

Abstracts

Note that Prof. Matsuda, Prof. Chen, and Prof. Surat have approved the publication of their abstracts in KUIO journal. Abstracts of others are not included.

Invasion and Infection: On Parasites of Invasive Animals

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I. Abstract

Being one of the most active trading and transportation hubs around the world, the East and Southeast Asia represents a unique model for study biological invasion. In particular, the island chains along the indo-pacific rims, from Japanese archipelago, Okinawa Islands, Taiwan, Philippines then to Indonesia, are not only the hot spots of biodiversity but also focal areas of highly threatened by the biological invasions. Nevertheless, the invasive alien animals didn't invade along by themselves, they often came with co-invaders, such as symbiotic/pathogenic microbes or parasitic worms. Herein, I provided cases of alien animals that originated from different continents and invaded to Taiwan as an example to investigate their parasitic infections during the invasion processes. We then compared the parasites of these animals in the invaded areas with those in their native areas. Based on these comparisons, the hypothesized emery released, spill-over, spill-back as well as the dilution effect resulted from species invasions and their impacts on infection dynamics can be illustrated.

II. Results & Discussion

Invasive animals, green iguana (*Iguana iguana*) and striped snakehead (*Channa striata*), have been caught attentions in recent years in Taiwan. These spectacular animals were introduced into Taiwan in past few decades due to different purposes. Green iguana is originated from central America and was introduced as pet animals after 2000, then become invasive in wild around 2010 in southern Taiwan. Since 2018, we have been collecting removal iguanas from different locations to study their parasites. Our study shown >90% of wild population of green iguana, with one exception, were heavily loaded with parasitic infections. The infection intensity ranged from hundreds to hundred thousand. All parasites founded in green iguana were new to local fauna and were obvious co-introduced with their iguana hosts from various sources.

In contrast to green iguana, the striped snakehead is widely distributed in southeastern Asia, including Indo-China, Malay Peninsula and Sundaland. It was introduced into Taiwan for aquaculture purpose in 1980s and became the most dominant aquatic animals nowadays in lowland freshwater ecosystems. In addition to its high fecundity and tolerance to hypoxia environment, the success of striped snakehead in Taiwan may also be contributed from human transportation among different watersheds. Our genetic study suggested the striped snakehead was introduced

one time and then experience rapid expansion. The parasitological survey for striped snakehead in Taiwan and Thailand revealed strong parasite-host clade associations between *Pallisentis* acanthocephalan and the striped snakehead, but not for *Camallanus* nematode.

III. Conclusion

Our studies had shown the biological invasion of alien animals often came with co-invaders. The symbiotic/pathogenic microbes or parasitic worms may cause potential biohazards similar to their host. It is equally important to investigate invasion species itself and its infectious agents.

The alien species invasion is one of the biggest threat to the nature life and biodiversity. By definition, species invasion is a cross-boundary issue. To solve this issue and to reach the UN SDGs 14 & 15, that demanded the protection of life below water and on land, requires the cooperation between and among nations.

While our colloquia "Sustainability & Health" is mainly concerning human health and well-being, here we highlight the importance of an integral approach to safeguard biodiversity as the fundament for human health, well-being and sustainability.