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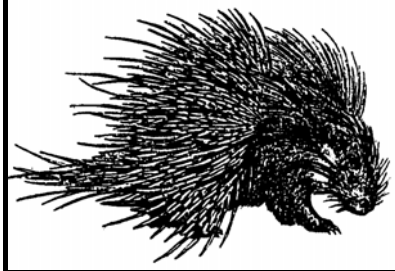


Porcupine!

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

The empty sea

As the global overfishing crisis deepens, so the need to reduce fishing effort and protect vulnerable marine species increases. The Hong Kong fishery is not immune to these global trends. Indeed, it unarguably lies towards the more serious extreme, both in terms of overexploitation and in the clear need for management attention and conservation action. Yet, fishery management and marine conservation (with the notable exception of the Cap D'Aguilar Marine Reserve) seem as elusive now as when I arrived almost a decade ago.

To identify a realistic way forward, it is important to ask why so little of any substance has been achieved in local marine fishery management. This is despite funding, expert advice, marine research, the social and cultural importance of seafood, and declines in fishes, crabs and prawns in local waters (see *Porcupines! passim*, Lee *et al*., 2000, Leung and Leung, 2000; Cheung, 2001). Hong Kong's reefs have among the lowest biomasses of fish per unit area ever recorded from coral habitats (Cornish, 2000), while the mean fish size taken in the 1990s by trawlers was < 10g, with most species within their juvenile size range (Sadovy, 1998; Leung, 2000). Twelve out of 17 commercially important species are overfished, the rest fully exploited (ERM, 1998). There is, without doubt, an urgent need to act.

One of the top fishery centres in the world, the University of British Columbia's Fisheries Centre, simulated Hong Kong's local fishery and concluded that "Continuation of the *status quo* without mitigation measures will lead to further fishing down the marine food web and shifts in ecosystem structure with a high probability of ecosystem collapse and attendant loss of economic and social benefits" (Pitcher *et al*., 2002). Yet, almost 5 years after the original sub-consultancy on the local fishery came out in January 1998 [the simulation was largely based on this earlier report], there is no licensing system (see *Feedback Porc! 25*) and not one 'no-take' Fishery Protection Area in place because the necessary legislative amendments to the Fishery Protection Ordinance (FPO) Cap 171 have still not been made.

How much longer must we wait and what can be done more immediately to address the serious problems in the local fishery and faced by many marine species? Two directions are suggested. The first, already in the FPO, while not the best possible solution, could at least be applied as an interim mitigation measure; it is also consistent with other fishery initiatives being taken in the wider region. Article 4(1)(g) allows for the closure of areas in Hong Kong to protect spawning adults during their periods of reproduction. The summer fishing moratorium already in place in inshore Chinese waters of the South China Sea is intended to achieve just such protection. Species in Hong Kong could likewise be protected during the same season (when most of them spawn anyway - Sadovy, 1998) under this Ordinance.

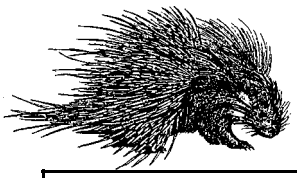
The second direction is to stem loss in biodiversity by identifying marine species and habitats of conservation concern (see Fellowes *et al*. p. 20 this volume for assessment criteria). A number of key reef and estuarine dependent species, many once locally valuable and important commercially, have declined to extremely low levels. These include species of shark, croaker, wrasse, parrotfish and grouper, as well as invertebrates, like lobsters, that are especially vulnerable to fishing and habitat degradation because of their life histories. Identification of fishes of conservation concern and protection of the natural habitats on which they depend are necessary if these species are to persist in local waters. Properly placed, fully protected marine reserves are proven and valuable conservation tools, and may also contribute to local fisheries (Roberts, 2000). More reserves are needed in Hong Kong.

Taking measures to control fishing effort and conserve marine biodiversity by protecting vulnerable species and habitats would also reflect a growing public concern for, and awareness of, the marine environment. Professor Pitcher and his coworkers have clearly warned of the ecological, social and economic prices to be paid for not acting soon; how much longer must we wait?

Yvonne Sadovy

(For bibliography see back page.)

Porcupine!



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

INSIDE THIS ISSUE:

Editorial

For the third *Porcupine!* in succession, we have Feedback on the front-page article of the previous issue. This time it is from Michael Lau, disagreeing with much of what I said in my "Empty forest" piece in May. Of course, I think I was right and Michael is wrong or, at least, I was righter and he is wronger, since we are not in complete disagreement. No doubt, Yvonne feels the same about Keith Wilson's comments on her "Irresponsible Fishery" article in the December issue, and I am not in complete agreement with Keith's response to "The Bad Biodiversity" before that. But now the *Porcupine!* readership has a choice of two informed opinions on all three issues. No doubt there are more opinions out there. Conservation is not physics and there is a lot of room for honest disagreement about both the facts and their interpretation. The front page is one of the privileges of editorship, but we would like to encourage both the contribution of more opinion pieces on conservation issues in Hong Kong and more Feedback about what we do publish. Conservationists in Hong Kong have tended to avoid public disagreement, for fear that this will provide an excuse for government inaction. However, suppressing differences of opinion is just as likely to result in wasted money and effort. I would mention Long Valley as an extreme example of this... but I am saving it for a future front page!

Richard T. Corlett

News from DEB

This finds me reeling from the beginning of yet another academic year but with the satisfaction of knowing that DEB produced another group of well-qualified environmental life science graduates by the end of last semester. I hope they will be able to find jobs in these economically depressed times. As I mentioned in my previous missive, June was to be the time that The University of Hong Kong was subject to a Teaching and Learning Quality Process Review undertaken by a panel of overseas experts appointed by the University Grants Committee. The focus of the review was quality assurance mechanisms and processes, with results that would "inform funding decisions" in the long term. DEB was one of the handfull of departments chosen to represent the University. The review was certainly an interesting experience, albeit time consuming for those involved. I am certainly grateful to the staff and students who took part. The review is one task that I am glad that we are now able to put behind us but, frustratingly, we have yet to receive any feedback on our performance.

Looking forward, and on a more positive note, I can tell you that one of our former graduate students, Dr Andy Cornish, rejoined the department in August for a one-year post as a teaching consultant. (You may remember him from such books as The Reef Fishes of Hong Kong. Anyway …..) Andy's post is funded by a grant from the Packard Foundation to Dr Yvonne Sadovy (see p. 10). Andy will take up Yvonne's teaching duties, which will free her to devote more time to her work on fishy matters, specifically the management and conservation of spawning aggregations. So, I'll take this opportunity to say congratulations to Yvonne, and welcome back to Andy.

Readers with longish memories may remember that our last three appointments in DEB were Billy, Kenny, Benny and (now) Andy. There is a pattern here. No, it isn't the names ending in –y. Each of these appointees was born and bred in Hong Kong, and are thus the natural custodians of the SAR's rich biodiversity. This does not mean that DEB has or will introduce a policy of recruiting only people born in Hong Kong. However, it does begin to rectify the peculiar imbalance that formerly characterised our department whereby the responsibility for teaching, research and conservation of local biodiversity fell upon the shoulders of people who did not regard the SAR as their permanent home. That said, in staff complement - as in natural ecosystems - variety is a good thing.

David Dudgeon

Feedback

Dear *Feedback*,

I would like to refer to the front-page article 'The empty forest' and the related piece 'Re-introduction: setting the ball rolling ….' on p.16 in the last issue of *Porcupine!* (issue 25) by Dr. Richard Corlett. Richard points out that many forest species are missing in Hong Kong forests and suggests that a programme of planned reintroductions would have many benefits such as restoring the ecological processes, enhance public awareness, improve survival prospects of the species concerned and reduce the risk of invasion by exotic species. It seems to make good sense but on closer examination of the issue, it is not as simple and straight-forward as Richard suggests (also refer to Lau, 2002). The IUCN Re-introduction Specialist Group has produced useful guidelines (IUCN/SSC Re-introduction Specialist Group, 1998) that cover the concepts, design, feasibility and implementation of wildlife reintroductions and I will not go into the detail of these here. Success rates are actually quite low and there are many risks associated with reintroduction projects, such as outbreeding depression and disease transmission (Dodd & Siegel, 1991; Reinhert, 1991).

Restoring ecological function is important but the case put forward by Richard is weak because most of our knowledge on ecological function is on degraded Hong Kong forests rather than the target 'pristine' forests. For instance, we know Hong Kong lacks many dispersers of large seeds but do we know exactly which species is (are) needed to disperse the seeds of, say *Beilschmiedia fordii*, and whether this disperser can survive in Hong Kong's young, patchy forests? Hence, the Phase 1 species are easy-to-establish ones rather than species that can fill a particular ecological role that is vacant. Moreover, many other groups besides mammals and birds also carry out important functions and we know even less about them.

Reintroductions are very costly if carried out properly and would require long-term monitoring to determine the results. Even for the easy Phase 1 species, it would require a lot of resources, yet the conservation gain (assuming success) is disproportionately small because all the proposed species are common and widespread in the region. Moreover, whether or not some of them (e.g. the Grey-cheeked Fulvetta) need reinforcement is too early to tell because most the listed species have only been in Hong Kong within the last twenty years or so. Quite a few have expanded their local range and some seem to be doing so. Shouldn't we give nature more time?

Another important point is that Hong Kong forests are not completely isolated. The forest at San Kwai Tin and the Wutongshan forest in Shenzhen are only separated by the few-metre-wide headwater of the Shenzhen River. The latter is connected to other hill forests further north. Natural re-colonization has occurred in Hong Kong forests. On a local scale, quite a few forest species have spread from refuges to certain secondary forests in the last twenty years as the forests became more established. There are also cases of 'cross-border' colonization by birds and butterflies. The list is not long but one has to bear in mind the very short history of re-forestation, and the fragmentation of forests in the region. The other reason is that Hong Kong forests are still not mature enough for some species. This condition will change but it takes time for the young forests to mature, expand and join adjacent forest patches. Re-forestation under the Chinese Government's 'ecological forests' scheme should link up many existing forest patches in the future. Then a larger scale re-colonization is possible.

In view of the many risks involved and the costly nature of reintroduction projects, extra care should be exercised when planning for these. The first step will be to gather rigorous scientific information. Research needs to be carried out in South China's intact forests to see which species perform the ecological functions we want to fill. We also need to find out the exact requirements of the target species to determine whether existing Hong Kong forests (in terms of size, forest structure, food availability, predators/disease, etc.) are suitable.

Reintroduction is just one of many conservation tools and we need to prioritise them. Locally there are many urgent conservation issues that need to be tackled. For instance, we still lack a conservation policy; the vast majority of the important sites identified by the Biodiversity Survey undertaken by HKU remain unprotected, many marine species are still facing uncontrolled exploitation, and most invertebrate groups have yet to be inventoried. Reintroduction of several common and widespread species, i.e. Phase 1 in Richard's articles, does not seem to be particularly pressing. Hong Kong biota is part of the South China region and we should not treat it in isolation. South China forests and the species they support are under immense threats. A lot of input in terms of funding, expertise, education, capacity-building and community development will be needed to reduce these threats. I think that in most cases, resources put into reintroduction projects could be better spent in *in-situ* conservation. There are obviously exceptions and we need to identify them based on hard data. That's the alternative to 'experimenting' on an *ad hoc* basis, as Richard proposes.

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Michael Lau

Let's meet Benny Kwok Kan Chan

by Benny Chan

This is the third recent passage in 'Porcupine' introducing new members of staff in the department. After Billy and Kenny, here I am Benny. (Hope this will not get you confused with names!) Those in the Department of Ecology & Biodiversity are quite familiar with Benny---'born' in this Department in 1993 as an Environmental Science undergraduate student, and now a Research Assistant Professor (RAP) in 2002.

During my childhood, my family often went to beaches in Stanley. Apart from swimming, I spent much of my time looking at the creatures on the shores. As a result, I developed a keen interest in inter-tidal organisms as a child. I particularly recall the time when I was an A-level student, when I had a field trip to Cape d'Aguilar. This was my first sight of the Swire Marine Laboratory (now called the Swire Institute of Marine Science – SWIMS). At that very moment, I started to think about how great it would be if I could have an opportunity to conduct marine research at that laboratory in the future. Today, my RAP post is based exactly at SWIMS. My big dream has come true!

In the summer of 1994, I first learnt what formal ecological research was all about. Being a student research assistant supervised by Dr. Gray Williams, I was assigned to study limpet trails. This proved to be a good head start and I learnt a lot of good research practices including the setting up of field and laboratory log books for recording ideas, data and observations related to research. Today, I also encourage my students to stick to such good and systematic research practices. My final year B.Sc. project was related to rocky shore ecology investigating the physico-chemical environment in rocky pools. This final year project further stimulated my research interest in inter-tidal ecology. In 1996, I started my Ph.D. degree investigating the ecology of the rocky shore barnacles *Tetraclita squamosa* and *Tetraclita japonica* in Hong Kong, and once again, Gray was my supervisor. In this research, *T. squamosa* and *T. japonica* were separated into different species using adult and larval morphological analyses and allozyme electrophoresis. A comparative ecological study was then conducted to compare the distribution, population dynamics, reproductive biology, larval morphology and recruitment of the two *Tetraclita* species.

Conducting research during my post-graduate life was a very enjoyable experience. Besides gaining knowledge in barnacle ecology by conducting independent research, I also learnt from my supervisor a lot about research ethics in performing good quality work which has influenced my research. Although my supervisor is a limpet 'nut' always playing jokes in saying that limpets are interesting but barnacles are boring, barnacles, in fact, are far more interesting than limpets. Try to think of any marine environment or habitats where you cannot find a barnacle? Have you ever figured out how many life forms of barnacles there are?

As Jerome Tichenor said:

"There are some crusty balanoids who ride on whales,
And among the hosts in more congenial climes,
Is dainty *Janthina* who harbors as she sails,
A little *Lepas* sweeping water for its feeding times…..

Their variety of life and form is great in ocean's range:
Borers into snail shells, and parasitic ways so nauseous,
And shadow dodging *Pollicipes* is passing strange,
Yet all begin their lives as a dainty nauplius!"

(From: New Frontiers in Barnacle Evolution, Frederick R. Schram and Jens T. Hoeg(eds). A.A. Balkema/Rotterdam/Brookfield. 1995, pp.9.)

After obtaining my Ph.D. degree at 1999 I started my post-doctoral studies (2000-2002) in the Virtual School of Biodiversity (VSB), a collaborative project between our Department and the University of Nottingham, UK. My research in this project focused on creating an independent student-centred learning environment in environmental education using web-based resources. This project gave me new opportunities for conducting educational research beside scientific research. Working with colleagues in the department also involved in the VSB project, I was involved in designing and implementing Learning Support Centres, web-based practicals and Virtual Scrapbooks for courses in the Environmental Life Sciences Programme to enhance students' learning environment. The pedagogy of web-based practicals and Virtual Scrapbooks was published in international refereed educational journals. Continuing to work on computer assisted learning materials for the course in the Environmental Life Science Programme, my VSB and DEB colleagues and I won first place awards in both the first (2001) and second (2002) IT in Education Competition in HKU and this gave us tremendous encouragement!

My current research focuses on the patterns and processes affecting organism distributions in mangroves. Previous studies on the factors affecting distribution patterns of intertidal organisms were mostly conducted on rocky shores, with few studies made in other intertidal habitats, resulting in little assessment of the generality of the patterns seen. Investigations of the factors affecting the distribution patterns of intertidal organisms, therefore, need to be conducted in a variety of intertidal habitats including mangroves, sandy shores and boulder shores. Currently, I am using mangrove barnacles, which are common on the mangrove tree trunks, as an example to study the effects of biological factors, such as larval supply and settlement, as well as physical factors including heat stress, in affecting the horizontal and vertical distribution patterns in mangroves. This study will initiate a research programme addressing the distribution patterns of barnacles in mangroves, their larval morphologies, larval supply and settlement processes in relation to their distribution patterns. I am also interested in the morphology and ecology of the parasitic barnacle, *Sacculina sinensis* (Crustacean: Rhizocephala) in Hong Kong, which infects the intertidal crab *Leptodius exaratus*. At present, I am involved in teaching

Coastal Ecology and co-ordinating the Dissertation course in the Environmental Life Science Programme.

Apart from conducting research, I am also responsible for establishing mechanisms and processes so as to ensure that SWIMS runs as an effective Institute. Currently, I am updating and arranging the specimens and database in the museum of SWIMS and creating systems so that the museum will serve as a useful marine research resource. I am also designing systems for new students, research assistants and foreign visitors so that they can start their work easily at SWIMS.

I also involve myself very much in the department. From being a Post-doctoral Research Fellow to date, I have been responsible for developing and maintaining the connections between the department and local secondary schools, introducing secondary school students to the basic ecology of Hong Kong and to our undergraduate Programme in Environmental Life Science. I am also involved in the JUPAS Open Day designing and managing the demonstrations of our Environmental Life Science Programme to the JUPAS students. Collaborating with the staff in this department, we have a grant in the UGC Interface Project 2000 to create workshops for secondary school teachers so that they can teach more effectively in the field. We also hold a grant from the HKU Seed Fund for authoring Environmental Field Guides for secondary school students so that they can have easy access to identification of organisms and information on the basic ecology of Hong Kong habitats. This summer, I am representing the department in a Faculty-organised function titled "Summer Science Institute for Secondary Students" and am responsible for taking students to Cape d'Aguilar to look at the marine organisms and their conservation in Hong Kong.

Marine ecology is a very enjoyable profession. When alone on the shore, you can think a lot about ecology. As Keats Sonnet said "…Then on the shore. Of the wide world I stand alone, and think…" *(From Ecology of Rocky Coasts, essays presented to J.R. Lewis, D.Sc., P.G. Moore and R. Seed (eds). Hodder and Stoughton 1985, pp.467).*

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INVERTEBRATES

A note on butterflies utilising longan fruit

by Roger Kendrick

Observation date: 14-August-2002; weather – fine and hot, max temperature approximately 33°C, light easterly winds. Location: Ping Long, Lam Tsuen Valley, N.T.; recorded by: Roger Kendrick.

For one day from 10:30 to 12:30 and 13:30 to 15:00 a longan tree with many unharvested fruit was observed to record butterfly species utilising the over-ripe fruit as a food source. The tree in question is a large longan (*Euphoria longan*, Sapindaceae), some 10 m in height, with a spread of approx. 12 m and a heavy crop of fruit. The tree was observed from the second floor of an adjacent building. Initial observations were made by searching for butterflies in flight around the tree. Once alighted, butterflies were viewed with the aid of 10x50 binoculars, or a telescope using a x20 magnification to confirm that the butterfly was using its haustellum ("tongue") to imbibe the juice from the longan fruit. Identifications of the butterfly species were made by comparison with plates in Bascombe *et al*. (1999), Marsh (1960), Johnson & Johnson (1980) and Chou (1994).

A total of 13 species was recorded to utilise the longan fruit (table 1). Of these species, eight are not listed by Bascombe *et al*. (1999) as using ripe fruit (other than figs) as a food source, and are marked (*) in Table 1. This includes three species of Lycaenidae, a family not listed by Bascombe *et al*. (1999) as using ripe fruit (other than figs) as a food source.

One further species was recorded at the same location on 11 August (by R.C.Kendrick and Cecily Law) at around 17:00, also feeding on the longan fruit. Initially thought to be *Polyura nepenthes*, closer inspection through the telescope revealed an unfamiliar ventral pattern that, upon referring to Chou (1994), matched the illustration of *Polyura eudamippus* (Doubleday, 1843) and would represent a new Hong Kong record. However, as no photographs were taken nor a voucher specimen collected, this record must be regarded as a provisional sighting only. Notes taken on distinctive markings were as follows: ventral post-median fore wing band straight, sub-medial band angular with an extension of the band from its centre costally towards the post-medial band; ventral hind wing medial band incomplete, with the dorsal third missing (see Figure 1). As a result of this sighting, all future records of *Polyura nepenthes* in Hong Kong should be closely checked for possible *P. eudamippus*.

Table 1: butterfly species observed feeding on longan fruit

Family	Subfamily	Tribe	Species	Time
Nymphalidae	Satyrinae		*Elymnias hypermnestra* (Linnaeus, 1763) *	pm
	Nymphalinae	Limenitidini	*Parathyma sulpitia* (Cramer, 1779)	am, pm
			Euthalia lubentina (Cramer, 1777)	am
			Euthalia phemius (Doubleday, 1848)	am, pm
		Nymphalini	*Hypolimnas bolina* (Linnaeus, 1758)	am, pm
			Junonia atlites (Linnaeus, 1763) *	am, pm
		Apaturini	*Hestina assimilis* (Linnaeus, 1758) *	am
			Rohana parisatis (Westwood, 1850)*	pm
	Charaxinae	Charaxini	*Polyura nepenthes* (Grose-Smith, 1883) *	pm
			Charaxes bernardus (Fabricius, 1793)	pm
Lycaenidae	Theclinae	Amblypodiini	*Iraota timoleon* (Stoll, 1790) *	pm
		Deudorigini	*Rapala manea* (Hewitson, 1863) *	am
	Lycaninae		*Heliophorus epicles* (Godart, 1824) *	pm

* see text for explanation

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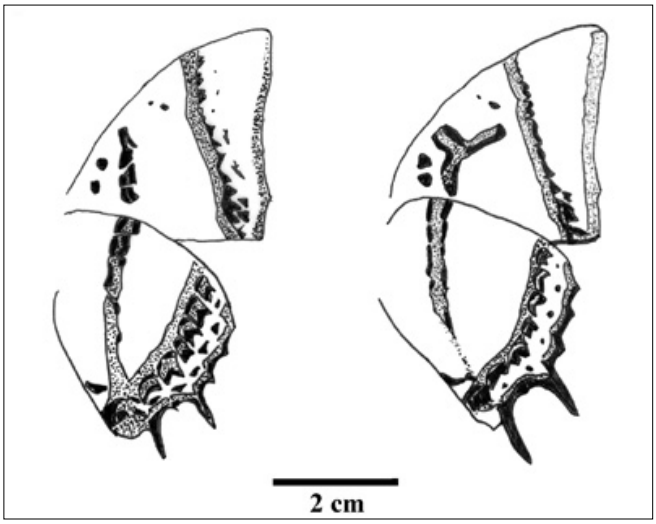

Figure 1: ventral wing patterns of *Polyura nepenthes* (left) and *P. eudamippus* (right)

New records of epilithic cyanobacteria: a further documentation of rocky shore species richness

by Sanjay Nagarkar

As we approach November, the algal assemblages on rocky shores seem to be more comfortable after facing harsh physical environmental conditions during the summer (June to September). Many of these were cyanobacteria, well able to tolerate these harsh conditions and that served as the only primary producers on rocky shores. The situation in winter, however, when environmental conditions are favourable for algal growth is very different. At this time of the year (November-March), Hong Kong rocky shores are densely populated by a variety of micro- and macroalgal species, of which the proportion of microalgal species is much higher. These species comprise cyanobacteria, diatoms and the spores and sporelings of macroalgae, that inhabit the entire tidal gradient in the form of an epilithic biofilm, exhibiting distinct zonation patterns. In the biofilm, cyanobacteria are the most important primary producers due to their high nutritional quality, fast production rate and great species diversity. A wide salinity gradient, oligotrophic and eutrophic waters and different rock types, i.e., basalt, granodiorite and volcanic tuff on Hong Kong rocky shores, provide a favourable environment to accommodate a large variety of epilithic cyanobacterial species.

In the past four years, I have surveyed the coastline of Hong Kong to document cyanobacteria species richness and biodiversity. So far, I have recorded more than 200 species, many of which are believed to be new to science (Nagarkar 1998, 2000, 2001, 2002). During this survey I made an interesting observation. In winter, at mid-shore levels, the biofilms become thicker and are mostly composed of non-heterocystous, filamentous, cyanobacteria, especially a species of the genera *Lyngbya*, *Oscillatoria* and *Phormidium* (LOP). These species are the major food items for intertidal grazers in the mid-shore. Morphological investigation of the thick LOP biofilm revealed a total of 32 filamentous species from 26 locations around Hong Kong's rocky shores (Fig. 1, 2), all of which are new records for Hong Kong (Table 1). The addition of these species takes the Hong Kong cyanobacteria checklist to 87 published species. At present, I am compiling unicellular and heterocystous cyanobacteria species richness lists. Please don't forget to check your next issue of *Porcupine!* for an update on Hong Kong's cyanobacteria diversity.

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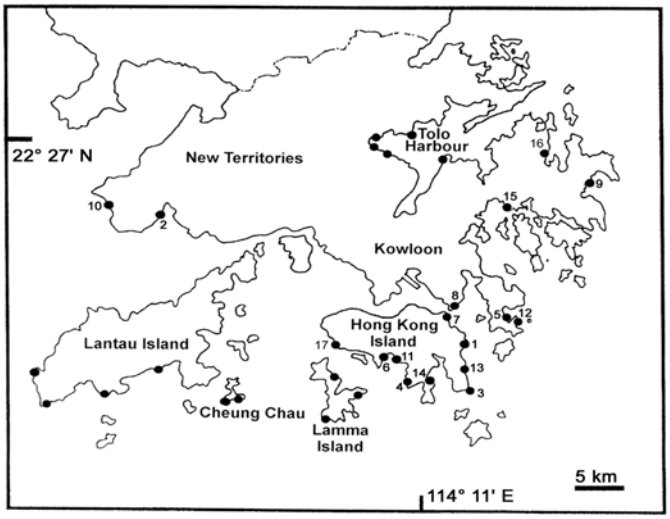

Fig. 1. Location of rocky shores survey areas around Hong Kong (• sampling site). Principal sites are numbered as follows: 1. Big Wave Way, 2. Butterfly Beach, 3. Cape d'Aguilar, 4. Chung Hum Kok, 5. Clear Water Bay, 6. Deep Water Bay, 7. Heng Fa Chuen, 8. Lei Yue Mun, 9. Long Ke Wan, 10. Lung Kwu Tan, 11. Middle Bay, 12. Shek Mei Tau, 13. Shek O, 14. tai Tam, 15. Stanley Bay, 16. Tai Mong Tsai, 17. Tai Tan, 18. Wah Fu.

Table 1. Check list of epilithic cyanobacteria; genera *Lyngbya, Oscillatoria* and *Phormidium*.

Lyngbya cf. *aeruginosa-coerulea* Kützing *ex* Gomont,
Lyngbya cf. aesturaii var. constricta Ghose,
Lyngbya cf. *birgei* Smith G. M.
Lyngbya cf. *cinerescens* Kützing
Lyngbya cf. *hieronymusii* Lemm.
Lyngbya cf. *major* Meneghini *ex* Gomont
Lyngbya cf. *martensiana* var. *minor* Gardner
Lyngbya cf. *stagnina* Kützing
Lyngbya cf. *truncicola* Ghose
Oscillatoria cf. *annae* van Goor *ex* Gomont
Oscillatoria bonnemaisonii Crouan *ex* Gomont
Oscillatoria cf. *borneti* (Zukal) Forti
Oscillatoria brevis Kützing *ex Gomont*
O*scillatoria chalybea* Mertens *in* Jürgens *ex* Gomont
Oscillatoria cf. *curviceps* Agardh *ex* Gomont
Oscillatoria cf. *irrigua* Kützing *ex* Gomont
Oscillatoria cf. *limosa* Agardh *ex* Gomont
Oscillatoria margaritifera Kützing *ex* Gomont
Oscillatoria cf. *obtusa* Gardner
Oscillatoria cf. *ornata* Kützing *ex* Gomont
Oscillatoria cf. *princeps* Vaucher *ex* Gomont
Oscillatoria cf. *proboscidea* Gomont
Oscillatoria cf. *salina* Biswas
Oscillatoria sancta Kützing *ex* Gomont
Phormidium ambiguum Gomont

Phormidium anomala Rao C. B.
Phormidium stagnina Rao, C. B.
Phormidium retzii (Ag.) Gomont
Phormidium lucidum Kütz. *ex* Gomont
Microcoleus acutissimus Gardner
Microcoleus chthonoplastes Thuret *ex* Gomont
Hydrocoleum lyngbyaceum Kütz. *ex* Gomont

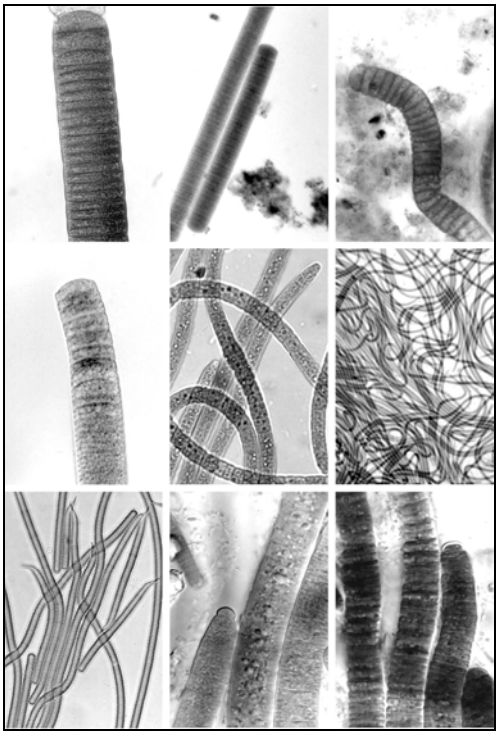

Fig. 2. Some examples of epilithic marine cyanobacteria (LOP); size (width) ranges from 10- 50 μm.

VERTEBRATES

An endemic enigma: the secret identity of Hong Kong's black paradise fish

by David Dudgeon

For a time, it seemed that we had things sorted out. There were two species of paradise fishes belonging to the genus *Macropodus* in Hong Kong: the common Chinese paradise fish, *Macropodus opercularis*, plus the recently recorded and relatively scarce black paradise fish, *Macropodus concolor*. A third species, the round-tailed paradise fish, *Macropodus ocellatus*, occurs further north in mainland China but has not been found in Hong Kong. Things appeared pretty simple: the two co-occuring *Macropodus* were easily distinguished by their colour patterns (*concolor* lacks the vertical banding of *opercularis*), although those seeking morphological differences between the two would have had to examine bony structures (specifically the otoliths). Scientists are frequently urged to seek simplicity of this type, but to mistrust it. Mistrust or skepticism was certainly warranted in this case, as the benefit of hindsight now shows. In fact, *M. concolor* does not occur in Hong Kong. Our 'black paradise fish' is, in fact, not the black paradise fish (i.e. *M. concolor*) but another black paradise fish. It has now been described by Jörg Freyhof and Fabian Heder, from specimens collected at Sha Lo Tung, and named *Macropodus hongkongensis*. Freyhof & Heder (2002) relegate *M. concolor*, first recorded from Hong Kong by Dudgeon & Chan (1996; see also Dudgeon, 1999; Chan & Töpfer, 2000), to a junior synonym of *M. hongkongensis*. The new species is, as far as anyone knows, a Hong Kong endemic. Given the threats to its habitat in Hong Kong (especially lowland marshes – the former wetland at Sham Chung comes to mind), *M. hongkongensis* should be treated as an endangered species.

So what is the difference between *Macropodus concolor* and *Macropodus hongkongensis*? To all intents and purposes they are indistinguishable by external characteristics when dead and preserved in formalin. In life, however, they can be separated by their colour. *Macropodus hongkongensis* has black spots on the top of the head and may have blotches on the back (around the anterior portion of the doral fin). In addition, it has a thin black margin along the anal fin. These characters are lacking in *M. concolor*. An additional distinguishing feature – probably the most conspicuous one - is the pelvic fin rays: the first soft pelvic fin ray of *M. hongkonensis* is white; it is red in *M. concolor*. Furthermore, *M. hongkongensis* has an opercular spot that *M. concolor* lacks or expresses indistinctly. There are also subtle differences in the scale pigmentation. As far as is known these two species are geographically separate, and may have evolved independently from populations of the widely distributed *M. opercularis* in Vietnam (*concolor*) and southern China (*hongkongensis*).

Is that the end of the story? Not at all. It turns out *Macropodus concolor* is not really *M. concolor.* In fact, *M. concolor* does not really exist! Let me explain. When Ahl described the 'original' *M. concolor* in 1937 he treated it as a subspecies of *M.opercularis*: i.e. *M. opercularis concolor* (Ahl, 1937). Vierke (1983) raised the subspecies to full speices rank, and this assignment has been widely accepted (Paepke, 1994). However, unknown to Ahl, Schreitmüller (1936) had already described some of the same batch of fish specimens as *M. opercularis* var. *spechti* in honour of the German aquarist M. Spechti who received the first importation of these paradise fishes to Europe. Under the International Code of Zoological Nomenclature, the oldest name applied to a species normally has precedence and, since both workers described portions of the same collection of fish, it is clear that *M. spechti* is the valid name (Freyhof & Heder, 2002). So *M. concolor* disappears, relegated to a junior synonym of *M. spechti*.

To recap: there are two species of paradise fish in Hong Kong: *Macropodus opercularis* and *M. hongkongensis* (the fish

formerly known as *M. concolor*). An additional species that resembles *M. hongkongensis* is confined to Vietnam; it is called *M. spechti* (the other fish formerly known as *M. concolor*).

Some of the fishes known in the European aquarium trade as *M. concolor* are the descendents of Spechti's original importation almost 70 years ago, and are now highly inbred. Others may be later exports from Vietnam or Hong Kong. This means that the actual identity of any fish illustrated in the aquarium literature under the name *M. concolor* is uncertain. But we can be confident of one thing: *M. concolor* is the wrong name! Of greater importance, we now know that Hong Kong is host to an endemic and apparently endangered freshwater fish. The challenge is now to conserve it. Inclusion under the Protection of Endangered Species Ordinance in Hong Kong would be a constructive initial step.

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Fig. 1 A black paradise fish

New reef fish from High Island dam dollos

by Keith Wilson
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At the High Island Dam, just south of Long Ke Wan, a very rich coral and associated fish community has developed on the mass concrete structures (dollos). These structures were placed in front of the dam in 1974 to protect it from rough seas. The dollos form a 0.5 km stretch of artificial reef rising from over 12 metres depth to the sea's surface. After five years, in 1979, according to P.J. B. Scott's book on the Corals of Hong Kong, published in 1984, six species of hard coral had begun to colonise the dollos. Today, a rich and extensive coral community has developed with many encrusting corals, including numerous table corals (*Acropora solitaryensis*) with some measuring up to 1 metre in diameter. A few hermatypic corals even occur at depths below 10 metres, which is unusual for Hong Kong's turbid waters. A recent fish SCUBA survey, conducted on August 14 2002, encountered 70 fish species at the dollos including several species known to associate with hard coral reefs such as the butterflyfish *Chaetodon octofasciatus*. Two species, the Blackfin dartfish (*Ptereleotris evides*) and the Pearlscale angelfish (*Centropyge vrolikii*) were newly recorded for Hong Kong. Several small shoals of juveniles of *Ptereleotris evides* were observed and at least three separate individuals of adult *Centropyge vroliki*. The High Island Dam dollos, form an artificial reef with a high level of complexity, which has been established in shallow waters for over 28 years. It is here that Hong Kong's most diverse artificial reef fish communities can be found. Few local natural reefs including coral reefs can rival the diversity of fish found at the High Island Dam dollos. A one-year consultancy study has recently been awarded to assess the marine biodiversity of the marine area east of High Island Dam, including the dollos, in consideration of this location as a potential Marine Park.

The humphead wrasse: a threatened species

by Yvonne Sadovy

The humphead, Maori or Napoleon wrasse, *Cheilinus undulatus* (So Mei in Cantonese), is one of the largest reef fishes in the world, exceeding 2 m in maximum length and 30 years of age. This species is highly regarded for its flavour and texture and, in many places in the Pacific, is considered to be a special fish, presented to community leaders or only used on special occasions. Long-lived and slow maturing fishes such as the humphead, which takes about 5 years to become sexually mature at about 50 cm in total length, are particularly

vulnerable to overfishing and the humphead wrasse has declined significantly in many parts of its geographic range because of overexploitation. The declines are due to excessive catches, both by spearfishing for traditional use and for the live reef food fish trade. Recent surveys show that live humpheads currently on sale in Hong Kong's retail markets are mostly juveniles (i.e., below 50 cm total length) and have therefore never had the chance to reproduce to replenish populations. This species is listed as vulnerable on the IUCN Red List and has recently been formally proposed for an Appendix II listing on CITES. For more information, see: www.humpheadwrasse.info.

Humphead wrasse on sale in Lei Yue Mun Market

Reproductive biology of *Halichoeres nigrescens*, the bubblefin wrasse

by Valerie C.M. Ho

A great variety of sexual patterns is exhibited by the teleosts. Labrids are generally gonochorists or protogynous hermaphrodites (Kobayashi and Suzuki 1990, Shibuno *et al*. 1993, Sadovy and Cornish 2000). Any species that functions as only male or female throughout life is considered to be gonochoristic. Sequential change of sex from female to male (protogyny) can be further subdivided into two forms, monandry (all males derive from sex changing females) and diandry (some males derive from juveniles, others from sex-changing adult females).

The family Labridae is one of the best studied groups of fish for protogynous hermaphroditism and this sexual pattern is better known in this family than in any other (Kobayashi and Suzuki 1990; Shibuno et al. 1993; Gillander 1995). Little is known of the reproductive cycle and sex succession in the life history of *Halichoeres nigrescens*, however, although it is a very common species in Hong Kong waters and the most common wrasse (Sadovy and Cornish 2000). This summer I had the chance to inspect some slides of the gonads of *H. nigrescens* taken from throughout the year. This article describes the reproductive biology of bubblefin wrasse. These data may be relevant to the management of *H. nigrescens* and provide reference for further research.

The sex and size frequency distributions fit the general labrid pattern of size and sex distribution indicating that *H. nigrescens* is a protogynous hermaphrodite. The fact that no males are found at smaller sizes suggests that all males are derived from females, i.e. monandry. The inspection of monthly data of the various maturity stages by sex revealed that the fish become mature from May to September inclusive as indicated by the dominance of vitellogenic (i.e. yolky) oocytes. The species has a spawning season that lasts for three months. This contrasts with the year-round spawning in some tropical species as suggested by Warner and Robertson (1978). A distinctive feature is observed in the inactive mature male. Sperms in the early developing stage aggregate in lobules with tails oriented towards the centre. This feature is lost later when the gonads become ripe close to spawning. The significance of this to the biology of the species requires further investigation.

This work was conducted as part of a summer project. Taking up this project was a challenge for me, because I knew nothing on this topic. In the end, I overcame all the difficulties and managed to come out with a story. If I could have also collected samples and prepared slides, it would have made my job more complete but I was working with samples already collected and prepared I wish to thank Dr. Sadovy for giving me this opportunity to explore and provide me the guidance and support throughout my job.

Note: Funding for Valerie's summer research position was provided by proceeds from the sale of Sadovy and Cornish, 2000, initially funded by the Hong Kong Jockey Club.

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What is SCRFA?

by Yvonne Sadovy

Many species of fish aggregate to spawn. Since these spawning aggregations are likely the only opportunity for such species to reproduce, and can be highly predictable in time and space, they are typically easy to find and readily overexploited. Experience in the Pacific, and elsewhere, including Hong Kong (see Chinese bahaba in *Porcupine !*24), shows that heavily fished aggregations rapidly decline, with

serious consequences for the future of fish populations that depend on them. SCRFA stands for the Society for the Conservation of Reef Fish Aggregations and was founded in 2000, following a mini-symposium on reef fish spawning aggregations, in response to biologists' concerns over the increased commercial targeting of reef fish spawning aggregations. While these are well able to sustain subsistence fishing levels, they clearly do not withstand the heavier levels associated with larger scale commercial fisheries, such as some of the tourist markets for chilled fish in the Caribbean and export markets in the Indo-Pacific like the luxury trade in live reef fish. The heavy fishing of spawning aggregations is considered to be a significant threat to the sustainable use of reef resources. SCRFA has received funding from the Packard Foundation to generate a database, carry out research, and produce educational materials on spawning aggregations as a basis for improving their management and conservation.

Starling Inlet – tomorrow's empty wetland?

by Captain Wong

Starling Inlet is a sheltered bay in the northeast New Territories, with small and fragmented wetlands scattered along the coast that support a surprisingly high number of waterbirds (Wong *et al.* 1999, 2001). Waterbird counts in Starling Inlet since 1997 have shown an increase in the number of breeding Great Egrets (from about 28 pairs in 1997 to 52 in 2001), and wintering Cormorants (from about 10 in 1997 to 700-800 in 2001), but a decrease in the breeding population of Cattle Egrets (from about 50 pairs in 1998 to about 28 in 2001). The count shows that Starling Inlet still holds the biggest local breeding population of egrets and herons, in particular Great Egrets (63% of the breeding population in Hong Kong in 2001) and Night Herons (71%).

Apart from recording the fluctuations in waterbird numbers, habitat changes in surveyed areas were also noted. These changes are mostly caused by humans and have resulted in negative impacts on the waterbirds there. The following table summarizes these changes and their impacts on the birds. Changes and disturbances were observed by the author, while the impacted area was estimated from an aerial photograph. The legality of the impacts was assessed by correspondence and communication with the relevant government departments.

Site	Type of change/ disturbance	Estim-mated area (ha)	Legality	Period	Impacts
Nam Chung	Fishpond filling for culturing fish in tanks	0.7	Legal	Early 2000 – present	Direct loss of wetland feeding habitat
Luk Keng	Opening fishponds for recreational fishing from bunds	1.5 – 2.0	Legal	Late 2001 - present	Indirect loss of wetland feeding habitat as humans are active around the fishponds on holidays
Luk Keng	Playing with remote-controlled helicopters in the freshwater marsh	>10	Legal	Early 2000 - present	Indirect loss of feeding habitat due to human activity and the noise emitted from helicopters
A Chau	Film production when egrets were nesting there	0.5	Legal	7 March 2002	Film production on the island caused a great disturb-ance to the nesting egrets. This could result in loss of eggs and mortality of chicks
Nam Chung	Channel-ization of Nam Chung River	0.5?	Legal	2001?	Reduce suitable feeding habitats for egrets and kingfishers
Nam Chung and Luk Keng	Electro-fishing and fish netting at Nam Chung River and the Luk Keng fresh-water marsh	>10	Electro-fishing – illegal Netting -?	Since 1997	Reduced fish populations and thus prey availability to egrets and kingfishers
Sha Tau Kok	Clearing a piece of disturbed grassland for open storage in close proximity to a winter day-time roosting site of Night Herons	0.25	?	Around late 2000 – present	The roosting site became too open and Night Herons abandoned it subsequently .

Although there has been no massive loss of wetland feeding habitats in the inlet, the cumulative impacts of these relatively minor disturbances and changes on the waterbirds are worrying. A particular concern is the apparently growing trend in the inlet towards exploiting traditional fishponds for culturing fish in tanks and recreational fishing, an activity that may generate more income than the traditional fishponds. According to the Planning Department Technical Circular on "definition of terms used in statutory plans", culturing fish in tanks and recreational fishing are "agricultural use", therefore these two activities are always permitted in areas zoned as agricultural land or even as Conservation Areas under the Town Planning Ordinance. In addition, there is a concern that this use of traditional fishponds for recreational fishing or other recreational activities may spread to the Deep Bay area. Recent observations in February and March 2002 indicated that at least one fishpond near Mai Po Nature Reserve is used for playing with remote-controlled speed boats, causing great noise pollution. From a conservation point of view, recreational activities in fishponds should be kept under control. Uncontrolled recreational activities in fishponds

would certainly degrade the ecological functions of this habitat for wildlife.

In view of the above-mentioned recreational activities and the legal loss of wetland habitats, it is clear that the existing planning controls alone cannot achieve the general planning intention stated in the Luk Keng and Wo Hang Outline Zoning Plan, i.e., preserving natural landscape and features of ecological significance, and promoting the conservation of the rural character of the area. A long-term conservation plan should be made by the relevant government departments, local residents, conservationists and other interested parties. It is hoped that the current review of Conservation Policy will help to protect the Starling Inlet wetlands.

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The 2002 Woodland Breeding Bird Survey – result highlights

by Captain Wong

Since 1998, volunteer birdwatchers have visited Tai Po Kau (Red, Blue and Yellow/Brown Walks), Shing Mun and Kowloon Hill Catchment once a month from April to July to record breeding birds and their summer populations. Significant breeding records between May and July in this breeding season were (1) one food carrying Mountain Bulbul in Shing Mun and (2) an unidentified cuckoo juvenile in May and June in Tai Po Kau, probably either a Large Hawk Cuckoo or Hodgson's Hawk Cuckoo.

The Mountain Bulbul would be a new breeding species for Hong Kong if this record is accepted by the Records Committee of the Hong Kong Bird Watching Society. A "food carrying adult" is considered as "confirmed breeding" by the European Ornithological Atlas Committee.

The followings are the result highlights:

May

Tai Po Kau
i. Unidentified newly fledged cuckoo juvenile. No foster parent was seen
ii. Grey-throated Minivet: 1 nest
iii. Crested Goshawk: display flights
iv. Hainan Blue Flycatcher: 5 calls and 1 female
v. Eagle Owl: 1 present

Shing Mun
i. Hainan Blue Flycatchers: 3 calls
ii. Hodgson's Hawk Cuckoo: 3 calls

June

Tai Po Kau
i. Grey-cheeked Fulvetta: 1 food carrying
ii. Blue-winged Minla: 1 juvenile and 1 food carrying/holding adult
iii. Grey-throated Minivet: 1 food carrying
iv. Hainan Blue Flycatcher: 2 juveniles
v. Pekin Robin: food carrying adults
vi. Silver-eared Mesia: 1 food carrying and 1 holding prey
vii. Chestnut Bulbuls: 1 holding prey
viii. An identified cuckoo juvenile (size of Hodgsons' Cuckoo; two white spots between the shoulder and the neck)

Shing Mun
i. Greater Necklaced Laughing Thrush: 1 juvenile begging food
ii. Grey-throated Minivet: 1 juvenile
iii. Hodgson's Hawk Cuckoo: 1 call

Kowloon Hills
i. Hwamei: 2 juveniles
ii. Red-capped Babbler: 1 juvenile
iii. Blue-winged Minla: 2 juveniles
iv. Crested Goshawk: 1juvenile with an adult (flying)

July

Tai Po Kau
i. Yellow-cheeked Tit: 1 juvenile
ii. Grey-throated Minivet: 2 juveniles

Shing Mun
i. Red-capped Babbler: 1 juvenile begging food
ii. Pekin Robin: 1 juvenile begging food
iii. Mountain Bulbul: 1 food carrying adult (observation distance: 3 - 15m)
iv. Blue-winged Minla: 1 juvenile

Apart from these woodland specialists, Crested and Chinese Bulbuls, Great Tits, Japanese White-eyes, Common Tailorbirds and White-backed Munia were also found to breed in these woodlands.

Please contact me at wongcaptain@yahoo.com if you want to join us in the next breeding season. Thanks.

Nesting population of egrets and herons in 2002 – preliminary results

by Captain Wong

In the 2002 breeding season, there was a total of 972 nests of egrets and herons in 19 egretries, including Great Egrets (*Egretta alba,* 112 nests), Little Egrets (*Egretta garzetta,* 269 nests), Cattle Egrets (*Bubulcus ibis,* 79 nests), Black-crowned Night Herons (*Nycticorax nycticorax,* 250 nests) and Chinese Pond Herons (*Ardeola bacchus*, 262 nests). Egretries at To Kau Wan on Lantau, and Che Ha, Shek Kong were first reported (a new one at Tai Tong, Yuen Long was found in the very late breeding season and it is not considered due to the

late discovery date and incomplete count), while the one at Shui Mei was abandoned. Relocation of nesting sites at Pak Nai and the Stonecutters was noted. A Chau (301 nests) was the largest egretry in this breeding season, while Tai O was the smallest (11 nests). Little Egret, Black-crowned Night Heron and Chinese Pond Heron were the three most abundant breeding species in Hong Kong, while Cattle Egret was the least abundant. In the Deep Bay area, a total of 289 nests was recorded. Little Egret (135 nests) was the most abundant breeding species there, while the nesting population of Black-crowned Night Herons declined dramatically.

In general, a 16% increase in nest numbers in Hong Kong was found between 2001 and 2002. This increase may be explained by the warm winter temperature between January and April 2002. Such warm temperature may enhance the recruitment of aquatic prey. Therefore, a higher prey availability may result and this could encourage more ardeids to breed in this year (Fig. 1 and 2).

Fig.1 (left) Three Night Heron chicks probably 3 weeks old at Mai Po village. Fig. 2. (right) A nesting Great Egret at Mai Po village.

Is the Yellow-throated Marten in Hong Kong?

by Michael Lau

There has only been one single sighting of Yellow-throated Marten (*Martes flavigula*) in Hong Kong, in which a juvenile was seen near Wu Kau Tang (Cook, 1994). This record was often quoted by subsequent authors who treated this species as native to the territory (e.g. Reels, 1996; Pei, 2001). However, while the mammal survey conducted by the Wildlife Conservation Foundation failed to find this species, another mustelid, Yellow-bellied Weasel (*Mustela kathiah*), was photographed by camera traps in the Pat Sin Leng area (Pei, 2001). Cook's (1994) descriptions of the animal - body length 200-250 mm, uniform dark-chestnut upperparts and orange cream colour underparts - actually match that of Yellow-bellied Weasel. On the other hand, the Yellow-throated Marten is much larger (body length 450-560 mm), the fore body is paler than the head and the hind body, and only the throat and chest are yellow in colour (Lekagul and McNeely, 1988; Ma *et al*., 2001). Cook (1994) thought the animal he saw in late May was probably a juvenile Yellow-throated Marten of about 2-months old because of its small size. However, Yellow-throated Marten is reported to give birth in May (Sheng *et al.*, 1999), thus casting further doubt on the original record. Hence, I think the Wu Kau Tang animal was actually a Yellow-bellied Weasel which locally seems to be restricted to the Northeast New Territories.

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More tiger talk

by Dan Waters
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I enjoyed reading *Porcupine!* (Number 25, May 2002), especially the article entitled, "A view to a kill – the mythologisation process in action", by Jonathan Downes. In fact I enjoyed it so much I have been prompted to add my own two penn'orth. For what it's worth here it is.

In early 1955, I recall news went around that a leopard had been spotted in the New Territories. On this occasion it was probably no more than a rumour. Leopards were rarer than South China Tigers. Quite frequently in the 1950s and '60s, news went the rounds that a tiger was visiting (or had visited) the Colony. I believe and still like to believe that tigers came into Hong Kong for short periods, from Guangdong, during my early days here.

I arrived less than a decade after the end of World War Two. Many of my colleagues had been interned and some mentioned on odd occasions the tiger that was shot by Rur Singh, an Indian policeman, in front of Stanley police station in May 1942. Some would add, "Of course there was a circus in town when the Japanese attacked (in December 1941), a tiger must have escaped …"

G. A. C. Herklots took a rather different view. In his book, *The Hong Kong Countryside Throughout the Seasons* (*South China Morning Post*) first edition published in 1951 and long out of print, he wrote:

"*During our internment at Stanley a remarkable story filtered into the camp that there was a tiger at large on Hong Kong*

Island. Later it was reported to be on Stanley Peninsula; our Formosan guards got very excited and it was risky walking about in the evening for an excited guard might fire at a prisoner mistaking him for a tiger! Soon pug marks were seen in the camp: I examined some myself but was by no means convinced. Then the story was spread that the tiger had been shot dead and finally there came into camp a Chinese or Japanese paper containing a photograph of the dead tiger. This photograph I saw. People said it was a menagerie animal that had got loose: a likely story! It is strange how loath people are to believe that tigers do visit the Colony and occasionally swim the harbour and visit the Island."

The animal was skinned by a European butcher named B.W. Bradbury who was also an inmate at Stanley during the occupation. He had previously worked for the Dairy Farm. Geoffrey Emerson says in his M.Phil Thesis, *Stanley Internment Camp, Hong Kong, 1942-1945* (HKU,1973), that it was a male tiger and the *Hong Kong News* (31st May 1942) reported it weighed 240lbs and was six feet long with a 19-inch tail. Officers of the Jockey Club were given the "rare treat of a feast of tiger meat". There were also reports that Indian guards had seen the tiger's mate and two cubs but these were never found.

The skin of this animal may still be seen hanging in a glass-fronted case in the Tin Hau Temple at Stanley in a poor state of preservation. Emerson writes in his thesis, "The truth was never discovered (whether it was an escape or if it really swam)". If it actually swam one wonders where it crossed the harbour? Possibly at the narrowest part, where it was relatively quieter, somewhere down by Lei Yue Mun perhaps?

For the doubters among us I would remind you of the words of author Jonathan Downes in his *Porcupine!* article quoted above. In it he says:

"*G.A.K* (sic) *Herklots was probably the greatest single naturalist ever to work with the wildlife of Hong Kong."*

Who was he? Dr Geoffrey Herklots was a Reader in biology at Hong Kong University before World War Two. After the War was over he went back to London and joined the Colonial Service. At one stage, I have been informed, he was Principal of The Imperial College of Tropical Agriculture in Trinidad. We are blessed however in one respect. He was prolific and wrote a lot about Hong Kong in his own inimitable, light-hearted style. His books are out of print now but they can be borrowed from libraries.

DIVERSITY AT A GLANCE

This is a new column, geared towards people working in specific areas of biodiversity, who may be 'neophytes' to other fields. It aims to introduce interesting species of Hong Kong flora and fauna that might be encountered during fieldwork. Distinctive physical characteristics and some interesting ecological facts are included for each example. If you wish to contribute to this column, or have any comments or suggestions, please contact either
Jacqui Weir (jesweir@hkusua.hku.hk) or
Sukh Mantel (skmantel@hkusua.hku.hk).

'The last remaining abundant grouper in Hong Kong waters' by Liu Min

The Chocolate hind, *Cephalopholis boenak* (Bloch, 1790) is the smallest and last remaining abundant grouper in Hong Kong waters (Fig. 1). Its commercial value in Hong Kong live fish markets has increased in recent years, since the larger groupers have been over-fished. *C. boenak* is a diandric protogynous hermaphrodite i.e., it has two pathways of male development. Primary males develop from juveniles directly through sexual differentiation and secondary males from females through sex change. It is strongly associated with corals and prefers hard corals, such as *Pavona decussata* and *Platygyra acute*, that provide plentiful crevices and holes for settlement and refuge. The fish live in small social groups consisting of a single large dominant male, two to five smaller females and several juveniles. Spawning season in Hong Kong waters is from April to October. Social control of sexual differentiation in juveniles and sex change in adults has been demonstrated in the laboratory. Juveniles develop into males when kept singly, while the largest fish developed into males when in pairs, triplets or quartets. Removal of the dominant male from a social group induced the largest remaining female to change sex to male. The Chocolate hind can also change sex from male to female in all-male groups. After understanding the habitat association and coral preferences of *C. boenak*, we realize that the traditional fishing management, such as limited landing size/quota, is not applicable to this species. Protecting the corals they live in by setting up marine reserve areas could be effective.

Fig. 1. External morphology of *Cephalopholis boenak* (adult). Body dark brown with 7-8 irregular vertical bands and several bars radiating from eye. Males and females can be distinguished from gonadal histology, or through behavioral observation in the field during the reproductive season.

'Split-gill fungus *Schizophyllum commune* Fr.' by Alvin Tang

This fungus is commonly found from March to October in forests and shrubland associated with dried or dead trunks of *Lithocarpus* spp. or *Acacia* spp. In Hong Kong it is common in Tai Mo Shan, Tai Po Kau and Sai Kung. It is probably the most widespread fungus in the world, being found everywhere except Antarctica, where there is no wood substrate. The gills produce spores on their surface. They appear to be split because they can dry out and re-hydrate many times over the course of a growing season. This makes the fungus easily recognisable, as each gill is divided longitudinally into two or more parts. The fruiting body is fan-shaped, leathery, and 2-4 cm in diameter (Fig. 2). The upper surface has dense hair, and is light greyish-brown when moist, but ashy grey to white when dry. The stalk is usually absent and the spore print (print of spores on paper) is white.

This fungus is well adapted for a climate with sporadic rains, and the fruiting bodies can function for several years. It is a very successful wood decaying fungus that causes white rot. Although not poisonous, it is too small and tough to eat! It has been used as traditional medicine in Yunnan to cure gynaecological illnesses.

Fig. 2. *Schizophyllum commune* Fr. on dead wood on Tai Mo Shan.

'*Rousettus leschenaulti* (Rousettus Fruit Bat/ Leschenault's Rousette Bat)' by Jacqueline Weir

Rousettus leschenaulti is one of two species of fruit bats in Hong Kong, the other being *Cynopterus sphinx*. *Rousettus* is the largest of Hong Kong's bats, and is quite easy to identify by its size, having a body length of up to 14 cm and a wingspan of around 40 cm. Despite being the largest bat in Hong Kong, its resident status here was overlooked until 1989, when it was rediscovered by Dr. Gary Ades (Kadoorie Farm and Botanic Garden). Prior to this the species had been regarded as a vagrant, with the only known specimen dating back to the 1800s.

Bat identification is made easier by the use of bat detectors. These convert the ultrasound emitted by bats into sound that is audible to humans. Old World fruit bats (Megachiroptera) are generally distinguished from other bats (Microchiroptera) by the absence of ultrasound calls. While the Microchiroptera use echolocation for navigation tasks such as locating insect prey in flight or detecting ripples on water surfaces, Megachiroptera rarely use ultrasound. The extent to which *Rousettus leschenaulti* does so is still unclear. However some ultrasound is produced by clicking the tongue. This is in contrast with other bats, which produce it in the larynx.

Rousettus leschenaulti in Hong Kong often roost in man-made structures such as abandoned mines or water tunnels, but are also known to roost in sea caves. A very large roost near Shek Kong in the New Territories used to contain thousands of these bats, but numbers there have recently been dramatically reduced. The reason for this is not clear.

MISCELLANY

Web resources for the biodiversity and ecology of animals

by Valerie C.M. Ho, Danny C.P. Lau, Justine C.Y. Tsui, George K.K. Kwok, K.H. Chu, and David Y.N. Poon

Introduction

A diverse group of people is interested in learning about the biodiversity and ecology of animals e.g. government agencies, private consultants, academic institutions and non-government organizations (NGOs). The advent of the Web has made massive information accessible through computers. But the identification of relevant and reliable sites for use in environmental science can be a headache for users looking for the right information. To make searches easier, we surfed the net and tried to come up with some currently available useful free Web resources related to molluscs, insects, fishes, mammals, amphibians and crustaceans. In this paper, some of the best web sites are recommended. We hope that this paper will make information searches less problematic and time-consuming for readers in the future.

Mollusca

A lot of nice web sites are available for the mollusca. The first few sites provide thorough and detailed information on morphology, biology, ecology, physiology, reproduction, food preferences and feeding habits of molluscs, as well as a glossary of malacology. A very powerful resource guide called BIOSIS has over 100 hyperlinks to Web sites and journals

relating to the seven classes of molluscs in all discipline, e.g. ecology, life history, anatomy, systematics etc. In addition, an image collection is uploaded with pictures of over 200 species of molluscs found in Singapore, Malaysia and the rest of Southeast Asia. The Web site, however, does not provide any description of the species. Furthermore, one site, The Micro Shells [BISYOGAI] provides detailed descriptions of molluscan species. The Animal Diversity Web of the Zoology Museum of Michigan University has general descriptions which introduce the phylum mollusca and its seven classes.

Among the five Web sites, the Living World of Molluscs is the best one to provide the most thorough information of molluscs whereas BIOSIS is the most powerful in providing links to the suitable Web sites.

1. The Living World of Molluscs
   http://www.weichtiere.at/Mollusks/
2. BIOSIS
   http://www.biosis.org/zrdocs/zoolinfo/grp_moll.htm
3. The Molluscan Pictures
   http://www.molluscan.com/
4. The Micro Shells (BISYOGAI)
   http://www.bigai.ne.jp/pic_book/index.html
5. The Animal Diversity Web of the Zoology Museum of the University of Michigan
   http://animaldiversity.ummz.umich.edu/mollusca.html

Crustacea (Decapoda)

Decapod crustaceans are a diverse group of animals that, like molluscs, are dominant aquatic ecosystem fauna. A lot of websites are available for decapod crustaceans, in particular for commercial species. Many of these websites are, however, created by aquatic hobbyists or only span a small section of official fisheries webpages and are therefore not listed here. Unlike for fishes, official detailed websites dedicated to taxonomy, distribution and identification of crustaceans are few, in particular for the anomurans such as hermit crabs and porcelain crabs.

The first web site is basically a jump-station type website which provides a collection of homepages dedicated to crustaceans. The next three URL links are websites that provides quick and easy searches on terminology or taxonomic details about decapod crustaceans. The next two links are websites dedicated to selected groups of decapods. The following two links provide checklists (with photos) of decapods which can be found in their respective region. The last link is a webpage talking about horseshoe crabs. Although horseshoe crabs are not crustaceans, in view of the paucity of websites focusing on these threatened species, this web-link is included in this article.

Many Japanese crab maniacs, however, often create web pages with high quality digital photos with professional taxonomic identification, which are useful for species identification purposes.

1. Biosis Resource Guide: Crustacea
   http://www.biosis.org/zrdocs/zoolinfo/grp_crus.htm#Anomura
2. Crustacea.net: An information retrieval system for crustaceans of the world (An Australian Museum website)
   http://www.crustacea.net/index.htm
3. Crustacea Glossary (From Natural History Museum of Los Angeles County)
   http://crustacea.nhm.org/glossary/browse.html
4. Shikoku University Decapod Index (From *The Home Page of ETI-Japan)
   http://etij.c.shikoku-u.ac.jp/index0.html
5. Mike Rosenberg's Fiddler Crab Homepage (From Arisona State University)
   http://www.public.asu.edu/~mrosenb/Uca/
6. J. Poupin's Indo-West Pacific *Calcinus* (Anomura: Diogenidae)
   http://biomar.free.fr/calcinus/index.htm
7. Marine Crustaceans of Southern Australia
   http://www.museum.vic.gov.au/crust/page1a.html
8. Taiwanese Naturalist (With Chinese and English versions)
   http://www.mbi.nsysu.edu.tw/~fiddler/SHIH_e.html
9. **The Horseshoe Crab: Natural History, Anatomy, Conservation and Current Research
   http://www.horseshoecrab.org/index.html

Some suggested Japanese website (In Japanese)

1. Yadokari Institute (Japanese hermit crab webpage, with introduction on general biology, species lists and excellent digital photos)
   http://www.asahi-net.or.jp/~JV7Y-YMD/inst/inst.html
2. Japanese Crab Field Guide 6th Edition (A webpage with excellent crab photos from a wide variety of families)
   http://www2.justnet.ne.jp/~uca/crab/crab_start.html
3. The Encyclopedia of the Ecology of Japanese Mitten Crab (A webpage created by the aquatic ecologist Dr. Kobayashi presenting with an English summary page, his works on the ecology of Japanese Mitten Crab *Eriocheir japonica*)
   http://www.zspc.com/mokuzu/

**ETI: Expert Centre for Taxonomic Identification. ETI is a non-governmental organisation (NGO) in operational relations with UNESCO*

***Horseshoe crab belongs to Class Merostomata*

Insecta

The insects are a very large and diverse group under the phylum Arthropoda. They are believed to be extremely successful in terms of number of species, individuals and habitats in the terrestrial part of this world although some of them act as aquatic larvae during their life cycle. Extensive information is available on many websites, which are set up by governmental organizations or other institutions, while some are maintained privately.

The list below includes websites suggested by the authors. The first website provides a database according to the type of insect, while the next two are websites that include several links to different organizations or institutions related to entymology. The rest of the list are websites that provide detailed information on species diversity, taxonomic information, distribution and photography of insects.

1. Iowa State Entomology Index: Databases

http://www.ent.iastate.edu/list/databases.html
2. Insect on WWW
http://www.isis.vt.edu/~fanjun/text/Links.html
3. Scientific Reference Research
http://www.sciref.org/links/EntDept/EntDept.htm
4. CSIRO Entomology
http://www.ento.csiro.au/
5. Agricultural Scientific Collections Unit
http://www.agric.nsw.gov.au/Hort/ascu/
6. Exhibit on Canada's Biodiversity
http://collections.ic.gc.ca/biodiversity/database.html
7. Bugbios
http://www.bugbios.com/entophiles/index.html
8. Class: Insecta
http://www.insecta.com/
9. Australian Insect Common Names
http://www.ento.csiro.au/aicn/
10. Thailand's Amazing Insects
http://www.thaibugs.com/

Amphibia

The following list shows some of the best free web resources related to amphibians. The first three web sites contain useful information like general descriptions, distribution, habitat, life history and special behaviours. The AmphibiaWeb Database is a highly recommended web site for searches as it is user-friendly. Counts of amphibian individuals over time by previous researchers can be checked using the Amphibian Count. This is useful for students or researchers to calculate sample size(s) for their own studies. Searches for articles about amphibians can be conducted by keyword, geographic region or genus in the fifth web site. Last, but not least, is a database of toxicity data of various contaminants and endpoints for reptiles and amphibia.

1. AmphibiaWeb Database
http://elib.cs.berkeley.edu/aw/index.html
2. Frogs.org: Species search
http://www.frogs.org/amphibianet/index.asp
3. Amphibian Species of the World V2.21 Database
http://research.amnh.org/herpetology/amphibia/index.html
4. Search the Amphibian Count Database
http://www.mp2-pwrc.usgs.gov/ampCV/ampdb.cfm
5. Amphibian Information Website (*Draft)*
http://www.mp2-pwrc.usgs.gov/amphibs/
6. Reptile and Amphibian Toxicology Literature (RATL)
http://www.cws-scf.ec.gc.ca/nwrc/ratl/index_e.htm

Fishes

Because of the extensive variation in morphology, adaptation and behavior observed in this group of amazing animals, it is not easy to find a web site that can include every single detail for each species of fish. As a result, most of the web sites choose to concentrate on one or two aspects. Many are set up by fishery departments and academic institutes while a lot of NGOs and fish hobbyists set up their own web pages providing loads of useful and interesting facts about the Pisces. But this section will focus only on those made by official organizations.

Below is a list of websites that readers will find useful when doing research relevant to this phylum. The first three web sites are powerful fish databases providing comprehensive information on fish and their larvae occurring around the world. Search results for the fourth to sixth websites will yield information on taxonomy, geographic distribution, external and internal morphology etc. In addition, references are given for further reading in these web sites. Scientific publications and photos are available also, along with multiple links to various fishery societies. HK Fish Net and Native Fish Australia particularly emphasize Indo-Pacific fishes found in the region. While HK Fish Net is an informative and beautifully created websites on local fish species, Native Fish Australia features some of the native Australian fish and introduced fish grouped by family, and has their basic distribution (by State) and conservation status data. Last, but not least, the last web site features techniques on aquaculture and fish production. The information might be useful for readers looking for materials in the fishery sector.

1. Fishbase
http://www.fishbase.org
2. Larval Base
http://www.larvalbase.org
3. SPC Coastal Fisheries Programme
http://www.spc.org.nc/coastfish/index.html
4. CAS-Ichthyology Catalog of Fishes
http://www.calacademy.org/research/ichthyology/catalog/fishcatsearch.html
5. The World-Wide Web Virtual Library: Fish
http://www.actwin.com/WWWVL-Fish.html
6. Ichthyology web resources
http://www.biology.ualberta.ca/old_site/jackson.hp//IWR/index.php
7. Fish Collection-online search
http://www.nmnh.si.edu/vert/fishcat/index.html
8. The Breeder's Registry
http://www.breeders-registry.gen.ca.us/index.htm
9. Aqua fish database
http://www.aquafind.com/
10. Hong Kong Fish Net
http://www.hk-fish.net
11. Native Fish Australia
http://www.nativefish.asn.au/

Mammals

Mammals, both terrestrial and marine, receive great attention in biological studies as we ourselves are mammals. Despite enormous effort in conservation, many mammals are under threat of extinction by human activities like hunting and landscape changes. This phylum has long been studied and there is plenty of information available on the net. Below are some selected websites, which allow access to reliable and accurate information. Most of them are set up by official NGOs and conservationists. These educational websites provide extensive information on terrestrial mammals. Apart from general facts like distribution, habitats and threats faced, most of these sites provide extensive linkages to other useful web sites for further reading (e.g. the first website on our list). News of endangered mammals and birds is constantly updated

in the second and third web sites. Usually, these homepages focus on a few types of mammals. Some of them are well known, e.g. panda and dolphins while others allow us to get a glimpse of endangered keystone species that the public is less familiar with. In addition, the conservation effort performed by various parties and some of the conservation projects underway around the world are mentioned in the last three websites. Human factors causing the extinction of species such as illegal trading, and overexploitation are also discussed.

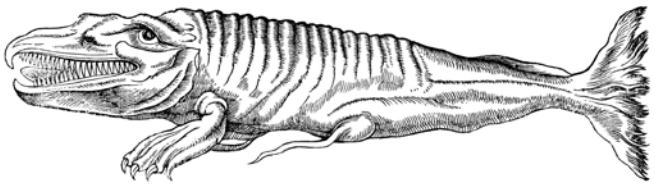
1. Mammals a WVC library by research
   http://134.39.150.204/wvclib/Research/ZoologyPages/RBZooMammals.html
2. Green Nature
   http://greennature.com/article578.html
3. The Whale and Dolphin Conservation Society
   http://www.wdcs.org/dan/publishing.nsf/frontpage?readform
4. WWF Global Species Account
   http://www.panda.org/resources/publications/species/threatened/
5. Nature's Biology Guide
   http://www.biologyofnature.net/
6. Conservation and Research
   http://216.89.160.131/dolphinportal/links/conservationandresearch.html
7. The Asian Conservation Awareness Programme.
   http://www.acapworldwide.com/animal.htm
8. BUBL Link/ 5:15
   http://bubl.ac.uk/link/e/endangeredspecies.htm
9. http://www.conservation.org/xp/CIWEB/regions/asia_pacific/china/china.xml

Conclusion

The Internet is a good starting point for locating useful information. But it is important to note that the web addresses provided in this review need to be updated regularly in order to obtain the latest information and evaluated carefully for accuracy. Nonetheless we hope this attempt to identify useful pages will be of use and readers are encouraged to conduct searches of their own.

Acknowledgements

We would like to thank Dr Kenneth Leung for initiating this project and commenting on an early draft of this paper. The authors are grateful for most useful comments by the editor Dr Yvonne Sadovy.



Introducing the Swire Institute of Marine Science Museum – a resource that may be useful for your research!

by Benny K. K. Chan

Prior to the 1970s there was little taxonomical information on local crabs, fishes or molluscs as only a few marine biologists were working in Hong Kong at that time (see Morton, 2000). To enhance this limited background information, a number of international workshops on the marine fauna and flora of Hong Kong was organized by Prof. Brian Morton at the University of Hong Kong from 1977 – 1998. These workshops invited overseas scientists with expertise in various marine phyla to investigate the intertidal and subtidal biodiversity of Hong Kong. One of the major important outputs of these workshops involved the identification and description of local species and new species in Hong Kong, much of which has been published in the workshop Proceedings (Morton, 2000). Workshop participants also deposited a considerable number of their representative samples, which were gathered together with the opening of the Swire Marine Laboratory. These were housed in a dedicated museum with the development of the Swire Institute of Marine Science (SWIMS) to provide a resource for future research. To make use of these representative specimens, the SWIMS Museum has been set up to store and maintain them in a systematic manner. Initially, the museum was not very user-friendly as many specimens were still being sorted and catalogued with a museum number and were not readily accessible.

This summer, however, with the help of three Environmental Life Science students (I really need to say a big thanks to Miss Chan Hoi Lam, Mr Kiwi Lee and Mr Cheung Kar Chiu), most of the specimens have been now re-arranged, updated and a new database for the collection has been produced. At present, the museum has a collection of over 1900 species including the Phyla Annelida (250 species), Brachiopoda (2 species), Chordata (400 species), Cnidaria (178 species), Echinodermata (37 species), Echiura (3 species), Mollusca (578 species), Nemertea (1 species), Phycophyta including Class Chlorophyceae, Rhodophyceae and Phaeophyceae (50 species), Sipuncula (6 species), and Sub-phylum Crustacea (418 species). The collection also contains para-types and type specimens of new species in Hong Kong (for example, see Kaehler, 1998; Bamber, 2000; Slingsby et al., 2000; Randall and Cornish, 2000; Yan and Chan, manuscript) and holds an especially rich collection of samples obtained from the workshop trawling surveys and local fish collections. In late September this year, a web-based version of the museum database will be uploaded at the SWIMS home page for people to search the collections and there is also a system for loans and museum visits (see the SWIMS home page at http://www.hku.hk/ecology/swims).

The SWIMS museum will, therefore, provide resources for researchers who want to confirm species identifications of local marine organisms and conduct further taxonomic studies. It also provides a database for the marine fauna and flora in Hong Kong. At present, a reference library is planned to include references that are relevant to the specimens inside the SWIMS museum. This is in an attempt to contribute useful resources to the research of marine ecology and enhance the understanding of marine biodiversity in Hong Kong.

The SWIMS Museum includes almost 2,000 species from Hong Kong waters compactly stored and catalogued.

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Fame at last!

Contributors will be pleased to know that many Porcupine! articles are now indexed in Zoological Record, a database of zoological literature published by BIOSIS and the Zoological Society of London.

New locality records for species of conservation concern

by Michael Lau

Recently, a comprehensive list of terrestrial and freshwater fauna of conservation concern has been produced for Hong Kong (Fellowes, *et al.*, 2002). The followings are sightings of some of these species made during this summer. According to the literature I have, these appear to be new locality records and hence they are reported here. The rather substantial increase in local distribution for some of the species reflects that there are still gaps in our knowledge on Hong Kong biodiversity, particularly for less known groups and at sites that are seldom visited by experts. However, some of these records were made at well-studied sites such as Tai Po Kau and they may well be examples of colonization by forest-dependent species as forest patches mature in Hong Kong.

A population of Curved-back Rice Fish (*Oryzias curvinotus*) was found in a stream near Wu Kau Tang on 19 April and 21 June. This species is considered to be of Global Concern.

One Baron (*Euthalia aconthea*) was seen in a riparian forest near Tai Ho, Lantau on 14 June 2002. It is a Local Concern species.

One *Philoganga vetusta* was seen by a forest stream at Ping Shan Chai on 22 June 2002. One more individual was seen at Lai Chi Wo on 26 June 2002. It is a Local Concern species.

Many *Mnais mneme* were seen near a forest stream near Ying Pun. Several individuals seen at Lai Chi Wo on 26 June 2002. It is a Local Concern species (Fellowes, *et al.*, 2002).

Several *Agriomorpha fusca* were seen near Wang Shan Keuk on 21 June 2002. Many individuals were seen in Ping Shan Chai on 22 June 2002. One individual was seen at Lai Chi Wo on 26 June 2002. Several individuals were seen by forest seeps near Sze Tau Leng on 27 June 2002. It is a Local Concern species.

One *Calicnemia sinensis* was seen beside a forest stream in Shing Mun on 18 April 2002. Two more individuals were seen near a forest seep in Tai Po Kau on 10 May 2002. It is a Local Concern species.

Several *Sinosticta ogatai* were found near forest streams and seeps at Tei Tong Tsai, Lantau on 7 May 2002. One individual was seen in my garden at Sheung Yeung, Clear Water Bay in the morning of 15 May 2002. It left by the afternoon. It is a Global Concern species.

Several *Drepanosticta hongkongensis* were seen near forest streams at Tei Tong Tsai, Lantau on 7 May 2002. Two individuals were seen near a forest seep at Wu Kau Tang on 5 June 2002. Two individuals were seen by a forest seep near Sze Tau Leng on 27 June 2002. It is a Global Concern species.

One *Potosticta beaumonti* was seen by a forest seep near Wu Kau Tang on 19 April 2002. It is a Global concern species and this record is apparently the first from the New Territories.

Several *Protosticta taipokauensis* were seen near a forest stream near Ying Pun on 9 May 2002. It is a Global Concern species.

One *Stylogomphus chunliuae* was seen by a stream near Tai Ho, Lantau on 14 June 2002. It is a Local Concern species.

One *Heliogomphus scorpio* was seen by a stream near Tai Lam on 17 May 2002. It is a Local Concern species.

One *Leptogomphus elegans* was seen by a stream near Tei Tong Tsai, Lantau on 7 May 2002. It is a Local Concern species.

A small population of *Rhyothemis triangularis* was found in a weedy pond and the adjacent marsh at Wu Kau Tang on 5 June 2002. One individual was seen in a marsh on Double Island on 26 June 2002. It is a Local Concern species.

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Society of Conservation Biology 16th Annual Meeting at the University of Kent at Canterbury, UK. 14th – 19th July 2002

by Billy Hau

I attended this meeting with Dr. John Fellowes, who got his Ph.D. from our Department several years ago, and presented a paper on biodiversity monitoring and nature reserve management in South China. There were nearly 1,200 participants from over 50 disciplines and more than 60 countries in this Meeting. I would like to share with *Porcupine!* readers my observations in this meeting about the problems and opportunities of conservation biology.

As pointed out by John Lawton of the Natural Environment Council of UK, the threats to global biodiversity continue to grow despite the impressive scientific advances in conservation biology in the last two decades. Something clearly has gone wrong. Amongst the papers presented (>500) at the meeting, many suggested that researchers and conservationists often focused too much on biodiversity and the science of it and overlooked the importance and complication of the role of humans i.e. local communities, in field conservation projects. It was suggested that the future direction for improvement in biodiversity conservation projects was to involve or work with community aid specialists. Certainly more recent projects presented in the meeting have already started to reconcile community development with biodiversity conservation. The South China Biodiversity Conservation Programme of the Kadoorie Farm and Botanic Garden here in Hong Kong is also developing towards this direction. Only when there is spare time, John Lawton suggests, there is still a lot of science to do.

Due to the project-based funding mode, both in universities and for international or local funds, conservation projects often involve sending foreign experts to work in the field sites, mostly in the developing countries, for a short period of time (3 to 5 years or less). Most such projects fell apart after the expert team had gone. On the other hand, many smaller groups have found it difficult to implement their field projects as the budget is too small to cover the costs of a team of foreign experts while there are few or no local experts available. Many conservation organisations have included capacity building as an integral part of their field projects. However, there is still a general consensus amongst the participants that local field biologists are highly insufficient, especially in developing countries.

As one of the countries with the richest biodiversity of all, China was heavily under-represented in this international meeting in comparison with other places such as Madagascar, North America and Europe. Only a handful of papers, including our one, are about China. The Society of Conservation Biology is now organising an Asia Section (for details, see recent issues of the SCB newsletter at http://www.conbio.org/SCB/Publications/Newsletter/) which would hopefully draw more mainland researchers into the international arena of conservation biology.

The final point I would like to make is about field sites. It is very common for universities in Europe and North America to have research students working in biodiversity rich countries especially in the developing world. Comparatively, our Department's postgraduate projects focus more in Hong Kong (I know there are exceptions). Being a university in China, perhaps we should build on our solid foundation in Hong Kong and explore more opportunities to develop field research projects in China.

Watching wildlife in Panamá

by Richard T. Corlett

Darkened conference rooms are not the ideal place to recover from 12 hours of jet lag, so I decided to go 5 days early to the Association for Tropical Biology meeting in Panama (29th July – 2nd August, 2002), to give myself time to adjust. From the web site, the Canopy Tower – a converted radar station in the rainforest - sounded the ideal place to do this: *"… in the dining room, a cup of coffee and rolls await you. Settle down at a table next to the window. Above the endless tropical forest*

of Soberanía National Park, a ship glides through the Panamá Canal. The hooting of a distant troupe of monkeys punctuates the birdcalls. You keep your field guide open on the table in front of you beside your rolls and fresh orange juice. In complete comfort, you greet the morning sun. Nothing obstructs your view. Through the unscreened open window, nature carries on its morning business"
(www.canopytower.com). (See Fig. 1.)

The reality was slightly different. My first night at the Canopy Tower ended abruptly when my alarm went off at 5.30 a.m. Soon after dawn we were birding along the famous (to birders) Pipeline Road. Following lunch and a couple of hours rest, we were off to another bird-watching site and the day finally ended at 10.30 p.m. after several hours spotlighting for night birds. Subsequent days were somewhat less energetic, but all were spent in serious birding led by Carlos or Josè, the Tower's immensely knowledgeable bird guides. I hit my first hundred bird species in less than two days, and my final total was between 120 and 140 species, depending on how clear a view you need for a tick. Among many other species, the final list included 5 species of pigeon, 5 parrots, 7 hummingbirds, 4 trogons, 3 motmots, 3 puffbirds, 3 toucans, 4 woodcreepers, 9 antbirds, 13 flycatchers, 3 manakins, 5 wrens, and 14 assorted tanagers and their relatives. My personal favourites were the distinctive Great Tinamou, the long-tailed Squirrel Cuckoo and the Crimson-crested Woodpecker. I also saw both Two- and Three-toed Sloths, Geoffroy's Tamarins, Western Night Monkeys, Mantled Howler Monkeys, Red-tailed Squirrels, Central American Agoutis, a Forest Rabbit, several White-nosed Coatis, and a Kinkajou. Not bad for 4 days with a completely new fauna.

The Canopy Tower is set among semi-deciduous rainforest, with some familiar pantropical plant genera, such as *Schefflera*, *Ormosia* and *Sterculia*, as well as such strictly Neotropical genera as *Gustavia* (Lecythidaceae). Disturbed areas are dominated by pioneer species of *Cecropia* and *Miconia*, which both provide a continuous and abundant supply of small-seeded fleshy fruits. One morning from the top of the Tower (coffee and rolls at hand, as promised), we watched the magnificent Keel-billed and Chestnut-mandibled Toucans, the incredibly blue Blue Cotinga, the incredibly green Green Honeycreeper, and several species of tanager, feeding together in the same *Cecropia* tree. At least another dozen bird species fed in the same tree at other times.

Serious birders favour the dry season, when Panama's diverse resident bird fauna is supplemented by numerous migrants from North America. The wet season, however, is cooler, cheaper and far less crowded, and the rain rarely interrupted our field trips. There are alternatives to the Canopy Tower but, wherever you stay, I strongly recommend professional guides for all but the expert. The Neotropical avifauna is the most difficult in the world – dominated by a few, exceedingly diverse families – and my subsequent attempts at independent birding convinced me that *A Guide to the Birds of Panama* (R.S. Ridely & J.A. Gwynne, 1989) is no substitute for being told what a bird is and how to recognize it in future.

Fig. 1. The Canopy Tower

My trip to the South American rainforest

by Elsa Lee

I took a trip of a lifetime to somewhere I think very few Hong Kong people would go, or even think about going to – Colombia. It was a very hard decision to visit Colombia, especially with the sensitive politics there, but for the rainforest, I would do anything!

I joined an Ecovolunteer project (www.ecovolunteer.org), which arranges for people to visit scientific research stations in many parts of the world to help with conservation work. For this trip I went to El Amargal Biological Station, under the Fundación Inguede (a private conservation organization in Colombia), on the Pacific Coast of the Chocó department of the country. The station is in a very isolated place. From Bogotá (the capital of Colombia) I took two one-hour flights to the little village of Nuquí, then a 2 hour boat-trip to arrive at the station. However, El Amargal is well worth the tiring and somewhat dangerous transport needed to get there. The view from the house up on the cliff is magnificent, with groups of pelicans and egrets flying past every now and then. The sea in front of the station is on the path of the migration route of humpback whales: during my stay I saw them three times! In the forest I saw many animals: toucans, hummingbirds, parrots, tanagers, lizards, frogs, howler monkeys, and numerous insects. Every tree in the forest is huge, with many epiphytes attached, and one of the largest trees in the plot under study has a diameter of 180 cm (as part of my voluntary work there was helping to measure trees). The forest is so dense and huge that you could not walk alone for 15 minutes without being lost; in fact, even with a guide we got lost once.

Before I took this trip I couldn't imagine myself being in a rainforest, as the wildlife there is so wonderful, the life-style so different from Hong Kong, and I met many different people, including the very friendly neighbouring Indians. All I wish is that more people could see and experience the true beauty of nature, protect it and keep it the way it is.

The most accessible rainforest in the world?

by Richard T. Corlett

Three cities claim to have the most accessible rainforest in the world, so I timed the US$1.25 taxi ride from the Parque Natural Metropolitano to my Panama City hotel very carefully. Eight minutes! Even a Panamanian taxi driver would find it difficult to reach Bukit Timah Nature Reserve from downtown Singapore that quickly, leaving only the Parque Nacional da Tijuca in Rio de Janeiro, Brazil, as a possible rival. If any *Porcupine!* reader has been there, please let me know.

Panama City, on the Pacific coast of Panama, has a severe dry season so the rainforest which occupies 192 hectares of the 265-hectare park is semi-deciduous, one of the last lowland remnants of this ecosystem in Panama. Although the forest must have suffered considerable damage during the city's long and turbulent history, it still looks and feels like rainforest, and it still supports tamarin monkeys, sloths, deer, agoutis and at least 186 bird species (other sources say "more than 200"). On my two early morning visits, I saw two groups of tamarins and several agoutis, as well as a great variety of birds. The gravel paths are reasonably well signposted and a number of trees and other plants are labeled, which I found very useful. I met nobody in the entire park on my first visit, except the warden to whom I paid my US$2 dollar entrance fee, and only two groups of visitors on my second visit.

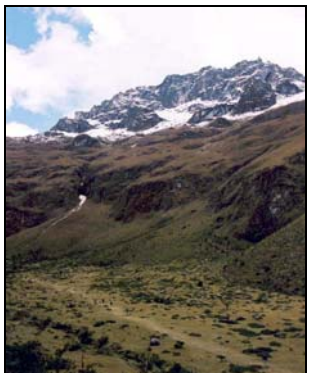
Trekking in the Peruvian Andes

by Jackie Yip

I visited the Peruvian Andes in August to trek the Inca Trail – a 50 km trail which ends up in the historical ruin of Machu Picchu in southern Peru. The trek was not exceedingly strenuous, leaving me abundant time for appreciating the beautiful scenery and the diverse flora along the route. The trail ranged in altitudes between 2600 m and 4200 m. This variation of altitudes results in a change of habitats over the four-day hike. At this altitude, the flora and fauna do not resemble anything that I am familiar with in Hong Kong, so I am only able to give a brief account of the habitats.

The trail starts at 2600 m, among the sparsely vegetated *Cactus* and *Agave* habitats. After 3000 m, the trail climbs steeply through the humid *Polylepis* woodlands, with rich diversity of mosses, ferns and lichens. This is one of the few shaded sections of the trail. Steady ascent up the first pass took us through the puna – high-elevation grassland characterized by tussock grass and pockets of alpine flowers. On the third day, the hike descended through the upper fringes of the cloud forest – a zone of nocturnal fogs, made temperate by increasing proximity to warm air rising from the Amazonian lowlands. Here we had the highest variety of plants and birds. Amazingly, a section of the trail was lined by bamboos, and another section by a species of tree fern. The Machu Picchu Historical Sanctuary holds a stunning diversity of orchids, with some 250 species identified. Spectacular orchids can be seen along this section of the trail, together with numerous wild flowers, including the national flower of Peru *Cantua buxifolia* (Polemoniaceae), a bright red flower frequented by hummingbirds. Over 370 species of birds have been identified in the Sanctuary. To my untrained eyes, and without the aid of binoculars, birds were heard but seldom located.

The Indians living in the Andes are Quechuas, who are direct descendents of the Inca Empire. My guides, being Quechuas, also knew some of the plants and their traditional uses by the Incas. The plants on the Andes form an important part of the daily life and culture of the Incas, being used as medicine, food, material for utensils, and soil stabilisers. A book recommended for understanding the ecosystems is *Machu Picchu Historical Sanctuary* (1995*)*, edited by Peter Frost and Jim Bartle. The bird watching guide is *Birds of the High Andes* (1990) by Nils Krabbe and Jon Fjeldsa. However, I was unable to locate either book in Lima.



(Left) Puna grassland against a background of snow-capped peaks. (Right) *Cantua buxifolia,* the national flower of Peru.

"In the News"

by Sukh Mantel

Thanks to Lily Ng, Ariel Yeung and Gloria Chau (for providing translation of Chinese articles) and thanks to Wallis Chan and Gloria Chau (for finding Chinese newspaper articles). Reuters News Service can be accessed at **www.planetark.org**.

Around 9000 freshwater turtles (*soi yue*), a popular Chinese food item, destined for Mainland China were seized recently off Po Toi Island. **(SCMP, 3.13.02)**

A council for sustainable development will be set up in Hong Kong to advise the government on sustainability issues. How much power it will have and when it will be set up is as yet unclear. **(Reuters News Service, 11.6.02)**

The Hong Kong government is planning to let the forthcoming Wetland Park in Tin Shui Wai be run by a profit-making company. This is despite recommendations from government-commissioned consultants (UK-based MET Studio Design and Wildfowl and Wetlands Trust) that it should be government-run. However the government will be involved in setting up objectives and policy for the park. **(SCMP, 17.5.02)**

The Hong Kong government will have to pay much more than originally expected to clean up dioxin contamination at the future Disney site on Lantau Island. The initial estimated cost was $30 million. The current estimate is $450 million. The under-estimate was due to the former owner – Cheoy Lee shipyard – restricting site investigations. Hong Kong legislation currently lacks 'polluter pays' policies which could prevent such incidents or force the polluter to pay for cleaning up. **(SCMP, 3.5.02)**

A new snake species for Hong Kong has been discovered in the New Territories. Four specimens of *Trimeresurus mucrosquamatus* were found dead on a road between Ma On Shan and Sai Kung, by Mr. Dave Willot. The snake – common name "branding iron head viper" – is closely related to the bamboo pit viper. It is venomous and aggressive. It is found in south China, Taiwan and Hainan, but has never before been recorded from Hong Kong. **(SCMP, 28.4.02)**

The two pandas kept at Ocean Park have been undergoing a training programme to increase their physical activity and amount of mental stimulation, following fears that they were too inactive. Methods are focused on retrieving food items in different situations. **(Ming Pao, 25.8.02)**

Ten thousand catties of cultured fish worth around HK$800,000 were killed in Kai Sai Mariculture Farm. Fishermen suspect it was due to pesticides from a nearby golf course. Response from the golf course was that they do not use pesticides in the rainy season. **(Oriental Daily, 24.8.02)**

BOOK REVIEW:

Hong Kong Flying Colour 3: Dragonflies

by Agriculture, Fisheries and Conservation Department, HKSAR Government, 111 pages, HK$50. Published by Friends of the Country Parks, 2002.

Butterfly Watching in Hong Kong

by James John Young and Vor Yiu, 342 pages, HK$188. Published by Hong Kong Lepidopterists' Society, 2002.

Hong Kong Flying Colour 3: Dragonflies is the third in a series of picture booklets produced by AFCD staff for Friends of the Country Parks (previous titles covered birds and butterflies), and comprises photographs of most of the Hong Kong dragonfly species, a checklist, and three pages for 'field notes'. This is fine, as far as it goes. The trouble is that it really doesn't go very far. There is no text. Photograph annotations are limited to a species name only. No information is given on habitat associations, diagnostic features, avoidance of confusion with dragonflies of similar appearance, dragonfly sites, or the local status of the illustrated species. Dragonflies are usually sexually dimorphic but the book does not tell you this, nor give any indication of the gender of the individuals in the photographs (sometimes male, sometimes female, occasionally both). The photographs themselves are of variable quality, ranging from the sublime to the ridiculous, although in fairness, the majority are of a high standard. In short, this book will be of little or no use as an identification handbook (in spite of those blank 'field notes' pages), and anyone attempting to use it as such will, wittingly or otherwise, come rapidly unstuck. The most useful part of the booklet is the reference page, which contains a single entry. Keith Wilson's 1995 book *Hong Kong Dragonflies* is still available. Buy that instead. It may be cumbersome, but at least it tells you how to identify these beautiful insects.

Much more useful for the would-be entomologist is Young and Yiu's *Butterfly Watching in Hong Kong*. This book contains numerous handy hints on watching, photographing, and identifying adult butterflies in Hong Kong. Each species is briefly described and then illustrated with up to six photographs, designed to show upper and under-sides of the wings, seasonal forms and, where it occurs, sexual dimorphism. Sites where species are known to occur are listed, and then a wealth of ecological and behavioural knowledge (such as local status, dimorphism, flight period, feeding habits and habitat association) is neatly summarised in a set of information boxes. Preliminary chapters include useful sections on ecology of butterflies, photographic equipment and (best of all) detailed descriptions of most of the top butterfly watching sites in Hong Kong.

Clearly, a lot of thought has gone into this book, and the authors should be applauded for producing a work which so aptly complements Bascombe, Johnston and Bascombe's epic *The Butterflies of Hong Kong* at such an affordable price and, moreover, for writing in both Chinese and English. A few criticisms may, however, be made. Neither of the authors speaks English as their first language, and the English text would have benefited from proof-reading by a native English speaker. Less trivially, a surprisingly high proportion of the photographs are of rather poor quality. This stems from the authors' understandable decision to include only photographs of live specimens in a natural setting. Such photographs are often difficult to obtain, and in their efforts to show the various forms and diagnostic features, the authors have all too often been forced to settle for a less than perfect photograph. Such a problem would not have arisen if pinned specimens had been used, and I think there is a case to be made for having a combination of both. Nevertheless, this is a must-buy for anyone interested in learning the local butterflies.

G.T. Reels

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

A 2.1 metre long **False Killer Whale** (*Pseudorca crassidens*) was beached in Sai Kung East Country Park on 19 August. The whale, which belongs to the dolphin family, weighed approximately 90 kg. (SCMP, August 20, 2002)

Kylie Chung caught a 60 cm long adult **Javan Mongoose** (*Herpestes javanicus*) in a cage trap placed under tall grass and shrubs on Tai Mo Shan. The mongoose was caught about 9 am. on 28 August at the edge of the forest patch next to grassland. It was very aggressive when she tried to get close to it.

Antonia and James Middleton saw two **Porcupines** (*Hystrix brachyura*) on Shatin Heights Road in early August crossing the road and then going down the valley hillside.

A **Wild Boar** (*Sus scrofa*) was disturbed from the undergrowth by a stream at Lai Chi Wo by Michael Lau on 26 June 2002.

Three young **Wild Boars** (*Sus scrofa*) were seen near the Lin Au section of the Wilson Trail (Tai Po) on 10 June by Jacqui Weir. They were moving through undergrowth and ran off when disturbed. No adults were seen with them.

Alvin Tang saw a **Seven-banded Civet** (*Viverricula indica*) on Harlech Road, Victoria Peak, at around 1 pm on 15 May. It foraged on the road for around a minute before disappearing into some shrubs near the road.

Robin and Jacqui Weir had a good view of a **Barking Deer** (*Muntiacus* sp.) on the Lin Au section of the Wilson Trail (Tai Po), on 7 July. It was seen on an open hillside from where it ran downwards into a forest patch. It then barked three or four times.

Cytochrome B DNA sequences from tail tips of two typical "upland *Rattus*" **Rats** caught by Kylie Chung on Lantau Island have been analyzed by Ken Aplin of the CSIRO Rodent Research Group. He confirms that they are very close to samples from northern Vietnam and Laos, which, in turn, agree morphologically with *Rattus sikkimensis* from the type locality in Sikkim. This is the species previously - and confusingly - known as "Sladen's Rat" in Hong Kong and must make up at least half of our upland mammalian biomass. (*Porcupine!* 23)

BIRDS

Captain Wong saw 1 male and 3 female **Fork-tailed Sunbirds** (*Aethopyga christinae*) and a flock of about 5 **Japanese White-Eyes** (*Zosterops japonica*) visiting flowers of *Cleistocalyx operculata* on 29 June in Shing Mun Country Park. Although the flowers of this species are white and not very large, the protruding stamens and style are typical of bird-pollinated plants.

Kwok Hon Kai saw a **Black-shouldered Kite** (*Elanus caeruleus*) perched on a powerline above a fishpond in Lok Ma Chau on 19 July. This species is more frequently recorded in winter or during migration seasons.

Karin Chan saw one **Lesser Frigatebird** (*Fregata ariel*) in Magazine Gap on 14 July. It was attacked several times by black kites that were flying with it. The Lesser Frigatebird was probably a sub-adult or a female as it had a pale head and a big patch of white feathers on its chest.

Karin Chan saw five **Caspian Terns** (*Sterna caspia*) heading east above the sea about 1 km north of Lung Kwu Chau on 10 July at about 7.30 am. They are usually are not seen in mid summer.

Jacqui Weir watched a juvenile **Plaintive Cuckoo** (*Cacomantis merulinus*) being fed by an adult **Common Tailorbird** (*Orthotomus sutorius*) at around mid-day on 19 May. The birds were in a longan tree in Kam Shan village, Tai Po. It was difficult to see what was being eaten.

AMPHIBIANS/REPTILES

Mike Kilburn has come across numerous amphibians and reptiles near Ng Tung Chai village, New Territories. These have included:

A 25 cm **Large-spotted Cat Snake** (*Boiga multomaculata*) on 10 April in Ng Tung Chai village. The snake was alive but partially paralysed, and was later euthanised.

A **Spotted Narrow-mouthed Frog** (*Kalophrynus interlineatus*) on 10 August in Ng Tung Chai village. The frog was seen at night, alive, on a raised concrete path.

A 30 cm road-killed **Coral Snake** (*Calliophis macclellandi)* on 23 August, on the Ng Tung Chai access road.

A live **Chinese Mountain Snake** (*Sibynophis chinensis chinensis*), around 15 cm long, on 24 August. It was found on the approach to Man Duk Yuen temple from Tai Mo Shan.

Various road-killed snakes have been found by Jacqui Weir on the road up Tai Mo Shan. Among them have been:

A **Many-banded Krait** (*Bungarus multicinctus multicinctus*) showing its stomach contents. The snake had consumed a small rodent with smooth, brown-grey fur. It was found on the approach to the top public car park on 5 June.

Two **Large-spotted Cat Snakes** (*Boiga multomaculata*) found close to the uppermost public car park. These were seen in approximately the same place, one around 11 August and one on 2 September. Both were small, measuring around 30 cm and 20 cm respectively.

A **Chinese Slug Snake** (*Pareas chinensis*), approximately 25 cm, found on the road between the bottom car park and the visitor's centre on 17 August. The specimen was collected.

Mike Kilburn found the sloughed skin (nearly 3 m) of a large **King Cobra** (*Ophiophagus hannah*) in June in Ngong Ping, Lantau.

A 1.5 metre **Common Water Monitor** (*Varanus salvator*) weighing 30 kg was found hiding under a van in Ma On Shan. It was captured and taken away by AFCD officers. (SCMP, 25 July 2002)

A 1.2 metre long, road-killed **Banded Krait** (*Bungarus fasciatus*) was seen by Graham Reels at Nam Chung, Starling Inlet on 7 August.

Jacqui Weir saw a young **Big-headed Terrapin** (*Platysternon megacephalum*) in a stream near the top public car park on Tai Mo Shan at around 6.30 pm on 3 July.

Kwok Hon Kai saw a road-killed juvenile **Mock Viper** (*Psammodynastes pulverulentus*) at Shek Pik on 8 August. A wasp was crawling on its dead body, presumably eating the flesh. Thirty minutes later, the wasp was dead!

On 25 May at around mid-day, workers in the native tree nursery in KFBG came across a **Burmese Python** (*Python molurus bivittatus*) in the scrub/grass near their work site. The python was in the process of capturing and consuming a young barking deer and was scared off by their arrival, although unfortunately it was too later for the deer. The dead barking deer was probably between 6 months to 1 year old. The following day a deer was heard barking continuously near the site, presumably the mother seeking her lost fawn. This continued for the best part of one day before she gave up. (Reported by Paul Crow)

A 3 metre long **Burmese Python** (*Python molurus bivittatus*) was seen stretched out in a long straight line on the road past the entrance gate in Shing Mun Country Park on June 20 at around 6 pm. It had rained earlier during the day, so the dry road surface may have been warmer than the wet forested area, although the road was not warm to human touch. Michael Lau affirms that probably the python was warming itself, as the road surface might have been relatively warmer than the python. (Reported by Sukh Mantel)

In November 2001, Robert Davison saw several **Common Rat Snakes** (*Pytas mucosus*) on the City University campus, among a section of wooded hillside: a pair of ~1.8 m long Common Rat Snakes mating on 16 April, and a third specimen nearby; a 2.4 –2.7 m long adult. There seems to be healthy population around. **White-spotted Slug Snakes** (*Pareas margaritophorus*) and their skins, as well as many empty snail shells, have also been seen on the same hillside.

On 21 April, Robert Davison found four road-killed snakes on the Country Park Access Road just south of Nam Chung Lo Uk (near Starling Inlet) within about 10 minutes walk of each other. (1) was seen at about 80 m; (2-4) were seen close to sea level.

1. A **Red-necked Keelback** (*Rhabdophis suminiatus helleri*; approx 60 cm)

2. A **Banded Wolf Snake** (*Lycodon subcinctus*; approx 55 cm)

3. A **Large-spotted Cat Snake** (*Boiga multomaculata*; approx 50 cm)

4. A **Chinese Slug Snake** (*Pareas chinensis*; juvenile, about 18-20 cm)

On the morning of 24 April, Robert Davison saw a dead, 75 cm **Chinese Cobra** (*Naja atra*) on the Lau Shui Heung Road near its junction with Sha Tau Kok Road

PLANTS

Michael Lau found a population of Bog Orchids (*Liparis ferruginea*) in a marsh near Tai Ho on 14 June. This orchid is considered to be very rare locally (Siu, 2000) and this appears to be the first record from Lantau Island.

Wild Corner Bibliography

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The KFBG website (www.kfbg.org) shows some recent photos of interesting wildlife sightings including **Pangolin**, **Taiwan slug snake**, **Python** and **Leopard cat**.

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