琉球大学学術リポジトリ

アジア太平洋域における大学院学生の国際連携教育プログラムーダブルディグリープログラムなどの推進ー最終報告書

インドネシア／ディポネゴロ大学　Arik Wijayanti

受入教員：久木　幸治

1.Research term: September 30, 2012 – October 31, 2012

2.Research title, the detail and the results:

Abstrak

Characteristics of wave height along of the East China Sea in 1999 assessed using WAM modeling method to determine the wave height in the East China Sea. In this study, also conducted the trial simulation model that refers to the fixed depth (bathymetry) to determine the effect of wind on wave model simulation results. Simulation results show that the wind waves along the waters of the East China Sea in 1999 had a high wave 0.5 – 5 m thought to have come from the Deep Sea (Pacific Ocean) as local wave generation by wind, and the effect of high water levels due to the current meeting Oyasiwo and Kurosiwo

Keywords : wave height, WAM Model, East China Sea.

Preliminary

Waters of the East China Sea is very important as a trade route and other transactions between China, Taiwan and Japan. Wave height is very influential on shipping and coastal protection. To get a good understanding of this, the study conducted characteristic wave height. The study of the characteristics and the wave height has been done both on a global scale (Semedo, et al., 2011; Dodet, et al., 2010) but the characteristics of the generated wave heights in the Pacific Ocean that extends into the East China Sea The primary method used in this study is modeling (simulation) of mathematics, namely the WAM Model

Methods

Equation builder

In this study, height and wave period predicted using the WAM Model [WAMDI group, 1988. The evolution of two dimensional ocean wave spectrum F(f, θ, Φ, λ, t) with respect to frequency f and direction θ, as function of latitude Φ and longitude λ on the spherical earth is governed by the transport equation :

$$\frac{\partial F}{\partial t} + (\cos\phi)^{-1}\frac{\partial}{\partial\phi}(\dot{\phi}\cos\phi F) + \frac{\partial}{\partial\lambda}(\dot{\lambda}F) + \frac{\partial}{\partial\theta}(\dot{\theta}F) = S \quad (1)$$

Where S is the net source function describing the change of energy of a propagating wave group. The sources function for the deep water case maybe represented as a superposition of the wind input, non linier transfer, and white capping dissipation source functions

$$S = S_{in} + S_{nl} + S_{ds}. \quad (2)$$

Aplication Models

Location model (Figure 1) covering the East China Sea. Boundary of the model is the Okinawa area on the northern boundary, the eastern boundary of the Pacific Ocean, at the southern Taiwan, China's western border. The selection of the model area refers to the data buoy (Figure 2)
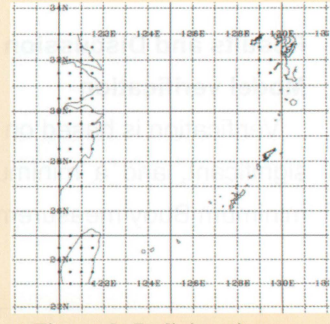
In definition models, In the area of defining the model, used in the form of the model grid size of 0.5 m, with the location of 22 N - 34 N and 118 E - 132 E (Figure 3)
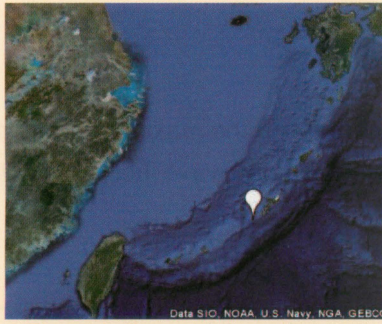
▲Figure 1. Research Location east China Sea
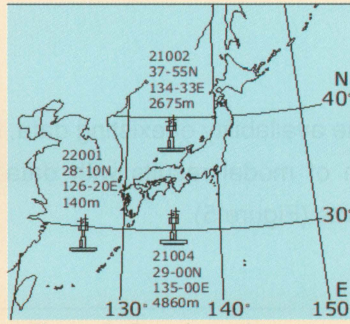
▲Figure 2. Buoy Location

▲Figure 3. Defining the assessment models

Wave generate that are used in the model of the ocean wave height are used in wind measurement intervals every 3 (three) hours obtained from ECMWF (The European Center for Medium – Range Weather Forecast). Model simulation conducted for 1 year (Januari 1 1999 –Desember 31 1999). The result of wave height prediction in Figure 4.
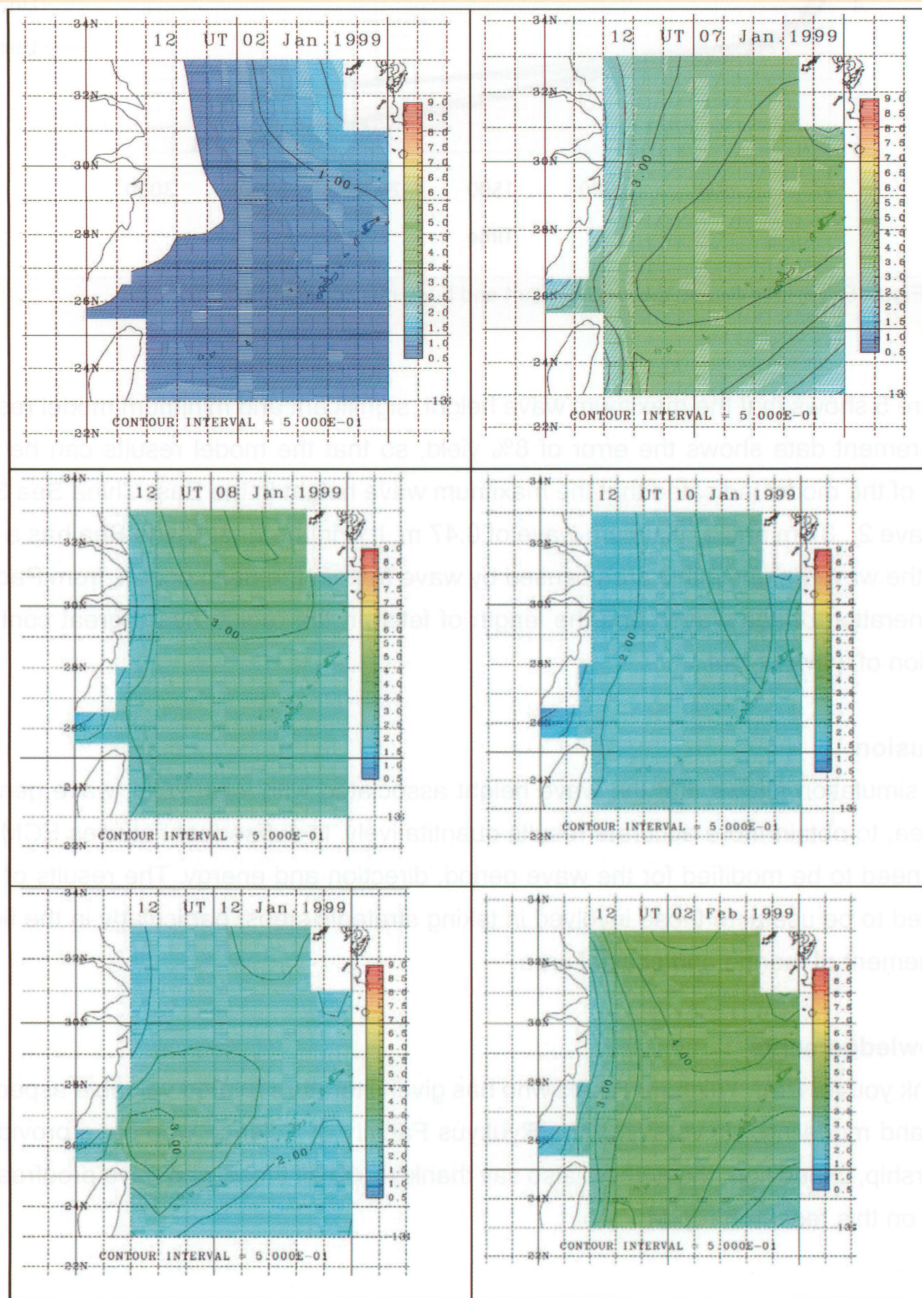
▲Figure 4. Wave height prediction

ダブルディグリープログラムについて

国際合同実習

大学院学生短期研修派遣・受入

平成22年　平成23年　平成24年

Results and Discussion
Model verification

Verification is based on the availability of existing data, by comparing the maximum wave height, significant, and a minimum of model results with data the maximum wave height, significant, minimum Buoy measurements (Figure 5)

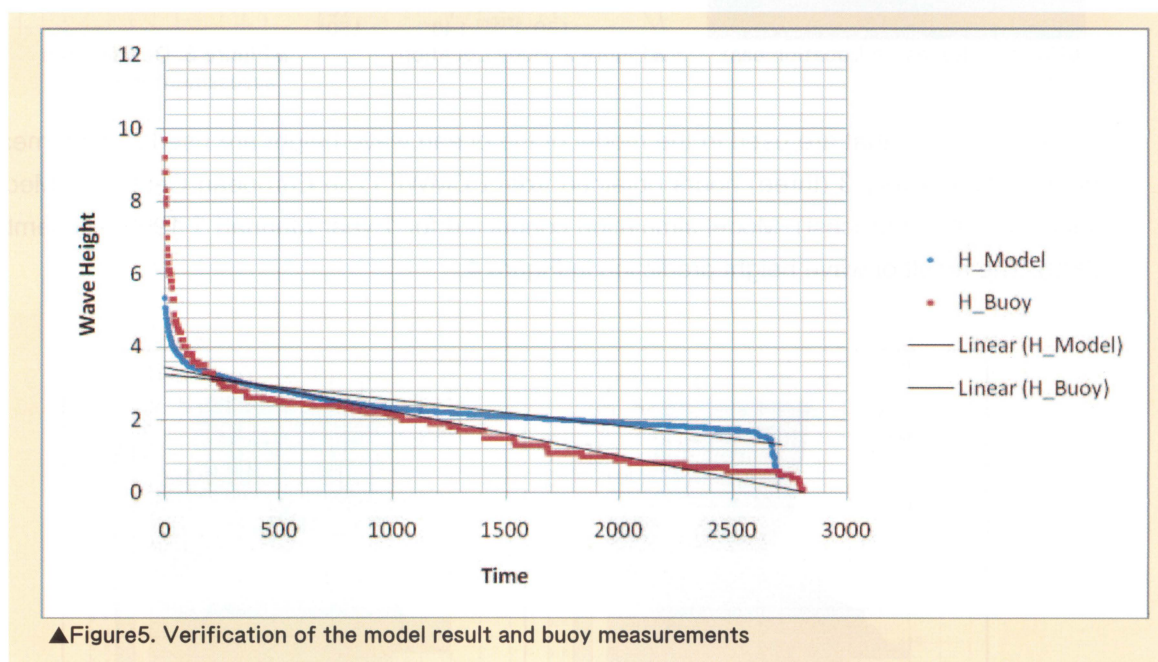▲Figure5. Verification of the model result and buoy measurements

Figure 5 shows that the maximum wave height, significant and minimum model results with buoy measurement data shows the error of 8% yield, so that the model results can be accepted, the results of the model indicated that the maximum wave height in the East China Sea 3.14 m, significant wave 2 , 37 m and a minimum wave of 0.47 m, it is in the East China Sea has a relatively high wave, the wave height in this area caused by wave from in the deep ocean, from Pacific Ocean. so the generation of sea waves and the length of fetch in the region has a great contribution in the formation of wave height..

Conclusion

The simulation shows that the wave height associated with local wind, wave generate location and area, to obtain more accurate results quantitatively, in subsequent studies ECMWF wind data inputs need to be modified for the wave period, direction and energy. The results of this study are expected to be useful to those involved in taking strategic steps, particularly in the field of disaster management of marine and coastal area

Acknowledgements

Thank you for Prof. Yukiharu Hisaki who has given literature related valuable aspects hidooseanografi and modeling. University of the Ryukyus Faculty of Science who have provided short term scholarship, in addition, the authors also say thank you to all those who have proofread and provide advice on this research report

インドネシア／ディポネゴロ大学　Sapto Pamungkas

受入教員：土屋　誠

1.Research term: October 5 - November 5, 2012

2.Research title, the detail and the results:

Research Title

Effect Of Burrowing Activity On Sedimentary Organic Matter By Soldier Crabs Myctyris Guinotae And Fiddler Crabs Uca Perplexa In Oura Bay, Okinawa, Japan

1.Introduction

Bioturbation activity evidently causes changes in the sediment characteristic. It is defined as biological reworking of soil and sediment through animal activities like burrowing and feeding (Meysman et al., 2006). Bioturbation by burrowing macrofauna has a major effect on the sediment (Machenga et al., 2007). One type of dominant it in coastal ecosystems is crab burrowing which can transport sediment, modify sediment texture and accelerating ecosystem nutrient cycling (Wang et al., 2010).

Soldier crab often inhabit at sandy or muddy bare shores. Unlike other species of crabs, it does not construct and maintenance of permanent burrows, its main roles over sediment biogeochemistry are linked by surface grazing and sediment working habbits (Webb and Eyre, 2004). This species produces feses which have a high FAMEs content, this possible to enrich sediment and influence organic matter composition (Takagi et al., 2010). On intertidal sediment, it appears to be the major consumer of transported detrital material and growing microbial mats that increase organic carbon, total nitrogen and chlorophyl-a concentration (Webb and Eyre, 2004). The predator of it is fiddler crabs that prey on tresspassing soldier crabs (Takeda, 2010). They are inhabit on intertidal flats irrespective of being adjacent or not to mangrove forest (Meizane et al., 2002). On Oura bay, Okinawa (personal observation) fiddler crabs Uca perplexa distribution and abundance nearly from mangrove forest, life partitionally with soldier crab Myctirys guinotae and construct permanently burrow. While M. guinotae live dominantly at sandy bare flat above the low water level of spring tide where it is occupied quite far from mangrove forest.

This study was done in order to investigate the effect of burrowing crabs on sedimentary organic matter at tidal flat and compare them; sediment which inhabited by fiddler crab U. perplexa and sediment which inhabited by soldier crab M. guinotae. In general, these two crabs segregate on large tidal flate. They have own spatial and temporal distribution which affected by prey-predator interactions among them (Takeda, 2010). Our hypothesis was any differences on both of the sediment especially in organic matter component and chorophyil-a composition.

2. Materials and Methods

2.1. Study site

The study was conducted in the Oura Bay (26° 33' N, 128° 02' E), the northern part of Okinawa Island at October 2012. The area extends at the mouth of Oura River.
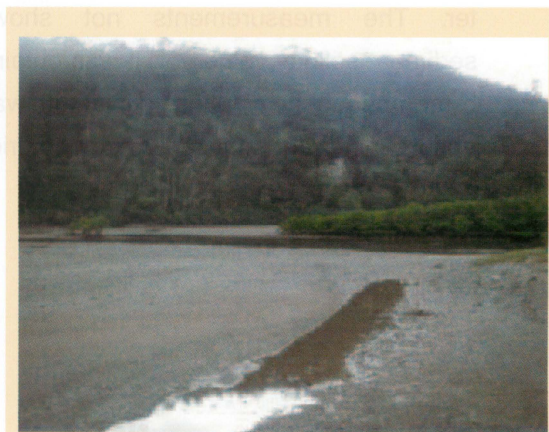
▲Figure1.Sampling site Oura Bay Okinawa

Allochthonous from surrounding mountain forest, sugar cane plantations and human settlement inside it through the river channel. The average of annual precipitation is 218 mm per month, May to July are the highest month and lowest in the October to November. Annual mean temperature is 22,9 ℃, highest monthly mean occur in July (28 ℃) and the lowest in January (14 ℃). The sediment surface varies from hard to soft mud; the most of them are big pebbles and clay. The large of the area is 10 Ha with the habitat of subtropical mangrove forest. At least 3 kinds of mangrove species had been found here, there are Brugueira gymnorhyza, Kandelia obovata and Rhyzhopora stylosa. Effects of wave action are relatively small to the forest because it is extended in an enclosed bay.

2.2. Sample collection and measurements

Sampling and measurements were conducted during low tide. Three samples were randomly collected from surface sediments (±1 cm in depth) inhabited by soldier crab and from those which inhabited by fiddler crab. For fiddler crab burrow sampling, a thin layer of the burrow wall opening (BO), to approximately 10 cm depth from surfaces was carefully scraped off using sterile spatulas. While soldier crab burrow, thin layer sediment was scraped off after feeding pellet had been moved from burrow surface. For burrow chamber sampling both of species, the burrows were carefully excavated. Approximately a 1-cm slice of sediment was collected from the bottom of the burrows.

Redox potential (Eh) was measured using an electrode Oxidation-reduction potential (ORP) meter (model RM 20P; TOA, Tokyo, Japan) Measurements was carried out by inserting the electrode gently into a burrow opening until it came in contact with the burrow wall. Burrow bottom measurement was made by pushing the electrodes into the bottom sediment after excavated. The Eh of surface sediment (both of inhabited by Fiddler crab and Soldier crab) were measured by inserting the electrode into the surface (±0.5 cm depth). Similarly, temperature and pH were measured in situ using a pH meter (model pH 310, EUTECH, Singapore).

Salinity measurement was made by put the sediments inside the unipack. Hang it by hand until a few water placed at the bottom, collected using an injection and measured by refractometer (model IS/Mill-E IUCHI, Japan). Differences of sediment density made the method above only applicable to the sediments which inhabited by soldier crab. The sediment in the fiddler crab habitat, more compact than that in the areas inhibited by soldier crab (Takeda, 2010). This condition not allowed for getting water by injection in the sample of fiddler crab sediment. Analysis it salinity were carried out in the laboratory. One gram sediment sample was added by 1 ml distillation water and measured using refractometer. The measurements not showed sediment salinity value yet. It was obtained by comparing the solution salinity with water absorbance after sediment had been dried.

▲Figure2.　Collecting sediment samples

2.3 Determination of TOC, TN and TOM

Total organic carbon (TOC) and total nitrogen (TN) contents in sediments were analyzed using C:N analyzer. Sediment was dried at 80 ºC for 20 hours to determine water content. Dried sediment was grinded to get smaller size and sieved through a 250 μm strainer. Delicate sediment was treated with 2N HCl for at least 24 hours to remove carbonates and bicarbonate. After no more reaction, sediment was rinsed with distilled water for three times, dried again at 80 ºC for 24 hours and passed through the strainer. The fine powder was analyzed by C:N analyzer.

For measurement of Total Organic Matter (TOM), sediment sample which have been treated was ignited in an electric muffle furnace (FUL 220FA) at 550 ºC for 3 h to obtain the percentage Loss on Ignition (% LOI).

▲Figure3.Measuring TOC and TN on sediment

2.4. Determination of Chlorophyll-a

Chlorophyll-a in the sediments were measured using spectrophotometer. Sediment samples were placed into unipack that wrapped by foil and kept them at ice book. Immediately, samples were placed into test tubes and added with 10 ml acetone 90%. The tubes were wrapped by aluminum foil, taken in sonicator 20 ºC for 10 minutes and freezes at refrigerator. After 20 hours, tubes were centrifuged at 2000 rpm for 5 minutes without removed foil. Centrifugation made sediment spaced at bottom layer, while acetone and chlorophyll solution placed above. The mixtures solvent were separated from sediments by using pipette and poured into new wrapped tubes. They were decanted into cuvette and placed into the spectrophotometer one by one.

3.Result

3.1.Environment parameters

Table 1.Parameters in sediment which are inhabited by fiddler crab and soldier crab
(SS: *sediment surface*, BO: *burrow opening*, BB: *burrow bottom*, u: *fiddler crab Uca perplexa*, s: *soldier crab Myctiris guinotae*)

Parameters	Uca perplexa			Myctirys guinotae		
	SSu	BOu	Bbu	SSm	BOm	BBm
Temp (ºC)	29,8 (29,3-30,2)	28,8 (28,4-29,4)	26,9 (26,5-27,5)	28 (27,0-29,9)	27,5 (26,7-28,7)	27,5 (26,7-28,7)
Eh (mv)	188,7 (175-196)	70,3 (38-112)	25 (38-112)	146 (132-158)	153 (129-165)	199,7 (27,0-29,9)
pH	7,36 (7,24-7,44)	7,14 (7,08-7,21)	6,68 (7,08-7,21)	7,05 (6,91-7,12)	7,10 (7,08-7,12)	6,92 (6,75-7,10)
Salinity (‰)	30,3 (28-34)	31,3 (26-38)	27 (26-29)	40 (39-41)	32,7 (29-35)	31,7 (30-33)

インドネシア／ディポネゴロ大学　Muliawati Handayani

受入教員：今井　秀行

1.Research term: Oktober 14, 2012 – Desember 13, 2012

2.Research title, the detail and the results:

Research Title: Molecular Ecology Comparison of Blue Leg Hermit Crabs (*Calcinus elegans*) and Its Relationship with Spatial Factor on South Coast of Java Island

Introduction

Nowadays hermit crab including species *C. elegans* becomes the important export commodity as the pretty ornament of aquarium. It is widely distributed in some regions of Indonesia and along the South Coast of Java Island. Hermit crabs are like other creatures of the intertidal zone; they are affected by human activities such as reclamation and pollution as well as over-collection for the pet trade and by hobbies.

Therefore, there is a need to undersatand the genetic variability *C. elegans* to develop effective resources management plans to conserve wild *C. elegans*. Moreover, few studies have investigated the genetic structure of hermit crab habitat through South Coast of Java Island. The purpose of this study was to determine genetic variability by means of Cytocrome oxydase 1 region sequence analyses. These results will provide useful evidence regarding whether surface current influences on genetic variability.

Material and Methods

Samples and DNA extraction

A total 145 individuals of Calcinus elegans (Garut 54 samples, Yogyakarta 44 samples and Banyuwangi 47 samples) were collected by supplier and manual collecting from 3 localities South coast of Java Island mainly along Indian Ocean current (surface and Tidal current). Samples were frozen and preserved in 96% alkohol and approximately 50 mg of minced muscle in tube that contains 0,5 ml TNES-8M urea buffer (Asahida et al, 1996). Genomic was extracted from the tissue using standard Protein K digestion and phenol/ chloroform extraction procedures.

Amplification and sequencing

The mtDNA CO1 was amplified by PCR using primers LCO 1490 (5´-GGTCAACAAATCATA-AAGATATTGG -3´) and HCO 2198 (5´TAAACTTCAGGGTGACCAAAAAATCA -3´) (Malay and Paulay, 2009). This is the table of PCR arrangement to DNA amplified in 30 cycles:

Pre-denaturation	Denaturation	Annealing	Extention	Long extention
94°C (2 m)	94°C (30 s)	45°C (30 s)	72°C (1 m)	72°C (7 m)

Data analyses

The data are analyzed by Clustal X, mcClade, MEGA vs 5 and PAUP. Gene diversity (h) and nucleotide diversity (π) within populations were calculated using the program Arlequin. Analysis of molecular variance (AMOVA) is used to calculate FST and a hierarchical analysis of FST is performed using ARLEQUIN vs. 35.

Result

The size of PCR products was approximately 625 base pairs was observed among the 145 individuals. The survey identified 64 composite haplotypes (total haplotypes). Only 12 haplotypes were shared among populations, and the remaining 42 haplotypes were specific to one population.

Haplotype 2 was found with the highest frequency in all population samples examined with frequency 20,69%, but the number of this haplotype in Yogyakarta is the least (Garut 13, Yogyakarta 6 and Banyuwangi 11).

The composition of frequency base A-T is 60,5% and base G-C is 39,5%. It showed that sequence of fragment CO1 A-T had more than G-C (AT rich).

Nukleotide	Amount in sekuen result
T	36,7 %
C	16,8 %
A	23,8 %
G	22,8 %

Genetic variability within populations

Nucleotide diversity in the all localities samples were almost all the same, but it indicates high genetic variability. The table displays the number of genetic diversity (H), nucleotide diversity (π) and the average of nucleotide difference in each localities.

Localities	H (genetic diversity)	π (Nucleotide diversity)	K (Average of nucleotide difference)
Garut	0,9266 ± 0,0251	0,007155 ± 0,003972	4,72 ± 2,376616
Yogyakarta	0,9630 ± 0,0165	0,007914 ± 0,004359	4,95 ± 2,453756
Banyuwangi	0,9288 ±0,0257	0,007232 ± 0,004021	4,52 ± 2,263972

Genetic differentiation among populations

The variance components within population samples and among population samples of the hierarchical analysis were statistically significant ($P < 0.05$). AMOVA allowed to the estimation of the haplotypic correlation measures (FST) and their significance (P) between pairs of population samples. Analysis of molecular variance on pairwise differences:

Variance component	% Total	F-statistics	P
Among populations	-0,09	$FST = -0,00091$	$P < 0,05$
Within populations	100,09		

Pairwise FST among three population samples

	Garut	Yogyakarta	Banyuwangi
Yogyakarta	0.00287		
Banyuwangi	0.00165	-0.00827	

Larvae dispersion by Surface Current

Four Zoeal stages and the megalopa of the *C. elegans* are described as plankton (planktonic stage) for 60 days. Larval dispersal by the surface current, which moves at a rate of nearly 108,1 meter/second along the South coasts of Java Island and Indian Ocean to southwest and northwest may connect those populations. Hermit crab dispersal in the ocean during the larval stage cannot be assumed over large geographic distances with the flow of currents and periodic. Monitoring of larval dispersal will be important to conserve this population. Our results indicate that the all populations of *C. elegans* have almost the same genetic variability and a different genetic.
C. elegans are like other creatures of the intertidal zone; they are affected by human activities such as reclamation and pollution as well as over-collection for the pet trade and by hobbies. According Oiki, et al (2008), considering the conservation of species, it is important to decide management units within species. Further study and monitoring are necessary to obtain the right ecology management.

インドネシア／ディポネゴロ大学　Forcep Rio Indaryanto

受入教員：今井 秀行

1.Research term: October 15, 2012 – December 13, 2012

2.Research title, the detail and the results:

Symbiotic Parasites and Genetic Study of *Lechitocladium* sp. from Short Body Mackerel (*Rastrelliger brachysoma*).

The aims of the research

The aims of the research were to investigate population genetics of Short Body Mackerel (*Rastrelliger brachysoma*), investigating worm parasitic infection data (prevalence, abundance and mean intensity) and genetics of *Lechitocladium* sp. whom infected the Short Body Mackerel from the five locations in Indonesia.

Materials and methods

Fish samples of *Rastrelliger brachysoma* were collected by purchasing specimens at fish markets from following five location in Indonesia: 1) Bandar Lampung Bay (Province Lampung – Sumatera Island, n = 50); 2) Banten Bay (Province Banten – Western part of Java Island, n = 50); 3) Jakarta Bay (Province Jakarta-northern part of Java Island, n = 50); 4) Pelabuhanratu Bay (Province West Java – Southern part of Java Island, n = 50); and 5) Banyuwangi Bay (Province East Java – Eastern part of Java Island, n = 18). Approximately 50 mg of body tissue was placed in 0,5 ml TNES-8M urea buffer at 1,5 ml sterilely tube, DNA extraction followed by a standard phenol-chloroform method.

Fish samples was amplified by means of polymerase chain reaction (PCR) using KapaTAQ™ DNA polymerase (Kapa Biosystems) with the following primer L15923 and H16498. The PCR mixture for KapaTAQ™ consisted of 10-50 ng of template DNA; 1 µl of each primer 12.5 pmole; 10 µl of 5x KAPATaq EXtra Buffer; 1.5 µl of 10 nM dNTPs; 3.5 µl of 25 nM MgCl2; and 0.5 µl of KAPATaq polymerase. Each samples was diluted to 50 µl with sterile distilled water. The process involved initial denaturation (94oC, 2 min); 30 cycles of denaturation (94oC, 30 s); annealing (55 oC, 30 s); extension (72oC, 1 min); and a single final extension (72oC, 7 min). DNA sequencing was sending to Macrogen-Japan.

Worm parasitic samples would be examined from *Rastrelliger brachysoma* digestive tract. Morphologically specimens diagnosed by microscopy comparative study were diagnosed to species based on morphology. All *Lechitocladium* sp. body was placed in 0,5 ml TNES-8M urea buffer at 1,5 ml sterilely tube, DNA extraction followed by a standard phenol-chloroform method.

Worm parasitic samples was amplified by means of PCR using KapaTAQ™ DNA polymerase with the following primer 18SU467F and 18SL1170R. denaturation (94oC, 2 min); 30 cycles of denaturation (94oC, 30 s); annealing (45 oC, 30 s); extension (72oC, 1 min); and a single final extension (72oC, 7 min).. DNA sequencing are sending to Macrogen-Japan.
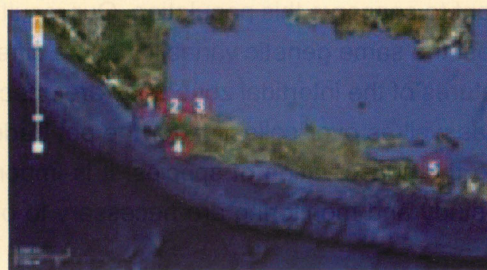

▲Fig1. Sampling locations

▲ Fig 2. Fish samples (top: *Rastrelliger brachysoma*; bottom: *Rastrelliger kanagurta*)

Results

Morphological data of Fish samples : Total length 11.1-28.8 cm with average 16.4 cm; Body depth 2.8-6.5 cm with average 4.3; Wight 15.0-303.9 gr with average 60.5 gr. 73.8% (124 fish) of fish samples are male and 26,2% female (44 fish). 50 fish samples from Banten are young, they can be identification male or female.
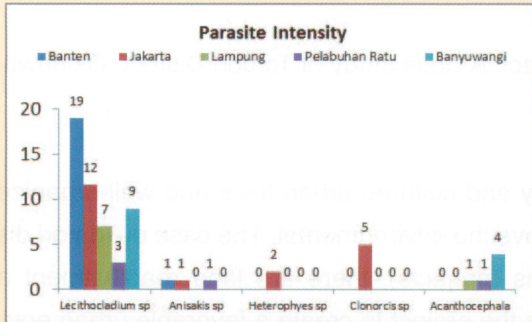

▲Fig4. Worm parasites intensity
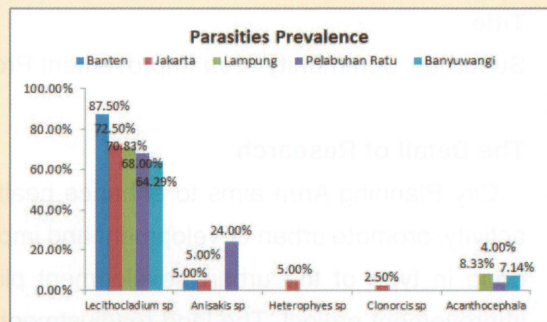
▲Fig5. Worm parasites

Sequencing result are 211 samples amplification, approximately 445 base pairs (bp) DNA segment. Other 8 samples can't amplification because of human error in the step DNA extraction. A total 65 haplotypes were identified.

Sequencing result for worm parasites are only 3 samples amplification, approximately 660 bp DNA segment. I suggest this species is *Lecithocladium angustiovum,* because only this species was reported from Indonesia.

3.Achievements:

This is my first experiment about genetics, I never know genetics before. I had realy wonderfull research experience. In this experiment i had successfully amplified DNA of *Rastrelliger brachysoma* and found a group different genetics but almost same in morphology. I suggest this is *Rastrelliger negletus*, this species is controversial, some researchers say this species is same with *Rastrelliger brachysoma* but other researchers say that is different species. And i had successfully amplified DNA of *Lecithocladium* sp. Only two data about *Lecithocladium* sp was deposited in the DNA Genbank under accession number AY222203 and AJ287529.
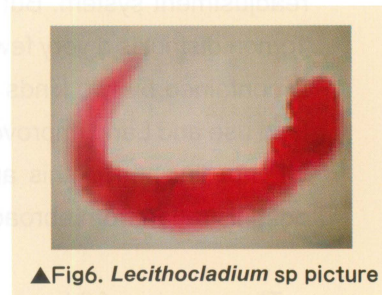
▲Fig6. *Lecithocladium* sp picture
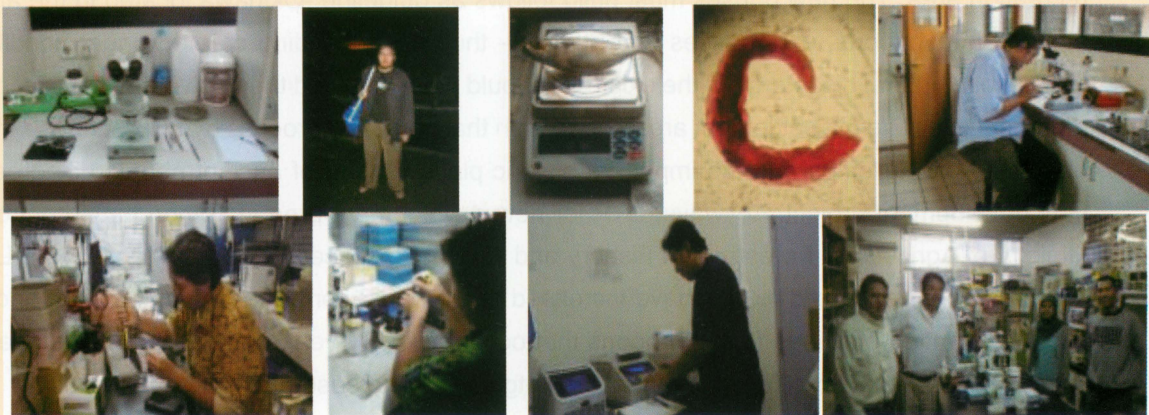
▲Fig. Research Activity

タイ／キングモンクット工科大学　Supinya Punyapaso

受入教員：小倉　暢之／小野　尋子

1.Research term: 19th October 2012 to 16th November, 2012

2.Research title, the detail and the results:

Title

Suburban Community Area Improvement Project: A Case study of Tomori District, Okinawa, Japan

The Detail of Research

City Planning Area aims to enhance healthy and cultured urban lives and well-organized urban activity, promote urban development and improve the environmental. The case of Tomori district has done in type of the urban development plans (projects), there are land readjustment and land improvement project. The land readjustment is the project to create a favorable urban environment through the comprehensive improvement of various buildings, landscapes, environmental, facilities in the city and through the promotion of better living conditions for people in area. The land improvement project refers to investments making land more usable by humans. Nevertheless, both of land readjustment and land improvement project have the same purpose that increases the value of land use.

The Tomori District, Yaese town is the cases are now 18 in 14 Prefectures, the one project of 18 cases in Japan, The Tomori settlement was performed by in type of Urbanization Control Area (UCA). In Japan, Urbanization Promotion Areas (UPA) in the city has been developed under land readjustment system. But some projects have been carried out in rarely case in type of UCA. The Tomori district is a very few case of Suburban Community Area Improvement Project and this project is contained by two kinds of project are Land Readjustment Project (LRP) as an increase of urban land use and Land Improvement Project (LIP) of agricultural field, Even though LRP has finished, but LIP not finished in this area. This project was expected to adjust the compartmentalized public administration from abroad perspective.

The purpose of this research is study about the transformation of Tomori District between the old settlement area and the new development area by this project, in other words is to compare each other for concerning about the results from Suburban Community Area Improvement in project area. For new development area, they have done of LRP all of buildings, facilities, open space such a recreation area. The new houses must build follows as guideline -Okinawa located in the area that affected by typhoons, earthquakes and humidity- thus every building created under conditions to resist those natural disasters but the existents should have adjusted themselves as a guideline to be more suitable. The old settlement area, the reason that could not process by LRP because this area has many old buildings and the important historic place include of ancient people disagree about new development project. Anyways, LRP for new development area in Tomori have controlled by Ministry of Agriculture, Forestry and Fishery and they have successful for LRP but for the LIP is in progress. Their expected results have increased the land use for better living condition and recreation, preventing buildings from Typhoons that occurred every year, making sense of places to be livable, improving of town landscape and the outgrowth is increase of land use value.

▲Figure3: Buildings, Facilities, Infrastructures, etc
--Old settlement area and new development area--

▲Figure 4: Recreation Area (Park for events and sport)
--Old settlement area and new development area--

▲Figure5: Farm Land --Old settlement area--

▲Figure6: Historic Place (Tomori Stone Lion,Okinawa) --Old settlement area--

Results

As comparison for the transformation of Suburban Community Area Improvement Project between old settlement area and new development area in Tomori District, the arrangement of land use proportion have tendency to better in new development area. All Buildings by LRP were apparent details as guideline thus setback, height and material of fence, material of roof, size of buildings in each zone (High and low residential area), length of streets. These transformation help people living to reduce effect from typhoons and increasing of urban land use. There is park as center area of recreation activities and meeting within community. Land readjustment system could not success if lacking in the factors of community's participation as landowner, administration of related organizations and appropriate legal. This case in Tomori,Okinawa has useful for city planning on further study for another urban area where has same characteristics of seashore city that effected by humidity, earthquakes and typhoons.

モンゴル／モンゴル科学技術大学　Enkhjargal Boldbaatar

受入教員：新城　竜一

1.Research term: November 26, 2012 – September 25, 2012

2.Research title, the detail and the results:

LA-ICP-MS Zircon U-Pb age dating analyses of Porphyry type deposits /South and Western Mongolia/.

Introduction

Mongolia produced 1841.1 t of copper in 2010 compared to 2100 t in 2011. Copper-molybdenum (Cu-Mo) mineralization in Mongolia is occurs primarily in three types of deposits, late Paleozoic to early Mesozoic Cu-Mo porphyries, of unknown age, and Paleozoic to Mesozoic stratabound Cu. The Cu-Mo deposits described above occur in four main base metal provinces in Mongolia, located in the Bayankhongor northern Mongolia, and southern Mongolia.

All of the samples collected new porphyry deposit and occurrences. I was collected 4 samples from the Gurvansaikhan island arc terrane in the southern Mongolia, 11 samples from the Edren island arc terrane in the Western Mongolia, and also 4 samples selected from the North Mongolia. The Gurvansaikhan and Edren island arc terrane, with huge amounts of copper, lead, zinc, molybdenum, gold, silver and other metal mineral resources, has become the most important national level successive resources base, and it has settled the status that severed as the standby base for prospecting and exploration of pillar and strategic mineral resources in Mongolia.

We want to do some analyses of LA-ICP-MS Zircon U-Pb age dating isotopic analyses for 19 samples.

Analytical Method

After rock samples were crushed, zircon grains were separated by using density and magnetic separation techniques and then, were picked out using a binocular microscope. The handpicked grains were mounted in epoxy-filled blocks (diameter: 1.5cm) and subsequently sectioned and polished to about 50-75% of their thickness. Mount were cleaned in different steps with acetone and water in an ultrasonic bath to remove surface lead contamination before introduction into the sample cell.

For all zircon samples used in this study backscattered electron (BSE) images were obtained using a HITACHI S-3000N scanning electron microscope (SEM) at Department of Physics and Earth Sciences Faculty of Science University of the Ryukyus.

After photographing BSE image to carry out the image analysis, the cracks, inclusions and residual nucleus in the zircons could be avoid in order selecting the appropriate measuring point (Pic-1).

We hope those new data provide important keys to understanding about geological setting and tectonic evolution of the porphyry deposits.

3.Achievements:

During the short-term exchange period, I accomplished collecting samples around another palace, meanwhile analysis some of my data for my first part research. Papers of the first part experiment are still under construction. However the preliminary results has presented in 5th international Geological and mineral exploration forum "MONGOLIAN MINERAL EXPLORATION ROUND-UP 2013" March 21-22, 2013 Ulaanbaatar.
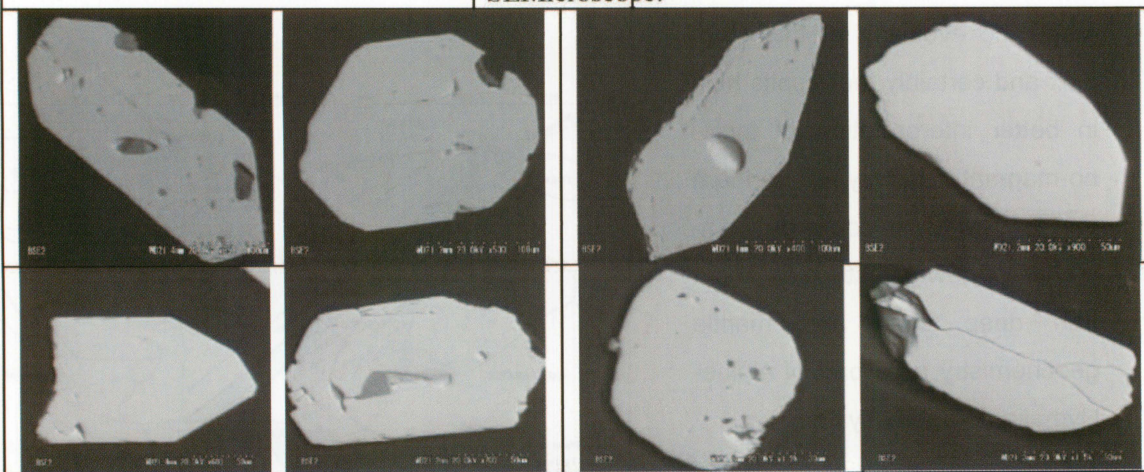

Preparation of The Mount
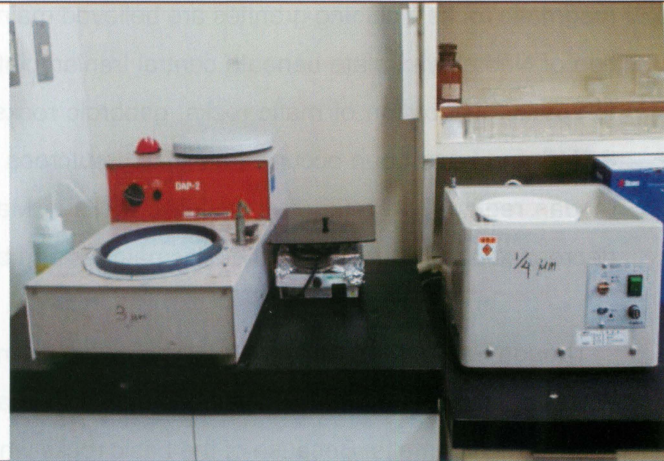
Sample polishing mashin

Carbon coating

BSE images were obtained using a HITACHI S-3000N SEMicroscope.

BSE images

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Research title, the detail and the results:

Malayer plutonic complex located at Sanandaj- Sirjan magmatic and metamorphic belt (SSMB), west of Iran. The belt is Mesozoic- Cenozoic in age and confined towards east and west by Cenozoic Urumieh- Dokhtar magmatic belt and system in part of Alpine-Hymalian orogeny system (Fig. 1). The magmatic rocks including granites are believed mainly to be the magmatic consequence of subduction of Neotethyan plate beneath central Iranian plate in Mesozoic to Cenozoic times. With respect to spatial distribution of mafic rocks, gabbroic rocks decreased from northern to Southern part of SSMB and have been occurred as limited outcrops of gabbroic rocks and mega-enclaves in Hammadan region. The ratio of mafic/felsic rocks in Malayer, Boroujerd and Aligudarz region is more decreased and include gabbro-diotitic patches and basic dykes (Fig. 2).

Though Sanandaj-Sirjan granitic rocks were the main theme of view study, it is not yet clear as to what the source are or which differentiation/ magmatic processes were involved in the evolution of felsic (granitic) melts. Because of the basic rocks which accompany these granitic bodies (i.e. in the form of dykes and small stocks) are largely neglected the main geochemistry and petrology of the basic- intermediate rocks. Moreover we would like to study relation between felsic and basic magmatism and exact age of basic rocks in comparison with felsic in Malayer-Boroujerd plutonic complex (Fig. 3).

There is no any information about Iran deep lithosphere and mantle geochemistry and nature, therefore isotopic study and trace and rare earth element geochemistry of basic rocks could help us to achieve more facts about it. The study of magmatic processes and events in magma chamber scale and evolution history of Iranian near subduction zone magmatic rocks are other prospect of this research. I think our recent studies will affect previous interpretation about geodynamic and magmatic evolution of this complex and certainly the results help in better interpretation of tectono-magmatic history of northern part of SSMB. It could be commence of new investigation about Iran deep crust and mantle geochemistry as a part of Alpine-Hymalian orogeny system.
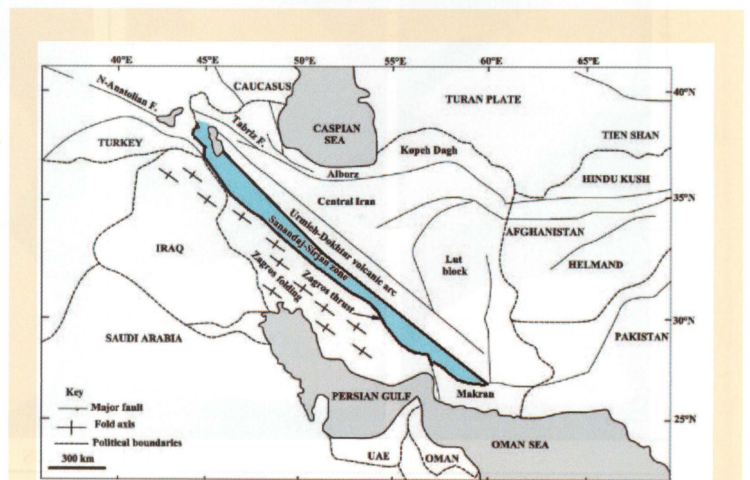
▲Fig. 1. Main structure in Iranian plateau and neighboring country. Zagros orogen: from Arabian plate to Central part of Iran: Zagros folded thrust belt, Sanandaj-Sirjan Zone, Orumieh-Dokhtar Zone and Central Iran.

Fig. 2. Our study area is 8 and 9. Some published paper in these region: 1, Oshnavieh; 2, Naghade-Khal-fe-Pasveh: 3, Piranshahr-Baneh-Saqez-Takab-Miando-ab; 4, Ghorveh; 6, Almogholagh Syenite; 7, Hammadan; 8, Malayer; 9, Boroujerd.

Large Basic dyke
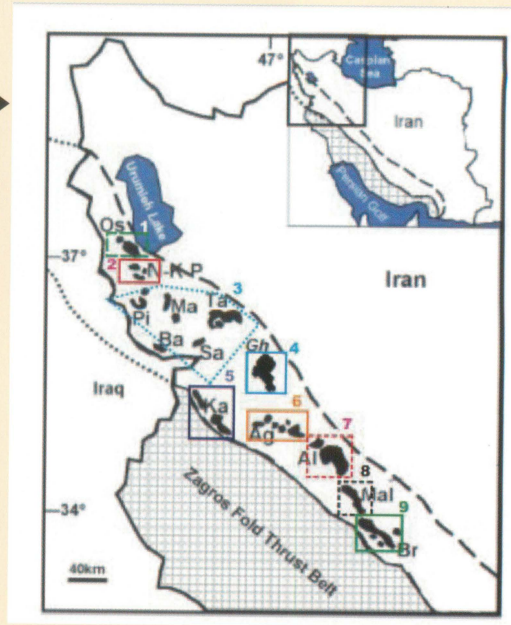
▲Fig. 3. Dyke swarm episode in this region.