

THE IMPORTANCE OF TREE CAVITIES IN HONG KONG- THE ECOLOGICAL PERSPECTIVE

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Trees are highly beneficial to wildlife in various ways. All parts of trees could be utilized by different kinds of wildlife. Amongst these, tree cavity is one of the important "micro-habitat" which are very vital to the survival of various species of wildlife. Some examples of the usage of tree cavities are:

1. Nesting Site - place for breeding, the most important function of tree cavities
2. Roosting Site - place for sleeping and resting
3. Water Pool - the shape of cavities sometimes acts as water bowl to hold rainwater for wildlife drinking
4. Food source - cavities provide decaying wood as food for insect larva/ arthropods, these insect larva/ arthropods in turns are prey for other predatory animals, e.g. birds
5. Rooms for activities - e.g.dining and grooming
6. Food storage place - some animals would use cavities as their food storage. Rodents such as mice and squirrels have such habit

Amongst these, the most important role of cavities on trees for wildlife is as nesting and roosting site. Cavities provide very good shelter for most wildlife especially those who breed and raise young. Plenty of wildlife in the world are cavity users. Many birds, for example owls, woodpeckers, parrots, ducks, falcons and many other small passerines prefer tree cavities as their nesting site. Many of them only survive with tree cavities, that makes these animals more vulnerable to tree cutting. In Australia, about 15% of vertebrate are cavity or hollow users, while a large percentage of them are even endangered (Gibbons, 2002). In Hong Kong, we can also find many different animals which utilize tree cavities. Some of the examples would be illustrated in the following paragraphs.



Figure 1

A Lesser Green Leafbird, *Chloropsis cyanopogon*, 小綠葉鵯 was drinking and bathing in a water pool formed by tree cavity (Photo taken in Sabah, Malaysia)



Figure 2

A Grey-capped Pygmy Woodpecker, *Dendrocopos canicapillus*, 星頭啄木鳥 was finding foods inside tree cavities. (Photo taken in Taiwan)

Figure 3

Large number of scattered feathers of the victim of Spotted Dove, *Spilopelia chinensis*, 珠頸斑鳩 were observed in a trunk base cavity at Central. It was an evidence that the predator had used this cavity as its dining room to enjoy the meal.



Mammals

Masked Palm Civet, *Paguma larvata*, 果子狸

Masked Palm Civet belongs to the family Viverridae. They can be easily recognised by their white facial mask and long tail (The similar looking Chinese Ferret-badger, *Melogale moschata*, 鼬獾 has a relative short tail). They are highly arboreal, foraging on trees for fruits and insects. They are mainly nocturnal but can be active in daytime if they are comfortable with the environment, becoming more common to be observed close to human settlement. Their breeding season is from early spring to late autumn, mainly inside large tree cavities.

Besides Masked Palm Civet, another two



Figure 4
Masked Palm Civet are highly arboreal



Figure 5
Masked Palm Civet rely tree cavities for nesting and roosting

Figure 6
Pallas's Squirrel is very common in some large urban parks



Pallas's Squirrel, *Callosciurus erythraeus*, 赤腹松鼠



Figure 7
Japanese Pipistrelle, *Pipistrellus abramus*, 東亞家蝠 is the commonest bat in Hong Kong, which could live in tree crevice and cavities.

Pallas's Squirrel belongs to family Sciuridae. It is the only squirrel member in Hong Kong and claimed to be an introduced species, while they are very common in nearby region, e.g. Southeast Asia and Taiwan. They are the most arboreal mammals in Hong Kong, foraging on trees for fruits and seeds. They would also chew the tree bark to control the growth of incisors, which might give some damage to the tree trunk. Pallas's Squirrel are diurnal and very common to be seen in all urban and rural areas in Hong Kong. They breed all year round, with the nests inside tree cavities, but the peak is from May to December.

Bats (Chiroptera) 蝙蝠

Bats is one of the most typical groups of mammals that frequently roost in tree cavities. Their faeces deposited inside the cavities can provide extra nutrients for the trees and hence are beneficial to the trees. There are around 27 species of bats in Hong Kong (many of them are migratory) but their cavity-roosting behaviour in Hong Kong is less studied.

Other mammals

In addition, there are some arboreal mammals which may well utilize tree cavities. For example, the Macaque, (*Macaca* spp. 獼猴) and some rodents such as Sikkim Rat (*Rattus andamanensis* 印支林鼠), carnivores such as Small Indian Civet (*Viverricula indica* 小靈貓) and Leopard Cat (*Prionailurus bengalensis* 豹貓) would also roost in tree cavities.



Figure 8

Sikkim Rat, *Rattus andamanensis*, is one of the arboreal rodent in Hong Kong, which may also utilize cavities for various purpose

Birds

Owls (Strigiformes) 貓頭鷹

There are about 200 species of owls worldwide. Many of them are bred in tree cavities, rock crevices, etc. There are at least 9 species of owls listed in HK and some of them breed inside Hong Kong. Collared Scops Owl (*Otus lempii* 領角鴞) and Asian Barred Owlet (*Glaucidium cuculoides* 斑頭鴞) are two of the owls which can be found in tree cavities in rural and urban area.

Collared Scops Owl is one of the commonest owls in Hong Kong which lives close to urban area. They can be seen and commonly heard even in urban parks. Their breeding period is from March to June.

Figure 9

Collared Scops Owl can be seen nesting in cavities of urban trees



Figure 10

Collared Scops Owl Chicks found inside a cavity.

Asian Barred Owlet is relatively diurnal when compared with other owls in Hong Kong. They breed from April to June in tree cavities. The OVT Chinese Banyan, *Ficus microcarpa*, in Shui Mei Tsun of Kam Tin, was one of the well-known nesting sites for them.

Parrots (Psittaciformes) 鸚鵡

There are around 400 species of parrots in the world and most of them are bred exclusively in tree cavities. In Hong Kong, there are 3 species of wild parrots, which are all introduced species.



Figure 11
Asian Barred Owlet, *Glaucidium cuculoides*, on an OVT at Shui Mei Tusen, Kam Tin



Figure 12
A pair of Lesser Sulphur-crested Cockatoo were excavating a tree cavity of a Camphor Tree in Sheung Wan

Lesser Sulphur-crested Cockatoo (*Cacatua sulphurea* 小葵花鳳頭鸚鵡) is probably the most familiar species of parrot for arborists in Hong Kong. Flocks of them were commonly observed biting off twigs and barks of trees in Hong Kong Park. They are sometimes treated as pest in the point of view from arboriculture.

Naturally Lesser Sulphur-crested Cockatoo is endemic to islands around Sulawesi of Indonesia. However, these birds were frequently caught by pet-trade and the number declined dramatically. IUCN Red listed the bird as Critically Endangered while some of the island population were already extinct. The introduced population in Hong Kong comprise around 200 or more individuals, becoming one of the very important groups of this species in the wild.



Figure 13
Tree cavities are the most important habitat for these endangered birds

The other two well established parrots species in Hong Kong are Alexandrine Parakeet (*Psittacula eupatria*) (Near Threatened) and Rose-ringed Parakeet (*Psittacula krameria*) which can be readily observed in Kowloon Park. The OVT Camphor Trees, *Cinnamomum camphora*, at Haiphong Road provide some good nesting cavities for them.

Ducks (Anatidae) 鴨

Ducks always give an impression of aquatic creatures but surprisingly some of the duck species are bred exclusive in tree cavities. One of the typical examples is the famous beautiful Mandarin Duck (*Aix galericulata* 鸞) which is also a winter migrant in Hong Kong. However, as natural breeding of duck's species are unlikely to be occurred in Hong Kong, it would not be discussed in details here.

Woodpecker (Picidae) 啄木鳥

Woodpecker are famous cavities excavator in the world. In Hong Kong, there are only five species of woodpeckers recorded and they are relatively rare, living in mature woodland, e.g. Tai Po Kau Nature Reserve. Their breeding records in Hong Kong are not yet confirmed and thus won't be elaborated here.

Other Passerine

There are also a large number of birds using tree cavities for breeding. One of the familiar small birds in Hong Kong, Oriental Magpie-robin (*Copsychus saularis* 鵲鴝) is the best example. They are very common urban birds and their nest can be seen even in the city. Their breeding season is from February to August.



Figure 14

Nest of Oriental Magpie Robin in a cavity of Yellow Poinciana at Central



Figure 15

Oriental Magpie-robin is a very common bird which can see their nest in urban tree cavities

Arthropods

Although insects are always regarded as pest in arboriculture, the symbiosis of trees and insects is very important for the survival of trees and even to the whole ecosystem. Tree cavities provide food and roosting rooms for large number of insects and other arthropods. Some of the social insects such as Honeybee (*Apis* spp. 蜜蜂 (Apidae)) and Giant Paper Wasps (*Polistes gigas* 棕馬蜂 (Vespidae)) would also nest inside tree cavities.



Figure 16

Honeybee, *Apis mellifera* nest in tree cavity at trunk base



Figure 17

Nest of *Polistes gigas* inside tree cavity



Figure 18

Large cavities does not mean instability. Most of the veteran "Fung Shui" Camphor Trees in Tai Po are actually totally hollow but they are strong and healthy which can withstand many many years of rainstorms and typhoon in HK wherever many younger solid trees were already collapsed.

With the known importance of tree cavities to wildlife, many countries consider the presence of tree cavities as one of the important conservation factors of trees. Trees with cavities are highly conserved. In Hong Kong, however, the situation is reversed. Tree cavities are always considered as unacceptable defects and hazards. A large number of old trees with cavities were wholly removed in recent years. However, it should be emphasised that the presence of tree cavities is not necessarily risk of failure to the tree. More factors should be taken into account for consideration. In other point of view, the presence of cavities could even be beneficial to the trees.

It is not only the environmental, conservational and moral issue for arborists to understand the importance of tree cavities to wildlife. Legally, all birds and most wild mammals, including the aforementioned species are protected under HK law Cap.170 *Wild Animals Protection Ordinance*. If an arborist is not knowledgeable enough to assess the existence of wildlife, especially the nest, inside tree cavities, he could be legally liable for disturbing the nesting wildlife if the trees were removed or pruned.

Figure 19

In many countries, cavities even on a dead tree in a targeted urban park are always retained as much as possible by pruning away the hazardous parts. Cavities can be created by some special chainsaw technique so to enhance the usage of wildlife. (Habitat Pruning in Sydney)

In order to provide professional advice on problematic trees with cavities, arborists are suggested to:

- (1) understand the importance of tree cavities to surrounding wildlife,
- (2) understand the surrounding wildlife, observe for their existence, especially those of protected species,
- (3) assess the condition of tree cavities as well as its effect on tree stability and determine the risk level,

In most cases, hazards from trees with moderate or even high risk, could be mitigated by special pruning (e.g. habitat pruning, coronet cut..., etc.) or propping such that important tree cavities could be retained. Arboriculture is not merely tree science, arborist should also consider the relations of tree and wildlife, giving it more thoughts and shaping balance ecosystem.



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