



# The Rogue Wiggler

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## *Perionyx excavatus* in a Home Worm Bin First Edition

Blue worms are making their way into home worm composters, DON'T PANIC!! This guide can help you survive it and you might learn to love them!

By Larry Shier

Cover Photo: *Perionyx excavatus* by Quoc-Huy Nguyen Dinh

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**BY LARRY SHIER**

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## **Notes**

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# Acknowledgements and Introduction

I've undertaken this project in an attempt to educate vermicomposters and vermiculturists alike to the blue worm. I've studied and used these worms now for a couple of years now and have found them somewhat misunderstood.

No other worm seems so despised, nor so unwelcome in a worm bin. Plagued with a bad reputation, the blue worms are still a very efficient composting worm.

This book wouldn't be what it is without some mentors and contributors: I want to thank Patrick Cartwright ([www.redwormsexpress.com](http://www.redwormsexpress.com)) for trusting me to admin his Facebook group and gain a lot of knowledge there and for bringing honesty and integrity to an industry previously known for its' charlatans.

Bentley Christie ([www.redwormcomposting.com](http://www.redwormcomposting.com)) a man who has mentored many of us in regards to worm composting and educating others through his blog, other websites, EBooks, and the Worm Farming Alliance (<http://www.wormfarmingalliance.com/Join-WFA>)

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([www.facebook.com/thelittlewormfarmer](http://www.facebook.com/thelittlewormfarmer)) for his photo contributions. He has some tremendous photos there and is fun to follow along on his worm journey.

Terri Gerth a good friend whom I've never met outside cyberspace for photo contributions.

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Ed Guerena another good cyberspace friend for contributing photos.

Kim Bolton ([www.avermifarm.com](http://www.avermifarm.com)) for photo submissions as well

Pauly Piccirillo Who began my writing by asking for a submission for his book [Worm Farming Revolution](#)  
(available by clicking the title)



Photo by Paul House

## **Introduction**

*Perionyx excavatus* (Perr.) is an earthworm found commonly over a large area of tropical Asia, Australia and Hawaii although it has been transported to Europe and North America. The Australian species known as *Perionyx spencerilia* is a near identical species but lacks a calciferous gland. Common names for these worms are many; Malaysian blue worms, Indian blue worms, Blues, PE's, California super red worms, among others.

PE's are rarely sold as composting worms in North America (largely because they're temperamental) but can frequently be mixed into shipments of red wigglers (*Eisenia fetida*) by invading commercial worm farm bins.

This is an epigeic species which lives in high moisture-content organic wastes. Adequate amounts of suitable organic material are required for populations to become fully established and for them to process organic wastes efficiently.

PE has a sinister reputation for making an exodus from a worm bin en masse, particularly before or during a heavy rain or thunderstorm. Identifying and being aware that you have PE in your worm bin is the first important step in managing these mass escapes.

It is becoming very common to find at least a few PE in shipments of "red wiggler compost worms" in North America. Most people new to vermicomposting neither notice immediately nor know the difference. There seems a recurring theme on the internet that "unscrupulous vendors" are spreading PE intentionally because of their very fast



reproduction rates and because they'll usually wait a few months before attempting mass escape creating an opportunity for a repeat sale. The author has had the privilege of being in contact with many North American worm farms and has discovered only a single vendor that MAY fit this category. The vast majority seem to have no knowledge of having PE mixed in their bins or they are aware, but the percentage is very low. Since 2014 social media vermicomposting groups have caused customers to pressure many vendors into now placing a species disclaimer on their websites.

Unfortunately there seems to be little credible information on this species, with most being a rehash of hearsay. As someone who has raised and studied these worms since March of 2014 I hope to shed a little light of truth about this species and perhaps improve their reputation a little bit. I will begin by giving a little history about how I got started with blues and my ongoing fascination with them. We'll cover topics like identifying blues, their life and breeding cycles, managing their

wandering ways, and how to care for them and keep them healthy.

I joined a Facebook group called “Vermicomposting-Worm Farming” operated by Patrick Cartwright Jr ([redwormsexpress.com](http://redwormsexpress.com)) in late 2013 and soon after someone posted “argh I ordered red wigglers and got PE.” At this point I’d never heard of PE or blue worms. I began reading whatever I could find and followed the progress of that post intently. I soon knew I had to get some of these worms and take on the challenge of containing them in a vermicomposting system. In March 2014 Patrick had bought out another worm farm to increase his own stock. To our amazement he discovered a mix of red worms and blues (a tropical species said to die below 50F/10C) in a frozen windrow in northern Pennsylvania. Amid worries of infecting his own worm farm with these “pest worms” he sold the contents of that purchased farm cheaply (as unprocessed bedding) to cut his losses. I ordered some from him and received a generous box of leaves, casting, worms and

cocoons. After a few months of allowing the worms from that box to increase in size and numbers I began separating a few blues to begin a pure culture. About this time Bentley Christie of [redwormcomposting.com](http://redwormcomposting.com) approached me about becoming an administrator and to help him with his Facebook presence, in return for some long hours he sent me a Worm Inn to experiment with keeping blues in (this Worm Inn has become my favourite blue worm system). I have since kept blues in totes with and without lids and different configurations of air holes and drainage holes, my Worm Inn, buckets, trays and other containers. I've kept them wet, moist and a little dry, in a variety of bedding materials and with different feedstock. I soon hope to set up a small, wooden continuous flow through reactor for them. I'm going to attempt in this E-book to outline a few things that have worked best for me and to give you a reason to experiment with this fascinating species.

## Identification:

*Perionyx excavatus* can be fairly easily identified from other worms by a few distinguishing characteristics. They have a clitellum that is flush or slightly indented to the rest of their body

beginning on the 13<sup>th</sup> segment of their body, often their head is a darker colour than the rest of their body and appears a bright blue colour in



PE flush clitellum segment 13



1Eisenia fetida, bulgy clitellum segment 25

light, with the blue colour becoming more intense with age and size. Blues also are a longer and skinnier worm than *Eisenia fetida*, with a more active and jerky movement than most other worms. In contrast *Eisenia fetida* have a bulged clitellum beginning at segment 25, are plumper in appearance and are lethargic by comparison, without the flashes of blue colour PE are known for.

PE can get close to 5 inches (13cm) in length, but will only do so when sparsely populated, shrinking as density increases.

Blues also have a feeding habit that can make them quite



visible in a worm bin, they tend to climb atop their food and stay closer to the surface of the bedding than *Eisenia fetida*.

## **Life cycle and Breeding habits:**

The range of breeding ability of PE is highly dependent on their habitat and living conditions. In rich organic matter at a steady temperature of 77F/25C PE are capable of producing up to 19 cocoons/week with a net average survival of 18.4 offspring WEEKLY/adult. Egg capsules hatch in as little as 19 days, and clitellum formation; indicating a sexually mature adult in as little as an additional 18 days for a total of 36 days from egg laying to mature adult capable of breeding. These reproduction rates seem fairly consistent between numerous scientific studies. I have never tried counting cocoons or babies to verify these numbers but I have witnessed such incredible population explosions that I have no reason to doubt their capacity to reproduce. This rate of reproduction is nearly double that of *Eisenia fetida* under ideal conditions. This breeding rate means you can produce a large biomass of very hungry worms in a very short time.

In the book [Organic Growing with Worms](#) author David Murphy speculates that PE may predominately reproduce parthenogenetically or without a sexual partner; as he claims in many years he has never seen PE embraced in mating (nor have I)

Dr. Clive Edwards has also made mention in the past of this trait. ***Joshi, et al***, in a study titled: ***Life cycle of Drawida nepalensis, Metaphire houlleti and Perionyx excavatus under laboratory controlled conditions***, claims PE as a sexual reproducer. I plan to setup a single worm in isolation and test both hypotheses. \*\*\*After writing this portion I received the following photo\*\*\*



Photo by Kim Bolton



With an incredibly fast reproduction and maturity rate as well as a high metabolism in PE comes an insatiable appetite for organic matter. These species have been thoroughly studied in tropical countries as a possible saviour from growing waste disposal problems. In Mexico some coffee producers have put the wanderlust and breeding ability of PE to use as valuable attributes. Laying waste material from coffee production out into windrows only a small number of worms seeded into the first windrow are enough to fill all windrows and convert the waste by breeding and wandering to subsequent windrows. Similar has been done in other parts of the world by tea producers to convert waste materials.



### **Managing PE against the mass escape:**

One thing I've learned about blues is: they behave very differently in

different climates. With all the methods of keeping PE I have



tried I've only had mass escape attempts when I have tried too hard to contain them. By this I mean when I've restricted airflow excessively and/or allowed condensation to build on walls of a bin. I have however seen photos of them escaping nearly every type of system out there and had other reports of never a problem. In numerous discussions with vermicomposters worldwide I've noted that in tropical climates blues seem to be more intent on escape than in my Canadian climate; outdoor bins seem to have more issues than indoor and thunderstorms near the sea seem to be more problematic than inland. Although it takes some maintenance to keep it moist enough, far and away the best system I've used for blue worms is the Worm Inn. With its Cordura cloth construction it has enough airflow that the worms are never short oxygen and does not collect condensation. In the Worm Inn I've been able to process up to 10 pounds (4.5kg) of waste in a week compared to the typically suggested 3-5 pounds (1.4-2.3kg) for *Eisenia fetida*. With PE I recommend wrapping the bottom drawstrings tightly back around the harvest opening and

securing them. I have had PE spill out of the harvest opening during watering, especially right after a casting harvest when the worms are closer to the bottom. The next best system that I have used is a simple Rubbermaid type tote without a lid or holes, it's best to place some material like damp sheets of newspaper over the bedding leaving a gap between the material and the bin walls. The gap allows air in and keeps the bedding surface near the walls dry which deters the blues from heading up. Running a fan in the room with your blues also ensures no condensation that can spur an exodus. When needed adding water should be done with care not to wet the bin walls and in outdoor bins or beds it's wise to do it in the morning when the sun will deter escape. Because blues tend to run in rainstorms some suggest their bedding should be kept drier than for reds. My personal observations have been that blues actually like a fairly wet bedding. From this I conclude that the climbing during a rainstorm may have more to do with a desire to spread the colony than any fear of water or drowning.

## **Care and Feeding**

Setting up a bin for blues is similar to setting up a bin for other compost worms. You should start with 4-8" (12-20cm) of bedding material that is predominately carbon based, this should be moistened until damp but not wet (squeeze hard to get 3-4 drops of water out). Remember worms need air so if you must use a lid then supply several larger holes and secure a tight weave cloth over the holes for best results. Blues can go through mosquito mesh or window screen like it isn't there.

### **Bedding**

Blue worms stay healthiest for me in a bedding mix similar to one of the following:

Shredded cardboard and leaf mold 50/50 by volume

Shredded cardboard, leaf mold and composted manure  
40/30/30 by volume.

Shredded cardboard and composted manure mix 50/50 by volume.

Moisture of the bedding maintained around 70-80% moisture.



*Perionyx excavatus* showing the blue glow that earns them the nickname "blues" Photo by: Quoc-Huy Nguyen Dinh

## **Favourite foods of PE**

Cucurbits (pumpkin, cucumber, squash, zucchini, melon etc.)

Well-rotted apple or applesauce.

Cooked carrot or sweet potato

Baked potato (no butter or sour cream etc.)

Rotting comfrey leaves (green)

PE will eat almost any decaying organic matter and do so quickly, these are treats that may allow you to observe them swarming their dinner.

**Note:** Try not to let your blues get hungry or low on fresh bedding

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Photo courtesy Quoc-Huy Nguyen Dinh





Blue Worm-Authors collection

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Blue Worm Photo courtesy Ed Guerena

### **Summary:**

After a couple of years of studying and raising blue worms I have observed firsthand a great potential in PE to be a valuable worm in waste reduction, particularly in a climate suited to their needs. Even in my Canadian summers I have observed a capacity for massive quantities of organic material to be converted to fine casting by blues. One of the greatest difficulties I have had raising blues is keeping them sufficiently fed to allow them to continue breeding and remain healthy.



Blues truly are a capable composter and a fascinating worm to watch. Bentley Christie once referred to them as “zombie worms” because of the creepy, twitchy way they move. George Mingin; a large Australian worm farmer regularly refers to them as “Ferraris” because they’re fast at everything and are temperamental. He’s mentioned at one time he believed they were consuming perhaps 70% of the food and bedding at his farm, this was despite the fact he had no intention of growing them at the time and considered them pest worms. Yet another worm farmer (he doesn’t want to be mentioned by name) whom I discussed the possibility of commercially raising blues said “I believe that keeping blues fed could be an expensive proposition on such a scale.” This gentleman is quite familiar with the abilities of blues to process organic matter. If you are looking for a worm to compost a large amount of waste in a short time, and you are willing to do a little more monitoring of your worm beds then you should enjoy working with *Perionyx excavatus*. While I wouldn’t recommend blues to a novice worm farmer I believe the reputation they have for escaping is far



Photo courtesy of Terri Gerth

overblown and in many cases preventable. Yes I have seen photos and videos of mass escapes; I've seen them climbing the walls of my own bins when I've been either neglectful or careless in adding water or allowing condensation to build up.

### **Avoiding getting PE in your worm shipment:**

If you've read about PE and decided they're not for you one way to minimize your chances of getting many in your order (in North America) is to order your worms in late summer to early winter. Observation has shown orders shipped in early spring the most likely to contain a larger number of PE. My hypothesis on this is that worm vendors use heated beds during the winter, and these heated beds encourage PE reproduction. Of course heating costs money so these beds would be the first emptied in the spring.

## **Getting PE**

If I have convinced you to try PE as a composting worm the bad news is that there is no one currently selling them intentionally on a large scale. If you find some in an order or *Eisenia fetida* you could separate a few and isolate them to their own bin and let them breed. I am in discussion with a couple of potential suppliers for PE in the USA and when I know more I'll post to my websites (currently under construction)

[www.bluewormscomposting.com](http://www.bluewormscomposting.com)

[www.thebluewormbin.com](http://www.thebluewormbin.com)

Whether you're a professional worm grower, casting producer or just a serious hobbyist the [Worm Farming Alliance](#) can provide you access to some of the greatest minds in the worm business today. From scientists, to bait growers and some of the largest and most successful worm farmers on the planet WFA has them. Membership can provide worm solutions, website and marketing help, business start-up advice and more.

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