Breaking down the barriers: Binomial Nomenclature Glossary for Invertebrates

Biolinks is all about invertebrate ID skills, bringing together new volunteers with existing ones along with conservation and ecology professionals to develop a community of biological recorders. I've been working with the FSC Biodiversity team this year and as a result I've been lucky enough to help out with and attend many of the 2018 Biolinks courses in the West Midlands region. The whole project is built on a training pathway, for the very purpose of making sure that beginners and people new to the world of invertebrates can be gently introduced and progress at their own pace. The beginner level courses focus on ecology and basic ID skills, then binomial names, microscopic examination and dissection appear in the intermediate level courses. The point is to gradually build up people's skills and confidence to encourage them to progress to the next level.

One thing I've realised from attending the Biolinks courses over the past few months is that it's not always the collection of specimens or microscopic examination that puts people off invertebrate ID, some people seem to almost have a mental block and feel out of depth whenever any binomial names (or Latin/scientific names) are mentioned. Binomial nomenclature is a formal system for naming species and it was put in place to avoid confusion, not cause it. These Binomial names of species are essentially an international language which everyone can understand. Each name is composed of two parts, which usually use Latin or Greek grammatical forms. The first part of the name is the genus to which the species belongs, and the second part is the specific epithet (i.e. the name which distinguishes it from other species within that genus).

For example, *Tyrannosaurus rex: Tyrannosaurus* is the genus and *rex* is the species. (There are certain rules when writing these names to let the reader know you are using the binomial name: the first letter of the genus is capitalized (but the first letter of the species is not) and both the genus and species names are written in italics or underlined, i.e. Humans: *Homo sapiens* or Homo sapiens).

I understand that it can seem quite daunting when you first come across these binomial names, it is a different language and yet another thing to remember. However, many invertebrate species lack common or "vernacular" names but this shouldn't scare anyone off because we already know what a *Tyrannosaurus rex* is so given time, other binomial names will roll off the tongue like that too.

It is important to note down these binomial names when recording species because the common names for species can differ between countries and regions, which can lead to confusion about which species someone is referring to. For example, *Melolontha melolontha,* the Common cockchafer is something I've always known as a May bug, even though it's not a bug. I've heard others refer to one of these as a Spang beetle, a Doodle bug or a Billy witch, which are all excellent alternatives. However, things would start to get confusing if I was carrying out an invertebrate survey noting down the presence of May bugs and if a friend was doing the same in another region noting down the presence of Doodle bugs. I'd start wondering why on earth there's no Doodle bugs present in my survey area but there are in my friend's. This is why we need binomial names.

These names can sound quite complicated and they are tricky to remember but you can easily look up the common name for a species to find out what its binomial name is online or in many field guides and keys. Below I've made a quick glossary of some commonly used Greek/Latin words that occur frequently in the binomial names of invertebrate species. This idea was sparked by one of the Biolinks 'Field Identification of Beetles' courses this year taught by Don Stenhouse. Any time he mentioned a binomial name he then started breaking down the names and translating them to teach those on the course how the binomial names can be useful when identifying species as they can give you many clues. For example, the green dock beetle, *Gastrophysa viridula.* 'Viridis' means 'green' in Latin, thus if you've worked your way through a key and the beetle you're identifying is green, you're probably onto a winner (or you've identified it incorrectly and need to start again!).

The glossary below includes some more of these commonly used Latin and Greek words and their translations. They may refer to the appearance of the species, like the Green dock beetle, or the habitat in which they're found, i.e. the mountain bilberry bumblebee, *Bombus monticola* (mont=mountain, cola =dweller, a species found on mountains and uplands). If you came across one of these and worked your way through a key to get to this species, and you had indeed found it in an upland area, then you'd know there was a good chance you've correctly identified it.

The glossary below is still a work in progress, but it is a way to show that these names should not put you off and there are many examples of when the binomial names give you helpful clues to aid identification. Please comment if you have any other examples to add in!

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Latin/Greek	Language	English	Examples
A			
agrestis	L	of the field/wild	Field harvestman, *Paroligolophus agrestis*
albiceps	L	white-headed	Wood groundling (a white-headed micro moth), *Parachronistis albiceps;*
albus	L	white	*Gyraulus albus*, the white ramshorn snail
alpinus	L	alpine; of the Alps, so species found in upland/mountain habitats.	*Anthophagus alpinus* (no English name), a species of rove beetle only recorded in the mountains of Snowdonia, the lake district and the highlands.
apis	L	bee	European honeybee, *Apis mellifera*
arthro	G	joint	Arthropod, the scientific name for invertebrates (arthro – jointed, pod - feet).
aurantius	L	orange-coloured	*Aurantothrips orchidaceus*, a thrips species
aureus	L	golden	Golden haired longhorn beetle, *Leptura aurulenta*
B			
bi	L	two	Two-spotted ladybird, *Adalia bipunctata*
bicolor	L	two-colored	Two-coloured mason bee, *Osmia bicolor*
brevi **brachy**	L G	short	Spiny weevil, *Brachysomus echinatus* (Brachy = short, soma/us=body, echinatus = spiny)
brevicollis	L	short-necked	Short-necked oil beetle, *Meloe brevicollis*
C			
caeruleus	L	blue	Steely blue beetle, *Korynetes caeruleus*
cephalo/ceps	G/L	head	Cephalothorax = head and thorax combined
cneme	G	shin, leg	White-legged damselfly, *Platycnemis pennipes* (platycnemis = flattened leg)
cola	L	dweller	Mountain bilberry bumblebee, *Bombus monticola* (monticola = mountain dweller)
cornu	L	horn	Garden snail, *Cornu aspersum*; horned treehopper, *Centrotus cronutus*
cristatus	L	crested or tufted	Common crab spider, *Xysticus cristatus*
crocos	G	yellow	Clouded yellow butterfly, *Colias croceus*
cyano	G	blue-green	Common blue damselfly, *Enallagma cyathigerum*; Blue carpenter bee, *Ceratina cyanea*
D			
deca/decem	G/L	ten	Ten Spot Ladybird, *Adalia decempunctata*
E			
echinatus	L	prickly, spiny	Spiny weevil, *Brachysomus echinatus*
erio-	G	wool, woolly	*Eriocraniidae* moth species

			(have long dense hairs on their heads giving them a wooly appearance)
F			
filum	L	thread	Hairy click beetle, *Synaptus filiformis*
flavus	L	golden yellow, light yellow	Yellow meadow ant, *Lasius flavus*
fulvus	L	deep yellow, tawny	Tawny mining bee, *Andrena fulva*
fuscus	L	dark, dark brown	The brown beetle, *Catops fuscus*
G			
grand	L	powerful, old, large	Brown hawker, *Aeshna grandis* (a large dragonfly species)
H			
hortus	L	from the garden	Garden bumblebee, *Bombus hortorum*
I-K			
Inflata, inflatus	L	enlarged, inflated	Beetle *Oligota inflata*
L			
laevis	L	smooth	*Porcellio laevis* (woodlouse species with a smooth, glossy appearance)
lepis, *lepido-*	G	scales	Lepidoptera (Order name for moths and butterflies as they have scaled wings)
lineatus	L	lined or striped	Stripe-winged grasshopper*, Stenobothrus lineatus*
M			
maculatus	L	stained/spotted/marked	Mottled grasshopper, *Myrmeleotettix maculatus*
mel	L	honey	European honey bee, *Apis mellifera*
mont/montanus	L	from the mountains	Mountain bilberry bumblebee, *Bombus monticola*
N			
niger	L	black	Black garden ant, *Lasius niger*
O			
ortho	G	straight	Orthoptera (order of grasshoppers and crickets, meaning “straight-wing”)
P			
platy	G	flat/broad	White-legged damselfly, *Platycnemis pennipes* (Platycnemis = flattened legs)
pseudo	L & G	false/fake	False scorpions: Pseudoscorpions
ptera	G	wing	Lepidoptera (order of butterflies & moths, translates to “scale-wing”).
punctatus/punctata	L	spotted	Twenty two-spot ladybird, *Psyllobora 22-punctata*
Q			
quadri	L	four	Four-banded longhorn beetle, *Leptura quadrifasciata*
quercus	L	oak	Purple hairstreak butterfly (oak-dwelling species), *Neozephyrus quercus*

R			
rostrum	L	bill/beak/snout	Moutparts of hemiptera (true bug) species are referred to as a rostrum
rubra/rufus	L	red/reddish	Red longhorn beetle, *Stictoleptura rubra*
S			
septem	L	seven	Seven spot ladybird, Coccinella septempunctata
sylvestris	L	woodland/forest-dwelling	Forest cuckoo bumblebee, *Bombus sylvestris*
striatus	L	striped	*Miris striatus*, a yellow and black striped bug
T			
tricho	G	hair	Trichobothria (elongated hairs found on arachnids which can aid identification).
U			
ulos	L	woolly	*Uloborus* species (spiders which produce fuzzy/woolly silk).
V			
vernalis	L	spring	Spring dor beetle, *Trypocopris vernalis*
villosus	L	hairy/shaggy	Golden-bloomed grey longhorn beetle (covered in golden hairs), *Agapanthia villosoviridescens*
viridis	L	green	Green dock beetle, *Gastrophysa viridula*
X-Z			