The conservation status of Cyperaceae in Hong Kong by Julia Shaw

Hong Kong’s biodiversity is fundamentally interesting as species numbers are higher than comparable areas elsewhere (Corlett & Turner, 1997; Shaw, in prep.; Fig. 1). The most reasonable explanations for this are Hong Kong’s biogeographical location, a wide range of local habitats and a history of relatively intense plant collection (e.g. Bentham, 1861; Dunn & Tutcher, 1912; Anon., 1994).

![Figure 1. Cyperaceae species richness](image)

Until the last millennium, East Asian forest was, uniquely, continuous from the equator to the Arctic (Kira, 1995). The establishment of open habitat as a result of human impact has added to the wide range of Hong Kong habitats from wetlands to high altitude forests (Ashworth et al., 1993; Dudgen & Corlett, 1994; Shaw, in prep.). Unfortunately, wetlands and lowland forests are under threat from development to cater for predicted population growth of the 21st century. Furthermore, lowland habitats are generally outside of the Country Park system (Chu, 1998).

Status by habitat
The Cyperaceae (reeds, rushes and sedges) is the fifth largest plant family in Hong Kong (Anon., 1993) with representatives in all major terrestrial habitats (Shaw, in prep.). A recent two year field survey and review of various herbaria (e.g. Kew, Edinburgh, South China Institute of Botany, Hong Kong AFD, Chinese University of Hong Kong and the University of Hong Kong) has generated a list of 137 species (Shaw, in prep.). Wetlands are the centre of Cyperaceae species richness (75 species) while forest habitats are the centre of Cyperaceae species endemism (3 species). At least 50% of Hong Kong Cyperaceae are, therefore, threatened by development of Hong Kong’s lowland habitats.

Status by range
The Cyperaceae is not listed in the China Plant Red Data Book, while 10 Hong Kong angiosperms out of 388 taxa are (IUCN, 1978; Lai et al., 1999). Locally and globally rare Hong Kong Cyperaceae species were identified from the recent field survey and review of herbaria, literature and the Internet, with feedback from specialists worldwide (Shaw, in prep.). A comparison of the distribution data for each species was made using WORLDMAP rapid assessment software (Williams, 1996: Table 1, Table 2). The distribution data of six rare Hong Kong species recently collected by Ng Sai Chit has yet to be analysed. The recent collections are: Carex breviculmis R. Br., Carex filipes Franch. & Sav. var. arisanensis (Hayata) Koy., Carex maculata Boott., Carex tristachya Thunb., Eleocharis chustaria Roem. & Schult. and Schoenus falcatus R. Br.

Management of Hong Kong Cyperaceae
There is currently no management of Hong Kong Cyperaceae, although protection is indirectly given to species growing within the Country Park system and Sites of Special Scientific Interest (SSSI) (Chu, 1998). The list above has been sent to the Agriculture and Fisheries Department of Hong Kong, according to the Technical Memorandum of the Environmental Impact Assessment Ordinance, and also to biodiversity information networks worldwide (Shaw, 1999a). There are 62 species of priority concern, 81 threatened species and 102 with important biogeographical populations.

Seven wetland sites of rare Cyperaceae are highlighted for protection: Tai Wan, Po Toi (22°09.80’N 114°15.20’E); Tai Long Wan, East Sai Kung (22°24.50’N 114°22.80’E); Lai Chi Wo, Wu Kai Sha (22°31.50’N 114°15.80’E); To Tei Wan (22°13.00’N 114°14.30’E); Siu Kau Yi Chau (22°17.30’N 114°03.00’E); and Cheung Lek Mei (22°25.00’N 114°11.70’E) (Shaw, in prep., 1999a). Further details are available from the recent Hong Kong Biodiversity Survey.

The only Hong Kong Cyperaceae species currently in cultivation is Gahnia tristis Nees at the Royal Botanic Gardens, Kew (Simpson, pers. comm.). Seed from the rare species above was limited and could not, therefore, be sent to the Royal Botanic Gardens seedbank. Advice is needed on appropriate in-situ and ex-situ conservation. Furthermore, molecular sequencing of Hong Kong Cyperaceae has yet to be undertaken, in particular for the rare genera Actinoschoenus, Diplacrum and Macherina (Muasya et al., 1998).
Table 1. Locally and globally rare Hong Kong Cyperaceae

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Species</th>
<th>Range</th>
<th>Status details</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Actinocystis fittiformis Benth.</td>
<td>21-2-1</td>
<td>(NP)</td>
</tr>
<tr>
<td>1, 2</td>
<td>Carex canina Dunn</td>
<td>1-0-1</td>
<td>(E)</td>
</tr>
<tr>
<td>1</td>
<td>Carex ligata Boott</td>
<td>2-0-2</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Carex neoxa Boott</td>
<td>2-0-1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Carex pumila Thunb.</td>
<td>31-0-1</td>
<td>(NP)</td>
</tr>
<tr>
<td>1</td>
<td>Carex speciosa Kunth</td>
<td>4-2-1</td>
<td>(E)</td>
</tr>
<tr>
<td>1</td>
<td>Carex tenebrosa Boott</td>
<td>1-0-2</td>
<td>(E)</td>
</tr>
<tr>
<td>6</td>
<td>Cyperus radians Nees. Mey.</td>
<td>23-3-1</td>
<td></td>
</tr>
<tr>
<td>4, 8</td>
<td>Diplacrum caninum R. Br.</td>
<td>42-3-2</td>
<td>(NP)</td>
</tr>
<tr>
<td>3, 4, 8</td>
<td>Fimbriatia insignis Thwaites</td>
<td>26-0-1</td>
<td>(NP)</td>
</tr>
<tr>
<td>1</td>
<td>Hyptis runcinana (Merr.) Tang &amp; Wang</td>
<td>2-0-1</td>
<td>(NP)</td>
</tr>
<tr>
<td>1</td>
<td>M. acerata (Gaudich) T. Koyama</td>
<td>1-0-1</td>
<td>(E)</td>
</tr>
<tr>
<td>1, 2, 3</td>
<td>M. longissima (Gaudich) T. Koyama</td>
<td>21-0-1</td>
<td></td>
</tr>
<tr>
<td>4, 6, 8</td>
<td>Schoenoplectus mucronatus (L.) Pallas</td>
<td>60-4-1</td>
<td>(NP)</td>
</tr>
<tr>
<td>4, 7</td>
<td>Schoenoplectus supinus (L.) Pallas</td>
<td>55-0-1</td>
<td>(X)</td>
</tr>
<tr>
<td>2</td>
<td>Scleria corymbosa Roxb.</td>
<td>24-2-1</td>
<td></td>
</tr>
</tbody>
</table>

Key:
- One species is currently locally extinct (X), while three are regarded as endemic (E) and eight have not yet been collected in protected areas in Hong Kong (NP).
- Each species is prefixed by a code for Hong Kong habitats (1 = dense forest, 2 = semi-shaded forest, 3 = shrubland, 4 = wetland, 5 = wasteland, 6 = beach, 7 = cultivated areas, 8 = grassland); and
- suffixed by a distribution code for world range, South China status and Hong Kong status respectively.
- The world range (1-80) gives the number of WORLDMAP grid squares of 10 degrees latitude by 10 degrees longitude where the species has been recorded.
- The Hong Kong and South China status (1 = rare, 2 = restricted, 3 = occasional, 4 = frequent, and 5 = common) is defined in Hong Kong by the number of populations known (1 = 1-3 sites, 2 = 3-6 sites, 4 = 10-20 sites and 5 = more than 20 sites).

Table 2. Collection details of rare Hong Kong Cyperaceae

<table>
<thead>
<tr>
<th>Species</th>
<th>Collection details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actinocystis fittiformis Benth.</td>
<td>Hance, HK, 8.1861, KI; SCNG 1354, Ma On Shan, 10.5.1997, HK</td>
</tr>
<tr>
<td>Carex canina Dunn</td>
<td>Dunn 7154, Lantau Peak 3.1911, K; SCNG 1354, Ma On Shan 10.5.1997, HK; SCNG 1171, Sunset Peak, Lantau, 5.3.98, HK</td>
</tr>
<tr>
<td>Carex ligata Boott</td>
<td>Wright, HK, 1853, K; Bentham 263, HK, 1858, K; SCNG 1334, Pokfulam, HK</td>
</tr>
<tr>
<td>Carex neoxa Boott</td>
<td>Bentham 790, HK, 1858, K; Rev. Fautie, Hance 15867, HK, 1898, K; SCNG 1488, Nei Lak Shan, Lantau Peak, 10.8.1998, HK</td>
</tr>
<tr>
<td>Carex pumila Thunb.</td>
<td>Wright, HK, 1853, K; Shaw 393, Tai Long Wong, E. Sai Kung, 23.4.1995, HK</td>
</tr>
<tr>
<td>Carex speciosa Kunth</td>
<td>Dunn 5288, San Tai, Lantau, 16.6.1908, BM; Shaw 262, Ma On Shan, 19.10.1994, HK; SCNG 1333, Pokfulam, 23.4.1998</td>
</tr>
<tr>
<td>Carex tenebrosa Boott</td>
<td>Wilford 565, HK, 1853, K; Shaw 891, To Tai Wan, 19.3.1997, HK; SCNG 1673, Wung Tung Chai, Tai Mo Shan, 24.12.1998, HK; SCNG 1785, Sunset Peak, 11.3.1999, HK</td>
</tr>
<tr>
<td>Cyperus diffusus Vahl</td>
<td>Hance 2149, HK, K; Hu SY 21651, Ng Tung Chai 2.1993, CHU</td>
</tr>
<tr>
<td>Cyperus radians Nees. Mey.</td>
<td>Wright 565, HK, 1853, K</td>
</tr>
<tr>
<td>Diplacrum caninum R. Br.</td>
<td>Hance 9932, HK, 11.1874, K; SCNG 896, Lai Chi Chong, Sai Kung, 2.11.1997, HK; SCNG 1504, Tai Tam, 8.9.1996, HK</td>
</tr>
<tr>
<td>Diplacrum pygmepoa Kern Koy.</td>
<td>SCNG 893, Li Chi Wo, 2.11.1997, HK</td>
</tr>
<tr>
<td>Fimbriatia insignis Thwaites</td>
<td>(Hance 1871; Dunn &amp; Tutcher 1912)</td>
</tr>
<tr>
<td>Fimbriatia longissima Steud.</td>
<td>Prof. Xing 9614; Shaw 645, Tai Po, 25.9.95, HK</td>
</tr>
<tr>
<td>Fimbriatia sericea R. Br.</td>
<td>SCNG 978, Siu Kau Yi Chau, HK; SCNG 1002, HK</td>
</tr>
<tr>
<td>M. acerata (Gaudich) T. Koyama</td>
<td>Hance, Pokfulam, 1.1883, K; Shaw 336, Shing Mun Country Park, 3.1995, HK</td>
</tr>
<tr>
<td>M. longissima (Gaudich) T. Koyama</td>
<td>Shaw 337, Shing Mun Country Park, 3.1995, HK</td>
</tr>
<tr>
<td>Schoenoplectus mucronatus (L.) Pallas</td>
<td>Bodinier 1324, Kowloon, 1895, E</td>
</tr>
<tr>
<td>Schoenoplectus supinus (L.) Pallas</td>
<td>Wilford 271, HK, 1.1868, K</td>
</tr>
<tr>
<td>Scleria corymbosa Roxb.</td>
<td>Hance 2985, HK, 12.1868, BM; SCNG 1534, Sunset Peak, 1.10.1998</td>
</tr>
</tbody>
</table>
Monitoring is recommended for the genus *Kyllinga* (Shaw 1999b). *K. polyphylla* Wild. has been recently introduced to Hong Kong (Corlett 1996) and is now running wild in grassland partly as a result of its robust rhizome system. It is burnt from the banks of traditional fishponds in Luk Keng in the north-east of Hong Kong. Cyperaceae are not good invaders of native habitats (Daehler 1998), however, *Kyllinga* species have the potential to invade forest, Hong Kong's largest original habitat (Kira 1995). *Kyllinga nemoralis* (Forst.) Dandy, with distinct white inflorescence heads, currently grows in disturbed forest areas.

To maintain Hong Kong's biodiversity and habitats amidst the development pressures of the 21st century, *in situ* and *ex situ* management of the Cyperaceae is, therefore, a necessity.

Acknowledgements

This work was funded by a studentship from the University of Hong Kong and facilitated by the hospitality of herbaria in the UK, Hong Kong and South China with feedback from specialists worldwide.

Anon (1994) Checklist of Hong Kong plants. Hong Kong herbarium, Agriculture and Fisheries Department Bulletin 1 (Revised): 87-90.


Shaw, J.C. (1999b) Report to monitor the genus Kyllinga, a woody genus with the potential to invade native habitats. Unpublished report for the Agriculture and Fisheries Department of the Hong Kong S.A.R. Government.


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**Monster weed may threaten Hong Kong wetlands**

Ng Sai Chit has found a clump of the Giant Sensitive Plant, *Mimosa pigra* L., growing in wasteland at Tai Tung, near Three Fathoms Cove. The plant is mature and bears flowers and ripe, bristly pods. This species is unmistakable, since it is the only shrub in tropical East Asia which grows 3-5 m tall, has touch-sensitive bipinnate leaves, prickly stems and pink, globular flower-heads, 1-2 cm diameter. Oddly, Linnaeus considered it less sensitive than other species in the genus, hence the epithet "pigra", meaning lazy!

This Central American species has already become established over huge areas of the seasonal tropics and subtropics, in Southeast Asia, northern Australia and parts of Africa. It replaces species-rich wetlands with imperceptible, monospecific shrublands. In the Northern Territory of Australia it is considered the number one environmental weed and the "largest single threat" to wetlands. In northern Thailand I have seen it thriving in habitats, such as abandoned paddy fields, and a climate very similar to Hong Kong's. The only effective method of control so far is intensive, repetitive treatment with herbicides, although 11 biological control organisms have already been released in Australia.

I will ask AFD to destroy the plant(s) at Tai Tung and monitor the site for regeneration from the persistent seed bank. However, it is unlikely that this is the only site. If you see any more individuals, please report them to me and the AFD, and ensure that they are destroyed.

Richard Corlett
King Cobra vs Copperhead Racer, PT 2
9 February 1999: at around 2pm, Joyce Ng, James Mubiru and Roger Kendrick observed a King Cobra Ophiophagus hannah attempting to quell a Copperhead Racer Elaphe radiata near one of the accommodation buildings at KARC. The Cobra held the Racer for some 25 minutes before letting go, when both snakes slid away along a water catchment. It was assumed that the Cobra must have bitten the Racer for a sufficient length of time to inject a fatal dose of venom and would wait for its victim to die before consuming it. No further trace of either snake was found in the following 24 hours. This observation was photographed by RCK and copies of the photos passed to Michael Lau for the records.

Roger Kendrick

On 24 June 1999, Ben Ridley saw a large Mangrove Water Snake Enhydris bennetti on the open mudflat at Mai Po, 150m from the mangrove fringe. The snake was observed for several minutes with binoculars, and its length was estimated at 1.1-1.2m.

Dead stuff
A dead Mock Viper Psammodynastes pulverulentus was found on Tai Ping Hill, Yung Shue Wan, Lamma on 25 July 1999 by Andy Cornish. Also found dead by Andy at Yung Shue Wan was a Copperhead Racer Elaphe radiata in August 1999. Another stilly of this species, freshly roadkilled, was found by Robert Davison on 2 October 1999 on the Mui Tsz Lam access road.


Gary Grant goes batty
The following records of Dog-faced Fruit Bats Cynopterus sphinx were made in May 1999 by Gary Grant:
1. Shenzhen, Lowu, ca. 200m west of railway station. About 10 individuals in fan palms in front of “Barber” shops.
2. Four roosting individuals in a fan palm by the Dinosaur exhibit at Ocean Park.
3. Five roosting individuals in a fan palm on Wan Tsai Road at Chai Wan, near the roundabout before Lin Shing Road turn-off.
From the (tea) bar...

Limited confidence in tests of significance

by Richard Corlett

The idea that the basic methodology of ecological research involves testing the statistical significance of a null hypothesis is so deeply ingrained in postgraduate students that most will be surprised to learn that there is probably no living statistician who supports this as a general approach, and some who believe it is never the best thing to do. The statistical reasons for this are clearly laid out in a recent paper by Douglas Johnson in the Journal of Wildlife Management ("The insignificance of statistical significance testing" JWM 63(3), 763-772) but they have been known and widely-reported for decades. I will only consider the most ecologically-relevant points here.

The most fundamental objection is that the null hypotheses tested are usually known, a priori, to be untrue. Thus, if they are "rejected", the test only confirms what is already known, while if they cannot be rejected it simply means the sample size was too small. Either way, we gain nothing from the test. Ecological null hypotheses most often state that some parameter equals zero or that two or more parameters are equal. In practice, however, no two things are ever exactly equal in biological systems and no effect worth the effort of testing is likely to be precisely zero. A parameter may be almost zero and two or more parameters may be almost equal, but large enough sample sizes will still show a "statistically significant" difference. Good examples of this misuse of significance tests in local studies are the comparison of ecological parameters (such as the abundance of an organism or the value of some physical variable) between seasons - nobody seriously believes that any parameter of ecological interest is exactly the same throughout the year - between two or more sites, where, again, large enough sample sizes will always show a difference in any parameter of ecological interest, or between two or more species which are, by definition, different.

To summarize the story so far: most null hypotheses tested in ecology - particularly, non-experimental ecology - are truly false, so P can be made as small as you want, and thus as "significant" as you want, simply by increasing the sample size. The value of P, and thus the "significance" of the test, is therefore arbitrary. The use of a...
standard cutoff value, typically $P = 0.05$, irrespective of sample size, is even less justifiable, since it does not allow you to use your common sense to decide whether the result has any biological significance.

The second major problem mentioned by Johnson is that the belief that the value of $P$ represents the probability that the null hypothesis is true - or the probability that the results were obtained by chance - is not generally correct, at least in the situations most relevant to ecologists. That it is not precisely true will come as no surprise to ecologists, who are used to relying on the supposed "robustness" of the statistical tests they apply in situations where the underlying assumptions of the test are not completely met, but the potential magnitude of the errors is much larger than we like to believe.

No wonder Clark (1963, in Johnson 1999) stated that statistical hypothesis testing was "no longer a sound or fruitful basis for statistical investigation" and Bakan (1966, again quoted in Johnson’s paper) called it "essential mindlessness in the conduct of research". Why, then, do we still do it? Johnson suggests many reasons, but believes the major one is physics envy. We envy the ability of physical scientists to say things which are precisely, universally and objectively true. Yet I find it hard to think of any non-trivial statement in ecology which I truly believe to have these properties. The ecologically-useful statements which appear to most nearly approach universality (e.g. "bulbuls are key seed dispersal agents in degraded Asian landscapes") do so because similar results have been found by different investigators, using different methods, at different sites: not because of high levels of statistical significance obtained in a single study at a single site over a limited period. Replication at different times and places, and by different methods and people, is the key to confidence in ecology.

What are the alternatives to statistical significance testing? The first step is to ask yourself what it is you really want to know. Very rarely is this "Is A different from B?" or "Is C different from zero?"... Given that we usually only investigate effects which we think likely to be non-zero, a more appropriate question is "How big is the effect and how reliable is our estimate of it?"... In such cases, parameter estimates with confidence limits are far more useful than tests of significance. And if, for instance, the 95% confidence limits include zero, we know that if we did do such a test, the resulting $P$-value would be $>0.05$. Looking through my own papers, and the theses of postgraduates I have supervised, it is (in retrospect!) obvious that most of the hypothesis tests should have been replaced by confidence intervals.

In applied ecology - including studies related to conservation or impact assessment - the question of interest is usually "Should we do X?" (Should we build the road? Should we burn the shrubland? Should we use this method or that?). In such cases, neither hypotheses testing nor confidence limits are adequate, since they ignore the relative costs of alternative actions. Thus a "non-significant" risk to human health or an endangered species - or an estimated effect which includes zero in its confidence limits - may still be unacceptable, while a small, but "statistically significant" risk to a common species may be acceptable. More generally,
Away from Cape D'Aguilar other observations on the day of the storm related to similar species, with small numbers of terns seen at Ap Lei Chau and terns, egrets and 36 Black-winged Stilts recorded from Cheung Chau. Away from the track of the storm a flock of 200 terns, probably mostly Whiskered Terns, appeared at Mai Po during the afternoon. On the following day there were still numbers of Whiskered Terns in the Deep Bay area, including a group of 90 birds at Long Valley which passed over in the early morning, suggesting a re-orientation movement.

Over the next few days there were a series of reports of Cattle Egrets in unusual locations, such as Kennedy Town and Ho Man Tin, as well as an exceptional count of 450 seen at Tsing Kwan O. Four exhausted Cattle Egrets were handed in to KFBG, as well as a single injured Black-crowned Night Heron, an Intermediate Egret E. intermedia and a Common Tern. One of the Cattle Egrets was found in a kitchen in Kowloon Tong, which suggests extreme disorientation, whilst the Common Tern, a species which is rarely reported away from open waters in Hong Kong, was found on a road at Sham Tseng. Whilst this total of seven birds may not seem excessive, an examination of KFBG records since 1994 revealed that other storms during this period resulted in at most one or two birds being taken into care whose condition could be directly attributed to effects of storms.

Observations of passerine migrants in unusual locations might have been anticipated, but apart from reports of Pallas' Grasshopper Warblers Locustella certhiola and Dusky Warblers Phylloscopus fuscatus at Chik Lap Kok, there seem to have been few unusual sightings.

It is noticeable that all of these observations relate to migrant species which were probably caught up in the storm. No direct adverse effects on resident birds were noted. This is unsurprising, as any resident species would have had adequate opportunity to seek shelter and smaller, potentially more vulnerable, species would have been able to find sheltered areas in which to feed. Arguably, since the storm passed over during the day, many small landbirds may have lost feeding opportunities. For example, Crested Mynahs Acridotheres cristatellus did not leave their roost on Kau Pei Chau until late morning (as the winds dropped during the eye passage) instead of at dawn as is normal. However, even during the period when winds were strongest Chinese Bulbuls
Pyconotus sinensis and Common Magpie-robin *Copyschus saularis* were noted feeding in sheltered corners at Wo Shang Wai. In any case, even the loss of most of one day’s foraging is unlikely to have been as stressful as a period of several days of cold wet weather in late winter when fruit is scarce and insect activity is low, or the passage of a wet frontal trough in late spring when breeding activity is at its peak and nests and nestlings would be most vulnerable.

Longer term effects arising as a consequence of damage to vegetation might be predicted but are essentially unknown. Reduced leaf cover might make roost sites more vulnerable to predators or they could be lost completely. A Chinese Pond Heron roost at Wo Shang Wai in a clump of White Popinac *Leucaena leucocephala* which suffered extensive leaf stripping and loss of branches held up to 60 birds before the storm. This roost was abandoned and had still not been re-occupied in mid October. Presumably also, damage to foliage will have affected insect numbers and damage to flowers or developing fruit will result in reduced fruit availability over the next few months, however the indirect impacts of such effects on birds are almost impossible to quantify.

Finally, it is interesting to speculate whether destruction of trees will have any genuine long term effects. Damage within secondary forests such as Tai Po Kau seems to be minor and even more isolated groups of trees such as those used as egrets at Mai Po and Tai Po are substantially intact. Whilst loss of large trees due to hurricanes in the Caribbean has been considered to have an adverse effect on populations of parrots *Amazona* spp. (Collar et al. 1994) such impacts seem to have been the consequence of much more devastating storms than York. Here, where large trees such as Chinese Banyan *Ficus microcarpa* or Big-leaved Fig *Ficus virens* have been affected this appears mostly to have resulted in the loss of branches rather than entire trees. Indeed, since Hong Kong has no woodpeckers and only one species, the Great Barbet *Megalaima virens*, which is capable of forming holes in healthy trees, the accelerate rate of hole formation which might be expected to result from the decay of broken limbs may have a beneficial effect in producing nest and roost sites for a range of species from Collared Scops Owls *Otus bakkamoena* to Hainan Blue Flycatchers *Cyornis hainana* which are unable to excavate holes themselves.

Acknowledgements:
Thank you to the following observers whose observations are included above: Elizabeth Leven, Richard Lewthwaite, Roger Muscroft, Samson So, Yu Yat Tung and Lew Young, also those who phoned in their sightings to “Birdline”. Inclusion of records in this summary does not imply acceptance by the Hong Kong Bird Records Committee and totals (for example of seabirds at Cape D’Aguilar) are likely to be amended once records are formally assessed.


**Moths, butterflies & typhoons in 1999**

Observations of moths recorded at lights (light traps and building lights at KARC) after Typhoon Sam (mid August) and T.York produced markedly low numbers of moths (both abundance and species richness reduced by between 50 and 75% on figures observed in 1997 and 1998 at KARC) for four to five days following the passing of both typhoons. Catch sizes approached more usual numbers within one week, indicating the adult populations are soon replenished from individuals that were pupae during the storms. Many moth larvae form subterranean cocoons in which to pupate and would thus be less affected by high winds, although these could be subject to landslides or being washed away.

Regular monthly butterfly monitoring was conducted at KFBG within a few days of both Typhoon Sam and Typhoon York. On both occasions, adult butterfly numbers (species and individuals) were noticeably depressed in comparison with general observations of numbers made in the days before the typhoons struck. However, as with adult moths, butterfly numbers had again noticeably increased back to ‘normal’ levels a week after the passage of the storms, indicating that pupae (and, presumably, larvae) were relatively unaffected by the adverse weather conditions associated with the typhoons.

Roger Kendrick & Graham Reels
SIX PAPERS THAT SHOOK...

John Fellowes

Six Papers is now in its seventh year, and has established an honourable tradition of targeting distinguished academics for the gleanings of their epic sojourns through the literature. Enough of that: it’s my turn. At the outset we hoped that our guests would fire the rest of us with renewed passion for scientific papers. This has happened to some extent, but there does appear to be a consensus that ‘serious’ papers inspire mainly apathy. Thus I am not the first to pay homage to publications that are more, well, human.

1. My early interest in animals was fostered largely by zoos, and by books about the ‘exotic’ animals within them. The Larousse Encyclopaedia of Animal Life was one, David Taylor’s Zoovet another. First real shaker, though, was Gerald Durrell’s The Stationary Ark. I bought this in Jersey Airport at the end of a holiday when we’d decided not to visit Jersey Zoo, thinking it would be a typically sordid tourist-resort menagerie. Dud decision. As I flew, and read, the marvels of that place were drolly brought to life as Durrell espoused his philosophy on conservation and the vital role of zoos. By the time I reached Gatwick I felt quite nauseous. It took me five years to get back there and see it for myself.

2. Throughout school biology I was sustained mainly by faith that it would get better. The endless repetitive laboratory practicals bore no relation to what interested me in nature. On the door of my locker I had a quote from Aldo Leopold in the 1940s about the contemporary zoology student, that went something like: “Instead of being taught to view his native countryside with appreciation and intelligence, he is taught to carve cats.” (It somehow gave me hope.) Later I came to read his classic: A Sand County Almanac and Sketches Here And There (1949, Oxford University Press). Throughout this magical book Leopold combines keen ecological perception and calm reflection on the human place in nature, all delivered with a poet’s linguistic finesse. The result is an infusion of sanity, and I still dip into it when the world gets too scary.

3. The work of some ethologists and behavioural ecologists did interest me during school and university – the likes of Tinbergen, Crook, Hamilton, Trivers – while a growing fascination for primate behaviour was fuelled by books such as Frans de Waal’s excellent Chimpanzee Politics. More influential, though was John MacKinnon’s The Ape Within Us, wherein the author shared the benefits of his field experience studying wild apes, and proceeded to form grand universal theories about humankind. Before reading the book I had a vague notion of doing something similar, and it had a dual effect on me: here was someone who had actually studied all those different apes, and done so with uncommon insight; yet his most fascinating conclusions were the most subjective. (He said it was panned by the critics.) Much as it impressed me, there was little point in retracing his footsteps.

4. My move from primate behaviour study towards ecology was rather gradual, but was helped by my WWF HK study of the Hong Kong macaques, which brought me into contact with the HKU ecologists. The spirit of inquiry into the neglected natural history of this part of the world, and the accompanying concern for its conservation, were infectious. I think this spirit found its expression in Hills and Streams: An Ecology of Hong Kong (1994, Hong Kong University Press) by David Dudgeon & Richard Corlett. It’s a pretty good book, but what inspired me was not the product so much as the process. It takes a certain breadth of thinking even to attempt to document what is important about an ecology, and I think all those in the DEB at the time (was it the DEB at the time?) learned something from it. Of course, the second edition will need a lot more ants.

5. Doing a PhD on ant community ecology meant wading through a vast amount of ecological literature, some of it rather good, but none of it succeeded in giving direction to my thesis (recommended reading if your life lacks directionlessness). In some respects the whole edifice was built on shifting sand, in that the taxonomy required to identify the species turned out to be suspect; as a result I developed a healthy respect for those taxonomists who had helped clear up the mess of old, scattered literature. The late W.L. Brown, Jr., made a special contribution to dragging ant taxonomy out of the Dark Ages, and his user-friendly keys were much appreciated. His heir as the world’s leading ant taxonomist is Barry Bolton, whose 1994 Identification Guide to the Ant Genera of the World (rather better than the unfinished version I had to learn with) will make things much easier. But the prize goes to his next (1995) book, A New General Catalogue of the Ants of the World (Harvard University Press) a 500-page listing of all the names (right or wrong) ever used, corrected using the
International Code of Zoological Nomenclature. While it has all the visual appeal of a telephone directory, it’s an invaluable tome and, as far as I can see, flawless.

6. Just when I thought I was wrapping up my time in this part of the world, I got a copy of *A Biodiversity Review of China* (WWF International, 1996). MacKinnon again (always a step ahead), plus co-authors Meng Sha, Catherine Cheung, Geoff Carey, Zhu Xiang and David Melville, here outlining the biogeographical features, habitats and protected areas of each province in this megadiversity nation. The approach here also provides a strong practical framework for interpreting faunal and floral inventories. John MacKinnon, poor tortured soul, has developed a tendency to tackle not what he can do easily, but what urgently needs to be done. The Review, in fact, has many holes, some of which could have been filled by a more thorough literature search, but what struck me were the genuine gaps: the countless reserves with no biodiversity information, and the clear message that we can’t even say what the urgent priorities are without further data. It directly inspired me, and many others, to get on our bike and go data-gathering.

A recurrent theme through all this? Hmmm. Perhaps only that the authors have put what is important in the big picture before what is academically expedient or ‘productive’. It takes not just clarity, but also a little vision, to make the fruits of mental ruminating illuminating.

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**Asian ant network established**

A recent international workshop in Bangkok marked the launch of a new network of Asian ant specialists. Thanks to the efforts of organisers, including Prof. Seiki Yamane (Dept. of Earth & Environmental Sciences, Kagoshima University), Dr. Maryati Mohamed (Tropical Biology and Conservation Unit, University of Malaysia), Dr. Yoshiaki Hashimoto (Museum of Nature & Human Activities, Hyogo) and host Dr. Decha Wiwatwitaya (Faculty of Forestry, Kasetsart University), the workshop brought together delegates from throughout the region.

In 1998 the parties to the Convention on Biological Diversity (CBD) endorsed a Global Taxonomy Initiative, to improve taxonomic knowledge and hence the capacity of countries to further the wise use of biodiversity. In Asia, ants have been one of the most important target groups for inventorying forest faunas. A coordinating organisation, DIVERSITAS in West Pacific and Asia (DIWPA), has established a Network for Establishment of Ant Reference Collections in Asia (ANEt), which currently includes about 15 institutions from ten countries. The aims of ANEt include the establishment of excellent reference collections of social insects (especially ants), exchange of information and specimens among institutions, and elucidation of the role of these insects in ecosystems and (hence) in agroforestry.

Delegates at the Bangkok workshop came from a variety of Asian countries, including Thailand, Japan, Malaysia, Philippines, Vietnam and China, and included both ant specialists and forest entomologists/ecologists with an applied interest in ants. Participants discussed the immense potential importance of ants in ecological agriculture, both beneficial (e.g. *Dolichoderus* tree ants as biological control agents on cocoa in Malaysia) and harmful (e.g. *Pseudolasius* ground ants as dispersers of damaging mealycbugs and fungi in longan orchards of northern Thailand). The economic and ecological importance of ant taxonomy was thus highlighted. A keynote speech by Takao Ilioka (Nagoya University) demonstrated the varied intensities of relationship between species of *Crematogaster* ants and *Macaranga* plants in Bornean dipterocarp forest, and the need to consider such ecological differences to help distinguish species of morphologically-identical ants.

Various recommendations were made to further the development of ANET, and a regional action plan will be prepared. Those interested may contact the author (kfrt@kfbg.org.hk, or 2483 9534) for details.
Book Reviews


Believe it or not, Hong Kong is a gorgeous place where you can see a lot of wild fauna and flora! I am really fascinated by the beautiful photographs in Edward Stokes’ new book “Exploring Hong Kong’s Countryside”. This book will be a useful aid to tourists and residents alike who wish to investigate the local countryside. It is divided into five parts: ‘The Countryside’, ‘Regions and Hiking’, ‘Areas and Walking’, ‘Special Interests’ and ‘Exploring Further’.

From a hiker’s point of view, Part Two will be the most attractive. It is divided into six regional sections, namely Hong Kong Island, Lamma Island, Lantau Island, Central New Territories, Sai Kung Peninsula and Plover Cove. Many hiking routes are described, and coded by colours, which is very helpful when one is reading any trail, because one can quickly tell where the trail is located. One can follow the suggested trails and appreciate the natural environment at the same time. The length of the trails, height, degree of difficulty and time needed are stated, such that one can be well prepared before the trip. Trail features, hiking safety, transport map, route map and other hiking information are useful aids. Also the special characters of the scenery are mentioned. Apart from that, the way/method to follow the trail is suggested, and you can see how considerate the author is. I am sure I will enjoy reading the “Sidelight” section and some history once I reach the top of the trail. There are also some very informative boxed text sections, such as Hillside Blazes, Revealing the Past, Maturing Forests and so on.

Ecologists or students who study environmental science/biology should read Part Four (Special Interests) which includes information on dolphins, rocks, birds, butterflies and dragonflies, amphibians and reptiles, mammals, trees and shrubs. Apart from giving general information on each topic, the author also suggests some relevant additional books to read, thus one can get to know the interested topics in depth. The most encouraging thing is that the Porcupine! is also recommended for readers. So I do hope more and more people will contribute to this publication when they see something exciting and interesting in the wild places.

In fact, teachers or educators must surely gain some advantage from reading this book. It is obviously useful for a science teacher or environmental educator, and I don’t need to say too much. Art teachers can bring their students for outings and get them to draw pictures of nature. Language teachers can ask their students to write an article or descriptive composition after a day trip in an outdoor environment. At least, I found I could learn a lot of descriptive terms from the book and I believe the students may find it advantageous.

For families with children, hiking / map reading may be a bit difficult. But I believe they will find Part Three very useful. The four places recommended by the author are City Escapes, Tai Po Kau Nature Reserve, Kadoorie Farm & Botanic Garden, and Mai Po and Deep Bay. One will know what can be seen in such places after reading the Key Features. Besides, the ways to these places (area access) are mentioned. So now, you and your family members should know where and how to go on the coming weekend(s)!

One other group of people which will benefit is photographers. You may now want to go to the natural environment, to see whether you can photograph the wild boar, or take a good picture of flying butterflies, because Hong Kong is really an attractive place for diverse fauna and flora. You do not have to go abroad to take pictures of wildlife. Stay in Hong Kong and you will find unbelievable things.

However, a few points should be clarified: on page 164 of the Chinese version, the picture shows a porcupine but is labelled as a badger. Also, the Chinese names given for some fauna are not consistent with the recommended books. The information on Lions Nature Education Centre in Part Four (Special Interests) should be put under Part Three (Areas and Walking), as Part Four describes things according to the scientific classification while the Centre provides lots of things to see and learn, like the other places mentioned in Part Three.

This book is of great worth. Why don’t you go out and buy one now? It costs HK$80 only, for something which is invaluable.

JUDY KIU KIN-YAN
Senior Education Officer,
KFBG
However, those who are able and willing to part with such a considerable sum will not be disappointed. The three authors have condensed their collective experience (amounting to several decades of study), and that of many others, into a volume which will surely remain unchallenged as the definitive account of Hong Kong's butterfly fauna until well into the next century.

The book's layout is clear, logical and attractive. It begins with a useful but rather too brief section placing Hong Kong and its butterflies in a biogeographical context, followed by a lengthy chapter on butterfly biology (structured around an account of the butterfly life-cycle), and a shorter one on taxonomy. Part Two of the book comprises a highly detailed systematic account of the Hong Kong butterfly fauna, complemented throughout by figures, tables, photographs and keys. All stages of the life-cycle are described (with occasional exceptions where knowledge is scant) for 219 species. Information on host plants, larval and adult behaviour, and known parasitoids of particular species is also given. Various useful appendices follow, before one reaches the splendid plate section, in which adults of all 219 species (including wet season forms and dry season forms where appropriate), and pre-adult stages of 163 species, are featured.

Throughout, one cannot fail to be impressed by the detail, technical scope, and sheer depth of information provided. A particular strength of the authors is their knowledge of pre-adult life history. One learns, for example, that Hong Kong butterfly species which feed as larvae on Papilionaceae are able to use, on average, thirteen different foodplant species. However, a few glitches have crept in, as on page 269, where the authors inadvertently assert that pupae of Hong Kong Satyrinae (Brown's) are not green or brown. This text unfortunately (or, perhaps, fortunately) appears beneath a photograph of the apple green pupa of the satyrine *Leithe confusa*. One might also question many of the photographs - particularly of adults - which accompany the species accounts. These are of variable quality, even for common and easily photographed species. The photograph of the Common Sailor *Neptis hylas* on p. 332, for example, is rather poor and virtually indistinguishable from the photograph of the Southern Sulphur Sailor *N. clinia* which appears next to it. However, these are trivial criticisms, and in truth it is difficult to find fault with the authors.

Those of us (this reviewer included) who are accustomed to using the common names given in Johnston & Johnston's 1980 book, *This is Hong Kong: Butterflies* will be interested to learn that many of these names have been thrown out by the present authors, in favour of names used in other regional texts. This means, for example, that 'Dark Mormon' becomes 'Spangle', 'Common Black Jezebel' becomes 'Red-base Jezebel', 'Common White' becomes 'Indian Cabbage White', 'Common White-banded Brown' becomes 'Banded Tree Brown' and 'Dark-veined Tiger' becomes 'Common Tiger'. There are many other examples, of which the most confounding is the renaming of the two *Ypthima* 'Six-ring' species (*lisandra* and *baldus*) as 'Five-ring', even though both commonly have three pairs of eyespots on the hindwing underside. The logic at work here is apparently that the third pair of eyespots...
occupies a single space on the wing, whereas the first two pairs each occupy two spaces. In one species, both the common and the scientific names have been corrected: Mycalesis panthaka Common Bush Brown should actually be M. zonata South China Bush Brown.

Hong Kong's recorded butterfly fauna is growing, and a number of claimed recent additions to the list (Amphitria virgata, Tagiades menaka, Zographetus satwa, Papilio dialis, Pithecops corvus, Ethalia monina, Mycalesis sangoica and Neptis nata) are omitted from The Butterflies of Hong Kong either because there is no specimen or because the additions are simply too recent for inclusion. So this magnificent book is not quite a final statement. However, it is as close to one as we are ever likely to get.

GRAHAM REELS

The book can be ordered from leading local bookshops or internet stores such as Amazon.com, or from the Associated Press at http://www.apcatalog.com.

SOMETHING OLD AND SOMETHING RARE: THE WORK OF ONE OF SOUTH CHINA'S EARLIEST NATURALISTS

BY EMMETT EASTON

Mr. John Crampton W. Kershaw was an Englishman who lived in Macao for much of the first decade of this century. He wrote a book entitled Butterflies of Hong Kong which was published in 1907. He received acclaim from his peers due to this work, and Frederick Muir, one of the travelling entomologists of the Hawaiian Sugar Planters Association, came to Hong Kong and Macao to meet him. For a number of years they worked together and published several papers on the insect order Hemiptera.

John Kershaw and Frederick Muir collected various insects in Macao as well as in the Dinghushan forest reserve (in Guangdong), which was known at that time by the English as Haulik or How-lik. Insect specimens that both Kershaw and Muir collected in South China are present in the Bernice P. Bishop Museum in Honolulu. During the time Kershaw lived in Macao he sent specimens to Hawaii and to George W. Kirkaldy, a noted authority on the Hemiptera. Kirkaldy described a new species of cicada from Macao, naming it Balinta kershawi after its collector, and the type specimen is currently in the Bishop Museum.

I have found a number of species of cicada in Macao since my arrival in 1988, but had not seen Balinta kershawi until only recently (June 1998), when one specimen was found in a densely forested portion of the Seac Pai Van Agricultural and Forestry Park on Coloane Island in Macao. This year, several more specimens were observed emerging from the ground from late May to the middle of June. This is apparently a rare species of cicada which has not been previously recorded in Hong Kong to the best of my knowledge. Due to its short period of activity as an adult and the apparently limited flight range, it could very well be present in Hong Kong and not yet discovered.

Many of the species of cicada, such as Cryptotympana, are strong fliers and can be found throughout the territory of Macao soon after they emerge from the ground. Balinta kershawi Kirkaldy, however, seems to not fly very far from its nymphal habitat, and this is surely one reason why it is so rarely seen and there are apparently so few specimens in museum collections.

Kirkaldy published a paper describing Balinta kershawi in 1909 in the Annals of the Entomological Society of Belgium (vol. 53: 177-183). The insect is mostly shining black, but the hind wings are crimson or vermillion coloured at the base, and there are submedian sinus or winding stripes down each side of the medium region of the pronotum.

This species is somewhat similar in size to the red-nosed cicada, Huechys sanguinea (De Geer), but in the latter species the crimson or red colour is on the head, thorax and abdomen, and not on the wings. Both species have been found in the same forested habitat in Macao, and even though H. sanguinea has been seen emerging from the ground in early summer, it is most commonly observed locally later on in the season, from September to November.
RECENT PUBLICATIONS

Books

Journal articles, book chapters and other published papers


Dudgeon, D. and Lau, M.W.N. Romer's frog re-introduction into a degraded tropical landscape, Hong Kong, P.R. China. Re-introduction News (Newsletter of the Re-introduction Specialist Subgroup of IUCN's Species Survival Commission [SSC]), 1999, 17: 10-11


Fellowes, J.R. Exotic ants in Asia: is the mainland at risk? The case of Hong Kong. Aliens, (Newsletter of the Invasive Species Specialist Group of IUCN's Species Survival Commission [SSC]), 1999, 9, pp. 5-6.


Hyde, K.D. and Alias, S.A. *Linocarpous angustatum* sp. nov., and *Neolinoocarpus nypicolae* sp. nov. from petioles of *Nypa fruticans*, and a list of fungi from aerial parts of this host. *Mycosience*, 1999, **40**: 145-150.


Kwok, H.K. and Corlett, R.T. Seasonality of a forest bird community in Hong Kong, South China. *Ibis*, 1999, **141**: 70-79.


Terman, J.L. and Neller, R. The erodibility of soils beneath fire-prone grasslands in the humid tropics, Hong Kong. *Catena*, 1999, **36**: 49-64.


Umali, T.E., Hyde, K.D. and Quimio, T.H. *Arecophila bambusae* sp. nov. and *A. coronata* comb. nov., from dead culms of bamboo. *Mycosience*, 1999, **40**: 185-188.


Wong, S.W., Hyde, K.D., Jones, E.B.G. and Moss, S.T. Ultrastructural studies on the aquatic ascomycetes *Annulatuscus velatisporus* and *A. trisepatus* sp. nov. Mycological Research, 1999, 103: 561-571.


Reports


Anderson, D., Andersen, P., Bricelj, M., Cullen, J., Hodgkiess, I.J. and Rensel, J.E. Study of Red Tide Monitoring and Management in Hong Kong: Executive Summary. Agriculture and Fisheries Department, Government of the Hong Kong Special Administrative Region. 1999, 45pp.


Books! Or to be more accurate, wildlife books dealing with Hong Kong. What really astounds me as I scan the shelves of the new, bigger, better bookshops which have sprung up around the malls of Causeway Bay, Kowloon Tong, and their ilk, is the ready availability of Birds of Britain, Mushrooms and Toadstools of Britain and Europe, Reptiles of Antarctica (made that one up), and Butterflies of the World. What possible use are they to us here in Hong Kong? Very little, is the answer.

Are these shopkeepers deluged with requests from folk who are jetting off for a bit of twitching in the UK? I recognise that Brits are remembered with undiluted fondness by Hongkongers, but does this extend to Britain's relatively poor temperate fauna and flora? I think not. I suspect that at least part of the reason you can buy so many Western nature books here, is that they are almost all printed in Hong Kong. What is really saddening is that there are some local gems out there.

Keith Wilson's *Hong Kong Dragonflies* is superbly illustrated with an informative text. Viney, Lam & Phillipps' *Birds of Hong Kong* has been with us for years, and should be kept in every school in the SAR.

Just to rub salt in the wound (I know the comparison always goes down like a lead lemming), I also challenge you to check out the availability of comparable books if you're ever down in Singapore. They have a range of at least 27 truly pocket-sized Common Guides costing only around S$5 each. And you should see the range of Southeast Asian books at their airport!

The good news is that WWF-HK are stocking a much wider range of local and Southeast Asian wildlife books out at Mai Po these days — it's a long trek, but hey you can kill two birds...well, that's an unfortunate metaphor, perhaps.

*Angus Proctor*