

Aporrectodea longa Earthworm Project

NEWSLETTER

Project website:

<http://northeast.landcarevic.net.au/kiewa>

Issue 2: April 2011

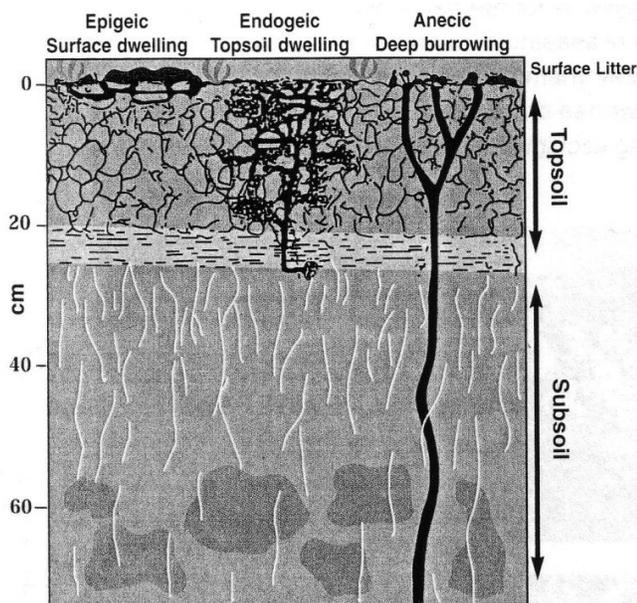
Earthworm nursery site update

The wet summer conditions across the North East has kept *Aporrectodea longa* earthworm nursery sites very moist, with very little need to apply additional moisture. Given that February rainfall in many areas has been the highest since records have been kept, we hope that the wet conditions have not adversely affected our new introductions! At this stage, it is a matter of leaving the worms to get on with maturing and reproduction.

Sampling of nursery sites will be undertaken in late August, early September, This will provide an indication on how well the earthworms have adapted to their new conditions.

Earthworm classifications

A. longa is an **anecic** (deep burrowing) earthworm. In NE Victoria, we have very few earthworm species that operate at depth, this is why this species is considered such a valuable introduction.



Deep burrowing earthworms improve soil porosity, water movement and plant root growth

Anecic worms eat fresh litter at the surface of the soil. They incorporate litter into the soil and bring mineral soil from different depths to the surface.

Diagram source:

Baker, G., Cooperative Research Centre for Soil & Land Management, Deep Burrowing Earthworms Boost Pasture.

Project Officer: Belinda Pearce

Phone: 02 6027 5294

email: opundo1@optusnet.com.au

Earthworm Lifecycle – from egg to adult

Earthworms begin life as an egg inside a cocoon. Cocoons are generally 2 to 4mm in length.



Earthworm cocoons from earthworm nursery site at Kergunyah.

Research in England (Butt et al., 1995) found *A. longa* produced an average of eight cocoons over a 12-week period.

Each cocoon produced one hatchling.

Cocoon production and hatching rates are related to soil temperature, moisture, and food supply.

Cocoon to hatchling rates

Research in southern Australia examined the incubation rates of *A. longa* collected from northern Tasmania (Baker & Whitby, 2003).

Cocoons collected mid July 1999,
93.0% hatched by mid November 1999
~ 16 week incubation rate

Cocoons collected mid September 1999
Most cocoons cultured at 15°C-25°C, hatched by mid November 1999
~ 8 week incubation rate

Cocoons collected in mid July were a bright yellow colour, suggesting they were freshly laid.

The impact of soil temperature

Survival of hatchlings was related to soil temp.

Highest survival rate: 5-15°C

97-100% survival after 6 months

Moderate survival rate: 20°C

78% survival after 6 months

Low survival rate: 25°C

13% survival after 6 months

Maturation rates of hatchlings

Faster earthworm maturation rates were associated with higher temperatures. Adult worms were found:

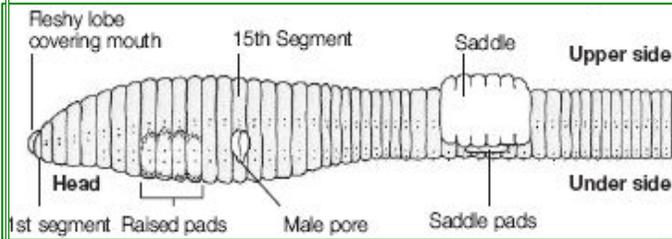
- 9 months from hatching when reared at 15°C,

- 6 months from hatching when reared at 20°C.

Baker, G. H. & Whitby, W.A., 2003. Soil pH preferences and the influence of soil type and temperature on the survival and growth of *Aporrectodea longa* (Lumbricidae), *Pedobiologia*. 47. 745-743.

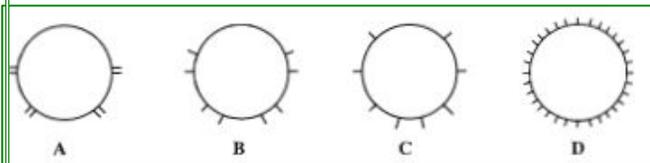
Earthworm bits and pieces

The body of an earthworm is divided into many segments. At one end is the mouth, which is covered by a flap that helps the earthworm sense light and vibrations.



Tiny bristles (setae) appear in pairs on most segments of the earthworm's body. The arrangement of bristles on each segment can be used to help identify earthworm species.

Arrangement of the bristles (setae) of earthworms



- A. Closely paired (most common)
- B. Widely paired
- C. Distant
- D. Numerous surrounding body (natives)

Source: Mele, P. & Hollier, C, 1995 – *Worm Wise II*

The brain, hearts, and breathing organs are located in the first few segments of the worm.

Earthworms breathe through their skin -- they have no lungs, so if the skin dries out, they cannot breathe and will die. Mature worms have a "saddle" which is the enlarged segments found on adult earthworms. The saddle is part of the earthworm reproduction system.



Even though earthworms are hermaphroditic (each worm has both male and female reproductive systems), it takes two worms to mate and reproduce. The reproductive organs are located in the saddle. After mating, the saddle forms a cocoon, which protects the developing eggs. Newly hatched earthworms look like tiny versions of adult earthworms.

The average life of an earthworm is around 4 to 8 years.

Information source:

<http://www.enchantedlearning.com/subjects/invertebrates/earthworm/Earthwormcoloring.shtml>

Project in the news: – "Such great length for soil health"



Country
Mail
Article

Border
Mail,

19th
March
2011

Our earthworm project was recently featured in the Country Mail section of the Border Mail. This was a great opportunity to demonstrate that Landcare is involved in a broad range of activities.

Dung Beetle Update

The cool and wet summer has seen low levels of dung beetle activity, compared to the summer of 2009-2010.

The first large trap catches (1000+ beetles) of *Onthophagus taurus* and *Euoniticellus fulvus* were not recorded at Lucyvale until mid February, compared to early Jan in 2010.

Tent trials with *Geotrupes spiniger* have also shown a later emergence time.



Bubas bison – male beetle

Be on the look-out for *Bubas bison*, which we expect to see emerging over the coming month.



CARING
FOR
OUR
COUNTRY

This project is an initiative of
Kiewa Catchment Landcare
Groups and is funded by:
Caring for our Country –
Community Action Grants