

Water Quality and Agricultural Environment Survey of Taiping Island – The Flora and Vegetation Survey Report

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Methods

The Flora of Taiping Island was investigated by field collecting throughout the island and the references review. The type of plant using, including agriculture, grazing and minor forest product utilities in different land use and vegetation type was recorded by the field exploration and interview of inhabitant. Land use classification and vegetation mapping was conducted by using the satellite image and global positioning system.

Result

1. The Flora of Taiping Island

The Flora of Taiping Island was conducted by summarization of specimen collection records, references and our survey (Huang et al. 1994, Peng 2014). The result shows 149 vascular plants belonging to 125 genera in 51 families are recorded in Taiping Island. Among them, three species are Pteridophytes, 113 species are dicotyledons and 33 species are monocotyledons. There are 13 naturalized species, 43 cultivated species and 93 native plants being recognized. The habits of the vascular plants include 31 species are trees, 10 species are shrubs and 108 species are herbs.

2. Useful plant survey

(1) Crops and edible wild plants

A total of 27 species are edible plants or crops on Taiping Island, including the wild papaya (*Carica papaya* L.) and coconut (*Cocos nucifera* L.). It not only grows well but also can successfully regenerating in the wild, as well as produce a large amount of edible fruit (Fig. 1). The crops can produce seeds or vegetative propagated including cantaloupe (*Cucumis mrlo* L. var. *reticulates* Naud.), squash (*Cucurbita moschata* (Duch.) Poir), bean (*Phaseolus vulgaris* Linn.), corn (*Zea mays* L.), luffa (*Luffa cylindrica* (L.) M. Roem.), roselle (*Hibiscus sabdariffa* L.), chili (*Capsicum annuum* L.), guava (*Psidium guajava* L.), basella (*Anredera cordifolia* (Tenore) van Steenis), sweet potato (*Ipomoea batatas*(L.) Lam.), ginger (*Zingiber officinale* Roscoe.), and banana (*Musa sapientum* L.).

(2) Grazing and pasture plant

The goats mainly graze under the coconut trees and the artificial grassland nearby the airport runway, but occasionally feeding with banana leaves and Terminalia leaf falls (*Terminalia catappa* L.). We also observed the goats biting the native plant beach-mulberry (*Morinda citrifolia* L.) leaves under the coconut trees (Fig. 2) and eating the grass and legumes in the artificial grassland (Fig. 3). We can confirm the forage source is from the plant growing on the Taiping Island.

3. Land use classification and vegetation mapping

The land use and vegetation types are classified into 9 patterns, include coastal forest, shrub land, coconut tree, natural grassland, artificial forest, artificial grassland, vegetable garden, and bared area of beach and buildings (Figure 4). The coastal forest with trees up to 20 meters and the vertical structure of forest is complete which includes

canopy, shrub and herb layer. As a result, the coastal forest creates a stable and shade microhabitat for ferns and other creatures. It also produces a large amount of litter to accelerate soil genesis and reduce water evaporation.

4. The tree age estimate

According to the experimental data survey by Gangkou Workstation of Taiwan Forestry Research Institute, *Terminalia catappa* can grow 1.5~1.4 cm/year in diameter at breast height and 0.86~1.07 cm for *Calophyllum inophyllum*. For the *Calophyllum inophyllum* with 100 cm in diameter at breast height, we estimate the age to be between 93~116 years. In this exploration on Taiping Island, we found the diameters at breast height of *C. inophyllum* are over 100 cm, so we estimate the age of the tree to be between 100~150 years old.

References

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Fig. 1. The wild papaya (*Carica papaya* L.) can naturally regenerate in the wild and produce a large amount of edible fruit.



Fig. 2. The goats bite the native plant beach-mulberry (*Morinda citrifolia* L.) leaves under the coconut trees.

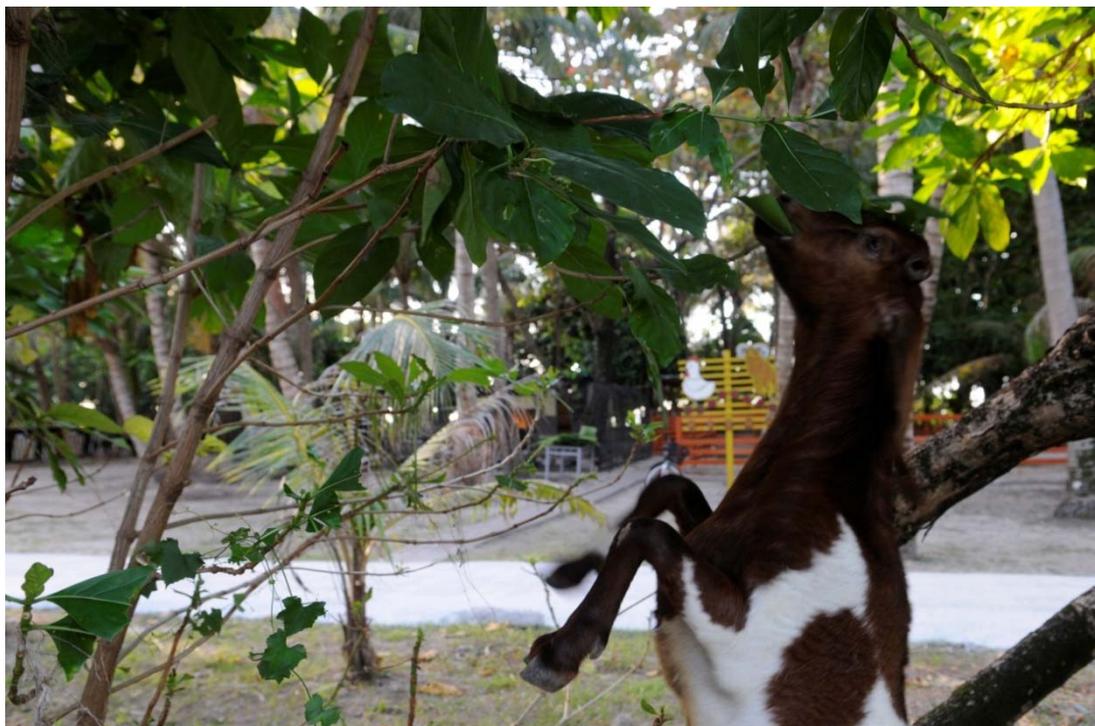


Fig. 3. The goats were grazing at artificial grassland nearby the airport runway, which eat the grass and legumes in the artificial grassland.



Fig. 4. The land-use and vegetation map of Taiping Island.

