

BIODIVERSITY RESEARCH ON PULAU TIOMAN, PENINSULAR MALAYSIA: A HISTORICAL PERSPECTIVE

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ABSTRACT. - The history of biodiversity research of Pulau Tioman is presented. Pulau Tioman is the third largest offshore island in Peninsular Malaysia, and has a very high diversity of habitats as well as plant and animal life. Its flora and fauna have been investigated for over 100 years, and a considerable amount of literature has been and is still being published. The active research program will substantially contribute to ongoing efforts to conserve the island's remarkable biodiversity.

KEY WORDS. - Pulau Tioman, biodiversity research, history.

Pulau Tioman is considered to be the one of the most beautiful islands in Southeast Asia, made famous as the film site of musical classic "South Pacific". Pulau Tioman is a pear-shaped island about 22 km long and 11 km wide lying about 38 km east of Peninsular Malaysia. It is under the state of Pahang (see Jasmi, 1999 [in this volume]; Medway & Bullock, 1966; Lee et al., 1977). In 1972, most of the island was gazetted as a state wildlife reserve while in 1985, the seas around the island became a national marine reserve (see Jasmi, 1999). While the island's natural heritage is spectacular, being the subject of investigators for over a hundred years, its natural beauty has also resulted in a booming tourist industry. The need to conserve its biodiversity as well as maximise its long term ecotourism value thus requires a better understanding of its flora, fauna and natural ecosystem.

During the last ice age, Pulau Tioman was possibly connected both to Peninsular Malaysia and Borneo, and some of its flora and fauna in fact more closely resemble Bornean rather than peninsular or mainland Malaysian taxa (e.g. Stubbs, 1961; Ng, 1988; Kottelat, 1990). It has a surprisingly large number of habitat types, which probably accounts for its high biodiversity. Although Pulau Tioman's rugged mountain terrain has preserved most of its

forested areas, much of its coastal habitat (including the reefs) has been badly affected by human use (and misuse) (New Straits Times, 1989). In this note, we briefly discuss the history of biodiversity research on Pulau Tioman. We believe that by putting the current state of our knowledge of its biodiversity on record will not only aid in better management but also help provide directions for future research and conservation programs.

Pulau Tioman is well known in scientific literature, but until the late 1960s, most of the reports of its flora and fauna have been of a sporadic nature, with miscellaneous small papers on various taxa (e.g. Miller, 1900; Thomas, 1908; Robinson, 1917; Henderson, 1930; Smith, 1930; De Beauchamp, 1933; Tweedie, 1936; Chasen, 1940). In 1966, the then National Museum of Singapore (now the Raffles Museum of Biodiversity Research) launched an important expedition into the island of Pulau Tioman (see Medway & Bullock, 1966). From this expedition, major contributions include reports on the mammal, bird, herptile and fish fauna, as well as notes on some terrestrial arthropods, parasitic acarines and selected endoparasites. In 1974, the University of Malaya launched another major exploration of the island (Lee, 1976; Lee et al., 1977), making significant contributions to the knowledge of its geology, freshwater life and flora.

It is important to note here that in the original University of Malaya (in the days when Malaysia and Singapore were still one country), the Honours year field courses were often conducted on Pulau Tioman. This “field tradition” continued even after the University of Singapore (originally the Singapore campus of the University of Malaya and now known as the National University of Singapore) split off from the University of Malaya when both countries became independent in 1965. In subsequent years, more Malaysian tertiary institutions like the Universiti Kebangsaan Malaysia and Universiti Pertanian Malaysia also conducted many explorations of the island. As a result of this long tradition, a substantial amount of data (for both terrestrial and marine ecosystems) has been accumulated over the years. The original Raffles Museum and Singapore Botanic Gardens were also focal points for studies of the Malayan flora and fauna during the British colonial days (Pulau Tioman inclusive) and this has continued even after Singapore’s independence. Through all the socio-political changes, the close collaborations between natural history investigators from both countries have continued, and have resulted in the publication of numerous small reports over the years (e.g. Stubbs, 1961; Johnson, 1968; Cheng & Fernando, 1969; Yong, 1973; Fernando & Cheng, 1974; Ng & Lim, 1989; Sin et al., 1994). In fact, the present monograph is a continuation of this long standing and very fruitful tradition!

More recently, the Department of Wildlife and National Parks Malaysia (Jabatan PERHILITAN) (see Anonymous, 1995) led a major exploration of Tioman, providing major insights on the island’s vegetation, flora, fish, bird, mammal and herpetofauna. Most of the findings, however, are still unpublished (much of which is redressed in the present monograph). There have also been many small and medium-sized expeditions by foreign scientists to the island in recent times (e.g. Day & Mowbray, 1990). These expeditions have substantially enhanced our biodiversity knowledge of the island. Interesting reports, for example, include publications on plants (Latiff et al., 1999 [in this volume]; Tan & Mohamed, 1999 [in this volume]; Jaman & Latiff, 1999 [in this volume], Holttum, 1979; Latiff, 1982; Ratnasabapathy & Kumano, 1982; Corner, 1985; Weber & Burt, 1985), nematodes (Bain et al., 1983), chelicerates (Bartsch, 1993a, b); crustaceans (Yeo et al., 1999 [this volume]; Ng & Ambu, 1998; Ng & Chong, 1986; Clark & Galil, 1993; Chong & Khoo, 1987; Chia & Ng, 1998; Wee & Ng, 1995; Ou & Yeo, 1996; Rahayu, 1996; Mueller, 1992a, b, c, d; Mueller, 1993a, b, c, d), insects (Eliot, 1980; Martin, 1987; Puhtz, 1990; Kurosawa, 1991;

Holzschuh, 1995; Slipinsk & Lobl, 1995), molluscs (Biraghi, 1977), amphibians (Lim & Lim, 1999 [in this volume]; Denzer et al., 1989), fishes (Ng et al., 1999 [in this volume]; Hartig-Beeckan, 1987; Kottelat, 1990), reptiles (Lim & Lim, 1999 [in this volume]; Denzel & Manthey, 1991; Traeholt, 1994a, b; 1997), birds (Hawkins, 1986; Csorba et al., 1997), and mammals (Lim et al., 1999 [in this volume]; Zubaid, 1988; Diong, 1993; Csorba et al., 1997).

From the above historical review, it appears that at least for some groups, there is very good base-line data on the biodiversity of Pulau Tioman. Our objective in this monograph is to further advance the biodiversity knowledge of the island, following in the significant "footsteps" of Medway & Bullock (1966), Lee et al. (1977) and PERHILITAN (Anonymous, 1995). Reviews and synopses of all the bryophytes, ferns and flowering plants, vertebrate groups (freshwater fish, amphibians, reptiles, birds and mammals), decapod crustaceans, butterflies, water insects are provided, as well as smaller papers on various groups of animals. These will not only update but complement the old classics dealing with Pulau Tioman's biodiversity.

Pulau Tioman has been under increasing threat to ever growing tourism. Therefore, there is an increasing great need for more precise biodiversity inventories of the island. We also hope that the knowledge accumulated through previous studies and the present exercise should now encourage and catalyse more precise ecological studies in the coming years which will help ascertain past and future anthropogenic effects on this island's biodiversity.

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