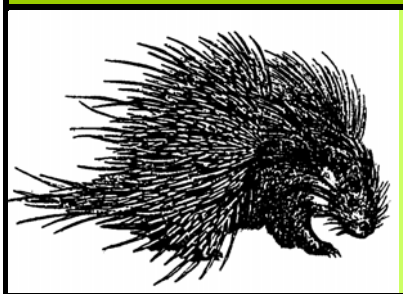
JULY 2001 NUMBER 23



Porcupine!

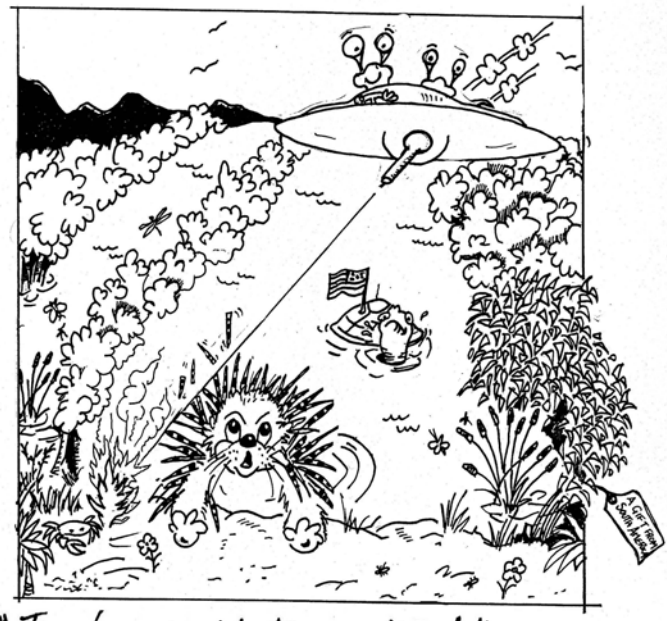
Newsletter of the Department of Ecology & Biodiversity, The University of Hong Kong

Hong Kong's Bad Biodiversity

Aliens - also known as exotics or introduced species - are species which did not occur here naturally but have been brought to Hong Kong by humans, either deliberately, as crops, ornamentals, domestic animals or pets, or accidentally, as stowaways in ships and cargo planes, as seeds or eggs in soil, or attached to shoes or clothing. Most species which arrive in this way do not "escape" to form wild populations, and most of the species which have escaped are confined to places that are continually disturbed by humans. The weeds of cultivated areas, roadsides and urban wasteland are mostly exotics, as are the fish in concrete channels, and such conspicuous urban invertebrates as the "American" Cockroach and the Giant African Snail. Most of these urban exotics are doing no obvious harm and some contribute positively to the quality of city life. However, they also form the pool of species from which are drawn the small number of ecologically-damaging ones: the invasive species.

Invasive species are aliens that invade natural or semi-natural communities. Out of the 150 or so well-established alien plant species in Hong Kong, less than a dozen have become invasive. The climbing American composite *Mikania micrantha* – Mile-a-Minute – is the most obvious example, but even this is confined to relatively disturbed sites. The "success" rate seems to be higher among birds and mammals, but the species which have done well in natural habitats are all from tropical East Asia and are apparently occupying niches vacated by the loss of the same or closely-related species when Hong Kong was deforested centuries ago. Thus, a dozen or so introduced bird species have become established in forest and shrubland in Hong Kong, but most are southeast China species that were probably part of Hong Kong's original native forest avifauna.

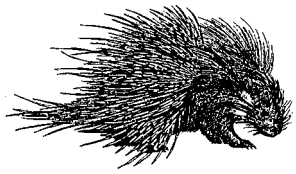
While most aliens do little harm, a small proportion cause massive ecological and/or economic damage. This small proportion is enough to make exotic species one of the major threats to global biodiversity. There have so far been two alien disasters in Hong Kong: the Pinewood Nematode (from North America) and Pine-needle Scale Insect (from Taiwan), which together virtually eliminated the native *Pinus massoniana* in the 1970s and 80s. The chance of another disaster increases every time an additional alien species becomes established in Hong Kong. And any species established here will eventually spread into mainland China, as both pine pests have already done. Exotic species that do no harm in Hong Kong may be much more damaging in the agricultural lowlands of southern China.



What needs to be done? Firstly, we need to identify the major routes by which alien species enter Hong Kong and see if these can be controlled. Hong Kong's open borders make it impossible to prevent all introductions, however, and a second line of defense is essential. We need a system by which newly established exotics are identified, reported and, if possible, exterminated, before they can spread: a permanent group of government Alien-Busters. *Who ya gonna call?*

Richard Corlett

Porcupine!



NUMBER 23
July 2001

Newsletter of the Department of Ecology & Biodiversity, The University of Hong Kong

INSIDE THIS ISSUE:

Editorial

It is natural we imagine that the world has long been, more or less, as we now know it. This perception represents a baseline against which we judge, and respond to, change. If you have never seen tigers, rhinos or gibbons in Hong Kong for example, it is hard to appreciate or even believe, what has been lost. Only by documenting diversity and its change we do learn that this baseline is ever-shifting, typically towards diminishing diversity. Whether the cause is direct removals or displacement by alien invaders, we need to record and understand such changes so better to halt, or reverse them. Many articles in this volume reflect not only the process of documentation but also the fact that, sadly, Hong Kong's biodiversity, terrestrial or marine, does not yet receive the attention it deserves. On reflection, some change is good!

YS

DEB News

Porcupine! time has come around again, leading to the regular ritual whereby Richard Corlett (ferret) badgers me to write something, I say "yes" and then forget about it, Richard badgers me again (gnaws my leg, etc.), and so on. The cycle continues until I realise he is not going to give up (badgers are persistent animals). Whereupon I sit down and write this. Ecology and the environment have been much in the news of late both locally (the Long Valley appeal – still *sub judice*) and internationally (Dubya Bush, climate change, and the Kyoto 'agreement'). Things have been happening here in the Department of Ecology & Biodiversity (DEB) as well. Firstly, the release of Version 2.0 of the Biodiversity Survey Database on CD-ROM. Copies were provided to the Environment and Conservation Fund Secretariat (c/o the Environment & Food Bureau) in March, for onward distribution to interested parties. The database, in GIS format (for use with ARC/INFO or Arcview), now includes almost 5,000 species and 95,000 records. Apart from the addition of many new records (mostly insects), we have corrected some minor mistakes in the data set, and made minor alterations to species names where there have been nomenclatural changes or where new information has become available.

What else is new? There have been changes to DEB senior staff. Steve Pointing (of whom, more on page 3) formerly held a research position in the department, but has now been appointed Assistant Professor. Dr Xuhua Xia will be moving to the Hong Kong University – Pasteur Research Centre this September where he will be focussing on bioinformatics research. We wish him well for the future. In the meantime, DEB has been carrying out a recruitment exercise to fill the vacated post. I hope that by the time you read this, the matter will be settled. This will allow Richard to badger the new recruit into providing a personal profile for the next issue of *Porcupine!* Which leads me to think that the time might be ripe for another change. How does *Badger!* sound?

VSB scoops award! Crowds roar

Many of you will be aware that the Department of Ecology & Biodiversity has been working in collaboration with the University of Nottingham (UK) and other partners in order to develop an IT-intensive, teaching and learning initiative: the Virtual School of Biodiversity (VSB). *Porcupine!* 18 gives more details of the aims and objectives of the VSB. As this issue of *Porcupine!* goes to press, we have just learned that the VSB has been awarded the first-place award in the category "Best Web-based or IT-enhanced learning initiative" in the *1st HKU IT in Education Awards*. The prize comes at a fortuitous time. The VSB received a funding extending over two years from the University Grants Committee; unfortunately, the money runs out on August 31. Hopefully, this first-place award will provide wider recognition of the value of the work of the VSB and aid in the search to place it on a more secure financial footing. In the meantime, congratulations to all concerned - especially, Alan, Benny, Gray, John and Lando – for their efforts.

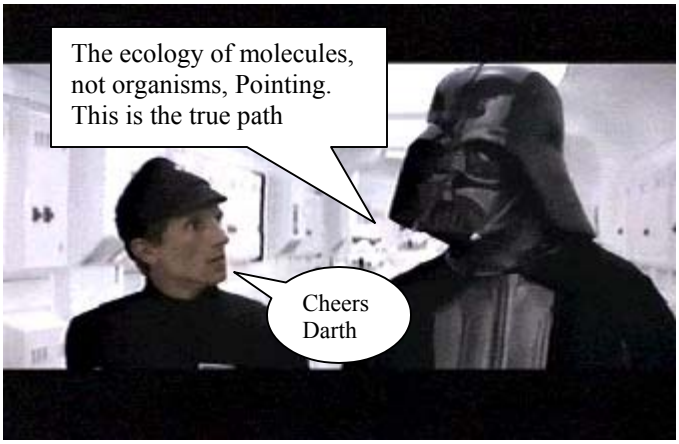
David Dudgeon

Introducing Steve Pointing

by Steve Pointing

I am extremely happy to announce that I will be taking up a new position as Assistant Professor in DEB from September 2001. For those of you already know me and are familiar with my research and teaching - you can skip this page! This article is really intended to introduce myself to any staff, students and affiliates of DEB who do not know me yet.

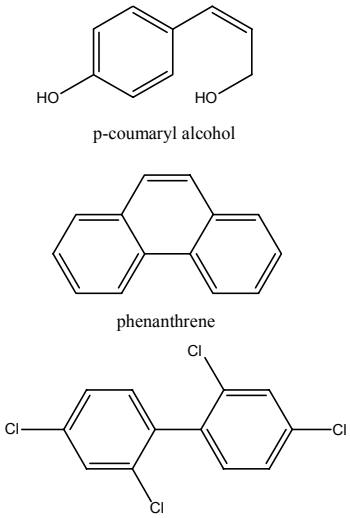
My first inspiration to become a biologist came from following the heavily accented adventures of Jacques Yves Cousteau on TV as a kid. I read The Silent World, learned to SCUBA dive and thought of becoming a marine biologist. I was, however, lured to what many might consider 'the dark side' as an undergraduate became fascinated by enzymology, and finally graduating with a major in biochemistry.



As a postgraduate, I found that microorganisms had the most interesting biochemistry, and that working on them had the added bonus of not requiring me to kill any 'real' animals. Ultimately I managed to include a bit of everything 'biological' that I loved into my PhD – the marine environment, enzymology and microorganisms!

My current research interests are varied, although they all adhere to a common theme of **microbial ecophysiology** - the study of physiological adaptations of organisms to habitat or environment. I am particularly interested in the catabolism of lignin in aquatic environments. Lignin is the Earth's second-most abundant biological polymer with annual production estimated at over 20 x 10^{12} kg. It is the component of wood and grasses that confers decay resistance, so it is extremely difficult to break down. This abundance and resistance to decay make lignin breakdown a rate-limiting step to carbon cycling within many environments. My PhD student, Ms Vivienne Bucher, is currently researching the relative lignin-degrading ability of freshwater and marine microorganisms at the molecular and physiological levels. I also have a project in collaboration with the Department of Biochemistry at HKU investigating transcriptional control of the enzymes involved in this process in response to nutrient and pollution stresses. One fortuitous spin-off from these studies has been the discovery that the enzymes involved are highly non-specific – that is they can degrade a number of compounds with chemical structures similar to lignin, and these include priority-listed organic pollutants such as PCB and PAH (Fig.1). Another of my postgraduate students, Ms Sin Kai Wai, is currently researching the possibility of using lignin-degrading microorganisms in pollution control.

Fig.1 Structural similarities between a lignin monomer (Coumarly alcohol), a PAH (phenanthrene) and a PCB (tetrachlorobiphenyl)



I have also been developing an interest in the ecophysiology of extremophiles, which are organisms living under particular stresses of water, chemical and/or energy source availability. I am especially interested in microorganisms capable of living in volcanically influenced habitats. I have visited the volcanoes, sulphur-mats, hot-springs and solfatra of the Phillippines and Hawaii over the last year and intend to begin a research programme in this field during 2002.

I am an experienced teacher, having taught at undergraduate level for 5 years. I hope to draw upon my research interests to introduce new and interesting topics to my teaching at DEB that will appeal to students. I am keen to include molecular and physiological aspects of microbial ecology, with particular reference to environmental stress. Any of you interested in reading more about my interests may want to check out: S.B. Pointing (2001) Exploiting the Versatile Ligninolytic System of White-rot Fungi, In: *Bio-Exploitation of Filamentous Fungi* (ISBN 962-85677-2-1) and J. Postgate (1996) *The Outer Reaches of Life* (0-521-55873-5).

INVERTEBRATES

Additional Noctuidae (Lepidoptera) to the Hong Kong List

by Roger Kendrick

Acidon paradoxa Hampson, 1896 [Lepidoptera: Noctuidae, Hypeninae] was recorded from KARC in October 2000 and in each month subsequently (to late April), including records from the butterfly garden at KFBG in 2001. Prior to these records, the species was only known from the holotype specimen, found in Bhutan and described by G.F.Hampson in 1896. My thanks to Dr. Martin Lödl, Vienna, Austria, for identifying the species from the photo and for providing the background information of the species' past history.

Nothing is known about the early stages of this species' life history. That this species was not recorded during three years of intensive work at KARC from 1997-1999, yet appeared regularly over seven months in 2000 / 2001, illustrates just how variable population levels of insect species can be and how little is known about the factors regulating many insect species abundance in the tropics. *Geographical Range:* China (Hong Kong NEW RECORD), Bhutan (Lödl, 1998)

Two individuals of *Athetis delecta* (Moore, 1881) (*Caradrina*) [Lep.: Noctuidae, Amphipyrinae] were recorded at a light trap in Lam Tsuen Valley, 24 February 2001. *Geographical Range:* India (Darjelling), Nepal, China (Jiangsu, Xiziang, Hong Kong NEW RECORD) (Poole, 1989; Yoshimoto, 1992, Chen, 1999). This represents a considerable range extension for this species.

Bibliography

Chen, Y.X. (1999). *Fauna Sinica Insecta Vol. 16: Lepidoptera; Noctuidae*. Science Press, Beijing. lxxiii + 1596 pp., 701 figs., 67 plates (b/w).

Lödl, M. (1998). Revision der Gattung *Acidon* Hampson, 1896 (Lepidoptera: Noctuidae: Hypeninae), *Quadrifina* **1**: 25-62.

Poole, R.W. (1989). *Lepidoptorum Catalogus* (New Series). *Fascicle* 118: Noctuidae. E.J.Brill, Leiden.

Yoshimoto, H. (1992). Noctuidae. In Haruta, T. (ed.) *Moths of Nepal*, part 1. *Tinea* **13** (Suppl. 2): 50-69.

Interesting Odonates from Hong Kong Island

by Michael Lau

On 11 May 2001, one *Calicnemia sinensis* was found near a forest stream along Mount Parker Road at about 140 m. Two *Drepanosticta hongkongensis* were found near a small stream at about 210 m. Several *Drepanosticta hongkongensis* and two *Sinosticta ogatai* were found along a forest stream south of Quarry Gap from 180 – 260 m. According to Wilson (1997b) *C. sinensis* is a regionally rare species with restricted local distribution. It has been recorded from five sites in Hong Kong (Wilson, 1997) and this Mt. Parker record represents the sixth site. Both *D. hongkongensis* and *S. ogatai* are believed to be endemic (but see Reels' article in this issue of *Porcupine!)* and have never been recorded on Hong Kong Island (Wilson, 1997b). Their presence in the Mount Butler area is hence of conservation interest.

Two Hong Kong 'endemics' sunk at Wutongshan

by G.T. Reels

Two species of damselflies previously only known from Hong Kong have been discovered on the slopes of Wutongshan in Shenzhen. *Sinosticta ogatai* and *Drepanosticta hongkongensis* (Platystictidae) were both found in good numbers in wooded ravines on the north-facing slopes of the 944 m mountain, just over the border from Sha Tau Kok, during a field visit organized by Kadoorie Farm & Botanic Garden on 16-17 May 2001.

Sinosticta ogatai (Matsuki & Saito, 1996) was first discovered by KDP Wilson, who recognised it as a new genus of Platystictidae, in May 1994 at Tai Mo Shan and Keung Shan (Wilson, 1995). It was subsequently erroneously described as a new species of *Drepanosticta* by Matsuki & Saito (1996), and re-described by Wilson (1997a), who created the monotypic genus *Sinosticta* to receive it. The species has also been recorded at Ng Tung Chai and Sunset Peak (Wilson, 1997b), and recently at Tai Tam (M. Lau, pers. comm.).

Drepanosticta hongkongensis Wilson, 1997 was first recorded in Tai Po Kau by Asahina (1987), who mis-identified it as *D. brownelli*. It was described as a new species by Wilson (1997a) on the basis of colour differences from the latter on segments 8-10 of the male abdomen. It is known from several sites across the SAR (e.g. Wilson, 1997b).

The north-facing slopes of Wutongshan are steep and relatively well-wooded. The mountain represents a continuation of the SW-NE trending uplands which comprise much of Hong Kong's landscape, and it is quite possible that another endemic damselfly, *Rhipidolestes janetae* (Megapodagrionidae), could turn up on the mountain's upper slopes. The species is currently known only from Sunset Peak on Lantau Island.

Bibliography

Asahina, S. (1987). A revised list of the Odonata of Hong Kong. Part 1: Zygoptera. *Tombo* 30: 7-24.

Matsuki, K. & Saito, Y. (1996). A new species of *Drepanosticta* from Hong Kong (Odonata: Platystictidae). *Nature and Insects* 31: 39-43.

Wilson, K.D.P. (1995). *Hong Kong Dragonflies.* Urban Council, Hong Kong, 211pp.

Wilson, K.D.P. (1997a). The Platystictidae of Hong Kong and Guangdong with descriptions of a new genus and two new species (Zygoptera). *Odonatologica* 26: 53-63.

Wilson, K.D.P. (1997b). An annotated checklist of the Hong Kong dragonflies with recommendations for their conservation. *Memoirs of the Hong Kong Natural History Society* 21: 1-68.

Barnacle species new to science recorded in Hong Kong!

by Yan Yan and Benny K. K. Chan

A tiny barnacle with mature egg masses (basal diameter ~ 5 mm) has been discovered in the exposed intertidal region (1.5 – 2 m above Chart Datum) at Cape d'Aguilar, Hong Kong. (Fig. 1) The barnacle is clearly of the genus *Chthamalus* and can also be found on the shell surface of the bivalve *Septifer virgatus*, the gastropod *Nerita albicilla,* and also other barnacles such as *Capitulum mitella* and *Tetraclita squamosa*. In Hong Kong, only two species (*Chthamalus malayensis* and *Euraphia withersi*) belonging to the family Chthamalidae have been recorded. *Chthamalus* species are variable in adult morphology and thus often difficult to distinguish. By detailed investigation of the adult and larval morphology of this species, however, certain diagnostic features have been discovered in the scutum, tergum (plates at the barnacle's opercular opening) and also the cyprid larvae (settling stage) which distinguished this species from previous descriptions of all *Chthamalus* species in the world. This species, therefore, is proposed to be a new species which has been neglected by people - even by barnacle lovers! Currently, we are preparing a manuscript to describe this new species.

Fig.1 Adults of the new *Chthamalus* species discovered in the mid-high shore region at Cape d'Aguilar.

Sacculina in Hong Kong: A special form of barnacle you may never have noticed!

by Benny K. K. Chan and David Y. N. Poon

What are barnacles? If you say that they are sessile feeders having conical shells and bearing six pairs of appendages on their bodies, then you just got it half right! In fact, not all barnacles have conical shells or even a definite body form. Rhizocephalan barnacles (Cirripedia: Rhizocephala), which parasitize marine and freshwater crustaceans (in particular the crabs and shrimps), are one of the exceptions.

The genus *Sacculina* is one of the Rhizocephalan barnacles that parasitizes crabs. Similar to other barnacles, *Sacculina* have a planktonic larval stage, the nauplius, and a settling stage, the cyprids. The adults, however, unlike other typical barnacles, are internal parasites (called the "interna"), cuticular tumors which grow inside their crustacean hosts. These tumors can develop a system of branching roots that ramify throughout their hosts' bodies and absorb their nutrients. The life cycle of *Sacculina*, therefore, comprises two stages: the endo- and ecto-parasitic stage.

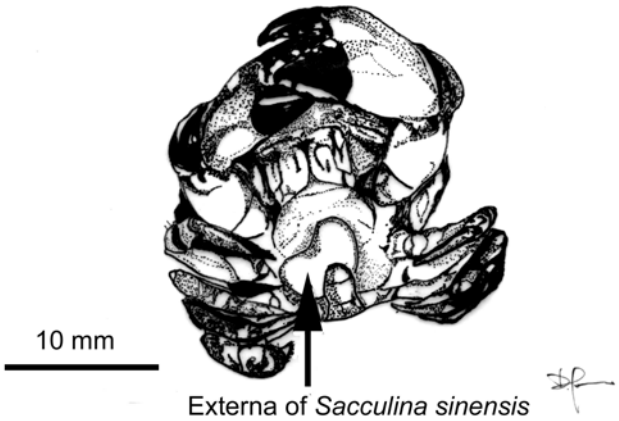
Sacculina larvae are dioecious. The male larvae are often smaller than those of the females. The life cycle begins with the female cyprid invading the crabs and then developing into a parasite with an internal root system (interna). Once the interna matures, it will develop a reproductive body outside the crabs through the abdominal part called the virgin externa. Male cyprids will then enter the virgin externa, which give rise to a fertilized externa with the eggs brooding inside it. Larvae will then be released via the externa once the eggs became mature.

The life cycle of *Sacculina* is complex and specialized, their distribution is, therefore, often localized and confined to very sheltered areas. For details about the life cycle and ecology of *Sacculina*, interested readers should see the review written by Hoeg and Lutzen (1995).

Identification of *Sacculina* is very difficult and often relies upon identification of their hosts (they are usually host-specific) as well as microscopic investigation of the transverse sections of the reproductive structure i.e. the externa (Hoeg et al., 1990).

Investigations of *Sacculina* infestations are often restricted to temperate species and little is reported from tropical intertidal regions. In Hong Kong, so far there are no detailed investigations of *Sacculina* infestations, the only records of *Sacculina* (parasitizing crabs) being those of Morton and Morton (1983) and Morton (1994). In January 2001 we discovered that the intertidal crab *Leptodius exaratus* was occasionally found bearing externae of *Sacculina* at Lobster Bay (a sheltered boulder shore) in Cape d'Aguilar. Investigation of the externa transverse sections revealed that this *Sacculina* species is *Sacculina sinensis*, which was once found by Baushma in Hong Kong in 1933. The size of the externa of *S. sinensis* is small with a mean width of 5 mm. By culturing the larvae of *S. sinensis*, we found that there are 4 naupliar stages and 1 cyprid stage. All the larvae are non-feeding and the limbs (antennules, mandibles and antenna) are structurally simple. Through extensive searches of crabs in a variety of intertidal shores around Hong Kong, only *L. exaratus* on boulder shores in Cape d'Aguilar and Lan Lai Wan in Tai Tam (Hong Kong Island) were found to have *Sacculina* infestation.

The infection rate and occurrence of *Sacculina* spp. are lower in Hong Kong compared to other South-Asian regions. In Taiwan, the infection rate of *Sacculina* spp. on crabs often reached 30 – 40 % and hosts included the rocky shore crabs *Grapsus albolineatus*, *G. intermedius* and *G. longitarsis* (Liu and Lutzen, 2000). In Japan, the crab *Gaetice* spp. is also found to be infected by *Sacculina*. In Hong Kong, *Sacculina* infestation has only been recorded for the crab *Leptodius exaratus* (the record of *Sacculina confragosa* parasitizing the crab *Epixanthus frontalis* in Morton 1988 is suspected to be a misidentification) and the infection rate is only around 10 % at Lobster Bay and in another boulder shore near Lap Sap Wan. In addition, so far neither *Grapsus* spp. nor *Gaetice depressus* in Hong Kong has been observed to have signs of *Sacculina* infestations. We are now preparing a manuscript describing the adult and larval morphology of *S. sinensis* and comparing its occurrence with other Asian regions. The differences of infection rate and also the crab species infected between Hong Kong and other Asian region is a potential area for further research.



Bibliography

Dai, A.Y. and Yang, S.L. (1991). *Crabs of the China Seas*. China Ocean Press, Beijing.

Hoeg J. T. and Lutzen, J. (1995). Life cycle and reproduction in the Cirripedia Rhizocephala. *Oceanography and Marine Biology: An Annual Review* 33: 427-485.

Hoeg, J. T., Kapel, C. M., Thor, P. and Webster, P. (1990). The anatomy and sexual biology of *Boschmaella japonica*, an Akentrogonid Rhizocephalan parasite on barnacles from Japan (Crustacea: Cirripedia: Rhizocephala). *Acta Zoologica* (Stockholm) 71: 177–188.

Liu, H-C and Lutzen, J. (2000). Asexual reproduction in *Sacculina plana* (Cirripedia: Rhizocephala), a parasite of six species of Grapsid crabs from Taiwan. *Zool. Anz*. 239: 277-287.

Miyake, S. (1983). *Japanese Crustacean Decapods and Stromatopods in Color Vol. II: Brachyura (Crabs)*. Hoikusha Publishing, Osaka (Japanese text).

Morton, B. (1988). *Partnerships in the Sea*. Hong Kong University Press, Hong Kong. 124 pp.

Morton B. and Morton J. (1983). *The Seashore Ecology of Hong Kong*. Hong Kong University Press, Hong Kong. 350 pp.

VERTEBRATES

When being female is better

by Yvonne Sadovy

The mandarinfish, *Synchiropus splendidus*, is a particularly attractive dragonet (Family: Callionymidae) which is favoured in the marine aquarium trade in Hong Kong and elsewhere. Little is known of the life history or fishery of this species. Males are particularly heavily sought by aquarists because their extended first dorsal fin, a sexually dimorphic character, (Fig.1) is thought to be especially attractive. Fishing tends to be sexually selective as a result. A study was initiated in 1997, funded by the National Geographic Society, to investigate the reproductive biology and effects of fishing on the mating system of this species, and will be completed this year. The mating system was studied by directly observing natural populations in the field in Palau, Micronesia, and the fishery was observed directly in the Visayas, Philippine Islands. Marine aquarium shops in Hong Kong were periodically inventoried to determine the sizes and sexes of fish available at retail outlets. The work was carried out in collaboration with Dr. Mariella Rasotto of the University of Padova, Italy.

Our results suggest that this species has a rather unusual mating system that involves regular spawning spots on the reef at which males and females assemble, in mini spawning aggregations, each evening. There is a strong, size-based, dominance hierarchy among the males such that larger males mate significantly more frequently than small males, both by excluding smaller males, and, we think, because females prefer to mate with larger males. Each female spawns only once each night but may go several nights without spawning so, on any one night, there is intense competition among males for a few active females. Spawning (mating) occurs after a female and male align themselves and rise slowly to about a metre above the substrate and release sperm and eggs.

The fishery of this species was observed in the Philippines where fishers use a specially designed mini speargun; the spear itself consists of two sewing needles which are fired into the side or tail of the animal. The capture of this species is quite specialized since they are difficult to spot and are only visible briefly during dawn and dusk or when there is heavy cloud cover. The fishers say that they select the bigger fish because the price of the attractive males is about twice that of the females. This selectivity was also suggested when retail outlets of aquarium businesses visited in Hong Kong and most fish observed were male. The Philippine fishery was clearly depleted according to interviews with fishers.

The effects of sex selective fishing, in general, and especially in respect of species involved in the marine aquarium trade, are virtually unknown. Over 1,000 species are traded globally for home aquaria, of which about 340 species have been recorded in Hong Kong where a small component of the global trade is operating (Chan and Sadovy, 1998). In the case of the mandarinfish, we were able to determine, from removal experiments in the field to mimic selective fishing on the largest males present (the males were replaced after the experiment), that selective fishing apparently has two effects. The first, obvious one, was the removal of dominant males producing a female bias to social groupings in the field. The second, unexpected, finding was that females were increasingly reluctant to pair with progressively smaller males. This led to increased numbers of failed pre-spawning rises, a longer time spent in the water column for male/female alignment to take place, and the possibility of increased predation pressure as a result; successful predations are rarely observed in the field, yet in this study we observed several such events following male removals.

This study suggests that to understand the full impacts of selective fishing for the aquarium trade on reef fish populations detailed knowledge is needed, both of the biology of the target species and the manner of operation of the fishery. This growing trade is worth billions of dollars globally (Wood, 2001), and involves an estimated 36 million fish traded annually. Yet it is little monitored, rarely regulated

and its impacts virtually unknown. In recognition of some of these problems, the Marine Aquarium Council is developing a certification system to promote good practice (Holthus, 2001). Lady mandarins, beware!

Bibliography

Chan, T.C., & Y. Sadovy. (1998). Profile of the marine aquarium fish trade in Hong Kong. *Aquarium Sciences and Conservation* 2:197-213.

Holthus, P. (2001). Certification for quality and sustainability in the collection, culture and commerce of marine ornamentals. *Marine Aquarium Council NEWS 1st Quarter 2001*.

Wood, E. (2001). *Collection of coral reef fish for aquaria: global trade, conservation issues and management strategies*. Marine Conservation Society, 80 pp.

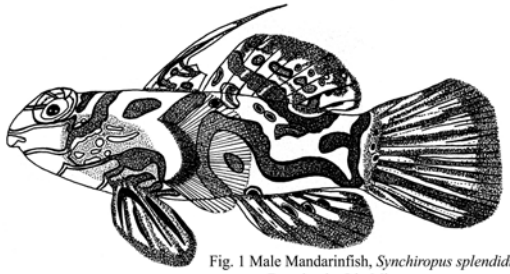


Fig. 1 Male Mandarinfish, *Synchiropus splendidus*.
Drawing by Liu Min.

Fisheries and fish prices in Hong Kong

by William Cheung

There is no doubt that fishery resources in Hong Kong waters have greatly declined over the last century, with an overall decrease in fishery catches and a shift from large predatory species to small fishes and invertebrates. Changes in the local fishery stocks and marine ecosystem have been variously discussed. However, it may also be interesting to also take a look at the changes in prices of local fishery landings. Do they show any particular trend? Is there any relationship between the prices and different components of the fishery?

To review trends in the prices of local landings, average annual wholesale prices of 34 groups of organisms marketed through the Fish Marketing Organization (FMO) responsible for the management of all local government fish wholesale markets, between 1965 to 2000, were compiled. The 34 groups of organisms were divided into three categories: small finfish (fish with an asymptotic length ≤ 60 cm), large finfish (fish with an asymptotic length > 60 cm) and invertebrates. To show any trend in changes in the annual average wholesale price for each group more clearly, a running average of the prices for sets of three consecutive years were calculated and plotted along with the annual Consumer Price Indices (CPIs) of Hong Kong (Census and Statistics Department, 1975-2000) (Fig. 1). The CPIs are used as a rough indicator of the local economic situation (an increase in CPI reflects inflation and vice versa).

Some trends in the prices of the three categories of landings were observed. Firstly, since the mid-1970s, wholesale prices of large finfish and invertebrates have increased rapidly and more rapidly than the economy. Increase in prices of large finfish slowed down around 1980 while the price of invertebrates continued to rise. Both around levelled off after 1990. The price of small finfish increased slowly and remained low throughout recorded years.

The observed changes in landing prices may be related to local fisheries. Though the inshore waters have been depleted of large fishes and suffer from over-exploitation, the total value of the fisheries in Hong Kong waters have evidently been sustained by the high value, and relatively more stable catches, of invertebrates. The high price of invertebrates might also be the major reason for the dramatic expansion of the shrimp trawling sectors in Hong Kong, despite an overall decrease in local resource abundance since the 1960s (Cheung, *in prep*.). Pauly (1994) also suggested that though fish populations were at densities lower than would be economically sustainable if only the fish were taken, trawling was effectively subsidized by the high value of the shrimp.

The high value of the shrimp trawl fishery may, in turn, lead to a more serious degradation of the local marine ecosystem. Shrimp trawling can be considered as a destructive fishing method because a small cod-end mesh size is used and the direct contact of the trawl-net with the sea bottom, by which it catches small fishes unselectively, damages and disturbs sea bottom habitat at the same time. Conventional single species bio-economic theory predicts that fishing become uneconomical and fishing effort eventually reduces to an economically 'optimal' level as fishery resources become depleted (Hilborn and Walters, 1992). Nevertheless, when an ecosystem perspective is adopted, the reduction in large predatory species by fishing reduces predation and releases their prey which include small fishes and invertebrates. Together with the generally high resistance to exploitation because of their fast turnover rate, the shrimp trawl fishery is being sustained in a depleted ecosystem.

To restore the Hong Kong marine ecosystem, reduction of fishing effort of trawlers, especially the shrimp trawlers, should be implemented and economic considerations would be a major factor in the practical implementation of management.

There are a few underlying assumptions in the above data analysis. Firstly, the FMO price record is assumed to reflect the average price of the whole fish market in Hong Kong. Cheung (*in prep*.), however, showed that there was a continuous decrease in the proportion of Hong Kong

fishermen landing their catch in the FMO since the 1950s. Therefore, care has to be taken when studying the changes in prices of landings in recent years. Secondly, the FMO record only represents prices of "dead" (frozen or preserved) food fishes; since live fishes are not treated as food under the present legislation their prices and landings are not recorded! Thirdly, only the general economic status of the society, represented by the CPIs, is roughly taken as a reference for the fish prices. Other factors affecting fish prices such as festivals and holidays are not taken in account here.

Under the above assumptions, though a precise and thorough analysis is not possible, the results provide a general insight into how local fish prices and fishery can be are related and what may be the driving factor(s) enabling fishing to continue in a depleted fishery.

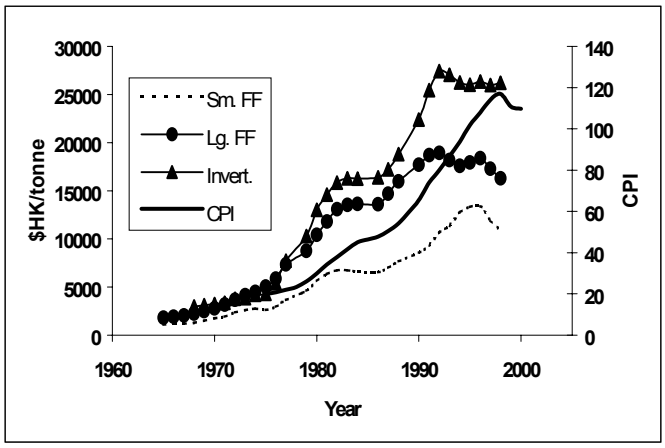


Fig. 1. Average landed value of small finfish (Sm. FF), large finfish (Lg. FF) and invertebrates (Invert.) recorded by the Hong Kong Fish Marketing Organization (FMO) from 1965 to 2000. The Consumer Price Index (CPI) of Hong Kong (Census and Statistics Department, 1975-2000) was also plotted to serve as a reference for the general economic status of Hong Kong society.

Bibliography

Census and Statistics Department (1975-2000). *Hong Kong Annual Digest of Statistics*. Census and Statistics Department, Hong Kong.

Cheung, W. L. *in prep.* Changes in Hong Kong's Capture Fisheries During the 20th Century and Reconstruction of the Marine Ecosystem of Local Inshore Waters in the 1950s. M.Phil. Thesis. The University of Hong Kong, Hong Kong.

Pauly D. (1994). On Malthusian overfishing. Page 112-117 In: *On the Sex of Fish and Gender of Scientists*. Chapman and Hall, London.

Hilborn, R. and Walters, C. J. (1992). *Quantitative Fisheries Stock Assessment: Choice, Dynamics and Uncertainty*. Chapman and Hall, New York.

Acrossocheilus parallens (Nichols) (Osteichthyes: Cyprinidae) newly recorded from Hong Kong

by Keith D.P. Wilson, AFCD

Introduction

The area of eroded hills, west of Castle Peak, bounded by Pak Nai, Black Point, Pillar point and Tuen Mun, holds little obvious interest for ecologists. Largely contained in a designated firing range, the hills have lost most of their forest cover and large areas of hillside have become excessively eroded with complete loss of surface vegetation. Carnivorous plants such as the Pitcher plant, *Nepenthes mirabilis* and sundew, *Drosera* sp. flourish in the nutrient deficient moist stream valleys.

During a dragonfly survey of the main stream about 2 km upstream of Pak Nai, where the main stream discharges to the sea at Deep Bay, a population of an unrecorded *Acrossocheilus* was observed by the author and G.T. Reels. The fish occupied stream pools, with boulders and bedrock as the dominant substrate. The maximum size observed was approximately 10 cm. A specimen was collected for identification. Its identity has proved somewhat problematical and is discussed below.

ACROSSOCHEILUS PARALLENS (NICHOLS, 1931)

Barbus (*Lissochilichthys*) *parallens*: Nichols, 1931: 455 - 459, fig. 1, "Description of type. – No. P-92, Lingnan University, from Lung T'au Shaan, Kwangtung, collected in 1926 by Tsang Wai Tak".

Acrossocheilus parallens*: Chen et al., 1991: 145 – 146, fig. 78, (Guangdong: north River, east river and west river); Yue Peiqi et al., 2000: 98 – 100, fig. 64, (Guangdong).*

Material: 1 specimen, Tai Lang Shui, near Castle Peak, Hong Kong, 19-V-2001, coll. K.D.P. Wilson & G.T. Reels.

Description: Fork length 84 mm. A moderately small cyprinid with two pairs of barbels, six short blackish vertical stripes above the lateral line, a further short blackish vertical stripe above the gill cover, prominent, thick, dark lateral stripe and pale yellow pectoral, ventral, anal and caudal fins. The colour of the sides becomes abruptly pale whitish, below the lateral line. The last dorsal spine is slender and soft and not much thicker than the branched dorsal rays. The specimen collected from Tai Lang Shui differs from typical *parallens* as there are

no fine serrations along the posterior border of the last dorsal spine.

Distribution: Zhujiang River (Guangdong).

Differential diagnosis: *A. parallens* is separated from its closest congener *A. labiatus* (Regan), known from Hainan, Fujian and Taiwan, by the lack of black stripes on the dorsal fin membrane, and the presence of fine serrations along the posterior border of the last dorsal spine. In addition *A. labiatus* lacks a lateral stripe and is not abruptly pale below the lateral line. In the case of the Hong Kong *parallens* specimen there are no fine serrations along the posterior border of the last dorsal spine but the striped lateral line is very obvious and there are no black stripes on the fin membrane. Other close congeners include *A. hemispinus hemispinus* (Nichols, 1925), recorded from Mingjiang River (Fujian and Jiangxi), which has a thick last dorsal spine, obviously thicker than soft branched rays, with strong serrations along the posterior border and no vertical bars on sides of body. *A. hemispinus cinctus* (Lin, 1931), known from Xijiang River (Guangxi and west Guangdong), has, apparently, a slender but ossified last dorsal spine structure, with five or six vertical bars and a horizontal stripe along the lateral line (Lin, 1933). *A. wenchowensis* Wang also has a thick last dorsal spine, obviously thicker than branched rays, with strong serrations along the posterior border, six vertical bars on sides of body, but lacks the lateral stripe. *A. bejiangensis* Wu & Lin is very close to *A. wenchowensis* but five vertical bars on side of the body, and no lateral stripe.

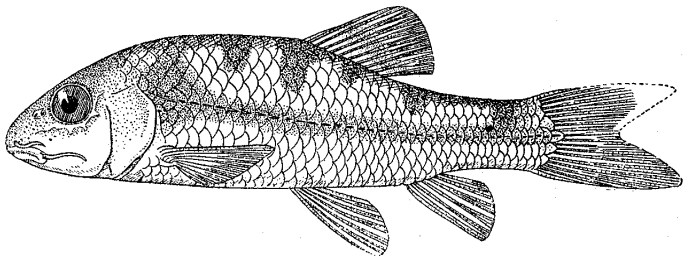


Fig. 1 *Acrossocheilus parallens* from Nichols (1931)

Remarks: Stephen Lai has also observed a species of *Acrossocheilus* in streams at Ha Fa Shan, northwest of Tsuen Wan, which he considers to belong to this species.

Discussion

The *Acrossocheilus* genus is a member of the very large subfamily Cyprininae, which has many genera and species in southern and eastern Asia. *Acrossocheilus* belongs to a group known as the 'barbs', which is a heterogeneous assemblage of unrelated genera concentrated in southern China and northern Vietnam, with a few genera, including *Acrossocheilus* reaching to northern China (Winfield and Nelson, 1991). Fishes belonging to *Acrossocheilus* are plentiful in southern and eastern China. They are very variable and difficult to define.

A. bejiangensis Wu & Lin is already known from Lantau and recently Bosco Chan has recently reported another species of *Acrossocheilus* from Kau Lung Hang, near Tai Po, Hong Kong, which is not *bejiangensis* and he considers may be *hemispinus*.

The closest congener to *parallens* is *labiatus.* Lin (1933) considered Nichols's (1931) differentiation of *parallens* from *matsudai* (a synonym of *labiatus*) was so unconvincing that he synonymised *parallens* with *labiatus.* Indeed it is difficult to separate these two taxa based on structural characters but there are nevertheless distinct catchment and colour marking differences. This synonymy was not accepted by later authors (Chen et al 1991; Yue et al. 2000)

The separation of *hemispinus* and *parallens* is also not straightforward. Nichols (1931), who also described *hemispinus,* makes an interesting point in his original description of *parallens.* He states that some large specimens of *hemispinus* may have reduced, or even absent, serrations to the posterior edge of last dorsal spine. Clearly, *hemispinus, parallens* and *labiatus* are very closely related species. *A. labiatus* and *hemispinus* are known to be sympatric in Fujian but no populations of *parallens* and *hemispinus* have been found living together in the same streams, despite the fact they are both found in linked river systems.

It may be that *parallens* and *hemispinus* represent a variable species complex with their respective populations linked to distribution. In some cases separation may amount to a qualitative judgment. If *parallens* is indeed part of a *parallens/hemispinus* species complex, given that *parallens* is widespread throughout the Zhujiang River catchment in Guangdong, it would appear improbable that natural populations of *hemispinus cinctus,* with its known distribution confined to Xijiang River in Guangxi extending to Zhaoqing in Guangdong, could be found in Hong Kong. Hong Kong has much greater affinity to the Zhujiang River catchment than the Xijiang River catchment, which is west of the Pearl Delta. It would appear, based on known geographical distribution, that if natural populations of this complex were to occur in Hong Kong, they are most likely to belong to *parallens.*

Another scenario is possible. When Lin (1931) established *cinctus* as a subspecies of *hemispinus* he may not have been familiar with Nichols's (1931) description of *parallens,* from in the same year. Later, Lin (1933) added to the confusion by

synonymising *parallens* with *labiatus*. Based on the colour markings of *cinctus* and, more importantly, on Lin's (1933) description of *cinctus* material having, "Dorsal with last simple ray ossified, slender and serrated behind" it could be argued that he should have synonymised *hemispinus cinctus* with *parallens,* since true *hemispinous* should have a thick last dorsal spine. This would certainly make more sense based on their type locations and respective catchments. If indeed *cinctus* is a synonym this also raises the question, which taxon was published first, either *hemispinus cinctus* or *parallens*. If *hemispinus cinctus* was first, then according to the International Rules of Nomenclature, *parallens* would become a junior synonym of *cinctus* and *Acrossocheilus cinctus* (Lin) would become a valid species.

I am not advocating such changes but I strongly recommend that material of Fujian *labiatus*, Fujian *h. hemispinus*, Guangxi *h. cinctus* and Guangdong *parallens* be carefully compared to resolve the taxonomic confusion between these taxa.

It would appear unlikely, but certainly not impossible, for three naturally occurring species, belonging to the *Acrossocheilus* genus, to be found in Hong Kong streams. However, it should be noted Southern Chinese *Acrossocheilus* spp. are occasionally offered for sale in the freshwater aquarium trade in Hong Kong. The possibility that populations of *Acrossocheilus* have been introduced to Hong Kong streams cannot be discounted.

Bibliography

Chen, X., J-H. Pan, Z. Liu and D. Liang. (1991) In: J-H. Pan, L. Zhong, C-Y. Zheng, H-L. Wu and J-H. Liu (eds.) *The Freshwater Fishes of Guangdong Province.* Guangdong Science and Technology Press, Guangzhou. 589 p.

Lin, S-Y, (1931). *Carp of Kwangtung*. 124.

Lin, S-Y. (1933). Contribution to a strudy of Cyprinidae of Kwangtung and adjacent Provinces. *Lingnan Sci. J*. 12(2): 197-215.

Nichols, J.T. (1925). Some Chinese freshwater fishes, 11. Certain apparently undescribed carps from Fukien. *Am. Mus. Novit.* 214: 1-3.

Nichols, J.T. (1931). A new *Barbus* (Lissochilicthys) and a new loach from Kwangtung Province. *Lingnan Sci. J*. 10(4): 455- 459.

Winfield, I.J., and J.S. Nelson. (1991). *Cyprinid Fishes – Systematics, biology and exploitation*. Pub. Chapman and Hall.

Yue Peiqi et al. (2000). *Fauna Sinica – Osteichthyes – Cyprinformes III*. Sci. Press, Beijing, China.

Email: wilsonkd@netvigator.com

Understanding bat language: The echolocation calls of Hong Kong bats

by Jacqueline Weir

Bats in Hong Kong

So far there are known to be twenty-two bat species in Hong Kong. Of these, four have been first recorded since 1974. The bamboo bat (*Tylonycteris pachypus*), was only discovered here in 1996, after a male bat entered a building at Kadoorie Agricultural Research Centre (Ades, 1996). It is possible that, with continued research, yet more species will be found to live here.

In Europe, the very common 'Pipistrelle' bat, formerly known as *Pipistrellus pipistrellus*, was recently found to comprise two distinct species. The initial distinction was made due to slight frequency differences in ultrasound calls of the bats. Differences were eventually confirmed by DNA sequencing (Barratt *et al*, 1997).

Other new species have also been identified by characteristics of their ultrasound calls, despite being morphologically similar (Jones, 2000). By using technology to listen in on the acoustic world of bats, it may be that a vast amount of 'hidden' diversity among these creatures is discovered. This applies particularly to Hong Kong, where the species list for bats continues to grow.

In addition to this potential, knowledge of bat ultrasound calls can be extremely useful in field surveys and population studies of known species. Listening to characteristic calls of different bat species can allow identification in a field situation, without necessarily having to see the animal that is calling!

While in Hong Kong this spring, I have been attempting to record and catalogue calls from as many bat species as I can. In this article I hope to outline the theory behind 'bat detection', and what I have been trying to achieve.

I hope to provide a basis for some bat call identification in Hong Kong, and present the results for use by others. Due to the restricted time frame of the project, there is little hope of recording all types of call from all insectivorous bats here, or of repeating species recordings numerous times, but I hope that the list of species I record will be added to in future. In order to explain my project better, the following section describes some of the theory and technology behind what I have been doing.

Echolocation Calls and Bat Detectors

Echolocation is the method used by insectivorous bats both to navigate and to catch their prey. Calls of very high frequency sound are produced, usually at an ultrasonic level too high for the human ear to hear. These sounds are reflected off surfaces near to the bat, and the time it takes for an echo to reach the bat indicates distance to a particular surface. Because bats are often moving as they call, as is their prey, calls need to be repeated extremely rapidly in order to update the information received from these echoes.

Echolocation calls of bats can be heard by humans, by means of 'bat detectors', which convert the very high frequency calls into lower frequency sounds detectable by the human ear. Using this method it is possible to distinguish between bat species by the sounds they produce.

Fruit bats, while using some ultrasound component in their social calls, usually do not use echolocation as a method of navigation, as their senses of sight and smell are sufficient to locate the required food sources. Calls produced by insectivorous bats also reflect the nature of their food source, in particular the size of prey, as well as the habitat in which they fly, and the body size and wing design of the bat species (Briggs and King, 1998). This means that individual insectivorous species have a repertoire of calls that distinguishes them from others. Using bat detectors this world of sound can be entered, and the language of different species can begin to be deciphered.

While this technology is quite widespread in the U.K., very little use has been made of it so far in Hong Kong. Having become interested in its potential while at home in Britain, I decided to employ it in Hong Kong, and began a project on the calls made by bats here. If a catalogue could be built up of calls from different Hong Kong species this would greatly increase ease of identification, especially of bats in flight, without the need to disturb or catch the animals. This would have benefits for ecological consultancy, population estimates and distribution studies.

The most basic type of bat detector is known as a 'heterodyne' detector. This converts the bat call into an electronic signal, which is compared against a signal produced within the detector. The internal signal is varied by tuning the detector, and the audible sound produced is the difference between the two signals. (Briggs and King, 1998.)

More sophisticated methods of detection include 'time expansion' and 'frequency division'. Time expansion detectors briefly record the ultrasonic signals, then play them back both at lower frequency and a slower speed. There may be an option of '/10', or alternative settings. At /10, the frequency is lowered by a factor of 10, and the time over which the signals are played is increased by a factor of 10. This setting is often used when calls are to be analysed by computer. At, for example, /32, a factor of 32 is employed. This produces a sound that is easy for the human ear to pick up (see bat detector user guides). The main drawback of time expansion systems is that recording stops while the previous sound is slowed down, so some incident calls may be missed (Catto and Walsh, 2000).

Frequency division detectors lower the frequency of sounds by measuring incident wavelength, and producing a new sound wave which passes through, for example, every tenth zero point of the wave. Thus wavelength is increased, and frequency reduced. However using this method, some information contained in the original sound wave is lost (Catto and Walsh, 2000).

Once converted by a bat detector, signals can be recorded and analysed. Computer analysis of calls gives a tangible method of species identification, by visually representing calls as graphs. Useful graphical representation of calls can be as 'sonograms', which show call frequency against time (Fig. 1), and as 'power spectra', which plot frequency against amplitude of the call (Russ, 1999).

The frequency scale should be multiplied by ten and the time scale divided by ten, to obtain true values for the recording.

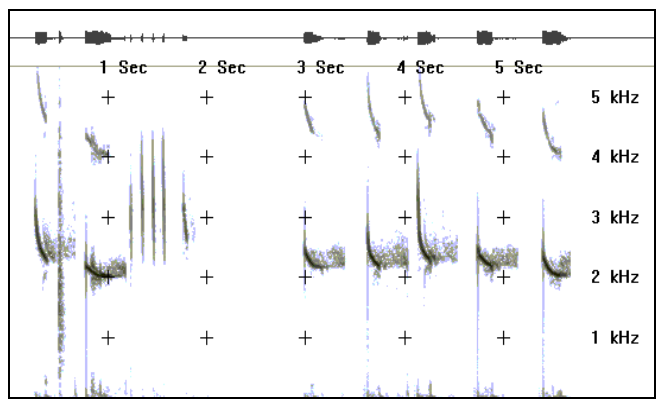


Figure 1 – Sonogram of a bat call, using a time expansion factor of ten.

In order to distinguish different, previously unrecorded, species, initially a positive identification is necessary in the field. The resultant graphs of calls can then be attributed to that species. Multiple recordings of each species are useful, both to verify the original recordings, and because each species has numerous calls that depend largely on where the bats are flying. Ideally, analysis should be carried out on a large number of recordings for each species, but it is anticipated that this short study (which spans three months) will not gain enough information to make this possible. However despite little repetition of recordings, it is hoped that the project will provide enough information to catalogue the

calls of some Hong Kong species, and enable their identification with bat detectors.

Project Aims

The main aim of the project is to obtain clear recordings, using both time expanded and heterodyne functions, of as many Hong Kong bat species as possible, then to analyse and catalogue these as an aid to field identification. For some species the frequencies and shapes of calls can be estimated prior to recording, due to records of similar species, or of the same species in different geographical locations. These can be used for comparison with recordings obtained in Hong Kong.

Recordings are made, as far as possible, from bats flying in similar habitats. This allows more direct comparisons between calls from different species, as calls vary between open and cluttered habitats (Russ, 1999). Ideally, recordings are made for each species from a variety of habitats, and on each occasion the weather conditions, habitat type and flight patterns of bats are recorded.

Another aim of the project is to increase awareness in Hong Kong of the potential of these techniques. Widespread use of these detectors, some of which can be obtained cheaply and are simple to use, would allow a great deal more information on Hong Kong bats to be gathered, with relative ease.

Project Results

Results will be written up, for as many species as I manage to record, to provide a basis for future work in this area. The calls will be displayed as sonograms, to provide visual images of the vocal 'signatures' of different species. I also plan to provide information from power spectra, on parameters of typical calls for each species.

The cheapest, most 'accessible' type of bat detector is the heterodyne detector. With this in mind, I will provide descriptions of each call as it would be heard on a heterodyne detector. While time expanded recording is more useful for indisputable identification, some calls sound very distinctive using the heterodyne method, and this remains a valuable field tool.

For further information on bat detectors, or to order equipment, try visiting http://www.biology.leeds.ac.uk/research/biomech/daw/bats. Also, keep an eye out on coming *Porcupine!* issues, for where to find published results of this project.

On a final note, recently while walking in Tai Po Kau forest I was circled by a bat which flew out of some vegetation, and very quickly disappeared back into it. This unusual experience was intensified by being able to listen to the animal as it flew around me. The potential of the bat detector as a scientific tool is complimented by the sheer pleasure of listening in on a world which is normally hidden from our ears.

Bibliography

Barratt, E. M., Deaville, R., Burland, T. M., Bruford, M. W., Jones, G., Racey, P. A. and Wayne, R. K. (1997). DNA answers the call of pipistrelle bat species. *Nature* 387: 138–139.

Briggs, B. and King, D., (1998). *The Bat Detective - A Field Guide for Bat Detection*, pp. 11-16. Stag Electronics. ISBN 0 9532426 0 9.

Catto, C. and Walsh, A. (2000). (Editors). Bat detector systems. *The Bat Conservation Trust Bat Monitoring Post. The Newsletter of the BCT's National Bat Monitoring Programme* 5 April 2000: 12-15.

Jones, G. (2000). Uncommon discoveries about one of Europe's most common bats. *Bats - Bat Conservation International* 18 (4) Winter 2000: 1-4.

Russ, J. (1999). *The Bats of Britain and Ireland - Echolocation Calls, Sound Analysis and Species Identification,* pp. 15-17, 81. Alana Books. Alana Ecology Ltd. ISBN 0 9536049 0 X.

Ernst Haeckel

New reptile and amphibian records for Kau Sai Chau, Sai Kung

by Thomas D. Dahmer, Kwok Hon Kai and Mary L. Felley, Ecosystems Ltd.

Introduction

Lau and Dudgeon (1999) listed records of amphibians on Kau Sai Chau based on surveys carried out there in May and September 1993. Monitoring of amphibians and reptiles on the island has been undertaken since that time, and has resulted in records of additional species, one of which is of local conservation concern. The purpose of this manuscript is to update the amphibian and reptile records for Kau Sai Chau as a contribution to the continuing development of the Hong Kong Special Administrative Region biodiversity survey.

Methods

Kau Sai Chau was surveyed on foot on 13 May and 14 September 1993 (Lau and Dudgeon 1999) by a team from the University of Hong Kong Zoology Department that included Michael Lau, a specialist in Hong Kong reptiles and amphibians. The survey covered the northern third of the island that was to be developed into a golf course.

We surveyed the northern third of the island during 1993 and 1994 for an environmental impact assessment (EIA) of the proposed golf course. We recorded reptile and amphibian sightings over that time period and continued monitoring annually after completion of the golf course from 1995 to date, with support of the Hong Kong Jockey Club Kau Sai Chau Public Golf Course Ltd. Sightings were recorded by species, and specimens collected whenever necessary for identification. Surveys were carried out during day and night in spring and summer months. Frogs were identified aurally and visually. Support was received from the golf course staff, which greatly increased the survey effort. Specimen identifications were confirmed by Dr. M. Lau, Kadoorie Farm and Botanic Garden. Results of the monitoring and research studies have been documented in periodic reports to the Hong Kong Jockey Club (Ecosystems Ltd. 2000). Nomenclature used in this report follows that of Karsen *et al.* (1998).

Results

Reptile and amphibian records for Kau Sai Chau are listed in Table 1. The pre-construction records include 4 species, as compared to the post-construction total of 14 species. The increase in reptile and amphibian species records over 5.5 years of golf operation is shown in Figure 1. The new records include one species of toad, two frogs, one terrapin (exotic) and seven snakes. One pre-construction frog species has not yet been recorded post-construction (Three-striped Grass Frog *Rana macrodactyla*).

Discussion

Lau and Dudgeon (1999) reported 2 frogs on Kau Sai Chau. Of those, Günther's Frog (*Rana guentheri*) is currently commonly seen and heard on the island, whereas the Three-striped Grass Frog has not been recorded since 1993 (surveys are underway to locate it). Two additional frogs have been recorded since 1993, the Brown Tree Frog (*Polypedates megacephalus*) and the Two-striped Grass Frog (*Rana taipehensis*). The latter has been recommended for statutory protection in Hong Kong based on its status as threatened or rare (*ibid*.).

No toad was reported by Lau and Dudgeon (1999), but the Asian Common Toad (*Bufo melanostictus*) has been reported since 1995, and is currently common and widespread on the island.

The only terrapin recorded on Kau Sai Chau is the introduced Red-eared Slider (*Trachemys scripta elegans*). It is now common in the ponds constructed for the golf course, but was not seen in 1993 when there were no ponds on the northern part of the island other than 2 small, coastal reservoirs used to store drinking water for occupants of mariculture sites.

The two gecko species reported by Lau and Dudgeon (1999) can still be seen on the island. Both are common around buildings and golf facilities.

The seven species of snake currently found on the island were not recorded in 1993. Of the six, the Indo-Chinese Rat Snake (*Ptyas korros*), the Bamboo Snake (*Trimeresurus albolabris*), and the Copperhead Racer (*Elaphe radiata*) are most commonly seen. The Chinese Cobra (*Naja atra*) is also abundant and widespread. The King Cobra (*Ophiophagus hannah*) is a recent addition to the species list and is not often seen. The Large-spotted Cat Snake (*Boiga multomaculata*) is also a recent addition to the list, but appears to be increasing in abundance. The Burmese Python (*Python molurus bivittatus*) was first recorded in 2000 after it apparently swam to Kau Sai Chau. It is not often seen, and only one individual is thought to occupy the island sporadically.

The apparent increase in species numbers since 1993 may in part reflect greater survey effort applied over an extended time period. However, golf course personnel and the authors concur that species and population numbers of reptiles (especially) and amphibians increased on the northern third of the island between 1993 and 2001.

Acknowledgements

Records of snakes were often reported by Cameron Halliday, Rick Hamilton, Paul Yip, and greenskeeping personnel at the Jockey Club Kau Sai Chau Public Golf Course. Their cooperation and assistance is greatly appreciated. The Large-spotted Cat Snake was identified by Dr. Michael Lau of Kadoorie Farm and Botanical Garden. Studies reported here were funded by the Jockey Club Kau Sai Chau Public Golf Course Ltd., whose support is gratefully acknowledged.

Bibliography

Ecosystems Ltd. (2000). Hong Kong Jockey Club Kau Sai Chau Public Golf Course Ecological Monitoring Report: July 1999 to June 2000.

Karsen, S. J., Lau, M. W. N., and Bogadek, A. (1998). *Hong Kong Amphibians and Reptiles*. Second Edition. Urban Council, Hong Kong

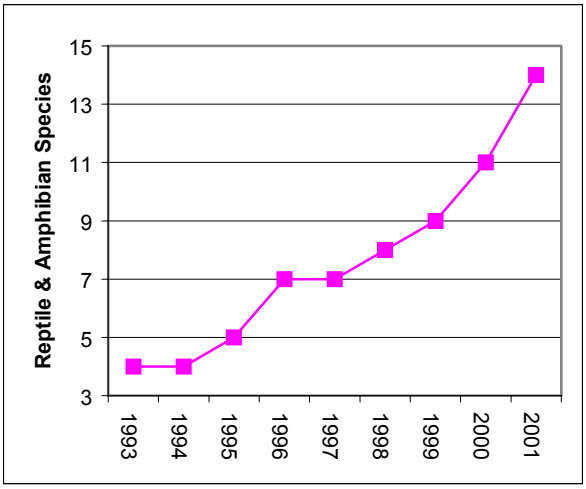
Lau, M. W. N. and D. Dudgeon. (1999). Composition and distribution of Hong Kong amphibian fauna. *Mem. Hong Kong Nat. Hist. Soc.* 22:1-80.

Ecosystems Ltd., 2/F Kingsun Computer Bldg., 40 Shek Pai Wan Road, Aberdeen, Hong Kong, ecosys@pacific.net.hk

Table 1. Reptiles and amphibians recorded before and after construction of the golf course on Kau Sai Chau.

Pre-Construction Records – May 1993 to May 1994		
Class, Order, Family	**Scientific Name**	**Year Recorded**
Amphibia, Anura, Ranidae		
Günther's Frog	***Rana guentheri***	1993
Three-striped Grass Frog	***Rana macrodactyla***	1993
Reptilia, Squamata, Gekkonidae		
Bowring's Gecko	***Hemidactylus bowringii***	1993
Garnot's Gecko	***Hemidactylus garnotii***	1993
Post-Construction Records – July 1995 to present		
Class, Order, Family	**Scientific Name**	**Year Recorded**
Amphibia, Anura, Bufonidae		
Asian Common Toad	***Bufo melanostictus***	1995
Amphibia, Anura, Ranidae		
Günther's Frog	***Rana guentheri***	1995
Two-striped Grass Frog	***Rana taipehensis***	2001
Amphibia, Anura, Rhacophoriidae		
Brown Tree Frog	***Polypedates megacephalus***	1996
Reptilia, Testudinae, Emydidae		
Red-eared Slider	***Trachemys scripta elegans***	2000
Reptilia, Squamata, gekkonidae		
Bowring's Gecko	***Hemidactylus bowringii***	1995
Garnot's Gecko	***Hemidactylus garnotii***	1995
Reptilia, Squamata, Boidae		
Burmese Python	***Python molurus bivittatus***	2000
Reptilia, Squamata, Colubridae		
Large-spotted Cat Snake	***Boiga multomaculatus***	2001
Copperhead Racer	***Elaphe radiata***	1998
Indo-Chinese Rat Snake	***Ptyas korros***	1995
Reptilia, Squamata, Elapidae		
Chinese Cobra	***Naja atra***	1999
King Cobra	***Ophiophagus hannah***	2001
Reptilia, Squamata, Viperidae		
Bamboo Snake	***Trimeresurus albolabris***	1996

Figure 1. Taxon accretion curve for reptiles and amphibians on Kau Sai Chau from 1993-2001.



The naming of rats

by Richard Corlett

Whoever said "*Fools rush in where angels fear to tread*" was surely thinking of rat taxonomy. I am therefore approaching this topic with some trepidation, but also, I hope, more as an unusually brave angel than a complete fool.

There are two common hillside rats in Hong Kong: the cute and lovable Chestnut Spiny Rat (or Chestnut Rat, or Chestnut White-bellied Rat), *Niviventer fulvescens*, and the larger, "rattier" rat species that has been known in Hong Kong for several decades as Sladen's Rat. The alert reader will now be thinking: Who was Sladen? What has he done to deserve having half Hong Kong's mammalian biomass named after him? I am afraid I do not know the answer to the first question, but I am sure the answer to the second, is: nothing at all. Sladen's Rat is - or was - *Mus sladeni* Anderson, 1879, collected from around 1000 m altitude in western Yunnan. This scientific name has since followed the same downward spiral as countless other Asian rat names: transfer to *Rattus* as *Rattus sladeni*, then reduction to a subspecies as *Rattus rattus sladeni*, and finally, reduction to a junior synonym of the Roof Rat, *Rattus rattus* (Corbet and Hill, 1992; see also under Sladen's Rat in Lekagul and McNeely, 1977). Along the way, the name appears to have been misapplied to a variety of other taxa, including, the larger, rattier rat of Hong Kong. It has also been widely misused for the same (?) species in Vietnam and Thailand.

Thus Sladen's rat is/was a form of the common Roof Rat, and nobody now seems to think it deserves separate taxonomic recognition. More importantly, it is not - I repeat, NOT - the larger, rattier rat of Hong Kong hillsides. We have Roof Rats in urban areas in Hong Kong, but the hillside rat is clearly a different species. So, what is it? Corbet and Hill (1992), whose names we usually follow in Hong Kong, say it is *Rattus remotus*, while Guy Musser at the American Museum of Natural History calls it *R. sikkimensis*. These names seem to be complete synonyms, referring to the same species that occurs from Nepal to South China, and south to Thailand. Corbet and Hill say *R. remotus* has priority, but the Smithsonian Institution Mammal Species of the World website still uses *R. sikkimensis*, so I presume there is some point of nomenclatural disagreement. Confusingly, though, neither name (nor *R. sladeni*, for that matter) seems to be used in China, and it is not at all clear what our rat is called there.

R. sikkimensis has been used more widely in Hong Kong than *R. remotus*, so I suggest we stick with it until someone does a proper revision of the *Rattus* rats. But what about the common name? It isn't Sladen's Rat, so we cannot continue to use that name. The Smithsonian web site suggests Sikkim Rat, which I suppose is O.K. Corbet and Hill make no suggestion, but Remote Rat would be a reasonable translation. Lekagul and McNeely (1977) call *R. remotus* the Island Rat, but distinguish it from our rat, for which they use *R. koratensis* (which they then call Sladen's Rat – but I was not going to tell you that!). Perhaps we should come up with something totally new which can be used for communication within Hong Kong, without implying any particular position on the taxonomy of *Rattus*: Hong Kong Rat? Ratty Rat? Hillside Rat? Please email your suggestions to me (corlett@hkucc.hku.hk), and I will report the best ones in the next issue.

Bibliography

Corbet, G.B. and Hill, J.E. (1992). *The Mammals of the Indomalayan Region: a Systematic Review*. Oxford University Press, Oxford.

Lekagul, B. and McNeely, J.A. (1977). *Mammals of Thailand*. Association for the Conservation of Wildlife, Bangkok, Thailand.

Fig. 1 *Niviventer fulvescens* (above) and *Rattus sikkimensis* (?)

Fig. 2 The rat in question (photo by Kylie Chung).

BOOK REVIEW:

Reef Fishes of Hong Kong
[Yvonne Sadovy & Andrew Cornish]
by Robin Kennish, ERM

"*It is indeed a pleasure to finally have available an attractive and informative guide to reef fishes from the northern sector of the South China Sea*" are the words from the eminent ichthyologist JE Randall at the beginning of this book. I have to say that I totally agree with him as this book services the purpose of the local scientist and people with a keen interest in knowing more about Hong Kong's marine environment. During the last year this book has served my purpose in a variety of ways.

As an environmental consultant many of the projects I work on are Environmental Impact Assessments and Environmental Reviews. These involve trawls of the available literature to classify habitats according to ecological/fisheries value and often entail surveys, the scales of which depend on the nature of the project. For inshore environments the information presented in this book is invaluable for identifying fish and obtaining some useful information on their behaviour and distribution.

Aside from people with a professional interest in using the book I have observed recently that many members of Hong Kong's burgeoning sport diving community have the book and refer extensively to it during both training and diving. Recently, I had the opportunity to put the book to the test with a group of divers from a variety of background, including both scientists and non-scientists. All agreed that the book had helped them finally put a name to "those fish" they always saw when diving in Hong Kong but could not put a name to due to the lack of suitable reference texts. This added value to their dive and made the whole experience more rewarding.

If you are reading *Porcupine!* and you know how to swim then get yourself down to your local bookshop and order a copy. The underwater life in Hong Kong has never seemed so interesting.

FLORA

New records and clarification of some names of vascular plants in Hong Kong

by Ng Sai-chit, KFBG

***Dendrophthoe pentandra* (L.) Miq. in Fl. Ned. Ind. 1: 818, 1856.**
Loranthus pentandrus L. in Mant. Pl. 1: 63. 1767.

On 29 March, 2001, Mrs Gloria Barretto presented to me some specimens from the family Loranthaceae that were collected from her garden 'Girashol' at Tai Po Kau. A closer examination of some of the flowering specimens (G. Barretto ex S.C. Ng 2927, 29 Mar 2001, New Territories, Tai Po Kau, (KFBG, HKU, AFCD)) revealed a taxon previously unrecorded in any of the local published checklists (Bentham 1860, Dunn & Tutcher 1912, Anon. 1978 & 1993; Xing et al. 2000). These specimens were keyed to *Dendrophthoe pentandra* (L.) Miq. using the keys by Kiu (1988) and Barlow (1997). The identity of these specimens was further confirmed by comparing them to a Kwangtung specimen of this species (G.W. Groff (HK24980), Apr 1918, Guangdong Province, exact locality unknown (AFCD)) identified by Xi Nianhe (IBSC, Guangzhou). No Hong Kong specimens of this species have previously been deposited in the AFCD Herbarium.

Without flowers, *Dendrophthoe pentandra* is similar to the locally abundant *Taxillus chinensis* (DC.) Danser in habit, but the former tends to have longer rhomboid elliptical leaves whereas those of the latter are usually more round. Among other locally occurring Loranthaceae, *D. pentandra* differs from *Marcosolen cochinchinensis* (Lour.) Tiegh. in having a single floral bract instead of three, and minutely hairy pedicels instead of glabrous ones. It also differs from *Taxillus chinensis* and *Scurrula parasitica* L. in having a 5-merous and radially symmetrical corolla tube. Similar to *Helixanthera parasitica* Lour., it has a racemose inflorescence, but it differs in having a short corolla tube instead of free petals.

Dendrophthoe pentandra is known to be distributed from E. India eastwards throughout Indochina to the Philippines (Barlow 1997). In China it has been recorded in Guangdong, Guangxi and Yunnan (Kiu 1988), and is locally common in Guangdong (Xing, F.W., pers. comm.). In Girashol it is a parasite of *Scolopia saeva*, *Diospyros kaki*, and *Albizia julibrisson* (introduced). Although it is not found in a truly wild habitat, it is apparently wild (G. Barretto, pers. comm.) and can live on native species. Hence, its presence in the nearby secondary forests of Tai Po Kau is to be expected.

***Viscum diospyrosicolum* Hayata in Icon. Pl. Formosan. 5: 192-193, f. 67-68, 1915.**

On 27 May, 2000, while hiking with a team of youngsters at Tan Chuk Hang near Hok Tau, I was attracted by some fallen twigs of a leafless *Viscum*. A specimen of *Viscum* was then collected on the branches of a *Cyclobalanopsis mysinifolia* tree immediately above (S.C.Ng 2189, 27 May 2000, New Territories, Tan Chuk Hang, HKU). Closer examination of this specimen suggested that it was different from the other two known records of leafless *Viscum* species in Hong Kong (*Viscum articulatum* Burm.f. and *V. liquidambaricolum* Hayata). More flowering and fruiting specimens were collected from the same site afterwards (S.C. Ng 2225, 14 Jun 2000, *same locality* (HKU, AFCD); S.C. Ng 2841, 17 Nov 2000, *same locality* (HKU)). These specimens were keyed to *Viscum diospyrosicolum* Hayata using Kiu's key (1987). Their identify was confirmed by comparing to Kwangtung and Fujien specimens in the AFCD Herbarium that were identified as *Viscum diospyrosicolum* Hayata by Xi Nianhe (IBSC, Guangzhou) (Hodgins (HK25017), 15 Apr 1909, Fujien Province, exact locality unknown (AFCD); R. Mell (HK25018), 12 May, 1912, Pak Wan, Guangdong Province (AFCD); S.T.Dunn (HK25016), 11 Apr 1909, Swatow, Guangdong Province (AFCD); E.D. Merrill (HK25009), 26 Nov 1917, Guangzhou, Guangdong Province (AFCD)). No Hong Kong specimens of this species have been previously deposited in AFCD Herbarium.

This species has terete internodes (0.5-3 mm width) that are always widest at the top. In contrast, *V. articulatum* and *V. liquidambaricolim* have flat internodes (3-20 mm width) that are widest at the middle or upper-half of the internode. Compared to *V. articularum*, its fruit is orange instead of white.

It has been recorded throughout SW China to Taiwan, including Guangdong. Locally in Hong Kong, the population where my specimens were collected is so far the only known site for this species.

***Smilax aberrans* Gagnep. in Bull. Soc. Bot. France 81: 71, 1934.**

Smilax ovalifolia auct. non Roxb.: Anon., Check List HK. Pl., 1993, name only.

On 5 February, 2001, I went to the forest at Sunset Peak (Lantau) to enjoy the cool and misty upland weather of Hong

Kong's early spring. On my way ascending along the Wang Lung Hang Path, I walked into the ravine forest immediately before the patch of *Asarum hongkongense*. At around 600 m, I encountered five flowering and fruiting individuals of an unusual *Smilax* species with no spines and tendrils, and having dark purple flower petals (S.C.Ng 2888, 5 Feb 2001, Sunset Peak, Lantau (HKU, AFCD); S.C.Ng 2889, 5 Feb 2001, Sunset Peak, Lantau (HKU)). Two individuals of the same species were encountered again in the forest on the north side of Mt. Nicholson on Hong Kong Island at 350 m (S.C.Ng 2907, 20 Feb 2001, Mt. Nicholson, HK Is. (HKU, KFBG)). These specimens were keyed down to *Smilax aberrans* Gapnep. using the key in Chen & Koyama (2000). Although not mentioned in any of the published checklists, examination of specimens in the AFCD Herbarium revealed that similar specimens had been collected on Victoria Peak (Anon. (HK7589), 16 Jun 1913, Mt. Victoria, HK. Is. (AFCD)) but were misidentified as *Smilax ovalifolia* Roxb. (Anon. 1993). Interestingly, neither *S. ovalifolia* or *S. aberrans* were mentioned in Xing *et al*. (2000). Another specimen, collected on Sunset Peak (Y.W. Lam 1365, 9 Feb 1999, Sunset Peak, Lantau (AFCD)), had been misidentified as a *Heterosmilax* sp.

This species is a subshrub less than one metre tall and with no tendrils, whereas all the other local Smilacaceae species and *Smilax ovalifolia* are climbers with tendrils. Although occasional *Smilax china* have a similar growth form in open exposed shrubland, tendrils are always present. Leaves of *S. aberrans* have a similar shape and size to *S. china* but the undersides are usually minutely papillose and have a heavily whitish colour that could not be rubbed off, as it can in *S. glabra* and *S. corbicularia*. Both lateral and reticulate veins are obviously depressed on the upper sides but raised on the underside. Male flowers have dark purple petals instead of white or pale green as in other local *Smilax* species. Stamens are erect but short and usually less than one third of the length of petals. Fruit is black instead of red as in *S. china*.

This species is regionally widespread and has been recorded from Yunnan to Guangdong and Vietnam. During my last trip to NW Guangdong, this species was found to be locally common.

***Carex fenghuangshanica* S.F. Wang & T. Tang ex P.C. Li in Acta Phytotax. Sin. 37(2):168, fig. 7, 1999;**

C. speciosa auct. non Kunth.: J.C. Shaw, HK. Cyperaceae Tax. Eco. & Geog. 2:29-30, 2000; *C. speciosa* var. *angustifolia* auct. non Boott.: Anon., Check List HK. Pl., 1993, name only.

In Volume 12 of *Flora Reipublicae Popularis Sinicae* (Dai *et al.* 2000), a recently described species (*Carex fenghuangshanica* S.F. Wang & T. Tang ex P.C. Li) that resembles *Carex speciosa* Kunth. was included (Li, 1999). Upon closer examination of Hong Kong specimens that were previously identified as *C. speciosa* (S.T. Dunn 5288, Jun 1908, San Tau, Lantau (AFCD); S.C. Ng 1333, 21 Apr 1998, Pokfulam, HK Is. (HKU, AFCD); S.C. Ng 1822, 28 Apr 1999, Mui Wo, Lantau (HKU); S.C. Ng 1892, 20 Jun 1999, Yi O, Lantau (HKU)), all of them turn out to be *C. fenghuangshanica* according to Dai *et al.* (2000). The identity of these Hong Kong specimens was confirmed by comparing them with the type specimens of *C. fenghuangshanica* deposited at the Beijing National Herbarium (PE).

These two species have similar habits and both have androgynous spikelets typical of the Section Radicales. However, they differ in the shape and character of their utricles, achenes and spikes. Utricles of *C. fenghuangshanica* are characterized by having many (>4) obvious and raised veins on each of the two dorsal faces, whereas *C. speciosa* always has only two raised veins, one at the middle of each of the two dorsal facing sides of the utricle, in addition to some tender and obscure veins (Fig. 1 & 2). Utricles of *C. fenghuangshanica* are also broadly ovate, whereas those of *C. speciosa* are elliptical. The achenes of *C. fenghuangshanica* have a broader shape than those of *C. speciosa*. *Carex fenghuangshanica* also has fewer spikes and broader spikelets than *C. speciosa*.

Li (1999) and Dai et al (2000) mentioned no additional locality for this species other than the type locality at Guangxi (Fenghuangshan, Gechang). Hong Kong is therefore a new locality for this species. The global status of this species, however, cannot be determined at this stage since the whole group is generally overlooked. Locally in Hong Kong, it is only found at four sites (Xing *et al.* 2000) in sparse forest at low altitude (50 – 250 m).

Bibliography

Anonymous. (1978). *Check List of Hong Kong Plants.* Agriculture and Fisheries Department Bulletin No. 1 (Revised), Hong Kong Herbarium, Hong Kong.

Anonymous. (1993). *Check List of Hong Kong Plants.* Agriculture and Fisheries Department Bulletin No. 1 (Revised), Hong Kong Herbarium, Hong Kong.

Barlow, B.A. (1997. Loranthaceae. *Flora Malesiana* 13: 209-401.

Bentham, G. (1861). *Flora Hongkongensis*. Lovell Reeve. London.

Chen, X.Q. and Koyama, T. (2000). *Smilax*. *Flora of China* 24: 96-115.

Dai, L.K., Liang, S.-Y., Tang, Y.C., Li, P.C. (eds.) (2000). *Flora Reipublicae Popularis Sinicae*. Science Press, Beijing.

Dunn, S.T. and Tutcher, W.J. (1912). *Flora of Kwangtung and Hongkong (China)*. Royal Botanic Garden, Kew.

Kiu, H.S. (1988). Loranthaceae. *Flora Reipublicae Popularis Sinicae*. 24:86-158. Science Press, Beijing.

Li, P.C. (1999). New taxa of *Carex* L. (Cyperaceae) from China. *Acta Phytotaxonomica Sinica*. 37(2):156-176.

Xing F.W., Ng, S.C. and Chau, L.K.C. (2000). Gymnosperms and Angiosperms of Hong Kong. *Memoirs of the Hong Kong Natural History Society*. 23:21-136.

Fig. 1 *Carex fenghuangshanica* S.F. Wang & T. Tang ex P.C. Li.

Fig. 2 *Carex speciosa* Kunth

[Photographs of all the species mentioned in this article will be available on the *Porcupine!* web site.]

Have you seen this plant?

by Richard Corlett

A few issues back (volume 14), I reported the first record in Hong Kong of *Mimosa diplotricha* (as *M. invisa*). This extraordinarily unpleasant Mexican weed is best described as "green barbed wire": a scrambling or climbing plant, with recurved spines on the 4-angled stems, and twice-pinnate leaves that close when touched. AFCD have tried to eliminate a large population at Ting Kok and there have been scattered sightings elsewhere. Please report any new populations to me and the AFCD.

Some brief notes on *Ligustrum punctifolium* M. C. Chang

by Patrick Lai

Hong Kong Herbarium, AFCD

The Biodiversity Survey has identified a *Ligustrum* species, *Ligustrum punctifolium*, which has not been recorded in the Checklist of Hong Kong Plants. The species was first published in 1985 based on a specimen collected by Mr. Tsiang Ying on a tidal plain at Wukautin (now called Wu Kau Tang) in 1929. A review on the *Ligustrum* specimens in the Hong Kong Herbarium has been carried out. Two specimens collected by Mr. William Tutcher in 1914 (Herb no: HK18555 & HK18556) formerly identified as *Ligustrum strongylophyllum* Hemsl. were re-identified as *Ligustrum punctifolium* M. C. Chang based on the shorter petioles, smaller and brown glandular dotted leaves of the specimens. These two specimens were in fact collected at a time earlier than the type specimen collected by Tsiang in 1929. The locality of the specimens was recorded as "Cheung Mi". I guess it could be "Chung Mei" which is the river month of Bride's pool flowing into the Plover Cove Reservoir. Apparently, the specimens were collected long before the reservoir was built when "Chung Mei" was still a coastal habitat of Tolo Harbour. As Chung Mei is the nearest tidal plain to the area Wu Ka Tang, it is likely that the Tsiang's specimen was also collected in this location.

The species has recently been recorded in Shum Chung, Sam A Chung and Sam A Tsuen. It appears that all historical and present localities are restricted to the coastal areas of the Northeast New Territories. More importantly, the species has so far been recorded in Hong Kong and Vietnam only, hence, it is definitely one of the species that deserves our attention.

Visits to the three existing populations of the species were carried out earlier this year and the one at Sam A Chung within the Plover Cove Country Park was found to be the largest and in the best condition. The site is a sheltered tidal inlet with freshwater input from a stream. Individuals of *L. punctifolium* were found growing along the stream bank. All three populations were found fruiting in February this year and seeds from individuals of the three populations were collected. The seeds were germinated in the nursery and the initial germination rate was found to be quite high (approximately 40%). Special care will be given during seedling establishment. The next step will be to identify suitable sites for re-reintroduction after the seedlings have been successfully established.

Bibliography

Chang, M.C. (1985). *Acta Phytotax*. Sin. 23(1):53.

Merrill, E.D. & Chun, W.Y. (1930). Contributions to our knowledge of the Kwangtung Flora. *Sunyatsenia* 1:79.

Tutcher, W. (1914). *Report of the Botanical and Forestry Department for the Year 1914.*

Is *Tsiangia hongkongensis* a synonym of *Ixora chinensis*?

by Richard Corlett

Tsiangia hongkongensis (Seem.) But, H.H. Hsue & P.T. Li is a mysterious Hong Kong endemic plant, known only from two specimens in the herbarium at Kew. Diane Bridson, in the latest *Kew Bulletin*, suggests that they are simply deformed specimens of the widespread *Ixora chinensis* Lam.

Bibliography

Bridson, D.M. (2000). The identity of *Tsiangia* (Rubiaceae). *Kew Bulletin* 55: 1011-1012.

Hong Kong's "*Psychotria rubra*" is *Psychotria asiatica* L.

by Richard Corlett

The common understorey shrub, *Psychotria rubra*, is one of the few plants every ecologist in Hong Kong knows – or, rather, thought they knew, since it turns out it is not *P. rubra* at all, but *P. asiatica* L. The story behind this name change spans the entire history of both modern plant nomenclature and the botanical exploration of South China.

The specimen of *P. asiatica* in the Linnean herbarium in London was probably collected by the great Swedish botanist Peter Osbeck, a pupil of Linnaeus who visited Guangzhou in 1751. This is the Osbeck who first described the Chinese white dolphins and after whom Linnaeus named the genus *Osbeckia*. Unfortunately, Linnaeus based his description of *P. asiatica* partly on this specimen and partly on an illustration of a species from Jamaica, since described as *P. brownei* Sprengel, although he clearly believed he was describing a plant from Asia, not the Caribbean.

This mess was not formally sorted out until 1964, when Petit selected the Asian specimen in London as the lectotype of *P. asiatica* L.. This still left the question of precisely where *P. asiatica* came from unresolved, but recent work by Davis *et al.* (2001) at Kew has shown that it is the same as the specimens from Guangdong, Hong Kong and Hainan which were previously named *P. rubra* (Lour.) Poir. At the same time, these specimens differ from specimens of the real *P. rubra* from Indochina.

Bibliography

Davis, A.P., Bridson, D., Jarvis, C. and Govaerts, R. (2001). The typification and characterization of the genus *Psychotria* L. (Rubiaceae). *Botanical Journal of the Linnean Society* 135: 35-42.

Fig. 1 *Psychotria asiatica* in fruit.

MISCELLANY

Wu Kau Tang, protected areas and the persistence of absurdity

by G.T. Reels

Last year the remote village of Wu Kau Tang in the northeast New Territories received some unaccustomed media attention, as the site for a proposed Chinese medicinal herb garden and associated developments. This proposal has since slid out of the public spotlight, but is presumably still being pursued by its proponents. The planned development should be a cause for concern to conservationists and nature lovers alike, because Wu Kau Tang and the surrounding area represents one of the best unprotected biodiversity sites within the SAR.

Wu Kau Tang is surrounded by Plover Cove Country Park but, as with so many rural villages, is excluded from the protection that the country park offers. An area of approximately two square kilometres, comprising the village and its extensive abandoned agricultural lands, as well as stretches of several unpolluted streams (and a small part of the excellent *fung shui* wood), is excised from the park and largely unprotected (part of it is zoned as a Conservation Area). The author has resided in Wu Kau Tang for the past three and a half years. So, what is the wildlife that utilizes this area?

The abandoned fields to the east of the village, forming a series of marshes and low terraced hills, are frequented by Wild Boar (*Sus scrofa*), Barking Deer (*Muntiacus muntjak* and/or *M. reevesi*) and Ferret Badger (*Melogale moschata*). A remarkably large group of 20 or so Broad-billed Rollers (*Eurystomus orientalis*) was seen hawking for termites after heavy rain in April 2000, and huge Leschenault's Rousette Bats (*Rousettus leschenaulti*) are frequently seen taking fruit in the village. Grey Nightjar (*Caprimulgus indicus*) and Savanna Nightjar (*C. affinis*) forage over the lowlands at night, and in March this year an Eastern Grass Owl (*Tyto longimembris*) was observed foraging over the same areas.

Black Paradise Fish *(Macropodus concolor*) are present in the marshes, one of which is also the only known site in the SAR for Hydrochidae beetles, as a result of which that particular marsh was recommended for protection (by extension of the country park boundary) in a report on freshwater wetland habitats commissioned by the then Agriculture and Fisheries Department (Dudgeon & Chan, 1996). The author is unaware as to whether any action has been taken on this recommendation.

Fish fauna in the streams passing through the area has not been thoroughly surveyed, but on a recent site visit by fish expert Bosco Chan, several individuals of *Osteochilus vittatus* were observed. There have apparently been no published records of this species in Hong Kong for thirty years. The author has, on two occasions, encountered terrapin traps in the same stream – a sure indication that the critically endangered Three-banded Box Terrapin (*Cuora trifasciata*) is present (although perhaps not for much longer). A dead specimen of the locally rare Banded Stream Snake (*Opisthotropis balteata*) was encountered on the village road beside this stream in 1999. The stream is also rich in dragonflies, and was recommended for protected status on the basis of its odonate fauna by Wilson (1997). Two species of *Macromia* (*M. katae* and *M. urania*) are present, while *Gynacantha japonica* and *Macromidia rapida* are abundant.

A pond and marsh area less than half a hectare in size within the village itself has been a breeding site for no less than ten amphibian species this spring, including Asian Common Toad (*Bufo melanostictus*), Günther's Frog (*Rana guentheri*), Paddy Frog (*Rana limnocharis*), Three-striped Grass Frog (*Rana macrodactyla*), Chinese Bullfrog (*Rana rugulosa*), Brown Tree Frog (*Polypedates megacephalus*), Asiatic Painted Frog (*Kaloula pulchra*), Butler's Pigmy Frog (*Microhyla butleri*), Ornate Pigmy Frog (*Microhyla ornata*) and Marbled Pigmy Frog (*Microhyla pulchra*). Sadly, this remarkable amphibian site is now directly threatened by construction of two new village houses. Other frogs present within the area include Spotted Narrow-mouthed Frog (*Kalophrynus interlineatus*) (Lau & Dudgeon, 1999), Lesser Spiny Frog (*Rana exilispinosa*) and Green Cascade Frog (*Rana livida*).

Doubtless this catalogue of animal life can be added to by others. It certainly does not pretend to be comprehensive (and the author readily admits to being floristically challenged). But one would already be hard-pressed to find any comparable site of similar habitats within Plover Cove Country Park. Indeed, it seems an absurd paradox that so many of the obvious wildlife 'hot-spots' in the vicinity of this country park – Wu Kau Tang, Sam A Tsuen, Lai Chi Wo, Kuk Po – have been excised from it. Of course, this is an all too-familiar story (think of Sha Lo Tung, Wong Chuk Yuen, Sham Chung, Luk Keng ...). In the case of Wu Kau Tang, recent years have seen two separate proposals, from authoritative sources, to gain a greater level of protection for different habitats (marsh and stream) within the site, and to date neither of these has apparently been approved or acted upon. In the meantime, the developers are starting to take an interest.

Having done me the courtesy of reading this far into such a rambling article, the exasperated reader may well ask: "So what's your point?" The point is simply this: that Hong Kong's biodiversity is inadequately served by the current protected areas system, which often seems to go out of its way to exclude that biodiversity. And the question is: How can we change this, when faced with an administration which apparently attaches more importance to satisfying the interests of 'indigenous' villagers than to establishing an effective, conservation-orientated protected areas system? As a non-indigenous resident of Wu Kau Tang, I'd love to know the answer.

Bibliography

Dudgeon, D. & Chan, W.C. (1996). *Ecological Study of Freshwater Wetland Habitats in Hong Kong*. Report prepared for the Agriculture & Fisheries Department, Hong Kong Government.

Wilson, K.D.P. (1997). An annotated checklist of the Hong Kong dragonflies with recommendations for their conservation. *Memoirs of the Hong Kong Natural History Society* 21: 1-68.

An update on the distribution of mangroves in the North East New Territories

by Captain L.C. Wong

The North East New Territories, which includes Starling Inlet (Sha Tau Kok Hoi) and Crooked Harbour (Kat O Hoi), is one of the few remaining unspoiled areas in Hong Kong, primarily due to its remoteness. In this area, the distribution of mangroves was studied as part of a territory-wide survey by Tam and Wong in the mid 1990s, and a total of five mangroves was found in Starling Inlet and Crooked Harbour (Tam and Wong, 2000). However, five more mangroves were located during a waterbird study in the area since 1997 (Wong *et al.*, 1999). In this paper, I would like to discuss an updated distribution of the mangroves in this region of Hong Kong and their use by other wildlife. The names of locations follow the Countryside Series North-East New Territories map (Edition 4) published by the Survey & Mapping Office, Lands Department. The mangrove species found there are based on casual observations.

Mangroves at Yim Tso Ha, Nam Chung, Luk Keng, Kuk Po, Yeung She Au and So Lo Pun are semi-natural habitats which are the result of abandonment of brackish water rice cultivation in the late 1960s. Only those along the coast are considered to be natural habitats.

(1) Sha Tau Kok

This mangrove is situated within the Frontier Closed Area (FCA), and is distributed along the coast from Sha Tau Kok Town to the Shek Chung Au Police Checkpoint. Although Tam and Wong (2000, and in more detail in their unpublished 1997 report to AFD) have described a mangrove with the name “Sha Tau Kok", this is at a different site outside the FCA. *Kandelia candel* is the main mangrove tree but *Avicennia marina* is also found. During high tide, egrets and herons use this mangrove as a roosting site. According to a 1981 aerial photo, there was previously a larger mangrove area off Sha Tau Kok which was destroyed by the expansion of the new Sha Tau Kok Town.

Another small mangrove (appro. 20 x 50 m) is found on the inland side of Sha Tau Kok Road. Mangrove species found there are *Kandelia candel* and *Aegiceras corniculatum.* Waterbirds that used this mangrove are Little Egrets, Chinese Pond Heron, Banded Rails (*Gallirallus striatus*) and Little-ringed Plovers (*Charadrius dubius*). Fiddler crabs (*Uca* spp.) were also found in the mangrove. According to the past aerial photos, this was once a coastal mangrove but has been cut off by the Sha Tau Kok Road, with a small channel that connects to the sea.

These two mangroves have no legal protection for conservation purposes but are within the FCA boundary and thus entrance is restricted to people with written permits. The North East New Territories planning study recognises this mangrove as one of the constraints to future developments.

(2) Wu Shek Kok

This mangrove is situated in a sheltered bay near the Shek Chung Au Police Checkpoint. Tam and Wong (2000) named this mangrove “Sha Tau Kok” but, according to the countryside series map, this area is called Wu Shek Kok. This mangrove was mentioned by Murton (1972) during his study of the critically endangered Chinese Egrets (*Egretta eulophote*) in Starling Inlet. *K. candel* is again the main mangrove tree but *Avicennia marina*, *Bruguiera gymnorhiza* and *Acanthus ilicifolius* are also found.

These mangroves are zoned as “Coastal Protection Area’ according to the Luk Keng and Wo Hang Outline Zoning Plan No. S/NE-LK/2.

(3) Yim Tso Ha

This mangrove is situated between the abandoned Yim Tso Ha Egretry and Ho Pui Leng Village. Tam and Wong (2000) named this mangrove “Nam Chung” but according to the map, this area is called Yim Tso Ha. *K. candel* 2-3 m high dominates the mangrove. Aerial photos from the 1950s and 60s show that this area was brackish rice fields at that time. Abandonment of rice cultivation between the late 60s and the early 70s caused the gradual formation of the mangrove.

A coastal dragonfly of global conservation concern, *Orthetrum poecilops*, was first found in these mangroves in 1994 (Wilson 2001). Since the 1990s, this dragonfly has only been found in Hong Kong and Japan. In addition, this mangrove serves as an important feeding habitat for Night Herons (*Nycticorax nycticorax*) nesting on A Chau (about 0.6 km to the east). In the 1997 and 1998 summer breeding seasons, about half of the Night Herons used this habitat as a feeding ground (Wong *et al*. 1999). Cattle Egrets also fed on the visiting insects when the mangrove was flowering in the 1998 summer.

This mangrove is zoned as “Conservation Area” according to the Luk Keng and Wo Hang OZP map. However, agricultural use and tree plantation are listed as always permitted land uses, which do not require approval from the Town Planning Board.

(4) Nam Chung

There are two mangrove stands at Nam Chung. Tam and Wong (1997, 2000) named these mangroves, together with those in the Luk Keng area, as "Luk Keng", but according to the map this area is called Nam Chung. Apart from the mangroves around Nam Chung Lei Uk listed in Tam and Wong (1997), another mangrove is found near Nam Chung Yeung Uk. Some mangrove trees in front of Nam Chung Yeung Uk are regularly cut down for *feng shui* reasons. According to local beliefs, the view in front of the village should be open and blocked by nothing, so the mangrove in front the village was cut down. Past aerial photos indicate that the mangroves at Nam Chung were ricefields in the 1950s and 60s.

The coastal dragonfly, *O. poecilops*, was also found in the mangroves at the Nam Chung Yeung Uk and Lei Uk (Wilson 2001). These sites and Yim Tso Ha are the only recorded locations of this dragonfly in Hong Kong. Ten to twenty Common Teals (*Anas cecca*) were seen to roost and forage in this mangrove in the 2000/2001 winter. The mangrove at Nam Chung Yeung Uk also serves as feeding grounds for a variety of waterbirds, including egrets, herons, and kingfishers.

These mangroves are currently zoned as "Agriculture" on the Luk Keng and Wo Hang OZP. However, according to the consultation digest of the Planning and Development Study on North East New Territories (Anon 1999), Nam Chung is classified as "Wetland" with area of conservation interest / mangrove under the category of "No Go Areas".

(5) Luk Keng

This forms part of the "Luk Keng" site of Tam and Wong (2000). Mangrove species like *K. candel* 2-3 m high are found here.

It is zoned as "Conservation Area" according to the Luk Keng and Wo Hang OZP map. Again, agricultural use and tree plantation are always permitted**.**

(6) Mangrove along the south Starling Inlet coast

Along the coast of Yim Tso Ha, Nam Chung and Luk Keng, particularly at the sheltered bay of Nam Chung, mangrove plants are found, including *K. candel*, *Acanthus ilicifolius*, *Aegiceras corniculatum*, *Bruguiera gymnorhiza* and *Excoecaria agallocha*. The restricted *Heritiera littoralis* (Xing *et al*. 2000) has been planted at the rear of the mangrove. During high tide, these mangroves serve as roosting sites for egrets and herons. White-breasted Waterhen (*Amaurornis phoenicurus*) are also regularly seen there.

These mangroves are zoned as "Coastal Protection Area' according to the Luk Keng and Wo Hang OZP map.

(7) Kuk Po

This mangrove is not listed in Tam and Wong (1997, 2000). Like the one at Nam Chung Yeung Uk, it is regularly cut down, probably for the same *feng shui* reasons, so only short mangrove trees are found currently. Past aerial photos indicate that the Kuk Po mangroves were ricefields in the 1950s and 60s. Intermediate Egrets (*Mesophoyx intermedia*), and Banded Rails were regularly seen during the bird survey in 1997/98. Apart from the mangrove, there is also a 6-8 ha *Phragmites* reed bed. In the 1998 summer, 2-3 newly-fledged Little Green Herons (*Butorides striatus*) were found around the reed bed suggesting that this bird bred there.

No conservation status is given to this mangrove.

(8) Yung She Au

This small mangrove is situated in Crooked Harbour and is not mentioned by Tam and Wong (1997, 2000). Only dwarf mangroves, mainly of *K. candel*, are found along the coast. Past aerial photos indicate that these mangroves were also once ricefields. There is also a 1 ha *Phragmites* reed bed and a Purple Herons (*Ardea purpurea)* were found there in August 1997.

No conservation status is given to this mangrove or the reed bed.

(9) So Lo Pun

This 1.5 hectare mangrove is situated in Crooked Harbour and is not mentioned by Tam and Wong (1997, 2000). Past aerial photos indicate that rice fields were the dominant land use in the lowlands of So Lo Pun. Dwarf (1-2 m) mangroves, mainly of *K. candel*, are found here. A rare seagrass (Xing *et al*. 2000), *Zosteria japonica*, was discovered in the mudflats adjacent to the mangrove in March 1998. In November 1997, a juvenile Wild Boar following an adult was seen at the mangrove. There is also a 1.5 ha tidal pond.

No conservation status is given to this mangrove or the pond.

(10) Lai Chi Wo

This mangrove has been well described by Tam and Wong (1997, 2000) and they identify it as one of three "extremely important stands". The seagrasses, *Zostera japonica* and *Halophila ovata*, can be found on the mudflats off the mangroves. There are also huge specimens of *Derris trifoliata*, a coastal plant.

The Lai Chi Wo mangrove is well-protected by zoning. The mangrove is a "Site of Special Scientific Interest" while the mudflats and the coastal areas are protected by the Yan Chau Tong Marine Park.

Mangroves in Starling Inlet, except those at Sha Tau Kok, Nam Chung and Kuk Po, are protected by zoning, while mangroves and other wetlands in Crooked Harbour are only protected by their remoteness. Even those protected by zoning as "Conservation Area" are still threatened by inappropriate land uses for which no permission is required. Further studies should be encouraged to investigate their ecological importance, and relevant conservation status should be given to these mangroves, in particular to those at Sha Tau Kok and Nam Chung, which are more easy to be threatened by urbanization and human disturbance.

Bibliography

Anon. (1999). *Planning and development study on North East New Territories: Development proposals for Kwu Tung North, Fanling North and Ping Che / Ta Kwu Ling – Consultation Digest*. Planning Department and Territory Development Department.

Murton, R. K. (1972). The ecology and status of the Swinhoe's Egret, with notes on other herons in Southeastern China. *Biological Conservation* 4: 89-96.

Tam, N.F.Y and Y.S. Wong. (1997). *Ecological study on mangrove stands in Hong Kong*. Unpublished report to AFD.

Tam, N.F.Y and Y.S. Wong. (2000). *Hong Kong Mangroves*. AFCD and City University of Hong Kong Press.

Wilson, K. D. P. (2001). *Orthetrum poecilops* Ris – A marine dragonfly of conservation priority. *Porcupine!* 22: 5-6.

Wong, L.C., Corlett, R.T., Young, L. and J.S.Y. Lee (1999). Foraging flights of nesting egrets and herons at a Hong Kong egretry, South China. *Waterbirds* 22: 424-434.

Xing, F., S. C. Ng and L. K. C. Chau. (2000). Gymnosperms and angiosperms of Hong Kong. *Memoirs of the Hong Kong Natural History Society* 23, 21-135.

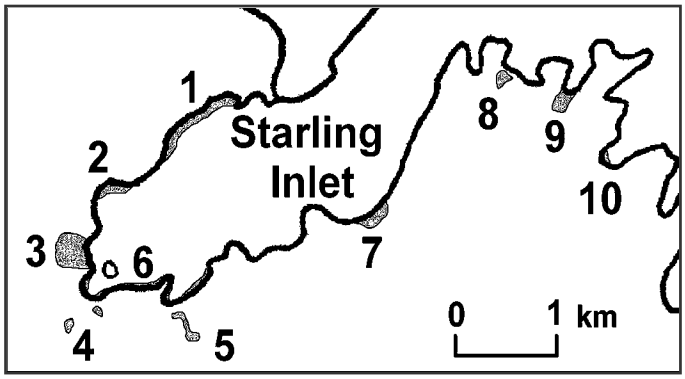


Fig. 1 The distribution of mangroves in the North East New Territories. The locations of these mangroves are based on a waterbird study in this area since 1997 (Numbers as listed in the text).

Conservation of buildings and cultural heritages: stone- and concrete-eating microorganisms

by Ji-Dong Gu

Microorganisms, including archaea, bacteria and fungi, are widely present in our environment and they were the first life form in the biological evolution process. They perform many favourable activities: degradation of plant debris and pollutants, recycling nutrients, fermenting food products for our consumption, and many more. At the same time, they are known disease-causing agents to aquaculture, land associated crops in agriculture, and ourselves. In addition, they are also responsible for degradation and deterioration of a wide range of materials including stainless steel, electronic insulating polymers and society's infrastructure from highways, bridges to sewer pipes. Indeed, several highly publicized cases have been reported regarding microbial involvement in corrosion of sewer concret; as a result economic loss was not only high but was unanticipated by the local government. They are also involved in damage to historical buildings and cultural heritage materials.

Many ancient monuments and historical buildings provide a rich source of microorganisms enriched over time. When stone monuments were examined at two locations in metropolitan city, one was relatively non-polluted and the other was polluted due to heavy traffic nearby. Both hydrocarbons and sulfur oxides were higher at the polluted location than the nonpolluted one. We found that the populations of heterotrophic and chemolithotrophic bacteria were significantly higher at the polluted location than the nonpolluted one, indicating deposition of non-combusted hydrocarbons and sulfur oxides deposited on surfaces of the stone promotes selectively the population of these two groups of microorganisms. This was supported by laboratory experiments. When examing the chemolithotrophic group from these two locations, we found that the percentage of chemolithotrophic bacteria capable of oxidizing sulfur was much higher (approximately by 30%) at the polluted location than the nonpolluted location. What was more interesting in this investigation was that the growth of the sulfur-utilizing bacteria resulted in rapid decrease in pH of the culture medium. This suggests the mechanism of stone attack by the microorganisms is by means of acid production so that minerals can be dissolved and assimilated for their own growth. In doing so, the stone surface is corroded. In addition to this mechanism, the colonizing bacteria on surfaces of stone also synthesize polysaccharides forming complexes with metals of the stone.

Considering Hong Kong's subtropical climate, high humidity and temperatures for a large portion of the year, building maintenance is a costly expenditure to any property owner. The surface of buildings with black, green, dark-green or even purple colour is a strong indication of a rich community of microorganisms and their biofilms on surfaces. To eradicate the microorganisms and inhibit their growth, frequent cleaning and application of new paint plus biocides are anticipated. From an ecological point of view, the surface microbial ecology is an interesting subject to investigate and such knowledge will provide for effective measures against biodeterioration. What is interesting in the whole process is the conservation of cultural heritage, old buildings, monuments and cultural materials with historical, religious value. Conservation is not simply to put them in an air-conditioned museum because a lot of them cannot be put into a museum due to site and size. In this case, preservation is an important subject for discussion. With reference to this new direction of development, the archaeological findings unearthed from the Disney Park project should be considered for conservation of these cultural objects.

The scientists engaged in this endeavour must have a passion for the art and appreciation of culture and people. Additional reward is the potential for isolation and identification of new microorganisms from previous unexplored niches (see Fig.1 below). Since each historical environment is unique in material composition, the microenvironment and microorganisms residing on the surfaces, the biology and conservation can truly go hand in hand.

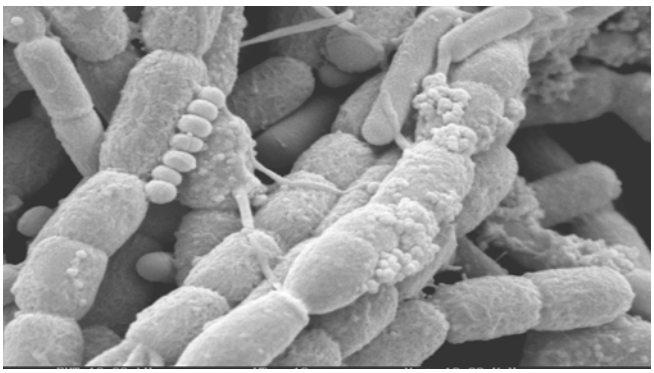


Fig.1 A scanning electron micrograph showing a rich and diverse microbial community on the surface of the stone monument described above. Many bacteria (more than 90%) in their natural environment are not yet identified (Magnification 10,000×).

Bibliography

Gu, J.-D., T.E. Ford, and R. Mitchell (2000). Microbial degradation of materials: general processes. Pp. 349-365. In: Revie, R.W. (ed.) *Uhlig's Corrosion Handbook* (2nd ed.) John Wiley, New York.

Gu, J.-D., T.E. Ford, and R. Mitchell. (2000). Microbial corrosion of concrete. Pp. 477-491. In: Revie, R.W. (ed.) *Uhlig's Corrosion Handbook* (2nd ed.) John Wiley, New York.

Mitchell, R. and J.-D. Gu. (2000). Changes in the biofilm microflora of limestone caused by atmospheric pollutants. *International Biodeterioration & Biodegradation* 46: 299-303.

WILD CORNER

Any sightings of civets, mongooses, ferret badgers, leopard cats, barking deer, pangolins and porcupines – live or dead – should be reported. Rare birds, reptiles, amphibians and fish, or unusual behaviour by common species, are also of interest, as are rare or interesting invertebrates and plants. If you think it is interesting, our readers probably will! Please give dates, times and localities as accurately as possible.

MAMMALS

James Varley saw a **Porcupine** (*Hystrix brachyura*) on Black's Link near Wong Nai Chung Gap at around 7:45 pm on 6th December 2000.

A single sub-adult male **Rhesus Macaque** (*Macaca mulatta*) was spotted by Richard Corlett on the Tai Mo Shan Road at about 650 m on 14th April. It looked in very poor condition.

Valery Garrett saw a **Masked Palm Civet** (*Paguma larvata*) behind her house on Mount Kellett Road at 8:30 pm on June 27th 2000, and regularly hears Barking Deer in the same area.

On 28th May, Richard Corlett and Jan Littlewood saw an elderly couple systematically feeding a rice mixture to a group of seven **Feral Dogs** in Kam Shan Country Park, about 2 km from the main road. It is now illegal to feed wild animals in this area, but feral dogs possibly do not count as wild. If this practice is widespread, it may account for the presence of apparently healthy groups of feral dogs in many of the more accessible Country Parks. The ecological impact of these dogs is unknown but they are a potential threat to walkers and a possible reservoir for wildlife diseases.

Around 10 am on 18th March, a **Mongoose** (*Herpestes* sp.) was seen crossing the road leading to the Education Center at the Mai Po Nature Reserve by Cheung Sze Man.

Around 9:30 pm on 10th March, Lung Hoi Yan and friends saw a **Barking Deer** (*Muntiacus* sp.) at the middle section of Sai Wan Road, Sai Kung, during a taxi ride along the road. The car stopped 2-3 metres away, but the animal had its rear facing the car, and stood for another 5-6 seconds before it turned and

immediately fled. Most of the records of Barking Deer are from the central or north-east New Territories, and this was one of the few records from Sai Kung.

Wong Lun Cheong saw a road-killed **Small Indian Civet** (*Viverricula indica*) on Lam Kam Road near Pak Ngau Shek in early January.

BIRDS

Richard Corlett and Kylie Chung saw large numbers of **Japanese White-eyes** (*Zosterops japonica*), and **White-rumped Munias** (= White-backed or Sharp-tailed Munias; *Lonchura striata*) on sale "for release" at the bird market in Kowloon on 15th March. The munias were only HK$6 each, which may explain why this species has become so common in Hong Kong in recent years, particularly in urban parks and gardens.

Two **Crested Serpent Eagles** (*Spilornis cheela*) were spotted by Kwok Hon Kai at Ha Tsuen on 12th February.

Kwok Hon Kai and Tom Dahmer saw a **Kestrel** (*Falco tinnunculus*) try to hawk a small **bat** (possibly Japanese Pipistrelle) at Kau Sai Chau on the evening of 9th March. The bat kept turning to escape and finally the Kestrel gave up.

A **Collared Scops Owl** (*Otus lempiji*) was seen in Shing Mun Country Park on 2nd May by Cheung Sze Man. It was tied with a fishing line to a tree on the stream bank. It flew away after the line was cut by hikers.

Manna Wan spotted a **Brown Hawk Owl** (*Ninox scutulata*) on the morning of 3rd April, 10.00 am at Cape D' Aguilar Marine Reserve. It landed on the big rubber tree outside the front door of SWIMS, took a good look and then flew off. It was too small to be a kite, had very big yellow eyes and owl type ears, a brown chest and no facial disk.

FISH

The sighting of *Megalops cyprinoids* (Broussonet 1782) is apparently not new to Hong Kong as indicated in *Porcupine!* 22. Joe Lee wrote to tell us he included this species in his list of fishes recorded from a gei wai at Mai Po Marshes, together with other species which may be of interest, such as the milk fish *Chanos chanos*. Both species were rare compared to the most other fish present in the gei wais. [Lee, S.Y. (1988) The ecology of a traditional tidal shrimp pond in Hong Kong, the population and fate of Macrodetritus and implications for management. PhD thesis, HKU.]

A **Sunfish** (Family: Molidae) was caught at 21.18 LAT., 113.48 LONG., on 19th April, 2001 at Wan San, which is more or less due south of the western tip of Lantau but more south than the Lema Islands, by a Hong Kong fisherman. The fish was about 120 kg, with total length 159 cm, maximum depth 79 cm and distal dorsal to distal ventral fins 173 cm. Species to be confirmed. (A. Cornish & Y. Sadovy)

AMPHIBIANS/REPTILES

Kwok Hon Kai saw a **Big-headed Frog** (*Rana kuhlii*) in Tai Po Kau on 11th May.

Kwok Hon Kai and Tom Dahmer saw two **Two-striped Grass Frogs** (*Rana taipehensis*) in Kau Sai Chau on 11th May. This species has only been recorded in a few places in Hong Kong.

On the same occasion a couple of **Bamboo Snakes** (*Trimeresurus albolabris*) were also seen.

On the afternoon of 22nd March, Cheung Sze Man saw a **Many-banded Krait** (*Bungarus multicinctus*) in Tai Po

Kau. It was recently dead and being eaten by ants and worms.

Cheung Sze Man also saw a **Many-banded Krait** (*Bungarus multicinctus*) and two **Striped Stream Snakes** (*Opisthotropis kuatunensis*) on 8th May by a stream in Shing Mun.

Three **Diamond-back Water Snakes** (*Sinonatrix aequifasciata*) were seen on different occasions (21st March, 3rd April and 24th April) in Tai Shing Stream, Shing Mun Country Park by Sukh Mantel. The first sighting was an adult about one meter long while the other two were juveniles about 46 – 61 cm long. All sightings were in the evening after 6 pm.

A **Diamond-back Water Snake** (*Sinonatrix aequifasciata*) was also spotted at Tai Po Kau Nature Reserve by Bosco Chan. The snake was observed underwater hiding among rocks. It is apparently the first local record at this suitable site.

On 30th April at around 9:15 pm, Bosco Chan heard a **Tokay Gecko** (*Gekko gecko*) calling on the hill slope of Wah Yan College on Hong Kong Island. The call was clearly heard among the busy traffic.

It was thought that the construction of Hong Kong's new airport and the destruction of Chep Lap Kok would result in the eradication of Lantau's population of **Romer's Tree Frog** (*Philautus romeri*). On 9th July 2000, several students from Green Across the Pacific and Peter Lynch (Executive Director, Green Across the Pacific) working in collaboration with The Conservation Agency, scoured the one remaining hill of Chep Lap Kok on the south side of the airport for signs of surviving herptofauna. We descended the northeast slope of the hill to discover an abandoned village among the trees. One emerges from this village through a path lined with banana trees onto a service road. A short distance to the east, amid the complex of thoroughfares leading to and from the airport, there is a small parking area. Amongst the ruins of this hidden village, near a dilapidated door sill, I captured and released one *Philautus romeri*. Presumably, a small population continues to survive due to the present of old water tubs and pitchers that maintain pools of standing rain water. Every reasonable effort should be made to provide a viable long term habitat for this remnant of a once great population.

Peter Lynch
(email:plynch@together.net)

On March 24th I observed for several minutes a live and very conspicuously marked **Red-necked Keel-back** (*Rhabdophis submineata*), approx. 60 cm long, that was trapped in a deep concrete culvert off Clearwater Bay Road near Tai Po Tsai Village. In recent years I have got into the habit of looking into all concrete culverts I pass when out for a stroll as I find them to be a good and convenient source of reptiles (albeit, usually dead) in the hilly vegetated catchment areas of HK, and particularly so after heavy rain. Of course, the degree and type of vegetation in the upper catchment will influence whether or not a dead snake makes it to the concrete flume for the ride of its... er, death, as will the distance to, and the extent and character of, the engineered surface drainage network. Never-the-less, these structures at least give an insight into what's out there.

My other pet subject (so to speak) is road kills. Again on the topic of snakes: during a walk over Tung Chung Road last September I observed a road-killed **Buff-striped Keel-back** (*Amphiesma stolata*) and a road-killed **Large-spotted Cat Snake** (*Boiga multimaculata*) - not forgetting the dead **Greater Green Snake** (*Ophedrys major*) I spotted in a drainage culvert. I wonder how much sampling time and effort I would have had to exert to have made these observations *in-situ* in the densely vegetated Tung Chung Valley.

So, why mention this at all? Well, apart from highlighting the fact that from now on through the coming months is the best time to make these observations, I wonder if any studies have been conducted into the contribution of these man-made structures to our knowledge of local Biodiversity? Whilst not wanting to encourage further road works(!), I wonder what we would know *without* road-kill records - would there be any geographical or even species gaps? Certainly in the case of snakes I would expect there is plenty of evidence in 'Wildlife Windows' alone that points to the important contribution of road-kill data to the local distribution of snakes. Similarly, given the potential of records from surface drainage systems to produce an indication of catchment abundance / diversity for snakes (and other species), does anyone know of any studies? If data in the Biodiversity Survey Database distinguishes between 'dead' and 'alive' species from observations, could the database be manipulated to produce the answers? This would be interesting to find out. Questions, questions. Answers, anyone...?

Ben Ridley

INSECTS

Roger Kendrick and Cecily Law saw **bumblebees** (*Bombus eximius*) nectaring on the following species of plants: Queens Wreath (*Petrea volubilis*) at KFBG (around 4 pm on 5th May); Yellow cow wood (*Cratoxylum cochinchinense*) at Pak Sha O, Sai Kung (around 11 am on 6th May); and, Periwinkle (*Catharanthus roseus*) at Science Museum, TST (around 5 pm on 6th May).

Recent Publications

Books, Monographs, CDs etc.

Beakes, W.J., Mackie, A., Saunders, R. and Caley, K.J. (2000) *Plant Diversity*. The Virtual School of Biodiversity, Scholar's Desktop CD ROM version 2.01.

Carey, G.J., Chalmers, M.L., Diskin, D.A., Kennerley, P.R., Leader, P.J., Leven, M.R., Lewthwaite, R.W., Melville, D.S., Turnbull, M. and Young, L. (2001) *The Avifauna of Hong Kong*. Hong Kong Bird Watching Society, Hong Kong. [Contains details of status, distribution and any historical changes in abundance of all species that have been recorded in Hong Kong]

Chan, B.K.K., Gray, J.S and Caley, K.J. (2000) *Spatial Variations in Biodiversity*. The Virtual School of Biodiversity, Scholar's Desktop version CD ROM version 2.01.

Chow, S. and Hui, L. (2001) *Green Outdoor Activity Guide*. Green Power, Hong Kong, 84 pp.

Davies, P.M.C. and Dudgeon, D. (2000) *Human Origins*. The Virtual School of Biodiversity, Scholar's Desktop CD ROM version 2.01.

Davies, P.M.C. and Dudgeon, D. (2000) *Primates*. The Virtual School of Biodiversity, Scholar's Desktop CD ROM version 2.01.

Dudgeon, D. and Corlett, R.T. (2001) *Biodiversity Survey (Version 2.0)*. Department of Ecology and Biodiversity, The University of Hong Kong: 1 CD-ROM and 111 pp.

Kadoorie Farm and Botanic Garden (2001) *Report of a Rapid Biodiversity Assessment at Nanweiling Forest Area, Central Hainan, 1 to 2 April 1998. South China Forest Biodiversity Survey Report Series:* No. 1. KFBG, Hong Kong, 10 pp.

Pointing S.B. and Hyde K.D. (eds) (2001) *Bio-Exploitation of Filamentous Fungi.* Fungal Diversity Press, The University of Hong Kong, 467pp.

Saunders, R. M. K. (2001) *Schisandraceae*. [Species Plantarum: Flora of the World 4]. Australian Biological Resources Study, Canberra, 62 pp.

Williams, G.A., Caley, K.J. and Trewhella, W.J. (2000) *Algae*. The Virtual School of Biodiversity, Scholar's Desktop CD ROM version 2.01.

Journal articles, book chapters and other published papers

Ades, G., Banks, C.B., Buhlmann, K.A., Chan, B., Chang, H.C., Chen, T.H., Crow, P., Haupt, H., Kan, R., Lai, J.-Y., Lau, M., Lin, H.-C. and Shi, H. (2000) Turtle trade in northeast Asia: regional summary (China, Hong Kong and Taiwan). In: van Dijk, P.P., Stuart, B.L. and Rhodin, A.G.J. (eds.) *Asian turtle trade: proceedings of a workshop on conservation and trade of freshwater turtles and tortoises in Asia.* Chelonian Research Foundation, Lunenburg, pp. 52-54.

Bridson, D.M. (2000) The identity of *Tsiangia* (Rubiaceae). *Kew Bulletin* 55: 1011-1012. [The Hong Kong "endemic": she says it is *Ixora chinensis*]

Brock, P.D. and Seow-Choen, F. (2000) The stick insects (Insecta: Phasmida) of Hong Kong. *Serangga* 5: 115-147. [Describes 9 species, including 5 that are new to science]

Cheung, W.L and Sadovy, Y. (2001) From food to feed. *About Life*. World Wide Fund for Nature Hong Kong. Spring 2001 p. 5.

Corlett, R.T. (2001) Pollination in a degraded tropical Landscape: a Hong Kong case study. *Journal of Tropical Ecology* 17: 155-161.

Corlett, R.T. and Hau, B.C.H. (2000) Seed dispersal and forest restoration. In: Elliott, S., Kerby, J., Blakesley, B., Hardwick, K., Woods, K. and Anusarnsunthorn, V. (eds.) *Forest Restoration for Wildlife Conservation*. International Tropical Timber Organization and The Forest Restoration Research, Chiang Mai University, Thailand, pp. 317-325.

Davies, A.M., Aitchison, J.C., Flood, P.G., Morton, B.S., Baker, R.G.V. and Haworth, R.J. (2000) Late Holocene higher sea level indicators from the South China coast. *Marine Biology* 171: 1-5.

Davis, A.P., Bridson, D., Jarvis, C. and Govaerts, R. (2001) The typification and characterization of the genus *Psychotria* L. (Rubiaceae). *Botanical Journal of the Linnean Society* 135: 35-42.

Dominy, N.J. and Lucas, P.W. (2001) Ecological importance of trichromatic vision to primates. *Nature* 410: 363-366.

Frohlich, J., Hyde, K.D. and Petrini, O. (2000) Endophytic fungi associated with palms. *Mycological Research* 104: 1202-1212.

Gu, J., Belay, B. and Mitchell, R. (2000) Protection of catheter surfaces from adhesion of *Pseudomonas aeruginosa* by a combination of silver ions and lectins. *World Journal of Microbiology & Biotechnology* 17: 173-179.

Hao, G., Chye, M.-L. and Saunders, R.M.K. (2001) A phylogenetic analysis of the Schisandraceae based on morphology and nuclear ribosomal ITS sequences. *Botanical Journal of the Linnean Society* 135: 401-411.

Harper, E.M., Hide, E.A. and Morton, B.S. (2001) Relationships between the extant Anomalodesmata: a cladistic test. In: Harper, E.M., Crame, J.A. and Taylor, J.D. (eds.) *The Evolutionary Biology of the Bivalvia*. The Geological Society of London, Special Publications 177: 129-143.

Harper, K.D. and Williams, G.A. (2001) Variation in abundance and distribution of the chiton *Acanthopleura japonica* and associated molluscs on a seasonal, tropical, rocky shore. *Journal of Zoology* 253: 293-300.

Hill, R.D. (2000) Laboratory tests of water-absorbing gel for Vetiver Planting. *The Vetiver Newsletter* 22: 17.

Hill, R.D. (2000) Observations on the formation and character of Vetiver Tiller. *The Vetiver Newsletter* 22: 14.

Hodgkiss, I.J. (2000) The N:P ratio revisited. *Proceedings of a Regional Symposium on the Prevention and Management of Harmful Algal Blooms in the South China Sea, Daya Bay and Hong Kong, November 2000.*

Hodgkiss, I.J., Chan, L.L. and Lo, S.C.L. (2000) Preliminary study of identifying HAB species using Isoelectric Focusing (IEF) and Two-dimensional SDS polyacrylamide Gel Electrophoresis (2-D page). *Proceedings of a Regional Symposium on the Prevention and Management of Harmful Algal Blooms in the South China Sea, Daya Bay and Hong Kong, November 2000.*

Hodgkiss, I.J. and Lu, S. (2000) Establishment of Hong Kong's first algal culture collection focused on harmful species. *Proceedings of a Regional Symposium on the Prevention and Management of Harmful Algal Blooms in the South China Sea, Daya Bay and Hong Kong, November 2000*.

Hyde, K.D., Ho, W.H., Jones, E.B.G. Tsui, K.M. and Wong, W.S.W. (2000) *Torrentispora fibrosa* gen. sp. nov. (Annulatascaceae) from freshwater habitats. *Mycological Research* 104: 1399-1403. [New genus from Tai Po Kau stream]

Hu, W.F., Lo, W., Chua, H., Sin, S.N. and Yu, P.H.F. (2001) Nutrient release and sediment oxygen demand in a eutrophic land-locked embayment in Hong Kong. *Environment International* 26: 369-375 [Tolo Harbour].

Jefferson, T.A. and Karczmarski, L. (2001) *Sousa chinensis*. *Mammalian Species* 655: 1-9.

Jim, C.Y. (2001) Ecological and landscape rehabilitation of a quarry site in Hong Kong. *Restoration Ecology* 9: 85-94.

Lam, H.Y.I. and Hodgkiss, I.J. (2000) An overview on red tides in Hong Kong. *Proceedings of a Regional Symposium on the Prevention and Management of Harmful Algal Blooms in the South China Sea, Daya Bay and Hong Kong, November 2000*.

Lau, M.W.N. (2000) Diversity of Hong Kong amphibians and the threats they face. In: Xu Zhihong (Chief Editor) *China's Biodiversity Conservation Toward the 21st Century. Proceedings of the Third National Symposium on the Conservation and Sustainable Use of Biological Diversity.* China Forestry Publishing House, Beijing, pp.182-186 (In Chinese with English abstract).

Lau M., Chan B, Crow P and Ades G. (2000) Trade and conservation of turtles and tortoises in the Hong Kong Special Administrative Region, People's Republic of China. In: van Dijk, P.P., Stuart, B.L. and Rhodin, A.G.J. (eds.) *Asian turtle trade: proceedings of a workshop on conservation and trade of freshwater turtles and tortoises in Asia.* Chelonian Research Foundation, Lunenburg, pp. 39-44.

Lau, M. and Shi, H. (2000) Conservation and trade of terrestrial and freshwater turtles and tortoises in the People's Republic of China. In: van Dijk, P.P., Stuart, B.L. and Rhodin, A.G.J. (eds.) *Asian turtle trade: proceedings of a workshop on conservation and trade of freshwater turtles and tortoises in Asia.* Chelonian Research Foundation, Lunenburg, pp. 30-38.

Lau, P.P.F. and Sadovy, Y. (2001) Gonad structure and sexual pattern in two threadfin breams and possible function of the dorsal accessory duct. *Journal of Fish Biology* 58: 1438-1453.

Lee, S.Y., Fong, C.W. and Wu, R.S.S. (2001) The effects of seagrass (*Zostera japonica*) canopy structure on associated fauna: a study using artificial seagrass units and sampling of natural beds. *Journal of Experimental Marine Biology and Ecology* 259: 23-50.

Leung, S.F. and Morton, B.S. (2000) The population dynamics of *Metapenaeus ensis* (De Haan) (Crustacea: Penaeidae) in the Mai Po Marshes Nature Reserve, Hong Kong. *Asian Marine Biology* 17: 77-99.

Lu, S. and Hodgkiss, I.J. (2000) Identifying important harmful dinoflagellates in Hong Kong Waters. *Proceedings of a Regional Symposium on the Prevention and Management of Harmful Algal Blooms in the South China Sea, Daya Bay and Hong Kong, November 2000*.

Mahunka, S. (2000) Oribatids from Hong Kong III (Acari: Oribatida: Microzetidae and Oribatulidae) (Acarologica Genavensia XCV). *Archives Des Sciences (Geneva)* 53: 177-

184. [Describes two new species in two new genera from Tai Mo Shan]

Martin, J.H. (2001) Description of an invasive new species of Neotropical aleurodicine whitefly (Hemiptera Aleyrodidae) – a case of complete or partial misidentification? *Bulletin of Entomological Research* 91: 101-107. [Found on crops in Hong Kong]

Mitchell, R. and Gu, J. (2000) Changes in the biofilm microflora of limestone caused by atmospheric pollutants. *International Biodeterioration & Biodegradation* 46: 299-303.

Morton, B.S. (2000) The pallial eyes of *Ctenoides floridanus* (Bivalvia; Limidae). *Journal of Molluscan Studies* 66: 449-455.

Morton, B.S. (2000) Hong Kong's international malacological and marine biological workshops: their successes and achievements. *National Taiwan Museum Special Publication Series* 10: 1-18.

Morton, B.S. (2000) Editorial: The Republic does not need scientists! *Marine Pollution Bulletin* 40: 721-722.

Morton, B.S. (2000) Editorial: Fishing in the South China Sea. *Marine Pollution Bulletin* 40: 287-288.

Morton, B.S. (2000) Editorial: Sustainable development. *Marine Pollution Bulletin* 40: 563-564.

Morton, B.S. (2000) Editorial: Scientific déja vu. *Marine Pollution Bulletin* 40: 887-888.

Morton, B.S. (2001) The function of pallial eyes within the Pectinidae, with a description of those present in *Patinopecten yessoensis*. In: Harper, E.M., Crame, J.A. and Taylor, J.D. (eds.) *The Evolutionary Biology of the Bivalvia*. The Geological Society of London, Special Publications 177: 247-255.

Pearce, C.A., Reddell, P. and Hyde, K.D. (2001) Revision of the Phyllachoraceae (Ascomycota) on hosts in the angiosperm family, Proteaceae. *Australian Systematic Botany* 14: 283-328.

Poonyth, A.D., Hyde, K.D., Aptroot, A. and Peerally, A. (2000) *Mauritiana rhizophorae* gen. et sp. nov. (Ascomycetes, Requienellaceae), with a list of terrestrial saprobic mangrove fungi. *Fungal Diversity* 4: 101-116.

Poonyth, A.D., Hyde, K.D. and Peerally, A (2001) Colonisation of *Bruguiera gymnorrhiza* and *Rhizophora mucronata* wood by marine fungi. *Botanica Marina* 44: 75-80.

Quednau, F.W. (2001) World review of the genus *Tinocallis* (Hemiptera: Aphididae, Calaphidinae) with description of a new species. *Canadian Entomologist* 133: 197-213. [*T. dalbergicola* described from *Dalbergia hancei* in Hong Kong]

Rainbow, P.S. and Blackmore, G. (2001) Barnacles as biomonitors of trace metal availabilities in Hong Kong coastal waters: changes in space and time. *Marine Environmental Research* 51: 441-463.

Sadovy, Y. (2001) The live reef food fish trade in Hong Kong: Problems and prospects. In: B.C. Paust and A.A. Rice (eds.), *Marketing and shipping live aquatic products: Proceedings of the Second International Conference and Exhibition*, November 1999, Seattle, WA. University of Alaska Sea Grant, AK-SG-01-03. pp. 183-192.

Sadovy, Y. (2000) Regional survey for fry/fingerling supply and current practices for grouper mariculture: evaluating current status and long-term prospects for grouper mariculture in South East Asia. Final report to the Collaborative APEC grouper research and development network (FWG 01/99). December, 2000. 109 pp + plates. [http://www.enaca.org/grouper/News/2001/02/survey.htm]

Salas, M. and Dudgeon, D. (2001) Stable-isotope determination of mayfly (Insecta: Ephemeroptera) food sources in three tropical Asian streams. *Archiv fur Hydrobiologie* 151: 17-32.

Schintlmeister, A. and Fang C.L. (2001) New and less known Notodontidae from mainland China (Insecta, Lepidoptera, Notodontidae). *Neue Entomologische Nachrichten* 50: 1-141. [Includes 3 species from Hong Kong, illustrated in colour]

Shan, X.C., Weatherhead, M.A., Song, S.Q. and Hodgkiss, I.J. (2000) Malondialdehyde content and superoxide dismutase activity in seed of *Phaius tankervilliae* (Orchidaceae) during storage. *Lindleyana* 15: 176-183.

Shan, X.C., Weatherhead, M.A. and Hodgkiss, I.J. (2000) Studies on symbiotic germination of *Spathoglottis pubescens*. *Malayan Orchid Review* 34: 82-88.

Sin, S.N., Chua, H., Lo, W. and Ng, L.M. (2001) Assessment of heavy metals in sediments of Shing Mun River, Hong Kong. *Environment International* 26: 297-301.

Siu, G. and Chau, L. (2000) Conservation of Native Orchids in Hong Kong. In: Xu Zhihong (Chief Editor) *China's Biodiversity Conservation Toward the 21st Century. Proceedings of the Third National Symposium on the Conservation and Sustainable Use of Biological Diversity.* China Forestry Publishing House, Beijing, pp. 222-229 (In Chinese with English abstract).

Tang, S., Hodgkiss, I.J. and Dickman, M.D. (2000) Distribution of Chlorophyll biomass in reverse to the nutrient

gradient in Hong Kong waters. *Proceedings of a Regional Symposium on the Prevention and Management of Harmful Algal Blooms in the South China Sea, Daya Bay and Hong Kong, November* 2000.

Trewhella, W.J., Davies, P.M.C., Chan, K.K. and Williams, G.A. (2000) Inter-Institutional Collaborative Teaching in the Virtual School of Biodiversity. *The Tenth International WWW Conference - Poster Proceedings*, pp.116-117.

Tsui, K.M, Goh, T.K., Hyde, K.D. and Hodgkiss, I.J. (2001) New species or records of *Cacumisporium, Helicosporium, Monotosporella* and *Bahusutrabeeja* on submerged wood in Hong Kong streams. *Mycologia* 93: 389-397.

Tsui, K.M., Hyde, K.D. and Hodgkiss, I.J. (2001) Colonization patterns of wood-inhabiting fungi on baits in Hong Kong rivers, with reference to the effects of organic pollution. *Antonie van Leeuwenhoek* 79: 33-38.

Utteridge, T.M.A. and Saunders, R.M.K. (2000). *Maesa reflexa* (Maesaceae): a new species from Mindanao, Philippines. *Kew Bulletin* 55: 981-984.

Wang, Y., Shen, P.P., Qi, Y.Z., Xie, L.C., Lu, S. and Hodgkiss, I.J. (2000) Comparative studies on the growth characteristic of *Phaeocystis globosa* Scheffel under different temperatures. *Proceedings of a Regional Symposium on the Prevention and Management of Harmful Algal Blooms in the South China Sea, Daya Bay and Hong Kong, November 2000.*

Weerasooriya, A.D. and Saunders, R.M.K. (2001) Three new species of *Mitrephora* (Annonaceae) from Sabah, Malaysia. *Botanical Journal of the Linnean Society* 135: 305-313.

Wewalka, G. (2000) Taxonomic revision of *Allopachria* (Coleoptera: Dytiscidae). *Entomological Problems* 31: 97-128. [Describes 2 new species from Hong Kong]

Williams, G.A. and Little, C. (2001) Preliminary observations on algal growth under limpet (*Patella vulgata*) home scars. *Journal of the Marine Biological Association, U.K.* 81: 175-176.

Wilson, K.D.P. and Reels, G.T. (2001) Odonata of Hainan. *Odonatologica* 30: 145-208.

Wilson, K.D.P. and Zhou W-B (2000) *Sinocnemis yangbingi* gen. nov., sp. nov. and *Sinocnemis dumontia* sp. n., new platycnemidids from south-west China (Odonata: Plactycnemididae). *International Journal of Odonatology* 3: 173-177.

Wilson, K.D.P. (2000) Notes on the genus *Rhipidolestes* with descriptions of two new species from South China (Zygoptera: Megapodagrionidae). *Odonatologica* 29: 45-50.

Wong, C.K., Wong, P.P.K. and Chu, L.M. (2001) Heavy metal concentrations in marine fishes collected from fish culture sites in Hong Kong. *Archives of Environmental Contamination and Toxicology* 40: 60-69.

Wong, L.C., Corlett, R.T., Young, L. and S.Y. Lee (2001) Utilization of wetlands by ardeids in Starling Inlet, Hong Kong: a year-round study and a comparison between the census and flight-line methods. *Waterbirds* 24: 153-160.

Wong, M.K.M and Hyde, K.D. (2001) Fungi on grasses: new species of *Ascotaiwania, Diaporthe* and *Oxydothis* (Ascomycetes). *Cryptogamie Mycologie* 22: 19-28. [Four new species from Hong Kong]

Wong, W.H. and Cheung, S.G. (2001) Feeding rates and scope for growth of green mussels, *Perna viridis* (L.) and their relationship with food availability in Kat O, Hong Kong. *Aquaculture* 193: 123-137.

Wong, W.H. and Cheung, S.G. (2001) Feeding rhythms of the green-lipped mussel, *Perna viridis* (Linnaeus, 1758) (Bivalvia: Mytilidae) during spring and neap tidal cycles. *Journal of Experimental Marine Biology and Ecology* 257: 13-36.

Xie, H. and Feng, Z.X. (2000) Description of two species of genus *Hirschmanniella* from Hong Kong. *Journal of the South China Agricultural University* 21: 53-55. [Nematodes!]

Yang, K. and Lam, K.C. (2001) Cumulative impact assessment: problems and practice in China Mainland and Hong Kong. *Huanjing Kexue* 22: 120-125.

Yang, Z. and Hodgkiss, I.J. (2000) Potentially harmful *Pseudo-Nitzschia* species in Hong Kong. *Proceedings of a Regional Symposium on the Prevention and Management of Harmful Algal Blooms in the South China Sea, Daya Bay and Hong Kong, November 2000*.

Yang, Z.B., Takayama, H., Matsuoka, K. and Hodgkiss, I.J. (2000) *Karenia digitala* sp. nov. (Gymnodiniales, Dinophyceae), a new harmful algal bloom species from the coastal waters of west Japan and Hong Kong. *Phycologia* 39: 463-470.

Yang, Z.B., Hodgkiss, I.J. and Hansen, G. (2001) *Karenia longicanalis* sp. nov. (Dinophyceae): a new bloom-forming species isolated from Hong Kong, May 1998. *Botanica Marina* 44: 67-74.

Yanna, Ho, W.H., Goh, T.K. and Hyde, K.D. (2000) A new species of *Everhartia* associated with leaf spots of Phoenix hanceana from Hong Kong. *Botanical Journal of the Linnean-Society* 134: 465-470.

Young, J.J. (2000) A brief note on the life history of *Tajuria*

maculata (Hewitson) Lepidoptera, Lycaenidae in Hong Kong, PRC. *Futao* 33: 11-16.

Yuen, T.K., Hyde, K.D. and Hodgkiss, I.J. (2000) Soft rot decay in tropical freshwater fungi. *Material und Organismen* 79: 33-38.

Zhang, D.X. and Saunders, R.M.K. (2001) ['2000']. Systematics of the *Burmannia coelestis* complex (Burmanniaceae). *Nordic Journal of Botany* 20: 385-394.

Zheng, G.J., Lam, M.H.W., Lam, P.K.S., Richardson, B.J., Man, B.K.W. and Li, A.M.Y. (2001) Concentrations of persistent organic pollutants in surface sediments of the mudflat and mangroves at Mai Po marshes nature reserve, Hong Kong. *Marine Pollution Bulletin* 40: 12, 1210-1214.

Zhou, D. Hyde, K.D. and Lu, B.S. (2000) *Striatodecospora* gen. nov. from bamboo in Hong Kong. *Mycotaxon* 76: 141-147.

Zhou, H. (2001) Effects of leaf litter addition on meiofaunal colonization of azoic sediments in a subtropical mangrove in Hong Kong. *Journal of Experimental Marine Biology and Ecology* 256: 99-121.

Zhou W-B. and Wilson, K.D.P. (2001) *Priscagrion kiautai* gen. nov., sp. nov., and *Priscagrion pinheyi* sp. nov., new damselflies from southwestern China (Zygoptera: Megapodagrionidae). *Odonatologica* 30: 117-121.

Zhuang, X. and Maxwell, G. (2000) Improving ecological impact assessment to enhance conservation of China's ecological resources. *Urban Environment and Urban Ecology* 13: 23-25. [Chinese with English abstract]

We try to list ALL recent publications on the ecology and biodiversity of Hong Kong - plus a few other things that we think may be of interest. If we have omitted anything that you think should have been included, or if you have published anything that you think we are likely to miss, please let us know.

FREE Column

Announcements:

Look out for a lovely new bilingual magazine called "Hong Kong Discovery" (editor-in-chief: Samuel Hung, kayiuhung@hotmail.com) to see Hong Kong's 'wild' side.

Ecoscope Applied Ecologists is looking for a Hong Kong-based Director, and a Wetland Habitat Creation Specialist. Contact: gtucker@ecoscope.co.uk.

Porcupine! No. 23
July 2001
ISSN 1025-6946

Chief Editors: **Richard Corlett**
Yvonne Sadovy

Assistant Editors: **Rachel Wong**
Laura Wong

Wild Corner: **Sukhmani Mantel**
Jackie Yip

Published by **the Department of Ecology & Biodiversity,** the University of Hong Kong.

Article submissions:
Porcupine!

Ms Eva Tam, Department of Ecology & Biodiversity, The University of Hong Kong.

Tel: 22990612
Fax: 25176082

Email address:
Ecology@hkucc.hku.hk

Website:
www.hku.hk/ecology/porcupine/

Guidelines for contributions:

Contributions are welcomed. Any original article related to natural history, conservation or ecological research in Hong Kong will be considered for publication. Authors of long articles should send their work as a Word file, either by post (on disk, with hard copy attached) or by email. Original artwork should be sent by post (please indicate if return of material is required). Short articles (less than a hundred words) may be faxed or posted.