

CEPHALOPOD INTERNATIONAL ADVISORY COUNCIL

CONFERENCE 2015
PROGRAM



NOVEMBER 6-14
Hakodate, Japan



CIAC 2015

PROGRAM BOOK

**Cephalopod International Advisory
Council Conference 2015**

平成 27 年
国際頭足類諮問委員会函館会議

Recent Advances in Cephalopod Science



November 6-14, 2015
Hakodate, Japan

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Welcome to the 2015 CIAC Conference

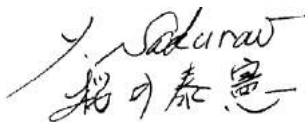


On behalf of the Cephalopod International Advisory Council and Organizing Committee, it is my honor to welcome you to the beautiful and historic city of Hakodate for the 2015 CIAC conference.

The theme for this year's conference - *Recent Advances in Cephalopod Science* – emphasizes the rapid progress and growing interest in the field of cephalopod research. Since the last CIAC meeting held in Japan 24 years ago, CIAC's triennial conferences have become the most important international gathering of cephalopod scientists. This year's program will comprise 106 oral presentations, including an opening talk by Dr. Roger Hanlon and three keynote talks, and more than 150 posters. Registrants will number more than 240 and come from 30 countries.

This year, I also look forward to welcoming a new generation of young scientists. The conference will be a great chance for you to meet and interact with a diverse array of leading scientists and educators. I am confident that your discussions will produce new ideas and point to future discoveries.

Enjoy the conference!

A handwritten signature in black ink, consisting of a stylized cursive name and the Japanese characters '桜井泰憲' (Sakurai Yasunori) written below it.

Yasunori Sakurai, PhD.
CIAC 2015 Conference Chair
Hokkaido University

Welcome from the Mayor of Hakodate



I warmly welcome the many cephalopod scientists from around the world to Hakodate for the 2015 CIAC conference.

Hakodate faces Tsugaru Strait, which connects the Pacific Ocean and Sea of Japan, and Funka Bay, and is blessed with a good harbor. It is also the location of important fisheries for the Japanese flying squid and spear squid, which support many local industries.

The fishery for Japanese flying squid opens every year on June 1, and in August, the city holds its annual summer festival called the *Minato Matsuri*, during which the citizens of Hakodate come together on two nights to perform the famous “squid dance”. Squid are so important to Hakodate that in 1989, they were designated the official “city fish”!

The city recognizes the importance of this gathering of researchers from around the world to discuss, present and exchange academic results. I am pleased that this information will also be shared with our citizens.

The night view from the top of Mount Hakodate is world famous, and the city was recently ranked by international tourists as the best sightseeing destination in Japan. Please be sure to try our fresh seafood and experience our local charm.

Lastly, I thank the organizers and sponsors of the conference, including Hokkaido University.

Mr. Toshiki Kudo
Mayor
City of Hakodate

Welcome from the Hakodate Chamber of Commerce



Hakodate is known in Japan as the "City of Squid". Annual landings total about 25,000 tons and are valued at about 6.5 billion yen (about US\$54 million). The catches support many industries that produce products such as "*saki-ika*" (dried squid), "*shio-kara*" (fermented squid guts pickled in salt), and "*matsumae-zuke*" (a pickled dish native to southern Hokkaido). After processing the shipping value is 50 billion yen (about US\$410 million). For many years, squid has been a traditional delicacy.

CIAC held its third general meeting in 1991 in Shimizu, Japan. Following the meeting, 10 researchers were invited to Hakodate for an international squid forum for local citizens. We are very honored that 24 years later, CIAC has returned to Hakodate for its conference and pleased that four experts will again give lectures to our local citizens.

The Hakodate chamber of commerce supports fisheries and marine products processing industries. Hakodate's "city fish" is squid. And based on the "Hakodate International Fishery and Ocean City Plan", the city is aiming to become an international ocean city.

At this symposium, squid and octopus researchers from 30 countries including the United States and Taiwan will present their research results on a wide range of topics such as classification of a cephalopods, ecology, behavior, occurrence, parasites, reproduction, culture, fishing resources, and stock assessment.

Opportunities for exchange like this are rare. People in industry and local citizens can learn from researchers and use this information to develop their industries and businesses. This will help Hakodate remain the "City of Squid" and become a truly international city.

Mr. Eiichi Matsumoto
President
Hakodate Chamber of Commerce

Organizers and sponsors

Organizers

Conference Chair

Yasunori Sakurai

Conference Vice-Chair

Tsunemi Kubodera

Scientific Committee

Takashi Okutani (Honorary Chair)

Tsunemi Kubodera (Chair)

John Bower

Ian Gleadall

Yuzuru Ikeda

Yoko Iwata

Susumu Segawa

Akihiko Yatsu

Organizing Committee

Yasunori Sakurai (Chair)

Hideaki Kidokoro

Ryuta Nakajima

Mitsuo Sakai

Kotaro Tsuchiya

Toshie Wakabayashi

Jun Yamamoto

Norio Yamashita

Secretariat

John Bower

Dharmamony Vijai

Sponsors

Hakodate Chamber of Commerce

National Cooperative Association of Squid Processors

Hakodate Fisheries Alliance Council

Japan Squid Fisheries Association

Hamade (Towa Denki Co., Ltd.)

Minamikayabe Set-net Fishery Association

Japan Overseas Fishing Association

Research Institute of Marine Invertebrates

Japanese Institute of Fisheries Infrastructure and Communities

City of Hakodate

The Hokusui Society Foundation

Fujiwara, Inc.

Gindako

Hakodate Kankyo Eisei Co., Ltd.

Hanabishi Hotel

Hokkaido Trawl Fisheries Cooperative Federation

Honda Cars – South Hokkaido

Ishio Shokuhin Co., Ltd.

Oshima Fisheries Cooperative Association

Tosho Building Service Co., Ltd.

Federation of Japan Marine Product Processing Industry Cooperatives

Japan Fishing Port Construction Association

Nakamura Fishery Department (Todohokke)

General information

Conference venue:

Hakodate Kokusai Hotel
 5-10 Otemachi, Hakodate
 Phone: +81 (0)138 23 0591
http://www.hakodate-kokusai.jp/index_en.php

Foreign exchange near Hakodate Train Station:

1. Hokuyo Bank, Hakodate Chuo Branch
 Mon-Fri, 0900-1500
 Cash (US\$, CA\$, HK\$, AU\$, NZ\$, EUR, KRW, CNY, CHF, GBP) → Yen
 T/C (US\$, CA\$, AU\$, EUR, CNY, GBP, JPY) → Yen

2. Hakodate Central Post Office
 Mon-Fri, 0900-1600
 Cash (US\$, CA \$, AUS\$, EUR, KRW, CHF, GBP) → Yen

ATMs that accept international cards:

1. Hokkaido Bank/ Jujigai Branch

Mon-Fri, 0900-1500
 Please ask at the counter. You must show your card and passport.

2. Post Office ATM (@ Hakodate Train Station (2nd floor))

Mon-Fri, 0900-1900
 Sat-Sun, 0900-1700
 Cards accepted: Visa, AMEX, Diners Club International, MasterCard, Union Pay, CITIBANK

3. 7-11 convenience stores

Tel: 0120-937-711 (English service, 0800-2100)
 Open: 24 hours
 Cards accepted: Visa, PLUS, AMEX, Diners Club International, MasterCard, Maestro, Cirrus, JCB, Union Pay, DISCOVER
<http://www.sevenbank.co.jp/intlcard/index2.html>

Postal service:

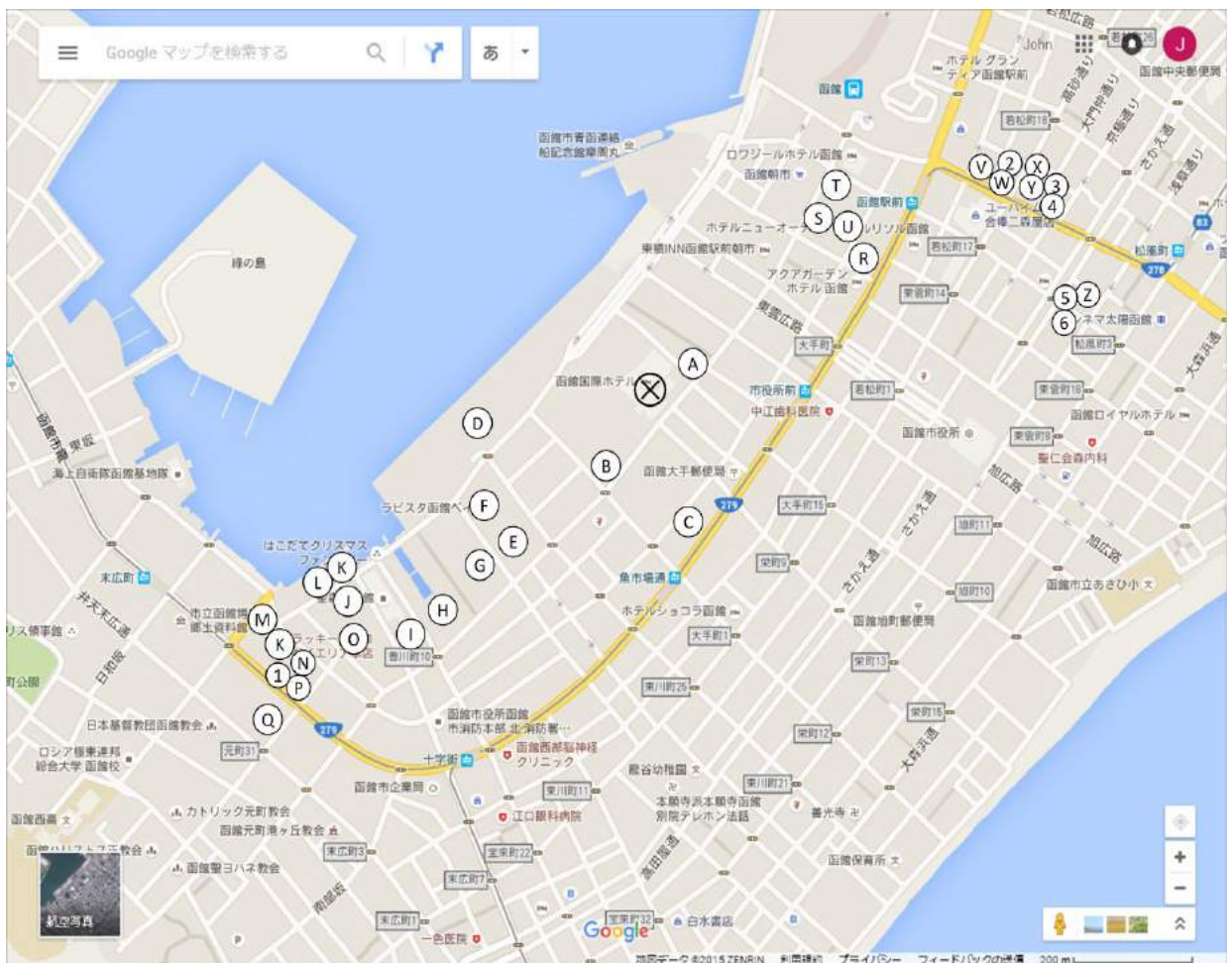
	Monday-Friday	Saturday	Sunday
Central Post Office 1-6 Shinkawa-cho	Open 24 hours	Open 24 hours	Open 24 hours
Ekimae Post Office 7-18 Wakamatsu-cho	0900-1700	Closed	Closed

Restaurants and bars near the Hakodate Kokusai Hotel

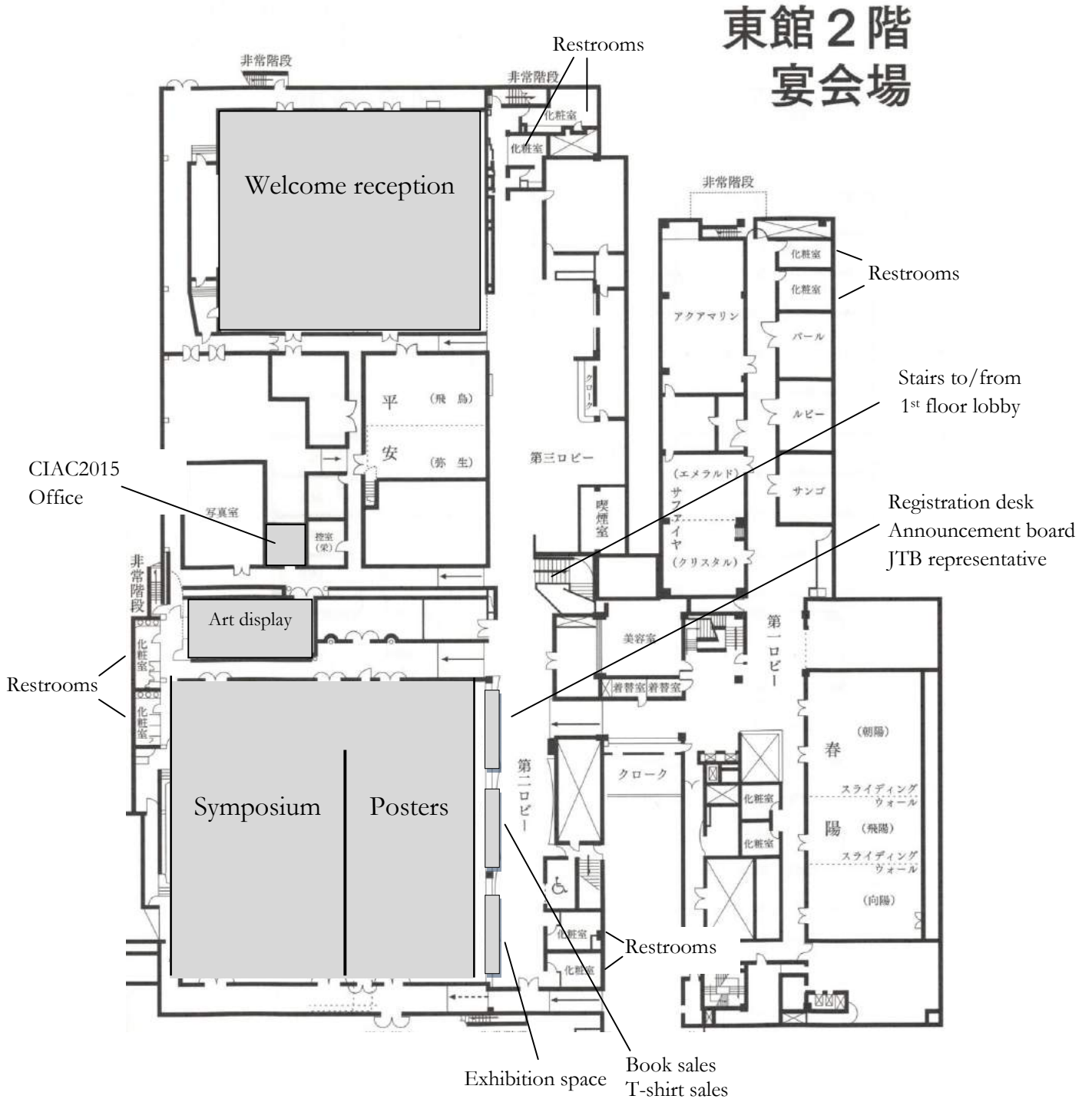
Map ID	Name/Address		Hours	Credit card?	English menu?
⊗	Hakodate Kokusai Hotel 5-10 Otemachi				
Restaurants (Note: Many restaurants stop taking orders 30 minutes before closing.)					
A	Cafe & Deli MARUSEN 5-10 Otemachi	Next door to the venue hotel (50 m away). Take-out available.	0900-1100: Breakfast 1100-1800: Lunch and café (last order 1700)	OK	Yes
B	Hakodate Beer 5-22 Otemachi	Beer hall, continental cuisine	1100-1500, 1700-2200 Closed: Wed	OK	Yes
C	Café Harujon-himejon (Leaves) 3-8 Otemachi	Patisserie and café. Sweets.	1130-2300 Sun: 1130-2100	OK	No
D	Uoichitei 魚いち亭 27-6 Toyokawacho	Cafeteria on second floor of wholesale fish market. Bay view.	0700-1400 Closed: Sun, Wed		
E	Ajisai 12-7 Toyokawacho	Ramen, dumplings	1100-1630 1700-2200	OK	Yes
	Meimeitei 羊羊亭 12-8 Toyokawacho	Yakiniku, grilled mutton	1130-2200	OK	Yes
	Megumi Soup Curry 12-8 Toyokawacho	Soup curry	1130-2200	OK	Yes
	Kikuyo Shokudo 12-9 Toyokawacho	Seafood, seafood rice bowls. Try the <i>kaisendon</i> (海鮮丼), a sashimi rice bowl with salmon roe, scallops, and sea urchin.	1130-1500 1730-2300 Closed: Tue	OK	Yes
	Marukatsu Suisan 12-9 Toyokawacho	Kaiten (conveyor-belt) sushi	1130-1500 1630-2200	OK	Yes
F	Casa de Norte 12-6 Toyokawacho	Seafood, steak, western	1130-1430 1730-2200	OK	No
	Kaifuurou 海風楼 12-6 Toyokawacho	Chinese	1130-1430 1730-2200	OK	No
G	Hakodate marukatsu suisan ikaikatei 函館まるかつ水産いかいか亭 12-12 Toyokawacho	Fresh seafood served morning to night. Seafood rice bowl is popular. Crab.	0730-1030 1130-1500 1630-2030 (last order:2000)	OK	No
H	Minato no Mori みなとの森 11-5 Toyokawacho	Café, some western cuisine, vegetarian friendly	M-F: 1130-2130 S-S: 1100-2130	OK	English menu and some spoken.
I	Italian GoGo 13-20 Suchirocho	Pasta, pizza, dining bar	1200-2300	OK	No
J	Hakodate Beer Hall 函館ビヤホール 14-12 Suchirocho	Beer hall	M-F: 1130 - 2200 S-S: 1100 - 2200	OK	Yes

Map ID	Name/Address		Hours	Credit card?	English menu?
K	Lucky Pierrot (Two shops in Bay Area)	Burgers and curry	Sun-Fri: 1000-0030 Sat: 1000-0130		Some English on menu
L	Starbucks 24-6 Suehirocho		0800-2300		Yes
M	California Baby 23-15 Suehirocho	Café, western food, sandwiches.(famous for “Cisco Rice”)	1100-2300 Closed: Thu	OK	Yes
M	Café & Deli ORIENTAL KITCHEN 23-15 Suehirocho	Noodles, curry. Located behind California Baby.	0930-1030 (Breakfast) 1030-1700 (Lunch) Closed: Wed	No	No
N	Hasegawa Store ハセガワストア 23-5 Suehirocho	Convenience store, bento	0700-2200		
O	La Concha 14-6 Suehirocho	Spanish	Thu-Sat: 1700-2330 Sun: 1700-2300 Closed: Mon	No	Menu in Japanese and Spanish
P	Bon pan ほんぱん 16-1 Suehirocho	Bread shop	0700-1830 Closed: Sun		No
Q	Café Pazar Bazar 17-19 Suehirocho	Café, shish kebab, curry, some vegetarian	1000-1700 Fri-Sat: 1000-2000	No	Yes
R	Seiryukan 7-3 Wakamatsucho	Ramen, rice bowl	1100-1700 Closed: Sun-Mon		Yes
S	Kamome かもめ 8-8 Wakamatsucho	Ramen	0630-1500	No	No (but pictures)
T	GAYA 8-14 Wakamatsucho	Seafood, sushi, izakaya (tavern)	1100-1430 1700-2400	OK	Yes
U	Kurobei くろ兵衛 8-23 Wakamatsucho	Yakitori (grilled chicken), izakaya (tavern)	1700- Closed: Sat-Sun		No
V	Gyosanko 魚さんこ 19-3 Wakamatsucho	Izakaya	1630-0100	OK	Yes
V	Yuumin ゆうみん 19-1 Wakamatsucho	Ramen, dumplings	1100-2300		English drink menu only (friendly staff)
W	Café Evergreen 18-1 Wakamatsucho	Café, western food		OK	Some English on menu
X	Tsugaruya Shokudo 津軽屋食堂 7-6 Matsukazecho	Good, cheap diner	1030-2000 Closed: Thu		No
Y	Daimon Yokocho 7-5 Matsukazecho	26 small ‘retro’ style restaurants and bars. Many kinds of food.	Most open 18:00-23:00 (some stay open later). Three open for lunch.		Most have English menus.
Z	Diner Calamaro 4-5 Matsukazecho	Western (steaks, pizza, pasta)	1730-2400 Closed: Mon	No	No

Map ID	Name/Address		Hours	Credit card?	English menu?
Bars					
1	Yamashita Beer Bar 16-3 Suehirocho	Beer and cocktails	2000-0200 Closed: Sun	No	No
2	Mojito 18-22 Wakamatsucho	Rum bar, large choice of rums and cocktails	1900-0300 Closed: Tue	No	No
3	Sugi no ko 杉の子 8-5 Matsukazecho	Bar	1830-2300 Closed: Sun-Mon	No	
4	Jazz Spot LEAF 8-19 Matsukazecho	Jazz bar	Café time: 1200-2000 Bar time: 1900-2400		
Y	Bar 109 7-5 Matsukazecho	Cozy cocktail bar	1800-0100 (last order: 0000)		No
5	Tsubaki 4-5 Matsukazecho	Nondescript, but open late.	2000-0300	OK	No
6	Bar Jey's 17-11 Shinonomecho	300 types of cocktails	1900-0300	OK	



Map of conference venue
(2nd floor)



Notes

Presentations

To allow the sessions to run smoothly, and in fairness to other speakers, all presentations are expected to adhere strictly to the time allocated. Speakers should designate at least 3 minutes for questions.

Speakers are asked to copy their presentations to the conference laptop well in advance of their talks. The laptop will be equipped with Windows and Microsoft PowerPoint.

Important: Please rename your files: start time-name.ppt (e.g., 0830-Kubodera.ppt)

If complications occur due to incompatibilities between PCs and Macs, Mac owners may use their own laptops to make presentations.

Posters

Posters will be displayed in the room next to the main meeting room. Posters can be affixed anytime after 09:00 on November 10 and will remain on display throughout the meeting. The poster session will be held on November 11 during 1830-2030, when poster presenters are expected to be available to answer questions. Posters must be removed by 13:00 on November 14.

Internet access

Free WiFi access will be available at the workshop and symposium venues.

Social activities

Welcome reception	November 10, 1900-2100
Poster session	November 11, 1830-2030
Excursion	November 12, 1300-1900
Sayonara Party (@ Hanabishi Hotel)	November 13, 1900-2100

Lunch-time video

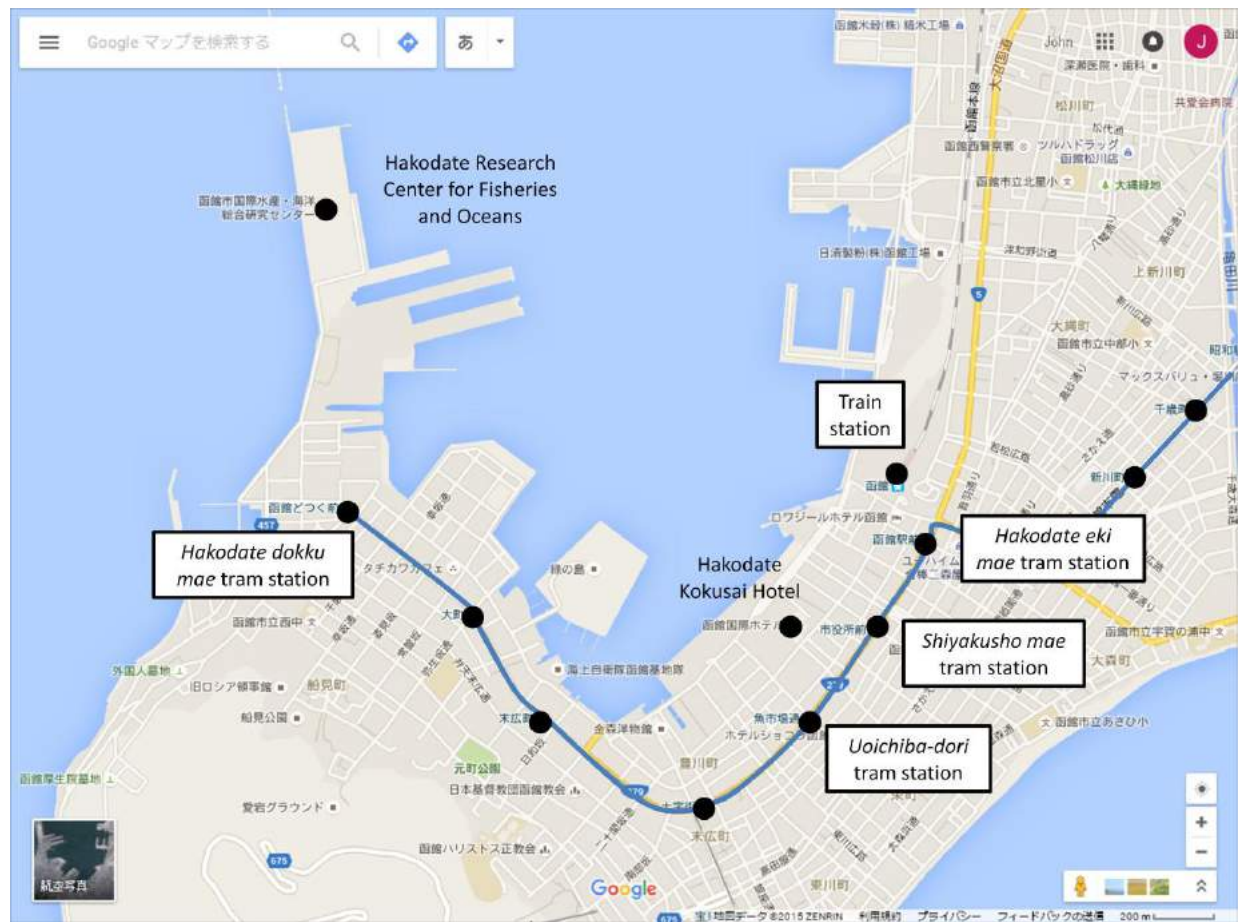
Angel Guerra will show a video titled “*Goods and services of a marine protected area*” on November 10, 11, 13, and 14 during 1300-1340 in the main symposium room.

Conference timetable

Friday, November 6	
0800-1700	Mini-workshop
Saturday, November 7	
0800-1700	Mini-workshop
Sunday, November 8	
0900-1700	Workshops
Monday, November 9	
0900-1700	Workshops
Tuesday, November 10	
0830-0845	Welcome addresses
0845-1630	Session 1: Behavior
1630-1730	Session 2: Biodiversity and conservation
1745-1845	<i>Panel discussion: An oral history of pioneers in cephalopod science: Where did we come from? What are we? Where are we going?</i>
1900-2100	Welcome reception
Wednesday, November 11	
0830-1215	Session 3: Reproduction
1400-1715	Session 4: Genetics and evolution
1730-1830	<i>Panel discussion: Online resources for cephalopod researchers</i>
1830-2000	Poster session
Thursday, November 12	
0830-1145	Session 5: Physiology
1300-1900	Excursion
Friday, November 13	
0830-1130	Session 6: Life history and roles in marine ecosystems
1130-1445	Session 7: Climate change
1445-1830	Session 8: Fisheries, stock assessment and management
Saturday, November 14	
0830-1430	Session 9: Systematics and biogeography
1430-1500	Session 10: Culture and welfare
1500-1545	Workshop summaries
1615-1715	Closing ceremony and presentation of awards
1715-1730	Closing remarks
1900-2100	Sayonara Party

Pre-symposium workshops and mini-workshop

Before the symposium, there will be five workshops (November 8-9) and one mini-workshop (November 6-7). All will be held at the Hakodate Research Center for Fisheries and Oceans. Transportation will be provided between the workshop venue and the Hakodate Kokusai Hotel.



Workshop 1

Artificial fertilization and squid handling

Organizers: Yuzuru Ikeda, Roger Villanueva and Yasunori Sakurai

Since the late Gen Matsumoto first succeeded in keeping spear squid (*Heterololigo bleekeri*) in a closed system in the 1970s, great progress has been achieved in rearing techniques for squids and other cephalopods. One innovative technique is artificial fertilization, which has great potential to contribute to experimental culture and advance research on reproductive biology. In this workshop, we will examine the latest protocol for artificial fertilization using live *Todarodes pacificus* and its applicability to other species. We will also discuss the standard techniques used for cephalopod culture, which include tank and rearing systems, handling, anesthesia, tagging and experimental design for studying behavior. Furthermore, we will discuss and get consensus on how captive cephalopods should be cared for, namely animal welfare. Since this topic is

currently an important issue in zoology as well as the animal industry, we will pay attention on the current animal welfare guidelines, food customs and historical backgrounds of each country.

Workshop 2

Biogeography and phylogeny

Organizers: Ian Gleadall, Jaruwat Nabhitabhata and Rigoberto Rosas Luis

The objectives of this workshop are:

- (1) Assemble datasets for the distribution patterns of the major Recent cephalopod groups, including inspection and analysis of recently acquired data on distribution patterns and ecology to detect further changes that have occurred during the last few years (e.g., as a consequence of global warming and periodic events such as El Niño).
- (2) Categorize characters that have arisen recently (synapomorphic) versus common key (symplesiomorphic) characters.
- (3) Undertake a new, comprehensive inspection (and, subsequently, construction) of cephalopod phylogeny through combined analysis of datasets from various fields.
- (4) Mark the evolutionary trends in the Cephalopoda, based on results of phylogenetic analysis for each major group and interpretation of how these (may) have affected the evolution and success of cephalopods.
- (5) Based on objectives (1)-(4), propose an appropriate taxonomy for cephalopod group names at higher level ranks (between Subclass Coleoidea and the various cephalopod order-group names).

Workshop 3

Novel biomimetic models: materials, soft robots and artificial intelligence

Lead organizer: Letizia Zullo

Co-organizers: Kohei Nakajima and Shuichi Shigeno

The goal of this workshop is to give an overview of recently advanced biomimetic models, design, and any theories or arts inspired by cephalopod molluscs or ceph-like objects. Biomimetics, traditionally an interdisciplinary area of biology and engineering, has been rapidly growing in recent years. Biological phenomena are inspiring innovations to harness unique features of animal sensing, manipulation, locomotion, and intelligence. This workshop illustrates both theoretical and practical artificial/robotic application inspired by cephalopod biology. Through the exploration of the amazing biological characteristics of cephalopods, such as their adaptive coloration, fast swimming, sharp vision, flexible arm movements, and giant brains, we will show the 'Why, What and How' of cephalopod biomimetics.

Workshop 4

Physiology of reproduction

Organizers: Mara Bainy, Yoko Iwata and Natalie Moltschanivskyj

The aim of this workshop is to provide direction for future research on the physiology of reproduction of cephalopods. A key research area for better understanding the dynamics of cephalopod reproduction is the endocrine control of reproduction. On the first day of the workshop, participants will each discuss his or her current research on this topic and the methodologies used, as well as show some results and discuss future prospects. Research areas

to be discussed will include gonadal development, spermatogenesis, oogenesis, signaling pathways, hormone receptors, and others. At the end of the second day, we will discuss submitting a review article using data obtained in the workshop.

Workshop 5

The role of cephalopods in global seafood supply chains

Lead organizer: Mitsuo Sakai

Co-organizers: Katsuhiro Miki, Hideaki Kidokoro and John Bower

This workshop will examine cephalopod supply chains around the world focusing on the links from stocks and fisheries to ports, processors, distributors, marketers and consumers. Special attention will be paid to the role in this chain of small-scale and artisanal fisheries. We will also look at how changing demands are affecting investment in cephalopod fisheries. Participants will assemble data from different countries prior to the workshop, and present and discuss these data at the workshop with the goal of producing a review paper to be published following the conference.

Mini-workshop

A review of the Cephalopoda collections used by Madoka Sasaki

Organizer: Ian Gleadall

Madoka Sasaki (1883-1927) was a prominent Japanese researcher who wrote a monograph in English describing and illustrating many of the Recent cephalopod species of Japanese waters. Unfortunately, he died in his prime, age 44, while he was still in the first year of a 3-year sabbatical in Europe. He had already completed his monograph, sending the final manuscript back to Japan (Hokkaido University, Sapporo) in August, 1927. However, he had no opportunity to label the type specimens of the 33 new species and subspecies that he described in his monograph (based almost entirely on specimens deposited in Japan), so for many years these types went unidentified and were presumed lost. Recently, inspection of specimens in the collections of the museums of Hokkaido and Tokyo universities, along with earlier papers written by Sasaki, have revealed that many of the type specimens are still extant in these collections. In addition, voucher specimens of many of the other species described in Sasaki's monograph are also still extant and mostly in good condition. The objective of this workshop is to facilitate detailed inspection of selected specimens from the Hokkaido and Tokyo University collections to improve our knowledge of the Cephalopoda.

Symposium program

Tuesday, 10 November 2015

- 0830 *Welcome addresses*
- **Louise Allcock**, CIAC President
 - **Yasunori Sakurai**, CIAC 2015 Chair

Session 1: Behavior

Chair: **Clyde Roper**

- 0845 **Roger T. Hanlon**
Cephalopod behavior: Recent advances and future challenges
[Opening talk]
- 0915 **Graziano Fiorito**
Octopus behavioral biology: the last 30 years of research at the Stazione
Zoologica Anton Dohrn
- 0930 **Rui Rosa, Jesse T. Kelly, Mark Norman, Vanessa M. Lopes, José R.
Paula, João Gonçalves and João P. Barreiros**
Hijacking, hitchhiking and burglary behaviors of pelagic octopuses
- 0945 **Benny Hochner, Ana Turchetti Mia, Naama Stern-Mentch, Nir
Nesher and Tal Shomrat**
Conservation and convergence in the neural organization of the cephalopod
learning and memory system
- 1000 **T. Gutnick, B. Hochner and M. J. Kuba**
Facing the challenge, how the octopus can control its flexible arms and use them
to extract sensory information
- 1015 **Toshifumi Wada**
Field observation of mating behavior in *Abdopus* sp. (Cephalopoda:
Octopodidae), and its effect on arm loss
- 1030 ***Coffee/Tea break***

Chair: **Yuzuru Ikeda**

- 1100 **Kelley M. Voss and David Scheel**
Behavior and personality of giant Pacific octopus (*Enteroctopus dofleini*) in
simulated social contexts

- 1115 **Jennifer Mather, Tatiana Leite and David Scheel**
Is prey diversity predicted by diversity of habitat or personality for *Octopus cyanea* in Moorea, French Polynesia?
- 1130 **Stephanie Bush, Chris Payne, Bret Grasse, Alicia Bitondo and Paul Clarkson**
Behavioral ecology, reproductive biology, and public display of an undescribed cirrate octopus from the northeastern Pacific
- 1145 **Jennifer Hofmeister, Kelley Voss and Connor White**
Movement patterns of the California two spot octopus, *Octopus bimaculatus*, using acoustic telemetry
- 1200 ***Announcements & Group photo***
- 1230 ***Lunch***
- Chair: **Jennifer Mather**
- 1400 **Shingo Maegawa, Nobuyuki Ochi and Hiroshi Hosokawa**
Analysis of characteristics of live preys evoking hunting behavior in pygmy squid, *Idiosepius paradoxus*
- 1415 **Noriyosi Sato, Fumio Takeshita, Eiji Fujiwara and Takashi Kasugai**
Use of ink for predation by Japanese pygmy squid (*Idiosepius paradoxus*)
- 1430 **Erik Anderson, Andrew Herbener, Ellen Turner, Abigail Noll, Graham Allen, Philip Graybill and Mark Grosenbaugh (posthumously)**
Time varying friction drag on the swimming squid, *Doryteuthis pealeii*, from flow visualization data
- 1445 **Yuzuru Ikeda**
Cephalopod intelligence, sociality and communication I) Prologue: Social recognition in squid
- Chair: **Graziano Fiorito**
- 1500 **Chikatoshi Sugimoto and Yuzuru Ikeda**
Cephalopod intelligence, sociality and communication II) Social structure and dynamics of the oval squid (*Sepioteuthis lessoniana*) school
- 1515 **Ryuta Nakajima, Kohei Okamoto and Yuzuru Ikeda**
Cephalopod intelligence, sociality and communication VIII) epilogue: How close can I get? Observations of predatory strategies of the pharaoh cuttlefish, *Sepia pharaonis* in captivity

- 1530 *Coffee/Tea break*
- 1600 **Jean Alupay and Khalil Iskarous**
Understanding bending and stiffening properties of the muscular hydrostat using the ‘arm slap’ of octopus, *Abdopus* sp.
- 1615 **Kerry Perkins**
Motion camouflage in relation to varying background and prey in *Sepia officinalis*

Session 2: Biodiversity and conservation

Chair: **Graham Pierce**

- 1630 **Michael Vecchione**
Twelve years of changes to the known cephalopod fauna of the western central Atlantic Ocean
- 1645 **Henk-Jan T. Hoving, Stephanie Czudaj, Heino Fock, Alexandra Lischka and Uwe Piatkowski**
Recent advances on the abundance and diversity of oceanic cephalopods from the eastern tropical Atlantic Ocean
- 1700 **Stefanie Keller, Valerio Bartolino, Manuel Hidalgo, Isabella Bitetto, Loredana Casciaro, Danila Cuccu, Antonio Esteban, Cristina Garcia, Germana Garofalo, Marios Josephides, Angelique Jadaud, Evgenia Lefkadiou, Porzia Maiorano, Chiara Manfredi, Bojan Marceta, Enric Massutí, Reno Micallef, Panagiota Peristeraki, Giulio Relini, Paolo Sartor, Maria Teresa Spedicato, George Tserpes and Antoni Quetglas**
Large-scale spatio-temporal pattern of Mediterranean cephalopod diversity
- 1715 **Gregory Jeff Barord, Frederick Dooley, Andrew Dunstan, Richard Hamilton, Anthony Ilano, Karen Keister, Job Veloso and Peter Ward**
Conservation status of *Nautilus* and *Allonautilus* in the South Pacific Ocean
- 1730 End of session
- 1745 *Panel discussion: An oral history of pioneers in cephalopod science: Where did we come from? What are we? Where are we going?*
Facilitator: Ryuta Nakajima
Panelists: Graziano Fiorito, Roger Hanlon, Tsunemi Kubodera, Jennifer Mather and Mike Vecchione
- 1845 End of symposium Day 1
- 1900-2100 Welcome reception

Wednesday, 11 November 2015

Session 3: Reproduction

Chair: **José E.A.R. Marian**

- 0830 **Natalie Moltschaniwskyj**
Cephalopod reproductive ecology: from individuals to populations
[Keynote talk]
- 0900 **Chingis Nigmatullin**
The phenomenon of monocyclic or semelparous ontogeny in coleoid
cephalopods: terminology, definitions and variety of patterns
- 0915 **Yoko Iwata, Noritaka Hirohashi, Yoshiro Watanabe, Paul Shaw and
Warwick H.H. Sauer**
Strategic sperm release from spermatophores in loliginid squids responding
to sperm competition risk
- 0930 **Noritaka Hirohashi and Yoko Iwata**
Complex adaptive ejaculate traits in relation to alternative reproductive tactics in
Heterololigo bleekeri

Chair: **Alexander Arkhipkin**

- 0945 **Luiza O. Saad, Lígia H. Apostólico and José E. A. R. Marian**
Fertilization mechanisms in the male-dimorphic squid *Doryteuthis plei*
- 1000 **Lígia H. Apostólico and José E. A. R. Marian**
Male dimorphic allometry in the squid *Doryteuthis plei*
- 1015 **Matthew A. Birk and Brad A. Seibel**
Observations of multiple pelagic egg masses from small-sized jumbo squid
(*Dosidicus gigas*) in the Gulf of California
- 1030 ***Coffee/Tea break***
- 1100 **Oscar E. Juárez, Clara E. Galindo-Sánchez, Fernando Díaz, Denisse Re,
Claudia Caamal-Monsreal and Carlos Rosas**
New insights in reproductive regulation of *Octopus maya* inferred by RNA-
Seq analysis of the optic lobe

Chair: **Yoko Iwata**

- 1115 **Joël Henry, Maxime Endress, Valérie Cornet, Benoît Bernay, Bruno Zanuttini, Erwan Corre, Gildas Le Corguillé and Céline Zatylny-Gaudin**
Control of egg-laying in the cuttlefish *Sepia officinalis*: structural and functional characterization of regulatory peptides
- 1130 **Dongming Lin, Xinjun Chen and Yong Chen**
Group-synchronous ovarian development in the Argentine shortfin squid *Illex argentinus* (Cephalopoda: Ommastrephidae)
- 1145 **Alexander Arhipkin**
Hermaphroditism in molluscs with the first case of finding a hermaphrodite specimen in cephalopods
- 1200 **Valérie Cornet, Joël Henry, Gildas Le Corguillé, Benoit Bernay, Erwan Corre and Céline Zatylny-Gaudin**
Characterisation of a new family of egg case proteins in the cuttlefish: SepiaECPs
- 1215 ***Announcements***
- 1230 ***Lunch***

Session 4: Genetics and evolution

Chair: **Ian Gleadall**

- 1400 **Dirk Fuchs and Yasuhiro Iba**
Coleoid gladiuses - homologues or homoplasies?
- 1415 **Brooke Whitelaw, Ira R. Cooke, Pierre Faou, Rute R. da Fonseca, Nathan Hall and J.M. Strugnell**
Deciphering the venom proteome of the Southern blue ring octopus (*Hapalochlaena maculosa*) and the southern sand octopus (*Octopus kaurma*)
- 1430 **O. Simakov, C.B. Albertin, T. Mitros, Y.Z. Wang, J.R. Pungor, S. Brenner, C.W. Ragsdale and D.S. Rokhsar**
Cephalopods and the evolution of metazoan genome architecture
- 1445 **Davin H.E. Setiamarga and Kazuyoshi Endo**
Transcriptome and proteome analyses of the nautilus' shell matrix proteins: Insights into their evolution in Mollusks

Chair: **Dirk Fuchs**

- 1500 **Caroline B. Albertin and Clifton W. Ragsdale**
Insights from the transcriptome into the embryonic development of *Octopus bimaculoides*
- 1515 **Samantha H. Cheng and Paul H. Barber**
Genome-wide single nucleotide polymorphisms reveal patterns of population structure in two widely co-occurring cryptic lineages of reef squid
- 1530 ***Coffee/Tea break***
- 1600 **Carlo Di Cristo, Giovanna Ponte and Graziano Fiorito**
Octopus vulgaris genome survey
- 1615 **Alvaro Roura, Steve Doyle, Nathan Hall, Angel Guerra, Angel F. Gonzalez and Jan Strugnell**
The planktonic stage of *Octopus vulgaris* paralarvae in the Canary current Eastern boundary upwelling ecosystem: distribution, dispersal and diet

Chair: **Jan Strugnell**

- 1630 **Gustavo Sanchez, Satoshi Tomano, Tetsuya Umino, Toshie Wakabayashi and Mitsuo Sakai**
Evaluation of the 5' end of the 16S rRNA gene as a novel DNA barcode marker for the Cephalopoda
- 1645 **Bronwyn Gillanders, Steven Myers, Stephen Donnellan, Damien Fordham, Thomas Prowse, Michael Steer and Skye Woodcock**
Population structure and geographic boundary of the Upper Spencer Gulf giant Australian cuttlefish
- 1700 **A. Ogura, S. Shigeno and M. Yoshida**
The genome and transcriptome of *Idiosepius paradoxus*
- 1715 End of plenary sessions, Day 2
- 1730 *Panel discussion:* Online resources for cephalopod researchers
Panelists: **Roger Hanlon, Hassan Moustafid and Mike Vecchione**
- 1830 ***Poster session***
- 2030 End of Symposium Day 2

Thursday, 12 November 2015

Chair: **Rui Rosa**

- 0830 **Tsunemi Kubodera**
Sperm whales and large mesopelagic squids – a talk in memory of Malcolm R. Clarke
[Keynote talk]

Session 5: Physiology

- 0900 **Shuichi Shigeno, Caroline B. Albertin, Rahul Parnaik and Clifton W. Ragsdale**
How the brain represents the body: neural circuitry and transcription factor codes in octopus
- 0915 **Céline Zatylny-Gaudin, Valérie Cornet, Gildas Le Corguille, Erwan Corre and Joël Henry**
Cuttlefish venomics: The multiple roles of posterior salivary glands in *Sepia officinalis*
- 0930 **Tsung-Han Liu, Chun-Yen Lin and Chuan-Chin Chiao**
Body pattern control in the optic lobe of oval squids *Sepioteuthis lessoniana*
- 0945 **Katina Roumbedakis, Marina Nunes Alexandre, José Alfredo Puch, Claudia Caamal-Monsreal, Ariadna Sánchez, Maite Mascaro, Maurício Laterça Martins and Carlos Rosas**
Short and long-term effects of anesthesia in *Octopus maya* (Cephalopoda: Octopodidae): Oxygen consumption, growth rate and hemolymph parameters
- 1000 **Natalie Moltschaniwskyj, Madeline Felton, and Joseph Bidwell**
Establishing a link between personality and resting metabolic rates in the dumpling squid, *Euprymna tasmanica*

Chair: **Shuichi Shigeno**

- 1015 **Yung-Che Tseng, Marian Y. Hu, Yu-Chi Chen, Po-Hsuan Sung and Jay-Ron Lee**
Recent advances in exploring of trans-epithelial proton and ammonia transport pathways in cephalopods
- 1030 **Yu-Chi Chen, Pei-Hsuan Chou, Jay-Ron Lee and Yung-Che Tseng**
Exploring neurohypophysial septatocin functions in cuttlefish epithelium

- 1045 **Laurence Murillo, Thomas Lacoue-Labarthe, Richard Cosson, Karine Churlaud, Maud Brault-Favrou and Paco Bustamante**
Oxidative stress in coastal and oceanic cephalopod from the Bay of Biscay in relation to their metal accumulation and detoxication capacities
- 1100 **Z. Yan Wang, Judit R Pungor, Caroline B. Albertin and Clifton W. Ragsdale**
A Next-Generation approach to profiling the *Octopus bimaculoides* optic gland
- 1115 **Marta Solé, Marc Lenoir, Mercè Durfort, Manel López-Bejar, Antoni Lombarte and Michel André**
Statocyst sensory epithelia ultrastructural analysis of cephalopods exposed to noise
- 1130 **Daohai Chen, Qiuling Zheng, Jing Wen, Yulin Sun, Juan Zhao and Wei Zhang**
Preliminary study of cuttlefish seedlings (*Sepia lycidas* and *Sepia pharaonis*) cultivation technology in China
[Early presentation from the “Culture and welfare” session]
- 1300 Excursion departure
- 1330 Public lectures for citizens of Hakodate
 - **Yasunori Sakurai**
 - **Michael Vecchione**
 - **Roger T. Hanlon**
 - **Ryuta Nakajima**

Friday, 13 November 2015

Session 6: Life history and roles in marine ecosystems

Chair: **Angel Guerra**

- 0830 **Erica Vidal**
Early life-history of cephalopods: an ecological perspective on critical events
[Keynote talk]
- 0900 **M.R. Lipinski**
How to measure ecological importance in the marine systems (example: cephalopods)
- 0915 **Rita Melo Franco-Santos and Erica A.G. Vidal**
Tied hands: synchronism between beak development and feeding-related morphological changes in *Illex argentinus* paralarvae

0930 **Zhou Fang, Katherine Thompson, Jin Yue, Xinjun Chen and Yong Chen**
Ontogenetic and stock variation of beak stable isotopes $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ of
neon flying squid *Ommastrephes bartramii* (Cephalopoda: Oegopsida) in the
North Pacific Ocean

0945 **Pandey Puneeta, Dharmamony Vijai, Hae-Kyun Yoo, Hajime Matsui
and Yasunori Sakurai**
Observations on the spawning behavior, egg masses and hatchlings of the
Japanese flying squid *Todarodes pacificus* in a mesocosm tank

Chair: **João Pereira**

1000 **Amanda Beasley, Anna Scott, Peter Harrison and Karina Hall**
Exploring methods to directly age cuttlefish via statolith increments

1015 **Tadanori Yamaguchi, Yuji Kawakami and Michiya Matsuyama**
Hatching sites and migratory routes of the swordtip squid *Uroteuthis edulis*
inferred from statolith analysis

1030 *Coffee/Tea break*

1100 **Charuay Sukhsangchan, Paphassawan Sunthornket and Sonthaya
Phuynoi**
Morphological characteristics of paralarvae of cephalopods found in Thai waters

1115 **Toshiro Saruwatari, Takashi Yanagimoto, Koji Matsuzaki and Makoto
Kuraishi**
A preliminary study on life history of Opisthoteuthid octopuses in Suruga Bay,
Japan

Session 7: Climate change

Chair: **Warwick Sauer**

1130 **Zoë Doubleday, Thomas Prowse, Alexander Arkhipkin, Graham Pierce,
Jayson Semmens, Michael Steer, Stephen Loporati, Sílvia Lourenço,
Antoni Quetglas, Warwick Sauer and Bronwyn Gillanders**
Ocean warming, altered food webs and the global proliferation of cephalopods?

1145 **Alexey V. Golikov, Rushan M. Sabirov, Pavel A. Lubin, Denis V.
Zakharov, Lis L. Jørgensen and Martin E. Blicher**
Recent cephalopod fauna of the western part of the Arctic under the pressure
of ongoing climate changes

1200 **Casey Zakroff, T. Aran Mooney and Colin Wirth**
Swimming behavior of paralarval squid, *Doryteuthis pealeii*, raised under ocean
acidification recorded with a novel 3D tracking system

1215 **Miguel Baptista, Vanessa M. Lopes, José R. Paula, Tiago Repolho and Rui Rosa**
Combined effects of ocean acidification and warming in the early ontogeny of the common octopus (*Octopus vulgaris*)

1230 ***Lunch***

Chair: **Bronwyn Gillanders**

1400 **J.M.W Githaiga-Mwicigi and D. Yemane**
The South African 'chokka' squid (*Loligo reynaudi*): which environmental variables are important under a changing climate?

1415 **Michael Navarro, P. Ed Parnell, Lisa Levin and Corey Garza**
Essential embryo habitat of the market squid, *Doryteuthis opalescens*, including the first direct and continuous measurements of pH and O₂

1430 **Masayuki Sawamura**
A hypothetical model of the effect of changing sea temperature on the migration of the Japanese flying squid *Todarodes pacificus*

Session 8: Fisheries, stock assessment and management

Chair: **Teresa Borges**

1445 **Graham J. Pierce, L.C. Hastie, Vasilis Valavanis, Colin D. MacLeod Jonathon Plotner, Beatriz A. Roel, Jim Ellis, Finlay Burns, M. Begoña Santos and Simon Greenstreet**
Distribution and abundance of cephalopods in UK waters: long-term trends and environmental relationships

1500 **Franck Malhomme, Edouard Duhem, Zoé Porcher, Ignacio Sobrino and Jean-Paul Robin**
English Channel loliginid squid stocks: surplus production models used to estimate population biomass and stock status in a context of variable environment

1515 **Karina C. Hall and Karen L. Astles**
Ecological risk assessment methods relevant to cephalopods taken as byproduct in multi-species fisheries in New South Wales, Australia

1530 **Owen C. Nichols, Jeremy R. King, Jonathan A. Hare and Steven X. Cadrin**
Environmental effects on squid availability to a seasonal inshore fishery: Untangling drivers, mechanisms and scales

1545 **Hiromichi Igarashi, Yoichi Ishikawa, Tsuyoshi Wakamatsu, Yusuke Tanaka, Masafumi Kamachi, Norihisa Usui, Mitsuo Sakai, Sei-ichi Saitoh and Yutaka Imamura**
Operational prediction of the habitat suitability index (HSI) distribution for neon flying squid in central North Pacific by 4D-VAR ocean data assimilation system “SKUIDS”

1600 *Coffee/Tea break*

Chair: **Michael Seki**

1630 **K.S. Mohamed, K.K. Sajikumar, N. Ragesh, T.V. Ambrose, J. Jayasankar, K.P. Said Koya and Geetha Sasikumar**
Relating purpleback flying squid (*Sthenoteuthis oualaniensis*) abundance to environmental parameters using GIS and GAM in South eastern Arabian Sea

1645 **Rafael Schroeder, Richard Schwarz and Augusto César Crespi-Abril**
Morphology and life history strategies of *Illex argentinus* in the north extreme of species distribution

1700 **Angel Guerra, Jorge Hernández-Urcera, Manuel E. Garci, Marta Sestelo, Marcos Regueira, Ángel F. González, Miguel Cabanellas-Reboredo, Matías Calvo-Manazza and Beatriz Morales-Nin**
Habitat selection by *Octopus vulgaris* in the Cíes Islands archipelago (NW Spain)

1715 **Kazuhiro Sadayasu, Minato Taniguchi, Kousuke Takahashi and Hideyuki Yamashita**
Acoustical quantitative estimation of the Japanese common squid *Todarodes pacificus* distribution in a jigging fishery using LED panels and metal-halide lamps

Chair: **Mitsuo Sakai**

1730 **Go Takayama, Takafumi Shikata, Hiroshi Inada, Yasunori Sakurai and Takafumi Arimoto**
A hypothesis of fishing lights function in capture process of squid jigging fisheries targeting Japanese flying squid *Todarodes pacificus*

1745 **Catalina Perales-Raya, Aurora Bartolomé, Elena Baldascino and Graziano Fiorito**
Stress marks of two fishing methods in octopus beaks

1800 **João Pereira, Graziano Fiorito and Giovanna Ponte**
Can those easy killed octopus die easy in Portuguese and Italian fisheries? - Ways to die and numbers killed in small scale fisheries in both countries

- 1815 **Ángel F. González, Lorena Olmos-Pérez, Álvaro Roura and Ángel Guerra**
Re-evaluating the ecological status of squid paralarvae by molecular tools in a seasonal upwelling system
- 1830 End of Symposium Day 4

Saturday, 14 November 2015

Session 9: Systematics and biogeography

Chair: **C.C. Lu**

- 0830 **Kat Bolstad**
Taxonomists' work is never done: Updates in oegopsid systematics and zoogeography from New Zealand
- 0845 **Roger Villanueva, Érica A.G. Vidal and Fernando A. Fernández-Álvarez**
Early mode of life and hatchling size in cephalopods: influence on the species distributional ranges
- 0900 **Giambattista Bello**
Biogeography of the Sepiolinae (Cephalopoda: Sepiolidae)
- 0915 **José C. Xavier, Ben Raymond, Huw Griffiths, David Thompson and Yves Cherel**
Cephalopod fauna of Antarctic waters: combining new information from predators, nets and habitat suitability prediction models

Chair: **Tsunemi Kubodera**

- 0930 **Amanda Reid and Jan Strugnell**
A review of pygmy squid, *Idiosepius* (Cephalopoda: Idiosepiidae), with descriptions of a new species, and placement of southern Australian endemic *I. notooides* in a new genus
- 0945 **Surangkana Tuanapaya and Jaruwat Nabhitabhata**
Morphometry and morphological phylogeny of *Sepia pharaonis* Ehrenberg, 1831 complex (Cephalopoda: Sepiida) in Thai Waters
- 1000 **Jaruwat Nabhitabhata and Surangkana Tuanapaya**
Allopatric variation of *Sepia pharaonis* Ehrenberg, 1831 complex (Cephalopoda: Sepiida) in two oceans of Thai waters based on morphology and mitochondrial DNA sequences

- 1015 **A. Lischka, U. Piatkowski and R. Hanel**
Cephalopods of the Sargasso Sea: distribution patterns in relation to hydrographic conditions
- 1030 ***Coffee/Tea break***
- Chair: **Uwe Piatkowski**
- 1100 **Kittichai Tongtherm, Jaruwat Nabhitabhata and Paladej Srisuk**
New records and undescribed taxa of Triassic ammonoid *Eutomoceras* (Ammonoidea: Ceratitida: Ceratitidae) and belemnoid cephalopods
- 1115 **Jürgen Guerrero-Kommritz**
Shallow water octopuses of the southern Caribbean, Tayrona sector
- 1130 **Heather Judkins and Michael Vecchione**
What have we learned about the cephalopod fauna of the Gulf of Mexico? Initial results of the NOAA Offshore Nekton Sampling and Analysis Program
- 1145 **Aaron Boyd Evans and Kathrin Bolstad**
Recent advances in the family Cranchiidae from New Zealand and adjacent waters
- Chair: **Kotaro Tsuchiya**
- 1200 **Fernando Ángel Fernández-Álvarez, Pilar Sánchez, Elisabeth Cuesta-Torralvo, Alejandro Escánez, Catarina P. P. Martins, Erica A. G. Vidal and Roger Villanueva**
The genus *Ommastrephes* d'Orbigny, 1834: a single species or more than one hidden behind a single name?
- 1215 **Yuko Takigawa and Tetsuo Yoshino**
Japanese source materials and knowledge used by Férussac & d'Orbigny to describe Japanese cephalopods in the 19th century
- 1230 ***Lunch***
- 1400 **Heather E. Braid and Kathrin S.R. Bolstad**
Systematics of the whip-lash squid (Cephalopoda: Mastigoteuthidae)
- 1415 **Jesse Tyler Kelly**
Systematics of the Octopoteuthidae Berry, 1912 (Cephalopoda: Oegopsida)

Session 10: Culture and welfare

Chair: **Roger Villaneuva**

- 1430 **Ian G. Gleadall, Goh Nishitani, Masami Abe, Keiji Matsubara, Shunzo Morii, Nobuhiko Akiyama, Kinuko Ito, Leo J. Che and Masazumi Nishikawa**
Recent progress in culturing the East Asian common octopus
- 1445 **Giovanna Ponte, Graziano Fiorito, João Pereira and Daniel Osorio**
The COST Action FA1301: A network for improvement of cephalopod welfare and husbandry in research, aquaculture and fisheries – CephInAction
- 1500 Workshop summaries
- 1545 ***Coffee/Tea break***
- 1615 Closing ceremony
- 1715 Closing remarks
 ➤ **Takashi Okutani**
 ➤ **Kiyohiro Ishio** (Vice-President, Hakodate Chamber of Commerce)
- 1735 End of Symposium
- 1830 Buses depart for Sayonara Party at the Hanabishi Hotel

Posters

Session: Behavior

- P1 **Toru Ao and Yuzuru Ikeda**
Cephalopod intelligence, sociality and communication III) Individual recognition and sympathy in oval squid (*Sepioteuthis lessoniana*)
- P2 **Graziano Fiorito, Piero Amodio, Ilaria Zarrella and Giovanna Ponte**
Being influenced from, and learning by conspecifics: the case of cephalopods
- P3 **Yuki Yonezawa, Chikatoshi Sugimoto, Tetsuya Umino and Yuzuru Ikeda**
Ontogeny of schooling behavior in the squid *Sepioteuthis lessoniana* (Kuwa-ika type)
- P4 **Sumire Kawashima, Saki Yoshikawa, Kaishu Takei, Haruhiko Yasumuro and Yuzuru Ikeda**
Cephalopod intelligence, sociality and communication VII) Operant conditioning in tropical octopus (*Abdopus aculeatus*)
- P5 **Masaki Kitaoka and John R. Bower**
Prey selection and handling in North Pacific giant octopus (*Enteroctopus dofleini*) from Hokkaido
- P6 **Yi-Hsin Lee, Wen-Sung Chung and Justin Marshall**
Complex visual ecology of the southern pygmy squid - good eyesight for docking, poor eyesight for hunting
- P7 **Chun-Yen Lin and Chuan-Chin Chiao**
Ethogram of reproductive body patterns in the oval squid *Sepioteuthis lessoniana* (Cephalopoda: Teuthida) from northeastern Taiwan
- P8 **Hajime Matsui, Go Takayama, Kazuhito Kashiwaya, Hisashi Kaga and Yasunori Sakurai**
Behavior of Japanese flying squid *Todarodes pacificus* to Light Emitting Plasma illumination
- P9 **Hajime Matsui, Go Takayama, Kazuhito Kashiwaya, Hisashi Kaga and Yasunori Sakurai**
Behavioral response of spear squid *Heterololigo bleekeri* to fishing light
- P10 **Ryuta Nakajima, Kohei Okamoto and Yuzuru Ikeda**
An ethogram of chromatic, postural and locomotor behaviors of the pharaoh cuttlefish, *Sepia pharaonis* from Okinawa Island, Ryukyu Archipelago, Japan
- P11 **Kazuya Narushima and Yuzuru Ikeda**
Cephalopod intelligence, sociality and communication IV) Group dynamics of cuttlefish (*Sepia pharaonis*)

- P12 **Takahiro Nishibayashi, Janine Graman, Yuzuru Ikeda, Michael Kuba and Tamar Gutnick**
Testing personality in cuttlefish (*Sepia officinalis*)
- P13 **Sarah Natasha de Mendonça and Ron O'Dor**
Analysis of *Sthenoteuthis oualaniensis* flying behaviour from recorded video
- P14 **Kohei Okamoto, Akira Mori and Yuzuru Ikeda**
Cephalopod intelligence, sociality and communication VI) Gradual exhibition of the defensive body patterns in cuttlefish (*Sepia pharaonis*), inferred by model and animated predators
- P15 **Kohei Okamoto, Akira Mori and Yuzuru Ikeda**
Individual identification using body pattern in cuttlefish (*Sepia pharaonis*)
- P16 **Vanessa M. Lopes, José R. Paula, Matilde Costa and Rui Rosa**
Behavioural patterns of recently settled octopuses under climate change
- P17 **Dharmamony Vijai, Pandey Puneeta, Hajime Matsui, Misaki Morooka and Yasunori Sakurai**
The hunting efficiency of Japanese flying squid affects their prey's schooling behavior
- P18 **Minoru Sano, Tadao Bando and Kazushi Miyashita**
Effect of water temperature on seasonal migration of North Pacific giant octopus *Enteroctopus dofleini* in Soya/La Pérouse Strait
- P19 **Chikatoshi Sugimoto, Miho Inoue-Murayama and Yuzuru Ikeda**
Genetic background for sociality of the oval squid (*Sepioteuthis lessoniana*)
- P20 **Chikatoshi Sugimoto, Shuhan Lei, Toru Ao, Xiumei Zhang and Yuzuru Ikeda**
Ontogeny of visual ability in the oval squid (*Sepioteuthis lessoniana*)
- P21 **Dharmamony Vijai, Pandey Puneeta and Yasunori Sakurai**
Head withdrawal reflex in squid paralarvae: A review and appraisal
- P22 **Kosuke Nagano, Dharmamony Vijai, Jun Yamamoto and Yasunori Sakurai**
Movement patterns of giant Pacific octopus *Enteroctopus dofleini* in a shallow coast
- P23 **Tsang-I Yang and Chuan-Chin Chiao**
Number sense and prey capture strategy in pharaoh cuttlefish *Sepia pharaonis* (Cephalopoda: Sepiida)
- P24 **Haruhiko Yasumuro and Yuzuru Ikeda**
Cephalopod intelligence, sociality and communication V) Effect of environmental enrichment in the behavior of cuttlefish *Sepia pharaonis*

- P25 **Sho Abe, Haruhiko Yasumuro and Yuzuru Ikeda**
Ontogeny of learning and memory in the cuttlefish *Sepia pharaonis*

Session: Biodiversity and conservation

- P26 **Gillian Allen, Jasmine Headlam, Morag Taite, Iain Barrett, Gillian Lyons and Louise Allcock**
IUCN red list assessment of the conservation status of cephalopod species
- P27 **Zih-Heng You, Jing-Yu Chen and Chih-Shin Chen**
Seasonal variation in species composition of cuttlefish in Yilan Bay, northeast Taiwan
- P28 **Chuan-Wen Ho, Hsing-Juh Lin and Chung-Cheng Lu**
A new octopus species, *Octopus longitubus* (Cephalopoda: Octopodidae) from Taiwan
- P29 **Elizabeth Shea, Heather Judkins, Michelle D. Staudinger, Valerie Hartigan, Annie Lindgren and Michael Vecchione**
Cephalopod biodiversity in the vicinity of Bear Seamount, western North Atlantic
- P30 **Rui Rosa, Carlos Vale and Joana Raimundo**
Trace element concentrations in the top predator jumbo squid (*Dosidicus gigas*) from the Gulf of California
- P31 **Inês C. Rosa, Vanessa M. Lopes, Joana Raimundo, Ana Couto, Catarina Santos, Rui Cereja, Ricardo Calado, Miguel Caetano and Rui Rosa**
Cuttlefish capsule: An effective shield against contaminants in the wild
- P32 **J. Granados-Amores, M.D. Montoya-Campos, F. Manini-Ramos, C.A. Salinas-Mayoral, A. Mejía-Rebollo, M.V. Morales-Zárte and C. A. Salinas-Zavala**
Taxonomic list of species of cephalopods in the Tamaulipas coast in the Gulf of Mexico, Mexico

Session: Climate change

- P33 **Matthew A. Birk, Erin L. McLean and Brad A. Seibel**
Effects of increased CO₂ on squid metabolism and hypoxia tolerance
- P34 **Ariadna Sanchez, Fernando Díaz, Gabriela Rodríguez-Fuentes, Karen Ortega, Maite Mascaró, Stephanie Bernal, Estefany López, Claudia Caamal-Monsreal, Clara Galindo, Oscar Juárez, Denisse Re and Carlos Rosas**
Embryonic development of tropical octopus (*Octopus maya*) under ocean warming

- P35 **Ying-Jey Guh, Marian Y. Hu, Jay-Ron Lee, Yu-Chi Chen, Po-Hsuan Sung, Chang-Jen Huang and Yung-Che Tseng**
Functional evolution of branchial acid-base regulation in squid (*Sepioteuthis lessoniana*) for sensitivity in times of CO₂-induced seawater acidification
- P36 **Hideaki Kidokoro, Yousuke Igeta, Sachiko Abe, Hideo Takahara and Tatsuro Watanabe**
Impact of climate change on the distribution and the site of fishing ground of the Japanese common squid *Todarodes pacificus* in the Sea of Japan
- P37 **Vanessa M. Lopes, Filipa Faleiro, Miguel Baptista, Marta S. Pimentel, José R. Paula, Ana Couto, Narcisa Bandarra, Patrícia Anacleto, António Marques and Rui Rosa**
Amino and fatty acid dynamics of octopus (*Octopus vulgaris*) early life stages under ocean warming
- P38 **Vanessa M. Lopes, Ana R. Lopes, Matilde Costa, José R. Paula and Rui Rosa**
Physiology of recently-settled octopuses in a changing ocean
- P39 **Nobuaki Nanjo and Akira Kozuka**
Relationship between regime shifts and the spawning pattern of *Watasenia scintillans* (Cephalopoda: Oegopsida), southwestern Sea of Japan
- P40 **Geetha Sasikumar, K. S. Mohamed, K. G. Mini and K. K. Sajikumar**
Temperature as a plausible determinant of variability in Indian squid, *Uroteuthis (Photololigo) duvaucelii* stocks
- P41 **Wei Yu, Qian Yi, Xinjun Chen and Yong Chen**
Variability of habitat suitability of jumbo flying squid (*Dosidicus gigas*) in the Southeast Pacific Ocean off Peru in relation to climate change

Session: Culture and Welfare

- P42 **Graziano Fiorito**
Guidelines for the Care and Welfare of Cephalopods in Research: A consensus based on an initiative by CephRes, FELASA and the Boyd Group
- P43 **Rita Melo Franco-Santos, Catalina Perales-Raya, Eduardo Almansa, Marleen De Troch and Diego Garrido**
Beak microstructure analysis as a tool to identify potential rearing stress for *Octopus vulgaris* paralarvae

- P44 **Diego Garrido, Juan Carlos Navarro, Catalina Perales-Raya, Manuel Nande, Virginia Martín, José Iglesias, Aurora Bartolomé, Alvaro Roura, Inmaculada Varó, Juan José Otero, Angel González, Covadonga Rodríguez and Eduardo Almansa**
Fatty acids composition and age estimation of wild *Octopus vulgaris* paralarvae
- P45 **Alvaro Roura, Steve Doyle, Nathan Hall and Jan Strugnell**
Intestinal flora of wild *Octopus vulgaris* paralarvae and their zooplankton prey: a metagenomic search of “probiotics” for use in aquaculture
- P46 **Xiaodong Zheng, Yongsheng Liu, Xiangzhi Lin, Jianming Yang, Yaosen Qian, Peiliang Wang, Zhaosheng Liu and Qikang Bo**
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