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Earthworms of Arkansas

David Causey

University of Arkansas, Fayetteville

THE EARTHWORMS OF ARKANSAS*

DAVID CAUSEY

University of Arkansas

I. Introduction

The terrestrial earthworm, *per se*, needs no introduction. It is *Lumbricus terrestris* in the textbooks and in the freshman laboratory, the *common earthworm* although in sober fact the common earthworm in the United States is either *Allolobophora caliginosa* or *Eisenia foetida*. That there are other earthworms, that some are native and others introduced from other continents appears to be esoteric and confidential.

The literature on the Oligochaeta is large. Beddard's Monograph of the Order of Oligochaeta (1895) covers the literature up to 1894. Following this came Michaelsen's Oligochaeta (1900) which is taxonomical and which has been ably supplemented by Stephenson's The Oligochaeta (1930), which is mainly morphological and biological. In this country Frank Smith devoted much of his professional life to the group, and among his many publications his 1915 and 1917 papers are valuable for taxonomic purposes. Olson's Earthworms of Ohio (1928) is perhaps the most useful to beginners. Later papers of especial interest are Gates' Genus *Pheretima* in North America (1937) and his Check List and Bibliography of N. A. Earthworms (1942), and Eaton's Earthworms of the Northeastern United States (1942).

This admittedly preliminary survey of the terrestrial earthworms of the state is largely incidental to collecting for other purposes. I am indebted first of all to Dr. Nell Bevel Causey for her continual assistance. I am further indebted to the many students who have brought specimens from their home areas. Among these, to whom grateful acknowledgment is due for repeated collections are: Gloria Roensch, Siloam Springs, Ruth Steuart, Clarksville; Sam Gooden, Conway; Newton Pillstrom, Altus; Henry Rogers, Smackover; Jack Walker, Magnolia; and Joseph Wellborn, Osceola. Dr. Thomas De Palma, Fayetteville, has brought many specimens from his "eighty," and I have made some use of a report prepared by Dr. Ruell Sparks, Little Rock, while a graduate student here at the University. Finally, I am indebted to Rev. H. M. Bevel, Junction City, and to Prof. Walter Harman, Louisiana Polytechnic Institution, Ruston, La., for specimens.

An activity which may change the earthworm fauna of an area is the growing of earthworms, either for personal use or for the market. The only *L. terrestris* record I have is due to an introduction for personal use. The Blytheville (Ark) Courier News, May 23, 1951, has an article upon the worm ranch being run by Mr. J. C. Chapin of Manila, whose product is being marketed in Arkansas, Oklahoma, Tennessee, and Texas. Probably other such enterprises exist in the state. Escapes from such projects or the discarding of left over bait will, no doubt, hasten the introduction of certain species.

A sample lot of earthworms kindly furnished me by Mr. Chapin contained six species:

A. Caliginosa t. trapezoides 13 specimens
E. foetida 111 specimens
E. rosea 5 specimens
L. rubellus 13 specimens
P. californica 2 specimens
P. hupeiensis 9 specimens

2. Distribution of Species.

Smith (1915) lists 18 species as present in Illinois, and Olson (1928) lists 20 species for Ohio. Gates' Checklist (1942) allows one to conclude that some 73 species have been described from the United States, a large portion of which are characterized by such statements as "doubtful," "known only from the

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original description," etc. The total number of valid species might reach 50, with somewhere between 30 and 40 being more probable.

The present paper reports 17 species, scattered among 9 genera. Of these 6 species are regarded as native to the United States, 8 are introduced European forms, and 3 are Asiatic in origin. The latter, the *Pheretimas*, are so adaptable that it would appear that they are already the most common earthworm in some parts of the southern half of the state, and are to be found in practically all of the state. As has been pointed out repeatedly by investigators, our native worms seem to be losing out in the competition with foreign species, and are being replaced by European species in the north. In the south the genus *Pheretima* seems to be the successful invader. The conflict between the European forms and the Asiatic *Pheretima* on American soil should prove to be an interesting struggle in the years to come.

Allolobophora caliginosa f. typica:
Altus, Franklin County.
Conway, Faulkner County.
Danville, Yell County.
Fayetteville, Washington County.
Pine Bluff, Jefferson County.

Allolobophora caliginosa f. trapezoides:
Alix, Johnson County.
Altus, Franklin County.
Clarksville, Johnson County.
Danville, Yell County.
Eureka Springs, Carroll County.
Fayetteville, Washington County.
Manila, Mississippi County.
North Little Rock, Pulaski County.
Smackover, Union County.
West Fork, Washington County.

Stephenson (1930) considers this "perhaps the commonest of all earthworms, taking the world into consideration," and Smith (1917) says, "There is scarcely one of the United States in which collections have been made in which this species is not found abundantly represented."

The two types are separated upon differences in the tubercula pubertatis, in *typica* they are separate swellings on 31 and 33, in *trapezoides* they form ridges from 31 to 33. "In many specimens it is difficult to decide which condition is present, and the two forms very generally occur together... Again I do not believe that these differences have subspecific value, since neither in Europe nor in America are they geographically significant, but suggest that one or more pairs of genetic allelomorphs may be responsible, the proportions varying among different populations of the species (Eaton)."

This species occurs in cultivated soils, lawns and gardens, woodlots, etc. It is an introduced European form.

Bimastos beddardi:
Fayetteville, Washington County, on Mt. Sequoyah.
Magnolia, Columbia County.
This species, according to Smith (1917) occurs in "wet situations, and in decaying logs, stumps, or moss." My collections are from wooded areas, "millipede territory," and I would expect it to be found more frequently than my records indicate. It is a native species.

Bimastos longicinctus:
Fayetteville, Washington County.
Little Rock, Pulaski County.
This native species was first described from Illinois and later from Ohio. I add it from Dr. Sparks' report. Occurs in garden soil and prairie region east of Little Rock.

Bimastos parvus:
Lake Leatherwood, Carroll County.
My specimens are from a wooded north side of a hill. This is a native species.

Dendrobaena octaedra:
Fayetteville, Washington County, on Mt. Sequoyah.
In a wooded area, formerly cultivated. This is an introduced European species.

Diplocardia communis:
Fayetteville, Washington County.
Siloam Springs, Benton County, from King Ranch, in garden soil.
This is a native species, and probably common.

Diplocardia riparia:
Osceola, Mississippi County. *Pheretima* occurred in the same collection.
Siloam Springs, Benton County, from King Ranch, in garden soil.

Diplocardia singularis:
Beaver, Carroll County. With *E. foetida*.
Conway, Faulkner County.
El Dorado, Union County.
Fayetteville, Washington County.
Mt. Magazine, Logan County.
Smackover, Union County.
This native species appears to be widespread. It comes from both cultivated soils such as gardens and lawns, and from relatively undisturbed soils in wooded areas.

Eisenia foetida:
Beaver, Carroll County. With *D. singularis*
Junction City, Union County.
Magnolia, Columbia County.
Manila, Mississippi County.
Smackover, Union County.
This is an introduced European form. It is found in cultivated areas and in decaying logs.

Eisenia rosea:
Fayetteville, Washington County, on Mt. Sequoyah.
Manila, Mississippi County.
This is an introduced European form, wide spread in the United States and no doubt common in Arkansas.

Eiseniella tetraedra:
Eureka Springs, Carroll County.
This introduced European form is widespread in the United States, and should be common in cultivated soils in Arkansas near creek banks, etc. My sole record is from Dr. Sparks' report. There are many varieties reported, which according to Eaton (1942) "Probably the difference is due to assortment of genetic allelomorphs."

Lumbricus rubellus:
Manila, Mississippi County.
Dr. Sparks' report lists this as "quite common and widely distributed," which I take to mean in N. W. Arkansas. It is an introduced European form.

Lumbricus terrestris:
Conway, Faulkner County.
My single record of this is based on a specimen brought to me by Mr. Sam Gooden, who had purchased them to start a worm bed for fishing purposes. This species, an introduction from Europe, is readily established and should be common in the older cultivated areas of the state. I would also expect it to be a species of choice by commercial growers.

Octolasium lacteum:
Beaver, Carroll County.
Weddington, Washington County.
West Fork, Washington County.
In leaf mold and detritus on hill sides. Generally considered to prefer moist and rich organic material. It is an introduced European form.

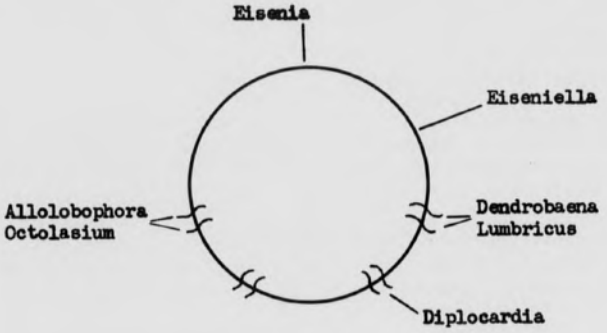
Pheretima californica:
Manila, Mississippi County.

Pheretima diffringes:
Little Rock, Pulaski County, in Boyle State Park.

Pheretima hupeiensis:
Fayetteville, Washington County.
Junction City, Union County.
Manila, Mississippi County.

This is the most widespread species of the genus in the state, according to my present records.

I have little doubt that more extensive collecting will disclose that this very successful genus is represented by a number of additional species. Gates' (1937) checklist indicates that we are in the probable range of *P. hawayana* and *P. morrisi*.



Text Figure A.

Text Figure A. The circle represents the intersegmental groove, and the setae could not be as represented. The approximate location of the spermathecal pores for the several genera. *Bimastus* has none, and the *Pheretima* species listed have pores which are on the segments, near the anterior border of the segments and ventrad.

3. Keys for Identification of Mature Earthworms

Probably there are as many ways of preparing earthworms for study as there are workers. I prefer to anesthetize the worms in about 50% alcohol, and when they become motionless to pile them up like cord wood between two small pieces of plate glass (1/4" x 1" x 6"). With a little experience reasonably straight worms can be prepared. After the worms have died in a straight condition I replace the alcohol with 5% formalin solution. This hardens the worms and the stiffened specimens are much easier to handle.

Although two keys are included, I find the tabular key much the faster. In the formal, systematic key one may be stopped by the inability to determine some characteristic called for. The tabular key presents all critical data at a glance. Some order in noting the characteristics is helpful. If the setae are observed first, the genus *Pheretima* will readily be separated from all the others. Then the position of the clitellum with respect to the number of the somites involved should be determined. This will narrow the possibilities considerabley. I prefer to determine the position of the first dorsal pore next. By now the possibilities will be few and other critical data, such as the openings of the spermathecal pores and the position of the tubercula pubertatis, looked for. Generally a specimen which has been allowed to become almost dry on its surface will show pores better than a moist one. Text figure A is a guide to the location of spermathecal pores with respect to the cross-section of the worm. A broad field dissecting binocular is almost essential if many worms are to be examined. Good artifical light is important. One should be prepared to discover that many specimens cannot be identified by gross examination. Immature ones will require dissection or sectioning. It should not be forgotten

that anomalies occur.

Rough field identification can be made of some. The brown and buff banding of *E. foetida* is readily recognized. The greenish color and pinkish clitellum will identify many *A. chloroticus*, but not all. The larger size of *L. terrestris* and the *Diplocardia* distinguish them from many other species and they themselves can be separated by the general position of the clitellum from the anterior end, its type, and the color of the worms. The *Pheretimas* are pugnacious, snake-like, lashing about vigorously, and if drawn through the fingers are distinctly rougher than our other genera. I suspect that such field characteristics are of more value to the person recommending them than to others!

The following key includes not only the genera and species of earthworms now known to occur in Arkansas, but also a number of species which may be found in the state when more extensive collecting can be done. It follows the keys of Smith (1917) and Eaton (1924). Technical details not referred to in the text are illustrated in the accompanying plate.

Key to Earthworms

1 (48) Setae arranged in 4 rows of 2 each (lumbricine)..... 2
2 (7) Clitellum begins at or anterior to 15; spermiducal pores posterior to clitellum. *Diplocardia*..... 3
3 (4) Clitellum a cingulum (complete ring).

D. singularis.

4 (3) Clitellum not a cingulum but saddle-shaped..... 5
5 (6) Spermathecal pores in 6/7,7/8, and 8/9; anterior dorsal surface pale flesh color.

D. communis.

6 (5) Spermathecal pores in 7/8, and 8/9; anterior dorsal surface dark brown color.

D. riparia.

7 (2) Clitellum begins back of 15; spermiducal pores anterior to clitellum..... 8
8 (43) Prostomium does not completely divide the peristomium (epilobic)..... 9
9 (30) Clitellum begins in front of 30..... 10
10 (11) Clitellum does not extend posteriorly to 28

Eiseniella tetraedra and varieties.

11 (10) Clitellum extends posteriorly at least to 28..... 12
12 (19) Spermathecal pores dorsal to seta line *d*.

Eisenia..... 13

13 (14) Setae widely paired, $ab : bc : cd = 5 : 9 : 5$.

E. veneta

14 (13) Setae closely paired..... 15
15 (16) Spermathecal pores in 8/9, 9/10, and 10/11; clitellum 24-30.

E. lonnbergi.

16 (15) Spermathecal pores in 9/10 and 10/11..... 17
17 (18) Segments transversely banded with brown and buff; clitellum 24, 25, 26-32; tubercula pubertatis 28-30, 31.

E. foetida.

18 (17) Segments not so banded; clitellum 24, 25, 26-31, 32, 33; tubercula pubertatis 29-31.

E. rosea.

19 (12) Spermathecal pores, if present, in or ventral to seta line *d*..... 20
20 (28) More than two pairs of sperm sacs (seminal vesicles) present; with seminal receptacles (spermathecae)..... 21
21 (25) Setae closely paired; sperm sacs in 9 - 12.

Allolobophora..... 22

22 (23,24) Clitellum 27, 28-34, 35; tubercula pubertatis 31-33 or 31 and 33.

A. caliginosa and varieties.

23 (22,24) Clitellum 27, 28-35; tubercula pubertatis 32-34.

A. longa.

24 (22,23) Clitellum 29-37; tubercula pubertatis 31, 33, and 35; greenish color when alive.

A. chlorotica.

25 (21) Setae separate or widely paired; sperm sacs in 9, 11, and 12.

Dendrobaena..... 26

26 (27) Clitellum 25, 26-31, 32; tubercula pubertatis 28-30.

D. subrubicunda.

27 (26) Clitellum 27, 28, 29-33, 34; tubercula pubertatis 31-33.

D. octaedra.

28 (20) Two pairs of sperm sacs present; no spermathecae (or imperfectly developed in *B. tenuis*)

Bimastos..... 29

29 (41) Setae closely paired..... 30

30 (38) Clitellum covers less than 10 segments..... 31

31 (35) Clitellum begins on or in front of 23..... 32

32 (33,34) Clitellum on 23-28.

B. palustris

33 (32,34) Clitellum on 20, 22-29, 30; *ab* greater than *cd.*

B. gieseleri and varieties.

34 (32,33) Clitellum 22-29; *ab* = *cd.*

B. tumidus.

35 (31) Clitellum begins on or behind 24..... 36

36 (37) Clitellum 24-30; tubercula pubertatis (indistinct) 25, 26-29, 30.

B. parvus.

37 (36) Clitellum 24, 25-31; tubercula pubertatis (indistinct) 24, 25-30.

B. beddardi.

38 (30) Clitellum covers 10 or 11 segments..... 39

39 (40) Clitellum 23-32 or 24-33.

B. longicinctus.

40 (39) Clitellum 27-37.

B. zeteki.

41 (29) Setae widely paired

B. tenuis.

42 (9) Clitellum on 30-35; setae widely paired.

Octolasium lacteum.

43 (8) Prostomium completely divides peristomium (tanylobic).

Lumbricus..... 44

44 (47) Clitellum begins on or in front of 28; sperm ducts without distinct papillae..... 45

45 (46) Clitellum 26, 27-32; tubercula pubertatis 28-31.

L. rubellus.

46 (45) Clitellum 28-33; tubercula pubertatis 29-32.

L. castaneus.

47 (44) Clitellum begins behind 28 (actually 31, 32-37); tubercula pubertatis 33-36; sperm ducts with distinct papillae.

L. terrestris.

48 (1) Setae more than 4 rows of 2 each, being in a ring more or less broken in mid-dorsal and mid-ventral lines (perichaetime).

Pheretima..... 49

49 (50,51) With 2 pairs of spermathecal pores, 7/8, 8/9.

P. californica.

50 (49,51) With 3 pairs of spermathecal pores, on anterior margins of 7-9.

P. hupeiensis.

51 (49,50) With 4 pairs of spermathecal pores, 5/6-8/9.

P. diffringes.

4. Glossary of Technical Terms

Formerly there was considerable lack of uniformity in the use of terms and symbols for earthworm taxonomy. Smith (1917) used a system which has been generally followed by subsequent writers, and which is used in this paper. The various terms used are defined in this glossary, and illustrated in the accompanying plate where deemed necessary.

ANNULAR CLITELLUM. Cf. cingulum.

CINGULUM = RING-SHAPED or ANNULAR CLITELLUM. The clitellum forms a complete ring about the body, cf. fig. 4, cing.

CLITELLUM. A completely or incompletely ring-shaped glandular thickening of the body wall in sexually mature worms and extending over several segments.

DORSAL PORES. Small mid-dorsal apertures leading to the body cavity, in the intersegmental grooves.

EPILOBIC PROSTOMIUM. Type in which the peristomium is only partly divided, the folds not reaching groove 1/2, cf. fig. 2, epi.

INTERSEGMENTAL GROOVE. The depression between two segments, generally representing externally the septum within.

LUMBRICINE. With setae in four rows of two each, as in *Lumbricus*, cf. fig. 3, lum.

PERICHAETINE. With more then 8 setae per segment, often 50-100 or more, and arranged in a ring around the segment; usually the ring of setae is more or less broken mid-dorsally and mid-ventrally, cf. fig. 3, pch.

PERISTOMIUM. The first segment, containing the mouth and not bearing setae, cf. fig. 1, per.

PROSTOMIUM. A rounded lobe overhanging the mouth and usually considered a part of the peristomium, cf. fig. 1, pro.

SADDLE-SHAPED CLITELLUM. A ring which is incomplete on the ventral side of the body, cf. fig. 4, sad.

SEGMENTS or SOMITES. Designated by arabic numbers from the anterior and posteriorly. In case of doubt, the second segment is the first to bear setae.

SEPTUM. The internal division which limits the body cavity, and which is more or less indicated externally by the intersegmental groove, cf. fig. 1, s.

SETAE. Lumbricine (8 per segment) or perichaetine (more than 8 per segment); lettered from the ventral-most dorsally, cf. fig. 3. If the distance from *a* to *b* and *c* to *d* is less than 1/3 the distance from *b* to *c* the setae are closely paired, if otherwise they are widely paired, cf. fig. 3. In perichaetine setae they are also lettered from z backwards through the alphabet if reference to the upper ones is necessary, fig. 3.

SPERMATHECAE = SEMINAL RECEPTACLES. Pouches developed in the septa which receive sperm cells from another individual at the time of copulation.

SPERMATHECAL PORES. Openings to the spermathecae.

SPERM SACS = SEMINAL VESICLES. Storage sacs for sperm cells produced by the worm itself, until the time of copulation.

SPERMIDUCAL PORES. Openings of the vas deferens.

TANYLOBIC PROSTOMIUM. Type in which the peristomium is completely divided, the folds reaching intersegmental groove 1/2, cf. fig. 2, tan.

TUBERCULA PUBERTATIS (ridges of puberty). "A series of 2 or 3 small swellings on successive or alternate segments, or a ridge reaching 3 or 4 or 5 segments. Their location is within the limits of the clitellum but they are sometimes absent (Eaton).

SYMBOLS; Used in descriptions and in keys:
5/6 reference is to the intersegmental groove between the segments indicated.
26-32 means the segments from 26 to 32, inclusive.
25, 26-29, 30 means that the structure begins on 25 or 26 and extends to 29 or 30, recognizing a range of variation.
31, 33, 35 (or 31:33:35) means on alternate segments as designated. If the structure extended from 31 to 35, it would be written 31-35.

5. Summary

1. Seventeen species of earthworms are reported from Arkansas, distributed among 9 genera. Six are regarded as native, 8 are introduced from Europe, and 3 are introductions from Asia.

2. Two types of keys to the species are given.

6. Literature Cited.

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1930 Stephenson, J. The Oligochaeta. Oxford.

7. Explanation of Plate.

Fig. 1. Diagram of anterior end of *Lumbricus*. Somites are numbered, 1-16, and structures used in keys indicated.

d.p. dorsal pore
i.g. intersegmental groove.
m. mouth
o. opening of oviduct
per. peristomium
pro. prostomium
s. septum
s.s. sperm sac
st. spermatheca
v.d. opening of vas deferens or spermiducal pore

Testes are represented in 10 and 11, and the ovary in 13, but they are not labeled.

Fig. 2. Anterior end, showing types of prostomium. After Olson.

epi. epilobic
tan. tanylobic

Fig. 3. Diagram of setal arrangements. After Stephenson.

a, *b*, *c* setae lettered from mid-ventral line
z, *y*, *x* setae lettered from mid-dorsal line
lum. lumbricine
pch. perichaetine

Fig. 4. Diagram of types of clitellum.

cing. cingulum
sad. saddle-shapped

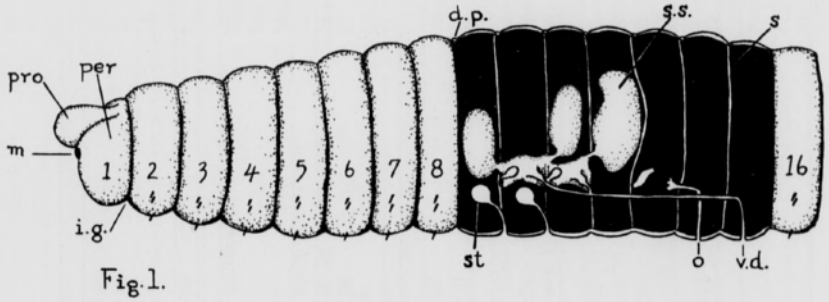

Fig. 1.

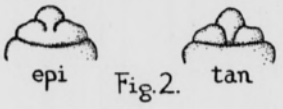

Fig. 2.

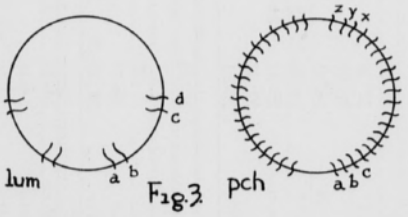

Fig. 3

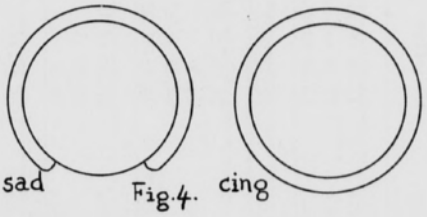

Fig. 4.

Tabular Key to Earthworms

Name	Clitellum	Tubercula pubertatis	Spermiducal pores	Spermathecal pores	Sperm sacs	Setae	First Dorsal Pore
Diplocardia							
D. singularis	13-18 cingulum		19	6/7,7/8,8/9	9,12	wide	7/8
D. communis	13-18 saddle		19	6/7,7/8,8/9	9,12	wide	7/8
D. riparia	13-18 saddle		19	7/8,8/9	9,12	wide	10/11
Eisenilla							
E. tetraedra	22,23-26,27	23-25,26	13	9/10,10/11 (dorsal)	9-12	close	4/5
Eisenia							
E. veneta	24,25,26,27,32,33	30 and 31	15	9/10,10/11 (dorsal)	9,11,12	wide	5/6
E. lönnbergi	24-30	26-29	15	8/9,9/10,10/11 (dorsal)	9,11,12	close	7/8
E. foetida	24,25,26-32	28-30,31	15	9/10,10/11 (dorsal)	9-12	close	4/5
E. rosea	24,25-32,33	29-30,31	15	9/10,10/11 (dorsal)	9-12	close	4/5
Allolobophora							
A. caliginosa	27,28-34,35	31 and 33	15	9/10,10/11	9-12	close	9/10 usually
A. longa	27,28-35	32-34	15	9/10,10/11	9-12	close	12/13
A. chlorotica	29-37	31,33,35	15	8/9-10/11	9-12	close	4/5
Dendrobaena							
D. subrubicunda	25,26-31,32	28-30	15	9/10,10/11	9,11,12	wide	5/6
D. octaedra	27,28,29-33,34	31-33	15	9/10-11/12	9,11,12	wide	4/5
Bimastos							
B. palustris	23-28	none	15	none	11 and 12	close	5/6
B. gieseleri	22-29	none	15	none	11 and 12	close	5/6
B. tumidus	22-29	27,28	15	none	11 and 12	close	5/6
B. parvus	24-30	25,26-29,30 indefinite	15	none	11 and 12	close	5/6
B. beddardi	24,25-31,32	24,25-30 indefinite	15	none	11 and 12	close	5/6
B. longicinctus	23-32 or 24-33	none	15	none	11 and 12	close	5/6
B. zeteki	27-37	none	15	none	11 and 12	close	5/6
B. tenuis	26-31	29,30 indefinite	15	none	11 and 12	wide	5/6
Octolasium							
O. lacteum	30-35	31-34	15	9/10,10/11	9-12	wide	8/9,9/10 or 10/11
Lumbricus							
L. rubellus	27-32	28-31	15	9/10 and 10/11	9,11, and 12	close	7/8
L. castaneus	28-33	29-32	15	9/10 and 10/11	9,11, and 12	close	6/7
L. terrestris	31,32-37	33-36	15	9/10 and 10/11	9,11, and 12	close	7/8
Pheretima							
P. californica	14-16		18	7/8,8/9	11 and 12	all	11/12
P. hupeiensis	14-16		18	7,8,9	11 and 12	peri-	11/12-12/13
P. diffringes	14-16 (all cingula)		18	5/6-8/9	11 and 12	chaet.	11/12

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Tabular Key to Earthworms (Continued)

Name	Number of somites	Length in cm.	Color antero-dorsal	Notes
Diplocardia				
D. singularis	90-120	18-30	flesh	Garden soil, leaves, hillsides
D. communis	125-160	18-30	pale flesh	Garden soil
D. riparia	135-160	20-27	dark brown	Garden soil
Eisenilla				
E. tetraedra	80-100	4-6	brown	Water-soaked banks of streams, ponds, etc.
Eisenia				
E. veneta	80-120	3.5-5		Stream banks
E. lönnbergi	138	9.6	brownish-violet	
E. foetida	75-125	5-15	brown and buff bands	Manure and compost heaps, decaying logs, etc.
E. rosea	120-150	3-8	pale red	
Allolobophora				
A. caliginosa	100-250	5-20	rose or brown red	Garden and woodland soil, river-bottom land.
A. longa	160-200	12-16		
A. chlorotica	80-125	5-7	greenish	
Dendrobaena				
D. subrubicunda	60-125	5-8	red	Wet soil with sewage contamination
D. octaedra	80-95	2.5-4	violet-brown	
Bimastos				
B. palustris	80-100	7.5	pale red	Wet banks of streams and ponds
B. gieseleri	100-110	4-7	brown-red	Decayed leaves, rotten logs, etc.
B. tumidus	40-60	2-5	reddish-brown	Decayed leaves
B. parvus	85-111	2.5-4	brown-red	
B. beddardi	70-100	2-6	reddish-brown	Wet areas, decaying logs, etc.
B. longicinctus	100-130	7-10	rose-red	Lawns and woodlands
B. zeteki	100-140	10-14	purplish-brown	Decaying logs, leaf mold
B. tenuis	90-110	4-8	rose-red	Decayed leaf mold and logs
Octolasium				
O. lacteum	100-170	5-16	pale pink	Under logs, leaf mold, etc.
Lumbricus				
L. rubellus	90-150	7-15	reddish brown	Debris along shores
L. castaneus	90	3-5	brown-violet	
L. terrestris	100-175	10-30	brown-violet	Lawn and garden soil
Pheretima				
P. californica	105-112	5-12.5	brownish	
P. hupeiensis	119-132	4.5-12	dark cream	Garden soil, etc.
P. diffringes	90-113	4.5-17	brownish	Damp soil along stream