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A new caecilian from Peru (Amphibia: Gymnophiona)

by

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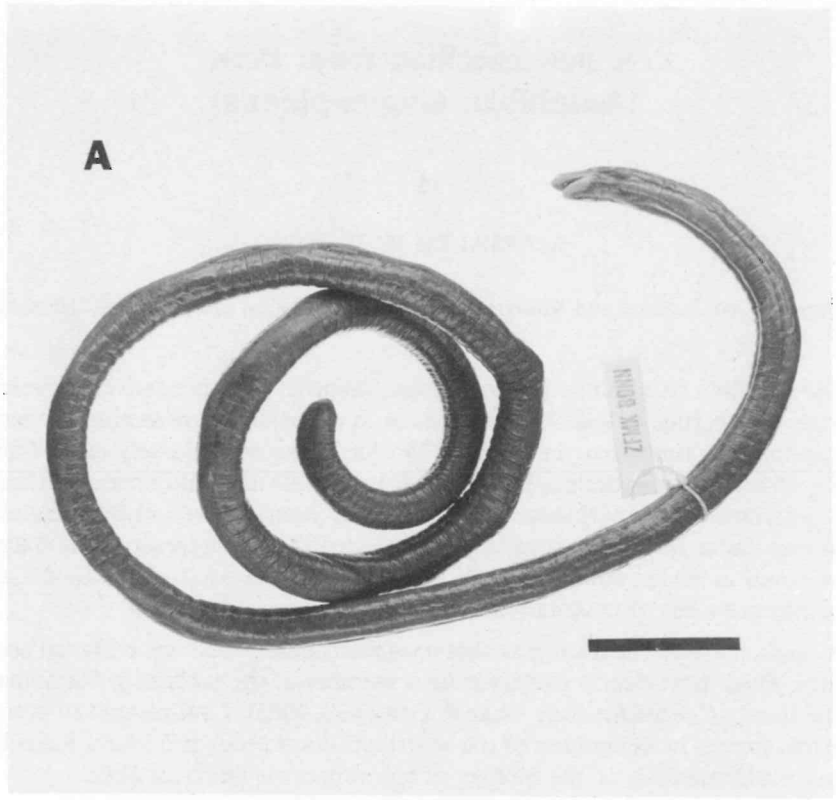
The caecilian (Amphibia: Gymnophiona) fauna of Peru is relatively rich and diverse, numbering at least thirteen species in six genera representing all three of the families that occur in the New World. These occur largely east of the Andes in the Amazon drainage (Table 1). It is possible that a number of the species described from southeastern Ecuador may occur as well in northeastern Peru (see Table 1), but the area is little collected. These suggestions are based on the data in Taylor, 1968, 1970, etc., collated for the Association of Systematics Collections list of caecilian and salamander species (in press).

A single specimen so distinctive that it warrants description was collected near Iquitos, Peru. It ist clearly an *Oscaecilia*, a member of the subfamily Caeciliinae of the family Caeciliidae (fide Wake & Campbell, 1983). I am pleased to designate this species in recognition of the contributions of Hans and Maria Koepcke to our understanding of the biology of the vertebrate fauna of Peru.

Oscaecilia koepckeorum sp. nov.

Holotype: ZFMK Bonn 23392. Type locality: Quisto Cocha, an oxbow of the Rio Itaya, 15 km S of Iquitos, Peru. Collected by K. H. Lüling, 24 July 1959.

Diagnosis: the species is an attenuate medium-sized member of the genus *Oscaecilia*. It is distinguished from all species of *Oscaecilia*, except *hypereumeces*, by its relatively high number of primary annuli (228) and low number of secondaries (9). It differs from *hypereumeces*, which is known from only two specimens, one from Santa Caterina, Brazil (Taylor, 1968) and the other of unknown provenance but presumed to be from Brazil (Taylor, 1970) ("probably from the vicinity of Manaos" — Duke Collections card, fide J. R. Bailey), in having fewer teeth, greater snout projection over the lower jaw, and a uniform grey coloration in contrast to the variegated brown dorsum with cream venter of *hypereumeces*. The new species differs from all other caecilians for which data are available in having fewer vertebrae (210) than primary annuli (228); caecilians typically have a vertebral number in excess of the primary annular count (see Remarks). Meas-



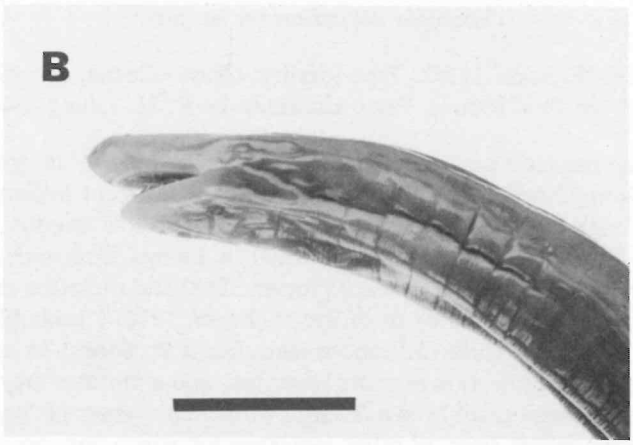


Fig. 1. A, holotype of *Oscaecilia koepckeorum* (ZFMK Bonn 23392), 495 mm total length. Bar = 25 mm. — B, head of holotype, enlarged to show details. Bar = 10 mm.

urements and counts for *O. koepckeorum* and *O. hypereumeces* are listed in Table 2.

Description of the holotype: a mature female, ovaries containing ova of three size classes; head small, flattened, narrow; snout projects over lower jaw; eyes not visible, covered by bone; nares relatively large, open; tentacles below and slightly behind nares; collars 2, distinct dorsally, with transverse grooves; primary annuli complete dorsally, virtually complete ventrally; secondaries split, anterior 3 incomplete; scales begin at primary annulus 96 and increase in number in posterior annuli; dermal scales broad, flat mineralized denticles on bilaminar unmineralized base plates; subdermal scales not observed; punctate glands very small, distributed over body between annuli, especially dorsally; vent transverse, without disc, nine-lobed aperture; anal glands absent; terminus blunt; tongue surface rugose; narial plugs linear, not pigmented; teeth elongate, recurved, widely spaced. The specimen is shown in Figure 1, osteological features are indicated in the radiograph (fig. 2), and the data are presented in Table 2.

Color: In perservative, the body is a uniform grey, including the venter, unlike most caeciliids which have a lighter venter than dorsum. The head is somewhat

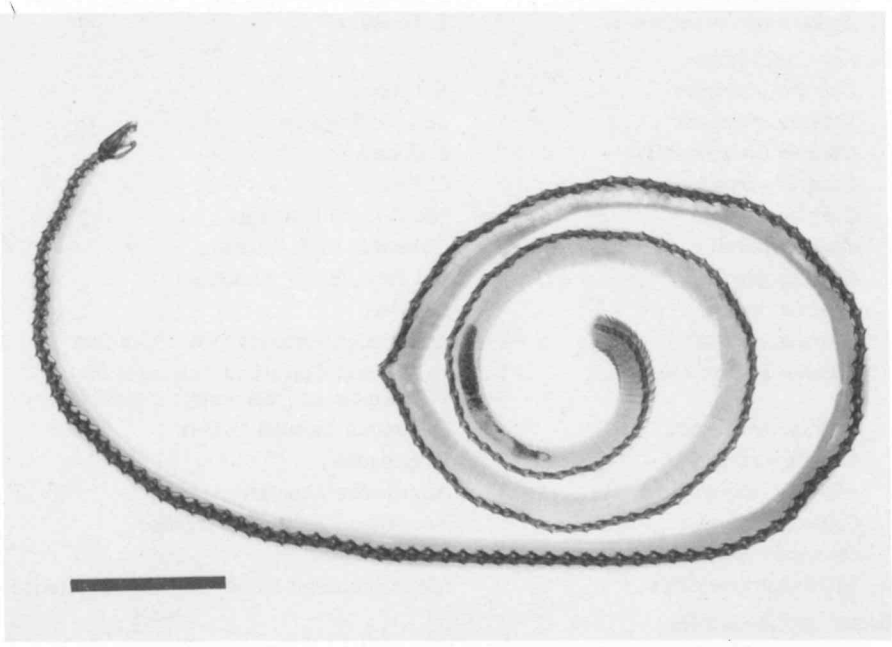


Fig. 2. Positive print made from radiograph of holotype of *O. koepckeorum*. Bar = 25 mm.

lighter, the jaw margins, the tip of the snout, and the throat a dark cream color. This is in marked contrast to the mottled pattern reported for *O. hypereumeces*, the species with the most similar annular counts.

Distribution and habitat: Known only from the type locality. Collected while digging small artificial ponds close to the bank of the Quisto Cocha for holding fish. Earth muddy, grass-covered; specimen less than 1 m deep in the soil. The species occurs in the center of the range of the genus, but the single specimen sheds little light on the relationships within the genus. It should be noted that Taylor, in his description of *hypereumeces* (1968), expressed concern that no other *Oscaecilia* was so distantly removed from the eastern Amazonian versant

Table 1. Caecilian fauna of Peru (Data from Amphibian Species of the World [in press])

Family Rhinatrematidae		
Epicrionops bicolor		SE Peru, Ecuador
Epicrionops lattivittatus		E Peru
Epicrionops peruvianus		SE Peru
Epicrionops petersi		S Peru, E Ecuador
Epicrionops marmoratus	?	E Ecuador
Family Caeciliidae		
Caecilia abitaguae	?	E Ecuador
Caecilia attenuata		Peru, E Ecuador
Caecilia bokermanni	?	E Ecuador
Caecilia corpulenta		C Peru
Caecilia diossea		NE Peru, S Ecuador
Caecilia dunni	?	Columbia to E Ecuador
Caecilia gracilis		NE Peru, Brazil, Guianas
Caecilia inca		NE Peru
Caecilia orientalis	?	Amazonian Ecuador, NW Colombia
Caecilia pachynema	?	Pacific and Caribbean drainages of W Ecuador and Colombia, possibly Peru
Caecilia tentaculata		E Panama through C Peru
Caecilia tenuissima	?	W Ecuador
Microcaecilia albiceps	?	Amazonian Ecuador
Oscaecilia bassleri		Amazonian Peru and Ecuador
Oscaecilia ecuatorialis	?	NW Ecuador
Siphonops annulatus		Amazonian and Caribbean South America
Family Typhlonectidae		
Potamotyphlus kaupii		Amazonian and Orinoco drainages
Typhlonectes compressicaudus		Guianas and Amazon drainage of Peru and Brazil

Table 2. Characters of *Oscaecilia koepckeorum* with comparison to *O. hypereumeces* (Measurements are in mm)

Character	*O. koepckeorum* ZFMK Bonn 23392	*O. hypereumeces* NMW 9122	Duke A 9627
Total length	495	640	385
Head length	9.5		7.5
Head width at jaw articulation	6.5		4.5
Head width at nostrils	3.4		2.5
Body width	8.5	7	5.0
Body width at vent	8.2		4.6
Primary annuli	228	226	208
Secondary annuli	9	4	21
Complete secondary annuli	6	4	6
Collars	2	3	3
Nostril–nostril distance	2.6		2.0
Tentacle–nostril	1.2	1.0	1.1
Snout projection	2.5	1.9	1.8
Premaxillary–maxillary tooth number	5–4	8–1–7	10–1–10
Vomero–palatine teeth	7–7	10–1–9	11–1–11
Dentary teeth	5–5	10–10	9–9
Splenial teeth	1–1	3–3	2–2
Scale inception	96th annulus	"Mid-body"	~ 90th annulus
Vertebral number	210		214
Anal glands	Absent		Absent
Narial plugs	Present, not pigmented		Present, gray
Sex	♀		♂

(Data for *O. hypereumeces* from Taylor, 1968, 1970 and Duke A 9627)

(*O. ochrocephala* of Panama not nearly so disjunct). He did not repeat that concern when he listed the Duke specimen of unknown locality but obviously presumed to be Brazilian.

Remarks: The specimen is particularly noteworthy for its apparent primary annulus–vertebral number ratio. All other caecilians have a greater number of vertebrae than primary annuli, for the dorsal musculature that elevates the head extends posteriorly over the anteriormost body segments in several species, so that the 'collars' obscure the otherwise direct relationship of primary annuli to vertebrae. There are also vertebral rudiments over and behind the vent where there are no annuli in many species (Wake, unpubl.). Repeated counts of annuli and analysis of photographs and radiographs indicate a higher number of primary annuli than vertebrae in the specimen described. The animal was gently dissected anteriorly to elucidate the relationship of head musculature to anterior

Table 3. Numbers of primary annuli and vertebrae in *Oscaecilia koepckerorum*

Primary annular number (intervals of 20)	Number of vertebrae/20 annuli
1—20	21 (includes atlas)
21—40	19.5 (41st vertebra mid-body at 40th annulus)
41—60	19.5
61—80	20
81—100	20
101—120	19
121—140	18
141—160	18
161—180	16
181—200	15
201—220	15
221—228	9

body segments and vertebrae, and posteriorly to determine the relationships of primary and secondary annuli to vertebrae. Dissection revealed that the head musculature does not obscure the vertebral—myocommatal direct relationship, nor is there indication of disruption posteriorly. A radiograph taken of the specimen with metal markers inserted every 20 annuli indicates that vertebral number diminishes posteriorly relative to annular number (see Table 3). It is not immediately obvious why primary annuli, usually assumed to be associated with segmental myocommata which are mid-vertebral and also associated with rib development, should number more than vertebrae and ribs from the mid-body region posteriorly. There do not appear to be aberrant or random secondaries, for annular intervals are regular, and the secondaries at the end of the body are typical in structure and position of many of the attenuate caeciliids. The greater number of vertebrae in the posterior-most interval is typical of many species, for 1—2 central rudiments often are present behind the vent where there are no annuli in blunt-ended species. This phenomenon contributes to the vertebral number typically exceeding that of the annuli. Resolution of this problem awaits an adequate sample of this species so that variation can be assessed. It may occur as well in other species not yet carefully examined, for there is considerable variation in annular and vertebral numbers within populations (Wake, 1980). However, a study of annular and scale development now in progress suggests that the presumed standard relationship of vertebrae, myocommata, and primary annuli is indeed typical of caecilians.

Acknowledgments

I am very grateful to Wolfgang Böhme for bringing the specimen to my attention, for allowing me to borrow and to dissect it, and for encouraging me to publish these observations, and to Joseph R. Bailey for loan of the rare specimen of *O. hypereumeces*. My travel was supported by funds from the Penrose Fund of the American Philosophical Society, and the research by the National Science Foundation.

Summary

A new gymnophione species from Peru, *Oscaecilia koepckeorum*, is described. The single specimen is distinct from all other caecilians in having a greater number of primary annuli than vertebrae, and from other species of *Oscaecilia* in a combination of characters including high number of primary annuli, low number of secondaries, fewer teeth, greater snout projection over the lower jaw, and color pattern.

Zusammenfassung

Es wird eine neue Gymnophione, *Oscaecilia koepckeorum*, aus Peru beschrieben. Das Einzelexemplar unterscheidet sich von allen anderen Blindwühlen durch eine Anzahl von Primärfurchen, die höher als die der Wirbel ist, von den anderen *Oscaecilia*-Arten zudem durch eine Merkmalskombination aus hoher Zahl von Primärfurchen, niedriger Zahl von Sekundärfurchen, weniger Zähnen, einem stärker unterständigen Maul sowie verschiedener Färbung.

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