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FIELD MUSEUM OF NATURAL HISTORY

PUBLICATION 221

ZOOLOGICAL SERIES

VOL. XII, No. 7

NEW SALAMANDERS OF THE GENUS OEDIPUS
WITH A SYNOPTICAL KEY

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REPORTS ON RESULTS OF
THE CAPTAIN MARSHALL FIELD EXPEDITIONS

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CHICAGO, U. S. A.

May 19, 1924

NEW SALAMANDERS OF THE GENUS OEDIPUS

BY E. R. DUNN.

Through the courtesy of the Field Museum of Natural History in loaning their collections of salamanders of the genus *Oedipus* for study in connection with the revision of the Plethodontidae, on which I have been engaged for some time, I am enabled to add to the number of described species, and to clear up the status of some forms hitherto imperfectly understood.

A good many new forms of *Oedipus* have been described since the last general discussion of the genus. The various expeditions of the Field Museum of Natural History, of the Museum of the University of Michigan, and of the Museum of Comparative Zoology, during the year 1923, have brought to light three more new species and good series of two forms hitherto very poorly represented in collections. One of these, *Oedipus parvipes* Peters, breaks down the distinction between the normal forms of the genus and the wormlike forms frequently referred to *Oedipina*. Therefore, it seems appropriate to append to the descriptions of these three new forms a brief synopsis of the whole genus. This is based on somewhat uneven material, the mountain forms being usually well known, while the lowland species are still represented in collections by very few specimens. Of the 30 species recognized hereinafter, I have seen specimens of 29, the missing one being the perhaps mythical salamander from Haiti. These 29 forms are represented by a series of 564 specimens preserved in various museums in America.

The genus *Oedipus* is closely allied to and perhaps derived from the wide-ranging northern genus *Hydromantes*. These two represent the terrestrial wing of the free-tongued *Plethodontidae*, as *Gyrinophilus*, *Pseudotriton*, and *Eurycea* represent the mountain-brook wing. I conceive these two to be parallel series, *Hydromantes* and *Gyrinophilus* (with their primitive double premaxillae) standing at their bases. *Hydromantes* differs from *Oedipus* in having double premaxillae, and in lacking the basal constriction of the tail. The "Oedipina" forms of *Oedipus* lack this constriction, but are degenerate in other ways as well, and are completely connected with normal *Oedipus* by *parvipes*. The genus is large and varied, but the very different extremes are connected by intermediate forms.

Oedipus schmidti sp. nov.

Type from mountains west of San Pedro, Honduras, at 2000 feet, on trail. No. 4538 Field Museum of Natural History. Adult female. Collected May 5, 1922, by K. P. Schmidt.

Range.—Known only from type locality.

Diagnosis.—A large *Oedipus*, with groove from eye to gular fold; feet well developed, almost entirely webbed; vomerine teeth 20, series extending beyond nares; lead gray, with indistinct black spots.

Description of Type.—13 costal grooves; 3 costal folds between appressed toes; head width $4\frac{2}{5}$ in length from snout to vent; head length $3\frac{1}{2}$ in length of body; head a truncated oval as seen from above; eye longer than its distance from tip of snout; outline of upper jaw concave as seen from side; angle of jaw back of hind angle of eye; both eyelids fitting under a fold of skin behind; a groove from eye to gular fold; a groove from this down behind angle of jaw; limbs well developed; fingers 3, 2, 4, 1 in order of length, last joint of 3 free, rest entirely in web; toes 4, 3, 2, 5, 1 in order of length, last joint of 3 and 4 almost free, rest entirely in web; anal lips smooth; tail longer than body, terete, a basal constriction; vomerine teeth 20 in series, beginning beyond outer border of nares, running nearly straight in and then a little back, separated from its fellow by such a distance as would result from the lack of one tooth of a series, separated from parasphenoids, by a little over the diameter of the nares; latter in a single patch divided posteriorly, beginning opposite anterior fourth of nares; leaden gray above, lighter below; small irregular black spots on sides of body and tail; total length 195, head 24, body 83, tail 88.

Remarks.—This species seems quite close to *robustus* of Costa Rica, differing mainly in the greater webbing of the toes, in the presence of black spotting on the sides, and in the absence of the white ring around the base of the tail. It is known only from the type.

Oedipus colonneus sp. nov.

Type from La Loma, on trail from Chiriquicito to Boquete, altitude about 2000 feet, Bocas del Toro, Panama. No. 9406 Museum of Comparative Zoology. Adult female. Collected by E. R. Dunn and Chester Duryea.

Range.—Known only from type locality.

Diagnosis.—An *Oedipus* with fully webbed toes; no teeth on maxilla; vomerine teeth 9, beginning behind inner edge of nares; belly

light gray; dorsal surface reddish gray much obscured by darker streaking; a dermal ridge across head and eyelids.

Description of type.—13 costal grooves; 4 costal grooves between appressed toes; head width 6 in length from snout to vent; head length $3\frac{1}{2}$ in length of body; head truncate, nostrils at angles; eye less than its distance from tip of snout; snout swollen; a tubercle below nostril; outline of upper jaw convex as seen from side; angle of jaw back of hind angle of eye; upper eyelid fits over lower behind; a dermal ridge across head between eyes, extending onto eyelid; an additional tubercle on eyelid posterior to this; grooves of head obsolete; limbs well developed; fingers and toes palmate; third finger and third toe longest, their tips projecting slightly beyond web; tail constricted at base; anal lips smooth; tail longer than body; vomerine teeth 9 in series, beginning behind inner edge of nares, extending in and back, separated from its fellow by width of nares and from parasphenoids by twice that distance; parasphenoids in a single patch beginning opposite middle of eye socket; no teeth on maxilla; reddish gray above; light gray below; on dorsal surface and sides the ground color is obscured by brownish black streaking, and shows clearly only on top of the head; total length 82, head 10, body 32, tail 40.

Habits.—This specimen was caught at night as it sat on a leaf about a foot from the ground near a small brook. It was sluggish.

Remarks.—The dermal ridge across the head is unique in the genus. Unfortunately only a single specimen was secured so that possibly it is abnormal, although it has every appearance of normality. The relationships are not very evident. The other palmate species without maxillary teeth is *rufescens*, and it may be allied to that form or to *striatulus*, another small species with dorsal streaking. The specimen, although a female, shows a strongly swollen snout.

Oedipus nasalis sp. nov.

Type from mountains west of San Pedro, Honduras, at 4500 feet altitude. No. 4568 Field Museum of Natural History. Adult male. Collected April 1, 1923, by K. P. Schmidt and Leon L. Walters.

Range.—Known only from type locality.

Diagnosis.—A small *Oedipus* with nostrils large in adult; toes webbed at base; 2-3 costal folds between appressed toes.

Description of type.—13 costal grooves; 2 costal folds between appressed toes; head a blunt oval; head width $4\frac{3}{5}$ in length from snout

to vent; head length about 4 in length of body; snout swollen, a tubercle below nostril; nostril larger than pupil; outline of upper jaw sinuous as seen from side; angle of jaw below hind angle of eye; both eyelids fitting under a fold of skin behind; a groove from eye to gular fold; a branch from this down behind angle of jaw; limbs well developed; fingers 3, 4, 2, 1 in order of length, last two phalanges of 3 free; toes 3, 4, 2, 5, 1 in order of length, last two phalanges of 3 free; tail longer than head and body, constricted at base, terete; anus lined with papillae; vomerine teeth 5 in series, beginning behind inner edge of nares, curving in and back, separated from its fellow by a space equalling the gap between two teeth of the same series, separated from parasphenoids by the length of a series; latter in single patch, beginning opposite middle of eye-socket; internal nares a slit; premaxillary teeth enlarged, forward, out of line with maxillary teeth; dark grayish brown, lighter on back, a dark band on sides; a dark triangle, apex backwards, base between eyes; lighter gray dotted with white below and on sides; two light spots on base of tail; total length 75, head 6.5, body 25.5, tail 43.

Variation.—A female, Field Museum No. 4579, same data, differs in having the snout not so swollen; no tubercle under nostril; anal lips smooth; vomerine teeth 8 in series, separated from its fellow by a gap equalling twice that between two teeth of the same series, separated from parasphenoids by twice that distance; total length 80, head 7, body 27, tail 46.

A young specimen, Field Museum No. 4584, same data, has the dorsal region covered by a light reddish gray band with scalloped edges, this band contains irregular darker spots, and two lighter spots above anus; a dark band between eyes; a dark stripe from eye to insertion of arm, total length 46, head 4, body 17, tail 25; 3 costal folds between appressed toes.

No. 4590, same data, is reddish gray above and on sides, gray below; weak and irregular dorsal and lateral dark lines; a dark stripe from eye to insertion of arm; total length 55, head 5, body 20, tail 30.

Some young have an immaculate dorsal band, and all the young are marked while most of the adults are almost uniform.

Remarks.—This species is closely allied to *O. picadoi* of Costa Rica, which has, however, weaker limbs, there being six costal folds between the appressed toes. The other two forms with large nostrils, *pennatulus* and *townsendi*, have the toes completely webbed.

A KEY TO THE FORMS OF OEDIPUS.

The species of *Oedipus* form four series, which may thus be outlined:

I. *bellii*, *schmidti*, *robustus* (a primitive series with no obvious allies).

II. *cephalicus* (*leprosus* auct.), *rostratum*, *morio*, *subpalmatus*, *adpersus*, *altamazonicus*, *colonneus*, *rufescens*, *striatulus*, *lignicolor*, *yucatanus*, *salvinii*, *attitlanensis*, *platydactylus* (*variegatus* auct.). This series begins with five mountain animals with incompletely palmate feet and ends with palmate lowland species whose immediate relationships are uncertain. However, the last five are pretty clearly allied.

III. *sulcatus*, *chiropterus*, *rex*, *nasalis*, *picadoi*, *townsendi*, *penatulus*. These are all small, mountain species. Four have enlarged nostrils.

IV. *lineolus*, *infuscatus*, *parvipes*, *alfaroi*, *collaris*, *uniformis*. These are the "Oedipinas" and have no primitive members and no obvious connection with any other forms. The Haitian form is perhaps mythical.

Of these four series the most primitive of each is set down first and is a Mexican species. What I have considered as *platydactylus* may prove divisible into two or three races. The key does not pretend to follow throughout the natural order, being arranged solely with regard to convenience and ease of determination.

1. *Oedipus* of normal salamander form, not wormlike, never more than 14 costal grooves, feet and limbs never much reduced, nostrils never large in adult..... 2
Oedipus of which the above is not true..... 21
2. Toes not fully webbed..... 3
Toes fully webbed..... 13
3. Large species reaching 195 mm., markings not a light dorsal band, vomerine teeth 18-20 in series..... 4
Medium and small species, never over 150 mm., markings usually a light dorsal band, vomerine teeth at most 15 in series..... 6
4. Toes nearly free, a double row of yellow spots on back, Mexico..... *bellii*
Toes about half webbed, no dorsal markings..... 5
5. Toes more webbed, no light ring at base of tail, Honduras..... *schmidti*
Toes less webbed, a light ring at base of tail, Costa Rica..... *robustus*
6. Small species not over 90 mm., toes nearly free, 9 or fewer teeth in vomerine series..... 7
Medium species, toes usually half webbed, 9 or more teeth in vomerine series..... 9
7. Vomerine series very oblique, beginning at inner edge of nares, inner toe rudimentary, tail longer than head and body, eastern Mexico... *chiropterus*
Vomerine series more transverse, beginning outside inner edge of nares, inner toe not rudimentary..... 8

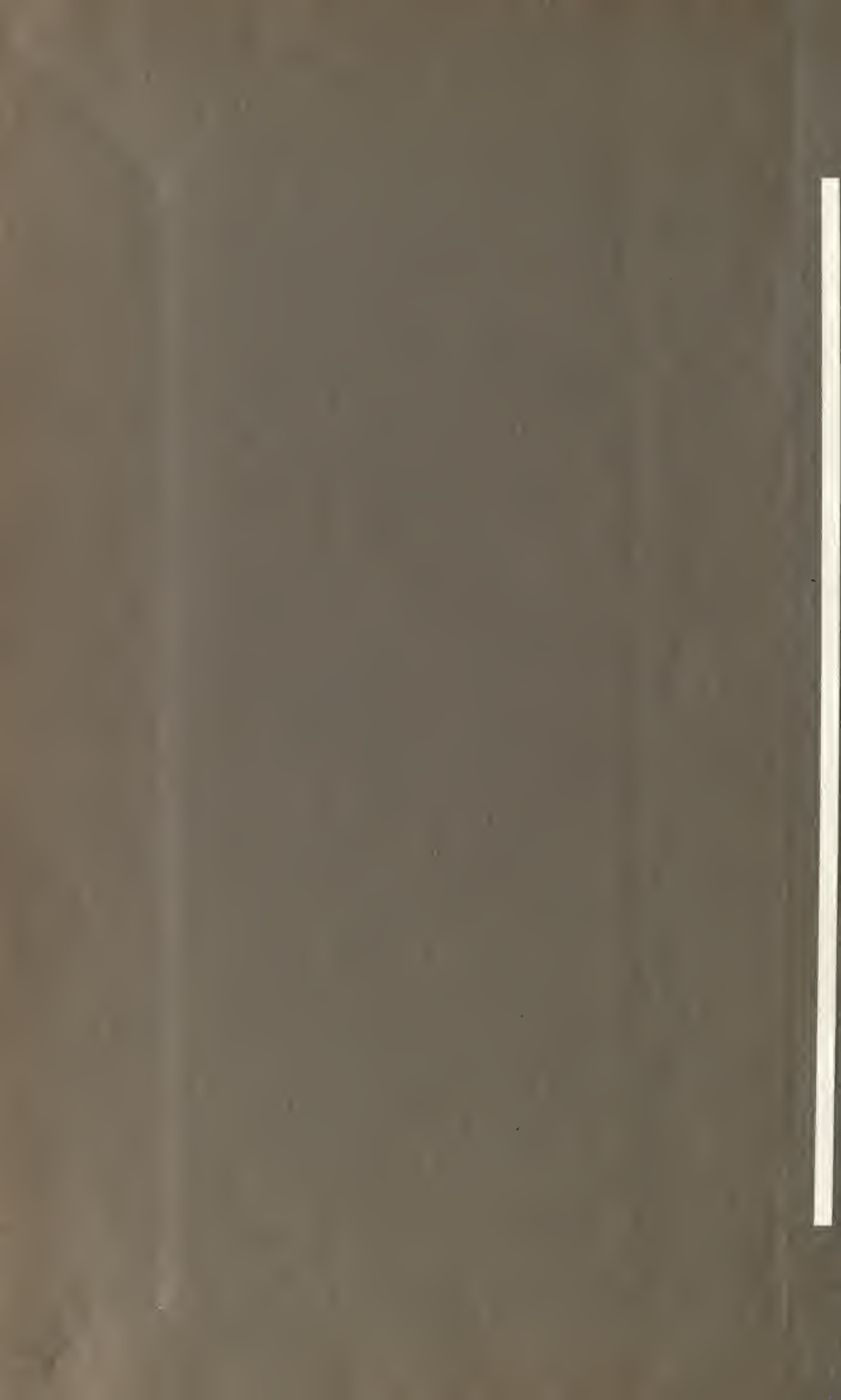
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| 8. | Tail shorter than head and body, western Mexico..... | <i>sulcatus</i> |
| | Tail longer than head and body, Guatemala..... | <i>rex</i> |
| 9. | Toes nearly free, a groove from eye to gular fold, Mexico..... | <i>cephalicus</i> |
| | Toes half or more webbed, no groove from eye to gular fold..... | 10 |
| 10. | Two phalanges of third toe free, Guatemala..... | <i>rostratum</i> |
| | Less than two phalanges of third toe free..... | 11 |
| 11. | One phalange of fourth toe free..... | 12 |
| | Less than a whole phalange of fourth toe free, Colombia and Venezuela..... | <i>adpersus</i> |
| 12. | Two very different color phases, one with light belly, Guatemala and Honduras..... | <i>morio</i> |
| | No light color phase, Costa Rica and Panamá..... | <i>subpalmatus</i> |
| 13. | Belly unpigmented..... | 14 |
| | Belly pigmented..... | 15 |
| 14. | A dorsal light area with large dark spots outlined with light, Pacific Coast, Mexico to Costa Rica..... | <i>salvini</i> |
| | Dark with two dorso-lateral light lines, Guatemala and Chiapas..... | <i>attilanensis</i> |
| 15. | Belly striped, yellow and blackish brown, Nicaragua and Costa Rica..... | <i>striatulus</i> |
| | Belly not striped..... | 16 |
| 16. | Dorsal area of clear yellow, with or without black spotting or streaking, Mexico to Honduras..... | <i>platydactylus</i> |
| | Dorsal area not of clear yellow..... | 17 |
| 17. | Large species over 150 mm..... | 18 |
| | Small species under 100 mm..... | 19 |
| 18. | Legs longer, black with dirty yellowish or reddish dorsal area, Costa Rica and Panamá..... | <i>lignicolor</i> |
| | Legs shorter, brown with ochre mottlings, Yucatan and Guatemala..... | <i>yucatanus</i> |
| 19. | No maxillary teeth..... | 20 |
| | Maxillary teeth present, east face of Andes, Colombia to Bolivia..... | <i>altamazonicus</i> |
| 20. | A dermal ridge across head, dark with lighter streaking, Panamá..... | <i>colonneus</i> |
| | No dermal ridge across head, a lighter dorsal area, Mexico and Guatemala..... | <i>rufescens</i> |
| 21. | Toes free or nearly so (nostrils large)..... | 22 |
| | Toes much reduced, entirely webbed..... | 23 |
| 22. | 2-3 costal folds between appressed toes, Honduras..... | <i>nasalis</i> |
| | 6 costal folds between appressed toes, Costa Rica..... | <i>picadoi</i> |
| 23. | Not wormlike, nostrils large in adult..... | 24 |
| | Wormlike, nostrils not large in adult..... | 25 |
| 24. | Teeth on maxilla, 4-5 costal folds between appressed toes, Mexico..... | <i>townsendi</i> |
| | No teeth on maxilla, 6 costal folds between appressed toes, Mexico..... | <i>pennatulus</i> |
| 25. | Costal grooves 14..... | 26 |
| | Costal grooves 17 or more..... | 27 |
| 26. | Black, Mexico..... | <i>lineolus</i> |
| | Brownish, Haiti..... | <i>infuscatus</i> |
| 27. | Costal grooves 17, Colombia to Panamá..... | <i>parvipes</i> |
| | Costal grooves 19-21..... | 28 |
| 28. | Larger, stouter, head longer, tail constricted at base, Nicaragua to Panamá..... | <i>collaris</i> |
| | Smaller, slimmer, head shorter, tail not constricted at base..... | 29 |
| 29. | Brown, no maxillary teeth, Costa Rica..... | <i>alfaroi</i> |
| | Black, maxillary teeth present, Honduras to Panamá..... | <i>uniformis</i> |

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