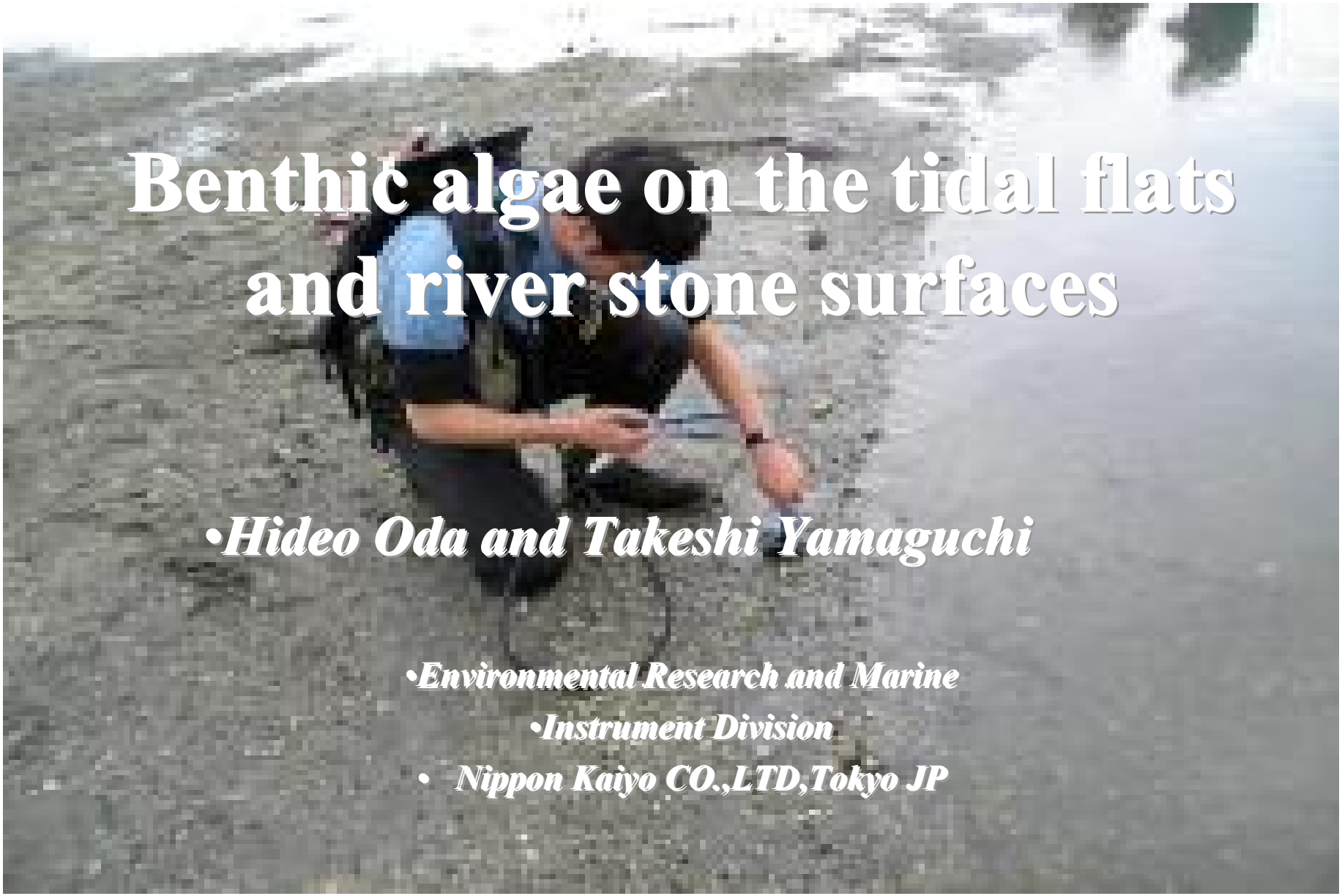


Benthic algae on the tidal flats and river stone surfaces

•*Hideo Oda and Takeshi Yamaguchi*

•*Environmental Research and Marine*

•*Instrument Division*

• *Nippon Kaiyo CO.,LTD,Tokyo JP*

bbe BenthoFluor of field-application in Japan

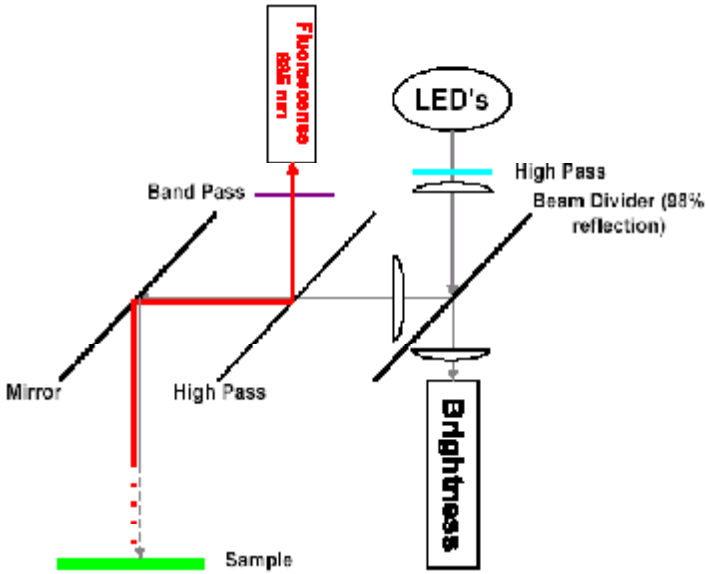
- *BF-measurement*
- *Case studies*
  - *Tidal Flat*
    - *a.Natural tidal flat*
    - *b.Artificial tidal flat*
  - *River environments*
    - *a.Mid stream zone*
    - *b.Down stream zone*

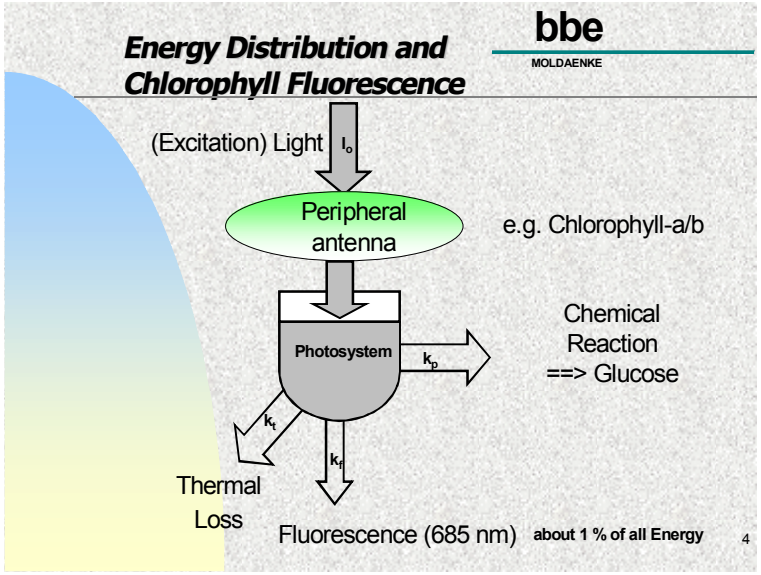
Configuration of BF and special adaptor

For sandy / muddy tidal flat

For stone/concrete surfaces

Principle of the Instrument





Natural tide flat CASE 1. Photo of Tennousu Tidal Flat Survey first using the bbe BF (Nov. 10, 2004)

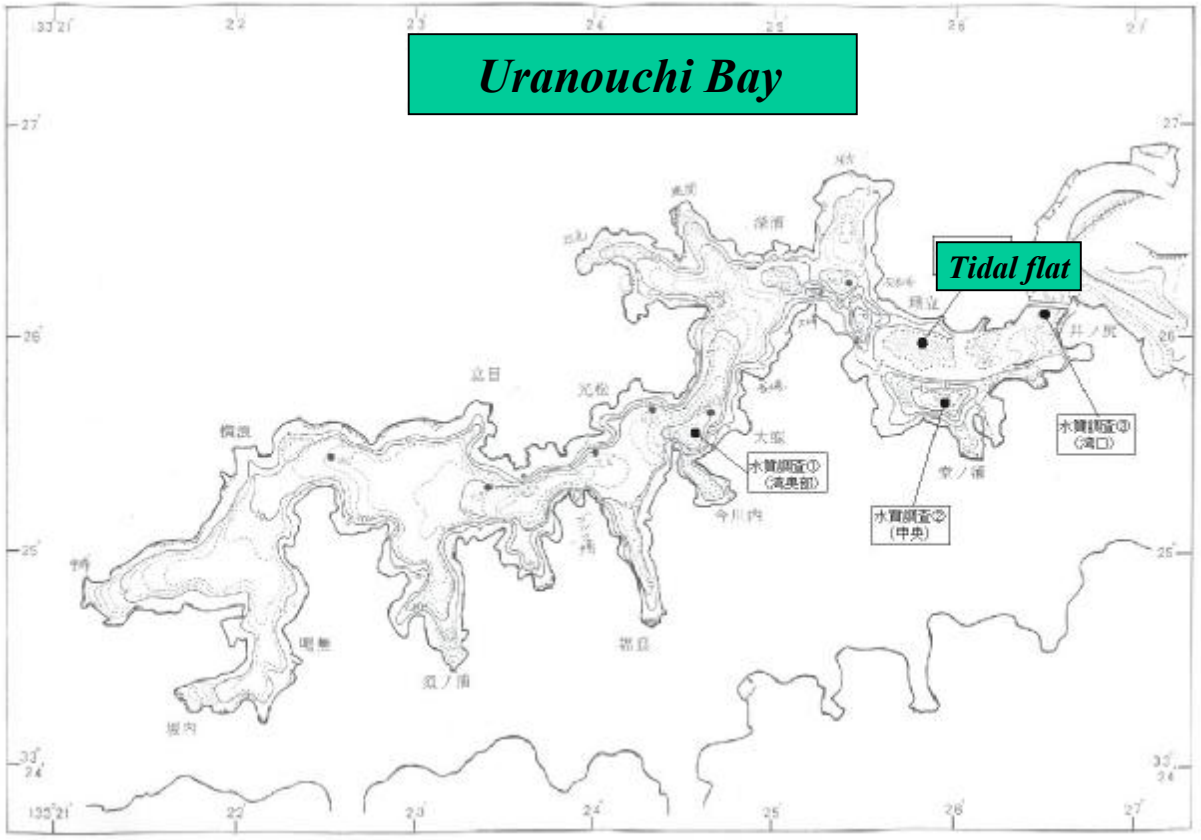


Photo of Tennousu Tidal Flat Survey (Kouchi Pref.) using the bbe BF (Nov. 10, 2004)

Typical fishing tidal flat of short-necked clam in Kouchi Pref.

Results of Tennousu Tidal Flat Survey with BF (Nov. 10, 2004)

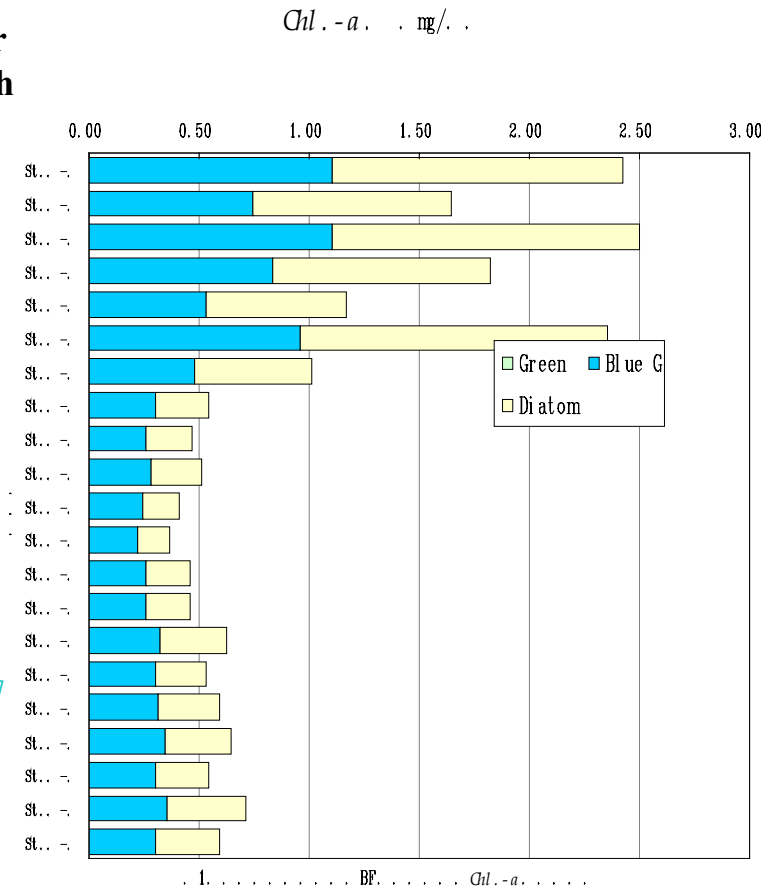
In average

mesurement line	mesurement point	mesurement number	green alg ƒ Ê/ cm2	bluegreen ƒ Ê/ cm2	diatom ƒ Ê/ cm2	total ƒ Ê/ cm2	remarks
‡ T	1	26	0	0	<0.001	<0.001	water depth F0.0cm
	2	28	0	0	<0.001	<0.001	
	3	27	0	0	<0.001	<0.001	water depth F0.0cm
	4	28	0	0	<0.001	<0.001	water depth F.0cm
	5	32	0	0	<0.001	<0.001	water depth F.5cm
‡ U	6	28	0	0	0.010	0.010	
	7	27	0	0	<0.001	<0.001	
	8	22	0	0	<0.001	<0.001	water depth F.0cm
	9	29	0	0	<0.001	<0.001	water depth F.5cm
	10	24	0	0	<0.001	<0.001	
‡ V	11	35	0	0	<0.001	<0.001	water depth F5cm
	12	36	0	0	<0.001	<0.001	
	13	27	0	0	0.005	0.005	
	14	36	0	0	<0.001	<0.001	
	15	26	0	0	<0.001	<0.001	
‡ W	16	29	0	0	<0.001	<0.001	water depth F.0cm
	17	36	0	0	0.005	0.005	water depth F.5cm
	18	38	0	0	<0.001	<0.001	water depth F.0cm
	19	27	0	0	<0.001	<0.001	drier sands
	20	28	0	0	<0.001	<0.001	water depth F.0cm
	21	28	0	0	<0.001	<0.001	water depth F0.0cm

Natural tide flat CASE 2. Natural tidal flat around river mouth in Hiroshima - the west part of Japan

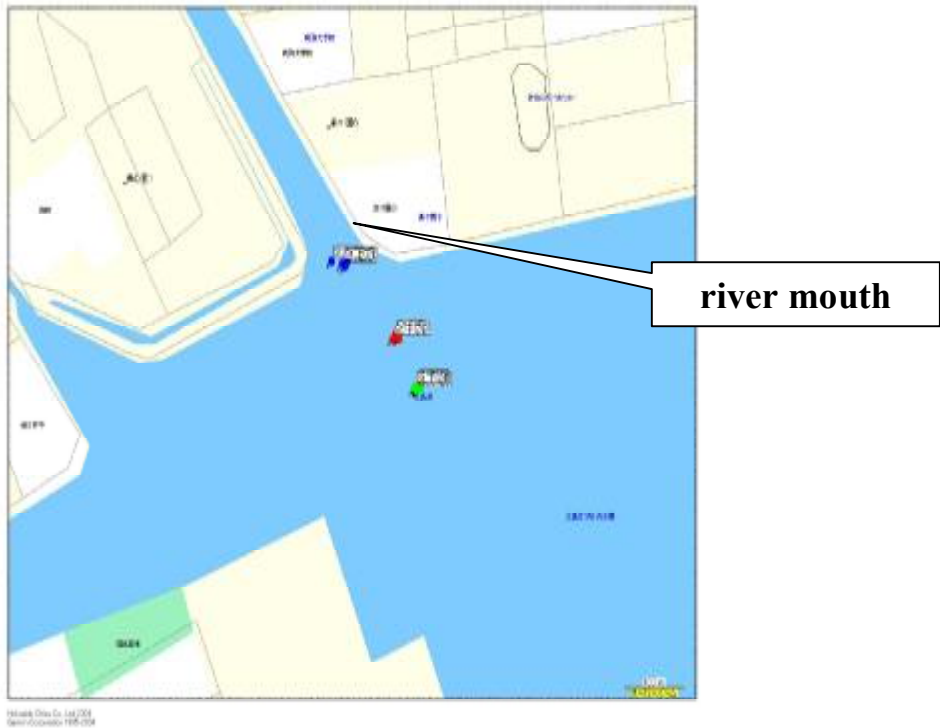
River mouth

offshore



Tidal flat of municipal river mouth:

Short-necked clam : small bivalve



Municipal river mouth

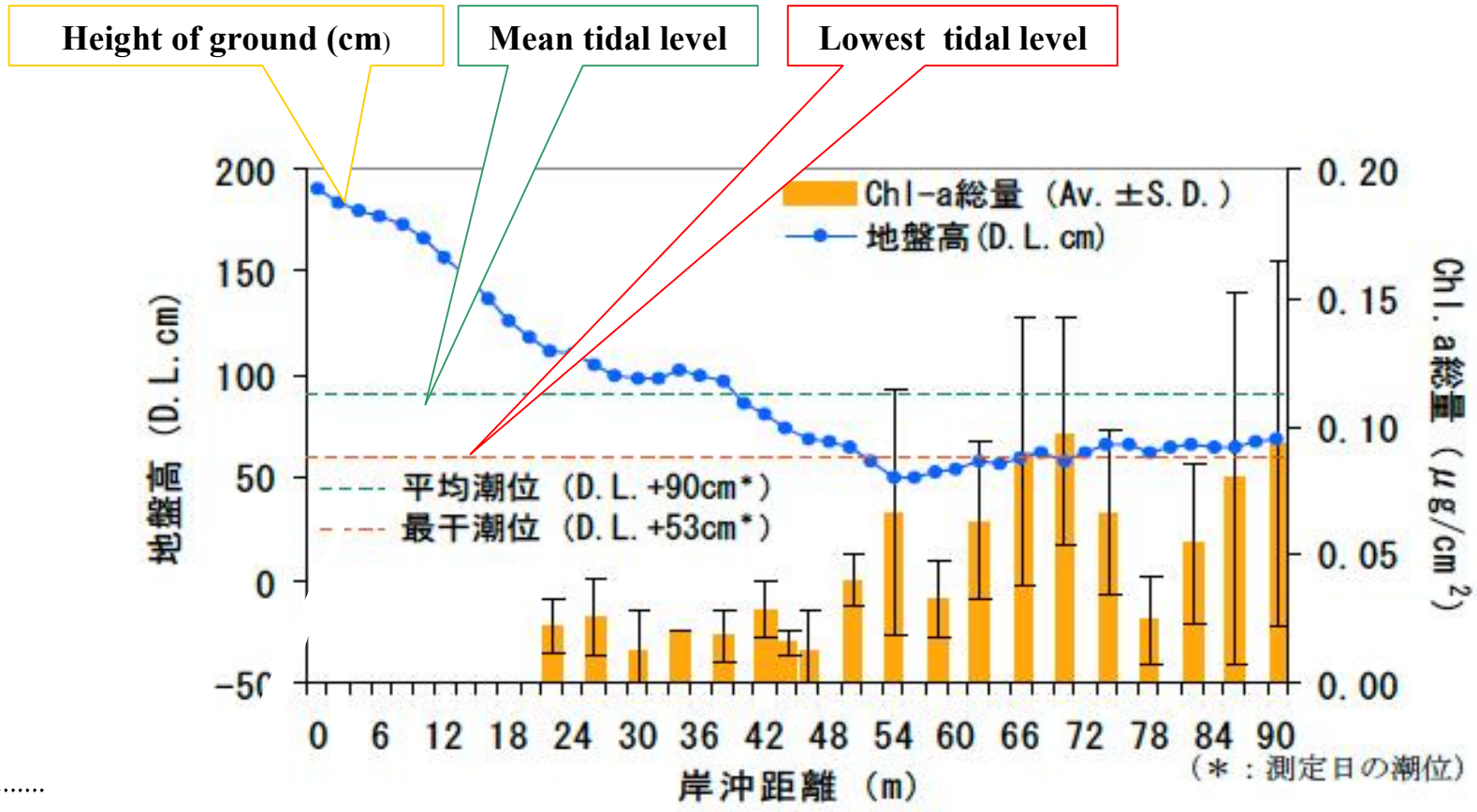
Artificial tidal flat CASE 1. Photo of Hannan Artificial Tidal Flat Survey in Osaka Bay





Experimental sites of National Institute for Land and Infrastructure Management

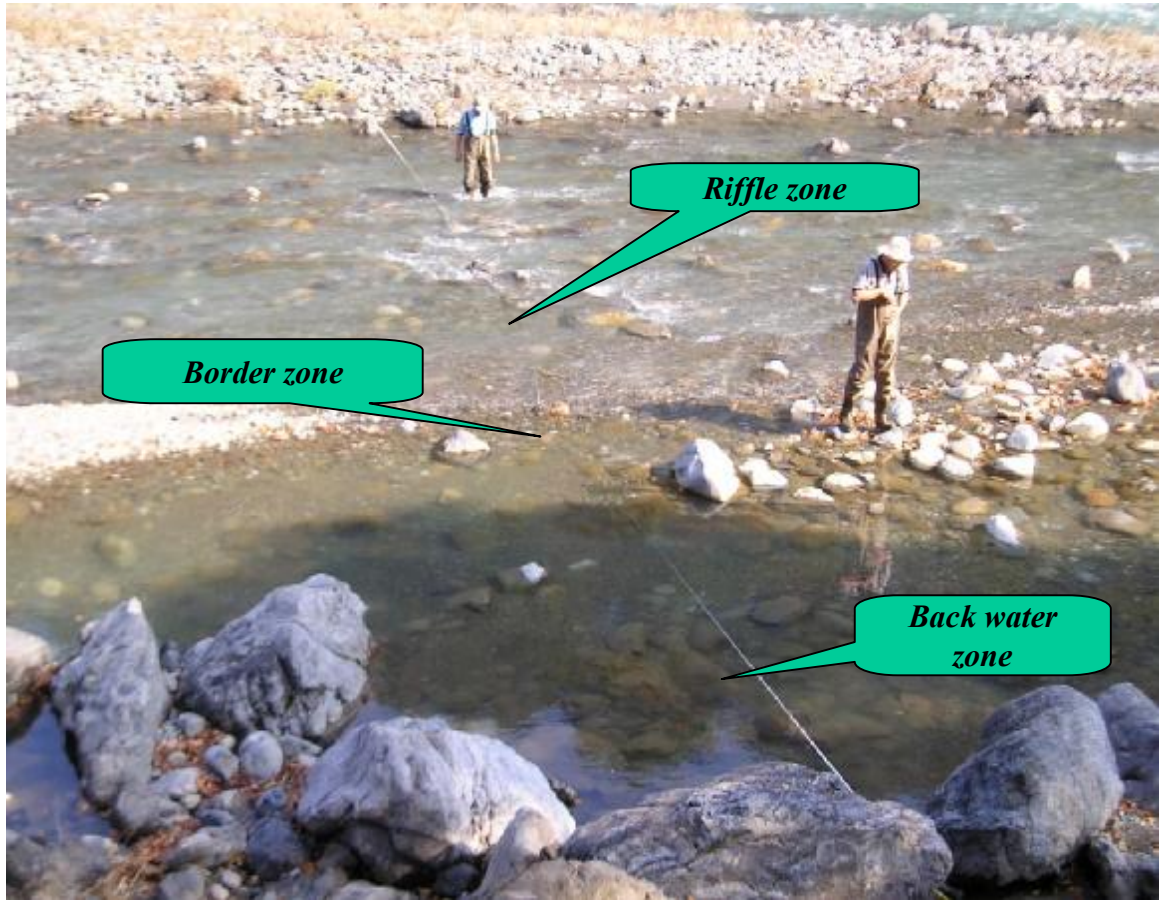
Shift of amount of Benthic algae with height of ground in artificial tidal flat (Osaka Bay)



D.L :.....

Distance from the control point on land

Mid stream zone CASE 1 **Photo of Tama River Survey in Tokyo**



Observation at three zones of Tama River in Tokyo

Riffle zone

RFR.20－60cm／sec

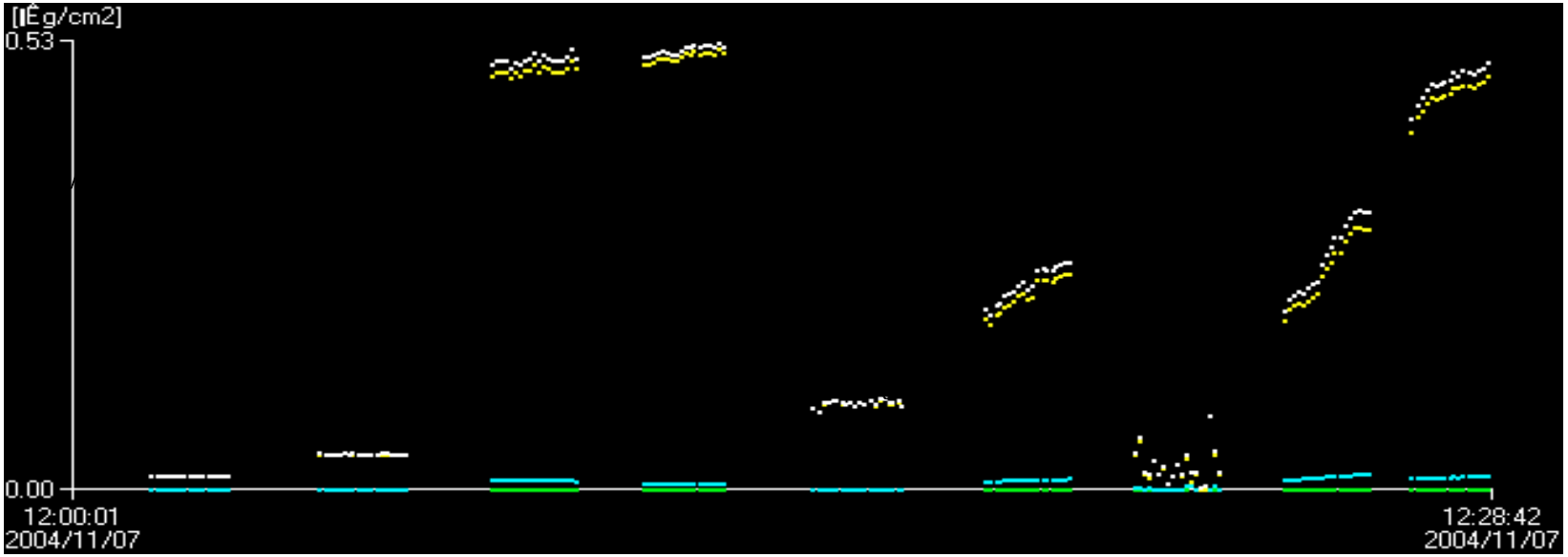
Border zone

RFR.15cm／sec

Back water zone

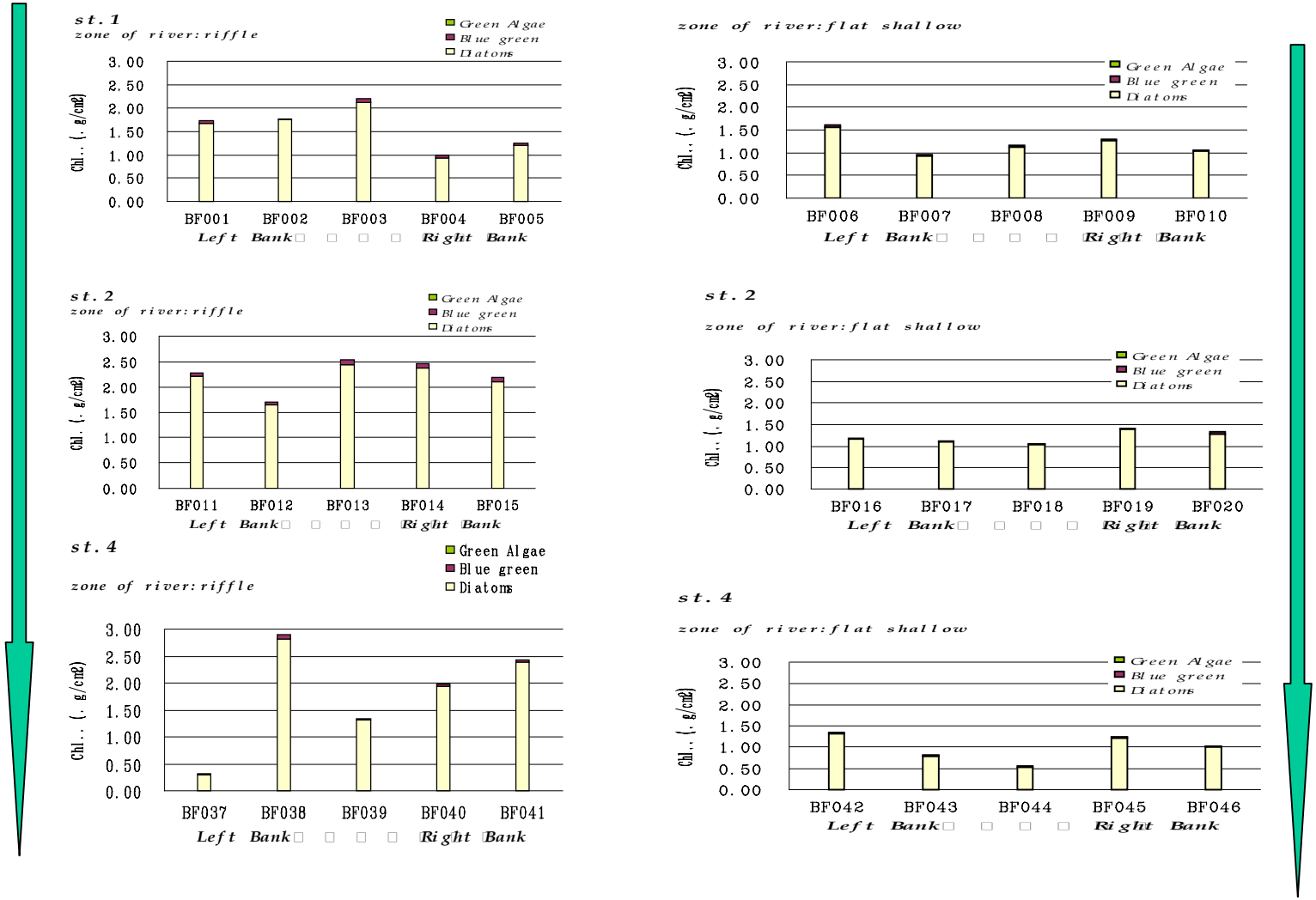
RFR.2.1cm／sec

Results of Tama River survey



	Back water zone	Border zone	Riffle zone .5 stones)
River flow rate	RFR. 2.1cm/sec	RFR. 15cm/sec	RFR.20-60cm/sec

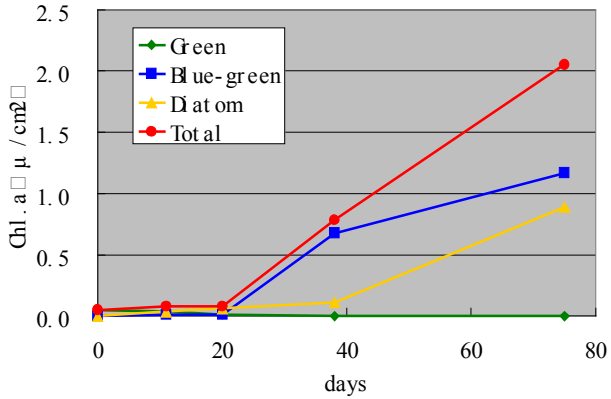
Mid stream zone CASE 2 . *Attached algae on the surface of rocks in the midstream of Ara River (Dec.2004) Tokyo JP -*

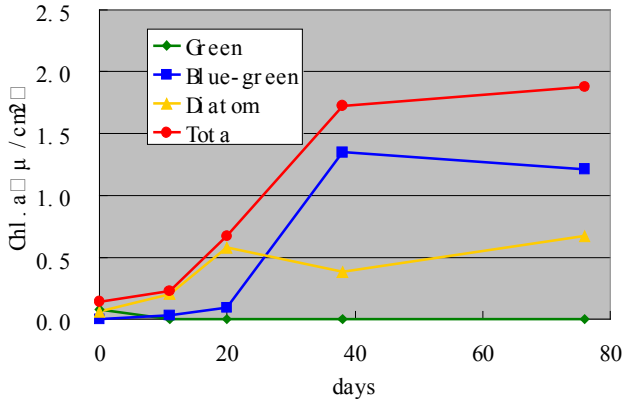


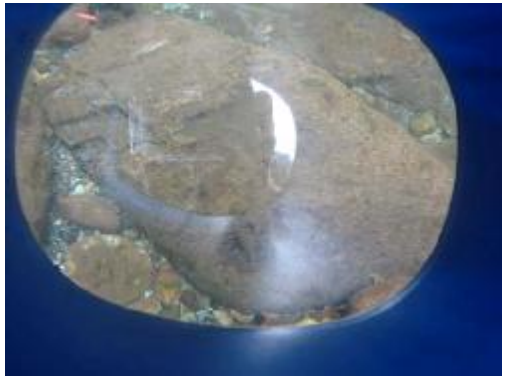
Riffle zone

Flat shallow zone

Mid stream zone CASE 3. Attached algae-succession of cleaning stones in a Japanese rivers(Sep. to Nov.2005)







Special fish “Ayu” in Japanese river environment

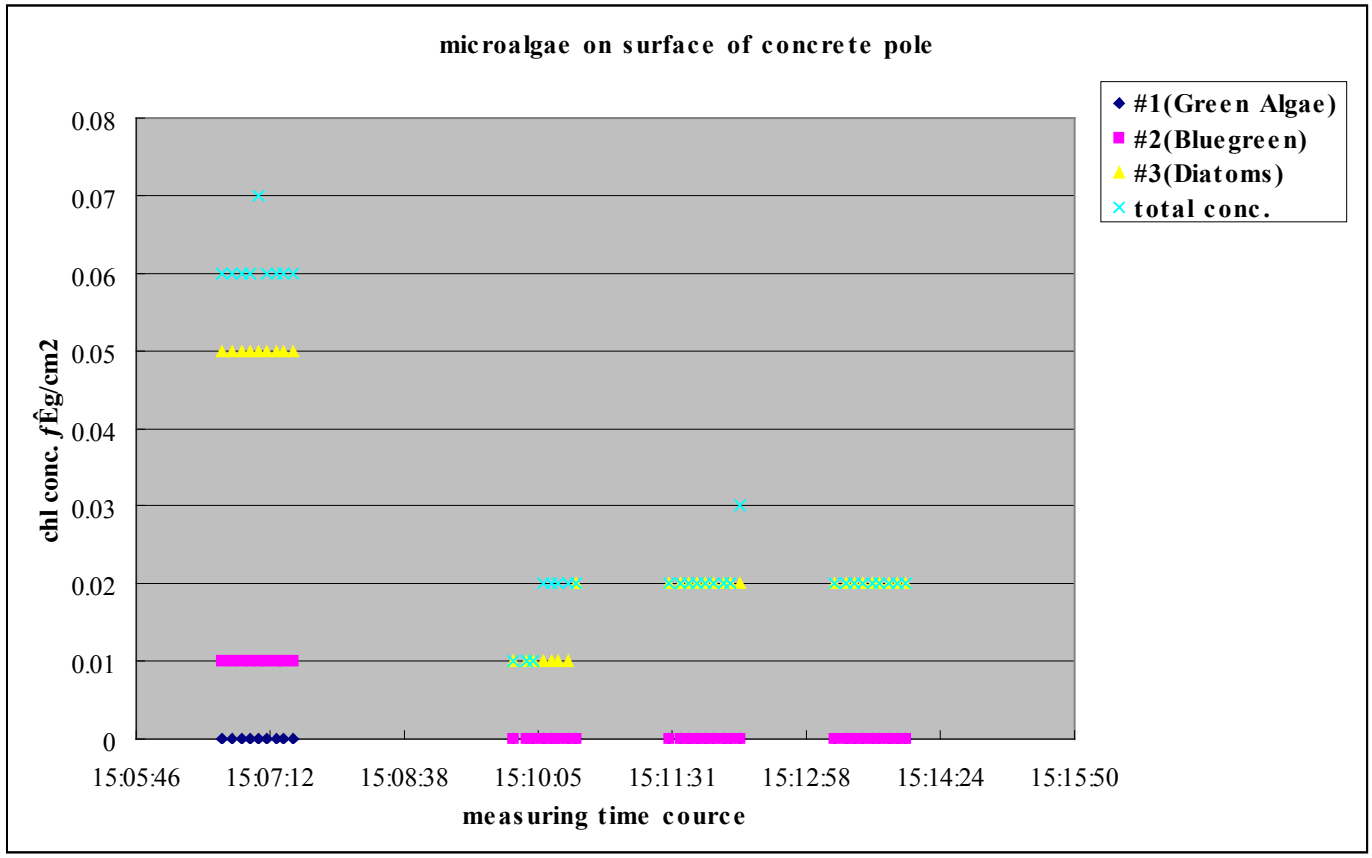
Scientific name : ***Plecoglossus altivelis altivelis***

Feeding habitat: ***Ayu feed mainly on water weeds(benthic algae). And scrape the algae from rocks in the river.***

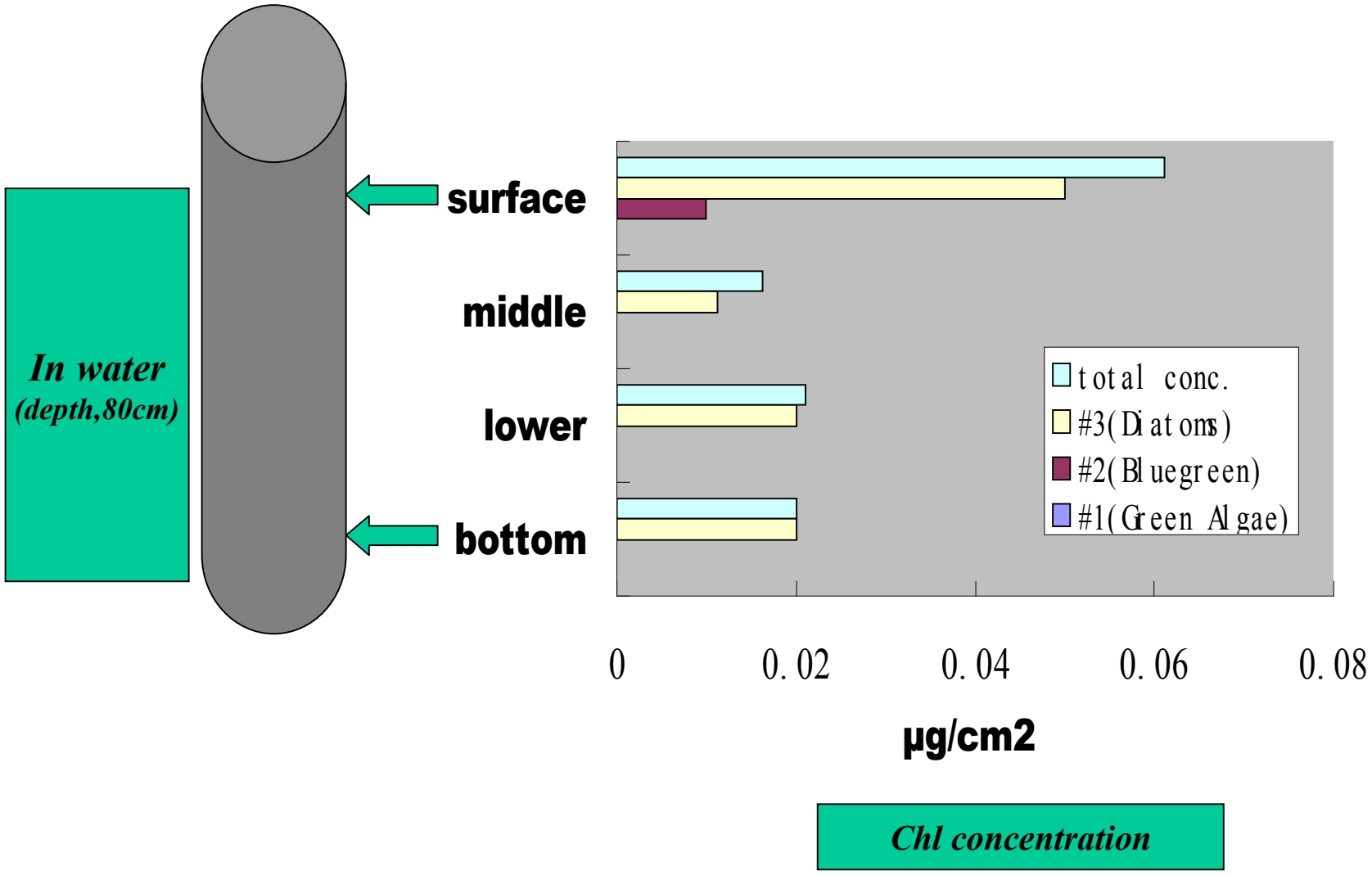
Special features:***Ayu are highly territolial when it comes to their feeding grounds.***

Down stream Case 1. Photo of Ayase River Survey with bbe BF

Raw data of micro algae attached on the concrete post by BF measurement(at Nawate Bridge)



Vertical profile of benthic algae attached on the concrete post in the tributary stream of Ayase River



Chl concentration

Summary

- Several applications of BF-measurement to tidal flat and river environments are presented here on trial basis in the last 2 years .
- Main applicable fields of the measurement are tidal flats and river environments in Japan.
- Prime reason is why we can obtain the reproducible data on non-destructive manner and conveniently.
- We are carrying forward cooperative experiments with many research bodies to expand BF user in Japan.


Thank You for Your Kind Attention !