



















## **8 INTERCALIBRATION**

The group agreed that an intercalibration (ring test) of the counting method is useful and necessary.

Mrs Gertrud Cronberg and Mr Norbert Wasmund cautioned about carrying out an intercalibration in a superficial way, as is sometimes done. A clear concept, a manual, and statistical tools are needed as well as an awareness that conflicting results may be found. Finally, appropriate steps must be taken to overcome discrepancies in results. Mrs Gertrud Cronberg's publication on carrying out an intercalibration must be read prior to taking action.

Mrs Agneta Andersson-Nordström will prepare a proposal for an intercalibration exercise (together with Mr Norbert Wasmund, as well as the experience of Ms Gertrud Cronberg and Mrs Seija Hällfors).

Some doubts were expressed about whether it is practical to carry out an intercalibration already next year. This should include the new counting program and it is important that all participants receive the new manual and become familiar with the program before an intercalibration exercise is carried out.

Ultimately, the group decided to apply for a special project so that the intercalibration exercise can be carried out in 2000.

## **9 NEXT MEETING**

The 1999 meeting of the group was proposed for the Laboratory of the Swedish Royal Society in Abisko (Northern Sweden) in early September. In contrast to the plan for last year, the training course should be on Chlorophyceae (by Mr Komarek) and *Chaetoceros* (by Mrs Jensen). Mrs Andersson-Nordström will ask Mr Juha-Markku Leppänen and Mr Kjell Grip whether they agree to such a change in the previous plan. After the course of study is agreed, the teachers will be formally invited.

## **10 CLOSING OF THE WORKSHOP**

After acknowledging the local organiser, Mrs Irina Olenina, and the teachers, Mrs Gertrud Cronberg and Mr Guy Hällfors, for their valuable contributions and thanking the group for their active participation, the Chair, Mrs Agneta Andersson-Nordström, closed the Workshop.

# ANNEX 1

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## **ANNEX 2**

### **AGENDA**

- 1) Opening of the workshop.
- 2) Adoption of the agenda.
- 3) Activities.
- 4) Suggestions to the Manual.
- 5) Phytoplankton check list.
- 6) Counting program.
- 7) Report from the biomass sub-group (including discussion).
- 8) Intercalibration (ring test).
- 9) Future meeting.
- 10) Closing of the workshop.

## ANNEX 3

### REPORT OF THE BIOMASS SUB-GROUP OF THE ICES/HELCOM WORKSHOP/TRAINING COURSE ON PHYTOPLANKTON

10–11 October 1998

#### *Opening of the meeting*

The meeting was opened on 10 October 1998 in Klaipeda, Lithuania by the Chair, Ms Susanna Hajdu. Mr Lars Edler was appointed as rapporteur.

The following persons took part in the discussions: Irina Olenina, Agneta Andersson-Nordström, Maija Huttunen, Maija Niemelä, Pirkko Kokkonen, Reija Jokipii, and Norbert Wasmund.

#### *Objectives*

The objectives for the sub-group, that biomass data and size classes for phytoplankton species in the HELCOM area should be included in the PHYTOPLA.DAT counting program, were reiterated. Considerable work on this has already been done, but there is still more to do. The work that has been completed is also included in the new *Manual for Marine Monitoring in the COMBINE Programme of HELCOM* (version 1.0, Revised June 1998).

#### *Biomass Calculations*

The group discussed the possibility that newly adapted formulas for the biomass calculation may deviate considerably from the old formulas. If so, this will influence the long time series of phytoplankton in the HELCOM data series. In order to check this, it was decided to compare volume values of those species where changes have been made, to determine the size of the discrepancy and, based on these findings, to decide on an acceptable deviation.

For six species/genus, the percentage subtracted from the calculated volume has been changed. The change is generally about 10%. The group found this change acceptable. There is no need to make changes in the old data for these species. These species are listed in Table A3.1.

Formula changes have been made for seven species or genera. The deviation varies considerably (see Table A3.1.A). Some species show a very large deviation (300–1300%) and the group found it necessary to reconsider the new formulas. These species are listed in Table A3.1.B. Each group member is asked to consider the formulas and give their opinion as to whether they should be kept or changed. A change of up to about 20% may be acceptable.

At the same time, it was stressed that, if the group finds a new formula that fits the species better than the old formula, the change must be done. It is not meaningful to keep an incorrect formula because old data were calculated from it.

It was decided that, when the group has agreed on new formulas for the phytoplankton species, the group should agree on a date from which the new formulas should be in effect.

#### *Size Classes*

Each phytoplankton expert is supposed to provide Ms Maija Huttunen with measures and calculations of species from their own area. In order to do this, however, an agreement on the size classes to be used is necessary. An agreement on the 'HIDDEN DIMENSION' (HD) is also necessary.

The sub-group discussed and agreed on size classes for about 15 species/genera/groups (Table A3.2). While doing this, several small mistakes in Table C.6.3 of the COMBINE Manual were found and corrected. It was decided that the entire Table C.6.3, including the formulas and figures, should be updated by Ms Maija Huttunen and Mr Lars Edler.

A suggestion for size classes of *Ceratium* species, based on Danish measurements (Plankton i de indre farvande. Havforskning fra Miljøstyrelsen. Nr. 11. 1992), was discussed and adopted (Table A3.3).

Measurements of cell dimensions for a number of species from different areas of the Baltic Sea were compiled and discussed by the group. More data will be added to the list and the results will form the basis for the deviation into size classes of these species. Mrs P. Kokkonen and Mr N. Wasmund have carefully checked the list and it became clear that more work on this is needed.

All formulas used for the calculation of species volumes were checked and stored in an EXCEL file. This will serve as the basis for future calculations of species volumes.

It was requested that dimensions (length, width, diameter, etc.) should be inserted into the PHYTOPLA.DAT counting program.

#### *Phytoplankton Counting Program*

A number of suggestions to improve the counting program were indicated.

- a) The program should have a loop. If you find a species that does not fit into the formula/volume given for this species in the program, it should be possible to enter your own measured values directly. The program should then be able to use these measures for the calculation immediately and report these data to HELCOM. This would give the program greater flexibility. The new measures should not be added directly into the overall program. Instead, the phytoplankton expert, finding these measures, should find out if the new measures are repeated regularly. If so, they should be inserted in the overall program after some years.
- b) The group was of the opinion that the transformation of volume values into carbon should be kept in the program. However, it is important that transformation factors for both plasma volume and carbon content are possible to be changed within the program.

The group was informed that the program will contain the entire check list and that it will be possible to select the group of species that are most common in the area of the phytoplankton expert.

With the new sampling and analysing strategy which in short means that one country will analyse all samples from a certain station, it is of great importance that the delivered samples are accompanied with protocols which clearly indicate station, location, date, etc., i.e., good meta data.

**Table A3.1.** Changes of volumes for phytoplankton species, as suggested by the ICES/HELCOM Phytoplankton Expert Group.

**A. Species/genus with changed percentage subtraction from the calculated volume.**

Species	New formula	% change from old formula
<i>Noctiluca miliaris</i>	sphere – (10–20%)	10–20%
<i>Protoperidinium depressum</i>	(cone + 2 cones) – 40%	10%
<i>Protoperidinium pallidum</i>	(cone + sphere/2) – (20–30%)	10%
<i>Protoperidinium pellucidum</i>	(cone + sphere/2) – (20–30%)	10%
<i>Scrippsiella</i> spp.	sphere – (10–40%) or (? sphere + cone)	10–40%
<i>Polykrikos</i> spp.	cylinder – 10%	10%

**B. Species/genus with changed formula.**

Species	New formula	% of old formula	Accepted
<i>Dinophysis acuminata</i>	ellipsoid	300%	? <sup>1*</sup>
<i>Protoperidinium bipes</i>	trapezoid + cone/2 or cone – 50%	1300%	No
<i>Gymnodinium simplex</i>	sphere – 10%	90%	Yes
<i>Dichtyocha</i> spp.	sphere/2	70%	?
<i>Attheya</i> spp.	cylinder	100%	Yes
<i>Qdontella</i> spp. ( <i>Biddulphia</i> )	cylinder – (20–30%)	280%	No <sup>2*</sup>
<i>Hantzschia</i>	parallel epiped	60%	? <sup>3*</sup>

<sup>1\*</sup> For *Dinophysis acuminata* another formula has been suggested:

Species	New formula	% of old formula	Accepted
<i>Dinophysis acuminata</i>	rotational ellipsoid with elliptic cross section	200%	

The result of this formula is still far from the old one. However, the cell form of *Dinophysis acuminata* is more equivalent to this one than any of the others, so it is fair to say that it is probably the most accurate formula we can find.

<sup>2\*</sup> *Odontella* seen in every book has the form of an ellipsoid, so I see no reason to change.

<sup>3\*</sup> The old formula would be good enough for this very rare species.

**Table A3.2.** Changes to Table C.6.3 of the COMBINE Manual and size class designations for selected species and groups of species.

Table C.6.3. Stereometrical formulas for common phytoplankton taxa in the Baltic Sea and size classes.

- a) Add formula for *Chrysochromulina* - Prasinophyceae: Sphere or Rotational Ellipsoid with circular cross section
- b) Add formula for Unidentified Thecal and Naked Dinoflagellates:  
 Sphere – (10–20 %)  
 2 cones  
 Rotational Ellipsoid with circular cross section – (20 % or more)
- c) Add formula for Unidentified Monads and Flagellates  
 Sphere  
 Rotational Ellipsoid with circular cross section
- d) Formula for *Mesodinium rubrum*:  
 2 Spheres –20 % < 30 µm  
 Sphere > 30 µm

'Ciliates with endosymbiotic algae' should be changed to 'Photosynthetic ciliate'

Size classes.

CENTRIC DIATOMS:	size class	calculation performed at	
	3–7	5	
	7–12	10	
	12–20	15	
	FACTOR Pervalvar axis / apical axis:	20–60 µm:	0.5
		> 60 µm:	0.3
<i>Actinocyclus octonarius</i>	size class	calculation performed at	
	20–30	25	
	30–40	35	
	40–50	45	
	50–60	55	
	60–70	65	
	70–90	80	
	90–110	100	
	FACTOR Pervalvar axis / apical axis:	< 50 µm:	0.95
		> 50 µm:	0.65
<i>Coscinodiscus</i> spp.	size class	calculation performed at	
	50–60	55	
	60–70	65	
	70–90	80	
	90–110	100	
	110–130	120	
	FACTOR Pervalvar axis / apical axis:	50–80 µm:	0.6
		80–100 µm:	0.5
		> 100 µm:	0.45
<i>Coscinodiscus granii</i>	size class	calculation performed at	
	50–70	60	
	70–90	80	
	90–110	100	
	110–130	120	
	130–150	140	
	150–170	160	
	FACTOR Pervalvar axis / apical axis:	< 100 µm:	0.66
		100–130 µm:	0.60
		> 100 µm:	0.48









