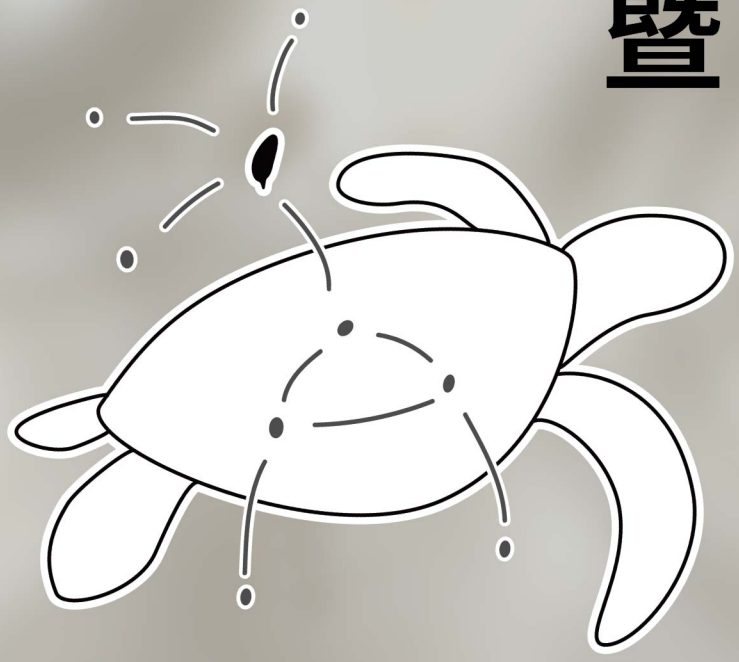
2025 ASIA REGIONAL MEETING AND
WORKSHOPS ON SEA TURTLE CONSERVATION

亞洲海龜保育會議
暨工作坊



2025

2025
International
Cetacean and
Sea Turtle
Summit Series -
Taiwan

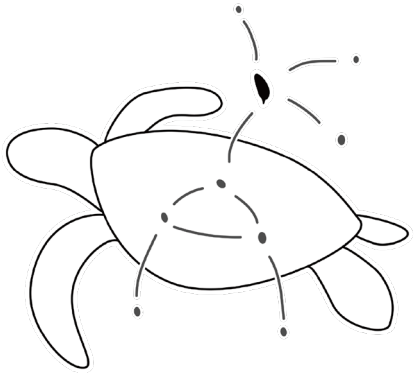
09/30
10/01
10/02

高雄 Kaohsiung

小琉球 Liuqiu Island

2025
亞洲海龜保育會議暨工作坊

2025 ASIA REGIONAL MEETING AND WORKSHOPS ON SEA TURTLE CONSERVATION



主辦單位 Organizers

中華鯨豚協會 Taiwan Cetacean Society

海洋委員會海洋保育署 Ocean Conservation Administration

社團法人台灣海龜點點名協會 TurtleSpot Taiwan

協辦單位 Co-organizers

香港城市大學海洋動物影像解剖研究組 Aquatic Animal Virtopsy Lab (CityUHK)

社團法人台灣咾咕嶼協會 Taiwan Coral Island Association

澄洋環境顧問有限公司 IndigoWaters Institute

伍家恩 博士 Dr. Connie Ka Yan NG

高雄市政府經濟發展局 Economic Development Bureau, Kaohsiung City Government

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Session (5) Environmental education and outreach effectiveness
講座主題 (5) 環境教育和推廣

Session (6) Others
講座主題 (6) 其他

Session (7) Application of photo-identification in monitoring
講座主題 (7) 海龜個體辨識的應用

About the 2025 Asia Regional Meeting and Workshop on Sea Turtle Conservation

關於 2025 年
亞洲海龜保育會議暨工作坊

The partnership for the **2025 International Cetacean & Sea Turtle Summit** began with an online conference call in January 2025. Geographically, both Taiwan and Hong Kong are situated on the East Asian continental shelf, close to the Pacific Ocean. Ecologically, they are crucial habitats for finless porpoises, Indo-Pacific humpback dolphins, and sea turtles. The waters in both regions are known for their high marine biodiversity, but these creatures face severe threats, including vessel strikes, fishing gear entanglement, marine construction, and ocean pollution.

The 2025 International Cetacean & Sea Turtle Summit is a collaborative effort between the Taiwan Cetacean Society, Aquatic Animal Virtopsy Lab (CityUHK), as well as local government agencies and NGOs. The summit will take place in Taiwan and Hong Kong in September and October 2025, respectively. The theme of the summit is **"Empirical & Evidence,"** with the goal of using scientific evidence to foresee and prevent current and future conservation issues. It also aims to provide a platform for attendees to share their research findings and the latest technologies in cetacean and sea turtle biology and ecology, and to network with peers to foster future collaborations.

The summit will feature two workshops covering a wide range of topics, along with an Asia regional meeting on cetacean and sea turtle conservation. This will allow participants from over 10 countries and regions to discuss region-specific issues and engage with the general public. The main days of the symposium will include keynote talks, oral presentations, social events, and excursions to famous marine localities in both Taiwan and Hong Kong.

2025 年 1 月一個線上的電話會議開啟了國際鯨豚、海龜高峰會的合作步伐。在地理位置上台灣與香港都位於東亞陸棚、鄰近太平洋；在海洋生態上也都為白海豚、露脊鼠海豚與海龜的重要棲地。這兩處的海，生物多樣性都很高，但居住其中的海洋生物也面臨相同嚴峻的挑戰：船隻撞擊、漁業干擾、海洋工程與海域汙染等干擾。

2025 年國際鯨豚和海龜高峰會由中華鯨豚協會、香港城市大學海洋動物影像解剖研究組以及當地政府和非政府組織聯合發起，將於 2025 年 9 月和 10 月分別在台灣、香港舉行。高峰會主旨是「實證與證據」，目標是透過科學實證，預見並預防當前及未來可能發生的保育問題，並為與會者提供一個平台，分享他們在鯨豚和海龜生物學和生態學領域的研究成果和最新技術，並與同行建立聯繫，促進未來的合作。

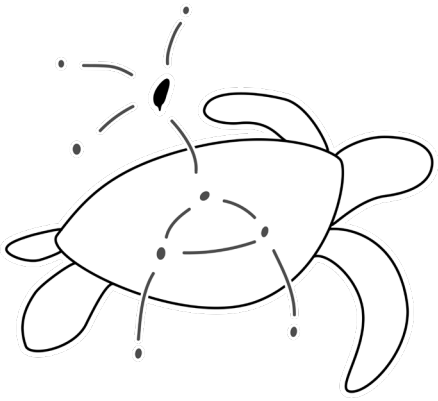
本次高峰會將舉辦兩場涵蓋廣泛主題的研討會，以及一場鯨豚與海龜保育的亞洲區域會議。這將讓來自超過 10 個國家或地區的與會者，有機會討論各區域特有的問題，並與大眾交流。連續幾天的研討會，包括主題演講、邀請短講、社交活動，以及前往台灣與香港一些著名海洋景點的考察行程。

中華鯨豚協會 Taiwan Cetacean Society

香港城市大學海洋動物影像解剖研究組 Aquatic Animal Virtopsy Lab (CityUHK)

Venue

大會資訊



2025 Asia Regional
Sea Turtle Meeting & Workshop

Sep 30th to Oct 1st: Kaohsiung Software Park

09/30-10/01 高雄軟體園區

(高雄市前鎮區復興四路 12 號中庭交誼廳)

Oct 2nd: The Liuqiu Management Station and Visitor Center

10/02 小琉球遊客中心

(屏東縣琉球鄉民族路 20 號)

Contact 聯絡資訊

tw.seaturtlemeeting@gmail.com

About the co-organizers and supporting organizers

主辦及協辦單位介紹

Co-organizers 主辦單位

Taiwan Cetacean Society

Established in 1998, TCS has been dedicated to cetacean conservation, focusing on stranding rescues, marine education, and promoting marine public awareness. In addition to our efforts with cetaceans, we have begun rescuing and promoting education about stranded sea turtles since 2020. In 2023, we established Taiwan's first privately run sea turtle rescue station. We are currently involved in habitat monitoring for sea turtles and finless porpoises, working to advocate for the survival rights of both cetaceans and sea turtles.

中華鯨豚協會

成立於 1998 年，長期致力於鯨豚擱淺救援、海洋教育、海洋公共開發監督等鯨豚保育工作。此外，2020 年起開始進行擱淺海龜的救援與教育推廣工作，於 2023 年建立台灣唯一民間專營的海龜救傷站。目前，我們投入海龜與露脊鼠海豚的棲地監測，努力為鯨豚、海龜的生存權而發聲。

Ocean Conservation Administration

The Ocean Conservation Administration (OCA) is Taiwan's authority for conserving marine protected wildlife. Through the Marine Animal Rescue Network (MARN), it conducts sea turtle and cetacean rescues and publishes quarterly stranding reports. In 2024, OCA launched the Sea Turtle Conservation Plan, combining policy, scientific surveys, and public participation to advance habitat protection, rescue networks, and education, underscoring its key role in sea turtle conservation.

海洋委員會海洋保育署

海保署是臺灣海洋保育類野生動物的主管機關。透過「海保救援網（MARN）」進行海龜及鯨豚救援，每季公布擱淺資訊，增進社會理解與研究應用。2024 年發布《海龜保育計畫》，結合政策、科學調查與社會參與，推動棲地保護、救援網絡及教育宣導，展現守護海龜的重要角色。

海 龜 點 點 名
TurtleSpot Taiwan

TurtleSpot Taiwan

A non-profit organization dedicated to sea turtle research and citizen science. Since 2017, the association has invited divers to contribute sighting information and images, building Taiwan's sea turtle photo-ID database and bringing the public closer to these marine animals. In recent years, it has conducted research in Liuqiu Island, Hengchun, and Green Island, while actively participating in international conferences to raise global awareness of Taiwan's sea turtles.

社團法人台灣海龜點點名協會

以海龜研究及公民科學為主的非營利組織，從 2017 年開始邀請潛水員提供海龜目擊資訊和影像，建構台灣海龜戶口名簿，拉近大眾與海洋海龜的距離。近年，陸續於小琉球、恆春和綠島等地進行海龜調查研究，積極參與國際會議，讓更多人認識台灣的海龜。

Co-organizers 協辦單位

Aquatic Animal Virtopsy Lab, City University of Hong Kong

Since 2014, the group has studied the health of cetaceans and sea turtles through field surveys, imaging, dissections, and specimen preparation. It has established a database to strengthen scientific knowledge and raise public awareness of marine conservation.

香港城市大學海洋動物影像解剖研究組

自 2014 年起，藉由海上考察、影像學、解剖和標本製作等不同的技術，調查鯨豚和海龜的健康狀況，並建立資料庫，加強大眾對海洋保育的意識。

Taiwan Coral Island Association

Based in Liuqiu Island, Taiwan, the Taiwan Coral Island Association (also called the Taiwan Loo-Koo-Yu) is committed to protecting the ocean through environmental education, plastic reduction

initiatives, and the promotion of marine citizen science to support the rescue and rehabilitation of marine life. In recent years, it has conducted beach surveys during sea turtle nesting and hatching seasons and worked with government agencies to advance sea turtle conservation policies.

社團法人台灣哱咕嶼協會

位於小琉球，以守護海洋為目標，推廣環境教育與減塑行動，並推動海洋公民科學家協助海洋生物救援及復育。近幾年在海龜產卵及孵化期間，進行沙灘生殖生態調查，與公部門共同協力推動海龜相關保育政策。

澄洋環境顧問
IndigoWaters

IndigoWaters Institute

An environmental consultancy promoting marine science communication and citizen science. It is dedicated to the study of marine debris and abandoned, lost, or otherwise discarded fishing gear (ALDFG), actively sharing research findings internationally and building bridges between Taiwan and global partners.

澄洋環境顧問

推廣海洋科普與公民科學之環境顧問，長期致力於海洋廢棄物與廢棄漁具（ALDFG）之調查研究，積極參與國際發表，串連台灣與國際合作。

Dr. Connie Ka Yan NG

Dr. Connie NG is Head of the Marine Discovery Centre at the Hong Kong Maritime Museum. With over 16 years in nature conservation, she has advanced marine protection through education, research, and stakeholder engagement, including serving as East Asia Regional Co-Vice Chair of the IUCN Marine Turtle Specialist Group. She now focuses on enhancing ocean literacy by integrating history, art, and science to engage wider communities in marine conservation.

伍家恩博士

現為香港海事博物館海洋探知館主管、IUCN 海龜專家組之東亞地區聯合副主席。伍博士投身科研、保育及公眾教育超過 16 年。致力促進跨文化界別的合作，結合歷史、藝術與科學，讓大眾認識海洋科學，參與保育工作。

Agenda

議程

Day 1

2025/09/30 (Tue) 08:10 to 18:00

Venue: Kaohsiung Software Park

08:10 - 08:30	Registration
08:30 - 11:00	Asian Regional Meeting
11:10 - 11:30	Opening ceremony
11:30 - 12:15	**Keynote talk** Sea Turtle Conservation: Cooperation, Challenges, and Legacy Yoshimasa Matsuzawa
12:15 - 13:15	Lunch break
13:15 - 13:50	**Session (1) Management of nesting habitats** 1-1 Monsoon dynamics shape spatiotemporal patterns in green sea turtle nesting on an island-based habitat Chia-Ying Ko 1-2 Natural Shading Is Not Enough: More Female Offspring in Green Sea Turtles Tsung-Han Liu

14:00 - 14:55	**Session (2) Bycatch issues and mitigation strategies** 2-1 Sea Turtle Bycatch around the Japanese Waters Takashi Ishihara 2-2 Navigating Conservation: A Spatial and Temporal Analysis of Sea Turtle Stranding Events in Hong Kong Waters Brian Chin Wing Kot 2-3 Research Findings on Sea Turtle Bycatch of Taiwan's Distant-Water Longline Fisheries in the three oceans and Mitigation Measures Research Hsiangwen Huang
15:05 - 15:40	**Session (3) Research on juvenile turtle foraging grounds** 3-1 Beyond Population Recovery: Toward Coexistence between Green Turtles and Seagrass Meadow Ecosystems in the Ryukyu Archipelago, Japan Junichi Okuyama 3-2 Impact of sea turtle grazing on seagrass meadows in the Duozaiping Intertidal Zone, Liu Qiu Island, Taiwan Ju-Hsiung Lucian Wu
15:40 - 16:05	Tea break
16:05 - 16:25	**Session (3) Research on juvenile turtle foraging grounds** 3-3 (online) Exploration of a dynamic thermal corridor: Experimental oceanography and migration of North Pacific loggerhead sea turtles Tomomi Saito

16:35 - 17:10	**Session (4) Rescue and long-term rehabilitation** 4-1 Rapid Field-Deployable Detection of Marine Pathogens Using Insulated Isothermal PCR: Applications for Spirorchiid Blood Flukes and Chelonid Herpesvirus 5 Wei-Cheng Yang 4-2 Shaping the Future of Sea Turtle Rehabilitation: Global Lessons from 25 Years in Lampedusa Daniela Freggi
17:20 - 17:55	**Session (4) Rescue and long-term rehabilitation** 4-3 Rescue and Rehabilitation of Marine Turtles in Hong Kong: A Retrospective Overview and Case Studies Ashley Kwok Sin Tung, Cola Cheung Hoi Lok 4-4 Saving Sea Turtles! Count Farglory Ocean Park In! I-Fan Jen
18:00	Closing

第一天

2025/09/30 (二) 08:10 to 18:00

會場：高雄軟體園區

08:10 - 08:30	報到
08:30 - 11:00	亞洲區域會議
11:10 - 11:30	開幕典禮及致詞

11:30 - 12:15	**主題演講** 海龜保育：合作、挑戰與傳承 松澤 慶將 Yoshimasa Matsuzawa
12:15 - 13:15	午餐
13:15 - 13:50	**議程主題 (1) 海龜產卵棲息地管理** 1-1 季風動態塑造綠蠵龜在島嶼棲息地之築巢時空模式 柯佳吟 Chia-Ying Ko 1-2 光靠樹蔭可不行，海龜子代多雌性！ 劉璁翰 Tsung-Han Liu
14:00 - 14:55	**議程主題 (1) 混獲和減緩策略** 2-1 日本海域的海龜混獲 石原 孝 Takashi Ishihara 2-2 航向保育：香港海域海龜擱淺事件的時空分析 葛展榮 Brian Chin Wing Kot 2-3 台灣遠洋延繩釣漁業海龜混獲分析與忌避措施研究成效 黃向文 Hsiangwen Huang
15:05 - 15:40	**講座主題 (3) 覓食棲息地青年龜研究** 3-1 超越族群復育：日本琉球群島綠蠵龜與海草床生態系共存之路 奧山 隼一 Junichi Okuyama 3-2 海龜啃食對台灣小琉球多仔坪潮間帶海草床的影響 吳如雄 Ju-Hsiung Lucian Wu

15:40 - 16:05	茶會
16:05 - 16:25	**講座主題 (3) 覓食棲息地青年龜研究** 3-3 (線上) 動態熱廊道的探索：實驗海洋學與北太平洋赤蠵龜的遷移 斉藤 知己 Tomomi Saito
16:35 - 17:10	**講座主題 (4) 海龜救傷和長期收容** 4-1 隔絕式恆溫聚合酶連鎖反應於海洋病原體的快速現地檢測：以螺蛭科吸蟲與綠蠵龜皰疹病毒 5 型為例 楊瑋誠 Wei-Cheng Yang 4-2 海龜救傷未來之路：蘭佩杜薩 25 年的經驗與全球啟示 Daniela Freggi
17:20 - 17:55	**講座主題 (4) 海龜救傷和長期收容** 4-3 香港海龜救援與復健：回顧與案例研究 郭倩彤 Ashley Kwok Sin Tung，張凱樂 Cola Cheung Hoi Lok 4-4 救海龜，遠雄海洋公園也能幫忙！ 任一凡 I-Fan Jen
18:00	閉幕

Day 2

2025/10/01 (Wed) 08:10 to 15:00

Venue: Kaohsiung Software Park

08:10 - 08:30	Registration
08:30 - 08:35	Opening
08:35 - 09:15	**Session (4) Rescue and long-term rehabilitation** 4-5 Synovial fluid analysis in healthy green turtles *Chelonia mydas* in Taiwan Pin-Huan Yu 4-6 *Staphylococcus aureus*: Health risk on juvenile green turtle in the Sea Turtle Conservation Center of Thailand Thanaporn Chuen-im
09:25 - 10:00	**Session (4) Rescue and long-term rehabilitation** 4-7 Lessons Learned in Sea Turtle Rescue and Conservation: Experiences from the Taiwan Cetacean Society Yu-Rong Chen 4-8 Anthropogenic Impact on Sea Turtles from the Perspective of the Sea Turtle Rehabilitation Facility Tsung-Hsien Li
10:00 - 10:30	Tea break
10:30 - 11:25	**Session (5) Environmental education and outreach effectiveness** 5-1 Promoting Marine Science Education through Integration of History,

10:30 - 11:25	Art and Science at the Hong Kong Maritime Museum Connie Ka Yan NG 5-2 Sustainable Partnership of Research, Traditional Knowledge Preservation, and Tourism at Kuroshima Research Station Kazunari Kameda 5-3 Taking up the Challenge: The Role of Public Aquariums in Sea Turtle Rescue and Rehabilitation Hsuan-You Lin
11:35 - 11:55	**Session (7) Application of photo-identification in monitoring** 7-3 Deep Learning for High-Accuracy Sea Turtle Individual Identification Takafumi Katayama
12:00 - 13:00	Lunch break
13:00 - 13:55	**Session (6) Others** 6-1 A preliminary evaluation of the scatological approach to understand Taiwan's sea turtle population structure and anthropogenic influence Daphne Z. Hoh, Ning Yen 6-2 The amazing skeletal structure of the leatherback turtle Wei-Lien Chi 6-3 Trafficking Currents: The Illegal Trade in Sea Turtles across Asia Seh Ling Long
14:05 - 14:40	**Session (6) Others** 6-4 Where Do They Come From, Where Do They Go? Migration of turtles

14:05 - 14:40	in the Asia-Pacific region Rushan Abdul Rahman 6-5 Digitizing Conservation: How Virtopsy and 3D Surface Scanning Transform Sea Turtle Stranding Investigation Tabris Yik To Chung
14:40 – 14:50	Closing

第二天

2025/10/01 (三) 08:10 to 15:00

會場：高雄軟體園區

08:10 - 08:30	報到
08:30 - 08:35	開場
08:35 - 09:15	**講座主題 (4) 海龜救傷和長期收容** 4-5 台灣健康綠蠵龜之關節囊液分析 余品奐 Pin-Huan Yu 4-6 金黃色葡萄球菌：泰國海龜保育中心中青年綠蠵龜的健康風險 Thanaporn Chuen-im
09:25 - 10:00	**講座主題 (4) 海龜救傷和長期收容** 4-7 中華鯨豚協會海龜救援與保育實務分享 陳毓蓉 Yu-Rong Chen 4-8 從海龜救傷中心視角探討人為衝擊對海龜的影響 李宗賢 Tsung-Hsien Li

10:00 - 10:30	茶會
10:30 - 11:25	**講座主題 (5) 環境教育和推廣** 5-1 從香港海事博物館出發 – 結合歷史、藝術與科學認識海洋 伍家恩 Connie Ka Yan NG 5-2 黑島研究站的永續夥伴關係：融合研究、傳統知識保存與旅遊 亀田 和成 Kazunari Kameda 5-3 民間經營公眾水族館肩負海龜救傷收容之挑戰 林宣佑 Hsuan-You Lin
11:35 - 11:55	**講座主題 (7) 海龜個體辨識的應用** 7-3 利用深度學習進行高準確度的海龜個體辨識 片山 貴文 Takafumi Katayama
12:00 - 13:00	午餐
13:00 - 13:55	**講座主題 (6) 其他** 6-1 運用糞便學方法初步評估台灣海龜族群結構與人為影響 何芷蔚 Daphne Z. Hoh, 顏寧 Ning Yen 6-2 神奇的革龜骨骼 祁偉廉 Wei-Lien Chi 6-3 暗流下的交易：亞洲海龜非法貿易 Seh Ling Long

14:05 - 14:40	**講座主題 (6) 其他** 6-4 牠們從哪裡來？又往哪裡去？亞太地區海龜的遷徙 Rushan Abdul Rahman 6-5 數位化保育：Virtopsy 與 3D 表面掃描如何改變海龜擱淺調查 鍾易陶 Tabris Yik To Chung
14:40 - 14:50	閉幕

Day 3

2025/10/02 (Thu) 10:30 to 15:30

Venue: The Liuqiu Management Station and Visitor Center

10:30 - 11:00	Registration
11:00 - 11:10	Opening
11:10 - 12:10	**Session (7) Application of photo-identification in monitoring** 7-1 The power of citizen-science and volunteers in a sea turtle conservation project Carl Bastian 7-2 Generating Representative Mark-Resight Data and Applying a Standardized Site Fidelity Index to Study Green Turtle Foraging Aggregations Chia-ling Fong
12:15 - 12:45	**Session (8) Conservation through community engagement** 8-1 Science-Driven Conservation at Chagar Hutang Turtle Sanctuary Mohd Uzair Rusli
12:45 - 13:15	Tea break
13:15 - 14:20	**Session (8) Conservation through community engagement** 8-2 Plastic Reduction Education Inspired by Sea Turtles Fu Kao

13:15 - 14:20	8-3 Returning the Ocean God's Daughter: Sea Turtle Ecology, Citizen Science, and Cultural Identity in Jeju Mi Yeon Kim
14:30 - 15:20	**Session (8) Conservation through community engagement** 8-4 Beach Guardians: How Liuqiu Locals Protect Sea Turtles Chun Hung Lin 8-5 Communicating Conservation: Display to Dialogue for Sea Turtle Community Engagement Henry Chun Lok Tsui
15:20 - 15:30	Closing

第三天

2025/10/02 (四) 10:30 to 15:30

會場：小琉球遊客中心

10:30 - 11:00	報到
11:00 - 11:10	開場
11:10 - 12:10	**講座主題 (7) 海龜個體辨識的應用** 7-1 公民科學與志工在海龜保育計畫中的力量 Carl Bastian

11:10 - 12:10	7-2 綠蠵龜覓食聚集研究： 個體辨識資料有效性的驗證及棲地忠誠度指數的應用 馮加伶 Chia-ling Fong
12:15 - 12:45	**講座主題 (8) 以社區參與促進保育** 8-1 馬來西亞熱浪島 Chagar Hutang 海龜保護區的科學導向保育 Mohd Uzair Rusli
12:45 - 13:15	茶會
13:15 - 14:20	**講座主題 (8) 以社區參與促進保育** 8-2 透過海龜所產生的減塑教育 郭芙 Fu Kao 8-3 海神的女兒回家了——濟州島的海龜、生態與人文故事 Mi Yeon Kim
14:30 - 15:20	**講座主題 (8) 以社區參與促進保育** 8-4 沙灘守護者：小琉球在地居民的海龜保育故事 林駿宏 Chun Hung Lin 8-5 保育傳播：從展示到對話的海龜社群互動 徐振樂 Henry Chun Lok Tsui
15:20 - 15:30	閉幕

Keynote talk

主題演講

Sea Turtle Conservation: Cooperation, Challenges, and Legacy

With over 30 years of dedicated research and conservation efforts focused on sea turtles, Dr. Yoshimasa Matsuzawa will guide us through the challenges faced by these oceanic migratory species, including impacts of fishing, habitat loss, and climate change. His keynote will highlight stories of international cooperation and the importance of passing on knowledge to ensure a shared future for sea turtle conservation in the Asia-Pacific.

海龜保育：合作、挑戰與傳承

松澤慶將博士投入海龜研究與保育超過 30 年。他將帶領我們從全球視野認識這些大洋性的洄游生物，探討牠們在漁業衝擊、棲地破壞與氣候變遷等威脅下的生存挑戰。透過分享跨國合作與經驗傳承的故事，展望亞太區域攜手守護海龜的未來。

個人簡介

Dr. Yoshimasa Matsuzawa
松澤 慶將 博士

Born in 1969 in Niigata, Japan, Dr. Yoshimasa Matsuzawa has dedicated his career to the study and conservation of sea turtles. He studied fisheries science at Kyoto University, where he began his lifelong engagement with sea turtle ecology. His doctoral research focused on the effects of temperature on embryonic development and sex determination in sea turtles, earning him a Ph.D. in 1998. He then conducted research at the Archie Carr Center for Sea Turtle Research at the University of Florida as a JSPS research fellow, gaining valuable international experience.

Upon returning to Japan, Dr. Matsuzawa played a central role in the Japan Sea Turtle Association, advancing collaborative projects worldwide and supporting local research and conservation initiatives. He has served as President of the International Sea Turtle Society, Deputy Regional Vice Chair for East Asia of the IUCN Marine Turtle Specialist Group, and an editorial board member of *Chelonian Conservation and Biology*. He also led research and education programs as Head of Research Planning at Suma Aqualife Park in Kobe.

Currently, Dr. Matsuzawa is Director of the Shikoku Aquarium, a visiting researcher at the Hiwasa Sea Turtle Museum, and a lecturer at Osaka Metropolitan University and Kinki University. He has contributed to several key publications, including Loggerhead Sea Turtles and Natural History of Sea Turtles.

Through his pioneering research, leadership, and commitment to international collaboration, Dr. Matsuzawa has become a leading figure in advancing sea turtle conservation across the Asia-Pacific region.

1969 年出生於日本新潟縣。自京都大學農學部主修水產學以來，即投入海龜生態的研究與保育。他的博士研究深入探討溫度決定海龜胚胎發育與性別的影響。畢業後，他前往美國佛羅里達大學的 Archie Carr 海龜研究中心進行研究，累積國際經驗。返日後，他長期推動日本海龜協會的發展，並參與多項跨國合作計畫。

松澤博士曾擔任國際海龜學會會長、IUCN 物種存續委員會海龜專家小組副主席（東亞區）、以及《Chelonian Conservation and Biology》期刊的編輯委員，也曾在神戶市立須磨海濱水族園擔任研究企劃課長，積極推廣海龜保育與教育。目前他身兼四國水族館館長、大阪公立大學與近畿大學講師，以及日和佐海龜博物館的研究員。他亦撰寫多本海龜專書，包括《Loggerhead Sea Turtles》及《ウミガメの自然誌》。

長年以來，松澤博士不僅在學術研究上貢獻卓著，更致力於推動跨國合作與社會參與，他是亞太地區海龜研究與保育的重要推手。

Session (1)
Management of nesting habitats

講座主題 (1)
海龜產卵棲息地管理

1-1.
Monsoon dynamics shape spatiotemporal patterns in green sea turtle nesting on an island-based habitat

季風動態塑造綠蠵龜在島嶼棲息地之築巢時空模式

Chia-Ying Ko[1]*, Tsung-Han Liu[1], Ming-Shiou Jeng[2], Chan-Yuan David Lee[1], Chih-Wei Tu[1], Po-Hsiung Lin[3], Chaolun Allen Chen[2]

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Studies have revealed combined influences of environmental variables on sea turtle reproduction, little is known about impacts of alternating monsoons on their nesting activities on island-based habitats. In the South China Sea, prevailing monsoon winds shift from southwesterly in summer to northeasterly in winter, with transitional periods in spring and autumn. These seasonal wind patterns subsequently change local environmental conditions. Through daily and monthly intensive surveys, we evaluated spatiotemporal variations in the nesting of green sea turtle *Chelonia mydas* and predicted conditions that increased their probabilities of successful nesting on Taiping Island.

The results revealed that the green sea turtles preferred nesting beaches on the north coast of the island, particularly during the SW to NE monsoon transition in late summer. They exhibited tortuous routes and expressed emergence preferences under specific climatic and circadian conditions. The prediction model revealed bimonthly temporal variations following monsoon alternations, with total distance being consistently an important variable, whereas climatic and circadian variables weakly influenced successful nesting under the prevailing southwesterly summer monsoon. Successful nesting additionally was positively correlated with total distance and atmospheric pressure but negatively correlated with straightness index, humidity, tidal height, and daily high tide. With findings in this study, further exploration of reproductive ethology, as well as monitoring nesting habitat conditions, will all substantially contribute to in situ management and conservation strategies for sea turtles, particularly those in complete island-based sea turtle habitats.

Keywords: Island-based habitat, Monsoon, Nesting activity, South China Sea, Reproductive ecology

個人簡介

Dr. Chia-Ying Ko
柯佳吟

Director and Professor
Master's Program in Biodiversity and Institute of Fisheries Science, National Taiwan University

Chia-Ying Ko is the Director of Master's Program in Biodiversity and also the professor at Institute of Fisheries Science, National Taiwan University, Taiwan. She mainly researches on global change biology, big data & long-term data analysis, interdisciplinary & transdisciplinary sciences, biogeography, macroecology, ecosystem dynamics & service, and marine ecology & conservation. She graduated from the National Taiwan University, with PhD degree in Ecology and Evolutionary Biology. She experienced as a visiting scholar fellow and a postdoctoral associate at Stanford University and Yale University, USA, before moving back to Academia Sinica and National Taiwan University. She is also currently working on marine pollution and fishing management at large spatial scales to achieve environmental sustainability for sustainable development. Her team had such a wonderful opportunity to study sea turtles in 2021 and had done several interesting studies. She hopes everyone can take a look at all her team's studies on sea turtles and share experience and comments with them.

1-2.
Natural Shading Is Not Enough: More Female Offspring in Green Sea Turtles

光靠樹蔭可不行 , 海龜子代多雌性！

Tsung-Han Liu[1]*, Ming-Shiou Jeng[2], Chan-Yuan David Lee[1], Chih-Wei Tu[1], Po-Hsiung Lin[3], Chaolun Allen Chen[2], Chia-Ying Ko[1,4]

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In the past decade, reducing nest temperature has been considered a key conservation strategy to mitigate the impacts of global warming and regulate sex ratios in sea turtles. However, the effectiveness of shading in lowering nest temperature remains unclear in tropical regions. In this study, we investigated the nesting of green sea turtles *(Chelonia mydas)* on Taiping Island in the South China Sea, recording environmental conditions and assessing the influence of natural shading on nest temperature and hatching outcomes. Results showed that nest temperature decreased from 31.94 °C in higher sun exposure group to 30.38 °C in lower sun exposure group. Nevertheless, the mean nest temperature during the middle incubation period remained above the pivotal temperature (29 °C), likely leading to a predominance of female offspring. Moreover, nest temperature was associated with hatchling malformation rates, with the lowest rate (9.68%) recorded in nests under low sun exposure. Our findings indicate that natural shading alone is insufficient to effectively reduce nest temperature in tropical regions, underscoring the need for strengthened local monitoring and regional conservation strategies.

Keywords: Green sea turtle, Natural shading, Global warming, South China Sea, Feminization

近十年來，降低海龜卵窩溫度被視為因應全球暖化及調節性別比例的保育策略之一。然而，透過遮蔭達到降溫的成效在熱帶地區尚不明確。本研究於中國南海的太平島調查綠蠵龜產卵情況，記錄環境條件並評估自然遮蔭對卵窩溫度與孵化的影響。結果顯示，低曝曬下卵窩溫度由 31.94 °C 降至 30.38 °C。然而，孵化中期的平均卵窩溫度仍高於性別決定溫度（29 °C），這可能導致綠蠵龜子代以雌性居多。此外，子代畸形率與卵窩溫度亦密切相關，低曝曬下孵化的綠蠵龜畸形率最低（9.68%）。研究顯示，自然遮蔭不足以有效降低熱帶地區的卵窩溫度，需加強當地監測與區域性保育對策。

關鍵字：綠蠵龜、自然遮蔭、全球暖化、中國南海、雌性化

個人簡介

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劉璁翰

Postdoctoral Research
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Session (2)
Bycatch issues and mitigation strategies

講座主題 (2)
混獲和減緩策略

2-1.
Sea Turtle Bycatch around the Japanese Waters

日本海域的海龜混獲

Takashi Ishihara[1, 2]*

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This presentation reports on sea turtle bycatch in Japanese coastal fisheries and explores possible mitigation measures. At first, structured interviews were conducted from 2009 to 2013 with 1,074 fishers from 175 sites across Japan, yielding 2,087 responses covering 47 different fishing methods. The results highlighted notable regional differences and high variability in bycatch rates, particularly in set nets (teichi-ami). While mortality was generally low in many teichi-ami, certain installations showed higher mortality levels, suggesting that impacts on turtle populations cannot be ignored. Skeletochronology was further applied to estimate growth rates and the size at maturity of loggerhead turtles (*Caretta caretta*). The analysis indicated that Japanese coastal waters serve as important foraging habitats for sub-adult turtles. The survival rate of subadult

loggerhead sea turtles around Japan is 0.852/year (95% HDI: 0.799-0.903), which is lower than that of smaller juveniles living in Baja California in the eastern Pacific Ocean. In addition, escape devices designed for teichi-ami were developed and tested as a mitigation measure. Both tank experiments and field trials in collaboration with local fishers confirmed the effectiveness of several designs in allowing turtle escape while retaining target fish. Remaining challenges include addressing fishers' concerns regarding catch loss and operational burden, as well as promoting the adoption of successful devices. Overall, sea turtle bycatch remains a significant conservation issue in Japan. However, the development of practical, fishery-appropriate escape devices offers a promising pathway for reducing impacts. Broader dissemination and outreach will be key to achieving widespread implementation.

Keywords: Bycatch, Loggerhead turtle, Maturity, Mortality, Sub-adult

個人簡介

Dr. Takashi Ishihara
石原孝

Researcher
AQUARIUM x ART átoa / Sea Turtle Association of Japan

Takashi Ishihara entered the Graduate School of the University of Tokyo and, under the guidance of Professor Kamezaki, conducted research on the reproductive ecology of loggerhead sea turtles, compiling findings on the age and size at maturity, as well as maturity levels in Japanese coastal waters. His primary research fields were Muroto City, Kochi Prefecture, and Kihoku Town, Mie Prefecture. He is working on a research program about sea turtles bycatch issues and nesting on Tanegashima and Yakushima Islands in Kagoshima Prefecture.

2-2.

Navigating Conservation: A Spatial and Temporal Analysis of Sea Turtle Stranding Events in Hong Kong Waters

航向保育：香港海域海龜擱淺事件的時空分析

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Five out of seven sea turtle species are recorded in the South China Sea, including Hong Kong. These species include green turtle (*Chelonia mydas*), loggerhead turtle (*Caretta caretta*), hawksbill turtle (*Eretmochelys imbricata*), leatherback turtle (*Dermochelys coriacea*), and olive ridley turtle (*Lepidochelys olivacea*). Stranding data can provide spatiotemporal insights into the health and threats affecting stranded sea turtles. This study retrospectively analysed the sea turtle strandings in Hong Kong waters over 23 years (2002–2024) through demographic, temporal and spatial analyses. Demographic data, including age and sex, were obtained from the measurements of carapace and tail, in conjunction with the gonad gross examination. Live stranded animals were rescued for clinical and radiological assessments, interventions and rehabilitations, while deceased cases undergone virtopsy-led postmortem examinations. Temporal analyses were conducted by visualising the annual and monthly distribution of strandings of each species. Spatial analyses were conducted by species distribution mapping, Kernel density estimation, and Getis-Ord Gi* statistics. The results showed that the green turtles were the most frequently stranded species in Hong Kong. There was an increasing trend of strandings each year, with the peak occurred in 2018. Monthly trends visualization showed that the number of stranding cases was higher during autumn and spring, and lower during winter. Demographic analysis revealed a predominance of juveniles in green and hawksbill turtles, while adults were more frequently encountered in loggerhead and olive ridley turtles; females were more common among stranded sea turtles except in hawksbill turtles. The majority of stranding causes were unidentified, followed by anthropogenic (fishery

interactions, vessel strikes, pollution), natural (disease, predation), and other factors. The spatial distribution showed the strandings were mostly concentrated in the eastern part of Hong Kong, especially the Sai Kung waters. Several strandings were also reported in designated marine parks and reserves. The study highlighted the need for integrated monitoring systems, rapid response and data-driven conservation strategies locally and regionally to mitigate threats and protect sea turtle habitats in Hong Kong and adjacent waters. These findings provided a quantitative basis for conservation planning, rehabilitation facility management, and site protection to maintain the sustainability of sea turtle populations in Hong Kong and adjacent waters.

Keywords: Spatial analysis, Temporal analysis, Sea turtle, Hong Kong, conservation management

Acknowledgements:
We would like to thank the Agriculture, Fisheries and Conservation Department of the Government of Hong Kong Special Administrative Region of the People's Republic of China for providing data and the continuous support in this project. Sincere appreciation is also extended to all the related personnel from the Aquatic Animal Virtopsy Lab, Jockey Club College of Veterinary Medicine and Life Sciences, City University of Hong Kong, and Veterinary Hospital and Grand Aquarium, Zoological Operations and Conservation, Ocean Park Hong Kong. Special gratitude is owed to technicians in CityU Veterinary Medical Center for operating the CT units in this study. This project is financially supported by Environment and Conservation Fund of the Hong Kong Special Administrative Region (grant numbers: ECF 2019-10, EECA 2467), the Marine Conservation Enhancement Fund (grant numbers.: MCEF21005) and the Marine Ecology Enhancement Fund (grant numbers: MEEF2023003, MEEF2023003A) of the Marine Ecology & Fisheries Enhancement Funds Trustee Limited. Any opinions, findings, conclusions, or recommendations expressed herein do not necessarily reflect the views of the Government of the Hong Kong Special Administrative Region, the Environment and Conservation Fund and the Environmental Campaign Committee; the views of the HKLTL, CAPCO and HK Electric, and the Marine Conservation Enhancement Fund; and the views of the Marine Ecology Enhancement Fund or the Trustee.

個人簡介

Pro Brian Kot
葛展榮

Assistant Professor
Aquatic Animal Virtopsy Lab, City University of Hong Kong

Prof Brian Kot is a registered diagnostic radiographer and veterinary imaging researcher in the City University of Hong Kong. He obtained his BSc in Radiography and PhD in Diagnostic Imaging from the Hong Kong Polytechnic University under the supervision of Dr Fiona Brook (PI of first successful dolphin artificial insemination project worldwide) and Dr Michael Ying, in 2005 and 2010, respectively. He completed his certificate course in virtopsy (postmortem radiology) with Prof Michael Thali and his team in 2016 at the University of Zurich. Brian joins the Department of Infectious Diseases and Public Health and the Department of Chemistry, City University of Hong Kong as an Assistant Professor in Diagnostic Imaging in July 2021. He is generally interested in questions relevant to Diagnostic Imaging, Postmortem Imaging, Forensic Science, Medicine and Pathology, Conservation Medicine, Environmental Science, and have expertise in applying various diagnostic imaging tools to clinical and forensic practice for marine conservation and policy decisions, which allows the use of aquatic animals as sentinels of ecosystem health, working towards a 'One Ocean-One Health' ideal. Currently, his team applies diagnostic imaging on captive aquatic animals for health assessment, as well as virtopsy routinely in stranded cetaceans and sea turtles in HK and adjacent waters to investigate their biological health profiles.

2-3.

Research Findings on Sea Turtle Bycatch of Taiwan's Distant-Water Longline Fisheries in the three oceans and Mitigation Measures Research

台灣遠洋延繩釣漁業海龜混獲分析與忌避措施研究成效

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Since 1999, Taiwan has deployed onboard observers to collect information on bycatch in distant-water longline fisheries, with the program extended to all three oceans in 2002. In the Indian Ocean, observer data collected between 2004 and 2008 recorded a total of 84 sea turtles, predominantly olive ridleys (*Lepidochelys olivacea*). Annual bycatch was estimated at 1,127–1,856 individuals, corresponding to a bycatch rate of approximately ranged from 0 to 0.0112 turtles per thousand hooks by fleet, primarily concentrated in tropical waters. In the Pacific Ocean, preliminary observations from 2008 to 2013 documented 123 sea turtles, mainly olive ridley, green (*Chelonia mydas*), and leatherback turtles *(Dermochelys coriacea*). Smaller longline vessels exhibited disproportionately higher impacts, with bycatch rates reaching 0.034 turtles per thousand hooks and an overall mortality rate of 63.4%. In the Atlantic Ocean, 767 turtles were recorded between 2002 and 2013, primarily leatherback, olive ridley, and loggerhead turtles (*Caretta caretta*). Bycatch was concentrated in tropical regions, with leatherback bycatch rates reaching 0.030 turtles per thousand hooks. With regard to mitigation, circle hook trials conducted in the Atlantic in 2012–2013 demonstrated no statistically significant effect on reducing turtle bycatch. Nevertheless, analyses indicated that 64% of turtles were caught on shallow hooks deployed near buoys. In terms of management interventions, since 2005 the Taiwanese government has mandated that vessels carry dehooking devices, and in 2009 introduced onboard resuscitation and release protocols for comatose turtles in the Pacific region.

Keywords: Observer program, Three oceans, Tuna, Bycatch rate, Circle hooks

個人簡介

Prof. Hsiangwen Huang
黃向文

Hsiang-Wen Huang is a Professor at the Institute of Marine Affairs and Resource Management, National Taiwan Ocean University. She previously served as Section Chief at the Fisheries Agency of the Council of Agriculture, Executive Yuan, where she was engaged in distant-water fisheries management. Since joining National Taiwan Ocean University in 2008, her expertise has focused on marine policy, fisheries management, stock assessment, bycatch conservation, and marine debris. She has published international journal articles on bycatch in distant-water fisheries.

黃向文教授為國立臺灣海洋大學海洋事務與資源管理研究所教授，現任海洋委員會副主委。她曾任行政院農業委員會漁業署科長，專責遠洋漁業管理。自 2008 年加入海洋大學以來，其專業領域聚焦於海洋政策、漁業管理、資源評估、混獲保育及海洋廢棄物等議題。黃教授亦在國際期刊上發表多篇有關遠洋漁業混獲的研究成果。

Session (3)
Research on juvenile turtle foraging grounds

講座主題 (3)
覓食棲息地青年龜研究

3-1.
Beyond Population Recovery: Toward Coexistence between Green Turtles and Seagrass Meadow Ecosystems in the Ryukyu Archipelago, Japan

超越族群復育：日本琉球群島綠蠵龜與海草床生態系共存之路

Junichi Okuyama[1*], Hideaki Nishizawa[2], Kotaro Ichikawa[2], Tomoko Hamabata[3], Nao Yoshida[1], Hiromori Shimabukuro[4], Kenji Sudo[4], Toshihide Kitakado[5], Masakazu Hori[6], Yoshiki Yamagata[7], Aoi Sugimoto[7]

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Green turtles (*Chelonia mydas*) have reportedly recovered in abundance in several populations worldwide over the past few decades. In Japan, major nesting populations have shown an increasing trend, and foraging aggregations in seagrass and seaweed meadows have likewise been reported to increase. Concurrent with this rise in green turtle abundance, many seagrass meadows in the Ryukyu Archipelago, Japan, have suffered collapse or severe degradation. To promote coexistence between green turtles and seagrass meadow ecosystems, we have initiated comprehensive research projects. These include assessments of foraging population abundance, determination of natal origins using genetic information, analyses of home range and grazing impact of green turtles, as well as evaluations of biomass and net primary production in current seagrass meadows and the development of restoration techniques. We also have social studies to explore the local perceptions, potential challenges, and communication strategies for supporting decision making on each island. This presentation outlines the various components of our project and introduces conservation efforts aimed at protecting seagrass meadow ecosystems to achieve coexistence with green turtles.

Keywords: Ecosystem services, Herbivores, Overgrazing, Seagrass restoration, Turtle exclusion cage.

個人簡介

Dr. Junichi Okuyama
奥山 隼一

Group, Head
Japan Fisheries Research and Education Agency

Dr. Junichi Okuyama is a specialist in the behavioral ecology and physiology of marine organisms, with a focus on conservation biology. His research primarily targets sea turtles and coral reef fishes. He is based on Ishigaki Island, Okinawa, approximately 200 km from Taiwan.

3-2.

Impact of sea turtle grazing on seagrass meadows in the Duozaiping Intertidal Zone, Liu Qiu Island, Taiwan

海龜啃食對台灣小琉球多仔坪潮間帶海草床的影響

Ju-Hsiung Lucian Wu[1]*, Vianney Denis[1], Yoko Nozawa[2]

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Seagrass meadows are highly valued ecosystems, offering essential services such as habitat provision, carbon storage, and food for numerous marine organisms. Green sea turtles (*Chelonia mydas*) are the main herbivores in these systems, and high turtle densities have been associated with meadow degradation. On Liu-Qiu Island, Taiwan, the once-extensive Thalassia hemprichii seagrass meadow in the Duozaiping Intertidal Zone (DIZ) has nearly vanished. Despite this decline, turtles continue to graze on the sparse vegetation during high tide, prompting concerns about their ecological impact. This study investigated the effects of green sea turtle grazing on seagrass and algae dynamics at the DIZ through exclusion experiments in 2021. Seagrass metrics (leaf length, abundance, biomass) and algal cover and biomass were measured quarterly, while the abundance of herbivores, including turtles, sea urchins, and fish, was monitored. Results revealed significant increases in seagrass leaf length, abundance, and algal cover within exclusion treatments compared to controls. Differences in underground seagrass biomass were also observed, although above-ground biomass remained largely unchanged. These findings suggest that intense green turtle grazing is the primary driver of seagrass decline at DIZ, whereas other herbivores play a relatively minor role. This study highlights a conservation paradox: protecting dense green turtle populations may endanger the health of their critical seagrass habitat. Addressing this conflict requires a deeper understanding of herbivore-plant dynamics and the development of balanced ecological management strategies.

Keywords: Exclusion experiment, Thalassia hemprichii, Chelonia mydas, Herbivores, Conservation

3-3.

Exploration of a dynamic thermal corridor: Experimental oceanography and migration of North Pacific loggerhead sea turtles

動態熱廊道的探索：實驗海洋學與北太平洋赤蠵龜的遷移

Larry B. Crowder[1], Dana K. Briscoe[1,2], George H. Balazs[3], Jeffrey J. Polovina[4], Jeffrey A. Seminoff[5], Alberto Abreu[6], Philippe Gaspar[7], Laura Jim[8], Masanori Kurita[9], Catherine A. Lee Hing[1], Masanori Mori[9], Denise M. Parker[10], Marc R. Rice[8], Tomomi Saito[11]*, Bianca S. Santos[1], Julien Temple-Boyer[7], Calandra N. Turner Tomaszewicz[5], Noah Yamaguchi[11]

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Until recently, scientists did not know how loggerhead turtles (*Caretta caretta*) migrate from nesting beaches in Japan to nursery grounds in Baja California, Mexico. The Thermal Corridor Hypothesis (TCH, Briscoe et al. 2021), based on 16 years of satellite-tracked data, proposes an intermittent thermal corridor allowing juveniles to transition from the Central North Pacific (CNP)

to the west coast of North America. The corridor is thought to open during anomalously warm conditions and close during cool conditions, forcing turtles to remain in the CNP. We report on two experimental cohorts: one in 2023, during warm El Niño conditions, and one in 2024, during the onset of La Niña. In 2023, all loggerheads encountered above-average SSTs due to a marine heatwave and El Niño. The cohort moved north until September, then south, with 7 of 23 turtles moving toward North America — 3 reaching coastal waters of Southern California and Baja Mexico. These responses confirmed that under warm conditions, loggerheads can pass through the thermal corridor. In 2024, the cohort was deployed as La Niña developed. Nearly two-thirds initially moved east, possibly driven by strong Ekman transport and/or warm SST anomalies linked to strong westerlies, causing entry into the California Current farther north than typical. Later movements shifted southward, but the cold current may have prevented coastal entry. Distributional shifts under changing ocean conditions highlight the need for dynamic management of this endangered species. More frequent or spatially altered corridor openings could significantly affect abundances and risks.

Keywords: Loggerhead sea turtle, Thermal corridor hypothesis, Satellite tracking, Ocean condition, Migration

個人簡介

Dr. Tomomi SAITO
斉藤知己

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Tomomi Saito, Ph.D., Professor at the Usa Marine Biological Institute, Kochi University, specializes in sea turtle biology, ecology, and conservation, with broader interests in marine and freshwater ecology and crustacean systematics. He has published widely and serves as Editor-in-Chief of an international journal.

Session (4)
Rescue and long-term rehabilitation

講座主題 (4)
海龜救傷和長期收容

4-1.
Rapid Field-Deployable Detection of Marine Pathogens Using Insulated Isothermal PCR: Applications for Spirorchiid Blood Flukes and Chelonid Herpesvirus 5

隔絕式恆溫聚合酶連鎖反應於海洋病原體的快速現地檢測：以螺蛭科吸蟲與綠蠵龜皰疹病毒 5 型為例

Cheng-Chen Hsieh[1], Chricel Lattao[2], Wei-Cheng Yang[1]*

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Emerging and endemic pathogens are increasingly recognized as significant threats to marine megafauna, with direct implications for biodiversity conservation and ecosystem health. Spirorchiid blood flukes and chelonid herpesvirus 5 (ChHV5) contribute to high morbidity and mortality in sea turtles through vascular disease and fibropapillomatosis, respectively. Traditional diagnostic methods for these pathogens are constrained by reliance on centralized laboratories,

skilled personnel, and intact sample quality, limiting timely detection during stranding events and conservation interventions. Insulated isothermal polymerase chain reaction (iiPCR) provides a rapid, portable alternative capable of DNA detection under field conditions, requiring minimal technical expertise. Here, we developed and validated iiPCR assays for spirorchiids and ChHV5. The iiPCR assays detected all five major spirorchiid species (Ct ~35) as well as ChHV5 (Ct ~34), demonstrating broad applicability of the platform across taxonomically distinct marine pathogens. These findings establish iiPCR as a reliable diagnostic platform for marine wildlife health surveillance.By enabling near real-time, on-site detection, this platform enhances the capacity of conservation programs to identify outbreaks rapidly, allocate resources effectively, and implement mitigation strategies. Beyond clinical diagnosis, iiPCR strengthens long-term epidemiological monitoring, facilitates early warning systems for population-level threats, and supports evidence-based conservation medicine. Consequently, iiPCR represents a critical advance in safeguarding sea turtles, taxa already under pressure from climate change, habitat degradation, and anthropogenic stressors.

Keywords: Insulated isothermal PCR, Field-deployed, Sea turtle, Surveillance.

個人簡介

Dr. Wei-Cheng Yang
楊瑋誠

Professor
School of Veterinary Medicine, National Taiwan University

Dr. Wei-Cheng Yang has dedicated over two decades to the rescue and research of stranded cetaceans in Taiwan. His research, focusing on pathogen and disease surveillance, noise-related stress evaluation, and the development of diagnostic tools, serves as a bridge between scientific discovery and effective marine resource management, benefiting both domestic and international organizations dedicated to rational and sustainable conservation strategies.

4-2.

Shaping the Future of Sea Turtle Rehabilitation: Global Lessons from 25 Years in Lampedusa

海龜救傷未來之路：蘭佩杜薩 25 年的經驗與全球啟示

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The Lampedusa Sea Turtle Rescue Center, operating since 1990 in the South Mediterranean, has developed strong collaborations with the local fishing fleet in the Pelagie Archipelago, enabling the rescue of over 6,000 loggerhead turtles (*Caretta caretta*). In this study, we analyzed data from 3,275 hospitalized turtles up to 2025, with the aim of identifying key factors influencing rehabilitation outcomes. We investigated the effects of clinical presentation, initial health condition, therapeutic approach, and surgical expertise on survival and recovery. Clinical cases included bycatch interaction (hooks and lines) damages, infections, fractures of the flippers/carapace/head, traumatic wounds. Rehabilitation success varied substantially among these categories, with head fractures and severe entanglements showing survival rates below 50%. Health status at admission (good condition, depressed, comatose) was strongly associated with rehabilitation outcomes, as confirmed by Fisher's exact test. We also examined outcomes across 5 time periods, reflecting the progressive introduction of advanced surgical techniques and the increasing involvement of specialized surgeons. A univariate ANOVA demonstrated a significant effect of surgical expertise on survival rates. Overall, our findings highlight that bycatch-related injuries and poor health condition at admission are the strongest predictors of rehabilitation failure, while the availability of experienced veterinary surgeons markedly improves survival. These results underscore the importance of advancing medical standards, promoting specialized training and strengthening collaborations to maximize the effectiveness of sea turtle rehabilitation programs.

Keywords: Sea turtle rehabilitation, Bycatch injuries, Sea turtle veterinary surgery, Sea turtle conservation medicine, Sea turtle survival outcomes

個人簡介

Daniela Freggi

Responsible of the wildlife and sea turtle rescue center in Cattolica Eraclea, AG, Italy
Caretta caretta Association - Lampedus Turtle Rescue

Daniela Freggi is a marine biologist and PhD student in Animal Health and Zoonosis at the Veterinary Department of the University of Bari. Since founding the Lampedusa Sea Turtle Rescue Center in 1990, She dedicated more than 30 years to the rescue, rehabilitation, and medical care of sea turtles, treating over 6,000 individuals. She also directs the Provincial Wildlife and Sea Turtle Rescue Center in Sicily and collaborate with universities and scientific institutions across the Mediterranean.Her commitment is focused on advancing veterinary techniques for sea turtle care, strengthening networks among rehabilitation centers, and involving local communities in marine conservation. She also co-organizes the annual Sea Turtle Medicine Workshops within the International Sea Turtle Society Symposia, hosted in a different country each year, and leads specialized training courses for veterinarians and rehabilitators worldwide.

4-3.

Rescue and Rehabilitation of Marine Turtles in Hong Kong: A Retrospective Overview and Case Studies

香港海龜救援與復健：回顧與案例研究

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Over the past decades, Ocean Park Hong Kong has collaborated closely with the Agriculture, Fisheries and Conservation Department (AFCD) of the Hong Kong SAR Government to rescue, rehabilitate, and care for stranded wildlife and confiscated endangered species. As the primary institution for sea turtle rescue and rehabilitation in Hong Kong, Ocean Park has received and treated over one hundred individual sea turtles since 2000. These turtles were rescued under various circumstances, ranging from injury and illness to entanglement and illegal trade. Following comprehensive medical care and rehabilitation, the majority were successfully released back into their natural habitat. This presentation reviews the data collected from these rescue cases, highlighting trends in stranding characteristics, medical interventions, and anthropogenic factors contributing to their distress. We will also showcase selected case studies to illustrate the rescue and rehabilitation process, including husbandry practices for live stranded sea turtles. These efforts reflect a collaborative approach involving AFCD, Ocean Park's veterinary team, and animal care specialists, underscoring the importance of inter-agency cooperation in marine conservation.

Keywords: Sea Turtle Rehabilitation, Wildlife Rescue, Stranding, Sea Turtle Husbandry

個人簡介

Ms. Kwok Sin Tung, Ashley

Animal Care and Conservation Manager
Ocean Park Hong Kong

Ashley has been instrumental in planning, leading, and developing diverse conservation programs and projects. Under her leadership, the park has implemented effective conservation plans for local species, including corals, sea turtles, freshwater turtles and sharks & rays.

Mr. Cheung Hoi Lok, Cola

Animal Care Specialist
Ocean Park Hong Kong

Cola Cheung is an Animal Care Specialist at Ocean Park Hong Kong, focusing on sea turtle rescue, rehabilitation, and conservation. He is responsible for daily husbandry, ensuring that sea turtles and other aquatic animals receive nutritious diets, appropriate environments, and compassionate care. Collaborating with AFCD, Ocean Park have rescued over 100 stranded or confiscated turtles, including species like green and hawksbill turtles. Additionally, He advocates for public education by sharing rescue stories through TV programs and public talks, raising awareness about threats to sea turtles such as illegal trade and habitat destruction.

4-4.

Saving Sea Turtles! Count Farglory Ocean Park In!

救海龜，遠雄海洋公園也能幫忙！

I-Fan Jen[1*]

[1]Farglory Ocean Park

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Farglory Ocean Park (FOP), the largest marine theme park in Taiwan, has previously focused on entertaining guests. However, public expectations have been changing over the past couple of years. People now expect aquariums and oceanariums to be more educational and to contribute to ocean conservation. In 2023, we established our new brand ethos, "Co-Enjoy, Co-Educate, Co-Exist," which invites every guest who visits the park not only to be entertained, but to leave with a deeper understanding and appreciation for the ocean. There are several live cetacean stranding cases in Taiwan every year. FOP's veterinary team has provided different kinds of resources to help these stranded animals. The latest case was a stranded baby sperm whale. We helped official vets evaluate the animal's situation and ultimately euthanized the baby sperm whale, as no other possible actions could save its life. Based on this experience, the Hualien County government now trusts the FOP team and has signed a Memorandum of Understanding (MOU) for the rescue and rehabilitation of sea turtles. While no sea turtle has been under FOP's care yet, FOP sent its veterinary and caregiving team to visit the Taiwan Cetacean Society and the National Museum of Marine Biology and Aquarium to learn how to treat and care for sick sea turtles. As the only aquatic facility with a comprehensive veterinary team in Eastern Taiwan, FOP promises to contribute to sea turtle conservation with every effort. Trust us, FOP can help Taiwan save sea turtles when they are in need!

個人簡介

Dr. I-Fan Jen
任一凡

Director
Farglory Ocean Park

Director, Marine Department, Farglory Ocean Park. Dr. I-Fan Jen graduated with a DVM from Chiayi University. While dolphins are his favorite animals, I have some experiences caring for sea turtles from my time at the Haichang Yantai Whaleshark oceanarium in China. I may not have extensive professional information to share with you during this conference, but I can guarantee that I'll learn from all of you to contribute sea turtle conservation in Taiwan.

4-5.

Synovial fluid analysis in healthy green turtles *Chelonia mydas* in Taiwan

台灣健康綠蠵龜之關節囊液分析

Hsiang-Pei Su[1], Chau-Hwa Chi[1], Tsung-Hsien Li[2], I-Jiunn Cheng[3], Pin-Huan Yu[1]*

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Septic arthritis is a frustrating disease in sea turtle rehabilitation because of its unclear pathogenesis, delayed onset during rehabilitation, long-term treatment requirements, and potentially poor prognosis. Radiography, blood cultures, and arthrocentesis have been used as diagnostic tools for suspected cases. However, there is currently a lack of data on the characteristics of synovial fluid in healthy sea turtles. To establish reference data for synovial fluid in sea turtles, we enrolled 14 green turtles Chelonia mydas rescued between 2019 and 2022 from 3 facilities using the following inclusion criteria: normal attitude and appetite, normal motor functions of the four limbs, no joint swelling, and no ongoing use of antibiotics for at least 1 month. Bacterial cultures of blood and synovial fluid from the shoulder joints of these turtles were obtained, and a qualitative analysis of the synovial fluid was performed. The results revealed bacterial culture-negative blood and synovial fluids at 37°C. Most characteristics of normal synovial fluid in green turtles, such as being transparent, colorless, and able to create a strand of over 2.5 cm by being pulled with a needle in viscosity trials, as well as the cytology of the normal synovial

fluids being dominated by histiocytes and synovial lining cells, lymphocytes, and occasionally a few heterophils or erythrocytes were similar to those in mammals. This study provides information on the normal synovial fluid characteristics of green turtles in Taiwan, which may be beneficial for the diagnosis of joint diseases in sea turtles.

Keywords: Sea turtles, Septic arthritis, Synovial fluid analysis, Blood culture, Arthrocentesis, Osteomyelitis

個人簡介

Dr. Pin Huan Yu
余品奐

Professor
School of Veterinary Medicine, National Taiwan University

Pin-Huan Yu is a professor at National Taiwan University. His recent work focuses specifically on the fungal diseases in reptiles, capillary zone electrophoresis in reptiles and fluid dynamic in exotic animals. As a passionate wildlife veterinarian, he is dedicated to apply clinical veterinary science in wildlife conservation.

4-6.

Staphylococcus aureus: Health risk on juvenile green turtle in the Sea Turtle Conservation Center of Thailand

金黃色葡萄球菌：泰國海龜保育中心中青年綠蠵龜的健康風險

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Staphylococcus aureus is one of the most frequent Gram-positive bacteria found infection in juvenile green turtles (*Chelonia mydas*) at the Sea Turtle Conservation Center of Thailand (STCCT), Sattahip, Chonburi Province. To assess health risk of juvenile turtles from *S. aureus* infection, presence of S. aureus in coastal seawater used as input to the containers, rearing water, fish fillet used as feed, and juvenile turtle carcasses was investigated. From the results, *S. aureus* can be isolated from rearing water, fish fillet, and juvenile turtle carcasses but not incoming coastal seawater. Antibiotic resistance assessment of these isolates against eleven drugs demonstrated that *S. aureus* from juvenile turtles possesses higher resistant-antibiotic numbers than those of isolates from rearing water and fish fillet. Moreover, a higher isolate number of methicillin-resistant *S. aureus* (MRSA) was found in juvenile turtle carcasses. We also detected *mecA*-positive MSSA and unusual penicillin-susceptible MRSA strain. When compared with our previous observation, difference of antibiotic resistance profiles in this study was observed, implying that change of antibiotic resistance properties occurs continuingly in *S. aureus*. This suggests that status of animal health is at high risk and it emphasizes the need of surveillance plan and treatment strategies to confront this serious threat.

個人簡介

Dr. Thanaporn Chuen-im

Assistant Professor
Faculty of Science, Silpakorn University

Dr. Thanaporn Chuen-im investigates bacterial infection in juvenile green turtle in the conservation center in Thailand. Her work covers microbiological investigation and antibiotic resistance property. She also carries out the study on genes from genome of green turtle.

4-7.

Lessons Learned in Sea Turtle Rescue and Conservation: Experiences from the Taiwan Cetacean Society

中華鯨豚協會海龜救援與保育實務分享

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Since 2021, the Taiwan Cetacean Society (TCS) has assisted several counties in sea turtle stranding management and collaborated with Xpark on rescue and rehabilitation. At the same time, it has worked with the National Taiwan University Veterinary Hospital to provide health examinations for sea turtles rescued in Penghu. In 2023, TCS officially established the Cetacean and Sea Turtle Rescue and Rehabilitation Center, which, building upon these collaborations, expanded its operations to include sea turtle stranding response and rehabilitation along the coastline from Changhua to Yilan. As of August 2025, the Center has rehabilitated 30 sea turtles, 15 of which have recovered and been successfully released back into the ocean. This presentation will review recent live stranding cases rehabilitated by TCS, highlight particularly notable cases, and use them as a basis to discuss the major threats faced by sea turtles along Taiwan's northern coast, as well as the challenges and prospects for future rescue and conservation efforts.

Keywords: Sea Turtle, Stranding rehabilitation, Conservation

自 2021 年起，中華鯨豚協會開始協助部分縣市的海龜擱淺處理，並與 Xpark 建立合作，進行活體救援與收容工作。同時，也與台大動物醫院合作，協助澎湖收容個體的健康檢查。2023 年起，協會正式成立鯨豚與海龜綜合救傷中心，在與前述單位持續合作的基礎上，擴展執行彰化至宜蘭海岸線的海龜擱淺處理與收容業務，截至 2025 年 8 月，協會救傷中心內已收容 30 隻海龜，其中 15 隻個體已經康復並成功野放。本次演講將回顧協會近年累積的活體擱淺案例，分享其中具有代表性的特殊個案，並以此探討北海岸海龜所面臨的主要威脅，以及未來在救援與保育上的挑戰與展望。

關鍵字：海龜、擱淺救援、保育

個人簡介

Yu-Rong Chen
陳毓蓉

Veterinarian
Taiwan Cetacean Society

Yu-Rong Chen is a veterinarian at the Taiwan Cetacean Society, specializing in cetacean and sea turtle stranding management and also engaging in public outreach and education.

4-8.

Anthropogenic Impact on Sea Turtles from the Perspective of the Sea Turtle Rehabilitation Facility

從海龜救傷中心視角探討人為衝擊對海龜的影響

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Sea turtles have been adversely affected by various human activities worldwide, including being caught as non-target bycatch, coastal development, marine debris, global environmental change, marine pollution, and human-exacerbated diseases such as fibropapillomatosis (FP). Because they live almost entirely underwater, the public has limited knowledge of sea turtles. Therefore, sea turtles in rehabilitation facilities provide a valuable opportunity to increase our understanding of how human activities impact wild populations. Since 2018, the National Museum of Marine Biology and Aquarium, with the support and cooperation of the Ocean Conservation Administration, has released a total of 108 rehabilitated sea turtles. In Taiwan, sea turtles have been observed to be affected by human-induced threats such as injuries from fishing activities, ingestion of marine debris, infections with antimicrobial-resistant bacteria, and FP. By visiting rehabilitation facilities and participating in educational activities, the public can raise awareness of the impact of human activities on sea turtles.

Keywords: Sea turtles, Human activities, Fibropapillomatosis, Antimicrobial-resistant bacteria, Educational activities.

個人簡介

Dr. Tsung-Hsien Li
李宗賢

Assistant Researcher 助理研究員
National Museum of Marine Biology and Aquarium 國立海洋生物博物館

Dr. Tsung-Hsien Li, who works at the National Museum of Marine Biology and Aquarium, is also a veterinarian with nearly 15 years of experience in sea turtle rescue and conservation, and has published numerous scientific research papers related to sea turtles.

Session (5)
Environmental education and outreach effectiveness

講座主題 (5)
環境教育和推廣

5-1.
Promoting Marine Science Education through Integration of History, Art and Science at the Hong Kong Maritime Museum

從香港海事博物館出發 – 結合歷史、藝術與科學認識海洋

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Advocating our mission of "exploring human-ocean interaction with the community through History, Art, and Science", the Swire Marine Discovery Centre at the Hong Kong Maritime Museum actively engages in partnerships with a diverse group of stakeholders for fostering marine science education. We provide the public and students with a variety of engaging learning activities, including exhibitions, guided tours, talks, workshops and movie screenings, with an aim to rebuilding the human-ocean relationship. In addition to addressing the challenges and opportunities in our sharing, this presentation will offer participants an exploratory journey and interactive experience of learning about the ocean.

Keywords: Marine Education, Museum, History, Art, Science

「通過歷史、藝術和科學探索人類與海洋的互動關係」 - 香港海事博物館內的太古海洋探知館積極與各界別合作，為大眾及學生提供海洋科學教育活動，如展覽、導賞、講座及工作坊，重建人類與海洋的連結。是次研討會將分享本館在推動海洋教育的挑戰和機遇，帶領參加者以互動的體驗方式，以「歷史、藝術和科學」角度探索海洋教育。

關鍵字：海龜、擱淺救援、保育

個人簡介

Dr. Connie Ka Yan NG
伍家恩

Head of Marine Discovery Centre
Hong Kong Maritime Museum

Dr. Connie NG is the Head of the Marine Discovery Centre at the Hong Kong Maritime Museum. She has dedicated over 16 years to nature conservation through public education, scientific research, and stakeholder engagement in her government and NGO positions. She has been involved in sea turtle research and conservation and served as the East Asia Regional Co-Vice Chair for the Marine Turtle Specialist Group of the IUCN. Being a museum practitioner, she is committed to enhancing ocean literacy and marine conservation through interdisciplinary collaboration and integration of history, art and science, engaging a wider community involvement in conservation effort.

伍家恩博士，現為香港海事博物館海洋探知館主管。IUCN 海龜專家組別、東亞地區聯合副主席。投身科研、保育及公眾教育超過 16 年。致力促進跨文化界別的合作，結合歷史、藝術與科學，讓大眾認識海洋科學，參與保育工作。

5-2.

Sustainable Partnership of Research, Traditional Knowledge Preservation, and Tourism at Kuroshima Research Station

黑島研究站的永續夥伴關係：融合研究、傳統知識保存與旅遊

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Kuroshima Island is a small island in the Yaeyama Islands with a population of about 200 and a circumference of 13 km. On this island, we operate the Kuroshima Research Station, a museum-like facility for marine biological research, environmental education, and contributions to the local economy. Our sea turtle research has a long history, with nesting surveys conducted continuously since 1978. In addition, we have continuously conducted a mark–recapture program targeting sea turtles in the Yaeyama waters since 1995, and approximately 2,500 individuals have been tagged and released. Meanwhile, the local community has faced challenges such as the decline of traditional culture and economic stagnation. In particular, the Great East Japan Earthquake in 2011 caused a sharp decrease in visitors to this region, resulting in a significant downturn in the island's tourism industry. To address these issues, we began partnership activities that involve traditional sea turtle fishing practices, local tourism operators, and academic institutions, and these efforts continue today. This presentation highlights the role of a small research institution operated by an NPO and discusses the strategies that have enabled it to sustain its activities.

個人簡介

Dr. Kazunari Kameda
龜田 和成

Marine Biologist
Sea Turtle Association of Japan

Kameda is a marine biologist belonging to the NPO Sea Turtle Association of Japan. He has been working at the Kuroshima Research Station for over 20 years. Kuroshima Island is located at the southern end of Japan and is surrounded by the largest coral reef in Japan. Marine animal research on sea turtles, corals, and fish has been conducted. In addition to research, Kuroshima Research Station also serves as a museum-like facility for the public and tourists.

5-3.

Taking up the Challenge: The Role of Public Aquariums in Sea Turtle Rescue and Rehabilitation

民間經營公眾水族館肩負海龜救傷收容之挑戰

林宣佑[1]、高嘉佑[1]、彭伊筠[1]、羅婕[1]、張哲維[1]、森田大輔[1]、竹中良太[1]、手嶋一雄[1]

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Xpark, the first overseas branch of Japan's Seibu Group's Hakkeijima Sea Paradise, opened in 2020 as Taiwan's first metropolitan-style aquarium. Guided by the Group's philosophy of contributing to society and protecting the environment, Xpark strives to provide safe, comfortable services while inspiring visitors through meaningful encounters with marine life. Although many guests visit for leisure, the aquarium's educational mission remains at its core. Proper animal welfare is essential, as it shapes public attitudes toward marine life. Without high welfare standards, visitors may misinterpret inadequate conditions as acceptable, undermining the message of respecting the ocean and its creatures. The way animals are cared for and the culture of management influence visitors both directly and indirectly, reinforcing education on respect for life. In 2023, Xpark partnered with the Ocean Conservation Administration, Taoyuan City Government, and the Cetacean Society of Taiwan to establish the Taoyuan Sea Turtle Conservation, Education, and Rescue Center. As Taiwan's fifth sea turtle rehabilitation facility—and the first operated through corporate–government collaboration—it has admitted nine turtles to date. Educational outreach has also grown, reaching nearly 7,400 participants since its launch. This presentation will highlight Xpark's initiatives in sea turtle conservation, education, rescue, and rehabilitation. We will share practical cases of collaboration with government and conservation groups, lessons learned from these partnerships, and the challenges that remain in advancing marine conservation through a corporate-operated facility.

Keywords: Rescue, Rehabilitation, Private public Aquariums, Sea Turtle

來自日本西武集團旗下八景島海島樂園的首座海外分館 Xpark，遵循集團理念為當地地區社會的發展及環境維護做出貢獻，提供安全舒適的服務，並且把為顧客創造新的感動作為自豪與責任。Xpark 作為臺灣首座城市型的都會水族館場域，開館迄今吸引許多遊客入館，對於來訪的動機，或許多是基於休閒和娛樂之目的而來，但場域的教育功能卻總是備受期待的。若生物展示上沒有完善的動物福利，來館參觀的遊客因此誤解為理所當然，則無法傳遞「尊重海洋環境與愛護海洋生物」的宗旨，也無法正向傳遞集團標語「用生物帶給每一位旅人的微笑與感動」。水族館中的動物福利對於水族館所賦予的教育功能來說是極為重要的，照養動物的態度和經營管理的文化會經由非正式的途徑影響前來參觀的遊客，而生物在館內展示所獲的待遇和生活品質，同時也意謂人類對待動物的態度，為教育遊客尊重生命和愛護動物的態度，相信透過館內規畫積極的規劃和引導，亦可將相關訊息傳遞給來訪的遊客。2020 年開館，2023 年與海洋保育署、桃園市政府與中華鯨豚協會所共同設立之「桃園市海龜保育教育暨救傷中心」，成為臺灣第 5 座海龜收容中心，也是迄今第一座企業經營與政府合作之場域，實績上已收治 9 隻次個案；整體營運所發揮教育功能，逐年增加觸及人數次，已累積近 7400 人次之量體，本次分享就 Xpark 就海龜保育、教育、救傷與收容，如何與中央主管機關、地方主管機關與專業保育團體 中華鯨豚協會透過互信、互助幾個實際合作案例，並從中所啟發之精進作為與後續所面臨挑戰。

關鍵字：救援、收容、民營水族館、海龜

個人簡介

Hsuan-You Lin
林宣佑

Associate Executive Director
Xpark

Session (6)
Others

講座主題 (6)
其他

6-1.
A preliminary evaluation of the scatological approach to understand Taiwan's sea turtle population structure and anthropogenic influence

運用糞便學方法初步評估台灣海龜族群結構與人為影響

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Research on endangered marine megafauna is often limited by strict permitting and logistical challenges, reducing opportunities for invasive sampling. Non-invasive methods, such as using faecal material, can offer valuable insights while minimising stress to the animals. In this study, we assessed sea turtle faeces as a source of information for both population genetics and

macroplastic ingestion. Faecal samples were opportunistically collected from green turtles at foraging grounds around Taiwanese waters. DNA was extracted and quality checked, and samples were also examined for macroplastic fragments. Preliminary genetic analyses confirmed that faeces provide sufficient host DNA for sequencing and mixed stock analysis. Results showed that the Liuqiu Island aggregation originates from multiple natal regions, including Ulithi Atoll (Yap Islands), the Central Ryukyu, and Palawan (Philippines). This underscores Liuqiu Island as a key foraging site for Pacific green turtles. Macroplastic fragments were found in most samples. The most common polymer types were polyvinyl chloride (PVC), polyethylene terephthalate (PET), polyurethane (PU), polypropylene (PP), and polymethylpentene (PMP). Fragment counts varied widely among individuals, with a significant average burden, high variation, and an extensive range from a minimal to a large number. These initial findings demonstrate the potential of faecal sampling as a non-invasive approach for both genetic and ecological monitoring. Refining this approach could expand our ability to track population structure and document human-induced pressures across life stages and habitats, offering a practical, non-invasive tool for marine megafauna research and conservation.

Keywords: Non-invasive sampling, Faeces, Mixed stock analysis, Plastic ingestion, Marine debris

研究瀕危海洋大型動物通常受到嚴格的許可限制與後勤工作挑戰，降低了進行侵入性取樣的可能性。非侵入性方法，如糞便樣本，能在不造成動物壓力的情況下收集寶貴的研究資料。本研究評估了海龜糞便在族群遺傳學與巨型塑膠攝食檢測方面的應用潛力。我們於台灣周邊海域的綠蠵龜覓食地點，隨機性地收集糞便樣本，並進行 DNA 萃取與品質檢測，同時檢視樣本中是否含有巨型塑膠碎片。初步遺傳分析證實糞便可提供足夠的宿主 DNA 進行定序與族群來源分析。結果顯示，小琉球聚集群體來源多樣，包含雅浦群島的烏利西環礁、日本琉球中部及菲律賓巴拉望，凸顯小琉球作為太平洋綠蠵龜重要覓食地的地位。大部分樣本中均發現巨型塑膠碎片，最常見的聚合物類型包括聚氯乙烯（PVC）、聚對苯二甲酸乙二醇酯（PET）、聚氨酯（PU）、聚丙烯（PP）及聚甲基戊烯（PMP）。不同個體之間的碎片數量差異極大，呈現顯著的平均負荷、高度變異，以及從極少量到大量的廣泛分布。這些初步發現顯示，糞便取樣具有成為同時進行遺傳與生態監測的非侵入性研究途徑的潛力。若能持續優化此方法，將有助於追蹤族群結構，並記錄人為壓力在不同生命史階段與棲地中的影響，為海洋大型動物研究與保育提供實用的非侵入性工具。

關鍵字：非侵入性取樣、糞便、族群分析、塑膠攝食、海洋廢棄物

個人簡介

Dr. Daphne Hoh
何芷蔚

Co-founder/Researcher 共同發起人 / 研究員
TurtleSpot Taiwan 社團法人台灣海龜點點名協會

Dr. Daphne Hoh is a marine scientist specialising in sea turtle ecology and biodiversity informatics. Her research has explored fungal infections in sea turtle eggs, foraging ecology, and the application of open data for conservation research. She co-founded TurtleSpot Taiwan, a citizen science initiative that gathers sea turtle sighting data to promote conservation and open science.

Ning Yen
顏寧

CEO 執行長
IndigoWaters Institute 澄洋環境顧問有限公司

Ning Yen is a passionate ocean conservation activist who has dedicated over a decade to safeguarding the world's oceans. Her expertise lies in science communication, policy advocacy, and forging meaningful connections among diverse stakeholders. She worked closely with the Environmental Protection Administration of Taiwan to co-author Taiwan's Action Plan for Marine Debris Governance. She leads several citizen science initiatives, crafting capacity-building programs for local NGOs and fostering regional collaboration with organizations in Korea, Japan, and the United States. Beyond her professional endeavors, she loves exploring new places through travel and cooking for her family and friends.

6-2.
The amazing skeletal structure of the leatherback turtle

神奇的革龜骨骼

Wei-Lien Chi[1, 2]*

[1]Asia University 亞洲大學

[2]Taiwan Cetacean Society 中華鯨豚協會

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The leatherback sea turtle skeleton specimen produced by our project are individuals that were stranded on Fulong Beach in New Taipei City on February 1, 2022. After the rescue failed, a pathological necropsy was performed. Because leatherback turtle samples are very precious and rare, the Ocean Conservation Administration is committed to preserving the value of scientific research and education. The production project was called for public bidding in the form of bids, and the team of Professor Wei-Lien Chi from Asia University won the bid. The production process began in September of the same year. The leatherback sea turtle sample was cut off the skin and muscles, bacteria digested periosteal tendon and residual meat, boiled and cleaned, degreased, bleached, strengthen, and parts assembled and integrated the whole skeleton system. The production was completed in March 2023. 3D digitally scanning each part, and completing a special report on "Leatherback sea turtle Skeleton Structure". In the report, the skull, spine, front and rear limbs, dorsal carapace, and plastron bones are drawn separately in a scientific drawing method to provide future scientific discussions or exhibitions.

2022 年 2 月 1 日於新北市福隆沙灘擱淺之個體，在搶救無效後進行了病理解剖，因革龜樣本非常珍貴稀有，因此海保署致力保存其科學研究及教育之價值，以標案方式公開招標，由亞洲大學祁偉廉教授團隊得標。同年 9 月開始製作程序，革龜樣本經清除皮膚肌肉、細菌消化骨膜筋腱與殘肉、煮沸清潔、脫脂、漂白、部位組裝與整體結合等程序，於 2023 年 3 月完成製作，期間也配合 3D 掃描將各部位進行數位記錄，並完成一份「革龜骨骼結構」專題報告，報告中以科學繪圖方式將頭骨、脊椎、前後肢及背腹甲骨骼分別繪製，提供日後探討或展出的科學資訊。

個人簡介

Wei-Lien Chi
祁偉廉

DVM, President
Taiwan Cetacean Society

6-3.
Trafficking Currents: The Illegal Trade in Sea Turtles across Asia

暗流下的交易：亞洲海龜非法貿易

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Although all seven species of sea turtles are protected under CITES, trafficking remains a persistent threat across Asia. Many countries also have national and local legislation in place, yet demand for meat, eggs, shells, and other body parts continues to drive illegal trade. This analysis examined patterns of sea turtle trafficking from January 2015 to July 2025, focusing on countries in Asia (specifically covering Southeast Asia, East Asia, and South Asia) implicated as source, transit, and/or destination points, while also noting flows within and beyond these regions. Drawing from TRAFFIC's Wildlife Trade Information System (WiTIS), the analysis identified temporal trends in trafficking activity, highlighted incident hotspots, and mapped trafficking routes. The analysis further assessed the volume and type of commodities involved and explores transport modes and concealment methods used in trafficking. These findings provide insights into the scale, geography, and dynamics of sea turtle trafficking in Asia, providing an evidence base to strengthen enforcement responses and conservation strategies.

Keywords: Sea turtles, Illegal wildlife trade, Poaching, Asia

個人簡介

Dr. Seh Ling Long

Senior Programme Officer - Training & Capacity Building
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Seh Ling Long is the Senior Programme Officer at TRAFFIC, based in Malaysia. She works with enforcement agencies, regulatory bodies, private companies and NGOs to build capacity of key stakeholders in tackling illegal wildlife trade through developing resources and delivering training. A founding member of the Perhentian Turtle Project, she has extensive experience in sea turtle monitoring and inclusive, participatory conservation with communities and stakeholders. She completed her PhD at Universiti Malaysia Terengganu on human–sea turtle interactions. She draws on both natural and social science to bridge the gap between research and practice in sea turtle conservation.

6-4.

Where Do They Come From, Where Do They Go? Migration of turtles in the Asia-Pacific region

牠們從哪裡來？又往哪裡去？亞太地區海龜的遷徙

Rushan Abdul Rahman[1,2] *, Juanita Joseph[3], Putu Liza Mustika[1], Windia Adnyana[4], Stephanie Duce[1], Nicolas J. Pilcher[5], Jaya Ratha[6], Nguyen Thi Dieu Thuy[7], Mark Hamann[1]

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Marine turtles are a species of charismatic marine megafauna which undergo long-distance migrations between their nesting beaches and foraging waters. Many of these marine turtles migrate across seas and oceans, or even around coastlines; these migration patterns are often a result of several factors, such as the initial current patterns present when the marine turtles hatched, species, and location of nesting site. This talk will provide a background into migrations and why they occur, followed by an overview of the migratory patterns within Southeast Asia.

Keywords: Marine turtle, Migration, Asia Pacific, Southeast Asia

個人簡介

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Rushan is a spatial ecologist and movement ecologist who primarily works on satellite tracking sea turtles. His research covers the movement ecology of olive ridley turtles, green turtles, and hawksbill turtles within the Indian Ocean and Southeast Asia. Through his research and analysis of satellite tracking data, he and others have identified foraging regions, important marine turtle areas, and work to develop spatial regions that can benefit both marine turtles and local livelihoods.

6-5.
Digitizing Conservation: How Virtopsy and 3D Surface Scanning Transform Sea Turtle Stranding Investigation

數位化保育：Virtopsy 與 3D 表面掃描如何改變海龜擱淺調查

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Understanding the health and causes of mortality in sea turtles is crucial for effective conservation. Stranding events provide valuable data on species composition, biometrics, health and pathologies, and the threats these animals face. Conventionally, stranded sea turtles may be visually examined to collect basic parameters. In fresh cases, necropsies performed by trained veterinarians can uncover threats and pathologies. However, limited resources and expertise have rendered many cases unexamined, leaving a wealth of information undiscovered worldwide. In Hong Kong, a virtopsy-led sea turtle stranding investigation programme was initiated in 2019. Stranded sea turtles were retrieved for Computed Tomography (CT), Ultrasonography (USG), and 3D Surface Scanning (3DSS) prior to rehabilitation and follow-up (for live cases) or necropsy (for deceased cases). CT captures cross-sectional images that accurately reveal internal structures and pathologies without physically opening the bodies, preserving biological evidence in situ. USG is a real-time, non-invasive method that visualizes soft tissues within the coelomic cavity utilizing specific acoustic windows. These methods have been reliably adopted in human and veterinary medicines for detection of common diagnoses. Meanwhile, 3DSS captures external shapes and optical features, which is used in forensic science to for archiving objects and scenes. The integration of CT, USG and 3DSS creates virtual representatives comprising precise structural

and textural data, enabling indefinite examinations (VIRTual necrOPSY = "virtopsy") in a digitally storable and transferable format without the actual bodies, facilitating knowledge transfer across the world and supporting retrospective studies. To date, whole-body CT and 3DSS has been performed on 106 sea turtles (54 live stranded, 52 deceased) of 5 different species, including cases shared by collaborators worldwide. USG has been performed on live stranded sea turtles (and occasionally on the deceased if body condition allowed). Virtopsy findings highlighted conditions including superficial wounds, entanglements, traumas, gas collections, foreign bodies, respiratory and gastrointestinal complications, skeletal ossification patterns, and reproductive statuses. The insights effectively informed treatment plan for live cases and guided necropsy for deceased individuals.

Keywords: Computed tomography, Ultrasonography, 3D surface ccanning, Virtopsy, Health assessment

Acknowledgements:
We would like to thank the Agriculture, Fisheries and Conservation Department of the Government of Hong Kong Special Administrative Region of the People's Republic of China for providing data and the continuous support in this project. Sincere appreciation is also extended to all the related personnel from the Aquatic Animal Virtopsy Lab, Jockey Club College of Veterinary Medicine and Life Sciences, City University of Hong Kong, and Veterinary Hospital and Grand Aquarium, Zoological Operations and Conservation, Ocean Park Hong Kong. Special gratitude is owed to technicians in CityU Veterinary Medical Center for operating the CT units in this study. This project is financially supported by Environment and Conservation Fund of the Hong Kong Special Administrative Region (grant numbers: ECF 2019-10, EECA 2467), the Marine Conservation Enhancement Fund (grant numbers.: MCEF21005) and the Marine Ecology Enhancement Fund (grant numbers: MEEF2023003, MEEF2023003A) of the Marine Ecology & Fisheries Enhancement Funds Trustee Limited. Any opinions, findings, conclusions, or recommendations expressed herein do not necessarily reflect the views of the Government of the Hong Kong Special Administrative Region, the Environment and Conservation Fund and the Environmental Campaign Committee; the views of the HKLTL, CAPCO and HK Electric, and the Marine Conservation Enhancement Fund; and the views of the Marine Ecology Enhancement Fund or the Trustee.

個人簡介

Dr. Tabris Yik To Chung

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Aquatic Animal Virtopsy Lab, City University of Hong Kong

Tabris obtained his PhD in Biological Sciences from the Hong Kong Polytechnic University in 2011. He joined AAVL in 2019, where he coordinated different research projects on health assessment of cetaceans and sea turtles. In 2023, he further acquired professional training on postmortem radiology and obtained his Certificate of Advanced Studies in Forensic Imaging and Virtopsy from the University of Zurich. Among various scientific approaches, Tabris has been focusing on visual health assessment on free-ranging dolphins, as well as imaging on stranded aquatic wildlife. In particular, Tabris is interested in digital documentation of animal specimens using 3D scanning, and their replication using 3D printing for research and outreach education, advocating public engagement in marine biology and conservation.

Session (7)
Application of photo-identification in monitoring

講座主題 (7)
海龜個體辨識的應用

7-1.
The power of citizen-science and volunteers in a sea turtle conservation project

公民科學與志工在海龜保育計畫中的力量

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Sea Turtle Conservation Project CHURAMURA are founding members of the Okinawa Coastal Protection Alliance (OCPA), a group of unfunded NGOs run by volunteers in Okinawa, southern Japan. Little observational or ecological research has been conducted on the populations of sea turtles that visit or inhabit the ocean surrounding the main island and other nearby islands. Therefore, Churamura started the citizen-science based project Okinawa Turtle Spotters (OTS) to help fill this knowledge gap. Citizen-science projects are useful in ecology, particularly where

photos can identify individuals within populations. The pattern of facial scales of sea turtles, particularly for Green sea turtles and to a lesser extent Hawksbill and Loggerhead, are clearly visible and have been shown to be both unique to an individual and stable through their lifetime. Leveraging the large diving community in Okinawa, OTS has received over 500 submissions of sea turtle encounters within its first three years, from over 65 members of the community. The photos have enabled us to learn about instances of fibropapilloma, fish hooks and amputations with the local population as well as identify locations that are used for foraging and resting. Automated analysis of the facial scale patterns have identified 208 individuals (82% Green, 14% Hawksbill, 4% Loggerhead). The majority of these individuals were observed being active inside a restricted area and did not travel between sites. There are challenges to overcome in such citizen science programs in volunteer organisations, but the benefits for conservation related research are clear.

Keywords: Citizen science, Photo ID, Japan, Volunteers, Sea turtles

個人簡介

Carl Bastian

Chief Ranger
Okinawa Coastal Protection Alliance, Sea Turtle Conservation Project CHURAMURA

Carl Bastian is the founder & Chief Ranger of Okinawa Coastal Protection Alliance (OCPA), Okinawa Sea Turtle Conservation Project CHURAMURA

7-2.

Generating Representative Mark-Resight Data and Applying a Standardized Site Fidelity Index to Study Green Turtle Foraging Aggregations

綠蠵龜覓食聚集研究：個體辨識資料有效性的驗證及棲地忠誠度指數的應用

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Understanding the population dynamics and site fidelity of marine turtles in foraging habitats is critical for effective conservation, yet few in-water survey designs ensure robust mark–resight data. We conducted a two-year multiple-event snorkel survey with photo-ID of 398 green turtles at two adjacent reefs in Liuqiu Island, Taiwan. Multiple-event surveys (two surveys in a day for three consecutive days every three months) achieved >95% sampling coverage and nearly doubled resighting rates compared to single-event surveys. Turtle counts varied with tides: sightings peaked during flood and high tides, while flood and ebb tides yielded more unique individuals. These results show the need to consider tidal timing when designing surveys. The majority (65.4%) of sighted turtles were juveniles, and 8.5% showed partially or fully-healed injuries. Using the Standardized Site Fidelity Index (SSFI), we identified two clusters: Low Fidelity (49% of the turtles) and High Fidelity (51%). Adult-sized turtles had significantly higher SSFI values than juveniles and subadults, consistent with ontogenetic expansion of home range. Relative to other regions with open-access datasets, Liuqiu turtles showed higher SSFI values, reflecting the influence of both survey design and habitat conditions on site fidelity assessments. Our results address methodological gaps in earlier single-event or opportunistic studies that often underestimated aggregation size, residency, and fidelity, with direct implications for monitoring and management of marine turtle foraging habitats.

Keywords: Photo-ID, Survey design, iNEXT, SSFI, Foraging habitat

瞭解綠蠵龜在覓食棲地的族群動態與棲地忠誠度對保育至關重要，但多數水下調查缺乏目擊資料有效性的檢視。本研究在台灣海龜覓食熱區小琉球進行為期兩年的系統性浮潛調查，驗證調查設計（傳統單次調查及重覆調查）和潮汐對資料有效性的影響，並進一步評估小琉球覓食族群的棲地忠誠度。重覆調查的資料辨識出 398 隻綠蠵龜，取樣完整度超過 95%，且海龜被重複目擊率為單次調查的近兩倍。漲潮與滿潮時海龜數量較多，而漲退潮時，則出現較多不同個體。觀察到的個體以青年龜為主（65.4%），其中 8.5% 帶有外傷或傷痕。標準化棲地忠誠度指數（SSFI）顯示低忠誠度與高忠誠度群體比例相近，且成體的 SSFI 值顯著高於幼龜與亞成體。相較其他資料集及地區相比，小琉球海龜有較高的 SSFI 值，可能是調查設計與棲地條件對其棲地忠誠度評估的影響。本研究補足過去傳統單次調查或機會性調查在覓食族群數量與棲地忠誠度上的低估，對綠蠵龜棲地的監測與管理有應用價值。

關鍵字：個體辨識、調查設計、iNEXT、標準化棲地忠誠度指標、覓食棲息地

個人簡介

Dr. Chia-Ling Fong
馮加伶

Co-founder/Researcher 共同發起人 / 研究員
TurtleSpot Taiwan 社團法人台灣海龜點點名協會

Chia-Ling Fong is a marine biologist specializing in sea turtle ecology and conservation, with interests in citizen science and coral reef ecosystems. She co-founded the TurtleSpot Taiwan project with other sea turtle lovers and recently completed her PhD at Academia Sinica and National Taiwan Normal University, where she focused on foraging habitats, site fidelity, and injury recovery of green turtles.

7-3.

Deep Learning for High-Accuracy Sea Turtle Individual Identification

利用深度學習進行高準確度的海龜個體辨識

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We address individual identification of sea turtles by augmenting a feature-based workflow (HotSpotter) with deep learning to improve robustness to viewpoint changes. While HotSpotter retrieves likely matches via SIFT keypoints, its accuracy drops when query and candidate images differ in shooting angle. We curated 150 images from 34 identified turtles and benchmarked four CNN backbones (ResNet, ConvNeXt, MobileNet, EfficientNet) for the identification task. Using one image per turtle as queries and the remainder as an image, we first selected the optimal backbone by comparing per-query similarity rankings. ResNet consistently achieved the highest scores on this small dataset, with MobileNet second. We then fine-tuned ResNet on the 34-class (116 images) and re-evaluated the 12 queries for which HotSpotter failed to place the correct identity in its top five. Fine-tuning raised the number of queries with a top-5 correct match from 3 to 5, demonstrating a gain despite limited training data. We analyze why ResNet outperforms larger modern backbones and outline ongoing work.

Keywords: Individual identification, Deep-learning, Pattern recognition

個人簡介

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Takafumi Katayama received his B.E. and M.E. degrees in electrical engineering from Tokushima University. He belonged to the Renesas Electronics Corporation from 2012 to 2014. He received his Ph.D. degree in electrical engineering of Tokushima University in 2019. Presently, he joined Tokushima University in 2019 as an Assistant Professor of the Department of Electrical and Electronic Engineering, Graduate School of Advanced Technology and Science, Tokushima University. His current research interests include video coding algorithms, hardware design, and machine learning.

Session (8)
Conservation through community engagement

講座主題 (8)
以社區參與促進保育

8-1.
Science-Driven Conservation at Chagar Hutang Turtle Sanctuary

馬來西亞熱浪島 Chagar Hutang 海龜保護區的科學導向保育

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Chagar Hutang Turtle Sanctuary on Redang Island, managed by the Sea Turtle Research Unit (SEATRU) of Universiti Malaysia Terengganu since 1993, has grown from a focused field research initiative into an integrated model of science-driven conservation, combining long- term ecological research, habitat protection, and public education. This sharing session showcases how decades of systematically collected data on nesting trends, hatchling productivity, and habitat use are now being applied in ecological modelling to guide conservation strategies.

Applications include spatial analysis of nesting beaches, marine spatial planning to reduce turtle–boat conflicts, and predictive modelling to assess tourism impacts on turtle populations. These science-based approaches support more effective resource allocation, inform sustainable turtle-based ecotourism, and strengthen the balance between ecological integrity and socio-economic benefits for coastal communities. The Chagar Hutang experience illustrates how rigorous data and targeted modelling can transform a remote turtle sanctuary into a field laboratory for innovation in marine conservation.

個人簡介

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Dr. Mohd Uzair Rusli is a marine wildlife conservationist passionate about protecting ocean ecosystems and endangered species. He leads the Sea Turtle Research Unit (SEATRU) and manages the Chagar Hutang Turtle Sanctuary, the densest sea turtle nesting site in Peninsular Malaysia. His work integrates research, conservation, and education, focusing on sea turtle ecology and long-term protection. Beyond scientific pursuits, he is dedicated to community development, creating impactful outreach through school tours, volunteer opportunities, and awareness programs.

8-2.
Plastic Reduction Education Inspired by Sea Turtles

透過海龜所產生的減塑教育

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HiiN Studio is a Taiwan-based team dedicated to marine conservation, with sea turtles at the core of its educational work, promoting plastic reduction. Through beach cleanups, reusable tableware rental services, and environmental education programs, we encourage people to reduce plastic use. By taking sea turtles as the guiding theme, our programs cultivate empathy and inspire behavioral change. We launched the “Beach Money” cleanup activity, in which participants collect glass fragments and paint them into turtle-shaped artworks, engaging both local communities and businesses. In our camps, participants spend three to four days learning deeply about sea turtles while practicing a plastic-free lifestyle and creating plastic-free maps to strengthen conservation awareness. We also visited turtle habitats in Lanyu, Liuqiu, and Japan to train our team and enhance outreach capacity. Through these cases, we aim to show how sea turtles can serve as a starting point to unite people in reducing plastic use and engaging in marine conservation.

Keywords: Sea turtle conservation, Environmental education, Beach cleanup, Plastic reduction

海湧工作室是台灣推動海洋保育的團隊，以海龜為教育核心，帶動減塑行動。我們透過淨灘、循環餐具租借與環境教育課程推廣減塑，課程中以海龜為引導，喚起同理心，讓民眾更有動力改變行為。我們舉辦「海灘貨幣」淨灘，把撿拾的玻璃碎片彩繪成海龜，吸引社區與商家參與；在營隊中，則以三至四天深入認識海龜，並實踐無塑生活，繪製無塑地圖，強化保育意識。我們也走訪蘭嶼、小琉球及日本等地海龜棲地，培訓團隊並深化推廣能量。藉由這些案例，我們希望讓更多人看見，如何以海龜為起點，凝聚力量投入減塑與海洋保育行動。

關鍵字：海龜保育、環境教育、淨灘、減塑

個人簡介

Fu Kao
郭芙

Executive Vice President 副執行長
HiiN Studio 海湧工作室

Fu Kao, with a background in sea turtle research, later founded Ocean Waves Studio, a social enterprise dedicated to plastic reduction with sea turtles as the educational focus.

過去從事海龜研究，後來創辦海湧工作室，以海龜為教育核心，成為推廣減塑的社會企業。

8-3.

Returning the Ocean God's Daughter: Sea Turtle Ecology, Citizen Science, and Cultural Identity in Jeju

海神的女兒回家了——濟州島的海龜、生態與人文故事

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A longstanding folk belief among Jeju's ocean-dependent communities venerates the Dragon King (Yongwang) and associates sea turtles with the deity's household, often as the Dragon King's third daughter; accordingly, turtles were not to be harmed, and carcasses were traditionally returned to the sea through ritual offerings. Such cultural identification of sea turtles as sacred marine beings can be leveraged to strengthen conservation planning and motivate foundational research on the Jeju sea turtle population by aligning management with local values and practices. Deep cultural identification of sea turtles on Jeju Island has enabled collaborative research with fishers, tourists, and divers to investigate turtle ecology in local waters. These efforts include fisher-assisted GPS/satellite tagging, which produced the first evidence of green turtles overwintering around Jeju;

citizen science photo-identification, highlighting core habitats that overlap with marine protected areas; and records of strandings and bycatch from 2012 to 2017. Combined, these ecological studies aim to clarify the current status of Jeju's sea turtles while informing long-term conservation strategies and mitigation of anthropogenic impacts

個人簡介

Mi Yeon Kim

Mi Yeon Kim

Co-Founder/Researcher
Marine Animal Research and Conservation

Graduated with a master's degree from Ewha Womans University after collecting data by trekking through mountains and rice fields in search of tree frogs. Motivated by a desire to study the acoustic behavior of more socially complex animals, relocated to Jeju in 2016 to begin focused observations of Indo-Pacific bottlenose dolphins. Currently enrolled in the doctoral program at Kyoto University's Wildlife Research Center, researching the acoustic behavior of Indo-Pacific bottlenose dolphins and finless porpoises, and serving as a co-founder and researcher at the Marine Animal Research and Conservation (MARC) institute. A scientist who dreams of a planet where wildlife can thrive and works toward that vision through action.

8-4.

Beach Guardians: How Liuqiu Locals Protect Sea Turtles

沙灘守護者：
小琉球在地居民的海龜保育故事

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Liuqiu, a coral reef island southwest of Taiwan, has seen rapid tourism growth overlapping with green turtle nesting season from March to October, increasing visitor pressure. Other threats include typhoons, heat, and climate variability affecting incubation. In 2022, a citizen science model involving locals was launched to study reproductive ecology. Volunteers took part in monitoring and conservation efforts, with over 1,400 people observed on nesting beaches at night in 2024, reaching a high of 300–400 per month from May to July. Through environmental education, it became clear that most tourists were unaware of turtle nesting and were willing to reduce disturbance. Behavioral observations documented five major nesting stages: digging the large pit (20 min), digging the small pit (22 min), egg laying (20 min), tamping sand (5–15 min), and covering the nest (50 min), providing baseline data for assessing disturbance or environmental change. Beaches are short and vulnerable to erosion and rainfall, while human-modified sites lacking shade experience higher sand temperatures that can reduce hatching success. A shading experiment using a 3 × 3 m, 1.2 m-high net (50% shading) lowered nest temperatures by 0.5–1 °C, potentially improving hatch outcomes. Over three years, joint patrols by researchers and residents reduced disturbance, established baselines on reproductive behavior and nest conditions, and tested cooling methods to boost incubation success. These results emphasize the importance of local participation in immediate protection and long-term monitoring, demonstrating that combining sea turtle conservation with community engagement provides an effective and sustainable approach.

小琉球，位於台灣西南方的離島，是座珊瑚礁島，近年觀光發展蓬勃。小琉球自 3 至 10 月是綠蠵龜產卵季，與觀光季重疊而面臨高遊客壓力，另外氣候上也面臨颱風與高溫等挑戰，卵窩孵化易受影響。為執行母龜生殖生態調查，本研究自 2022 年起組織在地居民共同參與，形成「公民科學」的保育模式。本研究招募在地居民成為海龜志工，讓其親身參與海龜生殖生態調查與保育工作。2024 年 3-10 月間，紀錄夜間在沙灘的人數超過 1,400 人次，其中 5-7 月的高峰期每月平均約 300–400 人。多數遊客進行環境教育後，對於小琉球沙灘有海龜產卵表示驚奇且願意降低干擾行為。產卵行為觀察上，本研究記錄小琉球產卵母龜五大行為模式所花費的平均時間，分別為挖大洞 -20 分鐘、挖小洞 -22 分鐘、產卵 -20 分鐘、揉沙 -5–15 分鐘、覆沙 -50 分鐘。這些數據未來可作為辨識遊客干擾或環境變動影響的基準依據。小琉球的沙灘面積短小，易受天氣影響、海浪侵襲與強降雨而導致沙量劇烈變化；且在人為開發而缺乏林木遮蔭的區域，容易出現異常高溫，降低卵窩孵化率。為因應全球暖化，本研究進行卵窩遮陰試驗，結果顯示使用「3 公尺 × 3 公尺、1.2 公尺」高、遮光率 50% 的遮陰網，可有效降低卵窩溫度 0.5–1 ℃，對提升孵化率具有潛在助益。總而言之，透過研究員與在地居民的合作，藉由固定巡守降低了遊客干擾，更在近三年的調查中建立了海龜生殖行為與卵窩環境的基礎數據。同時，也設計並試驗降溫設施，以改善孵化條件。此成果凸顯在地居民參與海龜保育所展現的即時性保護與長期調查的可行性，說明將海龜保育與在地連結，才是最有效且永續的方式。

個人簡介

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Mr. Chun Hung Lin currently serving as Project Manager at the Taiwan Coral Island Association, focusing on sea turtle conservation and local ecological outreach. He earned his master's degree from the Institute of Marine Biology at National Taiwan Ocean University, and participated in the Lanyu Sea Turtle Survey Team (2014–2016). After graduation, he engaged in the conservation and habitat restoration of protected species such as the Taipei frog (Rana taipehensis) and the Chinese water snake (Enhydris chinensis). In addition, he has experience in freshwater fish and shrimp surveys, and is dedicated to integrating scientific research with local participation to promote long-term and sustainable marine conservation actions.

現任台灣咾咕嶼協會專案經理，專注於海龜保育及在地海龜生態推廣。畢業於國立海洋大學海洋生物研究所碩士，曾參與蘭嶼海龜調查團隊（2014–2016），畢業後投入第二級保育類動物如台北赤蛙及唐水蛇的保育推動與棲地營造。此外，亦具溪流魚蝦類調查經驗，致力於結合科學研究與在地參與，推動長期且永續的海洋保育行動。

8-5.
Communicating Conservation: Display to Dialogue for Sea Turtle Community Engagement

保育傳播：從展示到對話的海龜社群互動

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Green sea turtles are keystone species, playing a vital role in maintaining the health and balance of marine ecosystems. They are also considered as umbrella species, of which their wide-ranging habitat and ecological role make its conservation beneficial for a variety of other species within the same environment. The Aquatic Animal Virtopsy Lab in City University of Hong Kong has committed to advance aquatic wildlife conservation by utilizing multidisciplinary knowledge and techniques (diagnostic imaging, postmortem investigation, forensic science, veterinary medicine) for the health assessment of aquatic wildlife (including sea turtles), for collaborative research and outreach education, working towards the "One Ocean One Health" ideal. This presentation explores the innovative use of virtual reality (VR) simulation on computed tomography (CT) operation and the anatomical study of sea turtles, alongside an unprecedented exhibition featuring diverse aquatic animal specimens in Hong Kong. By integrating VR technology with data yielded by CT imaging and 3D surface scanning, we enable immersive dissection experiences that facilitate detailed anatomical annotations. This approach not only enhances educational outcomes for students and researchers but also fosters a deeper understanding of sea turtle biology and conservation needs. The exhibition serves as a platform for community engagement, showcasing a variety of sea turtle specimens and their ecological significance. Through interactive display technologies with augmented reality illustration reconciled with conventional museum

presentation, visitors gain firsthand insights into the challenges faced by these endangered species, promoting awareness and advocacy for their conservation. Moreover, the integration of immersive reality experiences alongside community exhibition creates multi-sensory experiences that educate, foster emotional connections, and inspire action for our sea turtle public outreach programme. From display to dialogue, the program bridges the gap between scientific research and community involvement, encouraging collaborative efforts in conservation initiatives. By fostering dialogue among stakeholders, including educators, researchers, and the public, we aim to inspire collective action toward the protection of sea turtles and their habitats. Effective community engagement is critical to sustaining these initiatives, as public support drives policy and behavioral changes that protect sea turtles and the ocean.

Keywords: Outreach, Exhibition, Virtual reality, Simulation, Community engagement

Acknowledgements:
We would like to thank the Agriculture, Fisheries and Conservation Department of the Government of Hong Kong Special Administrative Region of the People's Republic of China for providing data and the continuous support in this project. Sincere appreciation is also extended to all the related personnel from the Aquatic Animal Virtopsy Lab, Jockey Club College of Veterinary Medicine and Life Sciences, City University of Hong Kong, and Veterinary Hospital and Grand Aquarium, Zoological Operations and Conservation, Ocean Park Hong Kong. Special gratitude is owed to technicians in CityU Veterinary Medical Center for operating the CT units in this study. This project is financially supported by Environment and Conservation Fund of the Hong Kong Special Administrative Region (grant numbers: ECF 2019-10, EECA 2467), the Marine Conservation Enhancement Fund (grant numbers.: MCEF21005) and the Marine Ecology Enhancement Fund (grant numbers: MEEF2023003, MEEF2023003A) of the Marine Ecology & Fisheries Enhancement Funds Trustee Limited. Any opinions, findings, conclusions, or recommendations expressed herein do not necessarily reflect the views of the Government of the Hong Kong Special Administrative Region, the Environment and Conservation Fund and the Environmental Campaign Committee; the views of the HKLTL, CAPCO and HK Electric, and the Marine Conservation Enhancement Fund; and the views of the Marine Ecology Enhancement Fund or the Trustee.

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Henry obtained his MA in Communication and New Media in the City University of Hong Kong in 2014. Since then, he stepped into the field of aquatic animals and marine conservation, a totally different field than his major. With the capacity of lab manager, Henry has led local and international aquatic animal deployments for the Aquatic Animal Virtopsy Lab. He also assists in logistics arrangement and data management for the virtopsy and necropsy of cetaceans and sea turtles, as part of the Hong Kong Aquatic Animal Stranding Investigation. Henry leads the grants and contracts administration and project financial management in support of AAVL conservation medicine and research activities.

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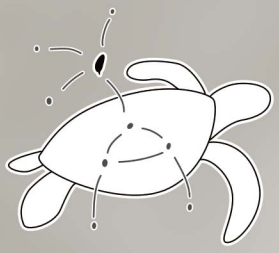

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