartDots

The SmartDots event worked fine. It has the advantage that each participant can identify the larvae at its own convenience and more importantly that each participant had the same quality of images. However, it became clear when one reader, who participated in both WKIDCLUP2 and this workshop, thought the images of this workshop were much poorer, that the quality of the screen used by the participants is an important factor that might influence the outcome of these events. In fact this reader was looking at the same images at both workshops but used a different screen the second time. Reader1 found it so difficult to identify the larvae from the images that almost none were identified to species and only few had myotome counts and none had a length measurement.

Probably the fact that participants are not used to identifying larvae from images plays a role. When comparing results of the same larvae identified fresh under the microscope and from images, the differences were not very large, except for one or two outliers. In fact the one larvae that was identified fresh by most readers as pilchard, was correctly identified as herring by some readers from the images. For future workshops it is important to improve the quality of the images, but also make sure that the resolutions of the screens used by the readers is of high quality and similar.