Fig. 1. Adult Hong Kong Newt

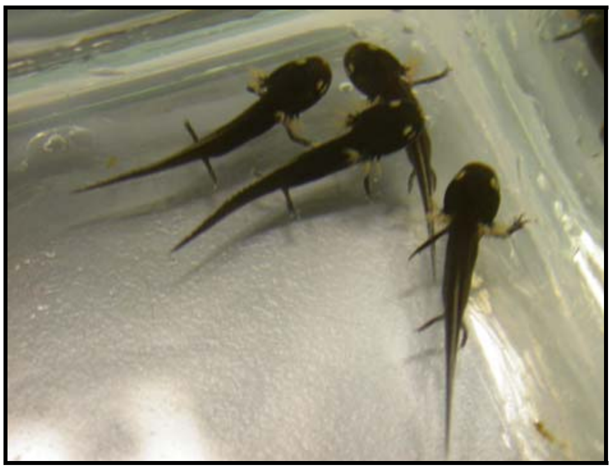

Fig. 2. Larvae of Hong Kong Newt (*Paramesotriton hongkongensis*).

VERTEBRATES

Preserving a gentle reef fish giant

by Yvonne Sadovy
IUCN Specialist Group for Groupers and Wrasses

Not so very long ago, the idea of a commercially important marine fish going extinct was considered highly unlikely, if not impossible. The assumption was that marine species are so widely dispersed and so fecund (productive of eggs) that there would always be places they could not be found, and that all those eggs endowed them with limitless capacity for recovery. Some biologists still argue that extinction is not possible, stating, in support of this view, that no marine fish has ever been known to go extinct from exploitation. Only time will tell whether or not they are right. However, we have learned enough about declines in populations of many fish species to know that these can be threatened with disappearance (or 'extirpation'), even if the species as a whole is not (Dulvy et al. 2003). Moreover, we now know that high egg numbers and wide geographic distribution are no insurance against serious depletions; the cod (*Gadus morhua*) and the southern bluefin tuna (*Thunnus maccoyii)* has shown us that. In any event, loss of single populations is the first step towards biological extinction and it makes little sense to wait until it is too late to see who is right.

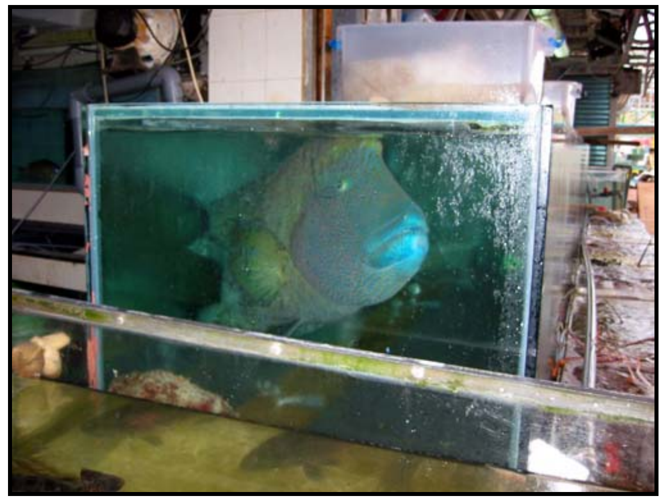

Fig. 1 Large humphead wrasse in small tank in Hong Kong. (Photo: Liu Min)

Many fish species for which serious declines have been noted are large and long-lived, often with life spans of several decades or more. Such species are likely to have rather low replacement rates and hence are particularly vulnerable because they are unable to withstand heavy fishing pressure. In other words, if too many fish are removed too quickly, the population will decline and, without management, dwindle and possibly disappear. This is especially likely if the species is particularly valuable because even if it becomes harder to catch, its value remains a big incentive to continue fishing. As just one example, a single large tuna can sell for US$40,000 or more. To make matters worse, increasing rarity may be associated with higher retail prices.

One of the largest and most valuable of all reef fishes is the humphead, or Napoleon, wrasse, *Cheilinus undulatus*, known better to many in Hong Kong as the 'So Mei' (Fig. 1). This species is a small but important part of the international trade in live reef fish for which Hong Kong is a major demand centre: at times its retail price has reached US$150/kg. So there is a lot of interest from traders and fishermen to find and market this species and, largely as a result of the trade in live reef fish, the humphead wrasse has declined in many areas. Even though it is widely distributed across the Indo-Pacific, sub-adults or juveniles, preferred as being a good 'plate-size' fish in restaurants, often occur inshore and are easy to overfish (Fig. 2). The species reaches 2 m in length and can live at least 30 years. It is, therefore, rather susceptible to fishing, and, as a result of demand, is disappearing.

Due to concern for this species, the humphead wrasse was listed under Appendix II of the Convention on International Trade in Endangered Species (CITES at www.CITES.org) in October, 2004 (Sadovy et al., 2003; www.humpheadwrasse.info). This was an historic listing because it is one of the first commercially important marine fish species to be so classified. A species on CITES Appendix II in international trade must be monitored and can still be exported if it has been sustainably caught in the source country. Many people think that CITES is all about banning species in trade. In the case of Appendix II, however, this is not the case; listed species can only be exported if they are captured at sustainable levels and so CITES promotes and fosters sustainable use for vulnerable species.

Fig. 2. 'Plate-sized' humphead wrasse, ready for the plate. (Photo: Valerie Ho)

Listing of commercial fishes, historically, has rarely occurred under CITES which many governments feel is not a suitable convention for fish. With the humphead listing, however, the mood is clearly changing. The Food and Agriculture Organization (FAO) of the United Nations was previously seen as the only appropriate body for dealing with fishes, but the FAO is not directly involved in management and tends to deal more with the large, more economically important, global fisheries, not reef fish species or those of more minor global significance. CITES, therefore, is an excellent mechanism for moving towards the sustainable use of species, like the humphead wrasse, which science has clearly shown to be threatened and in need of attention, and is not otherwise effectively protected. The recent listing was considered a landmark for fish conservation and sustainable management because it was the first to receive strong support from countries that normally oppose applying CITES for fishes. Let's hope that this listing also casts a spotlight on the need to better manage reef fish fisheries in general. These must continue to support the livelihoods and lives of the millions of fishermen living in coastal areas around the tropics, and will, as a result, allow us to eat reef fish that are sustainably caught, guilt-free.

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Newcomers to the local fish list, or unwelcome exotics!

by Allen To and Anna Situ

The first fish to be added to the local fish list is the yellowtail tang, *Zebrasoma xanthurum* (Family: Acanthuridae), or so called "purple tang" among aquarists (Fig. 1). This beautiful reef fish was observed by Allen To and Kiwi Lee at Hoi Ha Wan Marine Park in mid-May. The tang was about 15 cm in total length and was hiding among rocks close to shore. This tang is documented to occur in the Western Indian Ocean (from Red Sea to the Persian Gulf) and the Maldives (Randall & Anderson, 1993).

Fig. 1. The yellowtail tang, *Zebrasoma xanthurum*. (Photo: John E. Randall).

Another exotic fish, which is also an aquarist's favourite, is the emperor angelfish, *Pomacanthus imperator* (Family: Pomacanthidae)(Fig. 2). That gorgeous 20 cm-adult angelfish was sighted in early June at Hoi Ha Wan Marine Park by Allen and Kiwi, in waters under the flyover to the education centre. This reef-associated angelfish was observed to be hiding within a crevice at a depth of about 1.5 m. It occasionally swam out of the crevice and looked curiously at us. Its documented distribution is in the Indo-Pacific (Red Sea and East Africa to Hawaiian, north to southern Japan, south to the Great Barrier Reef) (Fricke, 1999).

Fig. 2. The emperor angelfish, *Pomacanthus imperator.* (Photo: John. E. Randall).

A deep-sea fish, the pineconefish, *Monocentris japonica* (Family: Monocentridae) (Fig. 3), was collected by Allen, Anna Situ and Wallace Choi on 6 September from Ap Lei Chau Government Market. This specimen was about 6 cm in total length. This species had been described locally by another specimen reported to occur at Ching Chau in 2003 (hk-fish.net, 2004). Fishermen reported that the fish was caught in waters off Lamma Island. This species is characterized by its ability to give out light under its chin at night. Its documented distribution includes the Indo-West Pacific (Red Sea, South Africa, Mauritius to southern Japan) (Masuda *et al.*, 1984; Smith 1986; Lieske & Myers, 1994).

Fig. 3. The pineconefish, *Monocentris japonica.* (Photo: Allen To)

Last but not least is another surgeonfish, the humpback unicornfish, *Naso brachycentron* (Family: Acanthuridae) (Fig.4). The documented distribution of this fish includes the coast of East Africa to French Polynesia, Ryukyu Islands south to the Great Barrier Reef, the Philippines and Taiwan (Randall, 2001). This specimen was sighted in Sai Kung Market on 11 Oct 2004 by Allen, Anna and Wallace. Fishermen reported that they caught this specimen within Hong Kong but were unsure of the exact location. There has been no previous local documentation of this species.

Even though Hong Kong may fall within the documented distribution regions of the emperor angelfish, humpback unicornfish and pineconefish, there has been no known record of the first two fish species and only one recent record for the pineconefish locally. The yellowtail tang should not occur here according to its known natural distribution. In view of the increasing accessibility and popularity of aquarium fish, the most likely reason for the local record of the emperor angelfish and the yellowtail tang is from deliberate release; this might also be true for the pineconefish. People may release their fish because of sympathy, in the hope of good luck, health or even wealth. Large groupers, for instance, have often been released by local people for that reason. Marine parks such as the Hoi Ha Wan Marine Park might give the impression of being a "fish sanctuary" or "fish paradise" to those aquarists who were bored with their fish and would like to set them free in areas "ideal" to their fish. However, it is strongly recommended not to release fish into waters where they may not belong natually.

Fig. 4. The humpback unicornfish, *Naso brachycentron.* (Photo: Allen To).

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The South China Cascade Frog, *Amolops ricketti*, found in Hong Kong

by Michael Lau

On the night of 21 October 2004, an adult female of *Amolops ricketti* was found resting next to a small cascade in a stream draining from Tei Tong Tsai to Tung Chung at about 270 m. Visits to the same stream on 25 October and 25 November 2004 found 1 and 2 more specimens next to another cascade. This species is rather similar to the Hong Kong Cascade Frog *Amolops hongkongensis* in colour pattern but the dorsal dark blotches are usually less distinct. It can best be distinguished by the smaller suction discs on the 3rd and 4th fingers. Their diameter is less than 3 times the width of the fingers whereas in *A. hongkongensis* the diameter of the suction discs is 3-4 times the width of the fingers. In addition *A. ricketti* lacks the tarsal fold which is present in *A. hongkongensis.* The first fingers of breeding male *A. ricketti* have white, granular nuptial pads. *Amolops hongkongensis* also has white nuptial pads on the first fingers but they are velvety. The eggs of *A. ricketti* are reported to be glued under stones in stream (Ye *et al.*,1993) whereas the eggs of *A. hongkongensis* are laid on rock faces in the splash zones of cascades. Another apparent difference between the two species in Hong Kong is that *A. hongkongensis* is only found in the New Territories and Hong Kong Island, whereas *A. ricketti* only occurs on Lantau Island.

Amolops ricketti is widely distributed in South China, including Sichuan, Guizhou, Hubei, Zhejiang, Jiangxi, Hunan, Fujian, Guangdong and Guangxi (Zhao & Adler, 1993; Fei, 1999). This species has also been recorded in Wutongshan, Shenzhen just across the border (Kadoorie Farm and Botanic Garden, 2002). It has never been recorded in the pet or food trades (Lau *et al.* 1995; Kadoorie Farm and Botanic Garden, 2004) and it is unlikely that the frogs originate from human introduction. Hence the case that this frog is native to Hong Kong is deemed strong.

The amphibian fauna has been rather well-studied (Romer, 1979; Karsen *et al*., 1998; Lau & Dudgeon, 1999) so it is intriguing as to why this species has not been found earlier. One of the reasons is that the stream supporting this species was not covered in previous surveys (e.g. Lau & Dudgeon, 1999 and the Hong Kong Biodiversity Survey). In addition, this species probably has a very restricted local distribution. Jiang & Xie (2003) reported several unidentified *Amolops* from a stream near Shek Pik Reservoir, Lantau. Based on the picture and the brief description in Jiang & Xie (2003), the frogs are likely to be *A. ricketti* and probably constitute another locality record. Because of its close resemblance to *A. hongkongensis*, this species may have been confused with the latter. Readers interested in finding out should examine the *Amolops* they come across, especially those in the New Territories, and look for the distinguishing features mentioned above.

Fig. 1. *Amolops ricketti*

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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 s*pecimens 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)
S. incognitus	Shing Mun	Juvenile	-
S. incognitus	Shing Mun	Adult	76.0
S. incognitus	Shing Mun	Juvenile	-
S. incognitus	Tai Tung Wo Liu	Juvenile	-
S. incognitus	Kadoorie Farm & Botanic Garden	Adult	97.0
S. incognitus	Ho Chung	Juvenile	-
S. incognitus	Sheung Tong	Juvenile	-
S. incognitus	Kadoorie Farm & Botanic Garden	Adult	81.5
S. incognitus	Shek Kong	Adult	92.2
S. indicus	Shing Mun	Adult	68.5
S. indicus	Tai Po Kau	Juvenile	-
S. indicus	Tai Po Kau	Juvenile	-
S. indicus	Tai Po Kau	Adult	64.5
S. indicus	Tai Po Kau	Juvenile	-
S. indicus	Kadooie Farm & Botanic Garden	Adult	66.5
S. indicus	Tai Po Kau	Juvenile	-
S. indicus	Kadoorie Farm & Botanic Garden	Juvenile	-
S. indicus	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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FLORA

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 19th century by the British colonial government (Corlett, 1999). Since World War II in 1945, mainly exotic tree species, for example *Acacia confusa*, *Acacia auriculiformus*, 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]**
Gleditsia australis	0 (20)	Not surveyed
Adenanthera pavonina	0 (20)	Not surveyed
Archidendron clypearia	20 (20)	3 (3) [Mui Tze Lam] 3 (3) [Tai Po Kau] 1 (3) [Wu Kau Tang]
Archidendron lucidum	20 (20)	0 (3) [Mui Tze Lam] 0 (3) [Tai Po Kau] 0 (3) [Pak Ngau Shek]
Archidendron utile	4 (10)	Not surveyed
Ormosia emarginata	9 (20)	0 (3) [Mui Tze Lam] 0 (3) [Pak Ngau Shek] 0 (3) [Wu Kau Tang]
Ormosia pachycarpa	20 (20)	0 (3) [Shek O]
Ormosia semicastrata	11 (20)	Not surveyed