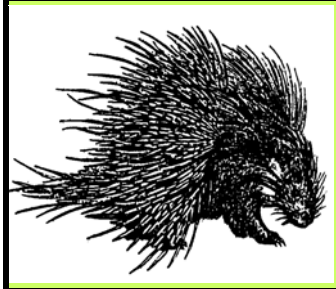
AUGUST 2000 NUMBER 21



Porcupine!

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

Biodiversity Survey Results Released!!!

Finally, under 'new' management, and according to tradition much later than anyone imagined, we deliver a summer 2000 Porcupine! Porcupine! was born in 1992 as the bimonthly 'Newsletter of the Hong Kong University Ecology Research Group'. Later, it was produced jointly by the Department of Ecology and Biodiversity in collaboration with Kadoorie Farm and Botanic Garden Fauna and Flora Conservation Departments. Its purpose has always been to disseminate information on wildlife observations within Hong Kong, provide (or provoke?) a forum for discussion and communicate ecologically related research and environmental issues in Hong Kong. The last 20 volumes of Porcupine! have gradually increased in scope, as well as volume, but the aims remain the same. This issue attests to the growing need for such a forum, and is a tribute to the founders of this publication.

YS

Eight years ago, when Hong Kong Electric built a tunnel portal and electricity substation in the oldest and most species-rich forest patch on Hong Kong Island (the remains of which is now the Nam Fung Road SSSI), the excuse was ignorance: the site was not known to be important and the species present were not known to be rare. Despite an exponential increase in the amount of information available (documented in the pages of Porcupine!), this excuse has been used repeatedly since, as much of Hong Kong's lowland biodiversity has succumbed to development. Most generally, it has been used to justify the abysmally low standard of the ecological assessments in EIAs.

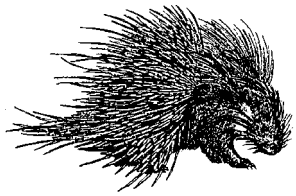
The Biodiversity Survey was intended to identify areas and species of conservation importance and thus to eliminate ignorance as an excuse. Even sites which the survey missed could be evaluated by the species present and by comparison with the best areas of similar habitat in Hong Kong. Data analysis has taken longer than we expected – most fieldwork was completed in 1996-1997 - but with the release of two major new outputs, we are finally at a stage where this is all possible. The first of these outputs is a report entitled *Conserving Biodiversity in Protected Areas: Recommendations for the Extension of Protected Areas in Hong Kong*, by Jackie Yip Yin, which identifies additional sites for protection on the basis of a GIS analysis of the Biodiversity Survey results for ants, amphibians, breeding birds, butterflies, dragonflies, mammals, vascular plants and reptiles. This report has been submitted to all relevant Government departments and compliments the CD-ROM of the survey data presented to the Government last year. A total of 75 sites are identified which are outside existing Country Parks, Special Areas or Restricted Areas, with a total area of 43 km^2. Some of this area already receives adequate protection by other means, so only 25 km^2 are recommended for more stringent protection.

The second major new output is the multi-authored *Hong Kong Vascular Plants: Distribution and Status*, which has just been published as volume 23 of the Memoirs of the Hong Kong Natural History Society. This a complete checklist of the 2135 vascular plant species reliably recorded from Hong Kong, annotated with information on growth form, habitats, conservation status and, for rare species, currently-known localities. Up till now, the conservation value of a plant has been assessed largely on the basis of its protection status. However, the majority of our rarest species are not protected and many of those protected are not rare, so this publication should transform the way in which the botanical importance of sites and species is evaluated.

What's next? We still have unanalyzed data, there is new information on moths, many of major insect groups, and bryophytes in the pipeline, and there are still many groups of organisms (such as the mites and nematodes) which have not yet been surveyed. Additional information will undoubtedly refine our picture of biodiversity in Hong Kong but we do not expect it to change our major conclusions. The sites that the Biodiversity Survey has already identified must be protected now if we are going to save Hong Kong's incredibly diverse flora and fauna for the future. Ignorance is no longer an excuse!

Richard Corlett

Porcupine!



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

INSIDE THIS ISSUE:

DEB NEWS

He's back. After a term of steerage under the hands of John Hodgkiss, headship of the Department of Ecology & Biodiversity has reverted to me. Along with this change at the top, there has also been a welcome change in location, as the department (or DEB) is now situated on the second and third floors of the new Kadoorie Biological Sciences Building. This is an inestimable improvement on our previous accommodation, and finds all the staff and postgraduates under the same roof for the first time since the department was established six years ago. We are extremely grateful to the donor, Lady Kadoorie, who made this change of situation possible. This is also a good moment to thank John Hodgkiss for his efforts with planning the building layout, since we are now enjoying the fruits of his efforts (including seemingly endless meetings with architects). Thanks are also due to Leo Chan (the DEB Senior Laboratory Superintendent) for coordinating the complex relocation effort, and for ensuring that we all got settled in once the move was complete.

So what else is new? The University is undergoing what has been termed 'institutional transformation'. The implications of this are not yet entirely clear, but there has been a significant change in the procedures for admitting postgraduate students. This will have important implications for research in DEB, and will mean also that most students admitted in future will have to be funded in part by a research grant gained by the supervisor through a competitive exercise. This will greatly limit flexibility in the scope, extent and subject matter of postgraduate research projects. A small number of studentships will be awarded also, but these will go only to the most highly qualified applicants (hands up those with first-class honors degrees and, for Ph.D. applicants, an M.Sc.) with innovative research proposals. Because this is a new system, there are sure to be bumps in the road. We will have to see how things develop.

Academically, DEB continues to be as productive as ever. Papers are still being published, seminars are being delivered, theses are still being submitted, and – just out – another book resulting from the efforts of department members (yes, Yvonne Sadovy and Andy Cornish, I mean you) . In addition, the major results of the Biodiversity Survey of Hong Kong have materialised in the form of a set of proposals to Government for extension of the protected areas system (more on this on page 1). The sites identified total around 2% of the area of Hong Kong, and it will be interesting to see how Government – with its much vaunted commitment to the environment – responds to our proposals.

As I write this, at the end of the academic year, the retirement of two staff members in DEB nears. Firstly, Prof. Mike Dickman, who has been in Hong Kong for seven years, and who joined the department when it was established in 1994. Secondly, Mr Chan Shu Tong, plant collector extraordinaire, who has worked in the University for a staggering 46 years! Mike will be returning to his native Canada, but we anticipate Chan Shu Tong will be a regular visitor to the department over the next few years (perhaps he is shooting for triple figures) so that we will continue to benefit from his wealth of experience with local plants. On behalf of DEB, I wish them both well in the future.

Finally, you will notice this periodical is now under new editorship. I'll close by thanking the former editors for their efforts. I'm also grateful to the new team for agreeing to take *Porcupine!* into the 21st century. So ….onward to world domination!

Cheers …… David Dudgeon

Feedback

Dear *Feedback,*

I am writing to join the 'debate' (I sincerely hope it is a friendly one) as stated in K. W. Cheung's articles (*Porcupine!* **20**: 5, 10-11). Readers are asked to pull out the last issue to follow the discussion in a Q & A format.

1) "the adequacy of the West Rail EIA" - West Rail EIA is indeed INADEQUATE; while the impact on birds (birds seem to be the only non-human living form in Hong Kong that attract big attention, in public and in EIAs) has been studied and mitigation measures are being implemented, three species of aquatic animals of extremely high local conservation value, two fish species and the swan mussel, have been overlooked and as a result large portion of their habitat in the whole of Hong Kong is being destroyed (see Dudgeon in *Porcupine!* **19**:17). The Rosy Bitterling (*Rhodeus ocellatus*) is the overwhelmingly dominant life form in the concerned stream. Being an active swimmer in the water column (in areas no more than 30cm deep), this species must be easily detectable and easy to catch, even by a child, but the 'ecology specialist' who carried out the work must have been so focused 'specialising' in other more important faunal groups that he/she just forgot to look into the stream –even though the stream is the most prominent habitat type in the locale.

2) "How much should an EIA include?" – do impact assessment of all natural habitat types for (at least) all vertebrate groups in the project area, i.e. while studying a project area with stream habitat, you HAVE to survey fish (fish was not on the 'compulsory survey list' for the West Rail project profile as far as I can tell). Let me quote my (I think it is) joke once more - not studying the impact on fish in a stream EIA is like not studying the impact of Giant Panda in a Sichuan bamboo forest EIA. By including fish, the 'ecology specialists' must demonstrate to AFCD and EPD that the method used and time spent in doing fish survey is adequate – in that case paid specialists will not easily 'overlook' (or did not look??) aquatic species with high conservation value in EIAs. Overlook is one issue, but NOT looking is another issue!!

3) Who should be blamed? – no-one should be solely responsible and none of us should be blamed. Blaming doesn't help conservation and the animals in trouble. We should all learn from the lessons (although the learning process must be very quick!) and make sure none of these unfortunate scenarios (e.g. Sham Chung and Kam Tin) happen in the future. We (governmental and non-governmental) should communicate more closely, frequently, and informally in conservation issues instead of partition ourselves into 'specialists' who go out and obtain data for the love, 'paid specialists' who go out and may not obtain satisfactory data, and 'decision-makers' who sit in their air-conditioned rooms to decide whether to accept/reject/disregard proposals/recommendations. Freshwater aquatic wildlife is indeed MOST susceptible to disturbance and habitat loss. Being fully aquatic and having very limited ability to move out from disturbed habitats (i.e. the water!), they can do nothing but wait to be murdered if the place they are inhabiting is destroyed. In the case of restricted species, it may result in local extinction.

4) About "representativeness" of an ecological study – It is open to debate, but I believe a study that tells you the overall distribution range of a species in a particular area (e.g. Hong Kong), its relative abundance on a local and international scale, whether it is habitat-specific, and whether that particular habitat is rare and/or threatened in the study area must be qualified. About Cheung's question on how to determine the status of a species if there are no representative data, perhaps this conclusion is inappropriate as, except for our fishes (or may be we do need a revised mammal guide), many of our animal groups have received adequate coverage in the forms of wildlife books (see Proctor in *Porcupine!* **20**:32) and brief but nevertheless accurate distribution records in local journals (e.g. see back issues on distributions of mammal, king crab, moth, sea grass etc.) such as *Memoirs of Hong Kong Natural History Society* and *Porcupine!*. For the fish, Drs. Sadovy and Cornish of HKU have prepared a book on our marine reef fishes, and a systematic survey of freshwater fishes in Hong Kong is now ongoing (see Dudgeon, *Porcupine!* **19**: 17). Such representative works on both marine and freshwater fishes are just out, or due to appear in the near future.

5) "rescue (or wiping out?) of Black Paradise Fish from Sham Chung – well, need I say more, please see the set of 'before, during and after' photos I attached for Sham Chung. This species needs marshes, and I did not see marsh where they were previously found (freshwater marsh on the left-hand-side of the stream when facing the sea to be exact!) in Sham Chung during recent visits with AFCD officers. The whole freshwater marsh was drained and dried during construction to allow landscaping of the now up and nearly running 4-holes golf course. In actual fact I am even more grateful in having rescued (yes, rescued) these fish after seeing what Sham Chung looks like nowadays; it's a haven for golf-players and 'organic farmers', but hell for wetland plants and animals. Oh, by the way, the mangrove fringing the sea has been destroyed as well, I could have 'rescues' some more life forms if someone had a coastal wetland to house them!

6) "Absolutely nothing has been done, is it true?" – I made that comment (*Porcupine!* **19**: 16) assuming interested readers will look up Dudgeon's 1993 article, in which he specifically highlighted the fact that all threatened fish species are confined to lowland waterways. Well, for lowland streams, my statement is almost true – except the recent designation of Tai Ho as SSSI, which is most welcome and I thank AFCD for their hard work. But I found

out about it only AFTER the article was written. Much of Tung Chung, one of the best sites for lowland freshwater fishes (i.e. the threatened group), is gone. The Bitterling stream in Kam Tin is on its way out (unless Mr. Cheung and his colleagues, responsible for the pending EIA, can 'rescue' it!). I recently found more new freshwater fish records for Hong Kong in lowland streams, which have been badly affected by channelization and pollution. Mr. Cheung is most welcome to contact me for a list of degrading-but-good streams if "environmental measures" to protect lowland fishes are taken promptly.

7) About the Bitterling (*Rhodeus*) – it is getting meaningless now to argue which species is in Hong Kong since the two species *R. ocellatus* and *R. sinensis* are treated as synonyms by Chinese fish authorities. But to stand my ground, my large, breeding, male adults still retain the size ratio of *R. sinensis* rather than *R. ocellatus.* About the body markings, defining "two inconspicuous markings behind the operculum" for *R. sinensis* and "two indistinct (Pan's meaning here is not dark as in contrasting colouration) bands behind the operculum" for *R. ocellatus*, as described by Pan (1991), is open to debate. How to determine whether a marking is distinct (as dark colour) or indistinct (as dark colour as well!) on a silvery fish is again, open to debate. By the way what is a marking and what is a stripe/band, is again, open to debate. On top of that, I would much rather save the species *in-situ* at Kam Tin stream than spend time arguing what it is at the moment.

This 'debate' is actually a good thing for the conservation of Hong Kong wildlife – it marks the beginning of an open and frank forum for different opinions, or otherwise such ideas and (possible) prejudices amongst the stakeholders will remain unknown and unsolved. We should keep it going with good intention and reasoning, until one day we all agree and work in unity towards our common goal – preserving the wildlife we all treasure in Hong Kong!

Bibliography

Pan, J. ed. (1991). *The Freshwater Fishes of Guangdong Province.* Guangdong: Guangdong Science and Technology Press.

Bosco Chan

With marsh: (above)
Sham Chung in 1996, the Black Paradise Fish was literally all over the plant-covered marsh. The remoteness of the site, the size of the marsh, and the number of fish gave me a false belief that they must be safe!

After destruction: (right)
Sham Chung in 2000 viewed from nearly the same spot (note the village houses and the crest). The whole marsh was drained during construction of the golf course. The 200+ individuals were 'wiped out' from a ditch situated by the hillside.

Something older: notes on early naturalists and the natural history of South China and Hong Kong

by Kerrie L. MacPherson

It may be of interest to readers of *Porcupine* to pursue the *Lepidoptera* and *Coleoptera* (and naturalists) of south China a bit further into the past. One of the first naturalists to cast his net around Hong Kong was John C. Bowring, eldest son of the Governor, Sir John Bowring, F. R. S. and F. Linn. Soc. Sir John began his varied career as a linguist, philosophical radical, free trader and member of Parliament before the lack of pecuniary wherewithal forced him into the diplomatic trade. He served as the British Consul at Canton (Guangzhou) and the superintendent of trade in China before he was appointed governor of Hong Kong in 1854. John junior's vocation was mercantile but his avocation was the flora and fauna of Hong Kong. He was a great fancier of the beetle (it was said he paid 1000 dollars for a single specimen from South America) and whether for love or money he assembled a stunning array of butterflies, moths and beetles that he donated to the British Museum. Robert Swinhoe, naval officer, China consul and naturalist *par excellence* (more about him later) dubbed him the best entomologist this side of the Cape.

John C., when not occupied by trade or insects, was also a noted botanist an interest he shared with his dad. The two Bowrings were suitably honoured for their plant collections by no less than Sir W. J. Hooker of Kew fame who proposed the genus name *Bowringia* for the arborescent fern of Hong Kong, *B. insignis* (*Kew Journ. Bot.* V (1853) 236). According to Hooker, the Messrs Bowrings were 'no less distinguished for their love of literature than for their patronage of science' and 'have contributed largely to our knowledge of the Natural History of Hong Kong'. However, Hooker overlooked the fact that another ardent naturalist of the flora of Hong Kong, John George Champion of the 95th regiment had proposed in the previous year, a new genus name *Bowringia callicarpa* to honour his good friend and fellow plant gatherer, John C. (*Kew Journ. Bot*. IV (1852) 75). This gaff was corrected in 1856, and happily another noted Hong Kong fern collector C. J. Braine, who donated many living plants to Kew, was justly compensated by lending his name to that new genus of arborescent fern renamed - *Brainea insignis*.

Although Sir John was less distinguished as a naturalist in the botanical field than his son, he garnered fame (or notoriety) as the close friend, confidant, and ultimately executor of the estate of Jeremy Bentham. Bentham of course was best known for his views on law and prison reform and founder of the philosophy of 'utilitarianism' that he promoted along with Bowring senior in his journal, the *Westminster Review*. Bentham, while sorting out the 'laws of man' and the 'laws of nature' like other great minds of his era, was also a bit of a word vender. He coined terms like 'international' (where would today's scientific congresses be without it?) and 'physiurgic somatology' as a substitute for 'natural history' which he thought was a misnomer. Fortunately for us it didn't catch on.

Jeremy's relations fared better in the naming game with his nephew George Bentham, who became one of the greatest taxonomists of the century. His eight volume opus, *Flora Hongkongensis* (1861) was partially based on 500 to 600 species of phaenogamous plants and ferns placed in his hands by John George Champion on his return to England in 1851. The volumes firmly contradicted first impressions of Hong Kong as a 'barren rock' as few islands contain as varied or extensive a flora as Hong Kong. Many plants in Hong Kong today thanks to George, thus bear as part of their moniker *Championii.*

Champion was also fascinated by the *Coleoptera* of Hong Kong a passion he shared with another companion at arms and fellow explorer of south China's biodiversity, Robert Swinhoe. Between his military duties and naval diplomacy, Swinhoe wrote prodigiously for all the scientific journals describing everything that moved or grew along the China coast. Born in Calcutta in 1836, educated at King's College, London, Swinhoe matriculated in 1853 at that 'godless institution', the University of London (later University College, London). Founded by religious dissenters and liberals in 1826 as a foil to the High Church crowd at Oxford and Cambridge, many of the best scientific minds lectured there. Jeremy Bentham even bequeathed himself to the University. Following his detailed instructions his friends conducted the postmortem, reconstructed his skeleton, dressed it in his clothes, stuck a wax model of his head on the effigy and placed it in a glass-fronted case where it is preserved (along with the original head) to this day.

Swinhoe, suitably educated for a life dedicated to the pursuit of science, was sent out to Hong Kong at the tender age of eighteen as a student interpreter for the Consular Service. He was transferred to the treaty port of Amoy (Xiamen) and helped to found the short-lived but active Scientific Society of Amoy, presenting an important paper on the zoology of the area. His best known works concerned the island of Formosa (Taiwan) where he served as vice-consul, forwarding his plant specimens to Kew, and his *Lepidoptera* to a man that took butterflies very seriously, Alfred Russel Wallace (co-discoverer of the theory of evolution). Wallace and Frederic Moore (assistant curator of the India Museum, London) described them in the *Proceedings, Zoological Society of London* (1866). The collection of butterflies though small (forty-six diurnal and ninety-three nocturnal), contained five new species one of which was appropriately named *Euploea swinhoei* after its captor.

Swinhoe's contributions to zoology (particularly ornithology) were remarkable, publishing 37 papers alone in the *Proc. Zool. Soc*. between 1861-70. His collections of specimens from China were studied by the great zoologists of his day such as John Gould (birds), Henry Adams (mollusks), Albert Günther (fish) and Frederic Moore (insects). Yet it was his 'biogeography' of the islands of the South China Sea that

caught the interest of Wallace who was developing his theory (like Darwin) of the geographical distribution of species that could move beyond patterns in time and space to encompass process or organic change.

Wallace (unlike Darwin) was largely self-educated, voraciously reading through all the scientific literature held in the libraries of local mechanics institutes where he also imbibed the radical philosophy of reformers like Robert Owen. Owen's New Lanark experiment was based on his conviction that men's characters are molded by their environments, an idea he shared with Jeremy Bentham his chief investor. The environment of the Malay Archipelago where Wallace spent eight years (1854-62), molded his own thinking on the problem of distinguishing species from varieties (his sale of specimens helped to support his family and he became a whiz at classification). Not surprisingly for a man who knew over eight thousand species of insects alone, Wallace came to the concept of evolutionary change based on a statistical appreciation of natural populations.

Swinhoe's butterflies, his descriptions of Formosa or Hainan and the work of many other naturalists, provided further fuel and substance for Wallace's understanding of the origin of new species by adaptation. Wallace's classic treatise on island biogeography, *Island Life* (1880) was a synthesis of a vast amount of information, structured on evolution, of the distribution and dispersal of living and extinct island fauna which Darwin adopted. The emergence of the theory of evolution was inextricably linked to the growing knowledge of the geographical distribution of species to which Hong Kong's and south China's first naturalists discussed in this essay, made an enduring contribution.

See Emmett Easton, 'Something Old and Something Rare: The Work of One of South China's Earliest Naturalists', at http://www.hku.hk/ecology/porcupine/por/kershaw.htm.

Best of PORC!

In this issue we have included 3 original cartoons by Gary Ades & Graham Reels from early issues of Porcupine! for those who missed them the first time around.

INVERTEBRATES

Beetles in seaweed in Hong Kong

by Guillaume de Rougemont

In 1980 Lanna Cheng and Dennis Hill published an introductory survey of the "marine" insects of Hong Kong. Although in the concluding chapter the authors make the point that "Perhaps a distinction should be drawn between truly marine insects and seashore insects. For the present we are interpreting 'marine' insects' as species that live in direct contact with seawater, and those whose actual contact might be limited but whose natural distribution is confined to one of the recognised marine littoral habitats.", the definition seems somewhat vague and confusing, and includes categories, such as insects of mangrove foliage, that do not even have "limited" contact, unless it is accidental, with sea water.

Strictly marine species are those that live in sea water, including ones like the Hong Kong staphylinids *Bryothinusa* that live in the intertidal zone, are active on the substrate at low tides, and are submerged at high tides. Other categories of sea shore insects should more properly be called 'littoral' species, but even these are sometimes not easily defined: for instance certain genera of halophiles ('salt loving' species) that in Europe are confined to the sea shore also occur on salty soils in central Asia. One category of sea shore insects is however unequivocally littoral: those that live and breed in accumulations of seaweed washed up on beaches. "In areas where seaweeds are washed ashore in large quantities, dense populations of seaweed (kelp) flies, reaching 10^7/km of beach, may create a nuisance, if not a health hazard." (Cheng & Hill, p. 174). "Members of several families of flies, especially the shore flies (Ephydridae) and seaweed flies (Coelopidae), breed in washed up seaweed (wrack) and other forms of flotsam. The larvae usually feed on decomposed vegetable matter and pupate in the sand or under stones. The adults of several ephydrids are generally rather common along most sandy shores." (Cheng & Hill, p. 177). Not surprisingly, the availability in such abundance of a food source has produced the evolution of a range of specialised predators of these flies and especially of their immature stages, including entire genera of beetles that are found nowhere else. However the only three beetles mentioned in this context by Cheng & Hill (p. 177) are not associated with seaweed or seaweed flies: "Beetles of several families also breed in wrack, or are associated with this habitat. Locally common beach beetles include rove beetles of the genus *Bryothinusa* (Staphylinidae), the darkling beetles. *Gonocephalum pseudopubens* (Tenebrionidae) and the beach tiger beetle *Cicindela anchoralis* (Cicindelidae)." *Bryothinusa* are strictly marine, intertidal beetles. *Gonocephalum* spp. are often found on beaches, because they prefer arid, light sandy soils,

but are equally common inland. *Cicindela anchoralis* is a true littoral species, actively hunting other insects on beaches by flying or running and pouncing, but is not associated with seaweed.

Yet the specialised predators of seaweed flies do occur in Hong Kong, just as they do in every zoogeographic region. My own prospections on Hong Kong beaches and searches through the drawers of the Natural History Museum, London, have produced the following list of seaweed beetles:

Family Staphylinidae:

Cafius algarum (Sharp); *Cafius corallicola* Fairmaire; *Cafius histrio* (Sharp); *Cafius nauticus* Fairmaire; *Cafius rufescens* (Sharp); *Phucobius tricolor* Bernhauer; *Aleochara fucicola* (Sharp); *Aleochara trisulcata* Weise; *Atheta algarum* Pace; *Hydrosmecta subalgarum* Pace; *Myrmecopora chinensis* Cameron.

Family Histeridae:

Hypocaccus varians Schmidt; *Eopachylopus* sp. cf. *ripae* Lewis.

Two other littoral staphylinid beetles, *Medon rubeculus* Sharp and a *Scopaeus* that appears to belong to an undescribed species (*Scopaeus* sp. 5, Rougemont 2000) were also found on Hong Kong beaches to the exclusion of any other habitat, but in drier jetsam further up the beach, and may not be associated with seaweed flies, but merely confined to sandy soil: like many staphylinids that live in deserts and other sandy habitats, both these species are relatively depigmented. *Cafius* is a genus of world-wide distribution exclusively confined to seaweed in which both the larvae and adults prey on the larvae and pupae of seaweed flies. *Phucobius* is a small genus that lives in the same way but is confined to China and Japan. *Aleochara* of the subgenus *Emplonota* (including the very common *A. fucicola*) are parasitoids of *Cyclorrapha* flies, as is probably the only known member of the subgenus *Triochara* (*A. trisulcata*); both these species were hitherto only known from Japan. The smaller *Atheta*, *Hydrosmecta* and *Myrmecopora* probably prey both as larvae and adults on the eggs and younger larvae of seaweed flies; the two former species are so far only known by the type series collected by me in Hong Kong in 1997, while the Myrmecopora, also only known from Hong Kong, has not been recorded since the types were collected in Mirs Bay before the war. The histerids are also predators of these flies.

The fauna associated with seaweed jetsam, and, more broadly, littoral species in general, appears to be less diverse in the tropics and subtropics than in temperate regions (cf. 22 kelp fly predators and 11 marine staphylinids in Japan (Shibata, 1993) compared with 11 and 5 respectively in Hong Kong), and whole genera of littoral species belonging to other families (Carabidae, Scarabaeidae, Tenebrionidae) that are abundant in Europe, especially southern Europe, appear to be absent in the tropics.

Bibliography

Cheng, L. & Hill, D.S., (1980): Marine insects of Hong Kong, pp. 173-183. In Morton, B.S. & Tseng, C.K. (eds). Proceedings of the First International Marine Biological Workshop: The marine fauna and flora of Hong Kong and southern China. Hong Kong University Press.

Rougemont, G. de. (2000). The Staphylinid Beetles of Hong Kong: Annotated check list, historical review, bionomics and faunistics. *Mem. Hong Kong Nat. Hist. Sco. 000*.

Shibata, Y. (1993). On the Staphylinid beetles living in the seashore. *Insects and Nature* 28, 11: 23-27. (in Japanese).

Beetle news

by Guillaume de Rougemont

The survey of the staphylinid beetles now Hong Kong announced in 1996 (Porcupine! 15, p. 44) is complete. The checklist of Hong Kong species now includes 423 species (up from 53 species recorded before 1997): read all about it in the Memoirs of the Hong Kong Natural History Society, vol. 24 ! The survey is completed, that is, but certainly not the list of Staphylinidae that actually occur in Hong Kong. Despite traps run continuously for almost two years, new additions to the list accrued almost every week right up to the last samples taken by Stephen Reels in October 1997, and this might have gone on for much longer had collecting for the biodiversity survey continued.

Most of the other beetles collected during the staphylinid survey still await study; others await specialists prepared to take them on. However a few publications have already appeared on the material collected in the course of the biodiversity survey, and I have received some feedback in private communications on three families of beetles given to friends and colleagues:

Subfamily Scaphidiinae

In Porcupine! 15 (p. 12) I gave a list provided by Ivan Löbl (Geneva Museum) of the Scaphidiinae collected in 1996. These beetles, formerly classed as a Family, are now considered to be a subfamily of Staphylinidae, but are not included in my work on the Hong Kong fauna. The "new species" of *Baeocera* mentioned in 1996 list has since been described as *B. cooteri* Löbl, after Jonathan Cooter, who also found this species in Zhejiang Province; the unidentified species of *Scaphobaeocera* has been identified as *S. spinigera* Löbl, which is widely distributed in Asia.

Family Histeridae

Histerids are very 'beetley' looking beetles, small to medium (1.5 - 10 mm) ovoid or pill-shaped insects with very hard shiny bodies and short stout legs and appendages. I love the name, but the consonance with 'histerics' is inappropriate: unlike my fretful staphs, histerids are rather ponderous, deliberate creatures. When teased they retract their heads and appendages, tortoise fashion, in which posture they become

invulnerable to almost anything but a nutcracker, and play possum until the annoyance ceases before resuming their purposeful progress. Most species are to be found in decaying organic material, dung, carrion etc, in which they prey on smaller arthropods, but many are highly specialised: some are flattened dorso-ventrally as an adaptation to living under bark; others are found exclusively in birds' nests in tree hollows, or in seaweed on beaches (see article "Beetles in seaweed in Hong Kong", p. 6); a few, usually very rare species, are found only in ant or termite nests. The histerids I collected in 1996-97 have found their way into the hands of Thomas Lackner (Amsterdam), who provided the following information on the only seven species represented in the material:
Species in organic litter: *Atholus bifrons* Marseul is widely distributed in the oriental region, but new to Hong Kong; *Hister sohieri* Marseul is common and widely distributed in the oriental region, including China; *Margarinotus arrosi* Bickhard on the other hand is very rare: it was hitherto known only by the type from "China" and one other specimen, also labelled "China".
Corticolous species: *Platyomalus oceanitis* Marseul is common and widely distributed in the oriental region and Australia; a *Eulomalus* sp. cannot be determined until the genus has been revised.
Littoral species: *Hypocaccus varians* Schmidt, which is occur on beaches throughout the eastern Indian and western Pacific Oceans, and an *Eopachys*, possibly a new subspecies of *E. ripae* which is known from Japan and the Russian Far East, were both found in abundance but only at a single locality, on the relatively pristine beach at Tai Long Bay, Sai Kong Peninsula, in March 1997.
Termitophilous or myrmecophilous species: *Paratropus* new species. This is the most interesting find, because this genus was hitherto only recorded from Africa and India. The flight interception traps and light traps used for the staphylinid survey revealed many termitophilous and myrmecophilous Staphylinidae for the first time from Hong Kong, but despite the activities of the resident termite expert (Mike Crosland) and myrmecologist (John Fellowes), none have so far been found in association with their hosts. Greater efforts required!

Family Leiodidae

All the Leiodidae, including Catopinae and Coloninae that I collected in Hong Kong and elsewhere in China were given to my friend Jonathan Cooter. Members of the Subfamily Leiodinae feed on fungi, many on subterranean fungi, and are therefore often of cryptic habits. So far material of the genus *Agathidium* has been studied (Angelini & Cooter, 1999), and includes three species from Hong Kong:
Agathidium xianggangense Angelini & Cooter. The type series is of 6 individuals sifted from leaf litter in May 1996 in a particularly interesting patch of woodland at over 800 m on Tai Mo Shan, a locality that produced other new species that have been found nowhere else (see Rougemont, 2000). The flight interception traps at KARC and CUHK yielded two other species, *A. venustum* Angelini and De Marzo, described from Taiwan and Guangxi, and *A. bowringi* Angelini & Cooter, known only from Hong Kong. Another species taken by John Fellowes in Guangdong in 1997 has been named *A. gutianense* Angelini & Cooter.

Studies of the other genera of Leiodidae have not yet been published, but the material includes at least two interesting finds:
A large series of a new species of *Colonellus* Szyczakowski was collected in the flight interception trap at CUHK. The genus was hitherto only known from Sumatra and Ceylon.
Six specimens of a new species of *Creagrophorus* taken in the same trap are an even greater surprise, for this genus of obligate feeders on puffballs was previously thought to be endemic to Central America.

Others

Among the many weird and wonderful creatures that suddenly appeared out of the tropical night to land in our light or flight interception traps in 1997 were two individuals that add two new beetle Families to the known fauna of Hong Kong:

Family Lymexylidae

In early January 1997 Roger Kendrick, with an expression of mild distaste, handed me an insect that had made its way into his Robinson light trap at KARC the night before. Its minute atrophied elytra were the only indication that this weird creature was a beetle, and suggested that it might be one of my jobs. It turned out to be not a staph but a member of the small Family Lymexylidae, a species of *Atractocerus* Palisot de Beauvois, possibly *A. reversus* Walker which was described from Ceylon (species of *Atractocerus* are very variable in size, and some of the species have been redescribed many times under different names).

These beetles were once thought to be among the most primitive of all Coleoptera, their simple wing venation, almost undifferentiated antennae and tarsi and naked abdomen being likened to a supposed neuropteran common ancestor, but later studies in higher phylogeny (Crowson, 1955) showed that they are highly evolved relatives the more 'beetley' cucujids and clerids. Nothing is known of the bionomics of *Atractocerus*. The larvae of two other genera of lymexylines, *Lymexylon* and *Melittomma*, bore galleries in wood and feed on particular species of fungus that grow on the walls of the burrows; *Atractocerus* may therefore live in a similar way, but the large eyes and very active behaviour of adults is more suggestive of predators than of fungus feeders. Some species appear to mimic *Ophion*, *Provespa* and other wasps when they are attracted to light (Kurosawa, p. 111, and my own observations in Africa). Since the great majority of captures have been made at light, these insects may be less rare than they appear to be from collections: few coleopterists regularly use light as a sampling method, and lepidopterists less enlightened than Roger are more likely to treat these arrivals as something nasty and likely to sting or bite, and to squash rather than collect them.

Kurosawa has divided *Atractocerus sensu lato* into five genera, based entirely on the size of the eyes and consequent modification in the shape of the head. These differences appear to be directly linked to the beetles' habits, according to whether they are diurnal, crepuscular or nocturnal. It is my

view that the differences are no more than specific, and that a study taking other characters into account will prove that all the species known at present belong to a single, or at most to two genera.

Family Rhipiphoridae

While sorting the KARC flight interception trap sample for that same week I was about to flick what looked like a midge with large flabellate antennae into the waste paper bin when, again, the sight of a pair of wrinkled atrophied elytra made me realise that this was not a fly but a species of *Rhipidius*. All rhipiphorid beetles are rare, and as far as is known all are parasitoids of other insects, mainly of wasps and solitary bees. The few species of *Rhipidius* known from Europe parasitise forest cockroaches: the larvae and the larviform females live in and on their hosts' living bodies. This is, as far as I know, the first occurrence of the genus in China where it presumably lives on one of the local wild cockroaches (how it might thrive in Hong Kong if it could be persuaded to exploit the domestic kinds!).

The Family Rhipiphoridae, notwithstanding the peculiar bionomics, is similar to and closely related to the Mordellidae, the so called "tumbling flower beetles" whose Hong Kong representatives are being studied by Lu Wenhua.

The unique Chinese specimen has unfortunately since been reduced to half a dozen separate fragments by a family cat that leaped from the floor to land, painfully I am glad to say, on the pinned specimens in an open box on my desk. I am now separated from my wife and cat and living in the woods in SW France, so this particular hazard to valuable specimens no longer exists, and material can safely be sent to me for determination.

Bibliography

Angelini, F. & Cooter, J. (1999). The Agathidiini of China with descriptions of twelve new species of Agathidium Panzer (Coleoptera: Leiodidae). *Oriental Insects* 33: 187-232.

Crowson, R.A. (1955). *The natural classification of the families of Coleoptera*. Nathaniel Lloyd, London.

Kurosawa, Y. (1985). Revisional notes on the Family Lymexylonidae (Coleoptera) in Eastern and Southeastern Asia. *Bull Natn. Sci. Mus. Tokyo, A* 11(2): 109-119.

Löbl, I.. (1999) A review of the Scaphidiinae (Coleoptera: Staphylinidae) of the People's Republic of China, I. *Revue Suisse de Zoologie* 106 (3): 691-744.

Rougemont, G. de. (1996). Scaphidiids in Hong Kong. *Porcupine!* 15: 12.

Rougemont, G. de. (1996). A madman, a taipan and Hong Kong's staphylinid beetles. *Porcupine!* 15: 44-45.

Rougemont, G. de. (2000). The Staphylinid Beetles of Hong Kong: Annotated check list, historical review, bionomics and faunistics. *Mem. Hong Kong Nat. Hist. Soc. In Press*

Aciagrion tillyardi Laidlaw (Odonata: Zygoptera) a damselfly new to Hong Kong

by Keith D. P. Wilson

Introduction

The dragonfly fauna of Hong Kong was comprehensively detailed in Wilson (1997). In this account 107 species were treated. A species of damselfly, *Aciagrion tillyardi* Laidlaw, discovered at Pat Sing Leng on 21 May 2000, brings the total odonate fauna known from Hong Kong to 108 species. A full description is provided here, with details of material and a full discussion of synonymy.

Aciagrion tillyardi (Laidlaw, 1919)

Fig.1

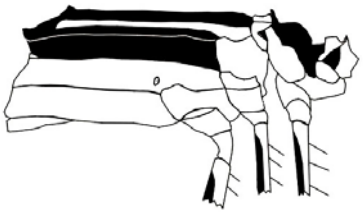

Fig.2

Fig.3

Fig.4

Figs 1-4

Aciagrion approximans (not of Selys): Fraser, 1933: 334-335 (key), 342-344, figs 148 (a-b), “Assam, India”.
Aciagrion tillyardi: Laidlaw, 1924: 3-6, pl. 1 (fig. 15), “Assam, India”; Lieftinck, 1954: 76, “Sumatra”; Lahiri, 1979: 121, “Assam, India”; Wilson, 1999: 28-30, figs 12-13, “Guangdong and Guangxi”; Hämäläinen & Pinratana, 1999: 9, 39, “Thailand”.
Enallagma assamica Fraser, 1920: 877, 888, “Assam”.
Material: 5 males, Pat Sing Leng, 21-V-2000.

Description: A medium-sized *Aciagrion* with male coloured with violaceous markings on head, thorax and tip of abdomen.
Male - Labium pale yellow. Labrum, anteclypeus and frons violaceous. Small dark spot discernible at base of anteclypeus. Postclypeus black. Top of head black with violaceous postocular spots, which are linked by a narrow, violaceous, transverse stripe across the occiput. The head is illustrated in fig. 1. Middle and hind lobes of prothorax black with pale anterior lobe and sides bluish violet or pruninosed white. Thorax black dorsally which extends beyond the

humeral suture into the metepisternum. Narrow violaceous antehumeral stripe. The remaining three-quarter of the metepisternum is bluish violet fading to a pale bluish green on the metepimeron. Pale areas of thorax heavily pruninosed. The thorax is illustrated in fig. 2. Legs white with femora broadly striped black on the outer surface. Wings hyaline with greyish pterostigma, which is larger in fore wing than hind wing. Dorsum of abdominal segments 1-7 and 10 black with sides of segments 1-2 and lateral base of 3 pale blue. Segments 8-9 wholly violaceous blue. Dorsal base of segments 3-7 narrowly ringed with pale whitish yellow and black areas are narrowly expanded laterally at apical border. Distal third of segment 7 and segments 8-10 markedly dilated. Length of superior caudal appendages (fig. 3) half their width, when viewed laterally, and slightly longer than the inferior appendages; coloured black. There is a pale distal mark at base of the inferior appendage, which is otherwise black. The penile organ is simple and illustrated in fig. 4.

Female (Guangdong material) - Similar head and thoracic pattern to male but predominant colour is yellow. Abdomen black with tenth abdomen segment blue. Segment 9 with large blue spots laterally at distal margins. Intersegmental membrane between segments 7 - 8 and 8 - 9 blue.

Measurements (mm): Male. Abdomen + appendages 22.0 – 25.0, hind wing 13.5 – 15.0; female (Guangdong material) abd. + app. 22.0, hw. 14.5.

Distribution: China (Guangdong, Guangxi, Hainan and Hong Kong), India, Indonesia (Sumatra) and Thailand.

Discussion

There are some 27 species of *Aciagrion* known from Africa, Australasia and the Orient. It is a difficult genus, with the dozen or so Oriental species in need of revision. Fraser (1933) synonymised *Aciagrion tillyardi* Laidlaw with *Aciagrion approximans* (Selys 1876). However, subsequent authors have discounted this synonymy. In order to avoid any confusion I have provided an explanation below for not accepting Fraser's synonymy with *approximans.*

Selys (1876) described *Pseudagrion microcephalum 'approximans'* (as a race of *P. microcephalum*) on the basis of a single male specimen, which lacked the last abdominal segments and also lacked any locality data. Selys subsequently wrote that he was, "convinced that the specimen comes from Malaysia or elsewhere from tropical Asia". Later in his Burma publication, Selys (1891: 80) wrote that *P. approximans* is an *Aciagrion* that occurs in Khasia Hills, which presumably refers to the Khasi Hills, Shillong, Assam. He stated the anal appendages of *approximans* resemble those of *A. hisopa*. However, Selys's identification of the Assamese specimens as being conspecific with the real *approximans* must be treated as a supposition, since the holotype lacked anal appendages and the type locality was uncertain. At that time only three species (*A. hisopa, A. approximans* and *A. pallidum*) were known in the genus, so his supposition based on colour pattern and venation was understandable. It is now known that these characters are too similar to be used to separate taxa in this species rich genus.

Laidlaw (1924) stated that the last three segments of the type *approximans* were missing and the female was unknown. He remarked that the type is, "said to have come from the Kjasi Hills", which is incorrect. Selys (1891) never claimed that the holotype of *approximans* came from Assam. Laidlaw (1924) indicated his only records and specimens of *tillyardi* were from Assam. The type of *tillyardi* comes from the Tura Garo Hills, which are located in west of the Khasi Hill range in Assam. Laidlaw considered his *Aciagrion tillyardi* was "possibly synonymous" with *approximans*.

Fraser (1933) supposed that his material from Khasia Hills (Khasi Hills), Assam was *approximans* and commented it was very common at 5000-6000 feet. In truth, the locality of *approximans* remains unknown. Fraser's drawings of the anal appendages of *approximans*, based on material of *tillyardi* (Fraser, 1933: 343, fig. 148a-b), are somewhat stylized. He clearly illustrates a lateral view of the inferior appendage with a robust tooth, which he described as, "directed inward and upward". In Chinese material this tooth is only slightly directed upwards and cannot be seen from the side without displacing or removing the superior appendage, but nevertheless it is clearly present.

The holotype of *approximans* was apparently destroyed in the Dresden bombings during the war. A future reviser of the genus should suppress the taxon *approximans,* since its status is uncertain and cannot be verified.

Few records of *Aciagrion* are known from China. Needham (1930) provides a few records and a description of *Aciagrion hisopa* Selys from Sichuan, Taiwan and Fujian. However, Lieftinck et al (1984) assigned Needham's Chinese *hisopa* records to *Aciagrion migratum* (Selys, 1891). Sui & Sun (1984) record *Aciagrion hisopa* (Selys), *Aciagrion olympicum* Laidlaw and *Aciagrion pallidum* Selys from China but these records require confirmation. *Aciagrion migratum* is therefore the only other *Aciagrion* hitherto recognised from China. Nine species of *Aciagrion* are known from Indo-China and 13 species in total are known from the oriental region. These are the first *Aciagrion tillyardi* records from Hong Kong.

There are no common names for *Aciagrion* that I am aware of. Perhaps this species might be known as the Violet Aciagrion.

Biological notes

Aciagrion tillyardi was found in a hilly wet marsh area at the north side of Hong Kong's Pat Sing Leng range. Males of *tillyardi* were perched on vegetation adjacent to small puddled areas of open water. In the same marsh area numerous adult *Nannophya pygmaea* Rambur, 1842 were present. In Guangxi and Guangdong *Nannophya* has also been found in company with *Aciagrion tillyardi.*

Acknowlegements

I am grateful to Dr. Matti Hämäläinen for his helpful advice regarding the taxonomic status of *A. tillyardi* and *A. approximans*.

Bibliography

Fraser, F.C. (1920). Indian dragonflies. *J. Bombay Nat. Hist. Soc.* 26(4): 874-888.
Fraser, F.C. (1933). *Fauna of British India, including Ceylon and Burma. Odonata.* Vol I, London, Taylor & Francis. xiii + 423 pp, 180 figs, 4 cpl. 1 map.

Hämäläinen, M. and Bro. Amnuay Pinratana (1999). Atlas of the dragonflies of Thailand. Pub. Chok Chai Creation Printing group Co. Ltd., 45 Salapee 1 Rd., Somdej Chao Phraya, Klongsarn, Bangkok.

Lahiri, A.R. (1979). Odonata (Insecta) from different States of North Eastern India. *Oriental Insects* 13(1-2): 119-132.

Laidlaw, F.F. (1924). Notes on oriental dragonflies of the genus *Aciagrion. Proceedings of the U.S. National Museum* 66(10)(2547): 1-9.

Lieftinck, M.A. (1954). Handlist of Malaysian Odonata. A catalogue of dragonflies of the Malay Peninsula, Sumatra, Java, and Borneo including adjacent islands. *Treubia* 22(suppl.): xiii + 202 pp. 1 map.

Lieftinck, M.A., Lien, J.C. & Maa, T.C. (1984*). Catalogue of Taiwanese Dragonflies (Insecta: Odonata)* Asian Ecological Society, Taichung, Taiwan. 81 pp.

Needham, J.G. (1930). A manual of the dragonflies of China. *Zoologia Sinica* 11(1): i-xi, 1-344, 2 figs, 20 pls.

Sui, J. Z., & Sun, H. G. (1984). *Common species of dragonflies from China.* Agric. Pub. House, Beijing, China. pp. 328, pls. 26.

Wilson, K.D.P. (1997). An annotated checklist of the Hong Kong dragonflies with recommendations for their conservation. *Mem. Hong Kong Nat. Hist. Soc*. 21: 1-68, pl. 1 excl.

Wilson, K.D.P. (1999). Dragonflies (Odonata) of Dinghu Shan Biosphere Reserve, Guangdong Province, China. *International Journal of Odonatology* 2 (1): 23-53.

Wilson, K.D.P. (2001). (in press). Odonata of Hainan. *Odonatologica.*

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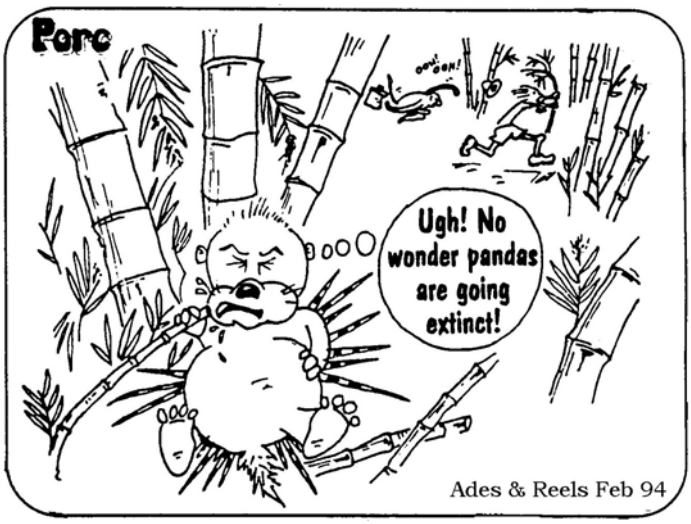


Winter mortality at Cape d'Aguilar Marine Reserve

by David Y. N. Poon

December, 1999, the last of the millenium, was one of the coldest months ever recorded in Hong Kong. Life was harsh during that period, with a minimum air temperature (5.8ºC, Hong Kong Observatory) for the year recorded on December 23. While I was pleased to have extra heavy clothing, the cold spell must be a nightmare to organisms of the rocky intertidal.

In the afternoon of December 23, I visited Cape d'Aguilar. As usual I walked along the boulder field of Lobster Bay (mid-low shore), which was also the study site of my final year project. Again, as usual, I looked at everything present there and this time I found a *Grapsus albolineatus* stranded in a rock pool. On closer examination I could confirm that it was dead, not the usual empty post-moulting carapace I often see. With curiosity I began searching for other corpses and soon encountered a dead juvenile moray eel, *Gymnothorax reevesii*, under a big boulder.

On the afternoon of the following day, I returned to Lobster Bay to collect sand and cobbles for my experiment. This time I noted a stranded crab, a portunid (*Charybdis annulata*), still alive but barely active. In a nearby rock pool, I discovered that some *Thais clavigera* were clustering around dead fish remains (most probably the *Bathygobius* spp.), while another *Charybdis annulata* was dead. I again searched for corpses and, this time, upon lifting a big boulder near the rock pool, I observed that a small grapsid *Gaetice depressus* was feeding on dead fish remain.

Later on, I brought the inactive portunid back to the aquarium where there were signs of recovery. At this point, I began to believe that the cold spell was responsible for the observed mortalities.

In the early morning of December 25, I began collecting hermit crabs and xanthids for my project. It was a terribly cold morning with the air temperature below 10°C. While collecting samples I found two more inactive crabs, both *Grapsus albolineatus*. After the sampling work I searched for corpses, and again found aggregations of *Thais* on fish remains (possibly gobies) in a low intertidal rock pool. One blenny (*Entomacrodus stellifer*) was found stunned (barely active, very easy to catch). All the stunned animals recovered soon after I brought them back to the indoor aquarium of SWIMS.

On the afternoon of the next day I extended my search to the western coastline up to Telegraph Bay. This time an inactive *Grapsus albolineatus* was found in a rock pool close to the pumphouse. Later on, in the journey towards the Telegraph Bay a further two stunned *G. albolineatus* and a dead goby were discovered, all found in rock pools (high shore pools for the crabs).

The effect of low temperature is well documented for local terrestrial communities, and mortality due to cold stress is known for certain vascular plants, birds, and insects (Dudgeon & Corlett 1994). While the effect of heat stress on the local rocky intertidal community is well understood (e.g. Hodgkiss 1984; Williams & Morritt 1995), there are few documented works concerning winter mortalities in Hong Kong (but see Maxwell 1997). The effect of cold stress is well documented for temperate shores (Williams personal communication) and the tolerance of temperate intertidal communities to cold stress is well understood (Loomis 1995). Little is known, however, of cold stress on Hong Kong's intertidal communities. This is certainly a gap in understanding Hong Kong's coastal ecology.

However, I have to admit that no quantitative measurements were done for the observations. It is therefore possible that other factors (any suggestions?) may also have contributed to the outcomes. Certainly follow-up is needed for the coming cold months to test the hypothesis that cold stress was causing the mortalities. Finally, I'd like to invite any person who has made similar observations to send a note to the next issue of Porcupine!.

Acknowledgements

Thanks to Dr. Williams for discussion on this matter and Andy Cornish for notification of the Maxwell (1997) literature.

Table 1. List of organisms dead/stunned as a result of the cold stress. The number in the brackets indicate the number of dead/stunned individuals. (D - dead; S - stunned; N/A - data not available)

Name	Fate
CRABS	
Charybdis annulata (Fabricius, 1798)	D (1) / S (1)
Grapsus albolineatus (Lamarck, 1818)	D (1) / S (5)
FISHES	
Bathygobius spp.	D (N/A)
Entomacrodus stellifer (Jordan & Snyder, 1902)	S (1)
Gymnothorax reevesii (Richardson, 1845)	D (1)

Bibliography

Dudgeon, D & Corlett, R. (1994). *Hills and Streams: An Ecology of Hong Kong*. Hong Kong University Press, Hong Kong.

Hodgkiss, I.J. (1984). Seasonal patterns of intertidal algal distribution in Hong Kong. *Asian Marine Biology*. 1: 49-57.

Loomis, S.H. (1995). Freezing tolerance of marine invertebrates. *Oceanography and Marine Biology: An Annual Review*. 33: 337-350.

Maxwell, G.S. (1997). Mullet mortality in the Sai Wan lagoon. *Memoirs of the Hong Kong Natural History Society*. 21: 223-224

Miyake, S. (1983). *Japanese Crustacean Decapods and Stomatopods in Colour* Vol. II: Brachyura (Crabs). Hoikusha Publishing, Higashiosaka, Japan (Japanese text).

Williams, G.A. & Morritt, D. (1995). Habitat partitioning and thermal tolerance in a tropical limpet, *Cellana grata*, on a tropical rocky shores. *Marine Ecology Progress Series.* 124: 89-103

Internet resources:

The Hong Kong Observatory: http://www.info.gov.hk/hko/
Fishbase: http://www.fishbase.org/

Epixanthus or *Macromedaeus*? Plus a new xanthid for Hong Kong

By David Y. N. Poon

As mentioned in another article in this issue of Porcupine!, I was collecting hermit crabs (*Pagurus trigonocheirus*) for my final year project in the morning of December 25, 1999. In addition to the hermit crabs I also needed to collect a species of crab (Xanthidae) thought to be *Epixanthus frontalis* (H. Milne-Edwards, 1834), which is common on Hong Kong's rocky shores (Morton & Morton 1983).

While lifting a boulder at Lobster bay to search for the cute little xanthid, I saw an unusual big "*Epixanthus*" emerging from the substratum and captured it. On closer examination I found that it was something new. After checking with the texts of Dai & Yang (1991) and Miyake (1983), the crab was in fact another species of xanthid called *Medaeops granulosus* (Guinot, 1967) which has not been recorded in Hong Kong before. In addition to the new discovery, I also noticed that the "*Epixanthus frontalis*" that I collected was quite different from the one described in Dai & Yang (1991), and looked identical to another xanthid *Macromedaeus distinguendus* (De Haan 1835). *Epixanthus* or *Macromedaeus*? The identification of this species remained unresolved until December 26.

On the afternoon of December 26, I searched for corpses along the western coastline of Cape d'Aguilar Marine Reserve and finally reached Telegraph Bay. There, I shifted my target from dead to living organisms -- the crabs -- in the hope of collecting crab samples for my project. I lifted boulders in one rock pool and successfully caught a crab. At the first glance it looked identical to the xanthid samples collected before. Again, on closer examination I found that it was something different. Without hesitation I collected a few more crabs from Telegraph Bay and took them back to the lab. After checking the texts of Dai & Yang (1991), Morton & Morton (1983) and Wei (1991), the identity of the crab was finally revealed - it was the real *Epixanthus frontalis*. Further checking with the text of Wei also confirmed the identity of the "*Epixanthus*" samples collected - they were *Macromedaeus distinguendus*.

Simple distinguishing features

Macromedeus distinguendus can be easily distinguished from the other two species by the presence of pubescence at the pterygostomian region. Carapace oval-shaped, with a convex surface and clearly divided into regions by fine grooves. Chelipeds asymmetrical, granulated, bearing short hairs on the dorsal surface of the merus (fourth segment) and inner side of the carpus (third segment). Fingers armed with teeth of varying sizes. Legs short and depressed, granulated, with the dorsal margin of the fourth segment (merus) serrated and fringed with hairs.

Epixanthus frontalis can be distinguished from the other two species by having a flat and almost smooth, oval-shaped carapace, with ill-defined regions and a characteristic H-shaped groove on the center (gastric-cardiac region). Chelipeds asymmetrical and smooth, with fingers longer and thinner than the other two species. Legs are long and slender, depressed and smooth, fringed with short setae at the distal portion of the first and second segments (dactylus and propodus).

Medeaops granulosus can be distinguished from the other two species by the more hexagonal-shaped carapace, with well-defined regions. Chelipeds asymmetrical, with the fourth (merus), third (carpus), and the second (manus) segments granulated. Fingers stout, with pointed tips and varying teeth sizes. Legs not serrated on the dorsal margin of the fourth segment (merus).

For detailed descriptions interested readers can refer to Dai & Yang (1991).

Macromedaeus distinguendus may have been misidentified as *Epixanthus frontalis* for a long time for several reasons. At first glance *M. distinguendus* looks superficially identical to *E. frontalis* and the former is common in many local rocky shores (personal observation). Moreover, while checking the live specimens against materials deposited at the SWIMS museum, I found that the *Macromedaeus* specimen there had been misidentified as "*Epixanthus* sp.". Furthermore, *M. distinguendus* was absent from Morton & Morton (1983) and Morton & Harper (1995). The latter is especially written for the Marine Reserve, and I found the illustration of *E. frontalis* more resembles *M. distinguendus*!

In Hong Kong, studies of brachyuran fauna have been largely restricted to the family Grapsidae, in particular the sesarmines (Lai 1999; also see Lee 1998). Intertidal grapsids have also received considerable attention and their feeding ecology is well understood (Depledge 1989; Kennish 1997). The ecology of other local brachyuran fauna, on the other hand, with a few exceptions, is poorly understood and is largely confined to taxonomic studies (Davie 1992; George 1980; Hills 1980; Jones & Morton 1994; Pregenzer & Morton 1990). There is no comprehensive taxonomic checklist of Hong Kong xanthids (but see Morton & Morton 1983), which are one of the least understood crab families locally.

Bibliography

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

Davie, P.J.F. (1992). A new species and new records of intertidal crabs (Crustacea: Brachyura) from Hong Kong. In Proceedings of the Fourth International Marine Workshop: The Marine Flora and Fauna of Hong Kong and Southern China, Hong Kong, 1989 (Ed. B. Morton). Hong Kong University Press, Hong Kong, pp. 345-359.

Depledge, M.H. (1989). Observations on the feeding behaviour of *Gaetice depressus* (Grapsidae: Varuninae) with special reference to suspension feeding. *Marine Biology*. 100: 253-259.

George, R.W. (1982). The distribution and evolution of the ghost crabs (Ocypode spp.) of Hong Kong with a description of a new species. In Proceedings of the First International Marine Workshop: The Marine Flora and Fauna of Hong Kong and Southern China, Hong Kong, 1980 (Eds. B. Morton & C.K. Tseng). Hong Kong University Press, Hong Kong, pp. 185-194.

Hills, D.S. (1982). The Leucosiidae (Crustacea: Decapoda) of Hong Kong. In Proceedings of the First International Marine Workshop: The Marine Flora and Fauna of Hong Kong and Southern China, Hong Kong, 1980 (Eds. B. Morton & C.K. Tseng). Hong Kong University Press, Hong Kong, pp. 195-205.

Jones, D.S. & Morton, B. (1994). The fiddler crabs (Ocypodidae: *Uca*) of Hong Kong. *Asian Marine Biology*. 11: 9-40.

Kennish, R. & Williams, G.A. (1997). Feeding patterns of the herbivourous crab *Grapsus albolineatus*. *Marine Ecology Progress Series.* 147: 87-95.

Lai, V.C.S. (1999). A new sesarmine for Hong Kong. *Porcupine!.* 20: 8-9.

Lee, S.Y. (1998). Ecological role of grapsid crabs in mangrove ecosystems: a review. *Marine and Freshwater Research*. 49: 335-343.

Miyake, S. (1983). *Japanese Crustacean Decapods and Stomatopods in Colour* Vol. II: Brachyura (Crabs). Hoikusha Publishing, Higashiosaka, Japan (Japanese text).

Morton, B. & Morton, J. (1983). *The Sea Shore Ecology of Hong Kong*. Hong Kong University Press, Hong Kong.

Morton, B. & Harper, E. (1995). *An Introduction to Cape d'Aguilar Marine Reserve, Hong Kong*. Hong Kong University Press, Hong Kong.

Pregenzer, C & Morton, B. (1990). Hong Kong Pinnotheridae: Pinnotherinae (Crustacea: Decapoda). In Proceedings of the Second International Marine Workshop: The Marine Flora and Fauna of Hong Kong and Southern China, Hong Kong, 1980 (Ed. B. Morton). Hong Kong University Press, Hong Kong, pp. 649-659.

Wei, C. (Ed.). (1991). *Fauna of Zhejiang. Crustacea*. Zhejiang Science and Technology Publishing House, China (Chinese text).

VERTEBRATES

New species of wrasse discovered in Hong Kong waters

by Andy Cornish

A new species of wrasse, *Xyrichtys trivittatus* has recently been described by Dr J. E. Randall of the Bishop Museum, Honolulu, and myself from a specimen caught off Lamma Island. The fish, a 12 cm male, was obtained from small-scale local fishers in October 1996 who caught it in Ha Mei Wan, the large bay to the west of Lamma Island. I photographed the fish but was puzzled as the colouration was similar to a specimen of *Xyrichtys pavo* pictured in "Fishes of Taiwan" (Shen *et al.* 1993) but differed from the written description. Dr Randall, a mine of information on Indo-Pacific, fishes visited Hong Kong in June 1998 and was able to confirm that the Lamma specimen was an undescribed species. The specimen photographed in the "Fishes of Taiwan" was located and proved to be the same, and so we described *X. trivittatus* with the Hong Kong specimen as the holotype and the Taiwanese individual as the paratype. We have given this fish the common name Triple Barred Razorfish. Colouration is primarily yellowish-grey with three vertical black bars on the upper of the body and dorsal, anal and upper caudal fringed with red . There are 24 known species of *Xyrichtys* wrasse (including *X. trivittatus*) globally and only *X. aneitensis* (which is not known from China) also has three black bars, but in that species the bars end in spots dorsally.

In an attempt to gain more specimens of the Triple Barred Razorfish I circulated a picture of the first specimen and a wanted notice offering $100 a specimen to the fishers in Yung Shue Wan, Lamma. This eventually proved fruitful with another two specimens turning up from west Lamma in summer 1999. Dr Randall also located some preserved specimens that had been collected in Vietnam. Razorfishes inhabit open areas of sand which they dive under when threatened. The catch locations and the fact that a species with such distinct colouration had not been previously been noted from Hong Kong suggest that the species is scarce locally and inhabits shallow areas of clean sand between the coast and the highly disturbed trawl grounds. The challenge now is to photograph this species in its natural habitat.

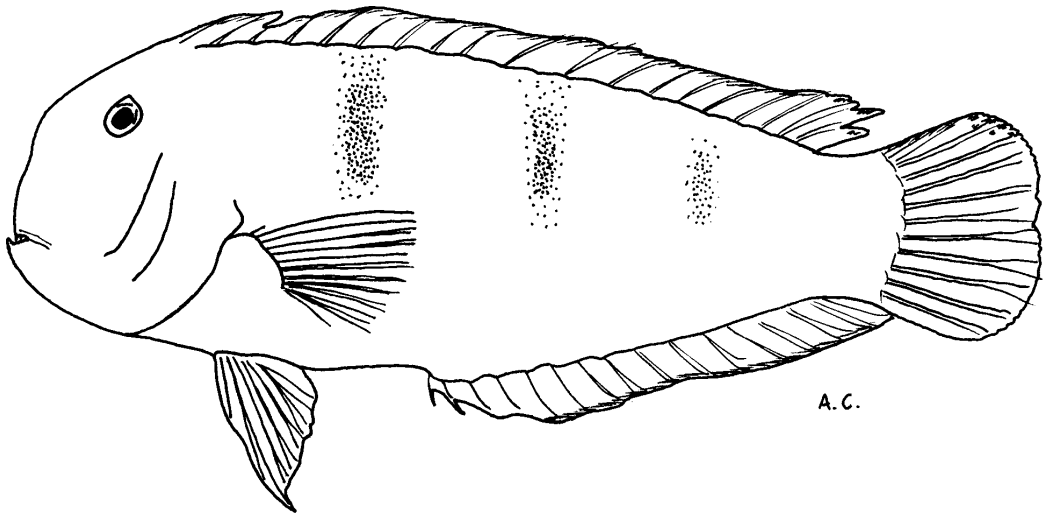
Bibliography

Randall J.E. & A.S. Cornish. (2000). *Xyrichtys trivittatus*, a new species of razorfish (Perciformes: Labridae) from Hong Kong and Taiwan. *Zoological Studies* 39(1): 18-21

Sadovy Y. & A.S. Cornish. (2000). *Reef fishes of Hong Kong.* Hong Kong University Press. pp 321.

Shen S. C., C. H. Chen, C. T. Chen, S. C. Lee, H. K. Mok & K. T. Shao. (1993). *Fishes of Taiwan*. University of Taiwan, Dept. of Zoology. In Chinese. pp 960.

Hot off the press is the "Reef Fishes of Hong Kong". This book includes descriptions and colour photographs (including one of this new wrasse species) of over 320 species from 70 families. A third of these records are new to Hong Kong and there is at least one species new to science (the wrasse). In compiling information for this book it became clear that species once common are now rare and that local reef fishes face serious impacts from coastal activities, the most serious of which is, without doubt, overfishing. Get your copy now, while stocks last!



Fish stocks bounce back at Cape d'Aguilar

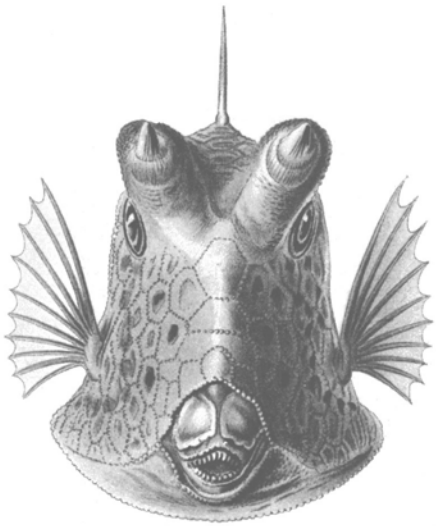
by Andy Cornish

Numbers of large reef fishes have shown a dramatic increase within the Cape d'Aguilar Marine Reserve this summer. Fishing was banned in the Reserve in July 1996. Semi-quantitative records show that smaller fishes, e.g. damselfish, increased in number in the first few years of protection while larger food fishes such as Painted sweetlips, *Diagramma pictum* and Mangrove red snapper, *Lutjanus argentimaculatus*, increased in size and number far more slowly.

Recent dives on 15 and 16 June to exposed rocky reef at around 10 m revealed a huge increase in abundance, diversity and size of larger reef fish to anything seen previously. Species present with individuals greater than 30 cm total length included Smallspotted dart, *Trachinotus bailloni*, Longtooth grouper, *Epinephelus bruneus*, Leopard coral-grouper, *Plectropomus leopardus*, John's snapper, *Lutjanus johnii*, Star snapper, *Lutjanus stellatus*, Picnic seabream, *Acanthopagrus berda*, Surf bream, *Acanthopagrus* cf. *australis*, Red pargo, *Pagrus major*, Harry hotlips, *Plectorhinchus gibbosus*, Spangled emperor, *Lethrinus nebulosus*, Spottedtail morwong, *Cheilodactylus zonatus*, Spotted nibbler, *Girella punctata*, Blue sea-chubb, *Kyphosus cinerascens*, Blue-barred parrotfish, *Scarus ghobban*, Knobsnout parrotfish, *Scarus ovifrons*, Pickhandle barracuda, *Sphyraena jello*, Scalpel sawtail, *Prionurus scalprus*, as well as the Mangove red snapper and Painted sweetlips. Some of these fishes, such as Knobsnout parrotfish and Longtooth grouper are rarely seen nowadays in local waters, indeed on many dives in Hong Kong no fish larger than 30 cm are encountered. Other rarities included Longface emperor, *Lethrinus olivaceus*, a new record for Hong Kong, Barred knifejaw, *Oplegnathus fasciatus*, a small school of Little tuna, *Euthynnus affinis*, and around twenty Dory snapper, *Lutjanus fulviflamma*, a secretive fish that I have only recorded singly before.

The increase in larger fishes seems to be due to cessation of fishing, allowing resident fish to grow without being caught, and immigration into the reserve. Immigration is likely for fishes such as a school of fifteen Pickhandle barracuda of 90 cm length which had not previously been seen in the 18 ha. reserve. Such carnivorous fish may be attracted by large numbers of small, potential prey species.

Remarkably, almost all of the larger fishes were untroubled by divers and could be approached to within a few metres. All of the named fishes are targets for spearfishers and are generally very wary of divers in Hong Kong. It seems that fish within the reserve have slowly become acclimatized to visits by divers who do not harass or shoot them (diving within the reserve requires a permit from Agriculture, Fisheries and Conservation Department). Even two 70 cm length Knobsnout parrotfishfish, which have not been encountered in the reserve previously, were quite bold, perhaps picking up on the untroubled reaction of other fish to divers. The dramatic change in behaviour in just four years within a protected area is great news for divers who currently have little chance of diving with large fish on natural reefs in Hong Kong. It does make the fish increasingly vulnerable to poaching by spearfishers, however, a problem already faced by the Clearwater Bay Marina where fishing is also banned.



Legal aliens

by Yvonne Sadovy

Recently, several species of non-native fishes have been sighted or captured in Hong Kong's marine waters. Divers have variously reported a single observation of a rather battered looking tiger grouper, *Epinephelus fuscoguttatus*, a species not known to occur along the continental land mass, and a number of red drum, *Sciaenops ocellatus*, a species from the western Atlantic (FishBase, 1998). The red drum has also been taken by recreational fishermen, both from around Ma Wan and off Sai Kung. Both species probably escaped from mariculture zones. Although the tiger grouper is not cultured as such, it is often held briefly in floating net cages near shore prior to sale. The red drum, on the other hand, is imported as fingerlings (several inches long) for grow-out. This species typically inhabits sand and muddy bottoms in coastal and estuarine areas and, based on the numbers being reported, survives around Hong Kong. It is not known whether it is reproducing locally.

The successful establishment of introduced marine fishes is less common than for freshwater species but is nonetheless reason for concern. The best known example is 27 introductions (21 for food and 6 others) into Hawaiian waters. Thirteen of these species became established, several with unfortunate consequences; two are known to cause human poisoning (ciguatera), while several had no food value for humans (Bohnsack, 1996), or outcompeted closely related native species. Even among those suitable for human consumption,

many were not readily accepted by the public.

The history of freshwater fish introductions both in Hong Kong and elsewhere includes many examples where newly established species have evidently displaced or outcompeted local species with negative impact on fisheries. Several introduced freshwater species found in Hong Kong streams, for example, have become established. Live-bearers from central America (poeciliids) were brought in to control the larvae of mosquitoes, or were released by aquarists and may have negatively affected native species (Dudgeon and Corlett, 1994). In a clear warning over the problems of introductions for fishery purposes, W. L. Chan (Government Fisheries Research Division) wrote in 1976: "The introduction of the mouthbrooder, Tilapia," (*Oreochromis mossambicus*) "is perhaps the biggest mistake ever made by fish culturists. Initially, this species was introduced to a brackish water fish farm for culture trial, but has subsequently found its way to inland fishponds and streams. The fact that it is capable of multiplying rapidly and thrives under nearly all unfavourable environmental conditions, makes it more of a pest than a truly acceptable species from the view of both the fish culturist and the biologist" (Chan, 1976).

Currently Hong Kong has no legislation to control the introduction of alien species into local aquatic environments. Given the problems, already documented globally, created by many introductions, inadvertent or otherwise, into marine and freshwaters, and given the growing interest in restocking and mariculture as proposed solutions to the poor state of local fisheries, there is clearly need for regulation. Escapes of non-native species brought in for mariculture, transmission of disease by international trade and interbreeding of non-native genotypes with local wild populations have already created problems, here and in other areas. Disease outbreaks in our local mariculture industry in recent years have been attributed to fingerlings imported from elsewhere in the region combined with the lack of quarantine requirements. The interbreeding of native wild salmonids in Norway with escaped cultured hybrids has evidently produced individuals of lowered reproductive potential in the wild with unknown long-term consequences for the persistence of affected populations.

The consensus on introductions is that extreme caution is essential if introduction of non-native species or non-local genotypes of native species is being contemplated. We have been warned!

Bibliography

Bohnsack, J. A. (1996). Maintenance and recovery of reef fishery productivity. Pp. 283- 313 In: *Reef Fisheries* (eds. N. V. C. Polunin and C. M. Roberts). Chapman and Hall Fish and Fisheries Series 20.

Chan, W. L. (1976). The fish fauna of Hong Kong. Pp. 108-127 In*: The fauna of Hong Kong* (ed. B. Lofts). The Hong Kong Branch of the Royal Asiatic Society.

Dudgeon, D. and R. Corlett. (1994). *Hills and streams*. Hong Kong University Press.

FishBase, (1998). *FishBase* 1998 CD-ROM. ICLARM, Manila.

Note of interest – Barking Deer (or muntjac) identity remains unsolved…

by Bosco Chan

I came across this brief report in the old but very interesting AFD journal *Wildlife Conservation* (1974):

A gentleman named Colin Gimson reported seeing an *"unusually large"* Barking Deer on Shek O Road, Hong Kong Island, in the evening of 14 July 1974. The deer was said to be 60 cm tall and was *"not the usual light colour (of a Barking Deer) but a darker colour"*.

This sighting may be of an escaped deer representing a non-native species as the author suggested, but it also fits the general description of the Indian Muntjac (*Muntiacus muntjak*) (e.g. Roberts, 1997). Readers are reminded that the preliminary measurements of a Barking Deer recently found in Central New Territories has been suggested as the Indian Muntjac (*Muntiacus muntjak*) (Reels and Crow, 1999). There are, however, many interesting reports (and photographs) of smaller, lighter colour adult deer in the series of *Wildlife Conservation* and *Hong Kong Naturalist*, which fit the description of the Chinese Muntjac (*Muntiacus reevesi*) – the only species of deer we all uncritically believed is running around on our hillsides.

It is surprising that the identity of our native deer has remained uncertain (or unchecked) for so long, despite all these years of scientific research and professional management of our countryside. So do we only have the Chinese Barking Deer? The Indian Barking Deer? Chinese on Hong Kong Island and Indian on the mainland? Chinese AND Indian on Hong Kong Island (after reading Gimson's sighting) but only Indian on the mainland, or vice versa? Or both occur all over Hong Kong? What about those living on the smaller islands? Or whatever combinations? Someone should look into this problem seriously…Richard, do Barking Deer disperse seeds??

Bibliography

Wildlife Conservation. (1974). Sightings on Wildlife. *Wildlife Conservation* 22/23:11

Reels, G. and Crow, P. (1999). Hong Kong's Barking Deer – What is it? *Porcupine!* 19:21.

Roberts, T. J. (1997). *The Mammals of Pakistan.* Oxford: Oxford University Press.

Vultures in the park (or nine days in Brazil)

by Richard Corlett

The obvious (to me!) attractions of the 5-day **3rd International Conference on Frugivores and Seed Dispersal** were almost equally counterbalanced by the unpleasant prospect of at least 30 hours air travel in each direction to Southeast Brazil. What decided me in the end was the fact that the São Paulo region, where it was being held, is remarkably similar in both environment and history to the Hong Kong region. At 23°S it has a similar temperature seasonality to Hong Kong and, although the rainfall is generally lower, most of the region was once covered in semi-deciduous forest. São Paulo city was founded by the Spanish in 1554 and the succeeding centuries have seen almost total deforestation, leaving a highly degraded landscape, similar in many ways to ours, but with an independently-evolved biota. The conference itself, as it turned out, was well worth the trip (in August, 2000), but this report is confined to my extracurricular activities at the rural conference site, from dawn to breakfast every day, and on two free days in the vast city of São Paulo (population >20 million!) at the end.

Bird-wise, the trip started badly. There was no suitable field guide available in Hong Kong and the first two species I saw, at São Paulo airport, were the cosmopolitan House Sparrow and Feral Pigeon. Things started looking up when we reached the conference site at São Pedro, 200 km inland, where the hotel gardens and surrounding secondary scrub were full of weird and wonderful bird songs. Moreover, there were several enthusiastic and knowledgeable local postgrads, willing to go birding at any time of the day or night, and two bird books were available for sale. The first of these, **Todas as Aves do Brasil** (All the Birds of Brazil), has poor illustrations, illegible range maps, and descriptions in Portuguese, but was useful as an illustrated checklist. The other, **Aves no Campus** (Birds of the Campus of a University in São Paulo city) has much better illustrations of most of the common species I saw. With the initial help of the Brazilian postgrads, these books and my Leica 8 X 32 binoculars, I managed to identify most species I got a good view of, but many cryptic or highly active species were no doubt missed.

A distinctive feature of the South American bird fauna is that, although it is amazingly species-rich, there are relatively few families, each of which is huge. An apparent consequence of this, is that all the major families have radiated into most major niches, and it is often easier to recognize species than the families to which they belong. I was most interested in the frugivores, so I will start with these.

Overall, the tanagers were the most abundant frugivores, with the blue-grey, bulbul-sized Sayaca Tanager the commonest tanager at both the conference site and in urban parks in São Paulo. The five other tanager species I was able to identify were more colourful but much less abundant. The tanagers share the open-country insectivore-frugivore niche with two other major groups, the tyrant flycatchers and the thrushes. Among the 6-7 very varied tyrants I saw, the largest and most conspicuous was the Great Kiskadee, with its loud calls ("kis-ka-dee!") and bright yellow underparts. Like other tyrants, the starling-sized Kiskadee takes both fruit and insects while hovering: indeed, I saw one take insects from the water surface in a São Paulo park lake.

In striking contrast to the novelty of the rest of the bird fauna, I was surprised by the abundance and diversity of thrushes in the same genus - *Turdus* - as most of the species we see in Hong Kong. However, these thrushes are residents in the São Paulo region, while ours are all winter visitors. I saw four species but the only one I got a really good view of was the Rufous-bellied Thrush, which was the commonest ground bird under trees in São Paulo parks, occupying the same niche as the similar American Robin and Eurasian Blackbird elsewhere.

Among the ground-feeding granivores, the House Sparrow - introduced a century ago - was confined to areas near buildings. The commonest native "sparrow" was the Rufous-collared Sparrow, which is a member of the huge Neotropical radiation of nine-primaried oscines, which includes the tanagers and icterids (New World blackbirds and orioles). This shared bare ground and short grass with two common columbids, the tiny Ruddy Ground Dove and the much larger Picazuro Pigeon. Off the ground, the dominant seed predators are parrots. I saw flocks of the tiny Blue-winged Parrotlet feeding on the fruits of both *Cecropia* and figs. Although I cannot confirm this from my own observations, the literature suggests they destroy the tiny seeds of both. Noisy flocks of the larger Plain Parakeet were common in urban São Paulo.

The most abundant nectarivore (or, at least, partial nectarivore) was another nine-primaried oscine, the ubiquitous Bananaquit. There seemed to one in every tree, even in the busiest streets of São Paulo. The constant insect-like buzz in the background is largely from these birds and one ceases to notice it after a few days. However, I never stopped noticing the wonderful hummingbirds, which seemed to prefer the widely-planted Asian *Bauhinia variegata* over any native plant species. They don't stay still long enough for easy identification but the commonest was probably the tiny Sapphire-spangled Emerald, while the most spectacular I saw was the much larger Swallow-tailed Hummingbird.

Foliage-gleaning insectivores tend to be little brown birds everywhere, and the commonest one I could confidently identify was the ubiquitous House Wren, for which the key character given in Birds of South America is "*without obvious features*", which is both accurate and helpful. I also saw two species of woodpeckers in the hotel grounds, the large Campo Flicker and the tiny White-barred Piculet. The aerial insectivore niche in both rural and urban areas was dominated by the Blue-and-white Swallow, although there were probably also other species. At the other end of the size scale, Black Vultures were always visible in the sky and often perched on trees, even in the beautiful Ibirapuera Park in downtown São Paulo. Are they waiting for the joggers to collapse or do they feed on discarded food scraps? This park also had both Great and Snowy

Egrets, and large numbers of Neotropical Cormorants. Flocks of the familiar Cattle Egret - a recent arrival in South America - flew over the hotel early every morning. Other carnivores included several species of hawks and falcons, of which I could positively identify only the roadside White-tailed Kite, and the Yellow-headed Caracaca, a species which is reputed to eat a considerable amount of fruit.

This still leaves a lot of interesting birds about which I know too little to slot them into one of the above categories. My favourite was the Rufous Hornero, a brown, thrush-like ground-feeder, which belongs, like the tyrants, to the vast New World suboscine passerine radiation. It was particularly common in Ibirapuera Park. I must have also seen its conspicuous mud nests, but probably mistook them for those of ants or termites, judging by the descriptions I have subsequently read. It is apparently the national bird of Argentina, which seems a rather odd choice. The Chalk-browed Mockingbird was also common in the same park, and is presumably an insectivore-frugivore. The only icterid I identified was the Shiny Cowbird, which was common in all open habitats I visited. I am not sure what this bird eats – my books say "seeds and insects" – but the main feature of ecological interest is that it is a brood parasite, like our cuckoos.

In contrast to the 50 or so bird species on my Brazil list, I only saw two mammal species, although both were of considerable interest. On my second dawn birdwatch, I got a very close view of a cat-sized mother and smaller baby South American Opossum. To someone familiar with only Australian marsupials, this is a weird-looking animal, but it is common and successful in almost all habitat types in South America. The other mammal was the only bat caught during a couple of hours early-evening mist-netting. Fortunately for me, this was the Short-tailed Leaf-nosed Bat, *Carollia perspicillata*, the best-studied open-country fruit bat of the Neotropics. I had always assumed that this species, although in a different suborder, was similar to our common Asian *Cynopterus* fruit bats, and was surprised to find it looks very different and is much smaller.

Birds eating figs in Brazil

by Richard Corlett

While exploring the 158 hectare Ibirapuera Park in the vast city of São Paulo, Southeast Brazil, on my way back from a conference, I came across two adjacent plants of the Asian fig species, *Ficus microcarpa*, which is common in Hong Kong, bearing ripe figs. I watched them for almost an hour on a cool winter morning (c. 14^{o}C) and recorded the following seven species of birds consuming the figs. The most abundant was the Rufous-bellied Thrush, *Turdus rufiventris*, followed by the Sayaca Tanager, *Thraupis sayaca*. The Cream-bellied Thrush, *T. amaurochalinus*, Fawn-breasted Tanager, *Pipraeidea melanonota*, Burnished-buff Tanager, *Tanager cayana*, and Blue-winged Parrotlet, *Forpus xanthopterygius*, were also represented by multiple individuals, while a single Great Kiskadee, *Pitangus sulphuratus*, took figs from the outer part of the canopy while hovering. Longer observations would undoubtedly have added to this list, since there were other frugivorous species present in the park. All the species seen, except the parrotlet, which is a known seed predator, are likely to disperse at least some fig seeds. However, the thrushes and kiskadee, which swallowed figs whole, may be better dispersal agents than the tanagers, which apparently mashed the figs in their beaks and may not have swallowed all the seeds.

Bats observed in semi-hibernation in a mine-shaft in Macao, South China

by Emmett R. Easton

In the Choec-van area of Coloane island in Macao several species of bats normally reside in a horizontal tunnel approximently 55 meters in length that exits in a ravine near a stream. Fresh water flows out of the entrance of the tunnel which probably discourages entry by man and water is present over a distance of 25 meters, while the rear of the tunnel has a dry floor for a length of 30 meters and is used by 5 species of roosting bats.

During the period from March 31-April 9, 1988, when night time temperatures on the island ranged from 19-23^{o}C, eleven great roundleaf bats, 3 least horseshoe and 5 lesser bent-winged bats were examined and released during a serological survey to determine if the mammals were carrying pathogenic agents that could be potentially dangerous to man. Blood samples were found to be negative when tested by Public health experts from the Communicable Disease Centre in Colorado of the USA.

In the spring and early summer, small numbers of common bent-winged bats as well as the great roundleaf bat have been routinely observed at this site, along with a pair of nesting violet-whistling thrushes. When the tunnel was entered on January 1, 2000, when night time temperatures were ranging from 8-13^{o}C in Macao, the author observed approximately 120 great roundleaf bats in a semi-hibernative state hanging from the ceiling in the rear portion (last 30m) of the tunnel. Normally during the spring these bats would all exit from the site upon entry by man but on this occasion no flight activity was observed. This may be the main site from December-March for overwintering or semihibernating great roundleaf bats. Smaller numbers of common bent-winged and lesser bent-winged bats are also found in the cavern but the main maternity cave for the bent-winged bats is at Hac-sa near the Macao golf and country club in a natural cavity that emerges at the base of a sea cliff.

FLORA

Notes on the Annotated Check-list of Hong Kong Lichens of Aptroot and Seaward (1999)

by Zhang Li

Aptroot and Seaward (1999) published an updated checklist of Hong Kong lichens based on available references and specimens. Unfortunately, I found occasionally that the checklist clearly failed to consult an important literature source pertinent to this issue (Tuckerman 1978), which was based on the collections of Charles Wright of the United States North Pacific Expedition, from 1853 to 1856. Forty-three taxa of lichens were reported from Hong Kong in that paper.

Aptroot & Seaward (1999) confirmed that 261 species of lichens occurred in Hong Kong. Comparing the checklist of Aptroot & Seaward (1999) to the species of Tuckerman (1978), there are 38 species reported by Tuckerman (1978) which were not included in their checklist. In addition, Aptroot & Seaward (1999) superfluously reported *Gyrostomum scyphuliferum* (Ach.) Nyl. new to China, although it has been reported before to occur in Hong Kong.

In summary, with the exception of three uncertain taxa (Species No. 7, 40, 43 in the following list), and two species *Gyrostomum scyphuliferum* (Species No. 20) and *Graphis rimulosa* (Mont.) Trevisan (Tuckerman (1978) as *G. asterizans* Nyl, species No. 14) the same as in Aptroot & Seaward (1999), the remaining 38 species should be added to the lichen list of Hong Kong. In total, the lichen flora in Hong Kong increases to 299 species. However, all the species of Tuckerman (1978) should be carefully checked for confirmation or rejection by studying the authentic specimens in FH and FH-Tuck.

The following list is excerpted from Tuckerman (1978), with the arrangement in alphabetical order. In this list, I give no comments except that I give the name used by Aptroot & Seaward (1999) for reference (*Graphis rimulosa* for *G. asterizans*). Each entry includes scientific name, locality, collection date, herbaria and specimen numbers if I can find them in Tuckerman (1978).

1. *Arthonia astroidea* var. *swartziana* Nyl. Hong Kong. [FH-Tuck. 3706]
2. *Arthonia biseptella* Nyl. in Willey Hong Kong. [FH, FH-Tuck. 3727]
3. *Arthonia stenographella* Nyl. Hong Kong. August 14, 1854 [FH, FH-Tuck. 3688]
4. *Biatora chlororphnia* (Tuck.) Tuck. Hong Kong. March 23, 1854 [FH, FH-Tuck. 2926]
5. *Biatora tephraea* Tuck. Hong Kong. April 6, 1854 [FH, FH-Tuck. 2931]
6. *Buellia parasema* (Ach.) Koerb. var. *triphragmia* Th. Fr. Hong Kong. August 14, 1854 [FH, FH-Tuck. 3297, 3298]
7. *Cladonia fimbriata* (L.) Fr. [a variety]. Hong Kong.
8. *Cladonia gracilis* (L.) Fr. Hong Kong. April 4, 1854 [FH, FH-Tuck. 2621]
9. *Cladonia mitrula* Tuck. Hong Kong. March 30, 1854 [FH, FH-Tuck. 2746]
10. *Coenogonium disjunctum* Nyl. Hong Kong. [FH, FH-Tuck. 2756]
11. *Glyphis confluens* Nyl. Hong Kong. August 14, 1854 [FH]
12. *Glyphis medusulina* Nyl. Hong Kong [FH]
13. *Graphis assimilis* Nyl. Hong Kong. August 14, 1854 [FH, FH-Tuck. 3495, 3496]
14. *Graphis asterizans* Nyl. Hong Kong. ------ Aptroot & Seaward (1999) as *G. rimulosa* (Mont.) Trevisan
15. *Graphis cleistoblephora* Nyl. Hong Kong. [FH, FH-Tuck. 3506]
16. *Graphis discurrens* Nyl. Hong Kong. [FH-Tuck. 3505]
17. *Graphis glyphiza* Nyl. Whampoa. July, 1854 [FH] ------- I wonder whether Whampoa is belonged to Hong Kong or not. But from the itinerary, Wright should be in Hong Kong during the period when the specimen collected.
18. *Graphis scalpturata* Ach. Hong Kong. [FH-Tuck. 3447]
19. *Gyalecta lutea* (Dicks.) Tuck. Hong Kong Aug. 23, 1854 [FH, FH-Tuck. 2253]
20. *Gyrostomum scyphuliferum* (Ach.) Nyl. Hong Kong. April 5, 1854 [FH, FH-Tuck. 2346] ------ The authorities of the present species are different between Tuckerman and Aptroot & Seaward. After cross checking the lichen lists via the internet (http://www.cabi.org/bioscience/), I follow Aptroot & Seaward.
21. *Heterothecium tuberculosum* (Fee) Flot. Hong Kong. March 30, 1854 [FH]
22. *Lecanactis premnea* (Ach.) Arn. Hong Kong. [FH, FH-Tuck. 3372]
23. *Lecanora subfusca* (L.) Ach. var. *cinereocarnea* Tuck. Hong Kong [FH, FH-Tuck. 1970]
24. *Leptogium tremelloides* Fr. Hong Kong. June 2, 1854 [FH, FH-Tuck. 1648]
25. *Pannaria parmelioides* (Hook.) Colm. Hong Kong.
26. *Parmelia perlata* (L.) Ach. Hong Kong. April 5, 1854 [FH, FH-Tuck. 692]
27. *Parmelia tiliacea* (Hoffm.) Fr. var. *flavicans* Tuck. Hong Kong. [FH]
28. *Physcia picta* (SW.) Nyl. Hong Kong. Feb. 2, 1855 [FH, FH-Tuck. 952].
29. *Physcia speciosa* (Wulf.) Tuck. var. *hypoleuca* Ach. Hong Kong [FH, FH-Tuck. 877, 878]
30. *Ramalina calicaris* (L.) Fr. var. *farinacea* Schaer. Hong Kong
31. *Ramalina scopulorum* (Retz.) Ach. Hong Kong. June 4, 1854 [FH, FH-Tuck. 145]
32. *Roccella tinctoria* Ach. L'am Tong Island, Chinese Coast, May 6, 1854 [FH, FH-Tuck. 20]
33. *Stereocaulon ramulosum* (Sw.) Ach. Hong Kong. May 17, 1854 [FH, FH-Tuck. 2373]
34. *Trypethelium sprengelii* Ach. Whampoa. July, 1854 [FH, FH-Tuck. 3974] ------ The reason is same to species No.17.

35. *Urceolaria scruposa* (L.) Ach. Hong Kong. April 4, 1854 [FH]
36. *Usnea barbata* Fr. var. *plicata* Fr. Hong Kong. August 23, 1854.
37. *Verrucaria biformis* Borr. Hong Kong
38. *Verrucaria insulata* Fee Hong Kong. April 23, 1854. [FH, FH-Tuck. 4058]
39. *Verrucaria marginata* Hook. var. *diminuens* Nyl. Hong Kong [FH?]
40. *Verrucaria* sp. Hong Kong [FH]
41. *Verrucaria thelena* Ach. var. *albidior* Nyl. Hong Kong. April 21, 1854. [FH]
42. *Verrucaria tropica* Ach. Hong Kong. May 14, 1854. [FH, FH-Tuck. 3978]
43. [A variety based on *Ramalina inflata* Hook.] Hong Kong. [FH, FH-Tuck]

Acknowledgements

Thanks are extended to Dr. R. T. Corlett for correcting the manuscript, and Mr. Y.-Z. Wang for suggesting checking names via the internet.

Bibliography

Aptroot, A. & Seaward, M. R. D. (1999). Annotated checklist of Hong Kong Lichens. Trop. Bryol. 17: 57-101.

Tuckerman, E. (1978). Lichens. In Pfister, D. H. (ed.): Cryptograms of the United States North Pacific Exploring Expedition, 1853-1856. Farlow Reference Library and Herbarium of Cryptogramic Botany, Harvard University, Cambridge, Massachusetts. Pp. 65-126.

Fire-breaks for Hong Kong's Grasslands

by R.D. Hill

Fire-breaks have long been used as a means of protecting areas of particular interest and significance though in Hong Kong they are not much used. Since about two-fifths of our land area is in Country Parks – presumably worth protecting from hill-fires – it is a little surprising that more use is not made of them. One possible reason is that the kinds of fire-breaks appropriate to what is to be protected have never been systematically investigated, though the nature and effects of hill-fires have, notably by Lawrence Chau, who studied these for his doctorate at HKU. At a recent seminar on vegetation regeneration, Richard Corlett asked that I set down some thoughts on fire-breaks since our experimental site near KARC was, we hoped, protected by them. "We" here, are Mervyn Peart and myself, more recently joined Sanjay Nagarkar. Our plot-based study, begun in 1992, was initially designed to study erosion with three treatments – vegetation protected from fire, vegetation not protected, i.e. burnt, vegetation harvested annually (in January). A fourth treatment, "kept bare" was added later. Since 1992 the site suffered two hill-fires, one of which, in December 1995, burnt out three of the four plots surrounded by fire-breaks.

Fire-breaks were two metres wide and were cleared every year in winter. Until after 1995, clearance meant cutting all vegetation, raking it up and dumping it at a distance. Following the failure of most of the breaks in the 1995 fire there was a change of practice so that all cut debris was swept off. This increased the labour requirement and, in all likelihood, erosion along the breaks as well. It is not known whether this would have succeeded in increasing the effectiveness of the fire-breaks since there has not been a fire since and in any case their maintenance has been discontinued in the hope of obtaining more data on erosion and regeneration after a fire, should one occur.

Why did the fire-breaks fail or succeed? The 1995 fire seems to have burnt very fiercely at times for woody stems 2 cm thick were burnt through in places on the hillsides, suggesting a fair amount of gusty wind. It is possible that burning embers were carried across the breaks and set new fires but as the fire occurred at night and was not seen by us we do not know. However inspection soon after the fire showed that at several points there were blackened trails, only a couple of millimetres wide, indicating that fire had found its way across the breaks from one contiguous piece of cut debris to another until it reached standing vegetation on the other side. In other words, the massive reduction in fuel load represented by cutting fire-breaks, was, on that occasion, insufficient to prevent threads of fire crossing the breaks.

An earlier fire did not burn out the whole area, approaching one plot where the break had been cut and raked but not swept. It succeeded in halting the fire. On the other hand, a fire on the north ridge of Tai Mo Shan in February 1999 crossed a fire-break five metres wide annually cut by KFBG staff in October. This break, like those at our site, is raked but not swept and was readily crossed. (It burnt out our tree-planting experiment on the ridge and also Billy Hau's tree-planting site nearby but that is another story, yet to be told.)

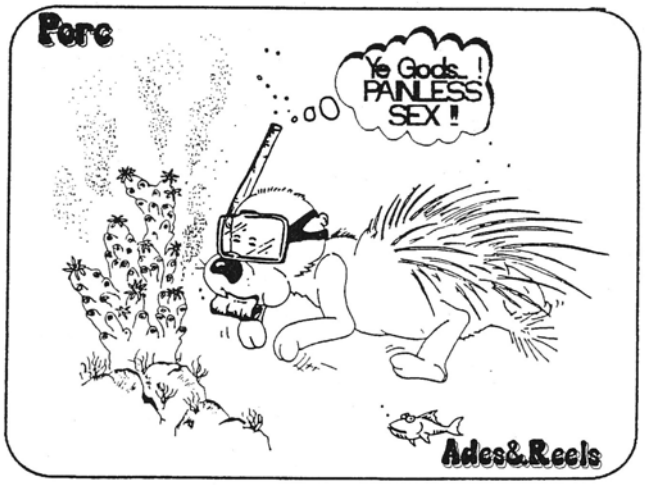
Though no systematic observations on fire-break effectiveness have ever been made (to our knowledge) in HK these unsystematic ones lead to some tentative conclusions. First is that cut and raked fire-breaks are not to be relied upon, for fire may find its way across remaining debris. However, had there been anyone around (and brave enough) it is likely that "fire rails" could easily have been broken e.g. simply by baring the soil. Such fire-breaks depend upon reduction of the fuel-load to a level insufficient to support combustion, but if debris is dry enough even a tiny quantity is enough. Such fire-breaks also depend upon regenerating vegetation on them being too green and sappy to burn. Much therefore depends upon when clearance is done, the amount of residual soil moisture available during the dry season to promote new growth and the amount and frequency of rainfall. Sweeping the fire-break is likely to prevent fire from picking its way across debris but might have to be done several times during a dry season for this is when the litter falls and is blown about. It is costly and doubtless is likely to lead to increased erosion, a major consideration for any long-term fire-break maintenance.

Neither cutting and raking alone nor with sweeping offer protection against "fliers" and "fallers". Fliers are bits of burning debris that are detached from the fire front and are carried downwind in its path. Whether they will set new fires depends – obviously – on their temperature when and where they land and the ignitability or inflammability of the surface on which they land. How far they travel depends upon the speed of the wind, their weight and volume and the height at which they form. In our grasslands the last of these variables is rarely more than two metres but many fliers are light in weight and may carry many metres, even hundreds of metres in advance of the fire-front. They are usually small, not dense and consequently go out quite quickly after landing so that unless there is something easily ignitable at the landing area , no secondary fire ensues. Most fall close to the fire-front so that a couple of metres of fire-break will reduce the chances of a flier setting a new fire.

Fallers are different. They comprise burning debris that simply falls in place. In grass, scrub and forest fires the direction of fall is usually with the wind. Unlike fliers, fallers may be large in volume, burning for many hours, and their combustion temperatures are usually higher than for fliers. To protect against fallers, a fire-break must be at the very least as wide as the adjoining vegetation is tall – in fact a bit more for fallers which usually bounce and break up as they land. Plus 50% is the usual rule-of-thumb as a guide to width. Thus a two-metre break is enough in our grassland but not in our forests, bearing in mind that new-grown vegetation regenerating along the edges of fire-breaks, though usually lower, greener than older vegetation nearby, will still burn if neighbouring combustion temperatures are high enough. This is because some of the energy in the advancing fire-front dries out the vegetation in front of it. (You may have noticed that in grass and scrub fires the fire-front often advances in fits and starts as it pauses while it dries out nearby vegetation and then advances very quickly, sometimes almost exploding once ignition-point is reached).

Obviously there is still much to learn about fires and fire-breaks in Hong Kong. It would be nice not to have one and thus not to need the other!

Ron Hill is Honorary Professor in the Department of Ecology & Biodiversity. He admits to having been scared (almost) shitless in several of the many scrub fires he long ago helped to fight as a volunteer fire-fighter in his native New Zealand.



MISCELLANY

There is a wealth of historical information on local species and habitats buried in old government reports, journals, newspapers and books. If you find something which you think should be more widely known, send it in to us!

Historic coral find and a few lessons

History, of course, helps to put things into perspective. I came across a 22-year old article from the South China Morning Post recently (26th March, 1978). It reports on the discovery by Professor (then a mere Reader) Morton and a team of divers of a large bed of living coral - 'somewhere' in Mirs Bay. A couple of things struck me about this article. The first was how much has been learned of the marine environment of Hong Kong in the last few decades. For example, the article reports that the British Museum, up until 30 years ago, did not even believe that Hong Kong waters contained coral! We now know there are at least 53 species! The second lesson is how long it takes to protect such treasures. The 'mystery' location was Chek Chau which was recommended for protection following the 1978 discovery. Nearby Tung Ping Chau, similarly coral-endowed, is only now being considered for marine protection. Chek Chau continues unprotected. *YS*

The following are abstracts from the original SCMP article:

"A Hong Kong University diving team has discovered a massive bed of perfect coral which they say is comparable to the best in Thailand or Singapore. They say the healthy coral, which is alive with colour extends down to a depth of 10 meters and completely circles a nearby island. But the name of the island in Mirs Bay is being kept a closely-guarded secret until further studies by local and international marine biologists is made.

The group's leader, Dr Brian Morton, a reader in marine biology at the university, said he also intends to notify the Government of its existence. He said the "major discovery" was made early this week "It is about 100 yards out from the shore and goes all the way round the island. It is a perfect piece of coral and nobody knows about it", he said."……..

"It's out there for the public to see and enjoy and it should be preserved for future generations", Dr Morton said. He said the group will recommend the Government declare it a protected area and turn it into a marine park."……..

"It was only seven years ago that the British Museum refused to believe that Hongkong waters contained coral. There has been little research into the substance and it was suspected that there were only a few species of coral around", he said."

The significance of logan stones

by Skip Lazell

In the course of my investigations of island biology I have repeatedly been faced with the question of what enables the survival of relict populations of forest-adapted species on brutally deforested land areas. The lands I have been especially interested in are aptly described by Dudgeon & Corlett (1994: 15) as: "Granite hills... with a surface cover of huge boulders exhumed as the weathered rock around them is eroded." Specifically, where a forest relict species has turned up in or close to ravine slopes into which the boulders had apparently tumbled, and where the latter were typically perched on one another so that damp, shady, almost cavernous recesses resulted. I thought forest-adapted species might have survived in these recesses when all around was reduced to grassland - or ashes. Initially, I called this the "boulder jumble" theory.

When the time came to begin a formal write-up of the fauna, however, I needed a somewhat more sophisticated characterization of the geology involved. I asked several prominent American geologists about my "boulder jumbles" before I struck one who asked me if they might be *core stones?* Ah, a *key word,* chink in the armour of ignorance. I began my computer search.

The problem with a computer search is that those who input the data and references often seem to act as though the printing press was invented about 1990. The beauty of it is that once the hare has started one can repair to the actual (as opposed to virtual) library and follow it home. 1 was eventually led back to David Linton who, in 1955, published The Paper That Explains Everything.

As noted by Dudgeon & Corlett (1994), most of the southwestern third of the Hong Kong region is founded on a great granitic Jurassic batholith: igneous, moulten granite that intruded beneath, but did not reach, the surface before it solidified. Subsequent soil-building episodes produced laterite: iron-rich, rust-red and acidic. Alternating cycles of erosion exposed the granite. Meantime, seismic activity cracked the batholith both vertically and horizontally. If we could back off far enough, and average the inclinations of thousands of cracks, most would fall into two categories: radial cracks, extending out from seismic centres, and horizontal cracks, parallel to the curvature of the Earth's surface. Viewed up close, the radial cracks appear vertical and the horizontal cracks appear straight, producing a subrectilinear pattern of blocks. However, the lateritic matrix speeds disintegration of the granite along the cracks and, especially, at their junctions, thus eventually rounding off the corners.

When ultimately exposed by erosion on the hilltops and along ridges, the subcubical blocks of old bedrock weather to subcircular, ovoid or pyramidal shapes. Those that remain standing are called *tors;* those that slump or roll away are called *core stones;* core stones that have tumbled together - often cracking again to make half-spheroids or half-ovoids - and are perched, are called *logan stones.*

A single logan stone cannot provide much of a refuge, but a good-sized ravine or a real valley chock-a-block with them might save a lot. Similarly, the likelihood of any species' survival in a logan stone refugiurn is inversely proportional to the size of the organisms in question. A hectare of logan stones will fail to save a viable population of tigers, but quite a lot of rodents, insectivores and even small carnivores might make it. Trees are unlikely to be saved in logan stone refugia, but even a single tree can perpetuate a population (no one seems concerned about inbreeding depression in trees).

To test my theory of logan stone refugia, I suggest two complementary lines of investigation. First, locate sites dominated by sizeable conglomerations of logan stones on likely islands and search for relict forest animals. An especially likely field to search is the Wanshan archipelago, stretching away to our south and west. There are hundreds of islands out there, most quite uninvestigated biologically. Second, extend the search to flora as well as fauna. If I am right, plants - especially small, herbaceous species of the erstwhile forest floor should have survived in logan stone refugia too. Such plants will predictably be easier to find than are most kinds of animals. It would be especially entertaining to develop a list of candidate species, perhaps based on the known floras cited by Dudgeon & Corlett (1994) for Happy Valley and Aberdeen, or that of Tai Po Kau, or even a distant site like Dinghushan. With list in hand, let the hunt begin. Or, you can begin without it and just be amazed by what you find. That has worked for the animals.

Bibliography

Dudgeon, D. and Corlett, R. (1994). *Hills and Streams - An Ecology of Hong Kong.* Hong Kong University Press.

Linton, D.L. (1955). The problem of tors. *Geographical Journal* 121(4): 470-487. [This superb paper would have been better titled *The solution of tors.*]

An unusual example of frugivory

by Richard Corlett

Between flights in Chicago, I spent a couple of hours walking around the downtown area on a summer morning. In a lakeside park, an ornamental plum species (*Prunus* sp.) had ripe fruit. Fallen fruits were being eaten by European Starlings, *Sturnus vulgaris*, Canada Geese, *Branta canadensis*, and Ring-billed Gulls, *Larus delawarensis*. Most of the fruit-eating gulls were juveniles, while most adults ignored them. Although this behaviour may seem surprising for a seabird, Ring-billed Gulls are common, resident scavengers in Chicago, and our own, winter-visitor, Black-headed Gulls are known to sometimes eat fruit in their summer range, including cherries (*Prunus* sp.), olives and *Cinnamomum camphora* (Corlett, 1998).

Corlett, R.T. (1998) Frugivory and seed dispersal by vertebrates in the Oriental (Indomalayan) Region. *Biological Reviews* 73: 413-448.

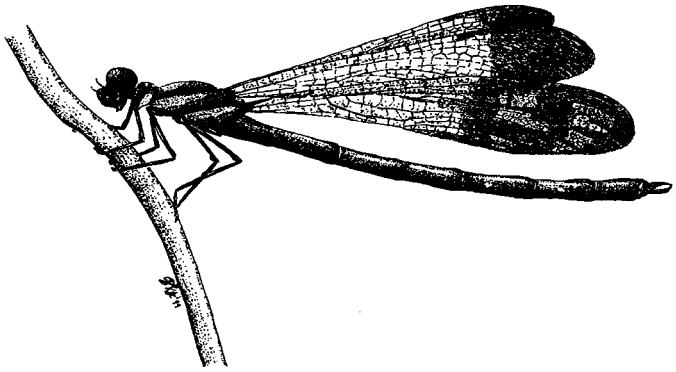
Temperate Feet in Tropical Waters

by Kevin J. Caley

Students analysing samples on the sandy shore day

Sun, sea and sand – what more could one ask for on a trip into the great outdoors? Well, some rocky shore would be good, with animals by the dozen and spectacular scenery. These requirements were more than adequately fulfilled by the first year Environmental Biology field course. I had been kindly invited by my colleagues in the Department of Ecology & Biodiversity to take part on this course as a visiting academic.

Almost immediately, we were thrown in at the deep end – some of us more literally than others – as we made the first investigations of the week, looking at a local stream.



***Rhynocypha perforata*, one of many odonates that were captured on the stream day**

Over that week, four different habitats were explored, all aquatic, most marine. This may be regarded as a little biased, but it does make some sense. Students are given the opportunity to compare four apparently similar environments, and discover through exploration that although general patterns may be followed, the number and type of species making up the diversity varies dramatically, even within the same general environmental theme. Being a marine biologist, I rather liked the setup anyway, but this is a personal note! However, did I learn anything on the trip?

Two features strike a biologist from temperate climes about Hong Kong's habitats. One is the great variety of organisms and the odd places that some groups turn up in when compared to similar environments back in Britain. A notable example is the presence of crabs in freshwater streams: mitten crabs (*Eriocheir sinensis*) have recently been introduced to the UK, but they are an uncommon occurrence and I have yet to see my first 'British' one in the wild. The other feature is the large amount of rubbish, which is everywhere in Hong Kong. This really detracts from the enjoyment of any ecology trip, for fun or work, not to mention the hazards it presents – picking your way through loads of rubbish in order to find interesting creatures is not my idea of a great time!

However, if you are a self-confessed zoology nut like me, the animals will win through in the end. A number of species seen on the course come to the fore as 'favourites' for me, some of which I'll include below. Be warned, as you may notice a theme.

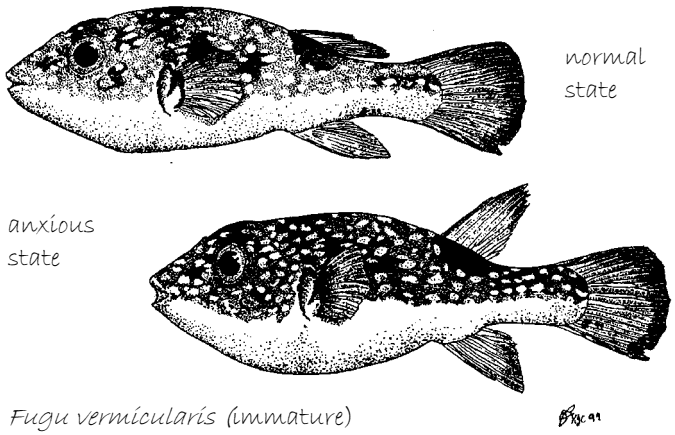
Barnacles of the genus *Tetraclita*, rocky shore day

Fiddler-crabs come at the top of this list, marvellous pieces of evolution with semaphore-waving behaviour designed to intimidate their opponents and excite potential mates. I saw at least two species, the most notable individuals being at Hoi Sing Wan (Starfish Bay), i.e. the mid-shore *Uca lactea* with its brown carapace and milky-white claw, and the high-shore, much more intensely decorated, *U. chlorophthalmus*, one particularly bright individual of which I found cowering among the sparse stalks of some seaside herbage. Crabs abound here, among them the soldier-crabs *Mictyris longicarpus*, scurrying over the sand in their search for food in the sediment, looking for all the world like miniature mauve battalions on some raiding mission – hence their name, I would imagine. I even see my first wild horseshoe crabs on this shore. Not really crabs, these animals are more closely related to spiders and are similar in general appearance to that most famous extinct arthropod group, the trilobites, although they are not closely related. Nothing like any of these animals occurs in Britain – most of our intertidal species are shore-crabs with 'typical' crab-like dimensions, and hence are similar in general appearance to rock-crabs (family: Grapsidae).

Fish also figure highly in my list of notables as, for the first time, I encounter wild puffers (*Fugu vermicularis*), among other delights. I only find a tiny individual, but the adrenaline rush is enough to make it worthwhile!

I do have to mention the *Littoraria* winkles of the mangroves because, while *Littorina* (a related genus) are not exactly high up on my list of favourite animals, as my friends will no doubt tell you, I have always wanted to see the mangrove versions of this family. Now I have - two species in fact, very different from each other in sculpture if not in apparent shape or patterning.

Finally, I must make space for the rocky shore. While no particular animal stands out as being very notable in itself, it has to be said that these rocky, spray-soaked places, as ever, are my favourite habitats. It was with this child-like excitement that I greeted the last day of trips, to Hoi Sing Wan's rocky side. The shear number of animals visible to the casual observer is remarkable. Certainly, the rocky intertidal doesn't have brightly-coloured dragonflies, nor soldier-crabs, nor even a notable array of fish species. However, it does have rock-crabs (*Grapsus spp.*). It also has porcelain crabs (*Petrolisthes*), and giant barnacles (*Tetraclita* spp.), hordes of mussels, limpets and, dare I say it, winkles (mostly *Nodilittorina*). One major difference that I should mention between the rocky

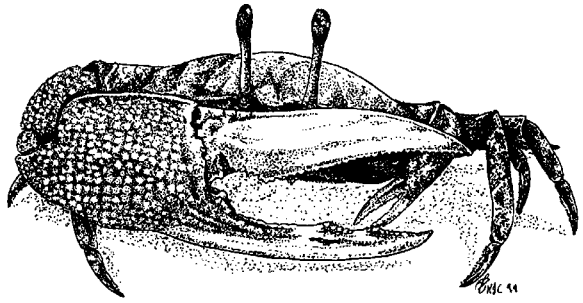


Juvenile common puffer (*Fugu vermicularis*), before (above) and after (below) becoming agitated

shores of Hong Kong and those of Britain at this time of year is the lack of seaweed on the former, at least on the site visited – Britain's rocky coastline would be dominated by great drifts of wracks (*Ascophyllum*, *Fucus*); *Ulva*, *Porphyra*, *Enteromorpha* and *Corallina* would fill rock pools with a wide array of colours and shades, whilst out in the lower intertidal / subtidal region would be forests of various kelps (*Laminaria* spp.). On the field trip I encountered only two species of marine algal growth, both encrusting and therefore not exactly what you'd call exciting to look at – and one of these was a cyanobacterium!

I enjoyed the trip, but did the students? I think that the answer has to be 'yes'. They also learned a lot. The enthusiasm with which most tackled the course was exemplified by the posters, which were generally well thought out and, for the most part, contained a lot of useful ecological information. Hordes of smiling faces greeted us every day, while the atmosphere was always friendly and relaxed, with students eager to learn and not, on the whole, worried about getting wet or dirty. I think that a lot of useful field techniques were also learned, from simple censusing to catching fast-flying insects. Could they identify the animals if they were sent into the field again on their own? That I'm not so sure about, at least not without expert help, but the enthusiasm is there, which is the main thing.

Dr. Kevin J. Caley is an Honorary Assistant Professor of the Department of Ecology and Biodiversity and a Universitas21 Research Fellow of the Virtual School of Biodiversity, School of Biological Sciences, University of Nottingham, UK



***Uca lactea*, Hoi Sing Wan**

By the way

by R. D. Hill

The notes concerning last season's typhoons and their effects jogged my memory concerning visits to two of my field sites (for erosion control). One is on a hillside near Shau Kei Wan, on the south side of the Eastern Corridor, opposite Lei Yue Mun. The other is at Mt. Butler, adjoining the Bomb-disposal Range. At the former, but not at the latter, it was very noticeable that the tree-crowns were mostly browned off and dying on the side facing the sea. York was a fairly dry typhoon and it seems likely that a fair amount of sea salt was entrained and deposited dry upon leaf surfaces on the windward side of tree-crowns. The "salt-storm" phenomenon is well-known along coasts where salt is carried inland by prevailing winds, deposited upon leaves and, in the partial – or complete – absence of rain is not washed off. Such dry deposition quickly damages the tissues, presumably at least in part because of desiccation.

In Hong Kong storms are usually accompanied by a great deal of rain so that such salt as may be deposited would soon be washed off. The salts would be added to the soil, of course, though in what quantity, with what residence-time and what effects no one knows. In other places sea salt has been detected a 100 km inland, while close to the sea annual additions of up to 40 t ha yr have been measured. Maybe there's a nice little study here for a chemically-minded ecologist.

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

Pradip Nath (CUHK) and his wife came across a **Barking Deer** while jogging in Shing Mun at around 7pm on 28 May. The deer was seen on the jogging trail, about 1.5 km from the main Shing Mun Dam. It looked quite young. It had just come down onto the trail from the embankment, and was just as startled to see the jogging pair as they were seeing it. After a shocked few moments, it turned around and went up the thickly grown embankment and disappeared from the sight.

Paul Crow (KFBG) provided the following information: on the evening of 27 May, a security guard at KFBG came across an adult **Pangolin** whilst on routine guard duties. The animal was traveling along the road side approaching the lower helicopter pad in KFBG. This is the first sighting of a pangolin within KFBG grounds for approximately three and a half years though signs of their presence are often discovered. This animal was collected, weighted, photographed and micro-chipped before a successful release the following evening. It was judged to be a young adult of around 2-3 years old, which indicates the continued existence of a breeding population in Hong Kong.

In late March, Kevin & Kit Sinclair saw a **Pangolin,** about two feet long, walking across the concreted water works road that continues through Po Lo Tse towards the foothills of Ma On Shan. About 5pm. Very fast moving!

On 28 April, Captain Wong (KFBG) found a dead **Ferret Badger** in the beginning section of the road to Yung Shue O, Sai Kung. The animal was then photographed, and identified by Billy Hau and Michael Lau. The body was quite fresh.

Tony Stevens (NHS) provided the following information: on 12th January, at 3pm, a large **Wild Boar** was seen along Lady Clementi's Ride opposite the South Island School about 20 yard from the road. The animal was large, weighing about 150 kg. It was startled at the sight of men and ran off.

Tony Stevens provided the following information: on 29/30 (unsure) January, a large **Red-necked Keelback** (*Rhabdophis subminiatus helleri*) was seen at Hok Tau Reservoir. The sighting of a snake at such low temperature was thought to be unusual.

On 11 June, Captain Wong saw **Porcupine**'s quill in Tai Po Kau along the Brown Walk.

On 11 June, Captain Wong saw very fresh regurgitates (the foam and bubbles of the digestive juice could be seen) of fresh grasses with digestive juice of possibly **Barking Deer** in Tai Po Kau along the Blue Walk.

On 18 March, Fiona Lok (HKU) found a **Chestnut Spiny Rat** *Niviventer fulvescens* sleeping in its nest inside a nestbox, which was 2.4m above the ground. The nestbox was put up on *Machilus* sp. and situated at the edge of a forest/ plantation at Pak Kung Au, Lantau.

On 27 July, *Captain Wong* (KFBG) saw two **Porcupines** on top of Kum Yum Shan, KFBG at about 20:00

A **Ferret Badger** was seen by *Captain Wong* (KFBG) near "Mountain Lodge", KFBG at about 20:30 on July 27. This is the first confirmed record of this species on the farm.

Call of a **Barking Deer** was heard by *Captain Wong* (KFBG) at Kum Yum Shan, KFBG at about 20:10 on July 27.

BIRDS

Kwok Hon Kai saw a **Buzzard** (*Buteo buteo*) kill a **White-breasted Waterhen** (*Amauromis phoenicunis*) in a mangrove plantation along a flood-control channel near Nam Sang Wai on 22 Dec 1999

Stephanie Crockett (Hong Kong Housing Authority) saw a **Peregrine Falcon** (*Falco peregrinus*) in Homantin (opposite the Housing Department HQ) on 11 January where it spent about 2 hours on an air conditioner shelf eating a magpie.
In the breeding season of 2000 (April to June) *Captain Wong, Dr. Kowk Hong Kai, Dr. John Fellows, Flora KY*

Chan, Lee Kowk Shing (KFBG) discovered three new egretries in Hong Kong: small egretries of **Chinese Pond Heron** (*Ardeola bacchus*) near Peter Scott Field Centre at Mai Po, and at Lam Tsuen. One egretry of **Little Egrets** (*Egretta garzetta*) and Chinese Pond Herons at Ho Chau Leng, Au Tau, Yuen Long.

Lee Kwok Shing (KFBG) and I saw a male **Black-naped Oriole** (*Oriolus chinensis*) at Sandy Ridge near Man Kam To, Frontier Closed Area (FCA) on 18 April 2000. A nice villager also showed them a male **Ring-necked Pheasant** (*Phasianus colchicus*) in captivity which he caught (illegally!!) on the hillside. Although the specimen they saw had sign of a clipped upper beak, there is a possibility that this species may have re-established themselves in HK. Villagers they met claimed that this species has always been around in FCA, and one gentleman said he saw female foraging with chicks in his fields on numerous occasions. Lily Ng and Michael Neumann (HKU) also photographed a healthy-looking male by Tan Shan River, NENT in April this year. This area, or the eastern side of FCA, may warrant more ecological study. Birders, for example, tend to frequent the San Tin-Mai Po side for obvious reason. Oh, I better not talk about the alleged South China Hare at Sandy Ridge and Lin Ma Hang... this is a scientific newsletter...

Bosco Chan (HKU)

AMPHIBIANS/REPTILES

On 25 May, I saw an explosion of millions of small termites (anybody know the species?) trigger a lot of herp foraging along Lam Kam Road between 1900 and 2000h – many **Asiatic Common Toads** (*Bufo melanostictus*), an **Asiatic Painted Frog** (*Kaloula pulchra pulchra*), a **Brown Tree Frog** (*Polypedates megacephalus*), and (unusually) dozens of **Bowring's Geckos** (*Hemidactylus bowringii*) on the pavements. *John Fellows* (KFBG)

On 25 May, *John Fellows* (KFBG) saw a dead **Chinese Water Snake** (*Enhydris chinensis*) on a side road near Lam Tsuen River at Hong Lok Yuen Roundabout.

Bosco Chan (HKU) and *Lee Kwok Shing* (KFBG) saw a dead **Chinese Soft-shell Turtle** (*Pelodiscus sinensis*) floating in an overgrown ditch at Sandy Ridge near Man Kam To, within the Frontier Closed Area on 18 April 2000. Villagers reported that this turtle is relatively common in the vicinity. No soft-shell turtle farm is known from this area.

John Fellows (KFBG) sighted two dead **White-spotted Slug Snake** (*Pareas margaritophorus*) one at Pak Ngau Shek on 15 May and one near Chung Uk Tsuen on 19 May

John Fellows (KFBG) saw a dead **Large-spotted Cat Snake** (*Boiga multomaculata*) near Pak Ngau Shek on 17 May.

ARTHROPODS

Stephanie Crockett (Hong Kong Housing Authority) saw large numbers (20-30) of dead **Horseshoe Crabs** washed up on the beach of Ma Lam Wat peninsular (facing Sai Kung) during the end of January.

INSECTS

On 16 May in Wong Chuk Yeung feng shui wood, Ma On Shan, *John Fellows* (KFBG) encountered a member of the insect order Mecoptera. This aptly-named **Scorpionfly (Family Panorpidae)**, about 1 cm in length, was recognisable by its stout scorpion-like tail, and a long, rather elephant-like proboscis. There are only some 500 Mecoptera species in the world, of which 60% are Panorpidae; members of this family occur in moist habitats in all major temperate and tropical regions except Australia. They feed primarily as scavengers on dead insects, but can also be herbivores. A quick consultation with other ecologists and entomologists revealed that scorpionflies have been sighted a couple of times before in Hong Kong, but no specimen has been collected and identified. This specimen flew away before the first record of it could be made. It is not known whether the Hong Kong species is/are forest specialists, but its occurrence in the Wong Chuk Yeung forest reinforces the site's known importance as a biodiversity refuge.

LUK KENG FRESHWATER MARSH

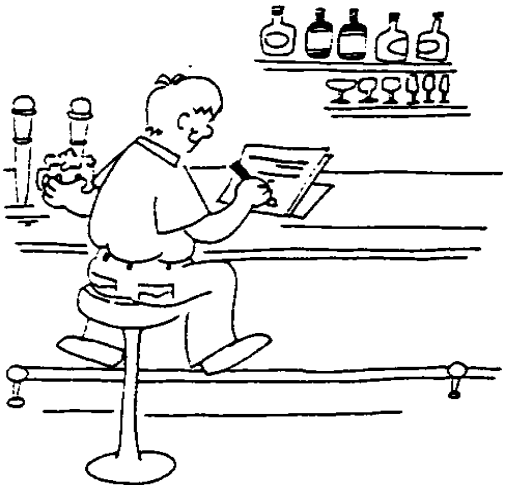
The **Luk Keng freshwater marsh** has been disturbed by a group of people who are playing their remote controlled helicopters probably since the beginning of the 1999/2000 winter. A great noise impact resulted and there was no egret feeding in the marsh where the helicopters were. The players even built their own sheltered place in the dry areas of the marsh. The marsh is the largest freshwater marsh in HK, which supports some rare wetland birds including rails and bitterns. In addition, the marsh is also the most important feeding habitat of egrets, especially Cattle Egrets, nesting on A Chau. The current recreational impact could certainly reduce the ecological value of this marsh which was zoned as Conservation Area but no management is involved.

Captain Wong (KFBG)

On 25 June, *Robert Davison* (City University) saw a road-killed juvenile **Mountain Water Snake** (*Natrix percarinata*) about 50 cm long near Wu Kau Tang.

On 1 July, *Robert Davison* (City University) saw a **Greater Green Snake** (*Opheodrys major*) about 55 cm long crossing the water works access road that runs along the north side of the lower Shing Mun reservoir.

From the (tea) bar…..



See the pyramids

by John R. Fellowes

Richard Corlett struggled in the last *Porcupine!* to come up with a non-trivial generalisation without exceptions in ecology. Since he has made this point before I feel impelled to mention one. Charles Elton's ecological "Pyramid of Numbers" admittedly had exceptions, but once adapted by Lindeman and Hutchinson into an energy pyramid, it became as firm as the Second Law of Thermodynamics in which it was rooted: as you hop up the trophic levels, total energy diminishes. The extent of diminishment is variable, but it is substantial, and is something like an order of magnitude. Perhaps Richard would exempt this as physics in ecology's clothing, but surely anything to do with trophic levels is ecologists' domain. I'm not aware of any exceptions (I'm sure the physicists would be keen to know if there are), which leaves us the question: is it non-trivial?

Not in 'pure' ecology. In general terms, the rule has been used, as Paul Colinvaux put it, to explain "why big fierce animals [carnivores] are rare". Less famously, it recently prompted Jean Tobin to question the role of ants in tropical forest canopies, those most species-rich of habitats, which they dominate numerically. Ants, unlike termites, were always supposed to be mainly secondary consumers, but there is simply too much of the animal biomass (and energy) packaged as ants for this to work. He concluded that we had grossly overlooked the importance of plant-derived fluids and/or fungi to these creatures.

But the non-triviality is of more immediate concern to our species than that. With six billion humans on this planet, it makes a great deal of difference where we ourselves sit on the trophic tree. Most agricultural land is now tied up providing for livestock. Occupying a higher trophic level than necessary demands either (a) higher primary production; (b) taking someone else's share; and/or (c) eating away another natural ecosystem. Recently in western Guangxi we visited areas that are, according to China's maps, strongholds of her diverse tropical forests. Indeed they were, until the last decade or so; vast genetic reservoirs of our potential food plants and insect allies. Now they are gone; the hills, instead, are growing corn. Why? To feed pigs. Increasing meat consumption in China's cities, Hong Kong included, demand an additional 20 million pigs each year. We are destroying biodiversity as we eat.

Historically the Chinese (and Asians in general) derived most of their protein from plant matter. But expectations have changed. Meat consumption in China rose from 20 million tonnes in 1991 to a staggering 63 million in 1998. Opinions differ on how to improve yields, and on how far they can be improved. Some agriculturists think we are close to our capacity. Some believe we can meet a projected threefold rise in food demand by increasing our dependence on biotechnology, while champions of traditional regenerative agriculture systems point to yields many times higher than those of the industrial-scale, soil-eroding systems that replaced them. None would dispute that eating meat calls for more land.

Agronomist and China specialist Vaclav Smil asked how China might feed its projected 2050 population (1.5 billion) without curbing this carnivorous appetite. He concluded it might be possible on an omnivorous diet, but only by sticking to relatively energy-efficient forms of meat production: fish and chicken, and perhaps a little pork. The current trend to eat more beef is a recipe to repeat China's tragic famine of 40 years ago – the worst in human history. A famine caused, as much as anything, by ecological ignorance.

Yet while everybody likes to rant about overpopulation ("out of our hands"), diet is a prickly subject, perhaps precisely because we *can* do something about it. *Vegetarians* are the "antisocial" ones, while the reactionaries seem to invoke the difficulty of giving up *all* animal products as a reason not to cut down on *any*.

It is perhaps early days for advocating a ban on McDonald's (as suggested by Smil), or even an ecological tax on meat; we should let the educators raise the issue first. But who is doing the educating? The Government is busy now compiling indicators of sustainable development. The number of Quarter-pounders sold each day would make one simple index, of the failure of ecological education. Perhaps the number sold to graduates might feed back negatively into departmental budgets, with ecology students counting double.

The energy pyramid is, in short, an ecological generalisation to which we are not exceptions, and which is very far from trivial. Within a broad range, we choose our own place within it. In terms of personal ecological impact, as in the calorie demand of a species, we are not only what we eat. We are also what what we eat eat, *et cetera*.

BOOK REVIEWS

Identification Guide to the Aculeata of the Nansei Islands, Japan

by Seiki Yamane, Shuichi Ikudome & Mamoru Terayama

On current knowledge, the largest phylum of animals is the Arthropoda, in which the largest class is the Insecta, in which the second largest order is the Hymenoptera, with some 120,000 species known and perhaps millions undescribed. About half of the known species are in the infraorder Aculeata, including the familiar stinging wasps, ants and bees. The taxonomic scope, then, of this book is ambitious. The geographic scope is the chain of islands between Taiwan and Japan, from 24° to 31° N, including over 150 islands in the Ryukyus as well as the outlying Senkaku and Daito groups. They comprise Japan's tropical frontier, and support almost half of its aculeate species on less than 1% of its land area.

The book is bilingual, in Japanese and English, and aims to assist both specialists and general naturalists in identifying these ecologically important insects. The bulk of it is keys: to superfamilies, to families, to genera and to species and descriptions, followed by descriptions at each taxonomic level. What makes it more approachable than most such keys is the clear line drawings at each couplet, giving even a newcomer the best chance of successful identification. Twenty-four colour plates illustrate a selection of species from 22 of the 26 families: most show mounted specimens, but many of the ants, and some vespids, megachilids and others, are shown in life. Preceding the keys are introductory chapters on phylogeny, morphology and biogeography. The appendices include a spreadsheet of distribution of the species on the islands, a very useful addition for those wanting more depth.

I cannot fully evaluate the keys without a trip to the islands (sadly beyond the *Porcupine!* expense account), but those for the ants, the only group with which I can claim a familiarity, seem exceptionally clear and simple to follow. The higher-level keys will be useful to students and naturalists far beyond the Nanseis.

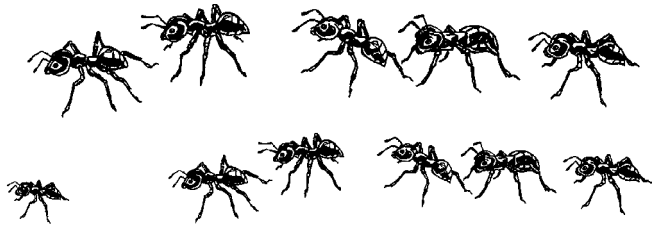
From one to half a million years ago and more recently, Taiwan and the southern and central Ryukyus were joined to the mainland, whereas the northern Ryukyus, across the Tokara Strait, were joined to Kyushu. Still, at least in the case of the ants the southern islands do not contain much of the tropical faunal element that would occur at the same latitude in Guangdong, while the subtropical elements tend to occur throughout the chain. More particular differences from the mainland fauna include a paucity of *Pheidole* and *Polyrhachis* species, balanced by a wealth of *Aphaenogaster*. Most of the Palaearctic species, of *Lasius*, *Formica* and *Myrmica*, are confined to the taller islands of Yakushima and the Tokara group; such islands also support most of the endemic aculeates. Thus the influence of altitude on the islands' ant fauna appears at least as strong as that of location.

For interpreting such distribution patterns, inclusion of the islands' altitudes in the appendix would have been helpful, as would brief information on their vegetation. As Skip Lazell would doubtless point out, species-altitude graphs might have been more illuminating than the species-area graphs shown. On the identification front, species descriptions are inevitably brief, and for the ants I would perhaps have included the measure of alitrunk length as well as total length, which is far more variable within a species. But overall the inconveniences of the book – typographical errors, the lack of a subject index to accompany the taxonomic one, the 'late entrants' in the Appendix – are very minor for such a wide-reaching tome.

On the whole this is a superb book, which sets the standard for Asia. The authors, particularly Professor Yamane, work tirelessly to help other would-be specialists in the region to attain such standards, and this book is just one example of their effort. It is also an important reference for those of us seeking a better general understanding of subtropical ecosystems or biodiversity. We haven't understood much until we've got to know the Hymenoptera.

The book runs to almost 900 pages in all, and comes hardbound with a strong case. It is available from Mr. Haruo Tamiya, Hokkaido University Press, Kita-9, Nishi-8, Kita-ku, Sapporo, 060-0809 Japan (up-tamiya@ coop.hokudai.ac.jp). Ordering through Prof. Yamane (sky@sci.kagoshima-u.ac.jp) may permit a discount rate. The normal price is 26,500 yen (about HK $1960), the discount rate 21,200 yen – a heavy price, but a heavy book. I shudder to think what the companion volume for continental China would weigh. In the authors' words: "When comparative work of species from this region and those from Taiwan and continental China is completed, this book should be completely revised." However hard we work towards making it redundant in this way, the Nansei book will have regional importance for many years.

John R. Fellowes



We welcome short notices about new publications on the natural history of Hong Kong or the region, but we only have room for one or two book reviews in each issue, so please ask us before you start writing!

Recent Publications

Books and monographs

Hyde, K.D. (2000) *Fungal Diversity* Volume 4, Fungal Diversity Press, pp.198

Hyde, K.D. and Pointing, S.B. (2000) *Marine Mycology - A Practical Approach*. Hong Kong, Fungal Diversity Press. Fungal Diversity Research Series 1, pp. 377.

Sadovy, Y. and Cornish, A. S. (2000) *Reef Fishes of Hong Kong*. Hong Kong University Press, 321 pp.

Saunders, R.M.K. (2000) Monograph of *Schisandra* (Schisandraceae). *Systematic Botany Monographs*, **58**: 146 pages

Xia, X. (2000) *Data Analysis in Molecular Biology and Evolution.* Kluwer Academic Publishers, 296 pp. (http://www.wkap.nl/book.htm/0-7923-7767-2)

Journal articles, book chapters and other published papers

Ades, G.W.J. and Dudgeon, D. (1999) Insect seasonality in Hong Kong: a monsoonal environment in the northern tropics. *Memoirs of the Hong Kong Natural History Society* **22**: 81-97.

Ades. G.W. J. (1999) The species composition, distribution and population size of Hong Kong bats. *Memoirs of the Hong Kong Natural History Society* **22**: 183-209.

Aptroot, A. and Seaward, M. R. D. (1999) Annotated checklist of Hong Kong lichens. *Tropical Bryology*, **17**: 51-101.

Chan T-C and Sadovy, Y. (1998) Profile of the marine aquarium fish trade in Hong Kong. *Aquarium Sciences and Conservation* **12**(4): 197-213.

Chau, K.C. and Marafa, L.M. (1999) Vegetation chronosequence in Hong Kong: soil properties and successional development. *Singapore Journal of Tropical Geography* **20**(1): 24-35.

Chen, R.J., Corlett, R.T. and Hill, R.D. (1999) Relationship between biofuel harvesting and upland degradation in Hong Kong and Guangdong. *Remediation and Management of Degraded Lands* (eds. M.H. Wong, J.W.C. Wong and A.J.M. Baker), pp. 235-241. Lewis Publishers, Boca Raton, U.S.A.

Cheung, K.W. (1999) Field evaluation of tree species for afforestation of barren hills slopes in Hong Kong. *Remediation and Management of Degraded Lands* (eds. M.H. Wong, J.W. C. Wong and A.J.M. Baker), pp. 225-234. Lewis Publishers, Boca Raton, U.S.A.

Chiu, S. T. and Shek, C. W. (1999) Mangroves of Hoi Ha Wan Marine Park. *Memoirs of the Hong Kong Natural History Society* **22**: 99-112.

Corlett, R.T.(1999) Environmental forestry in Hong Kong: 1871-1997. *Forest Ecology and Management* **116**: 93-105.

Corlett, R.T. (2000) Environmental heterogeneity and species survival in degraded tropical landscapes. *The Ecological Consequences of Environmental Heterogeneity* (eds. M.J. Hutchings, E.A. John & A. Stewart)**.** Blackwell Science, Oxford, pp. 333-355.

Dickman, M. (2000) Impacts of a mosquito selective pesticide, Bti, on the macroinvertebrates of a subtropical stream in Hong Kong. *Chemosphere* **41**(1-2): 209-217.

Dudgeon, D. (1999) Conservation evaluation of freshwater wetlands: a proposed metric for Hong Kong. *Memoirs of the Hong Kong Natural History Society* **22**: 113-126.

Dudgeon, D. (1999) Indiscriminate feeding by a predatory stonefly (Plecoptera: Perlidae) in a tropical Asian stream. *Aquatic Insects* **22**: 39-47.

Dudgeon, D. (1999) The future now: prospects for the conservation of riverine biodiversity in Asia. *Aquatic Conservation: Marine and Freshwater Ecosystems* **9**: 497-501.

Dudgeon, D. (1999) The Black Paradise Fish in Hong Kong (China): preliminary observations and conservation significance. *Labyrinth* **105**: 6-7.

Dudgeon, D. (1999) Threats to East Asian freshwater biodiversity: past, present and future. *International Symposium on Water Pollution Control. DFID (Department for International Development), UK, and Nanjing University, China,* 6 pp.

Dudgeon, D. (1999) Paradise fishes. *About Life - World Wide Fund For Nature, Hong Kong*, pp. 12-13.

Dudgeon, D. (2000) Riverine wetlands and biodiversity conservation in tropical Asia. *Biodiversity in Wetlands: Assessment, Function and Conservation (Eds B. Gopa, W.J. Junk & J.A. Davies)*, Backhuys Publishers, The Hague, pp. 35 - 60.

Dudgeon, D. (2000) Riverine biodiversity in Asia: a challenge for conservation biology. *Hydrobiologia* **418**: 1-13.

Dudgeon, D. and Wu, K.K.Y. (1999) Leaf litter in a tropical stream: food or substrate for macroinvertebrates?. *Archiv fur Hydrobiologie* **146**: 65-82.

Dudgeon, D., Choowaew, S. and Ho, S.C. (2000) River conservation in Southeast Asia. *Global Perspectives on River Conservation: Science, Policy and Practice (Eds. P.J. Boon, B.R. Davies & G.E. Petts)*, pp. 279-308.

Ge, X.J. and Sun, M. (1999) Reproductive biology and genetic diversity of a cryptoviviparous mangrove, *Aegiceras corniculatum* (Myrsinaceae) using allozyme and inter-simple se-

quence repeat (ISSR) analysis. *Molecular Ecology* **8**(12): 2061-2069.

Gu, J., Ford, T.E. and Mitchell, R. (2000) Uhlig's Corrosion Handbook (Second ed.). *Chapter 21: Microbial degradation of materials: general processes*, pp. 349-365.

Gu, J., Ford, T.E., Mitton, D.B. and Mitchell, R. (2000) Uhlig's Corrosion Handbook (Second ed.). *Chapter 25: Microbial degradation of polymeric materials*, pp. 439-460.

Gu, J., Ford, T.E. and Mitchell, R. (2000) Uhlig's Corrosion Handbook (Second ed.). *Chapter 27: Microbial corrosion of concrete*, pp. 477-491.

Gu, J., Ford, T.E. and Mitchell, R. (2000) Uhlig's Corrosion Handbook (Second ed.). *Chapter 50: Microbial corrosion of metals*, pp. 915-927.

Hill, R.D. and M.R. Peart. (1999) Vetiver grass for erosion control, Hong Kong and Guizhou, China. *Remediation and Management of Degraded Lands* (eds. M.H. Wong, J.W.C. Wong and A.J.M. Baker), pp. 295-304. Lewis Publishers, Boca Raton, U.S.A.

Hyde, K.D. and Wong, S.W. (1999) *Didymella aptrootii* sp. nov., from bamboo submerged in freshwater. *Australian Mycologist* **18**: 54-59.

Hyde, K.D., Ho, W.H., Taylor, J.E. and Hawksworth, D.L. (2000) Estimating the extent of fungal diversity in the tropics. *Nature and Human Society: The Quest for a Sustainable World* (ed. P.H. Raven). National Research Council, National Academy Press, pp. 156-175.

Johannes, R. E., Squire, L., Graham, T., Sadovy Y. and Renguul, H. (1999) Spawning aggregations of grouper (Serranidae) in Palau. *Marine Conservation Research Series Publication No. 1, The Nature Conservancy*, pp. 144.

Kwok, H.K. and Corlett, R.T. (2000) The bird communities of a natural secondary forest and a *Lophostemon confertus* plantation in Hong Kong, South China. *Forest Ecology and Management* **130**: 227-234.

Lau, M.W. and Dudgeon, D. (1999) Composition and distribution of Hong Kong amphibians. *Memoirs of the Hong Kong Natural History Society* **22**: 1-79.

Lau, S.P. and Fung, C.H. (1999) Reforestation in the countryside of Hong Kong. In: *Remediation and Management of Degraded Lands* (eds. M.H. Wong, J.W.C. Wong and A.J.M. Baker), pp. 195-200. Lewis Publishers, Boca Raton, U.S.A.

Lau, S.S.S. and Chu, L.M. (2000) The significance of sediment contamination in a coastal wetland, Hong Kong, China. *Water Research* **34**(2): 379-386.

Lazell, J. (1999) The origins and evolution of the herpetofaunas of the islands on the continental shelf of South China. *Tropical Island Herpetofauna: Origin, Current Diversity, and Conservation* (ed. Ota, H.), pp. 79-96. Elsevier, Amsterdam.

Lazell, J., Kolby, J., Lin, Y.M., Zhuang, D.H. and Lu, W.H. (1999) Reptiles and amphibians from Nan Ao Island, China. *Postilla* **217**: 1-18.

Lazell, J. and Ota, H. (2000) Aspects of life history, ecology, and distribution of the asiatic four-lined skink, Eumeces quadrilineatus, in South China. *Breviora* **509**: 1-9.

Lee, S.C., Williams, G.A. and Brown, G.D. (1999) Maculalactone L and three halogenated carbazole alkaloids from *Kyrtuthrix maculans*. *Phytochemistry* 52: 537-540.

Lee, S.Y. and Bull, M. (1999) Tropical mangrove ecology: physical and biotic factors influencing ecosystem structure and function. *Australian Journal of Ecology* **24**(4): 355-366.

Lu, L. and Wu, R.S.S. (2000) An experimental study on recolonization and succession of marine macrobenthos in defaunated sediment. *Marine Biology* **136**(2): 291-302.

Lu, W.H. and Fan, X. (2000) Two new chinese *Glipidiomorpha Franciscolo* (Coleoptera: Mordellidae) and a key to mainland species. *The Coleopterists Bulletin* **54**(1): 1-10.

Marafa, L.M. and Chau, K.C. (1999) Effect of fire on upland soil in Hong Kong. *Forest Ecology and Management* **20**(1-3): 97-104.

Maxwell, G. S. and Tam P. C. F. (1999) The ecological status of *Baeckea frutescens* L. in Sai Wan hills of Sai Kung East Country Park. *Memoirs of the Hong Kong Natural History Society* **22**: 155-163.

Morton, B. (2000) The anatomy of *Callocardia hungerfordi* (Bivalvia: Veneridae) and the origin of its shell camouflage. *Journal of Molluscan Studies* **66**(1):21-30.

Morton, B. and Chan, K. (1999) Hunger rapidly overrides the risk of predation in the subtidal scavenger *Nassarius siquijorensis* (Gastropoda: Nassariidae): An energy budget and a comparison with the intertidal *Nassarius festivus* in Hong Kong. *Journal of Experimental Marine Biology and Ecology* **240**(2): 213-228.

Morton, B. and Yuen, W. Y. (2000) The feeding behaviour and competition for carrion between two sympatric scavengers on a sandy shore in Hong Kong: the gastropod, *Nassarius festivus* (Powys) and the hermit crab, *Diogenes edwardsii* (DeHaan). *Journal of Experimental Marine Biology and Ecology* **246**(1):1-29.

Nagarkar, S. (1999) New Records of coccoid cyanobacteria from Hong Kong rocky shores. *Asian Marine Biology* **15**: 119-125.

Ng, S. C. and Corlett. R. T. (2000) Comparative reproductive biology of the six species of *Rhododendron* (Ericaceae) in Hong Kong, South China. *Canadian Journal of Botany* **78**:

221-229.

Ng, S. C. and Corlett. R. T. (2000) Genetic variation and structure in six *Rhododendron* species (Ericaceae) in Hong Kong, South China. *Molecular Ecology* **9**: 959-969.

Peart, M.R. (2000) Acid rain, storm period chemistry and their potential impact on stream communities in Hong Kong. *Chemosphere* **41**(1-2): 25-31.

Pointing, S. B. (2000) Lignocellulolytic enzyme assays. *Marine Mycology – A Practical Approach* (eds. K.D. Hyde and S. B. Pointing). Hong Kong, Fungal Diversity Press, Fungal Diversity Research Series **1**: 137-157.

Pointing, S. B. and Hyde, K. D. (2000) Lignocellulose-degrading marine fungi. *Biofouling* **13**:1-9.

Pointing, S. B. and Hyde, K. D. (2000) Marine mycology into the new millenium. *Marine Mycology – A Practical Approach* (eds. K.D. Hyde and S.B. Pointing). Hong Kong, Fungal Diversity Press, Fungal Diversity Research Series **1**: 337-341.

Pointing, S. B., Bucher, V. and Vrijmoed, L. L. P. (2000) Dye decolorization by sub-tropical basidiomycetous fungi and the effect of metals on dye degradation. *World J. Microbiol. Biotechnol* **16**: 199-205.

Pointing, S. B., Jones, E. B. G. and Vrijmoed, L. L. P. (2000) Optimization of laccase production by *Pycnopours sanguineus* in submerged liquid culture. *Mycologia* **92**:139-144.

Pointing, S.B., Fryar, S.C., Hyde, K.D. and Mouzouras, R. (2000) Assessment of wood decay, fungal interactions and colonisation. *Marine Mycology – A Practical Approach* (eds. K.D. Hyde and S.B. Pointing). Hong Kong: Fungal Diversity Press. Fungal Diversity Research Series **1**: 113-136.

Ranghoo, V.M. and Hyde, K.D. (2000) *Ascominuta lignicola*, a new loculoascomycete from submerged wood in Hong Kong. *Mycoscience* **41**: 1-6.

Ranghoo, V.M., Hyde, K.D. and Liew, E.Y.C. (2000) Molecular Techniques and Phylogeny. *Marine Mycology – A Practical Approach* (eds. K.D. Hyde and S.B. Pointing). Hong Kong, Fungal Diversity Press, Fungal Diversity Research Series **1**: 308-336.

Sadovy, Y. (1999) Adding color to 'gray' literature. *Environmental Biology of Fishes* **54**: 117-118. [Book review]

Sadovy, Y. and Eklund, A. M. (1999) Synopsis of biological data on the Nassau grouper, *Epinephelus striatus* (Bloch, 1972), and the jewfish, *E. itajara* (Lichtenstein, 1822). U. S. Dep. Commer., NOAA Tech. Rep. NMFS 146, and FAO Fisheries Synopsis 157, 65 pp.

Salas Guisado, M.L.H. and Dudgeon, D. (1999) Parthenogenesis in some Hong Kong mayflies (Ephemeroptera). *Memoirs of the Hong Kong Natural History Society* **22**: 165-169.

Sibley, F., Lu, W.H. and Lazell, J. (1999) Swinhoe's storm-petrel, bridled tern, and lesser crested tern at Wu Yu (Black Rock), Nan Ao County, Guangdong, China. *Waterbirds* **22**(1): 142-144.

Tong, X. and Dudgeon, D. (1999) Two new species of *Platybaetis* (Ephemeroptera, Baetidae) from Sulawesi, Indonesia. *Entomological News* **110**: 290-296.

Tong, X. and Dudgeon, D. (2000) A new species of *Prosopistoma* from China (Prosopistomatidae: Ephemeroptera). *Aquatic Insects* **22**: 122-128.

Tong, X. and Dudgeon, D. (2000) *Baetiella* (Ephemeroptera: Baetidae) in Hong Kong, with descriptions of a new species. *Entomological News* **111**: 143-148.

Tong, X. and Dudgeon, D. (2000) Two new species of *Alainites* (Ephemeroptera: Baetidae) from Hong Kong, China. *Pan Pacific Entomologist* **46**(2): 115-120.

Tsui, K.M., Hyde, K.D. and Hodgkiss, I.J. (2000) Biodiversity of fungi on submerged wood in Hong Kong streams. *Aquatic Microbial Ecology* **21**: 289-298.

Turner, I.M., Xing, F. and R.T. Corlett. (2000) An annotated check-list of the vascular plants of the South China Sea and its shores. *Raffles Bulletin of Zoology (Supplement)* **8**: 23-116.

Valente, R.M., McChesney, S.M. and Hodgson, G. (1999) Benthic recolonization following cessation of dredged material disposal in Mirs Bay, Hong Kong. *Journal of Environmental Engineering* **5**(4): 257-288.

Wang, Y.Z., Wong, M.K.M. and Hyde, K.D. (2000) *Ommatomyces,* with one new species and one new combination. *Fungal Diversity* **4**: 101-116.

Whitton, S.W., Hyde, K.D. and McKenzie, E.H.C. (2000) *Dictyochaeta* and *Dictyochaetiopsis* species from the *Pandanaceae*. *Fungal Diversity* **4**: 133-158.

Williams, G.A., Little, C., Morritt, D., Stirling, P., Teagle, L., Miles, A., Pilling, G. and Consalvey, M. (1999) Foraging in the limpet *Patella vulgata*: the influence o rock slope on the timing of activity. *J. Mar. Biol. Ass. UK* **79**: 881-889.

Wong, C.L. and Ni, L.H. (2000) Population dynamics of the feral macaques in the Kowloon Hills of Hong Kong. *American Journal of Primatology* **50**(1): 53-66.

Wong, K.C. and Sun, M. (1999) Reproductive biology and conservation genetics of *Goodyera procera* (Orchidaceae). *American Journal of Botany* **86**(10):1406-1413.

Wong, L.C., Corlett, R.T., Young, L. and Lee, S.Y. (1999) Foraging flights of nesting egrets and herons from a Hong Kong egretry, South China. *Waterbirds* **22**(3): 424-434.

Wong, L.C., Corlett, R.T., Young, L. and Lee, S.Y. (2000) Feeding ecology of Little Egrets on intertidal mudflats in

Hong Kong, South China. *Waterbirds* **23**: 214-225.

Wong, M.K.M., Goh, T.K. and Hyde, K.D. (2000) *Paraphaeosphaeria schoenoplecti* sp. nov. from senescent culms of *Schoenoplectus litoralis* in Hong Kong. *Fungal Diversity* **4**: 171-179.

Xia, X. (2000) Phylogenetic Relationship among Horseshoe Crab Species: The Effect of Substitution Models on Phylogenetic Analyses. *Systematic Biology* **49**: 87-100.

Xing, F., Corlett, R.T. and Chau, K.C. (1999) Study on the flora of Hong Kong. *Journal of Tropical and Subtropical Botany* **7**(4): 295-307. [In Chinese]

Yang, G., Zhou, K., Xu, X. and Leatherwood, S. (1999) A survey of the incidental catches of small cetaceans in coastal waters of China. *Chinese Journal of Applied Ecology* **10**(6): 713-716.

Zhang, D.X., Saunders, R.M.K. and Hu, C.M. (1999) *Corsiopsis chinensis, gen. et. sp. nov.* (Corsiaceae): first record of the family in Asia. *Systematic Botany* **24**: 311-314.

Zhang, D.X. and Saunders, R.M.K. (2000) Reproductive biology of a mycoheterotrophic species, *Burmannia wallichii* (Burmanniaceae). *Botanical Journal of the Linnean Society* **132**: 359-367.

Zhou, D.Q. and Hyde, K.D. (2000) *Submersisphaeria bambusicola* sp. nov. from bamboo in Hong Kong. *Fungal Diversity* **4**: 181-186.

Zhuang, X.Y. and Yau, M.L. (1999) The role of plantations in restoring degraded lands in Hong Kong. *Remediation and Management of Degraded Lands* (eds. M.H. Wong, J.W.C. Wong and A.J.M. Baker), pp. 201-208. Lewis Publishers, Boca Raton, U.S.A.

FREE Column

Announcement:

Looking for postgraduates who are interested in joining a postgrad discussion group that meets once a month for about an hour or so to discuss ecological issues - controversial, philosophical, new techniques, in fact any that a group member is interested in bringing to the table. The idea is to increase inter-group communication, enhance knowledge of other areas besides the very miniscule ecological part that each one of us concentrates on and think about issues that might be relevant to "real-world" ecology.

Any ideas, comments, suggestions are welcome. Please e-mail if you are interested in joining to Sukhmani Mantel (skmantel@hkusua.hku.hk) or Jackie Yip (yyipc@hkusua.hku.hk).

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