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Front Cover: Proboscis monkey at Bako National Park. Photo Credit: Wong SY

Amanat Pengarah 2021

18 MARCH 2021

The 2021 mandate for IBEC was delivered by Assoc. Prof. Dr Mohd Azlan Jayasilan on 18th March 2021. The mandate was attended and well received by the IBEC staff. IBEC members pledge support for the targets set in 2021.



AWANG KHAIRUL IKHWAN BIN AWANG ABDUL RAHIM

Life History of the Baleh Water Skink, Tropidophorus sebi in Sarawak, Malaysia

The purpose of this study is to investigate the spatial, thermal and trophic ecology of the Baleh Water Skink, *Tropidophorus sebi*. Skinks are encountered along transects and harnessed with a temperature-sensitive radio transmitter (Holohil BD-2). Telemetry techniques used to track individuals help to obtain a variety of data, from locations to understanding microhabitat use, to displacement and body temperature. The study is expected to show an association of an ectotherm with its surroundings in terms of intraspecific relationships, habitat use, thermal resources, and physiological adaptations to the landscape, and possible effects of climate change. There have been few prior studies on the field ecology of Bornean squamates, and the current project is expected to contribute to the knowledge of life history of this recently described species, that will be useful for conservation and management of other similar ectothermic vertebrates of Sarawak's interior.



A recently-released *Tropidophorus sebi* fitted with radio-transmitter

KANATI MADAKI



Mountain of the dead Chappal Wade the highest peak in Nigeria 2419 above sea level at Gashaka Gumti National Park

The study area Gashaka Gumti National Park GGNP, Nigeria is situated at the foot of the Mambilla Plateau and covers a land area of about 6,411 km². It lies between latitude 6°55'N and 8°05'N and longitude 11°13' to 12°11'E. The park was originally gazetted as Gumti, Gashaka and Serti Game sanctuaries by the defunct Northeast Government in the 1970s. The three game sanctuaries were merged and upgraded to a National park by the Nigeria National Park Decree of 26th August, 1991 which was repealed by Decree 46 of 1999. Gashaka –Gumti National Park is a vast land of spectacular wilderness (6,000 km²) in the southeast corner of Taraba State, adjoining the Mambilla Plateau.

The Park is an outstanding tourist landmark in Taraba State and the largest of all the eight national parks in the country. It is a home to diverse fauna such as the colobus monkey, warthog, buffalo, roan antelope, chimpanzee, hippopotamus, hyena, giant forest hog, lion, and leopard. The park is surrounded by 25 communities; five outside, 11 on the periphery and nine inside, including six enclaves belong to different ethnic groups such as Jibu, Dakka, Ngoro, Tigun, Gbaya, Tiv, Mambilla, Kaka, and Fulani in the southern part of the park, while in the northern part or Toungo sector are the Chamba, Kutim Potopore, Fulani, Dakka, Nyamnyam, and Kona. The main sources of income are farming, livestock husbandry, vocational jobs, civil service with a few hunters and fishermen. The best time to visit the park is during dry season, that is between December to March yearly.

Gashaka Gumti National Park faces a wide range of threats in conserving biodiversity. The evidence of poaching, logging, encroachment, farming, invasive species, and grazing are similar to the findings of previous studies. However, some of the threats to GGNP are severe and others not severe. But, the overall level of threat is high.

Considering that park managers are concerned with threats to park while managing biodiversity, these results give managers a clearer picture of the various types of threats and their current status. With this understanding, park managers, especially those in GGNP, can direct more attention to logging, poaching and grazing and implement appropriate conservation strategies to reduce the high level of threat.

Based on these findings, the study suggests that managers should educate communities on the current and future implication of poaching, logging, and grazing. Also, participatory resource management should be considered to enhance conservation of biodiversity.



River Gamgam in Gashaka Gumti National Park

Why are some museums and academic institutions continuously collecting, curating, and carefully preserving the biological collections? Is the existing biological collection insufficient to serve the purposes? This is the curiosity usually expressed by the public and policymakers. Commonly, the general public perceives biological collections in museums or academic institutions are merely to serve for exhibition and teaching purposes. But, scientists have shown that biological collections in museums are valuable materials for scientific studies benefiting global society. In some museums, various forms of biological collections such as wet and dry collections, GenBank, Barcode of Life Data (BOLD System), and Protein Data Bank of which each of the collection provide a historical state of the organism and its past time environment. This character permits biological collections to be used for (i) tracking the history of diseases and identifying their resources, (ii) reconstructing the evolutionary history of viruses, (iii) examining the timing of introduction of a vector, (iv) estimating historical levels of environmental contamination and construct baseline against current level, (v) detecting loss of genetic diversity and the timing of invasive species, (vi) modeling effects of climate change on the animal population, (vii) determining areas of conservation importance based on historical occurrence of a species, and many more, in addition to traditional usage in taxonomy and systematics study (Suarez & Tsutsui, 2004; Holmes et al., 2016; Bakker et al., 2019). Series of museum specimens caught at different places and time hold crucial information of changes, which are worth preserving for present and future use. In the digital era today, the use of biological collection in the form of digitized images and open access databank has been expanded for global sharing and benefits (see Bakker et al., 2019).

In the Laboratory of Systematics and Ecology of the Institute of Biodiversity and Environmental Conservation, the biological collections started in the early 1990s. This first documentation briefs the fish collection in wet preservation. The fish collections are preserved in 75% solution of ethyl ethanol in

Biological Collections of the Institute of Biodiversity and Environmental Conservation.

Part 1: Fish

“The collections contain a wealth of hidden data that we might not even understand exists in our lifetime, so there’s a practical element to keeping and preserving them.” — Emily Meineke

various sizes of 446 clear glass jars and vials with code UNIMAS.P.00001 – UNIMAS.P.00446. The collection contains 3100 individual specimens, comprising 92 species in 34 genera and 10 orders (Figure 1). Seventy-two percent of the specimens are freshwater fish and 28% are from marine, mangrove, and brackish habitats. The freshwater fish were caught from major basins in Sarawak including Sadong, Samarahan, Rambungan, and Baram in various habitat types such as peat swamp, streams, rivers, and limestone caves. Image of each individual of every species was also obtained for a digital database that links to the excel dataset (Figure 2). Once completed, the digital database is accessible online upon permission granted by the authorized curator. We would like to acknowledge Dr. Tan Heok Hui of the National University of Singapore (also Honorary Research Fellow of IBEC) for sharing his expertise and verification of fish specimens.



Figure 1. Fish collection in 75% solution of ethyl ethanol



Figure 2. Example of digital images links to database in excel to ease the access of the specimens. Species from top left to bottom right: *Barbodes kuchingensis*, *Desmopuntius johorensis*, *Rasbora sarawakensis*, *Paracrossochilus vittatus*, *Gastromyzon scitulus* (3 views), *Brachygobius doriae*, *Gerres filamentosus*, *Puntigrus anchisporus*, *Rasbora paucisqualis*, *Rasbora cephalotaenia*, *Nemacheilus saravacensis*, *Parachela oxygastroides*, *Nanobagrus torquatus*, *Silurichthys marmoratus*, *Leptosynanceia asteroblepa*

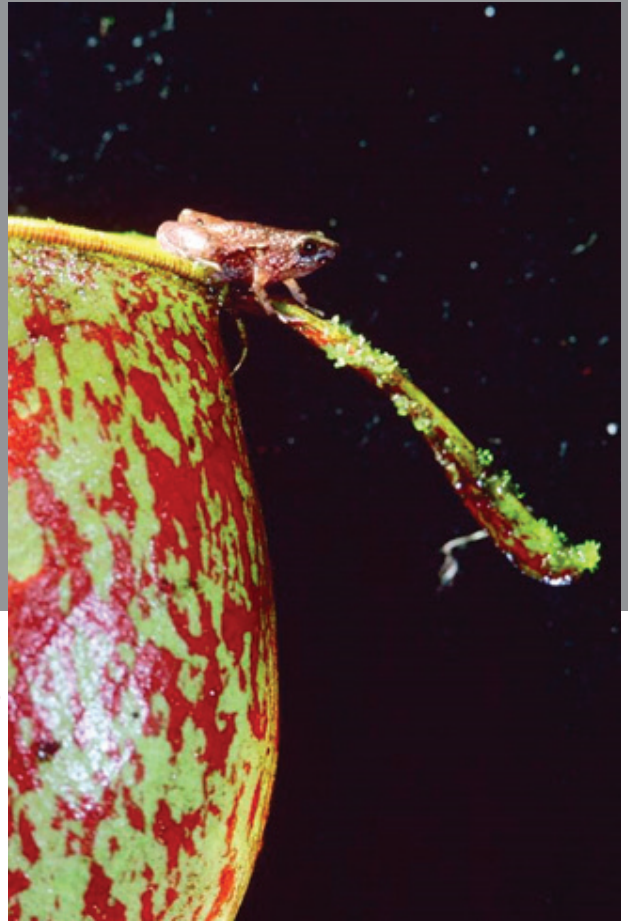
PANG SING TYAN

Gear Up for The 9th International Bornean Frog Race 2021!

An adult male of one of the world's smallest frogs, *Microhyla nepenthicola*, from the Matang Range and elsewhere in Sarawak (Photo credit: Indraneil Das)

It has been nearly two years that the world has started adapting to a new lifestyle, embracing new norms resulting from the COVID-19 pandemic. Most think we should start accepting the inevitable fact and bring a semblance of normalcy to our lives. Indeed, many convention businesses has moved from physical interactions to perhaps a more challenging online one. Meanwhile, the Frog Race crew has been planning an innovation in the running of the Race amidst the pandemic fight.

New rules and regulations are being made for the International Bornean Frog Race 3.0 Virtual. For starters, the Race will run for 100 days at anywhere within Borneo (Sarawak, Sabah, Brunei or Kalimantan) instead of just one night, at any locality or at multiple localities within Borneo (Sarawak, Sabah, Brunei or Kalimantan). Second, webinars on conservation and on amphibians by world-renowned biologists and herpetologists will be held over the said period. Third, 10 winners will be announced monthly for "The Best Photos" category. Winning images will be entitled to compete for the grand prizes. As for "The Most Number of Species" category, the number of species will be accumulated through monthly submission of images by the participants, which will be updated and displayed in a league table. By the end of the Race, participant with the most number of species will be crowned as the winner.



Winners of monthly prizes and the several categories of grand prizes will be invited to a grand closing ceremony in Kuching at the end of the year, if the global and local pandemic situation improve. Expect fabulous cash awards. Foreign and local participants are welcome, as long as they are physically on Borneo during the duration of the event. As planning for the virtual version of the Race is ongoing, the aforementioned ideas are subjects to change. The Organising Committee of the Race would naturally ensure that the Race complies with all SOPs and is safe for participants.

For more information, please visit us on Facebook and Instagram for updates on the Race.



PANG SING TYAN

A Replanting Project at Jagoi Heritage Forest, Bau, Sarawak

Figure 1: The replanting carried out by the volunteers (Upper); A group photo with the community after completing the project (Lower) (Photo credit: Sally Soo Kaicheen)

Jagoi Heritage Forest is a rising star among culture and nature tourism hotspot in Sarawak. For nature lovers and hikers, it is famous for its cascading waterfalls with crystal clear water, fresh air, and breath-taking view. It also has rich cultural and traditional elements in the form of Bung Jagoi village, the original settlement of the Jagoi Bidayuh people. A homestay located at Bung Jagoi village is a perfect place for both local and foreign visitors to relax and enjoy the lifestyle and traditional cuisine prepared by the local community while immersed in the natural beauty and sounds of the surrounding forest.

Peterson & Control Union has funded a project called “Retaining Forest and Culture in Jagoi Heritage Forest, Sarawak” in collaboration with Jagoi Area Development Committee (JADC) and WWF-Malaysia. The saplings were courtesy of Forest Department Sarawak (FDS) as part of its drive for forest landscape restorations in Sarawak. This six-month project started in December 2020 and the execution planned out in phases throughout the period. A total of 1000 native tree species such as Meranti (*Shorea* spp.), Kapur (*Dryobalanops beccarii*), Gaharu (*Aquilaria beccariana*), Belian (*Eusideroxylon zwageri*), Selangan batu pinang (*Shorea havilandii*) were replanted in degraded site of Jagoi Heritage Forest.

Under the leadership of Prof. Dr. Gabriel Tonga Noweg, the President of JADC and a principal research fellow of IBEC, the last 60 saplings of native trees were planted by volunteers, mostly by IBEC postgraduates and local community (Figure 1) on 6th May 2021. This replanting project put hope for local community, not just increasing the chance to be recognized as one of the sites under IUCN (International Union for Conservation of Nature) Green List of Protected and Conserved Areas), but also appears to be a more promising site which is socially desirable, economically viable, and environmentally sustainable.

SOON VIVIAN

Diet of Mossy-nest Swiftlets in Taiton Cave, Bau

The Mossy-nest Swiftlet (*Aerodramus salangana*) is one of the four species of echo-locating swifts residing in the limestone caves of Borneo. What distinguishes this species of swiftlet from other morphologically-identical swifts, is their nests, which are constructed from moss and other vegetation that could be seen neatly tucked in the cavities of cave wall.

A study on the dietary composition of Mossy-nest Swiftlet was conducted in Taiton Cave, Bau. Swiftlets were caught using mist-netting method and were then induced to regurgitate their stomach contents through oral administration 1ml of 1% tartar emetic solution per 100g of bird's body weight. Occasionally, the swiftlets would readily regurgitate food bolus – a compacted mass of more than 100 insects that they carry in their mouth.

A total of 50 regurgitated stomach contents in addition to three food bolus and 60 faecal samples were collected. The insect fragments found in the samples were identified to Order level. The result recorded a total of seven insect Orders including, Hymenoptera, Coleoptera, Diptera, Lepidoptera, Hemiptera, Homoptera and Arachnida. Diet of this species of swiftlet were largely made up of Hymenoptera (50.5%), followed by Coleoptera (27.0%), Diptera (12.5%) and other orders (10%). Examination of the food bolus showed a wide range of insect preys including Hemiptera and Homoptera, that were hardly recorded in regurgitated stomach contents and faecal samples.

Mossy-nest Swiftlets are aerial insectivores that have large foraging range that covers over 24 km from their breeding and roosting caves. The swiftlets from Taiton Cave could potentially be foraging in nearby oil palm estates such as SALCRA Bratak (~5.7km away) and Stenggang (~19.2km away). Hence, the knowledge of the diet of Mossy-nest Swiftlet and the composition of insects available in the environment may shed light on their ecological role as natural predator to insect pests in the oil palm agroecosystem.



Mossy-nest Swiftlet regurgitating food bolus

Food bolus made up of hundreds of flying ants and other insects



Mossy-nest Swiftlet in its nest



1 cm

CINDY PETER, GAVIN JOLIS, OSWALD BRAKEN TISEN, JAMES BALI, SAMANTHA AMBIE & HILMY MAT GHANI

Sarawak Dolphin Project: Rajang Delta Survey collaborates with WWF-Malaysia and Sarawak Forestry Corporation, ventures into new study site to study marine mammals



Figure 1: The research team comprised of members from WWF-Malaysia and Universiti Malaysia Sarawak conducted boat-based survey along the Belawai coastline in March 2021. (Photo source: Gavin Jolis)

Since December 2020, Sarawak Dolphin Project (SDP), a research arm focusing on marine mammals under IBEC has been holding online discussions and meetings with WWF-Malaysia on collaborative research to study marine mammals along the Rajang-Belawai-Paloh coastline. This is a continuation from the initial study on Irrawaddy dolphins, fisheries sampling and crocodile surveys conducted along the Rejang-Belawai-Paloh delta in 2017-2018. The initial study was a joint effort between IBEC, WWF-Malaysia, Sarawak Forestry Corporation, Forestry Department Sarawak and Inland Fisheries Division, Department of Agriculture, Sarawak.

Findings from 2017-2018 surveys which were conducted in the three interconnecting deltas and rivermouths indicated high encounter rates of Irrawaddy dolphins at the lower Batang Belawai around the confluence of Sungai Tebu with Batang Belawai. Sarawak Forestry Corporation conducted surveys in April 2009 to October 2010 from the Batang Rajang rivermouth to Sibu (Bali et al., 2017). In that study, Irrawaddy dolphins were found up to 86 km from the rivermouth with hotspot for sightings from Sungai Sebulal to Sungai Barong and around the Tanjung Manis jetty in the Rajang River (Bali et al., 2014).

Following the recommendations of the initial study, WWF-Malaysia and the Sarawak Dolphin Project with support by the Sarawak Forestry

Corporation are embarking on another collaborative research, this time focusing on the distribution and population estimates of marine mammals along the coast of the Rajang-Belawai-Paloh area, and to establish the rate of incidental catch and fishing mortality in the dolphin-fisheries interaction along these coasts. Anecdotal reports from fishermen and local communities indicated the presence of marine mammals off the coast of Belawai. Since 2018, SDP has been receiving reports from local villagers indicating marine mammals were caught in fishing nets off the coast of Belawai, indicating that the risk of incidental catch which is happening globally is also a localized issue.

Prior to traveling to Kampung Belawai, approvals were obtained from the Tanjung Manis District Office as well as Pemanca of Tanjung Manis District (Mr Moshidi bin Moris) and relevant authorities (Royal Malaysian Police, Malaysian Maritime Enforcement Agency; and Fire and Resuce Department) were informed to ensure that the local communities and authorities were aware of our arrivals and our intentions to conduct marine mammal surveys. With the current fourth wave of COVID-19 pandemic outbreak in Sarawak, the team had to make sure proper procedures were adhered to. Cindy Peter and the entire research team undertook RT-Polymerase Chain Reaction swab test at a private hospital two days before their departure.

Following a negative COVID-19 result, approvals to travel for fieldwork were obtained from the UNIMAS Covid-19 Taskforce Committee on the MyActivity app and approval from the Kota Samarahan Police District Police Headquarters, the team traveled to Tanjung Manis on 8 March 2021.

During the three-day-long survey, the team covered total distance of 283km of transects over 30 hours, during which ten sightings of Irrawaddy dolphins, eleven sightings of finless porpoises and two off-effort sightings of Indo-Pacific humpback dolphins were recorded. The team documented the presence of Irrawaddy dolphins and finless porpoises calves during the survey indicating that the Belawai coastline is an important calving ground for both species. 713 photographs of Irrawaddy dolphins and humpback dolphins were captured which will be processed and analysed to establish a photo-identification database. This will be cross-checked with the photo-identification database from the riverine surveys conducted in 2017-2018 to determine whether the Irrawaddy dolphins found in the deltas utilizes the coastal waters as well.

In addition to the boat-based survey, questionnaire interview surveys were conducted between 5 March and 10 March 2021 to gauge the fishermen's fishing activities, perception of marine mammals, and understanding the threat of bycatch. The questionnaire consists of 73 questions comprising 18 open-ended and 55 closed-ended questions to assess fishermen's level of experience, types of fishing gear used, fishing effort and areas, incidental catch, cetacean-fishery interactions, and perceptions of cetacean and existing laws. In total 61 fishermen were interviewed; 43 from Kampung Belawai, three from Kampung Rajang, and 15 from Kampung Jerijeh. During interviews, the main types of fishing gear reported to be used were gill nets, trammel nets, cast nets, crab traps, trawl nets, handlines, and longlines. The usage varied by season and target species. Fishermen from the three villages are known to share the same fishing ground, from the Rajang estuaries up to the Belawai – Paloh coastal areas. All respondents stated that they had sighted marine mammals, and some reported several negative interactions. Of the 18 respondents who reported negative interactions, 50% mentioned net damage caused by cetaceans, 39% reported catch consumption, and 11% reported knowingly striking a cetacean with their boat/propeller.



Figure 2: A pod of Irrawaddy dolphins (*Orcaella brevirostris*) photographed in Belawai coastal waters. Photographs of Irrawaddy dolphins were captured and will be analysed to establish a photo-identification database. (Photo source: Gavin Jolis)



During the interview period, 44.3% of fishermen reported having experienced entanglement in their own fishing gear over their careers. The Irrawaddy dolphin was reported to be the most frequently caught species (92.6% of respondents reporting bycatch). Although most of the fishermen stated that cetaceans did not have any importance for them, some reported mutual relationships where cetacean presence is perceived to indicate fish availability. Apart from that, fishermen also reported positive interactions where they experienced cetaceans feeding on the discarded fish as they hauled in their nets. Moreover, positive perceptions such as the ‘entertainment’ they provide for fishers at sea, and long-held cultural lore which stated that dolphins may save drown people and provided protections to the fishers at sea, should help motivate fishers to participate in mitigation trials and willingness to address bycatch.

Five additional boat-based surveys are being planned from May to October of 2021 as the Sarawak Dolphin Project and WWF-Malaysia team try to better understand the distributional patterns of the three species and obtain the population estimates of the marine mammals along the Belawai coastline. More fisheries interviews are planned in villages utilizing the Belawai coastal areas, specifically in Kampung

Figure 3: Samantha Ambie (UNIMAS) interviewing a fisherman from Kampung Jerijeh. (Photo source: Gavin Jolis)

Jerijeh, Kampung Rajang, Kampung Paloh and Kampung Kedang, as the team aims to map the important fishing grounds, understanding the fishing patterns and activities of the fishermen in the area. In addition, onboard observer surveys will be implemented to establish the baseline and rate of incidental catch of marine mammals in the Rajang-Belawai-Paloh coastlines. These observers will be community members who will be trained to board fishing boats and assist in collecting fisheries and incidental catch data of marine mammals.

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