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NORTH AMERICAN  
HERPETOLOGY

OR,

A DESCRIPTION

OF THE

REPTILES INHABITING THE UNITED STATES.

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## P R E F A C E .

BESIDES the gentlemen already named as having aided in the preceding volumes, I must now acknowledge my obligations to those who have assisted me in this, the fifth and last volume of the external forms, colour, habits, &c. &c. of our Reptiles.

TO DR. G. MAURAN of Providence, Rhode Island, I am indebted for many Salamanders, and especially for a beautiful *Salamandra longicauda*.

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Dr. DEKAY, State Zoologist of New York, one of the most accurate naturalists of our country, has rendered me great service by his observations on northern Salamanders, and has furnished me with many drawings, and with the description of a new species (*Salamandra granulata*).

To Mr. J. H. RICHARD, who succeeded Mr. SERA as draughtsman, and who has the general superintendence of the plates, I am greatly indebted for many beautiful drawings done from life.

JOHN EDWARDS HOLBROOK.

*Medical College, Charleston, South Carolina, 1842.*

# NORTH AMERICAN HERPETOLOGY.

## FAMILY III. BUFONOIDEA.

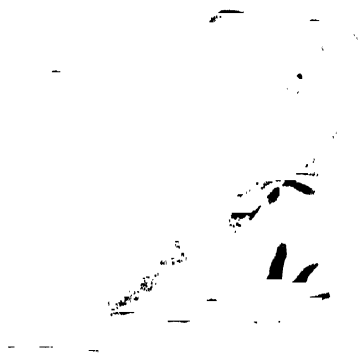
### CHARACTERS.

1. The head varies greatly in size and form; it may be pointed or truncated, smooth, or elevated in crests.
2. The upper jaw and palate, with one or two exceptions only, are entirely destitute of teeth.
3. The tongue is long, without a notch at its posterior extremity.
4. The extremities vary in size, but there are always four fingers, free, and five toes, palmated or not.
5. Most animals of this family have on their plantar surface a tubercle, sometimes greatly developed, which, from its position, resembles a sixth toe.

REMARKS. The animals of this family seldom leave their retreats until the grey  
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of evening, and are truly nocturnal in their mode of life. This family has been arranged in several genera, characterized by the form and structure of the tongue; the number of toes, palmated or not; tympanum visible or not; tubercle at heel, &c. &c. Two of these genera have only yet been observed in the United States—*Bufo* and *Engystoma*.





Bufo lentiginosus.

*On Stone by S. Cichowski*

*F. S. Duval, Lith. Phila.*





B U F O.—*Laurenti*.

GENUS BUFO.—CHARACTERS. Head large; mouth extensive; tongue elongated, elliptical, entire, generally a little larger behind, free posteriorly; jaws and palate without teeth; eyes large, pupil elliptical longitudinally; dilatible; tympanum more or less distinct; parotid glands more or less developed; males mostly with a sub-gular vocal vesicle; four fingers, sub-round, free; five toes of same form, more or less palmate, the last shorter than the penultimate; metatarsal region with two tubercles below, the one at the root of great toe largest.

BUFO LENTIGINOSUS.—*Shaw*.

*Plate I.*

CHARACTERS. Head large; snout obtuse; superciliary ridges greatly elevated and terminating posteriorly in a knob; upper jaw emarginate, lower furnished with a hook in front; parotid glands large, reniform, and reaching from below the tympanum to near the shoulder; tympanum large; vocal vesicle internal; body above warty, dusky brown, with a tinge of yellow; beneath granulated, dirty yellowish-white. Length 3 inches.

SYNONYMES. Land-frog, *Catesby*, Carolina, &c., vol. ii. tab. 69.

Land-frog, *Bartram*, Travels in Carolina and Florida, &c., p. 279.

*Rana lentiginosa*, *Shaw*, Gen. Zool., vol. iii. part i. pl. 53, p. 173.

*Bufo musicus*, *Daudin*, Rainettes, p. 92, tab. 33, fig. 3;—Hist. Rept., tom. viii. p. 190.

*Bufo musicus*, *Bosc*, Nouv. Dict. d'Hist. Nat., tom. vi. p. 490.



*Bufo musicus*, *Merrem*, Versuch eines Syst. der Amphib., p. 181.

*Bufo musicus*, *Harlan*, Med. and Phys. Res., p. 113.

Carolina Toad, *Vulgo*.

**DESCRIPTION.** The head is very large, dark-coloured, and without warts, except a few small ones on the eyelids. The mouth is of great size, without either maxillary or palatine teeth. The snout is obtuse, and from its tip runs an elevated bony line, subdividing at the nostrils, and forming the superciliary ridges; these increase in elevation as they reach the posterior part of the orbit, where they terminate in a rounded knob or tubercle; their great height gives to the upper surface of the head a canaliculated appearance; a second ridge descends from each of these, and completes the posterior border of the orbit. The upper jaw is yellowish-brown, and deeply emarginate in front; the lower is white, and furnished at its anterior part with a distinct hook, which is received in the notch of the upper jaw.

The nostrils are small and round, placed near the point of the snout. The eyes are large, prominent, and very beautiful; the pupil is black, the iris reticulated with gold and black, and has an inner margin of yellow. The tympanum is large and dusky, with a minute spot of a lighter shade in the centre. The parotid glands are large, reniform, and exude a pale milky fluid when pressed; the orifices of the canals, out of which it flows, are evident.

The back and sides are dusky, and covered with warts of different sizes; a pale vertebral line extends from the head to the vent, on each side of which are found the largest warts; an irregular row of spots of yellowish-white exists on the flank, having somewhat the appearance of an indistinct band, extending from the inferior and posterior part of the parotid gland to within a short distance of the thighs. The whole inferior surface of the animal is dirty-white, with a strong tinge of yellow.

The anterior extremities are short; the upper surface is dusky, with blotches

and bars of dark brown; the lower surface dirty-white, tinged with yellow. The fingers are four in number, slightly depressed, and not palmated. On the outer margin of the carpus, and opposite the thumb, is a large warty tubercle. The posterior extremities are short, dusky brown above, marked with blotches and transverse bars of darker brown, and dingy-white beneath. The toes are five in number, and semi-palmated; the fourth a good deal longer than the others; the metatarsus is furnished with two tubercles or knobs, the outer of which is cartilaginous, and so long as to resemble a sixth toe.

**DIMENSIONS.** Length of body, 2 inches 7 lines; of the thigh, 1 inch; of leg, rather less than an inch; of tarsus and toes, 1 inch 2 lines.

**GEOGRAPHICAL DISTRIBUTION.** This toad is found in the Carolinas, Georgia, the Floridas, and Alabama, and without doubt all along the northern shores of the Gulf of Mexico. North Carolina or southern Virginia must for the present be considered as its northern limit.

**HABITS.** This animal is timid and remarkably gentle in its habits, remaining concealed during the day in some dark place, and only venturing out as the dusk of evening approaches. It feeds on various insects, which it seizes only while alive and in motion. Catesby says it lives on ants and fire-flies, and will mistake a piece of burning charcoal for an insect of the latter description. The male seeks the female in the month of May, when hundreds of them may be seen together in some stagnant pool, in which they deposit their spawn, and then return again to the land. The males at this season are extremely noisy, though at other times they are silent, or make only a slight chirp when taken. Like many of the *Hyla* tribe, they have a large sac under the throat, which is distended when the animal croaks.

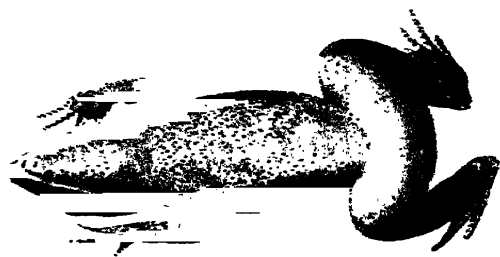
I have seen an individual kept for a long space of time, which became perfectly tame: during the summer months he would retire to a corner of the room, into a habitation he had prepared for himself, in a small quantity of earth, placed there

for his convenience. Towards evening he would wander about the room in search of food, seizing greedily whatever insect came in his way. Some water having been squeezed from a sponge upon his head one hot day in July, he returned the next to the same spot, and seemed very well pleased with the repetition; nor did he fail during the extreme heat of the summer to repair to it frequently, in search of his shower-bath.

**GENERAL REMARKS.** Catesby first described and gave a figure of this animal under the name of Land-frog; and although his figure is badly executed, both as to drawing and colouring, (the elevation of the superciliary ridges not being marked, and the eyes represented as red,) it has been repeatedly copied by later naturalists, as Foster, Shaw, &c. The name, however, *Rana (Bufo) terrestris*. cannot be retained, as it is previously applied to another animal.

Bosc, who, from a long residence in Carolina, had a good opportunity of examining this animal, refers it to the *Rana musica* of Linnæus, in which he is followed by Daudin, Merrem, and most naturalists. This cannot be correct, for there are no toads, as far as has been hitherto ascertained, common to North and South America; and Linnæus, in the twelfth edition of the *Systema Naturæ*, gives Surinam as the country of his *Rana musica*. Neither the specific name *terrestris*, nor *musicus*, can then be applied to this animal, but we must give it the one next in order under which it is found described—*Rana (Bufo) lentiginosa* of Shaw.





**Bufo erythronotus.**





BUFO ERYTHRONOTUS.—*Holbrook.*

*Plate II.*

**CHARACTERS.** Head short, rather pointed; upper jaw entire; body short and thick, brick-dust colour above, dirty yellowish-white and granulated beneath. Length, 20 lines.

**DESCRIPTION.** The head is short, brownish-red above, with the superciliary ridges but slightly elevated, and the snout rather pointed. The upper jaw is entire, or without a notch, and brown, with a few reddish-white spots; the lower jaw is white. The nostrils are small and near the snout, with a very slight ridge extending to the front of the orbit. The eyes are very large and prominent, with a black pupil and bright golden iris, through which passes a black band. The tympanum is small, brown below and red above. The parotid glands are kidney-shaped, and secrete a greyish-white fluid. The body is short, thick, and rounded, warty or granulated above, of Spanish-brown colour, with a light vertebral line. The throat and chest are silver-white, with small dusky spots; the abdomen yellowish-white, and minutely granulated.

The anterior extremities are small, pepper-and-salt grey above, with alternate transverse bars of brick-dust colour and black; there are four fingers, distinct, and nearly of equal length, with a very large wart or knob at the carpus, and a smaller one beside it. The posterior extremities are short, and coloured like the anterior; there are five toes, semi-palmate, the fourth longest; there are also two prominences, or warts, at the tarsus.



**DIMENSIONS.** Length of body from snout to vent, 20 lines; of thigh, 6 lines; of leg, 6 lines; of tarsus and toes, 6 lines.

**HABITS.** This animal is found in the deep forests of oak in the neighbourhood of Charleston, and is apparently rare, as in nine years I have not seen more than a dozen specimens, consequently nothing can be said of its habits.

**GEOGRAPHICAL DISTRIBUTION.** As yet this animal has only been observed in South Carolina.

**GENERAL REMARKS.** There is no doubt that this animal is an adult, though I was at first disposed to consider it the young of the large toad of similar colour mentioned by Bartram in his Travels in Florida, which as yet I have never seen. Subsequent observation has, however, convinced me to the contrary; for Bartram's animal weighed nearly a pound, while no specimen of the *Bufo erythronotus* exceeded twenty lines in length; nor can it be the young of the *Bufo lentiginosus*, as the superciliary ridges are not elevated, and the slight elevation that does exist is between the nostrils and orbit; or the young of the *Bufo Americanus*, which is sometimes red, for this latter animal does not inhabit the low country of South Carolina, nor has it the spade-like process at the foot, as in that animal; nor, in fact, is it the young of any animal, as might be inferred from its size, for I have seen the male and female together, and have seen their spawn.





**Bufo quercicus.**





BUFO QUERCICUS.—*Holbrook.**Plate III.*

**CHARACTERS.** Head short; snout pointed; superciliary arches slightly elevated; body short, very flat, rounded at the flanks, above dusky, with a yellowish vertebral line, on each side of which are black blotches; abdomen silver-grey; throat dusky; groins tinged with yellow.

**DESCRIPTION.** The head is short, with the snout rather pointed, and the nostrils near its extremity; from each nostril extends a slightly elevated ridge, increasing in height to the occiput, where it terminates in a small knob. The eyes are prominent and beautiful, with a black pupil and grey iris, having an inner circle of bright golden; the tympanum is evident but small; the parotid glands are oblong and large, though but slightly elevated.

The body is short and greatly depressed, almost flat; while the flanks are so rounded and projecting as to give the animal an orbicular appearance. The abdomen is flat and completely granulated.

The anterior extremities are small, short, and terminate in four fingers, with a small wart at the carpus; the posterior extremities are also short, small, and delicate, with five slightly webbed toes, and two small warts at the metatarsus.

**COLOUR.** The head above is dusky, with a yellowish central longitudinal line; the superciliary ridges are grey, with a white mark in the centre; on each side of this longitudinal line is an oblong black spot, extending from it to include most

of the posterior part of the orbit of the eye; a small part only of the orbit in front of this is light coloured; the upper jaw is light brown.

The back of the animal is dusky-brown, with a vertebral line of pale yellow, marked with a few scattered small warts of reddish-brown colour; on each side of this line are irregular black blotches, with here and there a slight tinge of reddish-brown; the back is covered with innumerable warts and granulations, of variable size and colour, generally black, but the smaller ones of dusky-red; on each flank, and extending from the axilla downwards towards the posterior extremity, is an oblong black blotch, bounded with white both above and below.

The throat is dusky; the abdomen silver-grey, yellowish at the groins, and with a pale tinge of yellow around the vent. The anterior extremities, as well as the posterior, are dusky-brown above, marked with black transverse bars or spots; their inferior surface is coloured like the abdomen, except the fingers and toes, which are reddish-brown.

**DIMENSIONS.** Length of the animal from the snout to vent,  $\frac{3}{4}$  of an inch; length of thigh, 5 lines; length of leg, 5 lines; length of tarsus and toes,  $6\frac{1}{2}$  lines.

**HABITS.** This beautiful little species of toad is mostly found about sandy places that are covered with a small species of oak, which springs up so abundantly where pine forests have been destroyed; whence it is commonly enough called the Oak Frog, which specific name I have preferred. It spends most of its time in concealment under fallen leaves, or partially buried in the sand, from which it is washed out by heavy rains. In the breeding season they seek out stagnant pools, where they deposit their spawn, during which time the male makes a slight chirp, not unlike some kinds of insects.

**GEOGRAPHICAL DISTRIBUTION.** As yet the range of this animal seems very limited: I have only found it near Charleston in South Carolina, and at Smithville

in North Carolina; further observation will doubtless prove its existence in other states.

**GENERAL REMARKS.** That this little animal is not the young of any other species I am certain, for

1. It cannot be the young of the *Bufo lentiginosus*, for the superciliary ridges are not elevated in proportion, the upper jaw is not emarginate, and with the young of that species I am well acquainted.

2. It cannot be the young of the *Bufo Americanus*, as that animal is not found near Charleston, and besides, it wants the characteristic spade-like process to the foot.

3. It cannot be the young of the *Bufo erithronotus*, for its whole form is different. It is not half the size, nor are its toes half as extensively webbed; it is, in fact, a distinct and adult animal, for I have seen male and female together, and have seen the female deposit her spawn, even when confined in a glass vessel.









Bufo Americanus.





BUFO AMERICANUS.—*Leconte.*

*Plate*

**CHARACTERS.** Head short; snout rounded; nostrils placed near the snout; tympanum moderate and very distinct; parotid gland narrow, elongated, elliptical; body short, bloated; anterior extremities large, fingers free; posterior extremities short, toes semi-palmated; a spade-like process at the root of the first toe.

**SYNONYMES.** *Bufo Americanus, Leconte.*

*Bufo musicus, Harlan, Journ. Acad. Nat. Scien., vol. v. p. 344.*

Common Toad, *Vulgo.*

**DESCRIPTION.** The head is short, with the snout almost rounded; the mouth is much smaller than in the *Bufo lentiginosus*, and the jaws are entire. The nostrils are small, and placed near the snout. The eyes are large and brilliant; the pupil dark, with the iris presenting a minutely reticulated appearance of black and gold. The superciliary ridges are but slightly elevated, and do not terminate in a knob posteriorly; the membrane of the tympanum is moderate and very apparent; the parotid glands are narrow, elliptical, and very long.

The body is short, thick, and bloated, and has its superior surface covered with warts of different sizes. A longitudinal line of dirty-white runs from the occiput to the vent; on each side of this are several conspicuous, well-defined spots, varying in colour, size, and shape: we sometimes find them systematically arranged in rows. Along the flanks is a broad but indistinct band, extending to the posterior extremities; this band is so broken as to give the appearance of a

row of black and white spots. The abdomen is granulated, and of a dirty yellowish-white.

The anterior extremities are short; their upper surface dusky, with minute spots of white; the lower is of the same colour as the abdomen; the fingers are distinct, and not palmated. The posterior extremities are short, their superior surface ash-colour, with blotches and transverse bands of black, extending to the tarsus; the leg is shorter than the thigh; the toes are semi-palmated, and five in number; a large spade-like process occupies the place of a sixth, on the metatarsus, as in *Scaphiopus*.

**DIMENSIONS.** Length from snout to vent,  $2\frac{1}{2}$  inches; of thigh, 1 inch; of leg, less than an inch; of tarsus and toes, 1 inch 6 lines.

**GEOGRAPHICAL DISTRIBUTION.** This is the most widely diffused of all the American toads. I have observed it from the mountains of Maine through all the Atlantic states. It is, however, remarkable that this animal leaves the sea shore in the south; for I have never met with it in the low country of South Carolina, although common in the upper districts of the state. Leconte has traced it along the western side of the Alleghanies, and in the valley of the Mississippi.

**HABITS.** This animal is very mild and timid, living under stones or dead or decaying trees, or in holes in the earth, and frequently making its way into cellars, and dark and lonely corners: as evening approaches, it issues from its place of concealment in search of insects, and at these times frequently falls a prey to snakes and owls. It may be brought to a partial state of domestication, and will swallow flies from the hand.

Early in the spring these animals resort to shallow pools in great numbers, for the purpose of depositing their spawn, and at these times their music is very

familiar to all, consisting of a prolonged trill, continued by different individuals, both day and night, and not unpleasant when at a sufficient distance.

The toad is looked upon with aversion by the greater part of mankind; its swollen body, its warty and tuberculous skin, with the large parotid glands, give it such a repulsive appearance, that it seems hard to believe an innocuous disposition can belong to a shape and colour so offensive to the eye; hence the vulgar have always considered it venomous: it is nevertheless perfectly harmless, destroying only the insects that nature has apportioned for its food. To an unhandsome exterior, however, it often owes its safety, being very abundant and entirely helpless.

It has been commonly supposed that the humour exuding from the skin and glands is poisonous, yet no experiments have proved it so, and certainly no injury has ever arisen from handling or examining the animal. Experiments have been made in Europe with the secretions of the common toad of that continent, and apparently with different results; for naturalists are still at variance—Laurenti\* considered the exudation innocuous, while Oken† believes it poisonous, and his opinion is supported by some interesting experiments of Davy,‡ which prove that “the skin of the European toad is possessed of minute follicles, secreting a thick yellow fluid, of a poisonous nature.”

**GENERAL REMARKS.** Leconte was the first to separate this toad from the southern animal, with which it had been previously confounded.

Schlegel considers the *Bufo Americanus* as identical with the common toad of Europe, from which however it differs specifically.

1. The head is smaller in proportion.

\* Laurenti, Synop. Rep. p. 195.

† Oken, Zool., B. II., § 198.

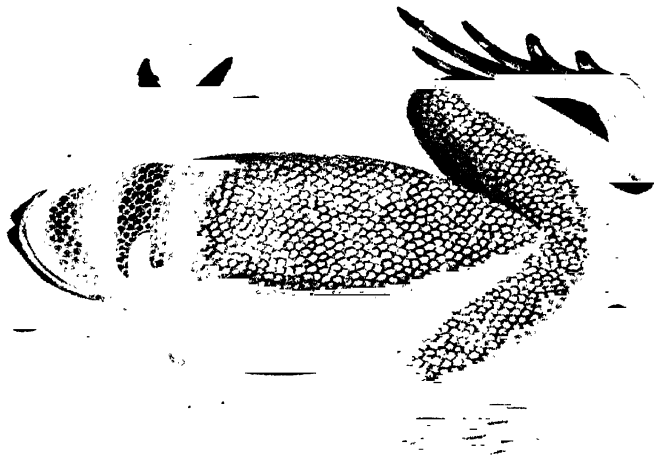
‡ Dr. Davy, Phil. Trans. for 1826, Part II., p. 127.



2. The body is less full and bloated.
3. Its motion and gait are much more lively and active.
4. It differs entirely in having a spade-like process at the root of the first toe, which in a measure approximates it to the Scaphiopus.

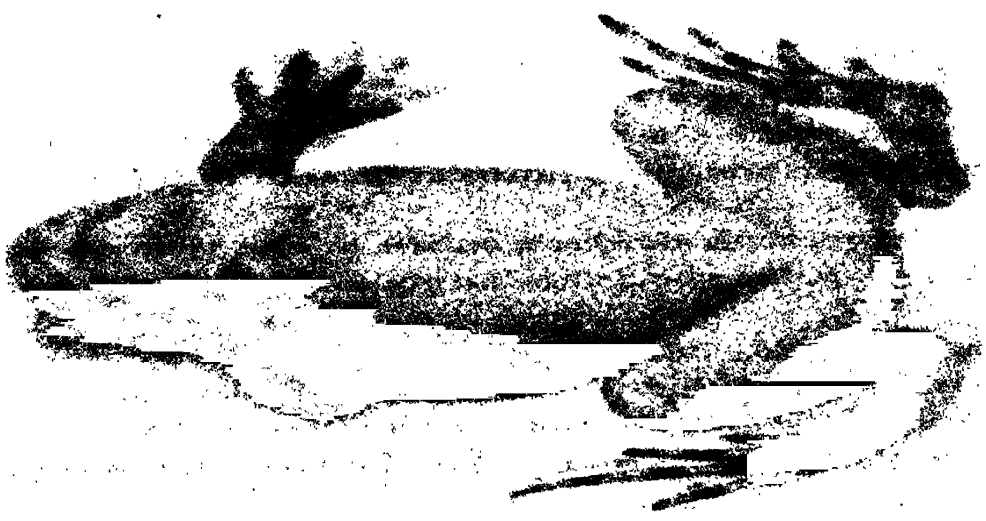
Leconte first proposed calling this animal *Bufo Americanus*; and although he has never published a description, still it is due to him to retain the name, which seems to me sufficiently appropriate; for although there are many toads in the United States, there are none so common, so widely extended, and so much like the *Bufo communis* of the old world. Indeed, we regard it as the representative of that animal in North America, and have taken it as the type of our genus *Bufo*.





*Bufo cognatus.*





BUFO COGNATUS.—*Say.**Plate V.*

**CHARACTERS.** Head large, canaliculated posteriorly, smooth anteriorly; body above dusky, verrucose, and marked with vertebral and oblique lateral lines of yellowish-brown; abdomen dirty white and granulated; feet armed with a spade-like process near the root of the first toe.

**SYNONYMES.** *Bufo cognatus*, *Say*, in Long's Exped. to Rock. Mount., vol. ii. p. 190.

*Bufo cognatus*, *Harlan*, Med. and Phys. Res., p. 109.

**DESCRIPTION.** The head is large, rounded at the snout, and canaliculated or marked with a deep groove above. This groove begins at the posterior part of the head, where it is deep, but it hardly reaches the anterior canthus of the eye, when it disappears, and the remaining portion of the head is smooth.

The nostrils are rather near the snout. The eyes are large and prominent, with the pupil dusky and the iris grey, reticulated with bright yellow.

The mouth is very large, with the jaws entire. The tympanum is distinct, but of moderate size. The parotid glands are large, and of oblong form.

The body is thick, rounded, dusky-brown above, and is covered with small black warts, which are most numerous and prominent near the sides. A yellowish-brown vertebral line extends from the head to the rump, from which proceed oblique lateral lines of the same colour. The first oblique lateral line begins at

the head and runs to the side, behind the shoulder; the second begins near the middle of the back by two branches which soon unite and run to the groin; a third line begins still further back and extends to the hips.

The abdomen is dingy yellowish-white, and is thickly granulated.

The anterior extremities are dusky-brown above, and dingy-white below, with four fingers, free in their whole extent. The posterior extremities are well developed, coloured like the back above, with bars of yellowish-brown, and are dingy-white below. There are five toes, semi-palmated, with a spade-like process at the metatarsus, near the root of the first toe.

**DIMENSIONS.** Length,  $3\frac{1}{4}$  inches.

**HABITS.** The *Bufo cognatus* "resides in prairies destitute of timber, where they are much exposed to the direct rays of the sun."

**GEOGRAPHICAL DISTRIBUTION.** This toad has as yet only been found towards the foot of the Rocky Mountains.

**GENERAL REMARKS.** Mr. Say was the first naturalist that observed this reptile, which he described under the specific name *cognatus*. I have never seen the living animal, and cannot, therefore, answer for the correctness of the colours of the accompanying plate. The specimen that I saw seemed closely allied to the *Bufo Americanus*, yet it is a larger animal, with the head shorter and broader, and the body differently marked; and Say observes that its habits are different, as it does not dislike the sun's rays.







**Engystoma. Carolinense.**

*on Stone by L. Brecheim*

*P.S. David, Little Hill*





ENGYSTOMA.—*Fitzinger.*

GENUS ENGYSTOMA.—CHARACTERS. Head small, pointed; mouth minute; tongue elongated, elliptical, movable only at its posterior extremity; tympanum concealed; jaws and palate without teeth; males with a sub-gular vocal vesicle; body oval, covered with a smooth skin; no parotid glands; anterior extremities with four fingers, free; posterior short, with five toes, not palmated.

ENGYSTOMA CAROLINENSE.—*Holbrook.*

*Plate VI.*

CHARACTERS. Head small, short, pointed; body short, thick, nearly oval, covered with a delicate skin; chestnut above, and thickly mottled with blackish specks beneath.

SYNONYME. *Engystoma Carolinense*, *Dumeril et Bibron*, *Hist. Nat. des Rept.*, tom. viii. p. 743.

DESCRIPTION. The general form of this animal approaches the oval; the skin is smooth; the head remarkably small and short, though large for the genus; its extent is marked by a delicate fold of the integuments behind the orbits; its shape is triangular, the snout being very pointed; the upper jaw is dark brown, the lower dark grey; the mouth is inferior and minute.

The nostrils are very small, lateral, and placed near the snout. The eyes are



## FAMILY II. CAUDATA.

## CHARACTERS.

1. The presence of a tail, at all periods of their existence, readily distinguishes the animals of this family from those of the last, though it varies in length and in form.
2. The body is elongated, round, and covered with a skin adherent to the muscles beneath.
3. The extremities vary in number; there may be four, (Salamandra,) or two, (Siren.)
4. The tongue varies in shape, size, and mode of attachment.
5. The tympanum is not visible.

REMARKS. Fitzinger makes a very natural subdivision of this family into two tribes.

*Mutabilia*, or such as undergo a metamorphosis, as Salamanders; and

*Immutabilia*, or such as are hatched with the forms they are permanently to retain, like the Siren.

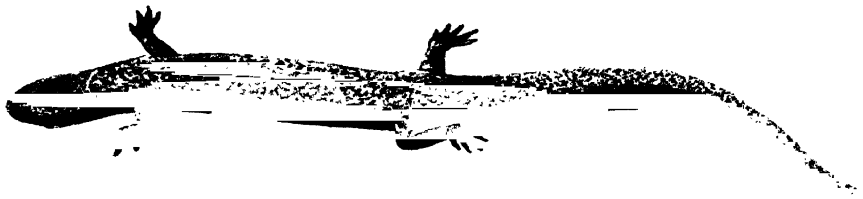
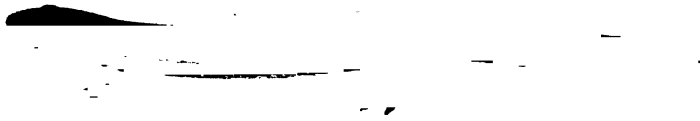
**TRIBE I. MUTABILIA.****CHARACTERS.**

The animals of this tribe undergo a complete metamorphosis; the young breathe only in water, and with gills, like fish; but in their adult state, respiration is performed with lungs.

The tribe Mutabilia includes two genera, Salamandra and Triton, distinguished by their mode of existence, whether terrestrial or aquatic, and each with its peculiar and appropriate organization.







*J. Queen del*

**Salamandra gutto-lineata.**

*P.S. Dural. Lith. Engr. del. &c.*





S A L A M A N D R A .—*Laurenti.*

GENUS SALAMANDRA.—CHARACTERS. Maxillary and palatine bones armed with minute teeth; tongue more or less pediculated, and free; body elongated, round, without a sternum; ribs in a rudimental state; pelvis suspended by ligaments; tail of variable form, most commonly round; extremities four; fingers four; toes five.

REMARKS. The animals of this genus live entirely on land in their adult state, or are only found in water during their breeding season, when they approach it to deposit their spawn.

Salamanders may be arranged in two sections, according to the disposition of their teeth.

I. *Salamanders with palatine teeth in transverse and longitudinal series.*SALAMANDRA GUTTO-LINEATA.—*Holbrook.**Plate VII.*

CHARACTERS. Head short and thick; snout obtuse; body pale straw-colour above, with a vertebral line of black, bifurcating behind the occiput; a lateral black band, in which is a row of white spots, and beneath this a white line. Tail nearly twice as long as the head, neck, and body.

**DESCRIPTION.** The head is short and thick, with the snout rounded. The mouth is rather large; the tongue is round or mushroom shaped, attached by a small pedicle in the centre, and is very movable. The palate is armed with numerous and minute teeth; a transverse series begins on each at the internal and posterior margin of the posterior nares; run inward and backward and unite in the middle of the palate; behind these teeth, and after a smooth space of a line, begins a broad longitudinal group that occupies the centre of the palate, increasing in breadth posteriorly.

The nostrils are antero-superior near the snout, and open upwards. The eyes are large and prominent, with a black pupil and a flame-coloured iris. The neck is but slightly contracted, and has a distinct transverse fold at the throat.

The body is elongated and cylindrical. The anterior extremities are small, and terminate in four fingers; the posterior are larger and stronger, and end in five toes. The tail is round, and very long.

**COLOUR.** The head is yellow above, mottled with black; the upper jaw yellowish, the lower whitish. The neck, body, and tail above are straw-colour; behind each orbit begins an indistinct line of black, which unite half an inch back of the occiput, and form a large vertebral line, which is extended to one inch beyond the posterior extremities; from the snout runs a black band through the lower part of the iris, along the flank, to near the end of the tail; beneath this is a white line, extending from the angle of the mouth along the flanks above the anterior and posterior extremities to about midway of the tail. The whole inferior surface of the neck, abdomen and tail, below the lateral white line, is dark grey. The superior surface of the anterior and posterior extremities is yellow; both the arms and the thighs have a black line on their posterior faces; the latter a white line, continuous with the white lateral one already described.

**DIMENSIONS.** Length of head, 7 lines; length of body to vent, 2 inches; length of tail, 4 inches 4 lines: total length, 6 inches 11½ lines.

**HABITS.** The *Salamandra gutto-lineata* is a land animal, and only seeks the water, as do others of the genus, at certain seasons of the year. They are most commonly found in damp, moist places, as under fallen trees, or near springs of water.

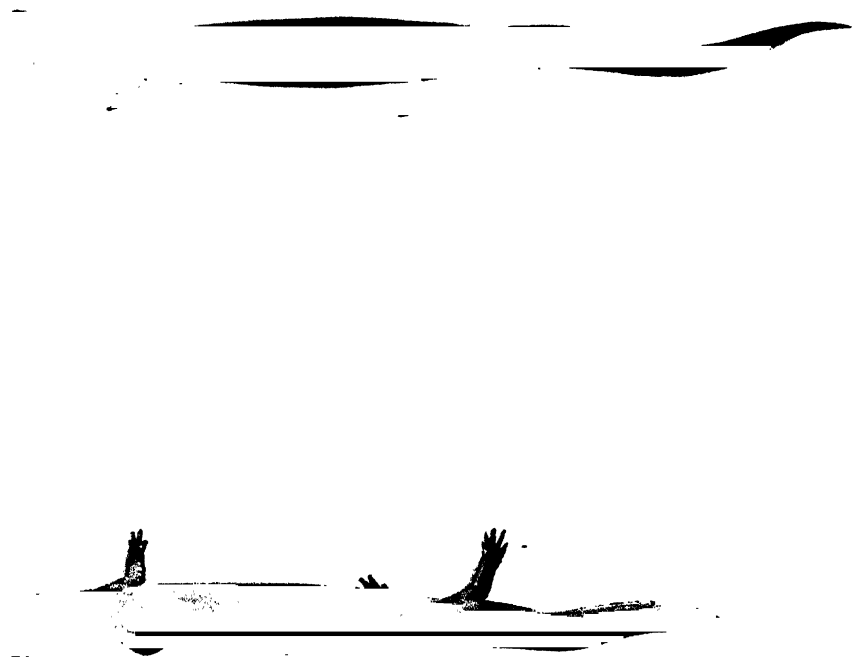
**GEOGRAPHICAL DISTRIBUTION.** This animal has only yet been observed in Carolina, where I have seen them in the middle country; and Dr. Wurdeman has furnished me with specimens from Greenville, near the mountains, where he says they abound.

**GENERAL REMARKS.** The *Salamandra gutto-lineata* bears some resemblance to the *Salamandra cirrigera* of Green, though it is three times the size; and indeed one of the four specimens that have fallen under my observation had two small cirri to the upper jaw. These cirri, however, should not be looked upon as of any great consequence in determining the species, for some have them, others not; and the same I know to be true of the *Salamandra cirrigera*. They should rather be regarded as certain developments that take place during the generative season of the animal, and disappear when that is passed. The *Salamandra cirrigera* differs furthermore from the *Salamandra gutto-lineata* in having a black lateral line only; the white spots, the white lateral and black vertebral lines that characterize the latter, are wanting in the *cirrigera*.









**Salamandra salmonea.**





SALAMANDRA SALMONEA.—*Storer*.*Plate VIII.*

**CHARACTERS.** Head large, flat; snout obtuse, truncated, with a salmon-coloured line on each side to the orbits; body and tail yellowish-brown above; salmon-colour, with a tinge of yellow, at the sides.

**SYNONYME.** Salamandra salmonea, *Storer*, MSS.

**DESCRIPTION.** The head is large and flattened above, with a broad and almost square snout. The mouth is rather large; the tongue is small, sub-round, and attached by a slender and rather short pedicle. The palatine teeth begin on each side at the outer and posterior margin of the posterior nares, which are very large; thence they run inwards and forwards to a line with their anterior border, and then suddenly turn back and run parallel to each other throughout the whole length of the palate. These teeth are all exceedingly minute and much arched backwards.

The nostrils are near its extremity, far apart, and antero-superior. The eyes are very prominent and large, the pupil deep black, the iris shining copper-colour. The skin of the chin and neck is smooth, with a transverse fold.

The body is cylindrical and much elongated. The tail is longer than the body, thick and rounded at the root, compressed laterally, and pointed at the tip.

The anterior extremities are short and small, with four fingers, distinct, the

second and third longest. The posterior extremities are twice the size of the anterior, and terminate in five toes, distinct, the third and fourth longest.

**COLOUR.** The head is yellowish-brown above, and salmon-colour at the sides, with a very bright salmon-coloured line extending from the nostril to the superior part of the orbit of the eye. The upper jaw is pale salmon-colour, with a few brown spots; the lower is nearly white, or palest flesh-colour. The chin and throat are white. The upper surface of the body and tail is yellowish-brown, with greyish marks; the flanks and sides of the tail are salmon-colour, with a tinge of yellow; the thorax and abdomen are white; the under surface of the tail is pale salmon-colour. The anterior extremities are yellowish-brown above and clear white below; the posterior are of similar colour, both above and below.

**DIMENSIONS.** Length of head, 7 lines; length of body to vent,  $2\frac{1}{2}$  inches; tail beyond the vent,  $2\frac{1}{2}$  inches: total,  $6\frac{1}{2}$  inches.

**HABITS.** But little is known of the habits of the *Salamandra salmonea*; it was first observed on land, in a moist situation, among the mountains of Vermont, by Dr. Binney, who kept it alive for nearly a year, feeding it on flies, which it devoured very greedily.

**GEOGRAPHICAL DISTRIBUTION.** This Salamander seems peculiar to the mountainous parts of our country. Dr. Binney found it in Vermont; Dr. Dekay observed it in Essex county, New York; and M. Cabanis, a Prussian naturalist, procured me several specimens among the mountains of South Carolina.

**GENERAL REMARKS.** To my friend Dr. Storer, of Boston, I am indebted for the description of the *Salamandra salmonea*.





*On Stone by J. S. G. Allen*

**Salamandra rubra.**

*J. S. G. Allen, 1846. Plate 10*







SALAMANDRA RUBRA.—*Daudin*.*Plate IX.*

**CHARACTERS.** Head short; snout rounded; eyes prominent; body above red, with numerous small black points; flanks red, immaculate; abdomen orange-red, immaculate.

**SYNONYMES.** *Salamandra rubra*, *Daudin*, Hist. Nat. des Rept., tom. viii. p. 227, pl. xcii. fig. 2.

*Salamandra rubra*, *Latreille*, Hist. Nat. Rept., tom. iv. p. 305.

*Salamandra rubriventris*, *Green*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 353.

*Salamandra rubriventris*, *Harlan*, Med. and Phys. Res., p. 97.

*Salamandra maculata*, *Green*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 350.

*Salamandra maculata*, *Hurlan*, Med. and Phys. Res., p. 96.

*Salamandra sub-fusca*, *Green*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 351.

*Salamandra fusca*, *Green*, Jour. Acad. Nat. Scien., vol. i. p. 357.

*Salamandra fusca*, *Harlan*, Med. and Phys. Res., p. 96.

**DESCRIPTION.** The head is rather large, with the snout rounded; the mouth is small; the tongue round, attached by a short pedicle, but is very movable. The palate is armed with a series of minute teeth that begin on each side behind, and without the posterior nares, which are very small; these run first inwardly, but do not meet in the middle of the palate, as they suddenly turn backwards in a longitudinal direction, the two series separating from each other more and more posteriorly.

The nostrils are antero-superior and near the snout. The eyes are prominent,

with the pupil black and the iris golden and large. The neck is not much contracted, and has a marked cutaneous fold at the throat.

The body is cylindrical and stout; the anterior extremities are small, and are furnished with four fingers; the posterior are larger, and have five toes, slightly palmated at their root. The tail is shorter than the body, thick at the root, but soon becomes tapering, ends in a point, and is compressed laterally.

**COLOUR.** The whole superior surface of the animal is red, with a few scattered black points about the head, and becoming very numerous along the back and tail; the flanks are brighter red and immaculate; the whole inferior surface of the animal is orange-red; the extremities are coloured like the flanks above, and like the abdomen below, but rather less bright.

**DIMENSIONS.** Length of head, 6 lines; length of body,  $2\frac{1}{4}$  inches; length of tail, 2 inches: total length, 4 inches 9 lines. I have observed individuals of still greater dimensions.

**HABITS.** The *Salamandra rubra* is a land animal, and is found under rocks, fallen and decaying trees, &c., and preying on such small insects as inhabit the same localities. Dr. Green has also frequently seen it in the water, whither it doubtless repaired during the breeding season; and he observed that it was then much more lively and active than when met with on land.

**GEOGRAPHICAL DISTRIBUTION.** This Salamander inhabits the Atlantic states from Massachusetts to Florida, inclusive; but I have no knowledge of its existence west of the Alleghany Mountains.

**GENERAL REMARKS.** Palisot de Beauvais was the first naturalist who observed this animal, which is certainly one of the most beautiful of our Salamanders; he found it under logs and in shady places in Pennsylvania, during his residence there.

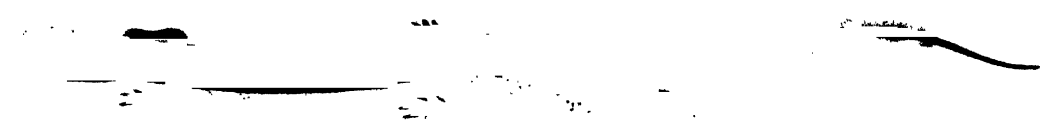
Daudin, however, gave the first description of it, and this he accompanied with a tolerable figure; he is wrong, however, in supposing the abdomen to be marked with a dusky line.

I refer, without much hesitation, the *Salamandra sub-fusca* and *Salamandra maculata* of Green to the *Salamandra rubra*, although I have never had an opportunity of examining those animals, yet Dr. Pickering informs me that they are identical; and even Mr. Green was latterly in doubt whether they were distinct species.



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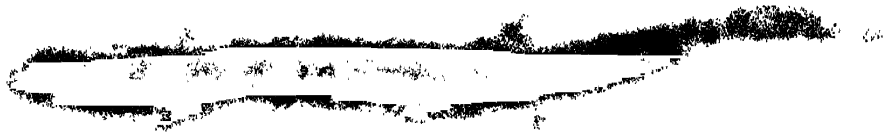
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*Salamandra glutinosa.*







SALAMANDRA GLUTINOSA.—*Green.**Plate X.*

**CHARACTERS.** Head large, semi-oval; tail round, nearly twice the length of body. Colour above bluish-black, with minute white spots on the back and tail, larger and frequently confluent white spots on the flanks.

**SYNONYMES.** *Salamandra glutinosa*, *Green*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 357.

*Salamandra variolata*, *Gilliams*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 460.

*Salamandra cylindracea*, *Hurlan*, Med. and Phys. Res., p. 94.

**DESCRIPTION.** The head is large and approaches a semi-oval form; the snout is rather pointed than rounded. The mouth is rather large; the tongue is thin, sub-cordiform, broadest behind, and attached by a pedicle, rather broad and short. The palate is armed with minute teeth, which begin on a line with the posterior and external face of the posterior nares on each side, and run at first transversely or inwards, and then a little backwards, but they do not meet in the middle of the palate; half a line behind these begins a group of numerous small teeth, which extend throughout the whole length of the middle and posterior part of the palate, increasing in breadth posteriorly.

The nostrils are lateral, and near the snout. The eyes are large and prominent; the pupil black; the iris dusky. The neck is slightly contracted, with a large cutaneous fold at the throat.

The body is elongated and cylindrical. The tail is nearly twice the length of the body, cylindrical, or almost imperceptibly compressed at its tip.

The anterior extremities sustain four fingers; the posterior are twice the size of the anterior, and terminate in five toes, slightly united at their roots.

**COLOUR.** The ground colour of this animal is a beautiful bluish-black over the whole superior surface; the back and tail is sparsely dotted with minute white spots, more or less abundant; on the flanks and sides of the tail these spots are much larger and frequently confluent: sometimes specimens occur where all these spots are nearly wanting, and the animal then appears of a simple bluish-black colour.

**DIMENSIONS.** Length of head, 6 lines; length of body, 2 inches 3 lines; length of tail, 3 inches 10 lines: total length, 6 inches 10 lines.

**HABITS.** The *Salamandra glutinosa* lives most of its time concealed under rocks, or under the bark of fallen and decaying trees, and is frequently so numerous that many are found under the same tree. Fallen trees seem a favourite residence of this species of animal, probably because the insects it preys upon choose the same locality; it will, however, emerge from its place of concealment after rains or in the dusk of evening in search of its prey.

**GEOGRAPHICAL DISTRIBUTION.** This I consider as the most common of the North American Salamanders, and most widely diffused, abounding from latitude 43° to the Gulf of Mexico. Dr. Pickering has seen it in Ipswich, Massachusetts, and Dr. Storer in the neighbourhood of Boston; Professor Green in Pittsburg, Pennsylvania; Say in Florida; and I have seen it in Virginia and in the Carolinas, and have received it from Georgia, Alabama, and Louisiana.

**GENERAL REMARKS.** To Professor Green belongs the merit of having first observed and accurately described this animal, under the name *Salamandra glutinosa*; and nearly at the same time, and in the same work, Gilliams gave it a new description and a new name, *Salamandra variolata*; long afterwards Dr.

Harlan adds a third specific name, *cylindracea*, for the same animal. I have retained, however, that imposed by Professor Green, as it has the right of priority, and is on the whole well enough, as the animal gives off a great quantity of glutinous matter when taken in the hand.







*Salamandra erythronota.*







SALAMANDRA ERYTHRONOTA.—*Green.**Plate XI.*

**CHARACTERS.** Head short, snout obtuse; body cylindrical, with a broad reddish-brown vertebral band, from the snout to the end of the tail; flanks yellowish-brown; abdomen white; tail shorter than the body, tapering and pointed.

**SYNONYMES.** *Salamandra erythronota*, *Green*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 356.

*Salamandra cinerea*, *Green*, loc. cit., vol. i. p. 356.

*Salamandra erythronota*, *Harlan*, Med. and Phys. Res., p. 95.

*Salamandra cinerea*, *Hurlan*, loc. cit., p. 95.

**DESCRIPTION.** The head is short, and the snout rather pointed. The mouth is small; the tongue is sub-round, rather large, flat, thin, attached posteriorly, and free only at its lateral margins; less so in front. A group of minute teeth begins behind each of the posterior nares, and runs backwards and inwards until they meet; thence they are continued along the middle of the palate to its posterior part, the group being broadest behind.

The nostrils are lateral and near the snout. The eyes are small, but very prominent; the pupil black, the iris copper-colour. The skin on the chin is smooth, with a transverse cutaneous fold at the throat.

The body is cylindrical and slender; the tail round at its root, and terminating in a point. The anterior extremities are delicate, and terminate in four fingers, the inner one very short; the posterior are much larger, and end in five toes, distinct, the internal as well as the external very short.

**COLOUR.** The head above is reddish-brown, the upper and lower jaw tinged with yellow. The back is marked with a broad vertebral band of reddish-brown, which extends to near the tip of the tail; below this the flanks are yellowish-brown, as well as the sides of the tail. The anterior and posterior extremities are yellowish-brown above. The whole inferior surface of the animal, body, tail and extremities, is dusky-white.

**DIMENSIONS.** Length of head,  $3\frac{1}{2}$  lines; of body to vent, 1 inch 3 lines; of tail beyond vent, 1 inch 2 lines: total length, 2 inches 8 lines.

**HABITS.** This is entirely a land animal, and is found under rocks and stones.

**GEOGRAPHICAL DISTRIBUTION.** The *Salamandra erythronota* is, perhaps, the most common species in the northern states, from latitude  $44^{\circ}$  to  $39^{\circ}$ ; it is abundant in the neighbourhood of Boston and Philadelphia; and if it be identical with the *Salamandra cinerea*, of which I have no doubt, then is its range very extensive, for Dr. Blanding has seen it as far south as Camden, in South Carolina, and Say as far west as Louisville, in Kentucky.

**GENERAL REMARKS.** The *Salamandra cinerea* is no doubt identical with the *Salamandra erythronota*—its form, its proportions, its habits and localities are precisely the same, being often found in company under the same stone; its colour is the same, except in having only a small remnant of the reddish-brown vertebral band, or in wanting it altogether, which may be the result of old age. Dr. Green, who first described the *Salamandra cinerea*, has, by further investigation, come to the conclusion that these two species are identical; and in this he is supported by Dr. Pickering. I have never had the opportunity of examining these animals alive, as might be desired.

To Professor Green belongs the merit of having first observed and described the *Salamandra* now under consideration; for although he believed it was only a variety of an animal described by Rafinesque, yet he informed me that Rafinesque

afterwards told him that the *Salamandra erythronota* was not the animal he (Rafinesque) had in view, and which, indeed, he had published under some other name.

To Dr. Dekay I am indebted for the drawing of this animal, which was done from life by Mr. Hill.







**Salamandra maculata.**







SALAMANDRA AURICULATA.—*Holbrook.**Plate XII.*

**CHARACTERS.** Head small, with a reddish-brown spot near the ear; body and tail cylindrical, with a series of minute reddish-brown spots on each side.

**DESCRIPTION.** The head is small, rounded above and in front. The tongue is small, round, pediculated, and very movable. A thick group of minute teeth begin behind the posterior nares, and unite in the middle of the palate; behind this transverse row, after an interval of two lines, begins a longitudinal group, which soon subdivides into two lines, diverging more and more from each other near the posterior margin of the palate.

The nostrils are small, lateral, and are wider apart than in the Salamanders generally. The eyes are prominent, but small; the pupil is black, the iris reddish-brown. The neck is slightly contracted, with a small cutaneous fold at the throat.

The body is long and cylindrical; the tail is long, round, but slightly compressed at the tip.

The anterior extremities are small, with four fingers, of which the third is the longest. The posterior extremities are also small, but thicker than the anterior; they each terminate in five toes, of which the third is the longest.

**COLOUR.** The *Salamandra auriculata* is dusky-brown above, rather darker

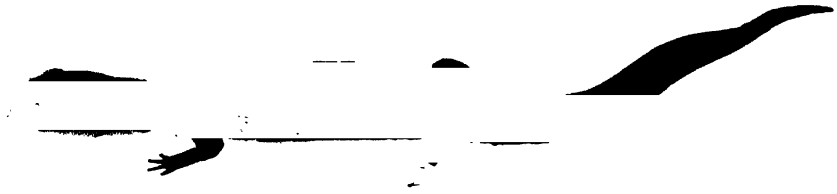
upon the head, with an oblong reddish-brown spot behind the ear. On each side of the body is a row of small and sub-round reddish-brown spots, extending as far as the extremity of the tail; these spots on the flanks frequently are double, but very closely approximated. The throat and abdomen are light grey, with a tinge of violet at the throat.

**DIMENSIONS.** Length of head, 4 lines; of body to vent, 2 inches 2 lines; of tail, 2½ inches: total length, 5 inches.

**HABITS.** Nothing is known of the habits of this animal.

**GEOGRAPHICAL DISTRIBUTION.** The specimens from which the above description was taken came from Riceborough, in Georgia, and were furnished me by my friend Dr. Harden.





*Salamandra quadramaculata.*

*J. H. Richard, del<sup>o</sup>*

*P. S. Duval, Lith. Phil<sup>a</sup>*





SALAMANDRA QUADRIMACULATA.—*Holbrook.*

*Plate XIII.*

**CHARACTERS.** Head rather large; snout rounded; body elongated, stout, dusky above, tinged with purple, and marked with two series of elongated, sub-quadrate red spots; tail of similar colour, with a red mesial line.

**DESCRIPTION.** The head is rather large, with the snout rounded. The tongue is round, and sustained on a short pedicle. The palatine teeth are very minute, and begin on each side at the inner and posterior margin of the posterior nares, and run inwards to unite in the middle of the palate; half a line behind these begin two longitudinal groups, placed side by side, and broader behind.

The nostrils are latero-anterior. The eyes are large and prominent, with the pupil black and the iris golden, tinged with red. The neck is contracted, and has a transverse cutaneous fold at the throat.

The body is elongated, but tolerably robust; the anterior extremities are small, with four delicate fingers; the posterior extremities are nearly double the size, and sustain five toes. The tail is longer than the body, compressed at the side, tapering and ends in a point.

**COLOUR.** The superior surface of the head is dusky, tinged with purple. The back and tail are of similar colour, the former marked with two rows of small elongated, sub-quadrate red spots, and the latter with a red mesial line. These spots and lines are bright in young animals, but in adults they are much obscured.



The inferior surface of the whole animal is pepper-and-salt grey, with a strong purple tinge; the upper surface of the extremities are dusky; the inferior are dusky, tinged with purple.

**DIMENSIONS.** Length of head, 5 lines; length of body to vent, 1 inch 6 lines; length of tail beyond vent, 1 inch 9 lines: total length, 3 inches 8 lines.

**HABITS.** This is a land animal, but I am ignorant of its habits, never having seen but two living specimens.

**GEOGRAPHICAL DISTRIBUTION.** The range of the *Salamandra quadrimaculata* is much more extended in the Atlantic states than I had at first believed; it is common in Georgia and Carolina, and is an inhabitant of Pennsylvania, from which state I have received living specimens; and no doubt it may be found in all the intermediate country.

**GENERAL REMARKS.** The specific name of this animal has been chosen from the sub-quadrangle red spots on the side of the mesial line; other Salamanders have similar series of spots, but not of the same form; the *Triton dorsalis* has round spots, but that is entirely a water animal; and the *Salamandra symmetrica* has in like manner small round spots on either side of the vertebral line, but then that has a rough skin.

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**Salamandra Jeffersoniana.**

*Figura del*

*P.S. Duval. Lith. Philadelphæ*





SALAMANDRA JEFFERSONIANA.—*Green.**Plate XIV.*

**CHARACTERS.** Head very large; eyes full and prominent; body long, cylindrical, light brown above, marked with azure spots; tail length of body, compressed and pointed at the tip.

**SYNONYMES.** Salamandra Jeffersoniana, *Green*, Maclurian Lyceum, p. 4.

Salamandra Jeffersoniana, *Harlan*, Med. and Phys. Res., p. 98.

**DESCRIPTION.** The head is very large, with the snout rounded and full. The mouth is large; the tongue is small, round, pediculated, though slightly attached anteriorly. The palate is armed with numerous minute teeth, that make a transverse row back of the posterior nares, and with two longitudinal series reaching to the posterior extremity of the palate.

The nostrils are near the snout. The eyes are remote and prominent, with both pupil and iris entirely black. The neck is contracted, and has a well marked transverse fold at the throat.

The body is elongated, cylindrical; the tail is as long as the body, round, and tapering to near its extremity, which is compressed and pointed.

The extremities are well developed; the anterior are provided with four fingers; the posterior with five toes, all remarkably long.

**COLOUR.** The whole animal above "is dusky-brown, interspersed with beautiful

azure-blue points, scattered irregularly over the whole surface; on the tail and legs these points are so grouped as to form small blue spots, while along the spine they are scarcely visible." "The throat and abdomen are purple."

**DIMENSIONS.** Length of head, 8 lines; length of body, 2 inches 6 lines; length of tail, 2 inches 10 lines: total length, 6 inches.

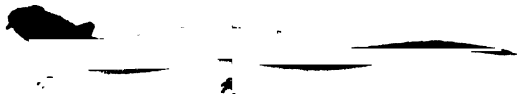
**HABITS.** Professor Green says this animal is terrestrial, and feeds on insects, earthworms, &c., and that "it creeps with much facility along the ground, being greatly assisted in its motions by its extremely long fingers and toes."

**GEOGRAPHICAL DISTRIBUTION.** Western Pennsylvania, near Charter's creek, is the only known locality of the Salamandra Jeffersoniana.

**GENERAL REMARKS.** This animal was first observed and described by Professor Green, an excellent herpetologist. Never having seen the animal alive, I cannot answer for the correctness of the colours of the accompanying figure; yet it was copied from an original drawing of Peale, done for Professor Green.







*Salamandra atra*.

*J. B. Duvet, Lith. 1844*





SALAMANDRA CIRRIGERA.—*Green.**Plate XV.*

**CHARACTERS.** Head short; snout rounded; two barbels to the upper jaw, between the nostrils and lip; body above pale yellow, mottled with black points, and a dusky lateral line; tail compressed, longer than the body.

**SYNONYMES.** *Salamandra cirrigera*, *Green*, Jour. Acad. Nat. Sci. Philad., vol. iv. p. 253.  
*Salamandra cirrigera*, *Harlan*, Med. and Phys. Res., p. 99.

**DESCRIPTION.** The head is short, with the snout rounded or obtuse, and with two barbels or cirri nearly one-fourth of an inch long, in life, projecting from between the nostrils and upper lip. The mouth is very small; the tongue is elongated, oval, thin, and very movable. The palate is armed with a transverse row of minute teeth that begin on each side at the inner and posterior margin of the posterior nares; behind these is a broad longitudinal group of exceedingly minute teeth that extend to the posterior border of the palate.

The nostrils are anterior and far removed. The eyes are prominent and large, with a dusky pupil and golden iris. The neck is contracted, and has a transverse cutaneous fold at the throat.

The body is elongated, but tolerably robust. The tail is longer than the body, compressed at the sides, tapering, and finally ends in a point. The anterior extremities are small, delicate, and terminate in four fingers; the posterior are larger, and sustain five toes.

**COLOUR.** The head above is pale cream-colour, tinged with red; the upper  
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jaw of similar colour, and the lower lip and throat nearly white. The back and tail above are pale cream-colour, with a tinge of reddish-brown, and speckled or variegated with numerous small dusky points; a dusky interrupted lateral line begins behind the eye on each side, runs along the flanks above the extremities, and is finally lost near the tip of the tail; below this line the flanks are mottled brown, with an irregular series of small white spots; the abdomen is yellowish-white, with a slight purple tinge along the mesial line; the extremities are coloured like the back above, and like the abdomen below, though more dusky.

**DIMENSIONS.** Length of head,  $2\frac{1}{2}$  lines; length of body to vent, 1 inch 5 lines; length of tail, 1 inch 7 lines: total length, 3 inches  $2\frac{1}{2}$  lines.

**HABITS.** Not much is known of the habits of this Salamander; it, however, lives on land, and probably never seeks the water but in the breeding season; and yet the barbels at the snout would seem to indicate an aquatic animal.

**GEOGRAPHICAL DISTRIBUTION.** Louisiana and Mississippi are as yet the only States in which this Salamander has been observed.

**GENERAL REMARKS.** The general appearance of this animal is so much like the *Salamandra bilineata*, that I was for a long time unwilling to receive it as a distinct species, not regarding the cirri as an indisputable specific character; for it is well known that many Salamanders put out "singular ornaments," or have curious developments at certain periods of the year; yet Dr. Green believes these cirri to be permanent in the male.

The distinctive characters perhaps the most to be depended on, between this animal and the *Salamandra bilineata*, should the barbels be wanting, which sometimes happens, is the shape of the tail: in the former it is compressed laterally throughout its whole extent, and in the latter it is round; besides, one inhabits the Atlantic states generally, while the other is confined, as far as is known, to the extreme south.





**Salamandra atra .**

*G. Rogers pinx.*

*F. S. Duval lith.*







SALAMANDRA BILINEATA.—*Green.**Plate XVI.*

**CHARACTERS.** Head small; body cylindrical; tail longer than the body, and slightly compressed towards the tip. Colour above brownish-yellow, with a black lateral line on each side; belly yellow.

**SYNONYMES.** *Salamandra bilineata*,\* *Green*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 325.

*Salamandra flavissima*, *Harlan*, Med. and Phys. Res., p. 97.

**DESCRIPTION.** The head is small, with the snout rather rounded than pointed. The tongue is small, sub-oval, thin, pediculated, and very movable. The palate is armed with a transverse row of minute teeth that begin behind the inner margin of the posterior nares; behind these teeth are two longitudinal groups extending to the posterior extremity of the palate.

The nostrils are lateral, though near the snout. The eyes are prominent, the pupil black, with a golden iris. The neck is not much contracted, but there is a slight cutaneous fold at the throat.

The body is cylindrical. The tail is also cylindrical, long, thick at the root, but soon becomes slender, and is slightly compressed towards the tip.

The anterior extremities are exceedingly small and delicate, and terminate in four small fingers. The posterior are twice the size, and have five toes.

\* From an error of the press, this stands *Salamandra bislineata*.

**COLOUR.** The upper surface of the animal is brownish-yellow, with a black lateral line on each side, which begins behind the orbit of the eye, and is continued without interruption along the flanks, above the anterior and posterior extremities, and is generally lost near the end of the tail. The inferior surface of the whole animal is bright yellow, and the skin so delicate as to allow the intestines to be seen, which gives to the animal a darker appearance along the mesial line.

**DIMENSIONS.** Length of head, 3 lines; length of body to vent, 1 inch 5 lines; length of tail beyond vent, 2 inches 2 lines: total length, 3 inches 10 lines.

**HABITS.** The *Salamandra bilineata* is found on land, but in damp places only, and is more lively and active than are Salamanders in general. It lives concealed under rocks or old trees, whence it emerges after a rain, or in the dusk of evening, to seek its prey.

**GEOGRAPHICAL DISTRIBUTION.** This animal has a wide range; Dr. Pickering has observed it in Salem, Massachusetts; Professor Green in Jersey; and I have found it in the lower part of North Carolina, and have received it from Greenville and Pendleton, in South Carolina.

**GENERAL REMARKS.** Professor Green first observed and described this Salamander under the name it here bears.

Dr. Harlan afterwards, apparently unaware of this, gave of it another description as the *Salamandra flavissima*, a name which must consequently be erased from our catalogue of reptiles, as that imposed by Professor Green has the right of priority.





*Salamandra Symmetrica.*





SALAMANDRA SYMMETRICA.—*Harlan.**Plate XVII.*

**CHARACTERS.** Head, body and tail brownish-red; throat and abdomen orange-colour; a row of deep red spots on each side of the vertebral line symmetrically arranged; tail longer than the body, small and compressed; skin rough.

**SYNONYMES.** Salamandra stellio, *Say*, Amer. Jour. of Arts and Scien., vol. i. p. 264.  
Salamandra symmetrica, *Harlan*, Med. and Phys. Res., p. 98.

**DESCRIPTION.** The head is short, and the snout rather pointed; the mouth is small; the tongue is small, with a short pedicle, and is only free and movable at its sides; a transverse row of minute teeth begins on each side of the palate behind the posterior nares; these run inwards and unite in the centre. The longitudinal series is very small, yet it extends throughout the whole palate behind the transverse row.

The nostrils are latero-anterior. The eyes are small and beautiful, with the pupil black and the iris flame-colour. The neck is about the size of the head, with a small transverse cutaneous fold at the throat.

The body is cylindrical, slightly compressed at the sides; and the whole animal is covered with a rough cuticle.

The anterior extremities are small and delicate, terminating in four slender fingers; the posterior have twice the bulk of the anterior, and terminate in five



short flexible toes. The tail is thick at the root, but soon becomes flattened, small, and terminates in a point.

**COLOUR.** The whole superior surface of the head, neck, body and tail, as well as that of the anterior and posterior extremities, is brownish-red; the inferior surface of the throat and abdomen is reddish-orange, with black dots; the inferior surface of the tail is the same as the superior, but with a glow of orange.

**DIMENSIONS.** Length of head, 4 lines; length of body to vent, 1 inch 8 lines; length of tail beyond vent, 1 inch 8 lines: total length, 3 inches 8 lines.

**HABITS.** Although placed by some among the aquatic Salamanders, the very skin, roughened as it is, would seem to shew that this animal is destined to live on land, and that it only approaches the water at certain seasons. I have always seen it on land, but in damp places, as under fallen trees or rocks, from whence it emerges after heavy rains, or in the dusk of evening, in search of insects, earth-worms, &c.

**GEOGRAPHICAL DISTRIBUTION.** The *Salamandra symmetrica* has a very wide range; I have received it from Florida and Alabama, and have seen it in Carolina, Virginia, and as far north as the Green Mountains of Vermont. Though abundant in the upper parts of Carolina, yet I have never seen them in the flat country around Charleston, or along the sea coast of the southern states.

**GENERAL REMARKS.** Harlan was the first who made this animal known to naturalists. Previous to his description it seems to have been confounded with the *Stellio* of Catesby, represented in the beak of the *Ardea herodias*. They were no doubt deceived by the spots on the sides of the body, which should have led them to a distinctive mark. The animal of Catesby differs from the one here described in many respects: it has the skin soft and smooth; the colour brown; the dorsal spots white; much less regular in size and disposition, and extending on the tail.





**Salamandra Haldemani**





**SALAMANDRA HALDEMANI.—*Holbrook.****Plate XVIII.*

**CHARACTERS.** Head flattened above; snout rounded; body and tail pale yellow above, slightly olive at the flanks, marked with dusky spots and blotches, disposed somewhat in three irregular longitudinal series.

**DESCRIPTION.** The head is of moderate size, a little flattened above, with the snout rounded. The mouth is small; the tongue is broad, sub-round, and attached by a broad, short pedicle. The palate is armed with a group of minute teeth, which begin on each side behind the posterior nares, run within and backwards, but do not meet in the mesial line; behind these, and in the middle of the palate, is a second group of minute teeth arranged in a longitudinal direction.

The nostrils are near the snout, lateral, but open a little upwards. The eyes are prominent and large, with the pupil dusky, and the iris bright yellow. The neck is contracted, with a slight transverse fold at the throat.

The body is cylindrical and slender; the anterior extremities are small, with four fingers; the posterior are much larger, and sustain five toes. The tail is longer than the body, slender and round, only a little compressed towards the tip.

**COLOUR.** The head and neck above are pale yellow; the lips are lighter, and the throat yellowish-white. The body above is straw-colour, tinged with olive at the flanks, and marked with numerous small dusky or brown blotches, variable in size, and disposed without much order; the largest, however, are on the flanks;

the throat is pale yellow; the abdomen is of similar colour, with its central portion strongly tinged with purple; the extremities are coloured like the back above, but with fewer and smaller dusky spots, and are yellow below.

**DIMENSIONS.** Length of head, 5 lines; length of body to vent, 1 inch 8 lines; length of tail, 1 inch 11 lines: total length, 4 inches.

**HABITS.** Little is known of the habits of the Salamandra Haldemani, except that it is a land animal, and is found under old logs and stones, &c.

**GEOGRAPHICAL DISTRIBUTION.** This Salamander inhabits the states of Pennsylvania, Maryland and Virginia, from all of which I have received specimens, and it will doubtless be found much more widely extended when our herpetology shall be better known.

**GENERAL REMARKS.** My friend, S. S. Haldeman, Esq., of Pennsylvania, to whom I am indebted for much information on the habits of reptiles, was the first naturalist who observed this Salamander, and procured me a specimen from the borders of the Susquehanna river, and to him I have dedicated the species.







*Salamandra longicauda.*

*J. H. Richard del.*

*P. S. Duval, Lith. Phot.*





SALAMANDRA LONGICAUDA.—*Green.**Plate XIX.*

**CHARACTERS.** Head narrow; snout rather pointed; body elongated, lemon-coloured above, and marked with small, irregular, oblong, or round black spots; tail more than twice the length of body, compressed at the sides, and marked with transverse black bands.

**SYNONYMES.** *Salamandra longicauda*, *Green*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 351.  
*Salamandra longicaudata*, *Harlan*, Med. and Phys. Res., p. 96.

**DESCRIPTION.** The head is short, and the snout obtuse; the mouth is of moderate size; the tongue is pediculated, oblong, and slightly notched posteriorly. The palate is armed with minute teeth, which begin on each side behind the inner margins of the posterior nares, and then run inwards and a little backwards to unite in the middle of the palate; a line and a half behind this transverse row begin two longitudinal series of teeth, which are continued in distinct groups to the end of the palate, and separate more and more from each other posteriorly.

The nostrils are lateral and near the snout. The eyes are small, but prominent, the pupil black and the iris golden. The chin and neck are smooth, with a strongly marked cuticular fold at the throat. The body is cylindrical, small and delicate. The tail is twice the length of the body, compressed at the sides, and exceedingly thin and slender.

The anterior extremities are rather long and slender; there are four delicate  
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fingers, distinct, and all nearly of the same length. The posterior extremities are nearly twice the size of the anterior, with five distinct small toes.

**COLOUR.** The head is lemon-colour above, and the chin and throat nearly the same. The body above is of similar colour, with numerous small irregular black spots; the thorax and abdomen are yellowish-white. The tail is coloured like the back, but the black spots on it are lengthened into transverse bars. The anterior as well as the posterior extremities are similar in colour above to the back; below they are straw-colour.

**DIMENSIONS.** Length of head, 5 lines; of body to vent, 1 inch 10 lines; of tail beyond the vent, 3½ inches: total, 5 inches 10 lines.

**HABITS.** Dr. Harlan places this among the aquatic Salamanders; and Professor Green informs me that he has also observed this animal, which is one of the most beautiful of our Salamanders, in water, and that its motions are exceedingly graceful. There can be but little doubt, however, that it lives in general on land, as its whole organization, teeth, tongue, &c., all place it among the true Salamanders; besides, Haldeman assures me that he has found it on land and at a distance from water. Professor Green probably saw it in water during its breeding season, for he further remarked that it is found on land in marshy places.

**GEOGRAPHICAL DISTRIBUTION.** The *Salamandra longicauda* is found in most of the northern parts of the United States. Dr. Smith has seen it in Massachusetts; Professor Green has observed it near Albany, and at Princeton, New Jersey; and Dr. Pickering informs me that they are found in the neighbourhood of Pittsburgh, west of the Alleghany Mountains.

**GENERAL REMARKS.** This is another of our Salamanders observed and first described by Professor Green, of Philadelphia.





*Salamandra granulata*

*P.S. Dvorák, Lith. PML*







**SALAMANDRA GRANULATA.—*De Kay.***

*Plate XX.*

**CHARACTERS.** Head large; body elongated, cylindrical; tail round, slender, slightly longer than the body and head; skin granulated, greenish slate-colour above, varied with grey and brown beneath.

**SYNONYME.** *Salamandra granulata, De Kay, New York Fauna, vol. ii.*

**DESCRIPTION.** The head is large, flattened, and smooth above, sub-truncate or rounded in front. The tongue is pediculated. The eyes are prominent, with the upper margins of the orbit very projecting. The neck is contracted, with the gular fold very distinct.

The body is elongated, cylindrical, and covered with a granulated skin; that under the lens exhibits the appearance of chagreen. The tail is long, slender, very slightly compressed, and ending in a slender, acute point.

The anterior extremities are very small, with four minute fingers; the posterior are much larger, and sustain five toes.

**COLOUR.** The colour of the whole animal above is a lustrous dark greenish-slate, of a uniform hue. The chin and throat are mottled grey; the gular fold is a soiled white, and the abdomen is mottled with brown and grey; the tail below is uniform ashen-grey; the soles of the feet white. "These colours must be received with some reserve, as they were taken from a specimen preserved in

spirits, and sent to me by Dr. Emmons from the northern district of New York; yet that gentleman, who saw it alive, says the colours are but little changed.”

**DIMENSIONS.** Length of head to fold, 7 lines; from the fold to vent, 2 inches 5 lines; length of tail beyond vent, 3 inches 6 lines: total length, 6 inches 9 lines.

**GEOGRAPHICAL DISTRIBUTION.** This Salamander has as yet only been observed by Dr. Emmons in the northern districts of New York.

**GENERAL REMARKS.** I have never seen the *Salamandra granulata*, and am indebted to my friend Dr. De Kay for the above description, as well as the accompanying plate. At first it would seem to resemble some varieties of the *Salamandra glutinosa* where the white dots are wanting; but the granulated skin prevents their being confounded.





*Figures del*

**Salamandra 4-digitata**

*J.S. Dring, Esq., Phil<sup>da</sup>*





SALAMANDRA QUADRIDIGITATA.—*Holbrook.**Plate XXI.*

**CHARACTERS.** Head large; body long and slender; tail very long; fingers four; toes four.

**DESCRIPTION.** The head is very large for the size of the animal, with the snout full and rounded. The tongue is round, flattened, and sustained on a short pedicle. There are a few scattered exceedingly minute teeth just behind and between the posterior nares.

The nostrils are latero-anterior, and near the extremity of the snout. The eyes are large and prominent, with a dusky iris and a golden pupil. The neck is smaller than the head, with a narrow cutaneous fold at the throat.

The body is much elongated and cylindrical. The tail is very long, round, or is compressed only towards its tip. The anterior extremities are very small, and are provided with four minute fingers; the posterior are rather larger, with four toes, equally minute.

**COLOUR.** The whole animal above is pale straw-colour, with a few minute dark brown spots or vertebral lines; the flanks are marked with an irregular series of dark brown spots, sometimes approaching a lateral line; the abdomen is bluish silvery-white.

**DIMENSIONS.** Length of head, 4 lines; length of body, 1 inch; length of tail, 2 inches: total length, 3 inches 4 lines.

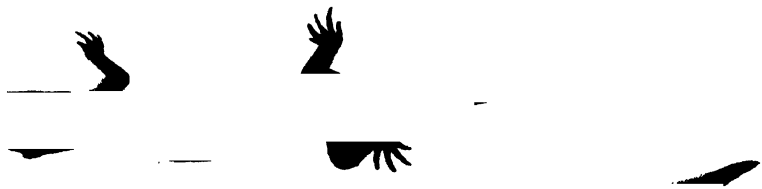


**HABITS.** The *Salamandra quadridigitata* is entirely a land animal. In general it remains concealed under fallen and decaying trees, and only ventures abroad after heavy rains or in the dusk of evening, in search of small insects, on which it feeds.

**GEOGRAPHICAL DISTRIBUTION.** This Salamander is abundant in the middle section of our state, which must for the present be considered as its northern limit; hence it inhabits the intervening country to the Gulf of Mexico. Mr. Couper and Dr. Harden have both furnished me with specimens from Georgia, and I have also received them from Florida.

**GENERAL REMARKS.** This animal bears some resemblance at first view to the *Salamandra gutto-lineata*, from which, however, it differs in many and important characters. This is the only one of our Salamanders with which I am acquainted that has four fingers and four toes, and from this circumstance is its specific name derived.

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*Salamandra venenosa.*

*On Salam. by J. Quoy.*

*1795. Devoit. L'Ann. Chim.*





II. *Salamanders with transverse groups only of palatine teeth.*

REMARKS. The animals of this section approach in their form, as well as in the arrangement of their palatine teeth, &c., the Tritons or Aquatic Salamanders. In some the tail is round, but in most it is compressed laterally, and yet they are as terrestrial in their habits as any other of our Salamanders.

SALAMANDRA VENENOSA, *Barton.*

*Plate XXII.*

CHARACTERS. Head moderate; snout slightly rounded; body and tail above bluish-black, with a row of round or oval yellow spots on each side; under surface bluish-black, tinged with purple.

SYNONYMES. *Salamandra venenosa*, *Barton*, Daud. Hist. Nat. des Rept., tom. viii. p. 229.

*Salamandra sub-violacea*, *Barton*, Trans. Amer. Phil. Soc., vol. vi. p. 112, pl. iv. fig. 6.

*Salamandra sub-violacea*, *Harlan*, Med. and Phys. Res., p. 93.

DESCRIPTION. The head is of moderate size, with the snout full and rounded; the tongue is large, flat, sub-oval, and broadest before; it is adherent by an extensive base below, and by a narrow point behind, and is only movable at its lateral margins. The palate is armed with a transverse row of minute teeth, which pass from side to side behind the posterior nares, the row being a little arched backwards in the centre.

The nostrils are latero-superior and near the snout. The eyes are small, but prominent, with a black pupil and dark grey iris.

The neck is slightly contracted, and has a large, transverse, cutaneous fold at the throat. The body is elongated, tolerably thick, cylindrical, and covered with a smooth skin. The tail is cylindrical at its root, but soon becomes more or less compressed laterally and terminates in a point.

The anterior extremities are small, with four fingers, all nearly of the same length. The posterior are larger, and end in five toes, of which the third and fourth are longest.

**COLOUR.** The head is bluish-black above, with four or five round yellow or orange spots; a small one is at the back of each orbit, and another behind the temples; both the upper and lower jaws are black; the chin and throat are bluish-black, with a purple tinge. The whole superior surface of the body and tail is bluish-black, with a row of yellow or orange spots, round or oval, on each side, extending to the tip of the tail. The belly is bluish-black, with a strong tinge of purple or violet. The extremities are coloured like the back, and are each marked with one or two small round yellow spots.

**DIMENSIONS.** Length of head, 10 lines; length of body to vent, 2 inches 5 lines; of tail,  $2\frac{1}{2}$  inches: total length,  $5\frac{3}{4}$  inches.

**HABITS.** This is another land Salamander, passing most of its time in moist places, as under the trunks of fallen and decayed trees, or under rocks and stones, and only appearing abroad after heavy showers of rain, or at the dusk of evening, in search of its food, which is earth-worms, as well as various small insects.

**GEOGRAPHICAL DISTRIBUTION.** The *Salamandra venenosa* is abundant at the northern portions of the United States. Professor Green informs me that it is common near Albany; Dr. Binney has observed it in Vermont; Dr. Storer in Massachusetts; and Say saw it in Ohio. For the present, Maryland must be considered as its southern limit—south of that state I have no evidence of its existence. Daudin, Harlan, and some other naturalists, however, speak of it as

inhabiting South Carolina, and refer it to the Salamander represented in the beak of the *Ardea herodias* of Catesby, which animal Say supposes to be identical with the *Salamandra dorsalis*. Catesby's Salamander is probably neither one nor the other, if his description is to be relied on.

**GENERAL REMARKS.** The history of our acquaintance with the *Salamandra venenosa* is as follows. In 1803, Dr. Barton obtained a living specimen of it from the neighbourhood of Philadelphia, which he presented to the American Philosophical Society, accompanied with a description and figure of the animal; but under what specific name does not appear, for I have consulted the records of the society, and they simply state, that a paper of this kind was read by Dr. Barton, and referred to a committee, consisting of Latrobe and others.

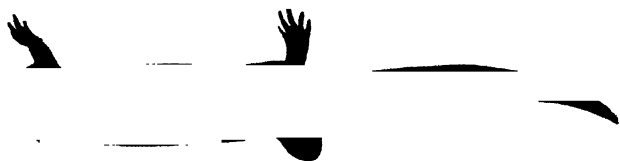
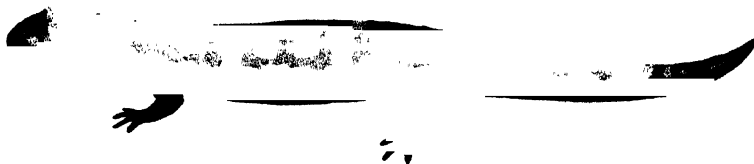
Now it is possible that Latrobe, or perhaps Dr. Barton himself, might have given some account of the animal to Rafinesque, or that he (Rafinesque) might have been present at the reading of the paper, for certain it is that he sent a good description to Daudin, who published it in his work under the specific name it now bears, which was probably given by Barton, and communicated through Rafinesque to Daudin, for the latter gives the specific name as one *imposed* by Dr. Barton.

Six years after, Barton published his account of the same animal in the sixth volume of the Transactions of the American Philosophical Society, under the name *Lacerta* (*Salamandra*) *sub-violacea*, from its colour. It would appear then that the specific name *Venenosa* is the appropriate one, at least so far as regards priority, as it was first published by Daudin, with a reference to Barton, who had no right to change a specific name, even though imposed by himself, after it had been once published to the scientific world.









*Salamandra fasciata.*

*on Stone by J. S. Quen*

*P. S. Dupont, Lith. Phil.*





SALAMANDRA FASCIATA.—*Green.**Plate XXIII.*

CHARACTERS. Head short, broad; snout large and rounded; body and tail above palest ash-colour, with irregular transverse bluish-black blotches on the back, and bars on the tail; throat and abdomen indigo-blue, tinged with purple; tail length of body, and compressed laterally.

SYNONYMES. *Salamandra fasciata*, *Green*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 350.

*Salamandra fasciata*, *Hurlan*, Med. and Phys. Res., p. 94.

DESCRIPTION. The head is large, short, broad, thick, and rounded in front. The tongue is sub-oval, elongated, thin at the margins, attached behind, and movable at all other margins, less so in front. The palate is armed with a transverse series of minute teeth, arranged in three groups; the two external are behind the posterior nares; the central and larger group occupies transversely the middle of the palate.

The nostrils are latero-superior, and nearer the snout than the orbit. The eyes are very prominent, with the pupil black and the iris of darkest grey.

The neck is but slightly contracted, with a well marked transverse cutaneous fold at the throat. The body is sub-cylindrical, a little compressed, and covered with a smooth skin. The tail is thick, rounded on its superior and inferior margins, though compressed laterally.

The anterior extremities are short and rather stout, with four fingers, distinct;

the posterior are nearly twice the size of the anterior, and have five toes, the third and fourth longest.

**COLOUR.** The head is palest ash-colour above, with two or three bluish-black blotches, the largest of which is about the occiput; the upper jaw is bluish-black, and the lower is of similar colour, but of lighter tint. The body is also of palest ash-colour above, marked with irregular blotches of bluish-black, placed transversely; the abdomen is uniform indigo-blue, with a tinge of purple; the tail is coloured like the back, but has transverse bars instead of blotches.

**DIMENSIONS.** Length of head, 5 lines; of body to vent, 1 inch 7 lines; of tail, 1 inch 4 lines: total length, 3 inches 4 lines.

**HABITS.** This is another true Salamander, and one of the most beautiful of the genus. I have kept them alive for many months in a small box filled with meadow moss, (*Sphagnum*,) which was occasionally moistened; and it was observed that they always chose the superior surface of the moss for their resting place, while their fellow prisoner, a *Salamandra venenosa*, was always found deeply buried.

**GEOGRAPHICAL DISTRIBUTION.** Professor Green first observed this animal in New Jersey; Professor Hitchcock found it in Massachusetts, and furnished my friend Dr. Storer, of Boston, with the fine specimen from which the accompanying plate was taken; in the west it has been observed by Dr. Hildreth, near Marietta, Ohio, who sent a specimen to the Academy of Natural Sciences in Philadelphia; at the south Dr. Blanding saw it at Camden, South Carolina; I have found it near Charleston, and lately Dr. Binney observed it in Georgia.

**GENERAL REMARKS.** The *Salamandra fasciata* was first accurately described by Professor Green, of Philadelphia, who has done so much to elucidate the history of this obscure family of reptiles; and it is remarkable that so large and so beautiful an animal should so long have escaped the observation of our herpetologists.







*On Salam. talp. & talp.*

**Salamandra talpoidea.**

*J. S. Durrill, Coll. 1882*





SALAMANDRA TALPOIDEA.—*Holbrook.**Plate XXIV.*

**CHARACTERS.** Head very large; body short, thick, clumsy; tail short, thick, compressed; colour above dusky, almost black; beneath dusky, with a tinge of purple.

**DESCRIPTION.** The head is very large and flattened, with the snout full and rounded. The mouth is large; the tongue is of sub-rhomboidal form, smallest behind, where it is perfectly adherent; at all the other margins it is free. The palate is armed with a transverse group of minute teeth, extending across behind the posterior nares, which are large; the series is a little arched backwards in the middle, where the teeth are largest and most numerous.

The nostrils are near the snout, latero-superior, and open a little upwards and backwards. The eyes are small, but prominent, with the pupil black and the iris dusky.

The neck is contracted, with a well marked cutaneous fold at the throat. The body is short, thick, clumsy, rather flattened than cylindrical, and covered with a smooth skin. The tail is short, very thick at its root, and compressed laterally throughout its whole extent.

The anterior extremities are short, thick, and stout, ending in four short fingers. The posterior extremities are still stouter in proportion, and terminate in five toes, slightly united at their roots.

**COLOUR.** The whole animal above, head, body, tail, and extremities, is of a dusky uniform colour, approaching to black. The throat, belly, and under surface of the tail are also dusky, but have a strong tinge of purple.

**DIMENSIONS.** Length of head, 5 lines; of body to vent, 1 inch 5 lines; of tail, 1 inch 3 lines: total length, 3 inches 1 line.

**GEOGRAPHICAL DISTRIBUTION.** The only locality that I have at present for the *Salamandra talpoidea*, is the sea islands on the borders of South Carolina, where it was discovered by Dr. Burden, one of my pupils.

**GENERAL REMARKS.** The habits of this animal are not a little curious, as it burrows in the ground like a mole, where it seems constantly to dwell. It chooses light soil for its residence, and if disturbed, it will bury itself in a few seconds, and there continue its course concealed from view; but its track can often be followed by the elevation produced on the surface of the soil, similar to that seen in fields infested by moles (*talpa*). It is curious that this animal has the teeth and tail of a Triton, and yet has never been seen in water, but always on land.

T R I T O N.—*Laurenti.*

Genus TRITON.—CHARACTERS. Palatine teeth mostly in transverse series; tongue adherent, except at its edges, never pediculated; tail compressed; fingers four; toes five, more or less palmated at their roots.

REMARKS. The animals of this genus are entirely aquatic, and soon die if taken from their accustomed element; yet, as their respiration is carried on with lungs, they cannot breathe under water, and are, consequently, obliged to approach its surface for atmospheric air.

Another remarkable feature in the character of the animals of the genus Triton, is their power of restoration of parts when mutilated, or their complete reproduction of organs destroyed. This reproductive power is so active, that the limbs of a Water Newt may be removed, and in less than one year they will be perfectly restored.\* The newly formed extremities may in turn be amputated, and will in turn be replaced by others. Even the eye may be extirpated, and, in less than eighteen months, this delicate organ, with its complicated apparatus of humours and transparent media, will be perfectly reproduced.†

In arranging the Tritons in two sections, it is to be understood that I speak only of those inhabiting the United States; and they all, so far as I have observed them, have the tongue more adherent than Salamanders, and never pediculated; the tail is always compressed; and the palatine teeth, with one or two exceptions, are arranged in transverse groups.

\* Blumenbach, *Spec. Phys.*, p. 31.

† Vid. anatomical part of this work.









J. H. Richard del.

**Triton dorsalis.**

*PS. DeLong. Lith. 1867.*





I. *Tritons with transverse and longitudinal series of palatine teeth.*

TRITON DORSALIS.—*Harlan.*

*Plate XXV.*

CHARACTERS. Head and body above olive-brown, with a tinge of green; on each side of the mesial line is a row of bright vermilion circular spots; throat and abdomen orange, studded with small black dots; tail longer than the head, neck, and trunk; greatly compressed laterally throughout its whole extent.

SYNONYME. *Salamandra dorsalis*, *Harlan*, Jour. Acad. Nat. Scien. Philad., vol. vi. p. 101.

DESCRIPTION. The head is short, broad behind, and rather pointed at the snout. The mouth is large; the tongue is broad, flat, entire, adherent in all parts, except at its lateral and anterior margins.

The nostrils are anterior; the eyes are full and prominent, the pupil black, the iris flame-colour; the neck and body are the same size as the head, and cylindrical in form, with a transverse fold at the throat.

The anterior extremities are small and delicate, and terminate in four small fingers; the posterior extremities have more than twice the bulk of the anterior, and terminate in five short flexible toes, united at their roots. The tail is thick at the root, but soon becomes compressed at the sides throughout its whole extent.

**COLOUR.** The whole superior surface of the Triton dorsalis, head, neck, and body, as well as the tail and extremities, is of an olive-brown colour, with often a tinge of green, and numerous small dots of black, most abundant on the tail; on each side of the vertebral line is a row of bright or red spots, symmetrically disposed; these spots vary a good deal in size in different individuals, but their colour is almost always the same. The inferior surface of the animal, throat, abdomen and tail, as well as the anterior and posterior extremities, is orange, studded with small black dots, most numerous about the abdomen and throat.

**DIMENSIONS.** Length of head, 5 lines; length of body, 1 inch  $4\frac{1}{4}$  lines; length of tail, 2 inches: total length, 3 inches  $9\frac{1}{4}$  lines.

**HABITS.** The Triton dorsalis is eminently aquatic in its habits; I have never heard of its being found on land, and indeed, when taken from its native element, its progression is difficult, its skin becomes dry, and it soon dies. In water it is very hardy, supporting great cold, and is torpid only during the excessive cold of winter; for I have frequently observed them under ice of an inch thickness, swimming with great vivacity.

**GEOGRAPHICAL DISTRIBUTION.** This animal is found from one end to the other of the Atlantic States; I have seen it in Maine, Pennsylvania, and Georgia.

**GENERAL REMARKS.** The Triton dorsalis was first described by Dr. Harlan.





*J. H. Richard, del.*

*Triton tigrinus.*

*P. S. Duval, Lith. Phila.*







TRITON TIGRINUS.—*Green.**Plate*

**CHARACTERS.** Head large, snout rounded; body elongated, bluish-black, with irregular lemon-coloured blotches; tail longer than the body, greatly compressed at the sides, ancipital, and coloured like the body.

**SYNONYMES.** Salamandra tigrina, *Green*, Jour. Acad. Nat. Scien. Philad., vol. v. p. 116.  
Salamandra tigrina, *Harlan*, Med. and Phys. Res. p. 93.

**DESCRIPTION.** The head is large, broad, flattened above and rounded in front. The mouth is large; the tongue is broad, sub-round, entire, adherent posteriorly, a little less so anteriorly, and is loose and movable only at its lateral margins. The palatine teeth are arranged transversely in three groups; one begins behind the outer margin of the posterior nares on each side, and runs for two lines inwards and backwards; between the internal extremities of these groups, but on a line a little in front, begins the largest group, which also runs transversely, but is a little arched forward in the middle of the palate.

The nostrils are latero-superior, near the snout, and open upwards. The eyes are large and prominent, the pupil black, the iris golden, reticulated with brown. The neck is contracted; the chin is smooth, and the throat has a transverse strongly marked cutaneous fold.

The body is robust and cylindrical; the tail is longer than the body, and compressed at the sides so as to offer a narrow margin above and below.

The anterior extremities are short and thick; there are four fingers, short, distinct, the middle ones longest, and nearly of the same length. The posterior extremities are larger than the anterior, and have five toes each, palmated at their roots.

**COLOUR.** The whole superior surface of the animal, head, neck, body, tail, as well as the extremities, is bluish-black above, marked with irregular spots and blotches of lemon-colour. The chin is dusky-yellow; the throat and abdomen are cinereous, with blotches of dusky-yellow; the inferior surface of the tail and extremities are clouded yellow.

**DIMENSIONS.** Length of head, 10 lines; of body to vent,  $2\frac{1}{4}$  inches; of tail,  $3\frac{1}{2}$  inches: total length, 6 inches and 7 lines.

**HABITS.** This animal is found on land, under rocks and stones, or under decaying vegetable matter, as leaves, &c. in forests.

**GEOGRAPHICAL DISTRIBUTION.** This species of Salamander inhabits the northern states from New Jersey to Massachusetts.

**GENERAL REMARKS.** The *Triton tigrinus* appears to be somewhat allied to the *Salamandra venchosa* in the general arrangement of its colours, but it is found, on closer examination, to be widely different, as may be seen in their respective descriptions, by which one will be found to be a land, and the other a water animal.





*J. Green, del.*

**Triton nigra.**

*J. S. Purcell, Lith. Philad.*





SALAMANDER ON NIGER.—*Green.**Plate XXVII.*

**CHARACTERS.** Body above black; abdomen purplish, with a few white spots; tail round at base, flattened and ancipital at tip.

**SYNONYMES.** *Salamandra nigra*, *Green*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 352.

*Salamandra intermixta*, *Green*, Maclurian Lyceum, p. 5.

*Salamandra picta*, *Harlan*, Med. and Phys. Res., p. 98.

*Salamandra nigra*, *Harlan*, Med. and Phys. Res., p. 97.

**DESCRIPTION.** The head is small, with the snout rather pointed. The mouth is of moderate size. The tongue is sub-oval, thin, broadest behind, narrow and adherent in front, loose and most movable at its posterior margin. The palate is armed with a transverse group of minute teeth, and others are placed in a longitudinal direction along the mesial line.

The nostrils are small and latero-superior. The eyes are prominent, with a black pupil and dusky-grey iris. The neck is slightly contracted, and has a large transverse fold at the throat.

The body is stout and sub-cylindrical; the tail is thick and round at the root, but it soon becomes compressed, and is ancipital near the tip, which is pointed.

The anterior extremities are short, and sustain four fingers; the posterior are much larger, and terminate in five toes, slightly united at their bases.



**COLOUR.** The whole superior surface of the animal is black, with a slight bluish tinge. The throat and abdomen are purple. The young animals are often rather brown than black, with a few amber-coloured spots on the flanks.

**DIMENSIONS.** Length of head, 4 lines; length of body, 2 inches; length of tail, 2 inches: total length, 4 inches 4 lines.

**HABITS.** The *Triton niger* is entirely aquatic in its habits.

**GEOGRAPHICAL DISTRIBUTION.** This animal inhabits the Atlantic states from lat. 43° to the Gulf of Mexico. Dr. Pickering found it near Salem, in Massachusetts; Professor Green observed it in Pennsylvania; I have seen it in Carolina and Georgia, and have received specimens from Louisiana.

**GENERAL REMARKS.** Professor Green was the first naturalist who observed and described the *Triton niger* under the specific name it here bears.





*Triton* *sp.*

**Triton porphyritica**





TRITON PORPHYRITICUS.—*Green.**Plate XXVIII.*

**CHARACTERS.** Head moderate; snout obtuse; body elongated; tail length of body, compressed, and slightly carinated on the upper and lower margins of its posterior half; superior surface of the whole animal dark brown, interspersed with irregular whitish spots.

**SYNONYMES.** *Salamandra porphyritica*, *Green*, Maclurian Lyceum, p. 3.

*Salamandra porphyritica*, *Harlan*, Med. and Phys. Res., p. 98.

**DESCRIPTION.** The head is rather large, with the snout obtuse and rounded. The mouth is moderate. The tongue is broad, elongated, thin, attached posteriorly, less so anteriorly, and most movable at the lateral margins. The palate is armed with a transverse row of minute teeth, beginning on each side behind the outer margin of the posterior nares.

The nostrils are latero-superior, near the snout, and open upwards and a little outwards, with a slight ridge extending from them to the anterior angle of the eye. The eyes are rather small, with a black pupil and dusky iris. The neck is contracted, and has a large transverse cutaneous fold below.

The body is cylindrical and long. The tail is much compressed, carinated on the upper and lower margin of its posterior half; in length it is equal to the body. The extremities, with the fingers and toes, are but slightly developed.

**COLOUR.** The whole superior surface of the animal is brown, more or less

dusky, interspersed with irregular whitish spots, which on the flanks are arranged in irregular longitudinal series. The throat and abdomen are whitish, shaded with dusky-brown.

**DIMENSIONS.** Length of head, 6 lines; length of body to vent, 2 inches; length of tail beyond vent, 1 inch 11 lines: total length, 4 inches 5 lines.

**HABITS.** Professor Green says he found this animal abundant in French creek, and that it does not differ in its habits from the water Salamanders in general.

**GEOGRAPHICAL DISTRIBUTION.** The only known locality of the Triton porphyriticus is the western part of Pennsylvania.

**GENERAL REMARKS.** Professor Green was the first naturalist who observed this animal, and he gave an excellent description and plate of it in the Maclurian Lyceum. Never having seen the Triton porphyriticus alive, I cannot vouch for the correctness of the colour of the accompanying plate, yet it was copied from the original of Professor Green.

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Triton ingens.





TRITON INGENS.—*Green.**Plate XXIX.*

CHARACTERS. Head large, depressed; snout full and rounded; body bluish slate-colour, with light ash-coloured sub-ovate spots; tail large, broad, much compressed; fingers four, slightly palmated at roots; toes five, slightly palmated, external toe fimbriated, as in *Menopoma*.

SYNONYME. *Salamandra ingens*, *Green*, Jour. Acad. Nat. Scien. Philad., vol. vi. p. 254.

DESCRIPTION. The head is very large, rounded at the snout, and flattened above. The mouth is large; the tongue is broad, circular, extensively attached, and is only slightly movable at its anterior and lateral margins. The palatine teeth are arranged in three groups transversely, a small group behind the posterior nares, with a larger group occupying the middle of the palate.

The nostrils are antero-superior and very near the snout. The eyes are large and prominent, with a black pupil and dusky-grey iris.

The neck is contracted, and has a large transverse fold at the throat. The body is large and sub-cylindrical. The tail is stout, longer than the body, much compressed laterally, and terminates in a rounded extremity.

The anterior extremities are short, thick, and sustain four fingers, slightly palmated at their roots. The posterior extremities are much larger, and terminate in five toes, the external of which is fimbriated on its outer margin.



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**Amphiuma means**

*Theo. M. Logan, M.D. pres.*

*L. S. Duval, Lic. Phil.*







A M P H I U M A.—*Garden.*

GENUS AMPHIUMA.—CHARACTERS. Head large; lips thick and extensive; superior maxillary bone with a thick series of small teeth; palatine teeth in two longitudinal rows; inferior maxillary bone with a single series; a single spiracle at each side of the neck; body eel-shaped; extremities four, imperfectly developed.

AMPHIUMA MEANS.—*Garden.*

*Plate XXX.*

CHARACTERS. Head large, sub-oval; snout depressed and rounded; neck contracted, with a transverse fold at the throat; body eel-shaped, and of a bluish-black colour, tinged with violet; anterior extremities very small, with two fingers; posterior still smaller, with two toes.

SYNONYMES. *Amphiuma means*, *Garden*, Smith's Correspond. of Linnæus, vol. i. p. 599.

*Amphiuma means*, *Harlan*, Med. and Phys. Res., p. 85.

*Chrysodonta larvæformis*, *Mitchell*, Med. Record., No. 19.

Congo Snake, *Vulgo.*

DESCRIPTION. The head is very large, elongated, sub-oval, and flattened above, especially near the snout, which is full and rounded. The mouth is large, extending to one-half the length of the head, and is provided with rather thick movable

lips. The tongue is broad, oblong, flat, smallest before, attached posteriorly, and is only free at its anterior and lateral margins for about two lines.

The upper jaw is armed with a thick series of minute teeth, that are all arched a little backwards; the lower jaw has also a single row, but less numerous. The palatine teeth are arranged in two rows, which begin near the superior maxillary series in front, run along the palate, separating more and more from each other, and terminate behind the inner margin of the posterior nares.

The nostrils are small and anterior, being placed at the very margin of the upper lip, and are near together. The eyes are distant from the snout, superior, very small, and covered with a production of the cuticle; a slightly depressed line runs from the eyes towards the nostrils, and marks the position of some minute glands.

The neck is contracted, with a transverse fold at the throat, and a single spiracle or branchial orifice at each side, which is partially covered in front by a thin fold of skin. The body is eel-shaped; and the vent appears like a longitudinal fissure just behind the posterior extremities. The tail is very long, round near the root, compressed laterally towards the tip.

The extremities are but imperfectly developed, and seem but little larger in the old than in the young animal. The anterior are very short, small, placed near the spiracle, and terminate in two small fingers. The posterior are placed before and a little on the sides of the vent, and sustain the same number of toes.

**COLOUR.** The whole superior surface of the animal is deep bluish-black, tinged with violet; the lips and throat are rather lighter in colour, and the belly is dark purple.

**DIMENSIONS.** Length of head, 2 inches; length of body, 20 inches; of tail beyond the vent, 6 inches: total length, 28 inches.

**HABITS.** The *Amphiuma means* lives in muddy waters or in mud. Harlan says they have been found at Pensacola, three feet or more deep in mud, of the consistence of mortar, in which they burrowed like earth-worms. They inhabit the ditches of our rice-fields, and feed on small fish and various fresh-water shells, as *Unio*, &c.; beetles and other insects have also been found in their stomachs. Sometimes like eels they are found on dry land, but for what purpose they approach it is unknown.

**GEOGRAPHICAL DISTRIBUTION.** North Carolina must, for the present, be considered as the northern limit of this animal, and it is even very rare in that state. In South Carolina it is more common, but is only abundant in some districts, as about Combahee river. The *Amphiuma means* is also found in the Floridas, Alabama, and Mississippi, and is said to be abundant in Louisiana.

**GENERAL REMARKS.** This singular reptile was made known to Linnæus by Dr. Garden of Charleston, South Carolina, so often mentioned in the progress of this work, but at too late a period to allow him to give it a place in any of the editions of the *Systema Naturæ* published during his life time.

Garden, in his letter to Linnæus,\* describing this reptile, calls it “an unknown animal, the only one I ever saw;” and further he says, “at first sight I suspected it to be another species of *Siren*, but upon nearer examination I found so many differences, that there proves to be no relationship between them.” Two years subsequent to this, I find Dr. Garden, in a letter to Mr. Ellis, of London, for the first time calls this animal “*Amphiuma means*.”†

As Linnæus never published any account of this animal, Garden’s description was of course locked up in manuscript, and thus our animal remained unknown to other naturalists for just fifty years from the time of its discovery. In 1821, Sir James Edward Smith, the eminent botanist, published the “Correspondence

\* Smith’s Correspondence of Linnæus, vol. i. p. 333.

† Ibid. vol. i. p. 599.

of Linnæus with other Naturalists," in which is contained the letter of Garden describing the *Amphiuma means*.

The next account, so far as I know, of our animal, may be seen in the work of Rusconi, an Italian naturalist, "*Amours des Salamandres Aquatiques*," and is but an extract of a letter from Dr. Pockels, of Brunswick. Pockels observed it in the Hunterian Museum, and supposed it to be the *Siren lacertina* in its perfect state,\* and as such sent a description and drawing of it to Rusconi, which agree perfectly with the *Amphiuma means*, and not at all with the *Siren lacertina*. It must be remembered, that most naturalists of that period, considered the *Siren lacertina* as the larva of some large and unknown Salamander.

Dr. Harlan, in the third volume of the *Journal of the Academy of Natural Sciences of Philadelphia*, published some interesting remarks on the anatomy of the *Amphiuma means*, and says that he never saw the slightest appearance of gills even in specimens that did not exceed three inches in length.

To Cuvier we are, however, indebted for the best account of the anatomy of this animal, and he clearly proves that it cannot be the *Siren lacertina* in any stage of development whatever, its organization is so entirely dissimilar.

The *Amphiuma means* is known to the negroes with us under the name of Congo Snake, and is regarded, without the slightest appearance of truth, as exceedingly venomous.

\* J'ai découvert un fait selon moi tres-intéressant; j'ai vu dans le Muséum Hunterien une Sirène lacertina avec les rudiments des pieds de derriere, &c. &c. Rusconi, loc. cit., p. 11.

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*Amphiuma tridactyla.*







AMPHIUMA TRIDACTYLUM.—*Cuvier.*

*Plate XXXI.*

**CHARACTERS.** Anterior extremities with three fingers; posterior with three toes.

**SYNONYMES.** *Amphiuma tridactylum*, *Cuvier*, Mem. du Mus. d'Hist. Nat., tom. xiv. p. 17.  
*Amphiuma tridactylum*, *Harlan*, Med. and Phys. Res., p. 86.

**DESCRIPTION.** "The description of the *Amphiuma* means will apply in almost all respects to the species with three toes. Its general form is the same; its length is twenty times its diameter; the length of its head is nearly one-fourteenth of the body; the tail constitutes exactly one-fourth. In a word, in order to distinguish them, it is necessary to confine our attention to the extremities, when we observe that the hands and feet are divided each into three toes, perfectly distinct, which constitutes the only visible external character."

**HABITS.** I am unacquainted with the habits of the *Amphiuma tridactylum*, but suppose them to be similar to those of the *Amphiuma means*.

**GEOGRAPHICAL DISTRIBUTION.** This reptile is found in Louisiana, from which state *Cuvier* received his first specimen. They also inhabit Mississippi and Arkansas, as *Dr. Pitcher* observed them in Neorho river, and presented the Academy of Natural Sciences of Philadelphia with a fine specimen procured near Fort Gibson.

**GENERAL REMARKS.** It is to *Cuvier* that we are indebted for the description of this animal.







*T. H. Peck, Junr.*

**Menopoma Alleghaniensis**





M E N O P O M A.—*Harlan.*

Genus MENOPOMA.—CHARACTERS. Head large, flat; upper jaw with two concentric series of minute teeth; inner series less extensive and terminating before posterior nares; lower jaw with a single series; single spiracle on each side; extremities four; fingers four; toes five, all short and palmated.

MENOPOMA ALLEGHANIENSIS.—*Latreille.**Plate XXXII.*

CHARACTERS. Head very large, broad, flat; mouth large, with thick lips; two series of teeth in the upper, and a single series in the lower jaw; body short, pale cinereous, with dusky blotches; extremities short; fingers and toes short, more or less palmated.

SYNONYMES. Salamandra Alleghaniensis, *Latreille*, Hist. Nat. Rept., tom. ii. p. 253, pl. 1.

Salamandra Alleghaniensis, *Daudin*, Hist. Nat. des Rept., tom. viii. p. 231.

Molge gigantea, *Merrem*, Versuch eines Syst. der Amphib.

Salamandra gigantea, *Barton*.

Abranchus Alleghaniensis, *Harlan*, Lyc. Nat. Hist. N. Y., vol. i. p. 233, pl. 17.

Menopoma Alleghaniensis, *Harlan*, Med. and Phys. Res., p. 87.

Hellbender, *Vulgo*.

DESCRIPTION. The head is large, flat, and broad, with the snout full and rounded. The mouth is large, and covered with thick fleshy lips. The tongue



thin, broad, flat, rounded in front, attached behind and below, free and movable only at its anterior and lateral margins. The superior maxillary teeth are arranged in two concentric series, of which the internal are most prominent, but are less numerous as they terminate before and on the outer side of the posterior nares.

The nostrils are anterior and very small. The eyes are very minute and black.

The neck is contracted, with a single spiracle or bronchial opening on each side, but there is no cutaneous fold at the throat. The body is stout, thick, sub-cylindrical, and the vent appears a circular orifice, with a plaited margin, unlike the longitudinal fissure of the Salamanders. The tail is large, much compressed laterally, broader below, with a rayless fin along its whole superior border, and is ancipital only for an inch or two from its tip.

The anterior extremities are short, thick, and fimbriated throughout their whole external border; there are four fingers, short, flattened, without nails, and palmated at their roots. The posterior extremities are also short, thick, and still more broadly fimbriated on their posterior border; there are five toes, palmated, the two internal have the web least extensive.

**COLOUR.** This animal I have never seen alive, but Dr. De Kay represents it as pale slate-colour, mottled with dusky; and from his plate was the accompanying figure coloured.

**DIMENSIONS.** Length of head,  $1\frac{1}{2}$  inches; length of body, 9 inches; length of tail  $4\frac{1}{2}$  inches: total length, 15 inches.

**HABITS.** The *Menopoma Alleghaniensis* lives entirely in water. It is carnivorous and very voracious, feeding on fish, worms, and shell-fish.

**GEOGRAPHICAL DISTRIBUTION.** The *Menopoma Alleghaniensis* is found in the

Alleghany river and its tributaries, and doubtless inhabits many of the branches of the Ohio and Mississippi rivers.

GENERAL REMARKS. This reptile was first described by Latrille from a fine specimen procured by Michaux, the botanist, in Virginia, among the Alleghany Mountains.

To Dr. Harlan, however, we are indebted for an excellent description of the anatomy of this animal, and he first recognised the impossibility of placing it among the Salamanders, and established for it a new genus, *Menopoma*.

N. B.—The beautiful plate accompanying this description, was done for Dr. Harlan from life, but uncoloured, by Mr. Peale. The snout, however, seems to me much more truncated than in the preserved specimens that I have examined; in them it appears full and rounded, as in the next species, (*Menopoma fusca*.)







*Menopoma fuscum*





**MENOPOMA FUSCA.—*Holbrook.****Plate XXXIII.*

**CHARACTERS.** Head large, flat; snout full and rounded; body above uniform umber, beneath paler.

**DESCRIPTION.** The *Menopoma fusca* resembles in its general form the *Menopoma Alleghaniensis*, but its head is rather larger in proportion, and the snout more full, broader and rounded; the palatine group of teeth is more concentric with that of the superior maxillary, but after all, we must depend chiefly on the colour to distinguish this animal from the *Menopoma Alleghaniensis*.

**DIMENSIONS.** The proportions of this animal are the same as those of the *Menopoma Alleghaniensis*, yet it reaches a greater size—I have seen one nearly 18 inches in length.

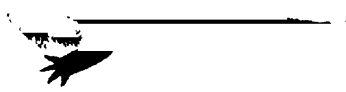
**GEOGRAPHICAL DISTRIBUTION.** This reptile inhabits the waters of the mountainous regions of North Carolina and Georgia, where they are said to be abundant.

**GENERAL REMARKS.** I have never seen but one individual of this species, which was captured in the waters of French Broad, by my friend Dr. Hardy, of Ashville, Buncomb county, North Carolina. The colouring may be relied on, as it was done from life.









Siren lacertina.





## FAMILY II. PHANEROBRANCHOIDEA.

## CHARACTERS.

Gills permanent; spiracles or branchial orifices concealed by branchial tufts.

SIREN.—*Linnaeus*.

GENUS SIREN.—CHARACTERS. Head short; mouth small; tongue arrow-shaped; palatine teeth minute, numerous on the outer margin of the bone; gills persistent during life; branchial tufts three; spiracles three; body eel-shaped; anterior extremities, but neither pelvis nor posterior extremities.

SIREN LACERTINA.—*Linnaeus*.*Plate XXXIV.*

CHARACTERS. Head short; frontal region elevated; snout depressed; branchial tufts three; spiracles three; body anguilliform; tail long, compressed, with a rayless fin above and below; anterior extremities only with four short, small fingers each; colour above dusky, approaching to black, with numerous white or yellowish-white spots; abdomen purplish.

SYNONYMES. *Siren lacertina*, *Linnæus*, *Amœnit. Acad.*, tom. vii. p. 311.

Mud iguana, *Ellis*, *Phil. Trans. London*, vol. lvi. p. 189.

*Murena siren*, *Gmelin*, *Syst. Nat. Linn.*, tom. i. pars iii. p. 1136.

*Siren lacertina*, *Shaw*, *Gen. Zool.*, vol. iii. p. 601.

*Siren lacertina*, *Schneider*, *Hist. Amphib.*, fas. i. p. 88.

*Siren lacertina*, *Daudin*, *Hist. Nat. des Rept.*, tom. viii. p. 272.

*Siren lacertina*, *Merrem*, *Versuch eines Syst. der Amphib.*, p. 188.

*Siren lacertina*, *Harlan*, *Med. and Phys. Res.*, p. 88.

Mud Eel or Siren, *Vulgo*.

DESCRIPTION. The head is rather small for the size of the animal, sub-oval, with the forehead elevated, and the snout flattened and truncated. The mouth is small, and covered with tolerably thick lips; the tongue is arrow-shaped, broadest and adherent posteriorly, free only at its anterior and lateral margin. There are no teeth in the upper jaw, but a broad group of numerous minute teeth begins at the anterior margin of the palate bones and extends along their outer border.

The nostrils are small, latero-anterior, and open outwards. The eyes are superior, very small, black, and covered with a cuticular prolongation. The neck is contracted, with three spiracles or branchial openings, elliptical, vertical, the central one largest; these are covered by three branchial tufts, of which the anterior is smallest and the posterior largest.

The body is eel-shaped, though robust; the tail is long, compressed, ancipital, with a rayless fin both above and below.

The anterior extremities alone exist, and these are but slightly developed, so as to be of little service, if any, in progression, and yet they are in constant motion as the animal moves from place to place on land, and are folded back when it swims in water. There are four short fingers to each extremity, the tips of which are rather pointed, slightly curved, and terminate in semicorneous tips.

COLOUR. The whole superior surface is dusky, sometimes almost black, and is

generally, though not always, studded with small white or milky-white dots. The under surface is purple, with a tinge of violet.

**DIMENSIONS.** Length of head, 1 inch; length of body, 12 inches; length of tail, 6 inches: total length, 19 inches. They frequently reach dimensions much greater. I have often seen them 2 feet long; and Dr. Philip Tydiman, of Charleston, informs me that many years since he procured one nearly 3 feet in length for the celebrated Blumenbach of Göttingen.

**HABITS.** The Siren lacertina lives chiefly in mud, and is abundant in our rice-fields, and are often thrown out in great numbers, at certain seasons, when the ditches are cleaned; being regarded, however, as venomous by the slaves, they are instantly killed or dreadfully mangled, and left to serve as food for racoons or for turkey-buzzards ever on the watch.

Sometimes they leave the soft mud, in which they commonly burrow, and take to the water, in which they swim with great swiftness. My colleague, Professor Moultrie, assures me that occasionally they are taken by persons angling for the common perch of Carolina, (*Pomotis Vulgaris*), with a bait of earthworms.

Sometimes they leave the water entirely, like eels, and are found on dry land; but whether in search of food, or to rid themselves of parasitic animals, cannot at this moment be determined.

**GEOGRAPHICAL DISTRIBUTION.** The range of the Siren lacertina begins as far north as latitude 35°, whence it reaches through South Carolina and Georgia to East Florida; but I have no evidence of their existence in any of the rivers or streams that empty into the Gulf of Mexico. Mr. Conrad the conchologist, in fact ascertained, that the dividing ridge of high land between the waters of the Appalachicola and Altamaha rivers, was an important limit in the geographical distribution of fresh-water shells; and it will doubtless be found the same as regards other animals exclusively aquatic.



**GENERAL REMARKS.** The Siren lacertina was first observed in South Carolina by Dr. Garden, who sent it with the following remarks to Linnæus: "this extraordinary two-legged animal lives in dams and ponds of fresh-water all over the province (South Carolina). I have them of all sizes, from 4 inches to 3 feet in length, and they always appeared to me the same animal in every thing but magnitude."

Linnæus, struck with the singular appearance and organization of this curious reptile, wrote to Dr. Garden, that "nothing had ever so much exercised his thoughts, nor was there any thing he so much wished to know as the real nature of an animal so extraordinary." Unable to refer it to any family of reptiles, he instituted for it a new order and genus; Ordo III., Amphibia meantes; Genus, Siren; which were published in the seventh volume of the *Amœnitates Academicæ*, for the year 1765.

At first Linnæus seems to have thought it possible that the Siren might be the larva of some large and unknown Salamander,\* and not an animal in its perfect or ultimate state; and he further says, "if it is a larva the Doctor (Garden) will doubtless find specimens with four legs." This opinion was adopted by the most celebrated naturalists until within a few years; thus Lacépède says that he "never for a single moment doubted that this animal was a larva and ought not to form a new genus." Even Cuvier himself was at first inclined to this opinion, though he subsequently abandoned it.

The publication of the correspondence of Garden with Linnæus on this subject in 1821, settled the question at last; for in 1770 he writes, "I have taken every opportunity of examining whether the Siren undergoes any metamorphosis or not; and though I have observed them in various stages, from its smallest to its largest size, I have never perceived any variation in form or other respects;" and in

\* Siren lacertina an Larva Lacertæ? Syst. Nat., tom. i. p. 371.

1771 he further remarks—"I have now clearly ascertained that the Siren is oviparous, and that it never undergoes any metamorphosis." These observations have been confirmed by several American naturalists, as Leconte, Dr. W. Hume, and Dr. E. Ravenel of Charleston.



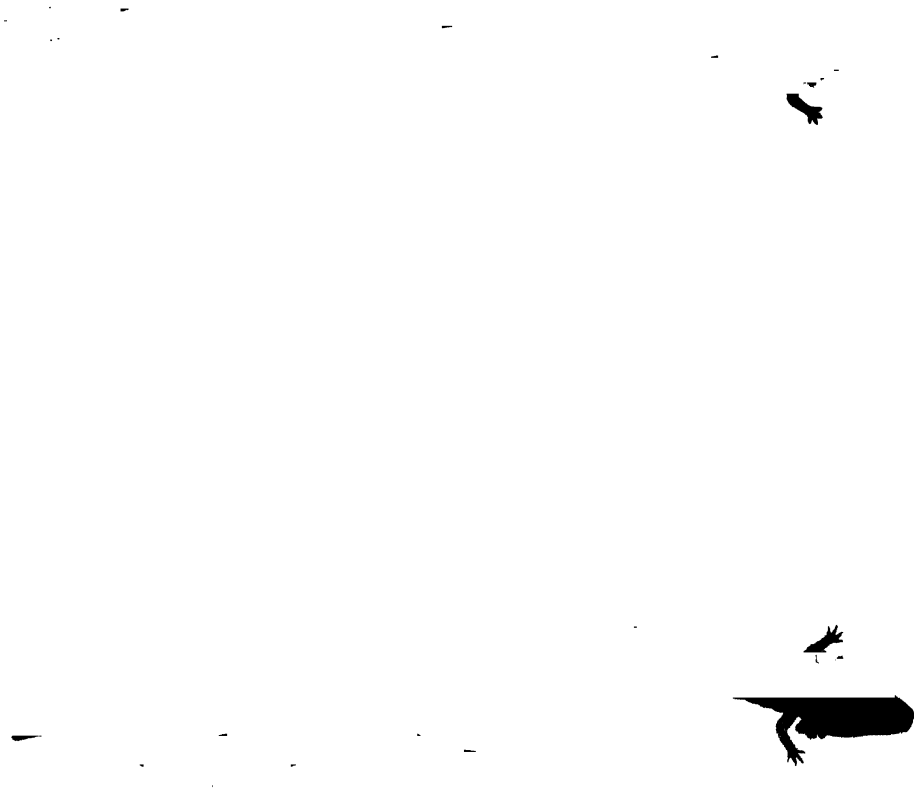
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**Siren intermedia**





SIREN INTERMEDIA.—*Leconte.**Plate XXXV.*

**CHARACTERS.** Head rather small, flattened; snout small and rounded; neck contracted; spiracles concealed by a fleshy trilobate operculum, smooth above, reticulated and fringed below; colour dusky, approaching to bluish-black.

**SYNONYMES.** *Siren intermedia*, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. i. p. 53.

*Siren intermedia*, *Harlan*, Med. and Phys. Res., p. 89.

*Siren intermedia*, *Wagler*, Naturlich. Syst. der Amphib., p. 310.

**DESCRIPTION.** The head is sub-oval and rather small, with the frontal region depressed, and the snout small, rounded and not truncated as in the *Siren lacertina*. The mouth is small; the tongue is small, arrow-shaped, though rather rounded in front, and is only free at its tip, and for a short distance at its anterior and lateral margins; the teeth are very minute.

The nostrils are latero-anterior. The eyes are small, black, and covered with cuticle, as in the eel. The neck is contracted, and the spiracles or branchial orifices are concealed by a fleshy trilobate covering on each side, which is smooth above, but reticulated and fimbriated below; and this net work seems to be made up of minute filaments resembling the fimbriated gills of the *Siren lacertina*.

The body is eel-shaped. The tail is thick at its root, but soon becomes laterally compressed, and towards the tip is ancipital, with a narrow rayless fin above and below. The anterior extremities, which alone exist, are small, short,



and terminate each in four short unarmed fingers, of which the external is very minute.

**COLOUR.** The whole superior surface of the animal is dusky, approaching to bluish-black; beneath it is tinged with purple.

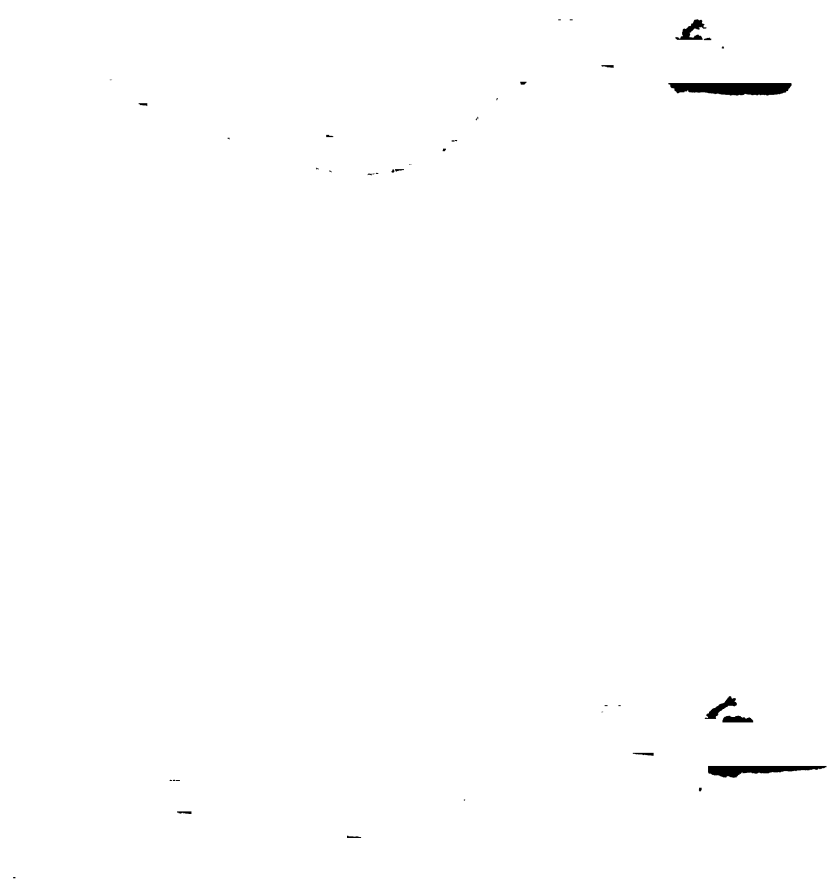
**DIMENSIONS.** Length of head in the specimen above described, 8 lines; length of body to vent, 6 inches; length of tail  $2\frac{1}{2}$  inches: total length, 9 inches 2 lines.

**HABITS.** The *Siren intermedia* frequents swamps and rice-field ditches, like the *Siren lacertina*; but of the nature of its food I can say nothing.

**GEOGRAPHICAL DISTRIBUTION.** This reptile inhabits Georgia and South Carolina; Leconte observed it in the former, and Dr. Blanding in the latter state.

**GENERAL REMARKS.** Leconte was the first naturalist who observed this animal, and described it under the specific name it here bears.





**Siren striata**

*The M. S. P. M. 1914*

*F. S. Durah, Esq.*





SIREN STRIATA.—*Leconte.**Plate XXXVI.*

CHARACTERS. Head small, depressed; snout rather pointed; colour above dusky, with a broad yellow stripe on each side, and another stripe still paler below; abdomen speckled brownish-white.

SYNONYMES. *Siren striata*, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. i. p. 54, pl. 4.

*Siren striata*, *Harlan*, Med. and Phys. Res., p. 88.

*Siren striata*, *Wagler*, *Natürlich. Syst. der Amphib.*, p. 310.

DESCRIPTION. The head is small, sub-oval, flattened, with the snout rather pointed. The mouth is small; the tongue is small, arrow-shaped, and pointed in front, free only at its tip, and for a short distance along its anterior and lateral margins.

The nostrils are anterior. The eyes are lateral, and rather large for a *Siren*, and are of a dusky-grey colour. The neck is contracted but slightly, and has a single spiracle on each side, concealed by three fleshy prolongations, with fimbriated edges, the anterior very small.

The body is eel-shaped. The tail is long in proportion, thick, and rounded at its root, but is soon compressed laterally, and is ancipital near its tip, though hardly furnished with a rayless fin, as in the two last species. The anterior extremities, which alone exist, are very small, and terminate each in three minute unarmed fingers.

**COLOUR.** The whole animal is dusky-brown above, with a yellow band or stripe on each side, and a second band of paler colour below; the "abdomen is speckled greyish-white."

**DIMENSIONS.** Length of head, 7 lines; length of body to vent,  $3\frac{1}{2}$  inches; length of tail, 2 inches: total length, 6 inches 1 line.

**HABITS.** The *Siren striata* does not seem to differ much in its habits from the *Siren lacertina*, it seeks the same localities and the same food. Leconte, however, says they do not burrow in mud, but swim constantly in water, and die soon if removed from it; yet the recent observations of Dr. Harden of Riceborough, in Georgia, prove that they are often found in soft mud.

**GENERAL REMARKS.** It is again to that accurate naturalist Leconte that we are indebted for a knowledge of this beautiful reptile.







*Menobranchius macleoti*.

*J.S. Davis, 1911*

*S. H. Parker, 1908*





MENOB R A N C H U S.—*Harlan.*

GENUS MENOB R A N C H U S.—CHARACTERS. Gills persistent through life; head large; mouth large; upper jaw armed with a single series of small, conical, pointed teeth; palatine teeth in a series nearly concentric with the superior maxillary, and terminating behind the posterior nares; neck contracted, with two spiracles on each side, covered by three branchial tufts; tail compressed laterally, ancipital; extremities four; fingers four; toes four.

MENOB R A N C H U S MACULATUS.—*Barnes.*

*Plate XXXVII.*

CHARACTERS. Body above dusky cinereous-grey, irregularly interspersed with sub-circular spots of darker hue; a brown stripe extends from the snout backwards over the eye.

SYNONYMES. Menobbranchus maculatus, *Barnes*, Amer. Jour. Arts and Sci., vol. xiii. p. 68.

*Proteus* of the Lakes, *Mitchell*, Amer. Jour. Arts and Scien., vol. iv. p. 181, also vol. vii. p. 63.

Monograph of Doubtful Animals, *Barnes*, Amer. Jour. Arts and Scien., vol. xi. p. 268.

Menobbranchus lateralis, *Harlan*, Med. and Phys. Res., p. 89.

DESCRIPTION. The head is large, flattened, with the snout truncated abruptly. The mouth is large, reaching to the eyes, and is covered by thick fleshy lips. The tongue is large, full, entire in front, free and movable only at its apex, and for a short distance along its lateral and anterior margins.

The nostrils are small, lateral, and very near the margin of the upper lip. The eyes are small and far asunder. The neck is contracted, with a transverse cutaneous fold at the throat, and three rows of external gills on each side, which are placed on the posterior margins of corresponding fleshy prolongations, and supported by three "branchial arches, between which are two apertures or openings apparently for the water to pass through;" these gills are exceedingly minute, and resemble fringe of the finest texture.

The body is elongated and sub-cylindrical, a little depressed along the mesial line, and is covered with a smooth skin permeated by many pores. The tail is long, broad vertically, ancipital and rounded at the tip.

The anterior extremities are short, and terminate in four unarmed fingers; the posterior are nearly of the same size, and end in four toes without nails.

**COLOUR.** The ground colour of the whole superior surface of the animal is dark cinereous-grey, produced by minute yellowish specks on a dark bluish ground, and irregularly interspersed with sub-circular spots of a darker hue, and of the size of a pea; a brownish stripe begins at the snout and extends backwards over the eye. The throat and abdomen along the mesial line are nearly white. The margins of the tail are often of an orange tint, with blackish blotches near the tip. This animal I have never seen alive, but Professor Benedict says, "the gills are of a most rich crimson colour, and these the animal keeps in constant motion as a fish does its gills; in bringing them down to the neck the filaments are brought pretty close to the fleshy fimbriæ; on elevating them the fimbriæ dilate and float as it were in the water, presenting from the beauty of their colour and gracefulness of their motions an appearance beautiful beyond description."

Of the correctness of the drawing and colouring of the beautiful accompanying plate, there can be no doubt, as it was done from life by an accomplished artist as well as profound scholar, the Right Reverend J. H. Hopkins, Bishop of Vermont.

**DIMENSIONS.** Length of head,  $1\frac{1}{2}$  inches; breadth of head,  $1\frac{1}{4}$  inches; length of body to vent, 7 inches; length of tail beyond,  $3\frac{1}{2}$  inches: total length, 12 inches.

**HABITS.** Of the habits of this reptile but little is known; in general it remains at the very bottom of the waters it inhabits, where it swims or creeps along the ground with a slow serpentine motion; it is said rarely to leave the water and crawl to the shore. The *Menobranthus maculatus* is seldom taken, except in the months of April and May, which is their spawning season; at this time they are found about waterfalls, where they conceal themselves in crevices of rocks, and are now often caught with the hook baited for catfish (*Silurus*) or eels, though little desired by the fishermen, by whom they are regarded as poisonous, and are, consequently, seldom taken in hand. Their eggs are about the size of peas, and as many as one hundred and fifty have been counted in a single female. The *Menobranthus maculatus* feeds on various kinds of worms, insects, shell-fish, and crustaceous animals.

Though living almost entirely in water, it does not appear that it opens its mouth, or that the water passes through it to the branchial arches, as in fishes, during respiration; but that function seems to be performed "simply by the vibratory motion of the gills in water." "When kept in a vessel containing a large quantity of water, or in which the water is frequently changed, it manifests but little disposition to rise to the surface for atmospheric air; but when the quantity of water is small, or not often changed, it soon finds the air in the water insufficient for its purposes, when it ascends to the surface, takes a mouthful of air, and sinks again with it to the bottom."

**GEOGRAPHICAL DISTRIBUTION.** This reptile has as yet been found only in Lake Champlain and Lake Erie, and their tributary streams. They are said to be common at the Falls of Onion river, near Burlington, Vermont.

**GENERAL REMARKS.** There can be no doubt that this animal was first described

by Schneider;\* indeed, his description is too good to be mistaken; he says he found it in the Museum of Professor Helwigg, at Brunswick—that it came from Lake Champlain—that it is reputed poisonous by fishermen, &c. &c.; he regards it, however, as a species of *Siren*.

This reptile is next mentioned in the work of Daudin, who very erroneously regarded it as the larva or young of the *Menopoma Alleghaniensis*.

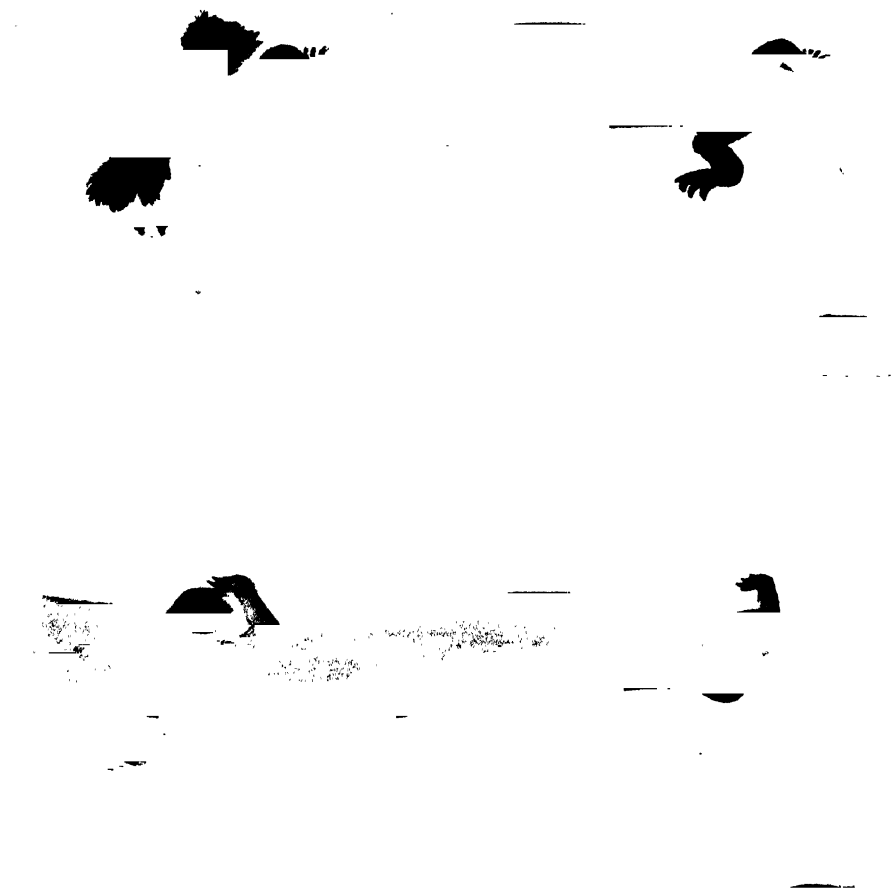
Dr. Mitchell gave a good description of it in the seventh volume of Silliman's *Journal of Arts and Sciences*, under the name of *Proteus of the Lakes*.

The account, however, of this animal, given by Mr. Barnes, aided by Professor Benedict, is the most accurate and most interesting of any that has fallen under my observation.

\* *Pervenit eo ex Americano lacu Champlain dicto transmissum, ubi captum cum piscibus timent ceu venenatum piscatores. Corpus ultra 8 pollices longum et fere pollicem crassum, molle, spongiosum, multis poris pervium, in utroque latere tribus macularum rotundarum, nigrarum sericibus variegatum: cauda compressa et anceps, utrinque maculata, inferiore acie recta, superiore curvata, in finem teretiusculum terminatur. Caput latum et planum: oculi parvi, nares anteriores in margine labii superioris, maxillæ superioris geminæ ut inferioris. dentes conici, obtusi, satis longi: lingua lata, integra, anterieus soluta: apertura oris patet usque ad oculorum lineam verticalem: labia piscium labiis similia: pedes dissiti quatuor, tetradactyli omnes, absque unguiculis: ani rima in longitudinem patet: Branchiæ utrinque ternæ extus propendent, appositæ superne totidem arcubus cartilagineis, quorum latus internum tubercula cartilaginea, velut in piscium genere, exasperant, &c. &c.*







**Membranae Lateralis .**





MENBRANCHUS LATERALIS.—*Say.*

*Plate XXXVIII.*

**CHARACTERS.** Head large, flattened above, truncated at the snout; body elongated, dusky-brown above, with a dark vitta extending from the nostrils through the eye, and along the flanks to the tail, which is compressed and ancipital; branchial tufts red.

**SYNONYMES.** Triton lateralis, *Say*, Long's Exped. to Rock. Mount., vol. i. p. 5.  
Menobranchnus lateralis, *Harlan*, Med. and Phys. Res., p. 89.

**DESCRIPTION.** The head of the Menobranchnus lateralis is large, broad, flattened above, truncated or almost sub-emarginate at the snout. The mouth is large, reaching to the eyes, and is covered with thick fleshy lips. The tongue is broad, full in front, and is free and movable at its tip, and for a short distance at its anterior and lateral margins.

The nostrils are lateral, and very near the margin of the upper lip. The eyes are small and far asunder, with the pupil as well as iris dark grey. The neck is contracted, with two spiracles or branchial orifices on each side, concealed by three branchial tufts.

The body is elongated, sub-cylindrical, and covered with a smooth soft skin. The tail is long, laterally compressed, ancipital and rounded at the tip, like that of an eel. The vent is a longitudinal fissure.

There are four extremities; the anterior are short, placed behind and near the

gills, and terminate in four small fingers destitute of nails; the posterior extremities are nearly of the same size as the anterior, and terminate in four unarmed toes.

**COLOUR.** The head above, as well as the whole superior surface of the animal, is uniform dusky-brown; from the nostrils on each side extends a dark or even black vitta through the eye, along the flanks, though there it is less distinctly marked, and is finally lost on the tail. The inferior is dirty flesh-colour at the throat and abdomen. The branchial tufts are of beautiful crimson colour during the life of the animal, but become discoloured and dark soon after death. I have never seen the *Menobranchnus lateralis* alive, yet I have every reason to believe the accompanying plate to be accurately drawn and coloured, as it was done from life by Mr. Heimors, under the direction of Professor Troost.

**DIMENSIONS.** Length of head,  $1\frac{1}{2}$  inches; length of body to vent, 7 inches; length of tail,  $3\frac{1}{2}$  inches: total length, 12 inches.

**HABITS.** The *Menobranchnus lateralis* lives in deep waters, and feeds on small shell-fish, crustaceous animals, &c. &c.

**GEOGRAPHICAL DISTRIBUTION.** This reptile has a wide range, it being found in many of the rivers and streams that open into the Mississippi on its eastern side, but I am not aware of its existence west of that river. Say found it as far north as Pittsburgh, in Pennsylvania, and Troost as far south as Cumberland river, in Tennessee.

**GENERAL REMARKS.** The *Menobranchnus lateralis* was first described by Say from a specimen taken by himself with a hook in the Alleghany river. He considered it a Triton, and applied to it the specific name "lateralis," from the dark "vitta" along the side of the head and body. At first I was disposed to believe that the *Menobranchnus maculatus* and the *Menobranchnus lateralis* were one and the same animal; but I am now convinced that the latter is at least a well marked

variety, if not a distinct species; it is more slender in proportion—its colour and markings are different—it is found only in the western waters that run into the Mississippi, while the former inhabits the rivers and streams that flow into the northern lakes and all the tributaries of the St. Lawrence river.

REPTILES known to inhabit the UNITED STATES, but which I have never been able to procure.

AMEIVA TESSELLATA, *Say*. Long's Exped. to Rocky Mount., vol. ii. p. 50.

“CHARACTERS. Above black, marked with nine or ten longitudinal lines, and eighteen or twenty transverse ones, dividing the whole surface in a tessellated manner, the lines being brownish on the back, yellowish on the sides; scales of the back small, convex and rounded; *beneath* bluish-white; throat and neck yellowish; *head* olivaceous, covered with plates; scales on the throat somewhat larger than those on the back; anterior feet yellowish within, covered with minute scales; on the exterior and posterior sides greenish-white, with confluent black spots and minute scales; the anterior side yellowish, with larger scales; *pores* of the thighs very distinct and prominent; *tail* elongated, brownish above, spotted with black near the base; *beneath*, impure white, immaculate; the scales carinated and placed in transverse series. Length, one foot; tail, eight and a half inches. Inhabits Arkansas Territory.” Dr. Harlan thinks this animal may prove the *Ameiva sexlineata*, which can hardly be, as Say must have been well acquainted with the latter animal; and besides, their colour and markings are entirely different.

*Coluber flavigaster*, Say, Long's Exped. to Rocky Mount., vol. i. p. 185.

**CHARACTERS.** *Above* olivaceous; *beneath* yellow; *lower jaw* beneath white; *scales* destitute of a carina. Total length, three feet eleven inches; tail, eleven inches; abdominal plates, one hundred and seventy-six; caudal scales, eighty-four. **Inhabits Missouri.**

*Conclusion.* I have now described and figured all the reptiles, with one or two exceptions, that I am at this moment willing to admit into our Herpetology, as existing within the limits prescribed for this work. That a great many more will be found when the vast country west of the Mississippi shall be explored, there cannot be the least doubt, but their description must be left to other and abler hands.

THE END.

ERRATA.

VOL. V., p. 30—fourth line from top, after “each” add “*side*.”

“ 93—fourth line from bottom, for “Neoro” read  
“*Neosho*.”

SYNONYMES.

*Bufo lentiginosus*, p. 7, for page 106 read page 109.









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