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探索台灣甲蟲生態之美

The Beauty of Beetle Business



日本的大型電玩卡片對戰遊戲「甲蟲王者」風靡全台，揭起一波飼養锹形蟲的熱潮，甲蟲因而成為新世代寵物的流行代名詞。其實，甲蟲迷大可不必過分崇洋媚外，因為台灣的甲蟲生態多樣且豐富，還曾擁有「甲蟲王國」的稱號。

As the popularity of the Japanese game card “Mushking” in Taiwan triggers a trend of stag beetles raising, beetles become the “pet of the new generation”. However, while the game originates from abroad, beetle fans in Taiwan must realize the fact that Taiwan was once the “Beetle Kingdom” for its diverse beetle species.

不論是在鄉野常見的金龜子，抑或是在夜晚顯見的光亮螢火蟲，在台灣生活的周遭處處都能看見甲蟲的蹤影。全世界的昆蟲種類約莫有100萬種，其中就有40萬種被歸屬為「鞘翅目」；而鞘翅目是昆蟲綱中最大的一目，約占昆蟲綱種類的40%，數量繁多。

台灣的昆蟲種類約有2萬種，其中就有6千種是鞘翅目昆蟲，比例相當高，而近來頗受注目的甲蟲，就正是鞘翅目昆蟲。國立台灣大學昆蟲學系暨研究所教授楊平世解釋，所謂的甲蟲在昆蟲分類學上屬於鞘翅目昆蟲，一般來說甲蟲的外殼較為堅硬，對各種氣候風土與生活環境都很能適應，食性包括草食性、肉食性、腐食性、寄生性、雜食性等，非常多元，導致地球上各個角落都能是甲蟲活躍的天地。

甲蟲生態面面觀

現代人喜歡甲蟲的原因，多將甲蟲視為勇士的象徵，也因外型特殊，與其他昆蟲有顯著差異。甲蟲革質的翅鞘包繞著整個身軀，仿若裝甲一般，很是雄偉，故得其名。而個體大小不一，體長從0.25公厘以下的迷你隱翅蟲，到150公厘以上的長戟大兜蟲都有。

鞘翅目屬完全變態，也就是會經歷卵、幼蟲、蛹、成蟲的階段。鞘翅目的分類，各家見解不一，一般可分為2~4個亞目，20~22個總科；水域或是陸域環境都可以發現鞘翅目昆蟲。

台灣的甲蟲種類依食性、棲地而有其歧異性，但普遍於全島山區都能發現牠的蹤跡。圖為陽明山古道（游家桓 攝）
Beetles have the distinct appearance due to their food habits and habitats in mountain areas of Taiwan. This photo shows Yangmingshan Historic Trail (by Jia-huan Yu)

From the scarab beetles in the country or fireflies that come out at night, insects are found everywhere in our life. Of the 1 million insect species in the world, 40% belong to the order coleoptera which comprises the largest order of the class insecta.

There are approximately 20,000 species of insects in Taiwan, and 6,000 of them are members of the order coleoptera. Ping-shih Yang, Professor of Department and Graduate Institute of Entomology explains that the so-called beetles in taxonomy belong to the order coleoptera. They in general have a hard exoskeleton and adapt well to all climates and environment. They may be herbivorous, carnivorous, saprophagous, parasitical or polyphagous, and therefore are active all over the world.

The Diversity of Beetles

People love beetles in that they symbolize warriors and have the distinct appearance from other insects. Armored with cuticle elytron, the beetle's body may have a size as tiny as the 0.25-mm-long rove beetle or as big as the 150-mm-long *Dynasted Hercules*.

Insects of the order coleoptera go through a complete metamorphosis, i.e. stages from egg, larva, pupa to adult. Though arguable, generally the coleoptera comprises 2 to 4 suborders and 20 to 22 superfamilies. They are found in both water region and on land.

台灣甲蟲生態研究

台灣的氣候涵蓋亞熱帶至溫帶，造就種類多樣的植物、昆蟲生態。楊平世說，甲蟲又因食性廣泛、適應力強，才會穩坐昆蟲界中種類最多的寶座。早在百餘年前，台灣就已開始進行甲蟲研究，在荷蘭人據台時期就有許多探險家與外交官會前往東南亞、台灣等地採集標本，再轉寄回歐洲博物館研究珍藏；日治時期，日本人更注重甲蟲的調查研究，當時已深入紀錄甲蟲種類，為台灣甲蟲研究揭開序幕。

而近20年來，由於台灣的國家公園與林務局等政府單位都非常重視昆蟲的相關研究，投入許多經費提供學術團體進行生態與保育調查。但楊平世認為台灣還需要更多業餘人士的幫助，要學習日本人喜愛昆蟲的精神，鼓勵喜愛甲蟲的業餘研究人員將發現與心得，發表在正式期刊中。

造訪台灣甲蟲世界

楊平世強調台灣的甲蟲資源其實不止於此，預估還有1至5萬的甲蟲新種亟待發掘，除了政府機關與專家學者的積極研究外，若業餘人員能將熱愛甲蟲的精神，轉化為投入研究與保育的工作，或許就能擴大甲蟲研究的領域。

Research on Beetles in Taiwan

The subtropical and temperate climates in Taiwan provide an environment suitable for various plants and insects. According to Yang, beetles have the greatest number of species among insects due to their comprehensive food habits of beetles and strong adaptability. Researches on beetles in Taiwan started over 100 years ago during Dutch occupation when explorers and diplomats came to Taiwan and Southeast Asia to collect them and sent the specimens back to European museums. During the Japanese occupation, the Japanese further made surveys and records that initiated the scholastic research on beetles in Taiwan.

In the recent 2 decades, the national parks, Forestry Bureau and other authorities pay much attention and actively sponsor the academic researches on insect ecology and conservation. But Professor Yang thinks that Taiwan may use more amateur participation. Amateur researchers need to be encouraged to publish their discoveries and experiences on academic periodicals.

the Beetle World in Taiwan

Yang emphasizes that an estimation of 10 to 15 thousand new beetle species are still to be discovered in Taiwan. While the government and academic field make efforts in researches, amateur beetle lovers should expand their researches and participate in the conservation work.





「螢火蟲是目前台灣發展較為完備的甲蟲產業之一。」楊平世說，1997年營建署率先推展螢火蟲研究，經過十餘年的努力，台灣螢火蟲的種類就由32種擴增至62種，這項研究也促成了螢火蟲產業。而另一方面，政府也同時向業者與遊客宣導正確的螢火蟲知識與保育觀念，進而成功地將螢火蟲融入休閒產業的開發。未來可再擴及至其他甲蟲與昆蟲類，讓更多人因為產業活動而喜愛昆蟲、保護昆蟲，並能在業餘時間一起投入昆蟲研究的領域。

台灣已有許多別具特色的甲蟲，已被劃歸為保育類昆蟲，有些甚至是消失了一百多年後，才再次被發現的罕見甲蟲。

“Fireflies related business is more developed in Taiwan’s “beetle industry”, says Yang. CPA first started promoting researches on fireflies in 1997, and the number of species of fireflies in Taiwan has increased from 32 to 62 after a decade’s endeavors. On the other hand, the government also tries to advocate correct knowledge about fireflies and conservation concepts to accelerate the development of tourism, B&B, recreation and other “firefly business”. In the future the research can be extended to other insects so that more people would become fond of insects, try to protect them and be devoted to the research.

Many and special beetles have been listed as protected insects, including certain rare ones that are rediscovered after disappearing for more than a century.

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1 螢火蟲是甲蟲中的一類，於水陸域都能發現其蹤跡。圖為金門慈湖附近濕地（廖東坤攝）

The fireflies belong to the order coleoptera, and found in both water region and on land. This photo shows the wetland near Cih Lake in Kinmen (by Dong-kun Liao)

2 外國產的甲蟲種類（楊平世提供）

The beetle species of abroad import (provided by Ping-shih Yang)

妖豔吉丁蟲 *Buprestis mirabilis*

主要分布 太魯閣、雪霸國家公園及中部橫貫公路一帶

Distribution TNP, SPNP and Central Cross-Island Highway

軀體呈現鮮豔亮麗色彩的妖豔吉丁蟲，翅鞘及前胸背板呈鮮綠色、翅鞘上有橘色斑紋，喜歡在豔陽下活動，飛行能力強，會在葉面上停歇，成蟲活動期為每年的5至10月間。屬於保育類昆蟲，因棲地破壞與非法捕捉的緣故，造成數量稀少。

Its brightly colored body has green pronotum and elytron with orange stripes. Preferring to move in sunlight, *Buprestis mirabilis* is a strong flier and sometimes rests on a leaf. The adult is active from May to October. This protected insects are few in population due to sabotaged habitat and illegal catch.



楊平世 提供
provided by Ping-shih Yang

台灣長臂金龜 *Cheirotonus formosanus*

主要分布 太魯閣、雪霸、玉山國家公園及全島山區
Distribution TNP, SPNP, YSNP and Mountain Areas

體長約5到8公分的大型甲蟲，體色呈帶有光澤的暗褐色，前胸背板中央有一縱溝、外緣為細鋸齒狀，翅鞘散布著大小不一的茶褐色斑紋，腹面密布著褐色短毛。雄蟲前腳可達6到8公分、雌蟲前腳則僅約5公分。屬於台灣特有亞種，是台灣體型最大的甲蟲，成蟲出現在7到9月間，有趨光性，是保育類昆蟲。

Cheirotonus formosanus has a body 5 to 8 cm long with dark brown luster. Its pronotum has a long indentation in the center and fine incised rim. Dotted with dark brown spots, its elytron is covered with short brown hair in the ventral. The forelegs of a male may be 6 to 8 cm long, while those of a female are 5 cm long. This endemic subspecies is the largest beetles in Taiwan. A protected insect species, the adults appear from July to September and has strong photokinesis.



楊平世 提供
provided by Ping-shih Yang

長角大鍬形蟲 *Dorcus schenkingi*

主要分布 太魯閣、雪霸國家公園
Distribution TNP and SPNP

體型差異大，大顎修長，且大顎中央具有一齒凸，其形態猶如關公手中的大刀，故有「關刀龜」之俗稱。以吸食青剛櫟、栓皮櫟、火燒柯、狹葉櫟的樹液維生；成蟲主要出現於3到12月，屬保育類昆蟲，分布在全島100到2,500公尺的山區。

Varies greatly in size, it has a slender mandible that has an incised indentation in the center, which looks like the falchion used by the Chinese war god. It feeds on the sap of *Cyclobalanopsis glauca*, *Quercus variabilis*, *Castanopsis fargesii* and *Cyclobalanopsis stenophylloides*. A protected species, the adults appear from March to December in mountains 100 to 2500 m in elevation.

楊平世 提供
provided by Ping-shih Yang



霧社血斑天牛 *Aeolesthes oenochrous*

主要分布 陽明山、太魯閣、雪霸國家公園及中北部山區
Distribution YMSNP, TNP, SPNP, Middle and North Mountain Areas

又被稱為霧社深山天牛，屬於大型天牛科昆蟲，體長約4.5到6.5公分，體色呈黑底帶有光澤，頭部、前胸背板與翅鞘處密布有宛如血一般的紅色天鵝絨狀短毛，故名「霧社血斑天牛」。成蟲於3到5月間出現，屬保育類昆蟲。

A large longicorn beetle, its body is 4.5 to 6.5 cm in length with black luster. Its head, pronotum and elytron are covered scarlet velvet hair, which gives it the name "Wu-she Blood-spotted Longhorned Beetle". A protected species, the adults appear from March to May.



楊平世 提供
provided by Ping-shih Yang

黃胸黑翅螢 *Luciola hydrophila*

主要分布 陽明山、太魯閣、雪霸、玉山國家公園
Distribution YMSNP, TNP, SPSP and YSNP

台灣目前已知有62種螢火蟲，此為常見的發光螢火蟲之一，為4年前才正式發現的新種，屬中型至中大型甲蟲。其前胸背板為淡黃色、翅鞘呈黑色，成蟲於3到5月出現，雄蟲發光時呈黃綠色，幼蟲以水中的川蜷為食，主要棲地在海拔200至2,000公尺、水質潔淨的山溝或山澗。

One of the 62 firefly species in Taiwan, it is often seen but newly discovered 4 years ago. This mid- to mid-large fluorescent beetle has light yellow pronotum and black elytron. While the larvae feed on *Semisulcospira libertina* in the water, the adults appear from March to May, and male emit yellowish green fluorescence.



楊平世 提供
provided by Ping-shih Yang



李春霖 提供
provided by Chun-lin Lin

橙斑厚角金龜 *Bolbocerosoma garritor*

主要分布 北橫公路
Distribution Northern Cross-Island Highway

消失約140年、直到3年前才再次現身，一度以為已經絕種。成蟲在白天會鑽入土中棲息，體長約0.75公分，體型厚實，翅鞘上有一大V型橙紅色斑紋，雄蟲前胸背板有4個向前的戟狀凸起，頭頂上有圓錐狀犄角搭配紅橙斑紋。

After disappearing for 140 years and once regarded as an extinct species, it reappeared 3 years ago. The adult would crawl into the soil to rest in the day. Its thick body is about 0.75 cm in length, and the elytron has a large V-shaped orange stripe in it. The male have a pronotum with 4 halberd-like projections, and a head with a conic horn and orange stripes.

台灣擬食蝸步行蟲 *Coptolabrus nankotaijanus miwai* Kano

主要分布 陽明山、太魯閣、雪霸、玉山國家公園及中低海拔山區
Distribution YMSNP, TNP, SPNP, YSNP, Middle and Low Elevation Mountain Areas

屬夜行性昆蟲，以捕食其他昆蟲、蚯蚓、蝸牛等小動物為食，軀體亮麗，體長約5到6公分，頭部與翅鞘為黑色、前胸背板呈粉紅色，翅鞘外緣亦鑲嵌粉紅色邊。雖屬保育類昆蟲，但在國立花蓮教育大學的校園內就能輕易見到其蹤跡。

This nocturnal beetle feeds on other insects, earthworms and snails. Its bright and beautiful body is 5 to 6 cm long, with black head, pink pronotum and black elytron with pink rim. Though a protected species, they can be easily spotted on the campus of National Hualien University of Education.

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provided by Ping-shih Yang



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