

# The occurrence of *Sphenomorphus incognitus* in Hong Kong with notes on its diagnostic features and distribution

by Michael Lau

The skink *Sphenomorphus incognitus* is very similar to *Sphenomorphus indicus*, a widely distributed species from South Asia to Indochina and northward to south and central China. The only clear-cut difference is the presence of a patch of enlarged scales at the back of the thigh in *S. incognitus* (Zhao *et al.*, 1999). *Sphenomorphus incognitus* is also slightly larger in size but the adult snout-vent length overlaps between the two species (see tables in Zhao *et al.*, 1999). Various researchers also report differences in general body colour and the shape of the lateral stripe (Zhao *et al.*, 1999) but colour markings of these wide-ranging skinks are quite variable and there is no consensus as to how to separate the two species based on colour markings alone. There is also a difference in life-history in which *S. incognitus* is oviparous while *S. indicus* is ovoviviparous (Zhao *et al.*, 1999), but this has limited use as an identification character. *Sphenomorphus incognitus* is endemic to China and, until recently, has only been recorded from Fujian, Taiwan, Hubei, Guangxi, Yunnan and Hainan (Zhao & Adler, 1993; Zhao *et al.*, 1999). This skink was discovered in Guangdong during the rapid biodiversity surveys carried out Kadoorie Farm and Botanic Garden (2002a) and was subsequently found in Wutongshan just across the border (Kadoorie Farm and Botanic Garden, 2002b). [See Addendum Page 31 for photo.]

It is likely that this species also occurs in Hong Kong and has been confused with *S. indicus*. Romer (1975) did report a *Sphenomorphus* skink with enlarged scales at the back of thigh from the Shek Kong area. However, he decided that more specimens were needed to draw a conclusion. To address this, *Sphenomorphus* specimens collected by the author from Hong Kong over the years and those in the St. Louis School and Kadoorie Farm & Botanic Garden collections were examined to determine their identity based on the scalation. Their markings, in particular the lateral stripes, coloration and snout-vent length were also noted to see if there is a consistent difference.

Both *Sphenomorphus incognitus* and *S. indicus* have been collected from Hong Kong. Some of the older specimens of *S. incognitus* were mis-identified as *S. indicus*. Adult *S. incognitus* is generally larger than *S. indicus* and the snout-vent length can exceed 90 mm (see Table 1). However, this is not be a good character for differentiating juvenile *S. incognitus* from *S. indicus*. The colour pattern also shows a slight difference; the upper edge of the dark lateral stripe in *S. incognitus* is jagged while in *S. indicus*, it is smooth. Dorsally, *S. incognitus* is bronze in colour speckled with light and dark spots. *Sphenomorphus indicus* is more or less uniform brown. The picture of '*S. indicus*' in Karsen *et al.* (1998) actually depicts a typical *S. incognitus*. There is also

some difference in habitat preference, with *S. incognitus* favouring riparian forests and often seen basking on stream banks while *S. indicus* is more frequently found in forests and often encountered along forest paths. However, both species are sympatric in good forests in the central New Territories like Tai Po Kau and Shing Mun.

Table 1: Measurements of *Sphenomorphus incognitus* and *Sphenomorphus indicus* from Hong Kong.

Species	Locality	Age	Adult snout-vent length (mm)
<i>S. incognitus</i>	Shing Mun	Juvenile	-
<i>S. incognitus</i>	Shing Mun	Adult	76.0
<i>S. incognitus</i>	Shing Mun	Juvenile	-
<i>S. incognitus</i>	Tai Tung Wo Liu	Juvenile	-
<i>S. incognitus</i>	Kadoorie Farm & Botanic Garden	Adult	97.0
<i>S. incognitus</i>	Ho Chung	Juvenile	-
<i>S. incognitus</i>	Sheung Tong	Juvenile	-
<i>S. incognitus</i>	Kadoorie Farm & Botanic Garden	Adult	81.5
<i>S. incognitus</i>	Shek Kong	Adult	92.2
<i>S. indicus</i>	Shing Mun	Adult	68.5
<i>S. indicus</i>	Tai Po Kau	Juvenile	-
<i>S. indicus</i>	Tai Po Kau	Juvenile	-
<i>S. indicus</i>	Tai Po Kau	Adult	64.5
<i>S. indicus</i>	Tai Po Kau	Juvenile	-
<i>S. indicus</i>	Kadoorie Farm & Botanic Garden	Adult	66.5
<i>S. indicus</i>	Tai Po Kau	Juvenile	-
<i>S. indicus</i>	Kadoorie Farm & Botanic Garden	Juvenile	-
<i>S. indicus</i>	Kadoorie Agriculture Research Centre	Adult	70.0

Due to the confusion of the two species in the past, earlier records of *S. indicus* from Hong Kong should be treated with caution. Re-examination of the available specimens and recent observations suggest that *S. incognitus* has a wide distribution in the New Territories covering the north-east, central and the

western part. It also occurs in the Sai Kung Peninsula. *Sphenomorphus indicus* seems to be restricted to the Tai Mo Shan massif in central New Territories. With forests becoming more mature, it is likely that the latter species will spread to other parts of the New Territories.

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# A survey on some native tree legumes for their ability to form root nodules and fix nitrogen in Hong Kong

by Angie Y. S. Ng

## Introduction

Nitrogen is one of the most important nutrients required by plants but also one of the most deficient nutrients in most ecosystems, particularly on degraded land. Due to increasing land degradation around the world, forest restoration has been a hot research topic over the last decade. Reforestation in Hong Kong was started in the 19<sup>th</sup> century by the British colonial government (Corlett, 1999). Since World War II in 1945, mainly exotic tree species, for example *Acacia confusa*, *Acacia auriculiformis*, and *Eucalyptus* spp., were planted (Corlett, 1999). More native tree species were tried over the last decade and some more studies on native tree species were conducted. However, no work has been conducted on native legume tree species which should in theory have high potential for forest rehabilitation and restoration. It is because legumes are able to fix atmospheric nitrogen that they may allow them to perform better on degraded soils and improve the soil condition. The aim of my final year project was to

investigate the nodulation and nitrogen fixing ability of native tree legume species in the field as well as in nursery conditions.

## Materials and methods

Eight native tree legume species were investigated in the Native Tree Nursery of Kadoorie Farm and Botanic Garden and in the field (4 of the 8 species only) from September 2003 to early 2004 for their abilities to form root nodules and fix nitrogen (Table 1).

In the nursery study, about 20 nursery grown seedlings (mean height 6.4 - 41.6 cm) of each species were examined for the formulation of root nodules. The ability to form root nodules was measured in terms of presence of nodules, number and size of nodules. In the field survey, 3 seedlings of each species from 3 sites were examined (Table 1). The occurrence of nodules was examined by excavating the roots to 20 cm deep and 30 cm in diameter around the main stem. The activity of the nodules found was determined qualitatively by examining the interior colour of the nodules – effective nitrogen fixing nodules appear to be red inside due to the presence of the nitrogen fixing enzyme nitrogenase while ineffective nodules are white inside (Sprent, 2001). Quantitative methods such as acetylene-reduction assay (Hardy *et al.*, 1968) or N-15 methods (Galiana *et al.*, 2002) were not used due to limitation in laboratory equipment and facilities.

Since two of the studied nursery species formed root nodules in some individuals only, the nitrogen content between nodulated and non-nodulated individuals of these two species were compared by measuring the Kjeldahl total nitrogen in shoots (Bremer and Mulvaney, 1982).

Table 1. Nodulation survey results in the nursery and the field.

Species name	No. of nodulating individuals (No. examined)	
	Nursery	Field [Site]
<i>Gleditsia australis</i>	0 (20)	Not surveyed
<i>Adenanthera pavonina</i>	0 (20)	Not surveyed
<i>Archidendron clypearia</i>	20 (20)	3 (3) [Mui Tze Lam] 3 (3) [Tai Po Kau] 1 (3) [Wu Kau Tang]
<i>Archidendron lucidum</i>	20 (20)	0 (3) [Mui Tze Lam] 0 (3) [Tai Po Kau] 0 (3) [Pak Ngau Shek]
<i>Archidendron utile</i>	4 (10)	Not surveyed
<i>Ormosia emarginata</i>	9 (20)	0 (3) [Mui Tze Lam] 0 (3) [Pak Ngau Shek] 0 (3) [Wu Kau Tang]
<i>Ormosia pachycarpa</i>	20 (20)	0 (3) [Shek O]
<i>Ormosia semicastrata</i>	11 (20)	Not surveyed