

Annex X

Activities of the “Cochlodinium Corresponding Group (CCG)”

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Provisional Plan for “the Cochlodinium Corresponding Group (CCG) ”

1. Purpose of the activities of CCG

Cochlodinium is one of the concerned species in the NOWPAP region. Especially the damages of coastal fisheries caused by this species are reported in Korea and Japan. However, our understanding of *Cochlodinium* is insufficient to make policies against it. Therefore, NOWPAP Working Group 3 (WG3) agreed to organize the corresponding group on *Cochlodinium* so as to make a set of information on *Cochlodinium*, and to help policy makers concerning coastal fishery.

2. Outputs of the activities of CCG

The outputs of the activities of CCG that the CEARAC secretariat is planning are to make a website about *Cochlodinium* and technical report about this species.

2.1. Web site (output in the first year, 2004)

For the result of the activities of CCG in the first year, CCG tries to make a website which introduces *Cochlodinium* briefly to the public concerning environmental problems. The website includes pictures of *Cochlodinium*, explanation of the species, and information of its damage to fishery, and so on. Pictures and information for the website of *Cochlodinium* are provided by the members of CCG. The constructed website could be loaded in the CEARAC website.

2.2. Technical Report (output in the second year, 2005)

In the second year, a technical report would be published as the final result of activities of CCG. The detail of contents of the report and procedure of technical report composition would be discussed later in CCG. These activities might become case-studies on the HAB reference database, which CEARAC and WG3 have developed

The CEARAC secretariat is scheduling that the work of CCG would be accomplished in two years.

3. Group members of CCG

3.1. Group Leaders

The First Meeting of WG3 elected the following experts of HAB as co-leaders of CCG:

- Dr. Hak-Gyoon Kim (National Fisheries Research & Development Institute, Korea)
- Dr. Yasuwo Fukuyo (The University of Tokyo, Asian Natural Environmental Science Center)

3.2. Group Members

Members of CCG are shown in Table 1. CEARAC secretariat accepted all scientists WG3 experts recommended.

Although Chinese WG3 experts are not on the list of members of CCG, Mr. Mingjiang Zhou is put on our mailing list and read our correspondences so that he (Chinese WG3 experts) can understand CCG's activities.

Table 1. Members of CCG

Name	Country	Organization
Dr. Songhui LU	China	Jinan University
Dr. Yasuwo FUKUYO	Japan	The University of Tokyo, Asian Natural Environmental Science Center
Mr. Haruyoshi TAKAYAMA	Japan	Hiroshima Fisheries Experimental Station
Dr. Kazumi MATSUOKA	Japan	Nagasaki University
Dr. Yasunori WATANABE	Japan	National Research Institute of Fisheries and Environment of Inland Sea, Fisheries Research Agency
Dr. Hak Gyoon KIM	Korea	Oceanography Research Team, NFRDI
Dr. Chang Kyu LEE	Korea	Marine Harmful Organisms Research Team, NFRDI
Dr. Kyoung Ho AN	Korea	Aquaculture Environment Institute, NFRDI
Dr. Wol Ae LIM	Korea	Marine Harmful Organisms Research Team, NFRDI
Dr. Tatiana ORLOVA	Russia	Institute of Marine Biology, Far Eastern Branch of Russian Academy of Sciences
Dr. Marina SELINA	Russia	Institute of Marine Biology, Far Eastern Branch of Russian Academy of Sciences

4. Procedure of group meetings

- Internet is the main tool for the group meetings for CCG in order to reduce the tasks and costs of meetings. CCG members exchange correspondences with their idea and information for CCG through Internet. All the members will be registered in a mailing list that the CEARAC makes for CCG.

Address of mailing list is:

ccg@npec.or.jp

Please use the above address to correspond with group members and CEARAC secretariat.

- The group activities are also discussed in WG3 Meeting and Focal Point Meeting (FPM).
- The subjects to be discussed are proposed by the co-leaders (Dr. Fukuyo and Dr. Kim) and the CEARAC secretariat.

5. Schedule of CCG

- Provisional schedule of CCG is shown in Table 2.
- The CEARAC secretariat plays a main role in gathering information, harmonizing opinions of the members, and assigning works to the members or the secretariat itself.

Table 2. Provisional Schedule of CCG

	CEARAC Secretariat	Leaders	CCG members
Early October, 2004	“The 1st Correspondence Exchanges” starts :		
	• Propose Provisional Plan for CCG	• Exchange opinion and information in response to the Provisional Plan	
October, 2004	Making a proposal of contents for Web-site		
Early November, 2004	“The 2nd Correspondence Exchanges” starts :		
	• Propose contents of website called “ALL about <i>Cochlodinium</i>”	• Confirm proposal of the content of website	
	• Collect opinions and information for the website	• Exchange opinions and information for the website	
November 25–26, 2004	The 2nd Working Group 3 Meeting:		• Dr. Lee and Dr. Orlova attend WG3 Meeting.
	• Review the activities of CCG		
	• Discuss future activities of CCG		
December, 2004~	• Revise the proposal of the contents of the website in response to the discussion in WG3 meeting		
January, 2005	“The 3rd Correspondence Exchanges” starts :		
	• Propose revised contents of Website	• Confirm revised content of website	
	• Collect opinions and information about the revised proposal	• Exchange opinions and information about revised contents of the website	
February~March, 2005	• Make a plan of structure of the website		
April, 2005~	• Construct the website		
	• Make proposal of contents of Technical Report		
May, 2005	• Open the Website		
	“The 4th Correspondence Exchanges” starts :		
	• Introduce our website	• Exchange opinions and information about the website and Technical Report	
	• Propose the contents of Technical Report		
	• Collect opinions and information about the website and Technical Report		
	“The 5th Correspondence Exchanges” starts :		
	• Ask CCG members to write Technical Report		
May, 2005~ December, 2005		• Write (Chapters or Sections of) Technical Report	
Late December, 2005	“The 6th Correspondence Exchanges” starts :		
	• Collect opinions and information about Technical Report.	• Exchange opinions and information about Technical Report	
January, 2006~	• Revise Technical Report		
March, 2006	• Publish Technical Report		

Principles in compiling “All About *Cochlodinium* “

1. Contents of “All About *Cochlodinium* “ and its editing principles

The purpose for compiling “All About *Cochlodinium*” is to summarize what we already know about *Cochlodinium* and to understand what issues need to be solved, which in longer term, will contribute to minimizing the harms caused by *Cochlodinium*.

The main contents will be; information on red tide occurrence caused by *Cochlodinium* and the conditions under which they occurred; extent of damage done; and the characteristics of the specie (which is vital to avoid the damage). By going through the existing literatures, what basic information on *Cochlodinium* was summarized in Table 1.

93 literatures on *Cochlodinium* were searched from HAB database by using the keyword “*Cochlodinium*”, as listed in appendix. Among these, contents were summarized for 56 literatures which were written in either English or in Japanese. The summary is attached as appendix.

The following contents are considered appropriate for what is to be compiled in “All About *Cochlodinium*”.

Contents of “All About *Cochlodinium* ”

1. Information which can be summarized from exiting literatures etc.

1) Information related to the occurring conditions and the occurrence of HAB caused by *Cochlodinium*

- ① Occurrence area (with figures)
- ② Time, duration and frequency
- ③ Co-existing species
- ④ Trigger for occurrence or disappearance

2) Extent of damage of HAB caused by *Cochlodinium*

- ① Status of damage (area, time, duration)
- ② Details of damage
- ③ Extent of Damage (number of affected people, \$, etc.)

3) Characteristics of *Cochlodinium*

- ① Morphological characteristics and photo
- ② Ecological characteristics (water temperature, salinity)
- ③ Trigger for multiplication (change of water temperature, nutrient salts concentration, etc.)
- ④ Life cycle, cyst identification (photo of cyst, trigger for the cyst formation)

2. What we do not know about *Cochlodinium* (Unknown parameters of *Cochlodinium*)

- ① Taxonomic matters : some *Cochlodinium* which has same morphological characteristics are classified as different species
- ② Life cycle : cyst formation not confirmed in sea area
- ③ Toxicity : not confirmed
- ④ Mechanism of the HAB occurrence : stimulation for multiplication (change of water temperature, etc.) , occurrence from the cyst in specific sea areas, relations (or competitiveness) between different species, etc.

Table.1 Information which can be summarized from existing literatures, and editing principle

Information to be summarized as cause of red tide or HAB	Number of literature containing the info (Total of 56)	Editing principle	
1) Information related to the occurring conditions and the occurrence of HAB caused by <i>Cochlodinium</i>	① Occurrence area	2 9	The area of red tide caused by <i>Cochlodinium</i> within NOWPAP area will be summarized.
	② Time (duration, frequency)	2 4 (1 4, 1 2)	Time of occurrence, duration, and frequency of each area of ① will be summarized.
	③ Co-existing species	3 1	Need help from other countries for gathering information on the competitiveness between different species.
	④ Trigger for occurrence or disappearance	1 3	Summarize what affects the occurrence and disappearance of HAB, i.e., the mechanism of dispersion by Tsushima warm current, and change in water temperature, etc. For cyst affecting HAB in specific sea area, what is still unknown, i.e. <i>Cochlodinium</i> cyst germination not identified in sea area, will be summarized as an issue for this specie. Cooperation will be requested to NOWPAP countries in going through existing literatures.
2) Extent of damage of HAB caused by <i>Cochlodinium</i>	① Status of damage (area, time, duration)	3 1 (2 0, 1 9, 5)	Sea area, time, and duration of damage caused by <i>Cochlodinium</i> will be summarized.
	② Details of damage	1 7	The details of damage will be summarized. Toxicity has not been confirmed, hence will be summarized as one of the issues to be solved.
	③ Extent of Damage (affected people, \$, etc.)	1 7	Extent of damage in a typical case of ① will be summarized.
3) Characteristics of <i>Cochlodinium</i>	① Morphological characteristics (Photo)	9 (1 2)	Some <i>Cochlodinium</i> with the same morphological characteristics are classified as different species. This will be summarized as an issue to be solved.
	② Ecological characteristics	1 3	Not enough information: cooperation will be requested to other countries in going through literatures.
	③ Trigger for multiplication	6	Not enough information: cooperation will be requested to other countries in going through literatures.
	④ Life cycle, cyst identification (photo of cyst, trigger for the cyst formation)	2, 3 (2, 5)	Cyst formation on seabed is not identified yet, hence will be summarized as an issue to be solved.

2. Cooperation to be asked

1) Request for literature information

More information of the below categories is to be collected:

- **Co-existing species**
- **trigger for occurrence and disappearance**
- **ecological characteristics,**
- **trigger for multiplication**

We would like to ask CCG experts to give literatures and information found in each country. Specific requests will be, for example, to make an English summary of literatures written in their own language, as listed in the Appendix, and to collect literatures not included in the database.

2) Photo

Use of photo will be necessary to introduce the morphological characteristics of *Cochlodinium* and the cyst. Copyright owner's permission for will be required using his/her photo.

