



↑美麗的雄蟲。65 mm。2007
Beautiful male *Dynastes tityus*.

美東白兜蟲

Dynastes tityus



✓ 150-mm長戟大兜蟲與54-mm美東白兜蟲合影。1999
150-mm *D. h. litchyi* and 54-mm *D. tityus*.



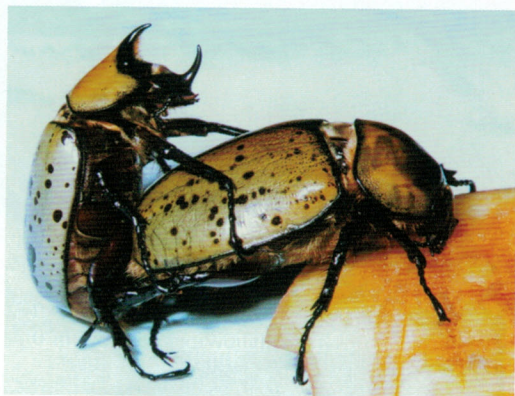
美東白兜蟲的分佈相當廣泛，幾乎整個美國的東部和東南部都有牠們的蹤跡。但是美東白兜蟲每年的採集量卻不及美西白兜蟲的。這是因為美西白兜蟲的族群全部都集中在範圍相當小的產地，要找到牠們容易多了。住在美西白兜蟲產地的一好友曾憤怒地指出，有一標本商一晚便捕殺了400多對趨光個體。雖然美東白兜蟲偶爾也會上百隻同時聚集於某些樹上，但大致上而言美東白兜蟲要比美西白兜蟲難採集多了。

美東白兜蟲成蟲在野外的發生期為五月底至七月中，之後便很難再採集到趨光個體。但是帶回家中飼養的野生成蟲卻都可以養活到十一月份。獨角仙也是一樣的情形。雖然桃園龍潭六月中以後便很難再採集到獨角仙成蟲，但帶回家的個體卻都可以養到八月底。除了以上兩種兜蟲以外，有許多種類也是出產期比飼養期短出許多。到底是為什麼在家中可以養那麼久，但卻無法繼續在野外見到牠們呢？有許多種兜蟲從野外採集回來後，15天內便會失去飛行能力。雖然有些還會繼續振翅，但已經無法起飛。或許十幾天的飛行能力則足以讓牠們尋找交配對象及產卵地點。之後由於無法飛行，食物取得不易，於是很快地便死亡，在野外消失。但是由於在人工環境下食物從來不會短缺，因此就算失去飛行能力也能夠繼續活下去。

→正在交配的小角型雄蟲和大型雌蟲。♂ 45 mm ♀ 50 mm。
1998
Small male mating with large female.

Dynastes tityus has a rather extensive distribution. It can be found in the entire eastern and southeastern United States and as west as eastern Texas. However, the number of *D. tityus* collected each summer is less than that of *D. granti*. The main reason is that all the populations of *D. granti* are concentrated in a very small area, making them very easy to find.

In the wild, *D. tityus* adults occur from late May to mid July, after which they disappear. However, wild adults live to November in captivity. *A. dichotoma* exhibits the same trend. It disappears from the wild in late June, but lives well into August in captivity. The phenomenon is also true with various species of rhinoceros beetles. Why is it that these beetles can live a much longer life in captivity but disappear in the wild? The key lies in flight. Most wild rhinoceros beetles lose their ability to fly within two weeks of being collected. Perhaps two weeks of time is sufficient for them to find mates and suitable breeding ground in the wild. Once they can no longer fly, finding food becomes a problem and they die shortly after. But in captivity, there is never a shortage of food and the beetles live on.





↗翅鞘斑點多的雌蟲。52 mm。2005
Female with numerous spots.



↗翅鞘斑點少的雌蟲。53 mm。2007
Female with few spots.

相當有趣地，美東白兜蟲的幼蟲在野外都出現於大樹接近根部的樹洞中。由於樹洞表面分分秒秒都在腐化，再加上每年秋天都有大量的落葉被吹入樹洞中，日積月累後樹洞裡面都是一層又一層肥沃無比的腐植物天堂。樹洞對美東白兜蟲非常重要。每一年雌蟲都重覆地使用相同的樹洞。1996年秋天馬克馬尼格曾在同一個樹洞內同時發現美東白兜蟲的卵、一齡幼蟲、二齡幼蟲，以及還蟄伏於蛹室內的新成蟲。由此可見樹洞對於牠們的重要性。

D. tityus larvae are almost always found in tree cavities at the base of hardwood trees, particularly oak. Because the surface of tree cavities is constantly undergoing decay and large amounts of fallen leaves are blown in every autumn, tree cavities are loaded with decayed vegetation. Tree cavities are extremely important to the propagation of *D. tityus*. Females use the same cavities year after year. In the fall of 1996, Mr. McMonigle found eggs, L1 larvae, L2 larvae, and hibernating new adults of *D. tityus* all in one single cavity.



→三齡美東白兜蟲幼蟲。1998
L3 *Dynastes tityus*.



美東白兜蟲大約六月份開始於樹洞內產卵，但養在家中的個體也很願意在飼育箱的腐植土中產卵。卵期在20-25°C之間為18-28天。自然朽木屑到高腐腐植土都可以用來飼養幼蟲。一齡幼蟲期約21天。二齡幼蟲期約42天。大部分的幼蟲於隔年的八至十月份開始製造蛹室，但有時有一些個體會提早或是延後化蛹。前蛹期18至21天，蛹期30至35天。此種在野外於秋天羽化，但新成蟲會蟄伏於蛹室中至隔年成蟲發生期才破土而出。不過由於室內溫度往往高於18°C，成蟲羽化後有可能提早開始活動。太早開始活動的新成蟲有可能不產卵或是只產無精卵，甚至1個月內死亡。正常的蟄伏期是4-6個月。最好的方式是羽化1個月後將新成蟲埋於至少10 cm深的腐植物內，然後放入15°C的冰箱中4-6個月。如果成蟲羽化時剛好是冬天，

D. tityus begins to oviposit in tree cavities in June. In captivity, it oviposits in flake soil equally well. Egg duration is 18-28 days under 20-25°C. Substrate ranging from natural decayed wood flakes to high-decay flake soil can be used to rear larvae. L1 stage lasts about 21 days. L2 stage lasts about 42 days. Most larvae begin pupal cell construction in the following August to October. However, some may do so even earlier or later. Pre-pupa period is 18-21 days. Pupa period is 30-35 days. In the wild, new adults eclose in fall, but remain inactive in the pupal cell until the following May to June. Because the temperature in captivity is often above 18°C, new adults may become active too soon. Adults without "hibernation" often lay no eggs or only infertile eggs; some even die within a month. Proper "hibernation" time is 4-6 months. The best way is to bury new adults in substrate at least 10 cm a month





羽化1個月後便可以直接把飼養箱放在戶外，就是寒流來襲都完全不用擔心。美東白兜蟲是非常耐寒的種類，因為美國東部的冬天時常都是0°C以下。經過了4-6個月的低溫後便可以將飼養容器放回18-24度的環境等新成蟲自行爬出腐植物覓食。

馬克馬尼格發現南佛羅里達州的個體似乎沒有冬眠也不受影響。這可能是因為當地幾乎是熱帶氣候，因此族群並未演化出強制冬眠的機制。

after eclosion and keep the container in a refrigerator set to 15°C for 4-6 months. If it happens to be winter during eclosion, the new adult can be kept outside a month after eclosion. *D. tityus* is remarkably resistant to cold, as American winter is often below freezing. After 4-6 months, new adults can be brought back to 18-24°C and wait for their emergence.

Mr. McMonigle has discovered that a lack of hibernation does not seem to affect individuals from southern Florida. The reason may be that southern Florida has a near-tropical climate so populations there have not evolved a mandatory hibernation mechanism.



↗ 一群人工飼育個體。馬克馬尼格攝

A group of captive-bred *D. tityus*. Photo by Orin McMonigle



↗羽化數日後的美東白兜。66 mm。2007。張懷仁攝
D. tityus a few days after eclosion. Photo by Willy Chang



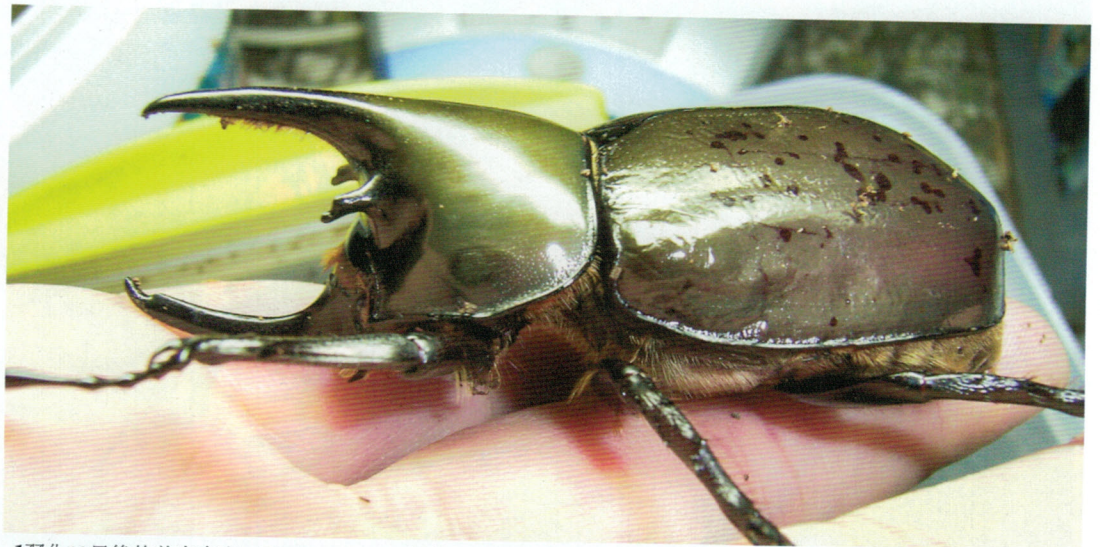
↗羽化數日後的美東白兜。66 mm。2007。張懷仁攝
D. tityus a few days after eclosion. Photo by Willy Chang



↗羽化10日後的美東白兜。67 mm。2007。張懷仁攝
D. tityus ten days after eclosion. Photo by Willy Chang



↗超級巨大的美東白兜蟲。2007。張懷仁攝
Absolutely enormous *D. tityus*. Photo by Willy Chang



↗羽化10日後的美東白兜。70 mm。2007。張懷仁攝
D. tityus ten days after eclosion. Photo by Willy Chang