



↑ 榮耀寶石金龜人工飼育個體。26 mm。1998
Captive-bred *Plusiotis gloriosa*.

寶石金龜與基本麗金龜

Tribe Rutelini

By Orin McMonigle 歐倫·馬克馬尼格 著



↗ 卡夫寶石金龜雄蟲，可見其交配時用來守住雌蟲的增長後腿。40 mm。馬克馬尼格攝
Chrysina cavei male. The elongated hind legs are used to secure the female during mating. Photo by
McMonigle



本章介紹的寶石金龜飼育法能夠廣泛應用於90%以上的麗金龜。「寶石金龜族」包含「麗金龜亞科」裡頭的9個屬，分別為*Chrysina*、*Cotalpa*、*Parabyrsopolis*、*Paracotalpa*、*Parastasia*、*Pelidnota*、*Plusiotis*、*Pseudocotalpa*，以及*Rutela*。

擁有美麗金屬光澤的寶石金龜，大部分來自新大陸，並且在美洲以外很少有人飼育。在許多圖鑑中出現過的「黃金寶石金龜」*Plusiotis resplendens*便是來自此族。飼育寶石金龜，困難在於幼蟲的夭折及化蛹的種種問題，但此章將談到的各種技巧能夠大大地降低這些飼育上的障礙。美國產的葡萄藤金龜*Pelidnota punctata*以及榮耀寶石金龜*Plusiotis gloriosa*現在已被很多飼育者成功地飼育著。

寶石金龜有時後也會被稱為花金龜，但是牠們和真正的花金龜有頗大的差異。寶石金龜的幼蟲不會用背部爬行，製作的蛹室也沒辦法和介質分開。成蟲擁有嚴重回鉤且不同長度的腳爪，身體也比花金龜圓滾。麗金龜的翅鞘把腹部的上半部完全覆蓋住，而且一定要完全打開後才能夠飛行。有些種類的雄蟲，尤其是*Chrysina*和*Chrysophora*屬的雄蟲，擁有交配時用來守住雌蟲的增長後腿。寶石金龜完全不長犄角。

雌蟲羽化2-3個星期後開始產卵，並且可活6-9個星期。產卵介質需要含有至少80%質感細膩的微濕朽木屑。每一隻雌蟲可產20-40粒卵。卵粒直徑1-2 mm，而且通常是白色的。卵殼既薄又

The beautiful metallic Rutelini scarabs come primarily from the New World and are seldom kept as pets outside of the Americas. The spectacular metallic gold beetles shown in many picture books come from this tribe. The rearing of Rutelini scarabs is difficult due to larval die-off and pupation problems but the techniques discussed in the this chapter greatly reduce these difficulties. Some species such as the Grapevine beetle *Pelidnota punctata* and the Glorious beetle *Plusiotis gloriosa* are now being kept successfully by numerous hobbyists.

The Rutelini are often called flower beetles but are quite different from the true flower beetles, the Cetonids. Rutelini larvae do not walk on their backs and the pupal cells are one-sided and cannot be separated from the substrate. Adults have hooked unequal tarsi (claws) and a more rounded body shape. The elytra cover the upper sides of the beetle and must be lifted up before flight. Also, the adult males of some species—most notably of the Genera *Chrysina* and *Chrysophora*—have enlarged rear legs for use in securing a mate rather than the elongated front legs of many true flower beetles. Finally, no Rutelini have thoracic or cephalic horns.

Two to three weeks after molting to adulthood, the females begin to lay eggs and will continue ovipositing for the next and last four to six weeks of their lives. Females are picky and require substrate that consists of eighty percent or more finely crushed, moist, rotten wood. Each female will produce twenty to forty eggs. The ova are one to two millimeters in diameter and are generally bright white. The shells of ova are thin and permeable to water and therefore are prone

可透水，因此很容易脫水。每4-5天應該採卵一次，並且將收成的卵粒放到另外一個小塑膠容器內。如果卵粒有超過10%的死亡率則該更換小容器的介質。如果採卵過程過於粗魯，卵粒就很有可能受傷。將枯葉碎片放置於卵粒的四周能夠有效降低死亡率。此外，介質使用之前經過高溫除蟲處理是很重要的。卵粒30天內孵化。



↗老熟的榮耀寶石金龜幼蟲。1998
Mature L3 *Plusiotis gloriosa*.

雖然幼蟲除了朽木以外的食材也會吃，但是添加過量的堆肥或是枯葉等物質就會造成幼蟲死亡。適合飼養幼蟲的介質為80-90%朽木屑和10-20%堆肥的混合。野生的寶石金龜幼蟲主要都是吃朽木；許多種類的幼蟲都是在朽木幹中採集到的。幾乎任何樹種的朽木都可用來飼養幼蟲。*Paracotalpa*屬的幼蟲比較特殊。這些幼蟲住在帶沙的土壤中，吃的是腐葉和植物的根部。

寶石金龜的幼蟲不會互相殘殺。叩頭蟲幼蟲和寄生真菌是牠們的天敵。叩頭蟲和寄生真菌的威脅可以透過高溫處

to drying out. Ova should be collected every four to five days and placed in a clear container so that wood substrate can be changed if more than a 10% die-off is seen. Rough handling damages the ova so care must be taken when collecting eggs. Crushed, dead hardwood leaves placed around the ova can help to prevent most die-off. Also, it is very important to heat disinfect all substrate prior to use. Eggs will begin to hatch into tiny white larvae in twenty to thirty days.

Although the larvae are able to feed on many substances other than rotten wood, more than a small amount of compost, dead leaves, etc. is detrimental to the health and survival rate. 80-90% crushed rotten wood along with 10-20% compost manure works well as a larval substrate. In nature rotten wood is the primary food for Rutelini larvae; the larvae of numerous species have been collected in the wild while feeding inside of rotten tree stumps. Larvae will feed and grow well on the decayed wood of nearly any species of tree. Exceptions of note are species in the Genus *Paracotalpa* in which larvae are found living in sandy soil and feed on decomposing leaves and plant roots



↗三齡中期的拜爾寶石金龜幼蟲。馬克馬尼格攝
Third instar *Plusiotis beyeri* larva. Photo by Mc-Monigle



理介質的方式排除。出現在朽木和其他幼蟲食物上的普通霉菌對幼蟲完全無害。飼養幼蟲的介質需要水分，但是過濕又不通風的介質會促進寄生真菌的生長，也往往會導致幼蟲發黑死亡。

幼蟲成長快速、脫兩次皮、3-4個月內長成老熟幼蟲。每一隻幼蟲應給予至少1公升的腐植物空間。一隻幼蟲一生可吃掉高達4公升的腐植物。中等體型的寶石金龜幼蟲，好比*Pelidnota punctata*和*Plusiotis lecontei*，一生只吃掉1-2公升的腐植物。當大部分的食物變成糞便時就要進行飼料更新。雖然被吃過的朽木顏色不變，但是質感會變成粉末狀或是顆粒狀。

寶石金龜的前蛹期和蛹期是最脆弱的，稍微不留神則有可能導致全軍覆沒。孵化8-12個月後幼蟲開始造蛹室。但是如果幼蟲找不到適合製作蛹室的環境則可能再拖上長達兩年的時間。幼蟲利用大顎推擠介質的方式製作出表面圓滑的橢圓形蛹室。因為這個原因，在過分乾燥的情況下幼蟲完全無法製造蛹室。蛹室做好以後，幼蟲2-6個月後化蛹。寶石金龜化蛹的特色之一就是幼蟲的舊皮仍然包住蛹，不像其他甲蟲會把舊皮推到蛹室末端。過高的濕度會導致每一隻幼蟲、前蛹，或是蛹發黑死亡。大部分的干擾都會導致剛造好蛹室不久的幼蟲爬離蛹室，並且至少1個月後才會再造另一個。

among the dirt.

Grubs seldom pose a threat to each other but are sometimes faced with two enemies that feed on them: wireworms (Elateridae larvae) and entomophagus fungus. The deadly effects of wireworms can be eliminated and the problem of fungus lessened by heat disinfection of the substrate prior to use. Common fungi and molds that grow on rotten wood or other larval food do not pose any threat. While substrate must be moist, wet and stagnant mat will facilitate entomophagus fungi and will often cause larvae to turn black and die.

The larvae eat, grow quickly, molt twice, and are full-grown in three to four months. One or more liters of space should be afforded each grub. Each larva can eat as much as four liters of rotten wood throughout its life. The larvae of medium-sized species such as *Pelidnota punctata* and *Plusiotis lecontei* consume only a liter or two. Rotten wood should be replaced when most of the wood has been converted to frass. Although the wood appears similar in color after it is eaten, this frass no longer has the texture of wood and is powdery or pelleted.

The pre-pupa and pupa stages of these animals are the most delicate and the entire culture can easily be lost at this point. The various Rutelini will become adults anywhere from eight to twelve months after eggs are laid but if unable to find appropriate surroundings for pupal cell formation may wait a year or two longer before pupating. Pupal cells are formed by the larval jaws pushing against the substrate until a smooth-sided, oval cell is formed. For this reason, pupal cell formation is impossible under dry conditions. After pupal cell for-



有三個技巧能夠幫助幼蟲成功地化蛹及羽化。首先，幼蟲變黃後在飼養容器內擺放一大塊朽木。幼蟲會在朽木內製作蛹室。第二，在介質中添加的10-20%的堆肥能夠增加製作蛹室時所需要的凝固力。第三，幼蟲開始製造蛹室後應避免任何干擾。

mation, pupation takes an additional two to six months. A unique aspect of Rutelini pupation is that the larval skin is stretched to fill the cell and surround the pupa rather than being pushed to the far end of the cell as in other beetles. High moisture levels will kill every pupa. Most disturbances of the rearing container will cause larvae to flee their constructed pupal cells and then they will wait at least another month before making a new attempt.

There are three techniques that will help pupation to be successful. First is the placement of a large piece of rotten wood



↗榮耀寶石金龜前蛹。1998
Plusiotis gloriosa pre-pupa.



↗羽化的前幾天，可清楚地看見成蟲的六肢。
Few days before eclosion. The six legs can be clearly seen through the pupal skin.



↗榮耀寶石金龜蛹。寶石金龜化蛹時均不會把舊表皮推到尾部，反而用其把自己包圍起來。
Plusiotis gloriosa pupa. In Rutelinae, the larval skin is not pushed to the end of the pupal cell but stretched to surround the pupa.



↗展翅中。
Spreading wings.



↗美麗的新成蟲!
What a beautiful beetle!

在野外，成蟲少量地啃食樹葉維生。*Plusiotis gloriosa*和*Paracotalpa puncticollis*啃食檜屬植物的樹葉、*Plusiotis beyeri*和*Chrysina cavei*啃食橡樹的樹葉、葡萄藤金龜啃食葡萄藤葉。寶石金龜對水果並沒有太大的興趣，但一般都會接受切片的梨子。

寶石金龜交配時就和大部分甲蟲一樣，雄蟲騎乘於雌蟲背部。雄蟲時常交配後繼續攀於雌蟲背部幾小時至數天，目的為保護牠們的基因投資。就如之前所提到的，有些屬的雄蟲，包括*Chrysophora*和*Chrysina*屬，有誇張的後腿可以用來保護自己的雌蟲。*Paracotalpa*屬的雄蟲時常過分激動，一口氣有4隻或是以上的雄蟲疊羅漢於一隻雌蟲身上，希望能夠等到交尾的機會。

所有的寶石金龜都有發達的後翅、能夠飛翔。成蟲為夜行性，而且通常都是夜晚趨光時被採集。雖然寶石金龜無法像花金龜一般能夠輕易地隨時起飛，但飼養時仍需加蓋。

in the cage when the larvae are very yellow and ready to pupate. The larvae will chew into the wood and make pupal cells. Second, mixing a small amount of compost in the substrate, as suggested previously, provides for more successful pupal cell formation, even under somewhat dry conditions. Third, cages should not be disturbed after larvae begin to form pupal cells.

In nature, the adult Rutelini feed minimally upon the leaves of trees or bushes. *Plusiotis gloriosa* and *Paracotalpa puncticollis* feed on juniper, *Plusiotis beyeri* and *Chrysina cavei* feed on oak leaves, and the leaves on which the Grapevine beetle feeds is self-explanatory. In captivity, the adults do not have much love for fruits but will usually accept pear slices.

Mating of the various Rutelini genera is similar to that of most beetles with the males simply climbing on the females' back. Males often stick around on the females' back for a free ride and to protect their investment from a few hours to a few days. As mentioned previously, males of a few genera including *Chrysophora* and *Chrysina* have huge, exaggerated hind legs that are used to hold onto and defend their claims to the females. Males in the Genus *Paracotalpa* are overzealous and four or more males may be seen in a tower on top of one female hoping for their chance.

All of the Rutelini fly and have well-developed wings. Adults are nocturnal and are usually collected after flying to lights in the evening. These beetles are not the most nimble of flyers and have a hard time taking off from the bottom of a cage. Because the

希望將來寶石金龜能夠普遍地被飼育著。銀綠相間的榮耀寶石金龜、閃閃發光的黃金寶石金龜，以及許多種類都值得世界各地的飼育家嘗試體驗。由於部分種類的棲地範圍狹小，北美及南美洲的農業作業和土地開發有可能導致一些種類在野外消失。人工飼育也許是唯一能夠防止這些種類絕種的方法。

adults are able to fly, a lid is necessary to keep them contained.

Hopefully the Rutelini will become more commonly reared in the future. The metallic silver and green Glorious beetles, the metallic Gold beetle, and many others deserve to be reared by enthusiasts throughout the world. Since the habitat of some of these beetles is relatively small, agriculture and construction in North and South America may wipe out some of these species. Without natural habitat in which to thrive, captive breeding may be the only hope for the survival of a number of the Rutelini.



雷康提寶石金龜人工飼育個體。24 mm。馬克馬尼格攝
Captive-bred *Plusiotis lecontei*. Photo by McMonigle



拜爾寶石金龜人工飼育個體。29 mm。馬克馬尼格攝
Captive-bred *Plusiotis beyeri*. Photo by Orin McMonigle