# 第四届国际鲎科学与保护研讨会

The 4th International Workshop on the Science and Conservation of Horseshoe Crabs

科学/保护/公众教育

Integrating Science, Conservation & Education



# 会议指南 Workshop Program

中国·钦州&北海 Qinzhou & Beihai, Guangxi, China

> 2019年 6月15日-20日 June 15th-20th 2019

### 尊敬的各位参会代表:

欢迎来到美丽的广西参加第四届国际鲎科学与保护研讨会!本次会议在广西两个城市举办,为方便您在参会期间的活动,请认真阅读本会议指南。

一些快速的指引和简单的注意事项如下:

# 注意事项

- 1 会议按照日程进行,如有临时变动,会议组织方会在会场和参会微信群通知大家。
- 2 当地天气: 广西地区夏季阳光猛烈, 六月的平均气温为27-33摄氏度, 偶有阵雨, 建议随身携带雨具, 以备不时之需。
- 3 着装建议:会场内休闲着装,户外考察请穿着可防晒及防蚊虫的服装,并注意携带雨具。
- **4** 接送机: 14-15号, 会议组织方会安排车辆在南宁机场接机到住宿酒店; 20号晚上和 21号早上, 会集中安排车辆送机到南宁机场。
- 5 会议期间,请注意会场秩序,将手机调为静音状态。
- **6** 钦州的酒店请于6月18日8:00前退房,并将行李带到会场;北海酒店的退房时间为中午12:00,请根据日程安排,提前办理退房手续。
- 7 如有需要协助之处,可以请会场着志愿者服装和挂牌的工作人员帮助解决;也可以联系会务组: 秘书长 关杰耀博士,国际事务,邮箱:kityuekwan@bbgu.edu.cn, 手机号码:+86 15307779400 副秘书长 林吴颖女士,国内事务,邮箱:linwuying@gxbrc.org, 手机号码:+86 15277004655 秘书处成员 肖晓波女士女士,国内事务,邮箱:xiaoxiaobo@gxbrc.org, 手机号码:+86 13687796401
- 8 会议网址(中文):http://www.gxbrc.org/horseshoecrab2019/index.jsp

# 日程简要

日期	日程	地点	备注
6.15	报到欢迎晚宴	会议指定酒店: 1.锦江之星风尚酒店 软州白海豚国际酒店 2.钦州白海豚国际酒店	到达广西钦州,入住
6.16-6.18	开幕仪式 学术研讨会	北部湾大学报告厅	18日上午退房,带 上行李
6.18	钦州—北海	1.北海香格里拉大酒店 2.城市便捷酒店(北海东都 海景大道店)	入住会议指定酒店
6.19-20	野外考察I 野外考察II 研讨会	北海滨海国家湿地公园 北海竹林盐场	20日晚安排车辆 送机
4 75	公众活动 闭幕晚宴	北海香格里拉大酒店2楼北海厅	1
6.21	离开北海		21日上午安排车 辆送机
	And the second s		

愿您有个美好的参会体验。

Dear participants,

Welcome to Guangxi to attend the 4th International Workshop on the Science and Conservation of Horseshoe Crabs. This conference will be held in two cities in Guangxi. In order to ensure a smooth running of conference events, please read this program carefully. Wish you a pleasant journey in Guangxi.

The following are some important notes:

### **Notes**

- 1 The conference schedule will be strictly followed. Announcement will be made at the meeting venue or through the Facebook and WeChat groups if there is any temporary change.
- 2 Local weather: Summer in Guangxi is hot and humid. The average temperature in June is 27-33C. There will be occasional showers. It is recommended to bring along your rain gear when needed.
- 3 Dressing suggestions: Casual dressing in the conference. For outdoor activities, please be aware of sun and insect exposures, and occasional showers. Hat, sunscreen, and umbrella are recommended.
- 4 Shuttle bus arrangement: Shuttle bus will be arranged on 14-15th June to connect the Naning Wuxu International Airport to the conference hotels in Qinzhou City. Shuttle bus will also be arranged to the Nanning Wuxu International Airport from the conference hotels in Beihai on June 20th evening as well as 21st June morning.
- 5 Pay attention to the conference code of conduct and make sure your mobile phone is silence/mute during the meeting.
- 6 Proceed check-out procedure at the conference hotels in Qinzhou before 8:00 am on June 18th and bring all luggage to Beibu Gulf University. The check-out time for hotels in Beihai is 12:00 pm. Proceed check-out procedure in advance according to your travel schedule.
- 7 Ask volunteers or staff for any assistance if needed. Emergency contacts: Secretary-general, Dr. KWAN Kit Yue, Billy, International Affairs, kityuekwan@bbgu.edu.cn, +86 15307779400 Deputy Secretary-General, Ms. LIN Wuying, Domestic Affairs, linwuying@gxbrc.org, +86 15277004665 Members of the Secretariat Ms. XIAO Xiaobo, Domestic Affairs, xiaoxiaobo@gxbrc.org, +86 13687796401
- 8 Conference website: http://www.gxbrc.org/horseshoecrab2019/index.jsp?lang=en\_US

# Schedule-at-a-glance

	Date	Activities	Location	Remarks
	15 June, 2019	Registration	Conference Hotels:  1. Jin Jiang Inn  White Dolphin Hotel-Qinzhou	Arrive in Qinzhou City and check in
		Welcome Party in the evening	2. White Dolphin Hotel-Qinzhou	""
	16-18 June, 2019	Opening Ceremony Presentation Sessions (Keynote Talks, Oral and Poster Sessions)	Conference Hall, Building 12, Room 204, Beibu Gulf University	Check-out on June 18th morning with luggage
7	18 June, 2019	Bus from Qinzhou to Beihai	Conference Hotels: 1.Shangri-La Hotel Beihai 2.City Comfort Inn Dongdu Baihui Branch	Arrive in Beihai City
	19-20 June,	Field Excursion I	Binhai National Wetland Park	Bus to Nanning airport
	2019	Field Excursion II Workshops, Side Meeting	Zhu Lin Yan Chang	after closing ceremony on June 20th
		Outreach Activities	Beihai Hall, 2nd Floor,	
		Closing Ceremony	Shangri-La Hotel Beihai	
	21 June, 2019	Departure from Beihai		Bus to Nanning airport on June 21th morning



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鲎是一类古老的海洋"活化石",是滨海湿地和海洋生态系统不可或缺的重要成员。 鲎的血液被用于制作鲎试剂,极大推动了人类的医疗安全。近年来,由于栖息地丧失,过度捕捞等原因,全世界鲎的数量急剧减少,关注和推动鲎的研究、保护和可持续利用成为有待全世界共同解决的问题。

2007 年, IUCN物种生存委员会鲎专家组为了更好地推动全球鲎的研究和保护工作,于纽约举办了第一届国际鲎科学与保护研讨会,之后每隔四年便会召开一次研讨会。继 2011年和 2015年分别在中国香港和日本佐世保举办的第二届、第三届研讨会后,第四届国际鲎科学与保护研讨会即将在中国广西举办。

研讨会定于2019年6月15-20日在中国广西壮族自治区钦州市和北海市举办。本次会议由 IUCN物种生存委员会鲎专家组主办,由北部湾大学【广西北部湾海洋生物多样性养护重点 实验室和北部湾大学广西水产一流学科(培育)】与美境自然联合承办,由阿拉善SEE广西项目中心、香港海洋公园保育基金、生态研究及发展机构(ERDG)、广西红树林研究中心、广西动物学会和广西野生动植物保护协会协办。会议指导单位为全国水生野生动物保护分会。学术研讨会主会场设在广西钦州的北部湾大学,野外考察、利益相关者研讨会和公众活动等设在广西北海进行。

欢迎您来到广西参与本次会议。 预祝您参会愉快!

Horseshoe crabs are ancient marine "living fossils", which are important members of coastal and marine ecosystems. The blood (haemolymph) of horseshoe crabs has been utilized for LAL/TAL production, which has greatly enhanced medical safety. In recent years, due to habitat loss, overharvesting and environmental threats, the world's natural populations of horseshoe crabs have decreased dramatically, especially in Asia. An urgent call for global collaboration is raised to promote horseshoe crab research, conservation and sustainable use.

The Fourth International Workshop on the Science and Conservation of Horseshoe Crabs builds on the successful foundation established by its predecessors, the International Symposium on the Science and Conservation of Horseshoe Crabs in New York, USA (2007), and the Second and Third International Workshops on the Science and Conservation of Horseshoe Crabs in Hong Kong SAR (2011) and Sasebo, Japan (2015).

The Fourth International Workshop will be held on June 15-20, 2019 in Qinzhou City and Beihai City, The Guangxi Zhuang Autonomous Region, China. The Workshop will be hosted by the IUCN Species Survival Commission Horseshoe Crab Specialist Group, co-organized by Beibu Gulf University [Guangxi Key Laboratory of Beibu Gulf Marine Biodiversity Conservation, and Guangxi First-Class Aquaculture Platform (Incubation)] and Guangxi Biodiversity Research and Conservation Association (BRC). National Aquatic Wildlife Conservation Association (NAWCA) will be the advisory organization. The main conference venue will be at Beibu Gulf University of Qinzhou City, whereas field excursions, stakeholder workshops and side events will be taken place in Beihai City.

Welcome to Guangxi to participate in this conference. We wish you a pleasant journey.

# 大会组织方 ORGANIZATIONS

# 主办方

世界自然保护联盟(IUCN)物种生存委员会鲎专家组

# 承办方

北部湾大学 广西北部湾海洋生物养护重点实验室 北部湾大学广西水产一流学科(培育)

美境自然 (全称"广西生物多样性研究和保护协会")

# 指导单位

全国水生野生动物保护分会

# 协办方

阿拉善 SEE广西项目中心

香港海洋公园保育基金

生态研究及发展机构

广西红树林研究中心

广西动物学会

广西野生动植物保护协会

# 支持方

崔斯特深圳创新技术 (深圳)

广西壮族自治区海洋研究所

广西合浦儒艮国家级自然保护区管理站

广西北海滨海国家湿地公园管理处

北海金海湾红树林生态旅游区管理有限公司

## Host

The International Union for Conservation of Nature (IUCN) Species Survival Commission Horseshoe Crab Specialist Group

# **Organizers**

Beibu Gulf University Guangxi Key Laboratory of Beibu Gulf Marine Biodiversity Conservation Guangxi First-Class Aquaculture Platform (Incubation) Guangxi Biodiversity Research and Conservation Association (BRC)

# **Advisory Organization**

National Aquatic Wildlife Conservation Association (NAWCA)

# Co-organizers

SEE Society of Entrepreneurs and Ecology Guangxi Programme

Ocean Park Conservation Foundation, Hong Kong (OPCFHK)

The Ecological Research & Development Group (ERDG)

Guangxi Mangrove Research Center (GMRC)

Guangxi Zoology Society

Wildlife Conservation Association of Guangxi Province

# **Sponsors**

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# 星期六 6月15日 | SATURDAY 15 JUNE

Time	Program	Session Chair/Speaker	Venue
时间	<b>内容</b>	主持人/报告人	地点
18:00-20:00	Welcome Party	Paul SHIN	White Dolphin Hotel-Qinzhou
	欢迎晚宴	单锦城	钦州白海豚国际酒店

# 星期日 6月 16日 上午| SUNDAY 16 JUNE MORNING

Time 时间	Program 内容	Session Chair/Speaker 主持人/报告人	Venue 地点
	Session Chair 主持人: Hu HUANG 黄	部湾大学)	
08:20-10:10	Opening Ceremony 开幕式		Conference Hall Block 12- 204 Beibu Gulf University 湾大12栋204报告厅
10:10-10:30	Tea break 茶歇		Conference Hall Aisle 报告厅走廊
	Plenary Tal	ks 特邀报告	
	Session Chairs 主持人: Chang-Po CHEN 陈	章波(Academia Sinica, Taiwa	n 台湾中研院)
10:30-10:50	Hope for horseshoe crab conservation in Asia- Pacific 特邀讲座:亚太区鲎物种保护的希望	Paul SHIN 单锦城	
10:50-11:10	The power of citizen science: Twenty years of horseshoe crab community research merging conservation with education 特邀讲座:公民科学的力量-鲎社区研究二十年,保育和教育相结合	Jennifer MATTEI	Conference Hall Block 12- 204
11:10-11:30	Horseshoe crabs in the face of climate change: future challenges and conservation strategies for their sustainable growth and existence 气候变化下鲎可持续增长和生存的挑战与相 应保护策略	Jayant K. MISHRA	Beibu Gulf University 湾大12栋204报告厅
11:30-11:50	The research of science and conservation of horseshoe crabs in China 中国的鲎科学与保护研究	Yongyan LIAO 廖永岩	
11:50-13:30	Lunch 午餐	_	Campus Canteen East Zone, 3rd Floor 东区食堂三楼

# 星期日 6月16日 下午 | SUNDAY 16 JUNE AFTERNOON

Time	Program	Session Chair/Speaker	Venue	
时间	内容	主持人/报告人	地点	
主题报告(鲎种群生态学和演化1)				
Oral Sessions (Horseshoe Crab Population Ecology and Evolution I)				
Session Chairs 主持人:Siu Gin CHEUNG 张肇坚(City University of Hog Kong 香港城市大学)				

Yusli WARDIATNO(Institut Pertanian Bogor University 印尼茂物农业大学)

13:30-13:45	Global distributions of horseshoe crabs and their breeding areas	Stine VESTBO	
13:45-14:00	Mapping of horseshoe crab habitats in India	Basudev TRIPATHY	
14:00-14:15	Population estimation of horseshoe crab <i>Tachypleus</i> tridentatus (Leach, 1819) in Balikpapan waters, East  Kalimantan, Indonesia	Ali MASHAR	Conference Hall Block 12- 204
14:15-14:30	Population dynamics of <i>Tachypleus tridentatus</i> in Eyu Islet intertidal zone, Xiamen, China	Lizhe CAI	Beibu Gulf University
14:30-14:45	Acoustic telemetry reveals contrasting habitat connectivity across several life history stages of American horseshoe crabs in coastal New York, USA	Justin BOPP	湾大12栋204报告厅
14:45-15:00	Tea break 茶歇		Conference Hall Aisle 报告厅走廊
15:00-15:15	Evaluating trends in Florida horseshoe crab abundance using state-space modeling	Geraldine KLARENBERG	
15:15-15:30	The IUCN Green List Assessment for <i>Limulus</i> polyphemus (session keynote speech)	David R. SMITH	
15:30-15:45	Occurrence and morphometric analysis of  Carcinoscorpius rotundicauda along Bhadrak coast of  Odisha, India	Rahimuddin SHAIK	Conference Hall Block 12- 204
15:45-16:00	Identification and characterization of essential nursery habitat for Asian horseshoe crabs in northern Beibu Gulf	Kit Yue KWAN	Beibu Gulf University 湾大12栋204报告厅
16:00-16:15	The conservation status of horseshoe crabs in Vietnam	Van Tu DO	
16:15-16:30	Landing population and toxicity study of horseshoe crabs in Pasir Putih Village, Sarawak, Borneo	Noor JAWAHIR A. Raman	
16:30-16:45	Tea break 茶歇		Conference Hall Aisle 报告厅走廊
Ses	主题报告(鲎种群生态 Oral Sessions (Horseshoe Crab Populati ssion Chairs 主持人: Faridah MOHAMAD(Universit Billy KWAN 关杰耀(Beibu Gulf	ion Ecology and Evolution i Malaysia Terengganu <sup></sup>	
16:45-17:00	Population genetic study on Carcinoscorpius rotundicauda	Hanne Juel CHRISTIANSEN	
17:00-17:15	How close genetically the mangrove horseshoe crab populations on East, West and Southern coasts of Peninsular Malaysia?	Nur FAIRUZ-FOZI	Conference Hall Block 12- 204 Beibu Gulf University 湾大12栋204报告厅
17:15-17:30	Population genomics of two horseshoe crab species in Singapore	Qian TANG	
17:30-17:45	Conservation genetic assessment for horseshoe crabs around East Asia	Ming-Che YANG	
17:45-18:00	Genetic and phenotypic variation in the American horseshoe crab ( <i>Limulus polyphemus</i> ): A case study from Northeast Florida	H. Jane BROCKMANN	
	Hom Horaroust Horara		

# 星期一 6月17日 上午 | Monday 17 JUNE MORNING

Time	Program	Session Chair/Speaker	Venue
时间	内容	主持人/报告人	地点
	主题报告(鲎生物		
	Oral Sessions (Advances in Ho		/_ \\\ \rightarrow
	Session Chairs 主持人: Hwey-Lian HSIEH 谢蕙莲		
	Jane BROCKMANN (University of F	florida 美国佛罗里达天字 T	)
09:00-9:15	Infectious diseases in <i>Tachypleus gigas</i> during captive breeding and rearing	Bavajohn AKBAR JOHN	
09:15-9:30	Quantifying the feed utilization on alternative feeds by adult horseshoe crabs Carcinos corpius rotundicauda in captivity	Farah Najihah RAZALI	Conference Hall Block 12- 204 Beibu Gulf University
9:30-9:45	Feeding ecology and food preferences of <i>Tachypleus</i> gigas from Malaysian waters	Sukree HAJISAMAE	湾大12栋204报告厅
9:45-10:00	Application of stable isotopes in traceability of food and ecology	Ling TIAN	
10:00-10:20	Tea break 茶歇		Conference Hall Aisle 报告厅走廊
10:20-10:35	Chemoreception in the American Horseshoe crab,  Limulus polyphemus: is there a "nose"?	Sandra HELMARK	
10:35-10:50	Behavioral response of horseshoe crab to green LED lights	Fahresa Nugraheni SUPADMININGSIH	
10:50-11:05	Semilunar periodic alternation of activity rhythms in the tri-spine horseshoe crab <i>Tachypleus tridentatus</i>	Shinichi WATANABE	Conference Hall
11:05-11:20	Genetic variation in COI gene of Indian horseshoe crabs (Tachypleus gigas) population along the coastal area (Bay of Bengal) of district Balasore, Odisha, India	Sanatan TUDU	Block 12-204 Beibu Gulf University 湾大12栋204报告厅
11:20-11:35	Molecular identification of horseshoe crabs in Java and Madura Islands, Indonesia	Agus Alim HAKIM	
11:35-11:50	Genome sequencing and transcriptome study for  Tachypleus tridentatus	Ke LIU	
11:55-13:45	Lunch 午餐		Campus Canteen East Zone, 3rd Floor 东区食堂三楼
	Poster session		Campus Library
	墙报报告		湾大图书馆

# 星期一 6月17日 下午| Monday 17 JUNE AFTERNOON

Time 时间	Program 内容	Session Chair/Speaker 主持人/报告人	Venue 地点		
主题报告(鲎生物学进展2、鲎生物技术)					
Oral Sessions (Advances in Horseshoe Crab Biology II, Horseshoe Crab in Biotechnology) Session					
Chair 主持人: Bisnu Prasad DASH(Fakir Mohan University 印度法基尔莫汉大学)					
	Menghong HU 胡梦红(Shanghai Ocean University 上海海洋大学)				

	Screening of antimicrobial activity of Indian horseshoe		
13:45-14:00	crab haemolymph on foodborne pathogen	Bhubaneswari BAL	
	Novel anti-bacterial compound from shells of fertilised		
14:00-14:15	eggs of Indian Horseshoe Crab Tachypleus gigas	Chinnari SUMEDH	
	(Müller)  Effects of dietary copper supplementation on non-		
	specific immune enzyme activities, blood- chemistry		Conference Hall
14:15-14:30	and hemocyanin concentration of Chinese horseshoe	Zhen XU	Block 12-204
	crab (Tachypleus tridentatus)		Beibu Gulf University 湾大12栋204报告厅
	Postembryonic development and population size of  Tachypleus tridentatus in a nursery habitat on		得入12你204报音月
14:30-14:45	Palawan and first data about the breeding season in	Dorkas KAISER	
	the Philippines		
	Changes of intestinal microbiome during the		
14:45-15:00	development of Chinese horseshoe crab (Tachypleus	Zhonghao ZHAO	
15:00-15:15	tridentatus) larvae		Conference Hall Aisle
13.00 13.13	Tea break 茶歇		报告厅走廊
15:15-15:30	Biotechnological significance and bio-prospecting of	Bisnu Prasad DASH	
13.13 13.30	horseshoe crabs (invited talk)	District Present Dr. 1511	
15:30-15:45	Clinical use of TAL from China horseshoe crabs in	Zeqi ZHOU	Conference Hall
	early diagnosis of IFD and their conservation  The long-term effect of bleeding for <i>Limulus</i>		Block 12- 204
15:45-16:00	amebocyte lysate on annual survival: an analysis of	David R. SMITH	Beibu Gulf University
	tagging data		湾大12栋204报告厅
	LAL/TAL and alternative endotoxin tests: Their		
16:00-16:20	characteristics and impact on the horseshoe crab	Glenn GAUVRY	
	populations in the USA and Asia		Conference Hall Aisle
16:20-16:35	Tea break 茶歇		报告厅走廊
	中学报告专场 Secondary Sci	hool Session	
Se	ssion Chairs 主持人: Bryan Raveen NELSON (Univer	-	
	Simon WH WONG (Ocean Park Conservation Fo		远保育基金) ————————————————————————————————————
16:35-17:50	The feasible methodology of stimulating the spawning and incubating the eggs under secondary school	Chi Wai CHOW and	
10.55 17.50	environment	students	
17:50-17:05	The relationship between living density and	Hei Man NG and students	Conference Hall
17.30-17.03	mortality of juvenile horseshoe crabs in captivity	Her Mail NO and students	Block 12-204
	Summary and countermeasure of campus		Beibu Gulf University
17:05-17:20	propaganda and education activities on protection of horseshoe crabs in Beihai Experimental School	Xiaoling WANG	湾大12栋204报告厅
	-		
17:20-18:30	Workshop on IUCN Green List of Species IUCN 物种绿色名录工作坊	Dave SMITH	

# 星期二 6月 18日 上午| TUESDAY 18 JUNE MORNING

Time	Program	Session Chair/Speaker	Venue
时间	内容	主持人/报告人	地点
	主题报告(公众意识)	宣教和参与)	
	Oral Sessions (Education and	d Public Awareness)	
	Oral chairs 主持人: Jennifer MATTEI(美国	圣心大学 Sacred Heart Ui	niversity)
	Wuying LIN 林昊颖(B	RC 美境自然)	
09:00-09:15	Linking horseshoe crabs conservation to the society  - conservation education effort in Hong Kong	Simon W.H. WONG	
09:15-09:30	Arachnophilia: The role of civil society in horseshoe crab conservation	Lester J.X. TAN	Conference Hall,
09:30-09:45	Using community-based conservation programs to protect horseshoe crabs and their habitat: Best practices and applications to underserved regions	Elizabeth E. HIEB	Block 12-204, Beibu Gulf University 湾大12栋204报告厅
09:45-10:00	Status of horseshoe crabs research in Myanmar; primary field survey in Myanmar citizen science approach	Wah Wah MIN	
10:00-10:20	Tea break 茶歇		Conference Hall Aisle 报告厅走廊
10:20-10:35	You can observe a lot by just watching: A tribute to Carl Shuster's contributions to horseshoe crab biology, conservation and education	Mark L BOTTON	
10:35-10:50	Conservation history of horseshoe crab through sand animation and lacquer painting	Kesu DAS	
10:50-11:05	Morphological characters for horseshoe crab identification: are they practical for volunteers in monitoring program?	Yusli WARDIATNO	Conference Hall, Block 12-204, Beibu
11:05-11:20	Consume or be consumed: Community and their sustainable practices	Bryan Raveen NELSON	Gulf University 湾大12栋204报告厅
11:20-11:35	Lessons from the public educations on horseshoe crab conservations through Wetland Society Platforms across two sides of the Taiwan Strait	Yuhong LI	
11:35-11:50	The power of public: what we can learn from the horseshoe crab conservation actions in the Beibu Gulf of Guangxi, China	Xiaobo XIAO	
11:50-13:15	Lunch 午餐		Campus Canteen East Zone, 3rdFloor 东区食堂三楼
	Poster session 墙报报告		Campus Library 湾大图书馆

# 星期二 6月 18日 下午| TUESDAY 18 JUNE AFTERNOON

Time	Program	Session Chair/Speaker	Venue
时间	内容	主持人/报告人	地点
	主题报告(鲎栖息地保	护面临的挑战)	
	Oral Sessions (Horseshoe Crab C	Conservation Challenges)	
	主持人: Glenn GAUVRY (ERDC	G 生态研究及发展机构)	
	Paul SHIN (City University of Ho	ng Kong 香港城市大学)	
13:15-13:30	Oyster rubble reduces the home range and disturbs the foraging behaviour in <i>Tachypleus tridentatus</i>	Siu Gin CHEUNG	
13:30-13:45	Reintroduction of <i>Tachypleus gigas</i> in Setiu Lagoon,  East Coast of Peninsular Malaysia	Mohamad FARIDAH	
13:45-14:00	Management on clam digging activity and at horseshoe crab hotspots in Hong Kong	Kelvin JY SO	Conformed Hall
14:00-14:15	Threats to the marine biodiversity in the South China coastal waters: implications for the Asian horseshoe crab conservation	Chun-Chieh WANG	Conference Hall, Block 12-204, Beibu Gulf University 湾大12栋204报告厅
14:15-14:30	Key issues for Chinese horseshoe crab, <i>Tachypleus</i> tridentatus conservation and management in China	Xiaoyong XIE	14)(12)(12)(14)(17)
14:30-14:45	Citizen science-based population monitoring program highlights urgent needs of comprehensive conservation and management for horseshoe crabs and their critical habitats	Xinyi ZHAO	
14:45-15:00	Tea break 茶歇		Conference Hall Aisle 报告厅走廊
15:00-16:00	Workshop on IUCN Red List Assessment for Asian		Conference Hall,
	Horseshoe Crabs 亚洲鲎的IUCN 红色名录评估工作坊	Kevin LAURIE	Block 12-204 湾大12栋204会议室
16:00	Depart to Beihai City 出发到北海	<b>∓</b>	

# 星期三 6月 19日 上午| WEDNESDAY 18 JUNE MORNING

Time 时间	Program 内容	Session Chair/Speaker 主持人/报告人	Venue 地点				
Field excursion I: Beihai Binhai National Wetland Park 实地考察 I: 北海滨海国家湿地公园							
08:00-08:40	Bus: Hotels to Beihai Binhai National Wetland Park 乘坐大巴从酒店至北海滨海国家湿地公园	BRC 美境自然					
8:40-10:00	Team A: Visit to horseshoe crab habitat Team B: Visit to induced spawning sites A组:鲎栖息地参观 B组:鲎产卵场实验参观	BRC 美境自然	Beihai Binhai National Wetland Park 北海滨海国家湿地公园				
10:00-11:30	Team A: Visit to horseshoe crab habitat Team B: Visit to induced spawning sites A组:鲎产卵场实验参观 B组:鲎栖息地参观	BRC 美境自然					

11:30-11:45	Bus: Beihai Binhai National Wetland Park to restaurant 乘坐大巴从北海滨海国家湿地公园至餐厅	BRC 美境自然	
11:45-14:30	Lunch and break 午餐及午夕	Beihai City 北海市区	

# 星期三 6月19日 下午| WEDNESDAY 19 JUNE AFTERNOON

Time	Program	Session Chair/Speaker	Venue				
时间	内容	主持人报告人	地点				
公众活动 Outreach Activities							
组织者 Organizer: 美境自然 (BRC)							
	参与者 Participants: 所有参	会人员 All attendees					
	International Participants Exhibitions						
	Horseshoe crab Art Show		Shangri-La Hotel 2 <sup>nd</sup> floor,				
14:30-17:00	Participatory Horseshoe Crab Painting	BRC 美境自然	Aisle				
	国际鲎文创作品展、机构展示		香格里拉酒店二楼走廊				
	参与式长卷轴绘画						
	可选边会 Optional Side Meeting						
	北部湾滨海湿地生物多						
	Workshop on coastal wetland biodiversit		ı Gulf				
	主持人 Facilitator: 美地	竟自然(BRC)					
14:30-14:40	主持人介绍座谈会背景及参会嘉宾、代表 领导致辞 Introduction of background and invited guests Remarks from honorable guests	BRC 美境自然					
14:40-16:00	参会嘉宾分享环节 Presentations by invited guest	BRC 美境自然	Shangri-La Hotel 2 <sup>nd</sup> floor,				
16:00-16:15	美境自然介绍《北部湾滨海湿地生物多样性公众监测报告及保护建议(第一版)》 Introduction of the <i>Coastal Wetland Biodiversity</i> Monitoring Report of the Beibu Gulf by BRC	BRC 美境自然	Beihai Room 香格里拉酒店二楼北海厅				
16:15-16:45	互动讨论:如何推动北部湾滨海湿地的跨界保护? Panel Discussion: How to promote comprehensive conservation of the coastal wetland in the Beibu Gulf?	BRC 美境自然	-				
	Action plans on Green and F	Red List Assessment					
	绿色与红色名录评估	行动方案讨论					
主持人:Dave SMITH (U.S. Geological Survey 美国地质调查局)							
Kevin LAURIE (Horseshoe Crab Specialist Group Programme Officer 鲎专家组项目官员)							
Action plans on Green and Red List Assessment 绿色与红色名录评估行动方案讨论		Dave SMITH Kevin LAURIE	Shangri-La Hotel 2 <sup>nd</sup> floor, Beihai Room 香格里拉酒店二楼北海厅				

# 星期四 6月 20日 上午| THURSDAY 20 JUNE MORNING

Time 时间	Program Session Chair/Speaker 内容 主持人/报告人		Venue 地点
	Field excursion II: Zhu 实地考察II:竹	_	
08:30-09:20	Bus: hotels to Zhu Lin Yan Chang 乘坐大巴从北海酒店出发至竹林盐场	BRC 美境自然	
9:20-10:10	Team A: Horseshoe crab artificial spawning station Team B: Horseshoe crab juvenile release activity A组:鲎人工繁殖基地考察 B组:野外幼鲎放流		Zhu Lin Yan Chang & Guangx Institute of Oceanology field base
10:10-11:00	Team A: Horseshoe crab artificial spawning station Team B: Horseshoe crab juvenile release activity A组:野外幼鲎放流 B组:鲎人工繁殖基地考察	BRC 美境自然	竹林盐场 & 广西海洋研究所 繁育基地
11:00-11:30	Bus: Zhu Lin Yan Chang to Restaurant for lunch 乘坐大巴从竹林盐场至餐厅	BRC 美境自然	
11:30-14:00	Lunch break 午餐及午休		Beihai City 北海市区

# 星期四 6月 20日 下午 | THURSDAY 20 JUNE AFTERNOON

Time	Program	Session Chair/Speaker	Venue					
时间	内容	主持人/报告人	地点					
	Ways forward 2019-2023 and the Beibu Gulf Manifesto							
未来展望与北部湾宣言								
主持人 Facilitator: IUCN SSC Horseshoe Crab Specialist Group (IUCN鲎专家组)								
	美境自然 (B		□ < 3/> √3/1/					
	), Old I (1)		Shangri-La Hotel 2 <sup>nd</sup> floor,					
14:00-15:00	Discussion: Ways forward 2019-2023	Mark BOTTON	Beihai Room					
11.00 15.00	讨论会:展望2019-2023	Paul SHIN	香格里拉酒店二楼北海厅					
			Meeting Room Aisle					
15:00-15:15	Tea break 茶歇		会议厅走廊					
	Stakeholder Workshop: Horseshoe crabs conservation		Shangri-La Hotel 2 <sup>nd</sup> floor,					
15:15-17:15	in the Beibu Gulf, Asia and beyond	BRC 美境自然	Beihai Room					
15.15-17.15	跨界座谈会: 鲎保护北部湾宣言	DIC 大物日系	香格里拉酒店二楼北海厅					
	Closing ceremony & F	arowall dinner	日相王亚田川一(文记4)					
	闭幕式 & 新闻发布会							
	Facilitator 主持人: 美地							
	Tachitator Tily.	北海市实验学校						
	Horseshoe Crab Ambassadors Shows 北海鲎卫士文艺表演	北海国际学校						
		Beihai Experimental						
17:30-17:45		School						
		Beihai International						
		School						
	Remarks from honorable guests	Selicoi						
17:45-18:00	领导及嘉宾致辞	BRC 美境自然						
	Outstanding Student Presentation Awards	Invited guests						
18:00-18:10	颁发优秀学生报告奖	领导及嘉宾	Shangri-La Hotel 2 <sup>nd</sup> floor,					
	Release.	VX 17 2×234 7×	Guilin Room					
	Horseshoe Crab Conservation Beibu Gulf Manifesto		香格里拉酒店二楼桂林厅					
18:10-18:25	International Horseshoe Crab Day	Invited guests	日祖王还相但一级还的4					
10.10-10.23	新闻发布会:	领导及嘉宾						
	国际鲎保护北部湾宣言 & 国际鲎保育日							
	Conference Closed							
	Group Photo							
18:25-18:30	宣布会议闭幕	BRC 美境自然						
	所有参会人员合影							
	Dinner							
18:30-19:30	晚餐及自由交流	BRC 美境自然						
	"九良八口田人(川)							

# 会议期间钦州接送大巴时刻表 Bus Schedule during Workshop in Qinzhou

日期 DATE	行程 Itinerary	时间 Time	上车地点 Venue
1	酒店至北部湾大学	7:20	锦江之星酒店 Jin Jiang Inn
2019.6.16	Conference Hotels in Qinzhou to Beibu Gulf University	7:30	钦州白海豚国际酒店 White Dolphin Hotel-Qinzhou
	酒店至北部湾大学	8:00	锦江之星酒店 Jin Jiang Inn
2019.6.17	Conference Hotels in Qinzhou to  Beibu Gulf University	8:10	钦州白海豚国际酒店 White Dolphin Hotel-Qinzhou
	酒店至北部湾大学	8:00	锦江之星酒店 Jin Jiang Inn
2019.6.18	Conference Hotels in Qinzhou to  Beibu Gulf University	8:10	钦州白海豚国际酒店 White Dolphin Hotel-Qinzhou
2013.0.10	北部湾大学至北海酒店 Beibu Gulf University to Conference Hotels in Beihai	16:20	北部湾大学

# 北海野外考察大巴时间表 Bus Schedule for field excursions in Beihai

日期	行程	时间	上车地点
DATE	Itinerary	Time	Venue
	北海市区-北海滨海国家湿地公园	7:50	北海城市便捷酒店东都店 City Comfort Inn Dongdu Beihai Branch
2019.6.19	Hotel to Beihai Coastal National Wetland Park	8:00	北海香格里拉大酒店 Shangri-La Hotel Beihai
X	Beihai Coastal National Wetland	11:20	北海滨海国家湿地公园 Beihai Binhai National Wetland Park
2019.6.20	北海酒店 -竹林盐场 Hotels to Zhu Lin Yan Chang	8:20	北海城市便捷酒店东都店 City Comfort Inn Dongdu Beihai Branch
		8:30	北海香格里拉大酒店 City Comfort Inn Dongdu Beihai Branch
	竹林盐场-北海 Zhu Lin Yan Chang to Beihai downtown	11:00	竹林盐场 Zhu Lin Yan Chang

# 到达

为方便大家到达钦州的酒店,我们将安排大巴从南宁市吴圩国际机场接送参会人员至 钦州白海豚国际酒店和锦江之星酒店。届时将会有持研讨会标志牌的志愿者在机场到 达楼层的国际到站口附近等候。

如果您在大巴时刻表之外的时间到达,您可以乘坐机场大巴到钦州市。在机场国际抵达出口附近长途汽车售票处可以购买到钦州的长途汽车票(约75元人民币);也可咨询工作人员:如何去钦州汽车总站。

直达钦州汽车站后沿出站口通道步行,您可乘坐出租车到达酒店,车费在 30 元以内。 更多的最新信息将在研讨会期间公布。请随时注意查看您的邮箱、 Asian Horseshoe Crab Facebook群和鲎研讨会与会者群微信群。

# **Arrival**

Shuttle bus will be arranged at Nanning Wuxu International Airport to transport to both White Dolphin International Hotel (Qinzhou) and JinJiang Inn (Qinzhou). Volunteers with the Workshop signboard will be available near to the gate of International Arrival on arrival floor of the airport.

In case you are arriving outside the shuttle bus schedule, you may take a connecting bus to Qinzhou city. Purchase a bus ticket (~ 75 Chinese Yuan) to Qinzhou (or show this to the staff: 我要去钦州汽车总站) at the ticketing counter near the gate of International Arrival on arrival floor of the airport. After arriving at Qinzhou Bus Terminal, walk to the main road and take a taxi to your hotel. The taxi may cost around 30 Chinese Yuan.

More updated information will be announced throughout the Workshop. Make sure to check your mailbox, Asian Horseshoe Crab Facebook Group and/or 鲎研讨会与会者群 WeChat Group from time to time.

# 离开

会议结束后我们会在6月 20日晚上、 21日上午的固定时间段安排车辆送参会人员从北海的指定酒店到南宁吴圩国际机场和 /或北海福成机场 。送机大巴时刻表如下:

# **Departure**

Shuttle buses will be arranged from hotels in Beihai City to the Nanning Wuxu International Airport and/or Beihai Fucheng Airport on the evening of 20 June, and the morning of June 21.

# 北海送机大巴时间表 Shuttle bus schedule for Beihai departure

日期 Date	行程 Itinerary	时间 Time	上车地点 Venue
2019.6.20	北海-南宁吴圩机场 Beihai - Nanning Wuxu International Airport	19:30	北海香格里拉大酒店 Shangri-La Hotel Beihai
2019.6.21	北海-南宁吴圩机场 Beihai - Nanning Wuxu International Airport	TBD 待定	北海香格里拉大酒店 Shangri-La Hotel Beihai 北海城市便捷酒店东都店 City Comfort Inn, Dongdu Beihai Branch
2019.6.21	北海 -北海福成机场 City Comfort Inn, Dongdu Beihai Branch	TBD 待定	北海香格里拉大酒店 Shangri-La Hotel Beihai 北海城市便捷酒店东都店 City Comfort Inn, Dongdu Beihai Branch

# 自行离开北海交通工具指引 从南宁乘机离开 北海市区—南宁吴圩国际机场 距离 225km

In case you are leaving outside the shuttle bus schedules, here are the options:

# **Departure from Nanning by flight**

Distance from Beihai downtown to the Nanning Wuxu International Airport: 225km

方案 1: 北海至吴圩机场直达大巴

乘坐点:北海市二运汽车站(北海市广东路60号)

价格:100元 路程:3.5小时 电话:0779-2023438

机场大巴时刻表:

05:00, 07:00, 08:00, 09:00, 10:00, 11:00, 12:00, 13:00,

14:00, 15:00, 16:00, 17:30

方案 2:北海至 南宁动车至南宁站或南宁东站,转南

宁机场大巴至吴圩机场

价格: 动车 58-61元 + 机场大巴 20元

路程: 共约 3.5小时 机场大巴时刻表: 5:30-22:30 30分钟/班

方案 3:北海至南宁动车至南宁站或南宁东站,乘坐

的士至吴圩机场

价格: 动车58-61元 +的士约 120元

路程:约3小时

可向司机出示以下文字 "我要去吴圩国际机场" Option 1: Take the Airport shuttle Bus from Beihai

downtown to the airport

Location of Bus Station: Beihai 2nd Bus Station, No. 60

Guangdong Road, Beihai City

Fare: RMB 100 Duration: 3.5 hours

Telephone No.: 0779-2023438

Schedule: 05:00, 07:00, 08:00, 09:00, 10:00, 11:00,

12:00, 13:00, 14:00, 15:00, 16:00, 17:30

Option 2: Take an EMU train from Beihai to the Nanning Station or Nanning East Station, transfer to the Nanning

Wuxu International Airport by Airport shuttle Bus

Fare: EMU Train RMB 58-61, Airport Shuttle Bus RMB 20

Duration: Around 3.5 hours in total Airport shuttle Bus Schedule: 5:30-22:30,

30 minutes in between

Option 3: Take an EMU train from Beihai to the Nanning

Station or Nanning East Station, then take a taxi to the

Naning Wuxu International Airport Fare: Train RMB 58-61, Taxi RMB 120

Duration: Around 3 hours

You can show the taxi driver the following words:

# "我要去吴圩国际机场"

(I want to go to Wuxu International Airport)

# 从北海乘机离开 北海市区—北海福成机场 约 20km。

方案1

乘坐机场大巴

乘坐点:北京路 138号万汇海珍城 城市候机楼

价格:20元 路程:45分钟

机场大巴时刻表: 6:30, 08:00, 09:00, 10:00, 11:30, 12:30, 14:00, 16:00, 17:00, 18:00, 19:00, 21:00

方案2

从酒店乘坐的士至北海福成机场

价格: 约 90元, 路程: 35分钟,

您可向司机出示以下文字:"我要去北海福成机场

# Departure from Beihai by flight Distance from Beihai Downtown to Beihai Fucheng Airport: 20 km

Option 1: Take the Airport Bus from Beihai downtown to

the airport

Location: City Terminal Building, Wanhui Haizhen, 138 Bei-

jing Road Fare: RMB 20 Duration: 45 minutes

Schedule: 6:30, 08:00, 09:00, 10:00, 11:30, 12:30, 14:00,

16:00, 17:00, 18:00, 19:00, 21:00

Option 2: Take taxi from conference hotel to to the Beihai

Fucheng Airport
Fare: Around RMB 90
Duration: 35 minutes

You can show the taxi driver the following words:

# "我要去北海福成机场"

"I want to go to the Beihai Fucheng Airport."

# 从北海乘坐动车离开

会议酒店距离北海火车站约5.5km, 建议乘坐出租车,路程约20分钟,价格:20元

# Departure from Beihai by train

The conference hotel is about 5.5 km away from the Beihai Railway Station. It is recommended to take a taxi. The travel time is about 20 minutes. Travel cost will be about RMB 20. You can show this to the taxi driver

# "我要去北海火车站"

"I want to go to the Beihai Railway Station"

# 电话通讯服务在中国

对一些外国手机来说用中国的 SIM卡无法拨打电话。建议向您的通讯服务商购买国际漫游 或其他短期套餐以较低的费率拨打国际电话。也可使用 Skype拨打电话(在大多数情况下 在中国内地是可用的,有时可能不太稳定)。

Phone services: Making a call with a Chinese SIM card may not work for some foreign mobile phones. It is suggested to arrange roaming or other short-term plans to allow international calls at a lower rate. Alternatively, making a call via Skype is working in Mainland China in most cases (sometimes may not be stable).

# 在中国内地被屏蔽的网站

几个常用的网站在中国大陆将无法正常工作,如所有谷歌 app或网(谷歌搜索引擎, Gmail, 谷歌地图等), WhatsApp, Facebook和 YouTube。建议在出发前往中国内地前, 在你的手 提电脑及流动设备上申请私人VPN。 或提前准备其他 App或邮箱账号在中国使用。

Websites blocked in mainland China: Several commonly used websites do not work in mainland China such as all Google APPs or websites (Google searching machine, Gmail, Google Map etc.),

WhatsApp, Facebook and YouTube. It is suggested to apply for a private VPN on your laptops and mobile devices before departure to mainland China. Or prepare other usable App or emails to use in China.

# 货币兑换

人民币准备

建议您尽量于出发前的所在地兑换人民币, 南宁市吴圩国际机场属于二线机场, 使用机场的 ATM机只能将英镑、美元、日元、欧元和港币兑换成人民币。您还可以在上海、香港、 北京等国内主要城市的机场换汇。白海豚国际酒店(钦州)和香格里拉酒店(北海)也可提供 货币兑换服务。

#### Chinese yuan (Renminbi) preparation:

#### it is suggested to exchange Chinese yuan at your residential place prior to departure,

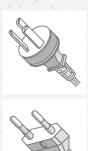
if feasible. Since Nanning Wuxu International Airport is a secondary-tier airport, only an ATM is available to exchange Chinese yuan from UK pound, US dollar, Japanese yen, Euro and Hong Kong dollar. You may also exchange the currency at the airports of Shanghai, Hong Kong, Beijing and other major cities in China when you are taking a connecting flight. White Dolphin International Hotel (Qinzhou) and Shangri-La Hotel (Beihai) will also provide currency exchange services.

# 电源

插头和插座类型

在中国有三种类型的插头使用:三叉角销,两个扁销(最常见)或两个窄圆销。电是 220伏, 50循环交流。使用下列插头。 请带备合适的适配器。

Plug and socket types: There are three types of plugs used in China – three pronged angled pins, two flat pins (the most common) or two narrow round pins. Electricity is 220 volts, 50 cycles AC. The following plugs are used. Please bring along your suitable adaptors.







# 语言翻译

本次会议将在6月16日和6月20日安排会议现场中英同声翻译,其他时间会议语言为英文。会场有翻译志愿者提供协助,如您有翻译需求,可以咨询工作人员或志愿者。 广西钦州和北海当地语言为中文,日常沟通主要语言为白话和普通话,建议您提前在 手机上安装语言翻译 APP,如谷歌翻译,腾讯翻译君等,以方便在当地使用。

**English-Chinese translations**: Simultaneous English-Chinese translation services will be provided during the meeting on June 16 and June 20 while English will be the major language for the presentations and other events. For regular communication, translation volunteers will be available to assist. You are welcome to consult any staff or volunteers if there is any need for language translation. The widely adopted language in Qinzhou and Beihai of Guangxi is Putonghua (Mandarin), and Baihua (a varied Cantonese slang) is also commonly used in daily communication. It is recommended to install an offline language translation APP on your mobile phone in advance, such as Google Translate and Tencent Mr. Translate, to facilitate your communications when travelling in China.

# 环保提示

为提倡环保办会,请自备饮用水瓶。大会将提供一份不含摘要的纸质会议手册。因此,您可根据个人需要从大会的官方网站下载会议报告摘要并打印。

**An eco-friendly conference**: To promote an eco-friendly conference, you are encouraged to bring your own water bottle. A hardcopy of conference booklet without presentation abstracts will be provided. Therefore, you may download the abstract book from the official website and bring along the abstract hardcopy, if needed.



单锦城 | Paul SHIN

香港城市大学化学系(退休)
Department of Chemistry, City University of Hong Kong (retired)

# 亚太区鲎物种保护的希望

**摘要:**在亚太地区鲎种群正遭受繁育地丧失的威胁,导致其在分布范围急速地下降。海岸带的发展和以食物及生物医药用途为目的的过度捕捞是导致鲎繁育地丧失的主因。虽然鲎在部分国家被列入红色名录或受当地法律的保护,但在部分地区若情况无法获得改善,鲎种群仍面临灭绝。除了持续开展的科研活动,亚太地区针对鲎所实施的保护措施是多样的,推广鲎演化史和其在生态维护的重要性在提升公众意识上也有很大的可探索空间。本次报告着重于亚太区鲎种群的保护现状以及在鲎专家组协调下中国鲎在世界自然保护联盟红色名录评估的进展。同时建议启动国际合作以为亚太区鲎种群的保护共同目标努力。

关键词:亚洲区鲎种群、保护状况、红色名录评估、中国鲎、国际合作

# **Hope for Horseshoe Crab Conservation in Asia-Pacific**

Abstract. Horseshoe crabs in Asia-Pacific are under various threats, including loss of spawning/nursery habitats due to coastal development and overharvest for food and biomedical use, which cause their decline in populations across their distribution range. While horseshoe crabs are on the "Red Data" list and/or under protection regulations in some countries, they may still face eventual extirpation in some areas if current situation continues. Across Asia-Pacific, conservation efforts vary and much can be implemented to raise public awareness on the importance of horseshoe crabs in evolutionary history and ecosystem health, apart from ongoing scientific studies. This presentation addresses the conservation status of Asian horseshoe crabs and reports on the work of the IUCN Red List Assessment of *Tachypleus tridentatus* through the coordination of the Horseshoe Crab Specialist Group. Suggestions to initiating international collaborations towards a common goal to protect Asian horseshoe crabs are presented.

**Keywords.** Asian horseshoe crabs, conservation status, Red List Assessment, *Tachypleus tridentatus*, international collaborations

# Jennifer MATTEI Department of Biology, Sacred Heart University



# 公民科学的力量: 鲎社区研究二十年, 保育和教育相结合

摘要:在1997年,人们对美国东北部河口的长岛海峡(LIS)的美洲鲎种群知之甚少。长岛海峡的 965公里海岸线由纽约州和康涅狄格州共有,海峡半径 80公里内有超过 2300万人居住。研究 LIS 鲎种群动态变化最合理的方式是让受过培训的志愿者参与对当地海滩上岸产卵的成年鲎进行标记和记录,Limulus项目便是因此而设立。Limulus项目旨在培训所有年龄段的志愿者以便收集鲎种群动态的数据。基于公众和学校的教育项目每年招募新的志愿者,促进鲎的保护,并将 LIS 生态系统的重要性和人类的健康紧密联系在一起。公民科学是公众积极参与科学研究的重要形式。它起源于中国,可追溯到几千年前,古人以此追踪农作物虫害的爆发。如今,全世界数千个项目借助公民科学家的力量获得了其他方式无法企及的大数据。自 1998年以来,数百名公民科学家通过 Limulus项目标记并报告了 LIS 两岸重复出现的鲎。R语言被用于绘制大约 14000只鲎的动态。LIS 被分成五个区域,收集种群遗传数据并进行交互式应用,使研究者或管理者了解制定一个针对该物种的综合管理计划的必要性。在这个过程中,我们发现旗舰物种的应用对于参与者来说具有持续的保护价值,哪怕这个物种并非有魅力的大型动物。Limulus项目的公众参与,也促进了河口地区的在地保护,并带动了长岛海峡一带滨海生境的有效恢复。

# The Power of Citizen Science: Twenty Years of Horseshoe Crab Community Research Merging Conservation with Education

Abstract. In 1997, very little was known about the horseshoe crab population (Limulus polyphemus) in Long Island Sound (LIS) an urban estuary in northeastern USA. Over 23 million people live within an 80 km radius of LIS and the 965km coastline of this large estuary is shared by the states of New York and Connecticut. The most logical way to study the population dynamics of the horseshoe crab in LIS was to involve trained volunteers to tag and record observations of spawning adults on local beaches throughout LIS, and so Project Limulus was established. Project Limulus educates volunteers of all ages to gather data on horseshoe crab population dynamics. Public and school based educational programs recruit new volunteers each year, promote conservation of horseshoe crabs and help make the connection to the importance of LIS ecosystem and general human health. Citizen Science, the active public involvement in scientific research, originated in China and can be traced back several millennia where residents tracked crop pest outbreaks. Today, citizen scientists help generate very large data sets which are not possible to obtain by other means on thousands of projects worldwide. Hundreds of citizen scientists, through Project Limulus, tagged and reported re-sightings of horseshoe crabs on both sides of LIS since 1998. Coding language R was used to map the movements of ~14,000 horseshoe crabs. LIS was divided into five regions where population genetic data was collected and an interactive application was made to allow researchers/managers understand the need for a comprehensive management plan for the species. We have found that the use of a flagship species, even one that is not a charismatic megafauna, has lasting conservation value for participants. Participation in Project Limulus has resulted in local conservation efforts of estuaries and active restoration of coastal habitats around LIS.



Jayant K. MISHRA

# 气候变化下鲎可持续增长和生存的挑战与相应保护策略

摘要:潮间带生境非常复杂,因其丰富的生物多样性被认为是最具活力的海岸生态系统。它涵盖了多种生境类型,包括沙滩、泥滩、盐沼地、红树林、草地、潮沟等。这些高异质性的沿海生境不仅支撑了此处生机勃勃的生物多样性,而且提供着无法估量的生态系统服务价值。虽然这些生境相互独立,但它们也是相互依存、并随着环境过程和生态条件同步发挥功能的。这些沿海栖息地的特殊性也因四种现存的鲎——巨鲎、圆尾鲎、中国鲎和美洲鲎——得以详细记录。这四种鲎现今都被认为是濒危物种,都面临着严重威胁。

但是近年来,全球气候变化的影响及其对沿海环境中不同生境类型造成的长期不可逆转的损害已成为人们关注的主要问题。这些威胁可能会影响沿海生态系统,甚至带来沿海地貌的改变。在全球气候变化和人类干扰的综合影响下,鲎繁殖地的丧失日益加剧。由于频繁的自然灾害和越来越多的不受管控的人为干扰带来的全球气候变化迫在眉睫,通过采取适当的生境管理策略来保护生境结构、并从利用和分层模式的角度来保护极度脆弱的环境,以抵御全球气候变化的影响,显得至关重要。本文讨论了鲎繁殖地可行的保护策略。

# Horseshoe Crabs in the Face of Climate Change: Future Challenges and Conservation Strategies for their Sustainable Growth and Existence

Abstract. Intertidal habitats are very complex, which is considered as the most dynamic living shore line endowed with rich biodiversity. It envisages variety of habitat types including sandy beaches, mud flats, marsh lands, mangroves, grass lands, creeks etc. These heterogenic coastal habitats not only support vivid biodiversity but also provide innumerable ecosystem-based services. Though these habitats are independent, but they are interdependent and function in synchrony with the environmental processes and ecological conditions. These coastal habitat specificities are well documented in case of four extant species of horseshoe crabs *Tachypleus gigas*, *Carcinoscorpius rotundicauda*, *Tachypleus tridentatus*, and *Limulus polyphemus*, which are considered as endangered species in the world. These are severe threats. Each of these species are adapted to specific environmental conditions for their egg laying by making nests in their preferred location in the intertidal zone. The breeding process found to be very unique with the selection of a specific nesting breeding zone with the involvement of specialized sensory mechanism. However, structural characteristics of breeding beach sediments play pivotal role in providing optimal incubating conditions for the development of eggs till they attend trilobite stage.

But in recent years, the impact of global climate change and its inflicting long-term irreversible damage on different habitat types in the coastal environment has become major concern. The major threat being the ecosystem and bring changes in coastal geomorphology. As a result, the loss of breeding habitats due to the compounding effect of disturbed global climatic conditions and human interference is increasing day by day. It is thus paramount to protect the habitat structure by adopting proper habitat management strategy and protect this highly fragile environment in terms of their utilization and stratification pattern to withstand any impact in the face of the global climate change, which is undeniably imminent due to frequent natural calamities and increased unregulated anthropogenic interference. The probable strategies towards the conservation of breeding beaches of horseshoe crabs are discussed.



**廖永岩 | Yongyan LIAO** 北部湾大学海洋学院 College of Marine Sciences, Beibu Gulf University

# 中国的鲎科学与保护研究

摘要: 祖述宪等人,1975 年将美洲鲎试剂生产方法引入中国,上世纪80 年代开始,夏振民、丁 友玲、吴洪伟等进行中国鲎血细胞研究,并开始利用中国鲎生产鲎试剂。广西海洋研究所的梁广 耀, 1982 年进行中国鲎人工育苗, 1984 年进行中国鲎人工养殖, 1985 年进行北部湾鲎资源调 查,1986年在中国发现圆尾鲎,弄清中国有中国鲎和圆尾鲎分布,是中国系统进行资源调查、 养殖和人工育苗的第一人。厦门大学生的洪水根 1985 年进行电刺激中国鲎催产, 1986 年阐明中 国鲎卵膜发生, 1987年阐明中国鲎卵黄的发生, 1988年阐明中国鲎卵子的发生, 1995年阐明 中国鲎精子的发生,1997年进行血蓝蛋白研究,1998年,研究鲎素抗菌活性,2000年,研究中 国鲎血细胞发生,2013年,出版《中国鲎生物学研究》。是中国系统进行中国鲎生殖生理和鲎素 研究的第一人。北部湾大学廖永岩 1997 年进行中国鲎人工授精育苗, 1998 年将鲎素引入中国, 与洪水根一道,启动了中国的鲎素研究。2000年在冬季发现中国鲎,2000年开始系统研究中国 的食鲎中毒,阐明了发生于中国的食鲎中毒问题,2000年,发现中国鲎资源濒危,2001年澄清 中国南方海域的鲎的种类及分布,提出保护策略,2002年鉴定清楚中国海域的黄皮鲎、蓝皮鲎、 鬼鲎、黑皮鲎,证明中国只有中国鲎和圆尾鲎分布,2006年澄清亚洲海域的鲎种类及分布。廖 永岩是创建中国的鲎保护生物学,并系统进行中国海域的食鲎中毒研究的第一人。此外,厦门大 学汪德耀(1983)和蔡心一(1984)、福建医学院的梁平(1981)和吴翊钦(1993)对中国鲎的 血液和幼体发育、消化道进行了细胞学研究; 集美大学的翁朝红对中国鲎的胚胎发育、细胞发 育、生物多样性等生物生态学进行了研究。2010年开始,广西水产科学研究院的李琼珍团队, 对中国鲎的保护生物学及生物生态学,进行了研究。

关键词: 中国、中国鲎、鲎试剂、人工育苗、保护生物学、鲎素、食鲎中毒

#### The Research of Science and Conservation of Horseshoe Crabs in China

**Abstract.** Research on *Tachypleus tridentatus* amebocyte and the production of *Tachypleus* amebocyte lysate (TAL) started in the 1980s by Zhenmin Xia, Youling Ding and Hongwei Wu, after the transfer of LAL manufacture techniques into China in 1975. Guangyao Liang from the Guangxi Marine Institute conducted captivity breeding of T. tridentatus in 1982, their artificial culture in 1984 and population investigation within Beibu Gulf in 1985, and first discovered Carcinoscopius rotundicauda in China in 1986. He is considered as the first scientist in China who clarified the distribution pattern of *T. tridentatus* and *C. rotundicauda* in China, and conducted systematic research on the population and artificial rearing of *T. tridentatus*. Prof. Shuigen Hong from the Xiamen University utilized electric stimulation techniques to enhance egg release from T. tridentatus in 1985, and researched on the oogenesis process in 1986-1988, hemocyanin in 1997, antibacterial activity of tachyplesin in 1998, and formation of amebocytes in 2000. Prof. S.G. Hong has summarized his research findings and published a book entitled "Biology of Horseshoe Crabs, Tachypleus tridentatus" in 2013. He is therefore recognized as the pioneer who conducted systematic research on breeding, physiology and tachyplesin in China. His work has been continued by Prof. Yongyan Liao from the Beibu Gulf University. He worked on artificial fertilization and captivity breeding of T. tridentatus in 1997, and researched on tachyplesin in 1998 with Prof. S.G. Hong. Prof. Liao recorded T. tridentatus during the winter in 2000, and in the same year he addressed the food poisoning cases due to horseshoe crab consumption. In 2000, he noted the threatened status of T. tridentatus, clarified the distribution of horseshoe crab species in the southern waters, and proposed conservation actions. In 2002, he summarized that there are only *T. tridentatus* and *C. rotundicauda* in Chinese waters to overcome the widespread misconceptions that other horseshoe crabs such as yellow-skin horseshoe crab, blue-skin horseshoe crab, ghost crab and black-skin horseshoe crab are other horseshoe crab species present in China. In 2006, he also clarified the species and distribution of horseshoe crabs in Asian waters. Prof. Liao is acknowledged as the first in China working on the conservation biology of T. tridentatus, and investigated food poisoning involving horseshoe crabs. Apart from that, Deyao Wang (1983) and Xinyi Cai (1984) from the Xiamen University, P. Liang (1981) and Y.Q. Wu (1993) from the Fujian Medical College implemented cellular research on hemolymph, growth and intestine of T. tridentatus; Zhaohong Weng from the Jimei University enhanced the understanding of embryo and cellular development, and ecological perspective of T. tridentatus. Since 2010, a research team led by Qiongzhen Li from the Guangxi Academy of Fishery Sciences has been working on the conservation biology and ecology of T. tridentatus.

**Keywords.** China, *Tachypleus tridentatus, Tachypleus* amebocyte lysate, laboratory culture, conservation biology, tachyplesin, food poisoning due to horseshoe crab consumption

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2	Sheikh SAJAN	B Tripathy	India	Zoological Survey of India	Potential habitat requirement of horseshoe crabs <i>Carcinoscorpius rotundicauda</i> and <i>Tachypleus gigas</i> in North-east Coast, India
3	Siddhartha PATI	SN Acharya, D Nandi, B Panda, BP Dash, S Tudu	India	Fakir Mohan University	Predicting the potential distribution of horseshoe crabs (Tachypleus gigas) along Odisha coastline incorporating Climate Change by Using Maximum Entropy Modeling
4	Gobinda Ch. BISWAL	S Pati, BP Dash	India	Association for Biodiversity Conservation & Research	Morphological abnormalities in Indian horseshoe crabs,  Tachypleus gigas
5	Naila K. AINI	R Kurnia, NA Butet, A Mashar, Y Wardiatno	Indonesia	Bogor Agricultural University	Does Indonesian <i>Tachypleus</i> tridentatus the same population stock as other Asian <i>Tachypleus</i> tridentatus stock?: a simple genetic approach
6	Shinji ITAYA	S Seino, M Shuuno, A Sakurada, R Koshiguchi	Japan	Kyushu University	Spawning site selection of the endangered horseshoe crab  Tachypleus tridentatus at  Tsuyazaki Cove in Fukuoka,  Japan
7	Yuyuan BAO	GL Ye, XY Xie	Mainland China	Chinese Academy of Fishery Sciences	Effects of morphological characters on body weight of artificially bred the first instars of horseshoe crabs <i>Tachypleus</i> tridentatus
8	Yijian FU	SY Huang, Z Wu, MD Su, XP Wang, YY Liao, KY Kwan	Mainland China	Beibu Gulf University	Sociodemographic drivers and public perceptions of consumption and conservation of Asian horseshoe crabs in northern Beibu Gulf, China
9	Juan LEI	JY Su, YY Liao, PL Wang, WF Li	Mainland China	Beibu Gulf University	The acute toxicity test of potassium permanganate on Tachypleus tridentatus

10	Wenrong YANG	JF He, Z Wu, SY Huang, YJ Fu, XY Huang, X Huang, YY Liao, XP Wang, KY Kwan	Mainland China	Beibu Gulf University	Asian horseshoe crab conservation: knowledge, attitudes and intentions of local college students in Beibu Gulf, China
11	Lusita MEILANA	QH Fang	Mainland China	Xiamen University	Local knowledge-based study on the status of horseshoe crabs along the Indonesian Coast
12	Lizhe CAI	XW Chen, YY Rao, DY Yang, BW Chen, WQ Peng, SJ Fu, ZW Huyou, WH Wang	Mainland China	Xiamen University	Benthic macrofaunal community at horseshoe crab habitat in Eyu Islet intertidal zone, Xiamen, China
13	Sujing FU	YY Rao, DY, Xinwei CHEN, Deyuan YANG, Lizhe CAI	Mainland China	Xiamen University	Nematode assemblages in horseshoe crab habitat in Eyu Islet, Xiamen, China
14	Xinwei CHEN	GQ Li, BW Chen, YY Rao, DY Yang, WQ Peng, LZ Cai	Mainland China	Xiamen University	Benthic macrofaunal community at horseshoe crab or sea turtle habitats in the southeast coast of China in summer
15	Hongke ZHANG	YJ Wu	Mainland China	Dugong National Nature Reserve	Public participation protection and preliminary study on habitat protection measures of Chinese horseshoe crabs in Shatian Area, Beibu Gulf, China
16	Abdul Halim ANIS SYAHIRA	M Faridah, A Fisal, N Ismail, TC Tuan Zainazor, AS Ahmad, FN Razali	Malaysia	Universiti Malaysia Terengganu	Bivalve selection and consumption by horseshoe crab in captivity
17	M ROZIHAN	P Nur Alisa, I Syuhaida, B Akbar John, HD Joni	Malaysia	University Putra Malaysia	Morphometric allometry of horseshoe crab ( <i>Tachypleus tridentatus</i> ) in north and east coast of Sabah, Malaysia
18	Mat Zauki NURUL– ASHIKIN	BR Nelson, N Fairuz- Fozi, B Satyanarayana	Malaysia	Universiti Malaysia Terengganu	Spawning ecology of  Carcinoscorpius rotundicauda  under reverse anthropic effects
19	Hsin-Yi YEH	HL Hsieh, YT Shu, JMC Yang, CP Chen	Taiwan	Academia Sinica	Local actions for conservation of the horseshoe crab, <i>Tachypleus tridentatus</i> , in Chiayi, Taiwan
20	Te-Shun HUNG	MC Yang	Taiwan	Kinmen Horseshoe Crab Conservation Association	Traditional culture-based public awareness and conservation actions for horseshoe crab at Kinmen Island, Taiwan
21	Huizhen ZHENG	E Hsu, A Martinelli, C Han, CP Chen	Taiwan	Chinese Cultural University	Designing an island protection program for horseshoe crabs in Kinmen

23	Yin-Tien SU  Ruth H  CARMICHAEL	CP Chen, MC Yang  M Estes Jr., J McFadyen, S Carter, E Hieb	Taiwan USA	Chiayi Ecological Environment Conservation Association Dauphin Island Sea Lab	Local extinction and restoration of horseshoe crab, <i>Tachypleus tridentatus</i> , in Chiayi, Taiwan  Horseshoe crab population response to natural and anthropogenic perturbations through time: Hurricane, oil spill, and a decade of change
24	Thomas O CARMICHAEL	RH Carmichael	USA	Phillips Preparatory School	Airsoft science: A test of horseshoe crab molt durability
25	Glenn GAUVRY	G Kreamer	USA	Ecological Research & Development Group	Tools for getting people to be aware and care: the Horseshoe Crab Teacher Toolbox revisited
26	Mark L BOTTON	K Mandeep	USA	Fordham University	Righting and burrowing behavior of juvenile <i>Limulus</i> in different sand substrates
27	H Jane BROCKMANN	S Barry, C Crowley	USA	University of Florida	Florida Horseshoe Crab Watch: Results from citizen science tagging and spawning surveys
28	Mark L BOTTON	S Zakrzewski	USA	Fordham University	Injuries in American horseshoe crabs ( <i>Limulus polyphemus</i> ) from Jamaica Bay, New York (USA)
29	Brett HOFFMEISTER		USA	Associates of Cape Cod, Inc.	Large scale IVF/culture system for supporting <i>Limulus</i> polyphemus populations
30	Guoling YE	Yuyuan BAO, Xiaoyong XIE	Mainland China	Chinese Academy of Fishery Sciences	Investigations of transcript expression on first instars of the juvenile horseshoe crab  Tachypleus tridentatus reveal impacts of cadmium

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# 主办方 Host

# 世界自然保护联盟(IUCN)物种生存委员会鲎专家组

世界自然保护联盟 I UCN 物种生存委员会鲎专家组旨在通过多方合作保护鲎种群和生境,提高公众对于鲎在演化意义、海洋近海生态和生物医药重要性的认知,从而达到保护全球鲎的目标。

## The International Union for Conservation of Nature (IUCN) Species Survival Commission Horseshoe Crab Specialist Group

The IUCN SSC Horseshoe Crab Specialist group aims to protect horseshoe crabs in the world through collaborative effort in conservation of their populations and habitats, and in raising public awareness of their importance in evolutionary history, marine coastal ecology and biomedical uses.

# 承办方 Organizers

# 北部湾大学

北部湾大学是一所以工学、理学、管理学为主,多学科协调发展的全日制普通高等学校,学校位于北部湾经济区核心港口城市钦州市。学校前身为1973年创办的钦州地区师范学校;2006年2月,升格为钦州学院;2018年11月底,教育部批准在钦州学院基础上设立北部湾大学。学校现有本科专业49个,硕士学位授权点3个,有全日制在校生14000多人。现有教职工1200多人,其中专任教师800多人。

学校形成了鲜明的海洋性办学特色,开设有海洋科学、水产养殖学、等一批涉海类专业,构建了海洋生物与技术、海洋交通运输与工程等具有海洋特色的学科专业群。有"水产""船舶与海洋工程"2个广西一流学科(培育)

## 广西北部湾海洋生物养护重点实验室

依托北部湾大学建设的广西省级重点实验室,主要从事鲎、中华白海豚等北部湾珍稀濒危生物,及生物多样性保护和资源修复研究。

## 北部湾大学广西水产一流学科 (培育)

#### **Beibu Gulf University**

Beibu Gulf University is located in Qinzhou, an Excellent tourism city in the center of the coastal area in Guangxi as well as the core industrial area of Guangxi Beibu Gulf Economic Zone. It was founded in 1973 as Qinzhou Normal College and upgraded to a comprehensive university in 2006. Covering 138 hectares, the newly-built campus, with avenues of green trees and patches of lush grass, are the ideal place for study and research. At present, the university offers 43 undergraduate programes, including marine science, port logistic, shipping engineering, navigation technology, aquaculture, port mechnical, chemical engineering and technology craft, tourism management, environmental design and others.

## Guangxi Key Laboratory of Beibu Gulf Marine Biodiversity Conservation

Affiliated to Beibu Gulf University, Guangxi Key Laboratory of Beibu Gulf Marine Biodiversity Conservation focuses on the conservation and recovery of horseshoe crabs and Chinese White Dolphins and other threatened populations in Beibu Gulf.

#### Guangxi First-Class Aquaculture Platform (Incubation)

# 美境自然(全称"广西生物多样性研究和保护协会")

美境自然是由广西从事生物多样性研究、保护和可持续利用的学者、保护工作者及业余爱好者自愿发起和成立的,也是广西第一家专业从事生物多样性保护的社团组织。 美境自然倡导人人都是自然保护者,相信人人都有责任、有能力保护自然,再微小的保护行动都能创造更美好的生活。美境自然通过促进公众参与、提高当地人的保护能力来保护桂西南喀斯特生态系统和北部湾滨海生态系统。

愿景:促进人类社会与自然生态系统的和谐共存和可持续发展。

**使命**:致力于在科学研究的基础上,充分考虑当地人的需求,鼓励公众参与,选择可持续性的解决方法保护广西的濒危物种和关键生态系统。

美境自然是北部湾地区首个大规模推动公众参与、多方合作滨海生态系统保护的民间自然保护组织。自2014年起,美境自然在广西北部湾约1600公里的海岸线上建立了22个监测点,开展鲎类种群调查、底栖生物多样性调查、迁徙水鸟监测、迁徙猛禽监测等长期调查和监测行动,获得了该地区关键栖息地和生物多样性的关键数据。 美境自然推动发起的"不吃鲎消费倡导"是第一个针对餐饮业解决中国鲎过度利用问题的多方参与的保护行动,吸引了多个政府机构、媒体、企业和公众参与并采取行动,并在广西三大沿海城市之一的北海发展了110多家"不吃鲎"海鲜餐厅。

#### **Guangxi Biodiversity Research and Conservation Association (BRC)**

Initiated by a group of local scientists, nature reserve staff and nature lovers who are contributing to biodiversity research, conservation and sustainable utilization, BRC is the first biodiversity conservation NGO in Guangxi. BRC advocates everyone is a nature conservationist as it is believed that everyone in the world has duty of and is capable of conserving nature and even the smallest action can bring better life. By applying the approaches of capacity building and public participation, the association is committed to conserving the limestone ecosystems in southwestern Guangxi and the coastal ecosystems in the Beibu Gulf.

**Vision**: to promote the harmonious co-existence and sustainable development of human society and natural ecosystems.

**Mission**: to conserve endangered species and important ecosystems in Guangxi through encouraging public participation and adopting sustainable solutions based on scientific research and thoroughly consideration of local needs.

BRC is also the first local conservation NGO promoting public participation and multi-level cooperation in coastal ecosystem conservation in the Beibu Gulf. On the 22 monitoring sites along the 1600m long coastline of Guangxi, it has been carrying out long-term investigation and monitoring since 2014, including horseshoe crabs population surveys, benthic invertibrate biodiversity survey, migratory seabirds monitoring and migratory raptors monitoring, and obtaining key data of important habitats and biodiversity in the region. Furthermore, it initiated the "No Horseshoe Crab Consumption Campaign", the first multi-stakeholder engagement conservation action to tackle the over-exploitation issue of Chinese horseshoe crab. This campaign has attracted the participation of many governmental agencies, media, enterprises and the public. Up to now, over 110 seafood restaurants in Beihai, one of three major coastal cities in Guangxi, have joint in the action and become "Horseshoe Crab Friendly Restaurants".

# 指导单位 Advisory Organization

#### 全国水生野生动物保护分会

全国水生野生动物保护分会成立于2007年,业务归口农业农村部渔业渔政管理局,是目前国内从事水生野生动物保护唯一的全国性社团组织。分会先后设立大鲵委员会、鲟鱼委员会、水族馆委员会、自然保护区委员会和专家咨委员会。在农业农村部的领导和支持下,分会牵头组织成立由相关行政部门执法机构、保护区管理机构、科研院所、高等院校、爱心企业及社会团体等参与的中华白海豚保护联盟、中国鲟鱼产业联盟、中华鲟保护拯救联盟、长江江豚拯救联盟、中国海龟保护联盟、斑海豹保护联盟,联盟成员单位超过400家。

#### National Aquatic Wildlife Conservation Association (NAWCA)

NAWCA was established in 2007 and has been under the jurisdiction of the Bureau of Fisheries, Ministry of Agriculture and Rural Affairs of the People's Republic of China. It is the only national association that is engaged in the conservation of aquatic wildlife in China. NAWCA has led the establishment of the Giant Salamander Committee, the Sturgeon Committee, the Aquarium Committee, the

Nature Reserve Committee and the Expert Advisory Committee. Under the leadership and support of the Ministry of Agriculture and Rural Affairs of the People's Republic of China, NAWCA has joined hands with the relative administration agency, protected area management institutions, research institutes, universities, philanthropic enterprises to establish the Chinese White Dolphin Conservation Alliance, the China Sturgeon Industry Alliance, the Chinese Sturgeon Conservation Alliance, the Saving Yangtze River Finless Porpoise Alliance, the China Sea Turtle Conservation Alliance, and the Leopard Seal Protection Alliance. There are over 400 members of the alliances in the NAWCA.

# 协办方 Co-organizers

## 阿拉善SEE广西项目中心

阿拉善SEE广西项目中心始终聚焦关注广西的生物多样性保护及广西流域及珠江上游流域的水资源保护、流域治理、湿地保护等水保育工作,以及针对北部湾沿海地区开展滨海湿地保护工作。

#### SEE Society of Entrepreneurs and Ecology, Guangxi Programme

SEE Guangxi Programme focuses on biodiversity conservation in Guangxi, water conservation in Guangxi and the upper reaches of the Pearl River like water resources protection, watershed management, wetland protection, as well as coastal wetland ecosystem conservation in coastal areas of Beibu Gulf.

## 香港海洋公园保育基金

香港海洋公园保育基金透过协作、科研及教育致力提倡促进及参与于亚洲区的野生生态保育 工作,与各界携手保护野生生态长久繁盛丰饶。

#### Ocean Park Conservation Foundation, Hong Kong (OPCFHK)

OPCFHK is committed to advocating, facilitating and participating in effective conservation of Asian wildlife through partnerships, fundraising, research and education. It envisions a world where Asian wildlife remains biologically diverse under the stewardship of humans, corporations and government

## 生态研究及发展机构

生态研究及发展集团成立于1995年,是一个关注全球四种鲎的保护的非盈利组织。我们的使命是寻求解决方案,防止或减轻人类活动对本地野生动物种群和栖息地造成的损害。 我们 通过科学研究和发展、环境规划和管理以及公共教育和外联来实现这一目标。

#### The Ecological Research & Development Group (ERDG)

ERDG founded in 1995, is a non-profit wildlife conservation organization whose primary focus is the conservation of the world's four horseshoe crab species. Our mission is to seek solutions that prevent or mitigate damage to native wildlife populations and habitats due to human activities. ERDG accomplishes this goal through scientific research & development, environmental planning & management, and public education and outreach. ERDG works to inspire and assist individuals, communities and organizations to solve problems, change behaviors and promote sound decisions in order to achieve sustainable ecosystems.

#### 广西红树林研究中心

广西的综合性、公益性海洋科学研究机构,以红树林、海草床、珊瑚礁、盐沼和滨海植被为 主要研究对象,为北部湾海洋环境保护恢复与管理提供科技保障。

#### **Guangxi Mangrove Research Center (GMRC)**

With main research objects as mangroves, seagrass beds, coral reefs, salt marshes and coastal vegetation, GMRC is a comprehensive and commonweal marine scientific research institution in Guangxi, contributing to providing scientific and technological guarantee for marine environmental protection rehabilitation.

#### 广西动物学会

广西动物学会成立于1978年,学会宗旨是推动广西动物科学发展,为广西地方社会经济发展服务。

#### **Guangxi Zoology Society**

Established in 1978, Guangxi Zoology Society aims at promoting development of zoology in Guangxi to serve local social economic development.

## 广西野生动植物保护协会

广西野生动植物保护协会成立于1983年。协会宗旨是组织动员社会力量,广泛开展科普宣传教育,提高广西民众的生态保护意识;加强科技交流与合作,促进野生动物保护科学技术的发展,拯救珍稀濒危物种,保护生物多样性,全面发挥其生态效益、社会效益和经济效益,推动广西野生动物保护事业与社会经济的协调发展,促进人与自然的和谐。

#### Wildlife Conservation Association of Guangxi Province

Wildlife Conservation Association of Guangxi Province aims to mainstream popular science education and promote public participation to raise public awareness of conservation in Guangxi. The Association also aims to improve the development and collaboration of wildlife conservation science and technology for better conservation of rare or endangered species and biodiversity, and for the harmonious co-development of conservation and social economy.

# 支持方 Sponsors

崔斯特深圳创新技术 (深圳)

Tracetech (Shenzhen) Co. Ltd

## 广西壮族自治区 海洋研究所

广西海洋研究所是一家专门从事海洋生物技术研究、应用及推广的省级科研机构。单位以海洋新品种繁育与技术服务为业务重点。

#### **Guangxi Institute of Oceanology**

Guangxi Institute of Oceanology is a provincial scientific research institution specializing in marine biotechnology research, application and promotion. Emphasis is placed on the artificial breeding and technical service.

#### 广西合浦儒艮国家级自然保护区管理站

我国中华白海豚主要的栖息地区之一,有典型海草床。主要保护对象为儒艮、中华白海豚、绿海龟、中国鲎、海草床、红树林生态系统等。

#### **Guangxi Hepu State Dugong Natural Reserve**

Guangxi Hepu State Dugong Natural Reserve is one of the core habitats of Chinese White Dolphin, *Sousa chinensis* in China. The main conservation targets include dugong, Chinese White Dolphin, green turtle, Chinese horseshoe crab, seagrass bed, mangrove ecosystem, etc.

# 广西北海滨海国家湿地公园管理处

广西北海滨海国家湿地公园总面积2009.8公顷,是我国南部沿海"库塘-河流-近海"复合湿地生态系统的典型代表。湿地公园动植物资源十分丰富,拥有近200公顷的原始红树林,野生动物200多种。

#### **Beihai Binhai National Wetland Park**

Beihai Binhai National Wetland Park possess a total area of 2009.8 hectares. The Park is a typical example of water storage-offshore-seacoast complex wetland ecological system in southern China. The wetland park has abundant wildlife resources. The Park accommodates about 200 hectares of mangrove and more than 200 species.

# 北海金海湾红树林生态旅游区管理有限公司

北海金海湾红树林生态旅游区是广西极富滨海湿地风情和渔家文化内涵的黄金景点,也是中国滨海湿地生物多样性重点区域。

## Beihai Golden Bay Mangrove Forest Ecological Tourism Zone Management Co., Ltd.

Beihai Golden Bay Mangrove Ecotourism Zone is a popular scenic spot with rich experiences of coastal wetland fisherman cultures in Guangxi. The Zone is also a hotspot of coastal wetlands biodiversity in China.

# 钦州会议酒店位置地图

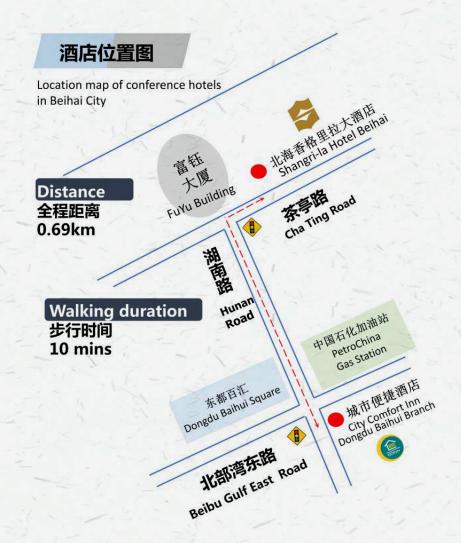
Location map of conference hotels in Qinzhou City



北部湾大学地图 Campus map of Beibu Gulf University



北海会议酒店位置地图 Location map of conference hotels in Beihai City





会议指南下载 Workshop Program Download

# 主办方 Host



# 协办方 Co-organizers













# 支持方 Sponsors

承办方 Organizers

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崔斯特深圳创新技术(深圳) 广西壮族自治区 海洋研究所 广西合浦儒艮国家级自然保护区管理站 广西北海滨海国家湿地公园管理处北海金海湾红树林生态旅游区管理有限公司

美境自然

# 指导单位 Advisory Organization



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