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Earthworms – The World’s Most Important Organism? by Dr Dan Carter, Thames Valley Environmental Records Centre.

Charles Darwin’s best known book is, of course, ‘On the Origin of Species’. During his life time, however, this was far outsold by his last book, ‘The Formation of Vegetable Mould through the Action of Worms’. Published in 1881, shortly before his death, this was based on some 40 years research. More recently, in a book by Christopher Lloyd, earthworms came top of the 100 most important organisms that have evolved since life began. At the end of Dr Carter’s talk, based on a deep knowledge of earthworms and delivered with enormous enthusiasm, one was left convinced that the question mark in the title was unnecessary.

Earthworms are members of the phylum Anellida which comprises some 20,000 species of ringed or segmented worms. Within this phylum there are some 3000 earthworm species worldwide and either 26 or 27 or 28 native species in the UK plus about 20 exotics. Interestingly, earthworms are most common in temperate grasslands (250,000 per acre in poor soils and up to 1.8M per acre in rich agricultural soils) and subtropical regions; in the tropics their role in recycling matter to form vegetable mould is undertaken much more efficiently by termites. The Natural History Museum in London holds the best collection of earth worms. It includes pink species, green species and a blue species which lives in epiphytes Nicaragua and was only discovered a few years ago; it also includes some of the shortest (less than 3 cm fully grown) and some of the longest, the Giant Gippsland earthworm from Victoria, Australia, which can grow to 3 m. cont.

Earthworms are relatively simple organisms. They have a tiny brain and a mouth but no eyes, although they can probably sense light. They have five pairs of hearts but no lungs; they ‘breathe’ by exchanging gases through their moist skin – so they don’t drown in oxygenated water but they can suffocate in deoxygenated water. Like birds, they have a crop and gizzard to grind up the organic matter that they ingest and, like ants, they live on the fungi that grow inside them on this matter. They are hermaphrodites; the characteristic saddle or belt, from which tiny egg-containing cocoons emerge, only develops in adults. However, although they may be simple, they are not stupid; they instinctively grasp leaves and paper triangles by their apex when pulling them into their burrows.

In the UK earthworms are divided into four groups:

- Composters, typically very fast living red worms.
- Epigeic worms, which live near the surface in leaf litter and rotting logs, generally in colder and wetter environments.
- Endogeic worms, which live in horizontal burrows and seldom come to the surface, generally in warmer and dryer environments.
- Anecic worms, which live in burrows up to 2 m deep, come to the surface at night and produce worm casts.

Earthworms have been described as ‘ecosystem engineers’. They improve the physical structure of soils, increase soil porosity, produce humus and decontaminate polluted soils. The annual benefit of earthworms, in terms of enhanced crop yield, is said to be worth £25 billion. They are however, threatened by climate change and particularly by prolonged dry periods.

Perhaps the most surprising thing about earthworms, which Dr Carter did not mention, is that they have a such a good press – they are wet and slimy but still the great majority of children are fascinated by them and the great majority of adults welcome them in their gardens, whether lob worms in the lawn or red worms in the compost. And anyone who had any lingering doubts must surely have been converted by Dan Carter's wonderful talk.

Robin Procter.