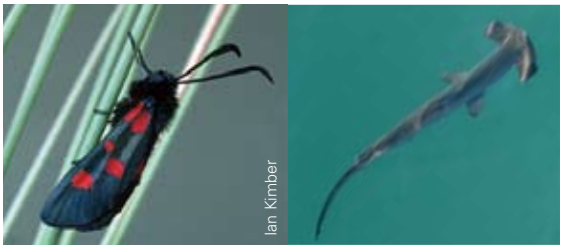
What's in a name?

Gary Skinner

Students are often daunted by long 'Latin names' in Biology. After all, why call it Drepanosiphum platanoides *when you could call it a sycamore aphid, or* Troglodytes troglodytes *(the wren)? Are these long names just biologists showing off, or do they have a purpose?*

Back in the early '70s, when I was doing a dissertation on the narrow-bordered five-spot burnet moth (*Zygaena lonicerae*), I had to search the literature to find out what was already known about this species. In those days, there were no PCs so it was all done by leafing through some very big books in the library called 'Abstracts'. These were indexes of scientific papers, giving title, author and a brief summary or *abstract* of each paper. This was laborious work and when I found a paper that looked promising, it was a question of tracking it down in the actual journal where it had been published. If the library did not have that journal, I would have to get it traced, photocopied, and sent from another library. This led to some embarrassment on one occasion. Having found a title which looked promising, I ordered it through the inter-library loans department. After a week or so it arrived, but I was only to find it was all about a different *Zygaena*, the smooth hammerhead shark, *Zygaena malleus*!

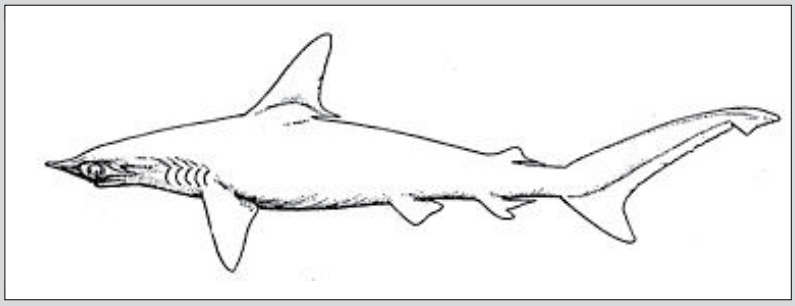


*Two very different species with similar Latin names: (left) the narrow-bordered five-spot burnet moth '*Zygaena lonicerae*' and (right) the smooth hammerhead shark,* Sphyrna zygaena, *formerly* Zygaena malleus.

So, how had this happened? At some point in the past, the hammerhead shark had been named *Zygaena* but then it was discovered that this name had already been used for the burnet moths. By the rules of naming things, called the International Code of Botanical Nomenclature (for plants) and the International Code of Zoological Nomenclature (for animals), the older use of the name had to stand. So, the moths got *Zygaena* and the shark had to be given a new name. It is now called *Sphyrna zygaena*, but notice the old name lingering on in the so-called specific name, although this animal has had many names, called synonyms, in its past (Box 1).

The benefits of this system are that it is economical (just two words do it, some older systems stretched to sentences long!), it leads to some stability of names and it is usable all over the world, whatever the language (Box 2). Also, it is unambiguous, unlike common names (Box 3).

Box 1 Synonyms



The smooth hammerhead shark (now *Sphyrna zygaena*) has had several different Latin names in the past. These are called synonyms, and each is accompanied by the name of the biologist who gave the name, plus the date. The rules of naming are slowly making sure that no two living species end up with the same Latin name.

Squalis pictus Blainville, 1816
Squalus carolinensis Blainville, 1816
Squalus malleus Valenciennes, 1822
Squalus zygaena Linnaeus, 1758
Zygaena malleus Valenciennes, 1822
Zygaena subarcuata Storer, 1848
Zygaena vulgaris Cloquet, 1830

Box 2 Understanding Chinese

This paper in a Chinese scientific journal is about *Pistia stratiotes*, the water cabbage or water lettuce. If a scientist was doing research on this major weed of water bodies around the world, they would know from the Latin name that this paper might be worth translating.

水浮莲(*Pistia stratiotes* Linn.)的体外再生与繁殖*

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摘 要 建立了水生单子叶植物水浮莲(*Pistia stratiotes* Linn.)通过器官发生途径的体外高效再生与繁殖方法。采用叶、茎节和间茎为外植体诱导愈伤组织。只有茎节能够在添加2,4-D和6-BA的MS基本培养基上形成愈伤组织。叶和茎在含有不同组合植物激素的培养基上都不能够诱导愈伤产生。将愈伤组织转到添加6-BA和NAA的MS固体分化培养基可以在2 wk内形成小苗。将小苗移至含NAA的MS固体生根培养基形成完整的植株。将生根苗转入无植物激素的不同基本液体培养基里比较其生长效果。其中含有2倍大量元素的SH培养基最适合其生长繁殖。在2 wk内可以由1个小商繁殖出10个新的植株。本研究是关于该植物体外再生的首次报道。水浮莲体外再生及繁殖系统的建立不仅可以用于在无菌条件下进行基础生理生化研究，还可以用于该植物遗传转化系统的建立。由于该植物生长迅速且为无性繁殖，生产成本低。通过基因工程方法表达外源基因将可以用于重组药用蛋白的生产及污染水体的转基因植物修复。
图3 表1 参24

关键词 水浮莲；水生植物；器官发生；再生

Box 3
Common names can be confusing

People have takean an interest in living things for millennia, whether it be because they were potential food, potential predators or poisonous plants or just very attractive or striking. So, many of these things were given a common name. Any red-breasted bird tends to be called, at least by people of British origin, a robin. So the American robin is called for its red-breast although not the same species as the one we find in Britain. The Australian robin red-breast is actually the scarlet robin, which is a warbler with a red-breast.

The Australian robin, Petroica multicolor

The American robin, Turdus migratorius

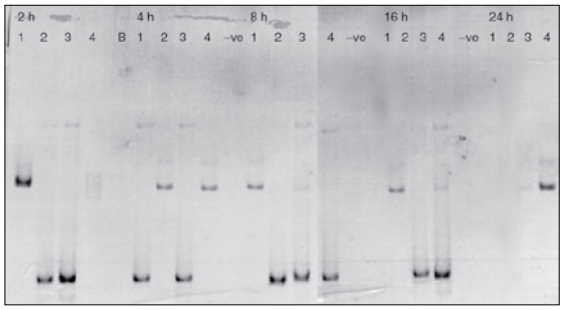
The European Robin, Erithacus rubecula

Why do binomial names change?

Apart from the changes due to the rules mentioned above, why else might the names of living things change? There are many reasons but one that is becoming more common today is that DNA fingerprinting of living things (yes, it works with them too!) is revealing that many species that we thought we knew are turning out to be more complicated than we thought.

Take the example of the humble, and very common, earthworm *Allolobophora chlorotica*. In a recent study, scientists at Cardiff University were trying to find out what food ground beetles survive on when they cannot get their most popular dietary items of slugs and aphids. They thought earthworms might be part of the answer. To check their ideas, they fed beetles with earthworms which they believed to be *A. chlorotica*. They then analysed the DNA fingerprints of the remains of food found inside the gut of the beetles, and got some very surprising results. They found that, instead of the one earthworm species, *A. chlorotica*, there were two different kinds, which were further apart genetically than a human and an orang utan! At this stage the researchers said:

> Interestingly, DNA from the earthworm *A. chlorotica* was detected as one of two alternate and very different bands on the gel. Variation is possible, but there is evidence that *A. chlorotica* comprises two cryptic species and the observed separation into two distinct genotypes would tend to support this.



Banding patterns shown by earthworm DNA from the gut of a beetle. This shows two sorts of banding pattern where only one would be expected.

So, there *had* been a suspicion that this so-called species was in fact two. A scientist called John Satchell wrote a paper in 1967 in which he had hinted at this possibility, based on the appearance of the worms, some of which are pinkish, others greenish.

Two earthworms - but are they one species or two?

However, the Cardiff group went further than this and found that there are in fact *three* different British species of this worm, which was thought to be one, as well as yet another in the rest of Europe, four species in all!

So, with the names of living things it is a question of 'watch this space', but at least we know we have a worldwide system for giving a name, once we know what it should be!

Gary Skinner is biology editor of Catalyst.

Look here!

National Earthworm Survey, starting in Spring 2009:
www.nhm.ac.uk/nature-online/science-of-natural-history/science-at-the-museum/earthworm-survey/

One of many links about Linnaeus:
www.nhm.ac.uk/research-curation/research/projects/linnaeus-link/