



SUB COURSE B: THE BIODIVERSITY OF COASTAL ECOSYSTEM

Indonesia is known as a mega-biodiversity country. Indonesia is an archipelagic state, its territory stretches from 6° N to 10° S and from 95° E to 142° E, comprises about 18,110 islands with a coastline of about 108,920 km. About 78 % of the Indonesian territory is covered by waters with shallow seas in the western and eastern parts, the Sunda and Sahul plates, separated by the deep Banda Sea. The diversity of Indonesian marine life is hard to be precisely reported, new species are still being described and many more are still unknown. The Indonesian coastal zone is rich in tropical marine ecosystems such as estuarial beaches, mangroves, coral reefs, seagrass, algal beds and small island ecosystems which are homes of different varieties of living communities with various types of association as well as richness in species diversity. Other coastal habitats such as sandy and muddy shores, sand or mud flats, although hosting relatively poorer biodiversity but they are scientifically interesting. Each of these marine ecosystems, with their associated habitats, supports a wealth of marine biodiversity which are not well explored and very poorly documented.

In CommTECH Camp Insight 2020, our subjects will take you to discuss and simulate the biodiversity in this archipelagic country, Indonesia. The highlights in this subject consist of Exploring The Microbial Diversity in Tropical Mangrove Rhizosphere, Vegetation Analysis of Mangrove Ecosystem, Birdwatching on Track, Identification and Analysis of Parasite for HealthyFood, Conservation of Germplasm from Coastal Ecosystem and final review. This program is designed to suit bachelors, masters or doctoral students with or without specific knowledge in biology or coastal management. The difference between the two modes are the assignments. The rest is just new knowledge, inspiring insights, fun, rewarding, and life-changing experiences.





Level : Bachelors, masters, or doctoral students with or without specific background in the area of coastal development and planning.

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Synopsis of the course :

Topic 1 : Exploring The Microbial Diversity in Tropical Mangrove Rhizosphere

Indonesia's natural conditions with abundant availability of organic substrate open up many opportunities for the exploration of various microorganisms. The availability of abundant organic substrates can be found in the mangrove rhizosphere in the coastal area. Mangrove habitat is a rich natural resource as an ecosystem for various living species, including microorganisms such as bacteria and fungi. This program aims to provide insight to the students about the various characters of bacteria and fungi in the mangroves. Activities include isolation and characterization of bacteria and fungi. The student will be invited to walk around mangrove in the coastal area to take a sample of the microbe. Microbial isolation was performed in-situ, while microbial characterization was performed after culture was incubated for 24 hours.





Topic 2 : Vegetation Analysis of Mangrove Ecosystem

Walsh (1974) described the mangrove ecosystem as a unique type of forest characterized by its highly specialized vegetation and a typical and limiting environment. The distributions of individuals within it, as well as factors which have molded this habitat have become a recurrent concern in studies on mangrove ecology. The study was conducted in order to establish and describe the mangrove community and vegetation of the mangrove forest in East java coastal area. Thus, this study will serve as baseline information. Sampling plots (10m x 10m) were established into sea ward, middle ward and landward. Individual plants found within the plot were identified and counted. Mangrove vegetation analyses were determined using relative density, relative frequency, relative dominance and importance value.

Topic 3 : Birdwatching on Track

Indonesia represents a really amazing home to numerous wonderful species of birds. Some of them can only be seen in this part of the world and they are one of the most important natural treasures of this country, especially when we talk about the numerous endangered species. For birdwatching, student will take a course about bird distribution in mangrove ecosystem. Distribution is an important study in ecology to understand the species biogeography and how the utilization of species in landscape. Furthermore, distribution study of birds will contribute to have a better understanding about climate change effect in ecosystem area. This course aimed to understand distribution of bird use spatial landscape analysis. The spatial landscape study use mapping methods and visual illustration.





Topic 4 : Identification and Analysis of Parasite for HealthyFood

All of the major groups of animal parasites are found in fish, and apparently healthy wild fish often carry heavy parasite burdens. Parasites with direct life cycles can be important pathogens of cultured fish; parasites with indirect life cycles frequently use fish as intermediate hosts. Knowledge of specific fish hosts greatly facilitates identification of parasites with marked host and tissue specificity, whereas others are recognized because of their common occurrence and lack of host specificity. Examination of fresh smears that contain living parasites is often diagnostic.

Parasites are organisms that live in the body of other organisms and generally have negative effects on the organism they occupy. Parasites can also spread the disease indirectly by damaging the surface of the body and internal organs, resulting in various injuries as the pathway of other pathogenic organisms into the body of the fish but it also leads to high mortality that occurs without showing symptoms first. Parasitic infections in fish can bring an impact on the decrease of selling value in fish and potentially dangerous if consumed by human. Parasites that commonly attack fish are *Ichthyophthirius multifiliis*, *Chillodonella*, *Tetrahymena*, *Trichodina*, *Ambiphyra*, *Aplosoma*, *Epistylis*, *Ichthyobodo*, *Cryptobia*, *Dactylogyrus*, *Gyrodactylus*, *Camallanus*, *Ergasilus*, *Lernaea*, and *Argulus*. Ectoparasit examination in fish is conducted by using scraping method. The scraping method was performed on all parts of the skin surface of the body, covering both sides of the lateral portion of the head to the distal end of the caudal fin, then on the dorsal portion of the head to the caudal part, the ventral part from the bottom of the mouth to the tail. The substances came off from the skin of the fish as the result of scraping then were placed into glass of modified objects such as sedgwick rafter made out of glass object and fiber. The samples then were observed using a compound microscope with magnification 100 and 400 times and documented using OptiLab® photomicroscope. Right after, the identification were done using some references of parasites identification.





Topic 5 : Conservation of Germplasm from Coastal Ecosystem

Topic 6 : Mangrove's stomata for Experiencing the Beauty of Anatomy

Topic 7 : Wrapping Up and Review

At the end of the course, participants will have time to wrap up and review all the topics that had been learned. The findings and the ideas for future improvements will be presented. Last but not least, individual insights and initiative for coastal development and planning in each participant's context will be shared.





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