# Some Observations on Amphibians in the Northern Lower Peninsula of Michigan, June-August 1949

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## INTRODUCTION

For the past forty years students of the University of Michigan have done extensive work on the natural history and taxonomy of the amphibians of this area. The purpose of these observations, therefore, was not to find new species, but to add to my own knowledge the life history and habits of various forms found in this area.

## ACKNOWLEDGMENTS

At this time I would like to thank Dr. Charles W. Creaser of Wayne University under whose direction I was able to accomplish this work. Although I learned much about the natural history of the amphibians previously unknown to me, it was secondary to the many new methods of taking notes and catching amphibians. I would also like to thank his assistant Mr. Wm. Pruitt, Jr. for taking me out on various occasions to catch amphibians. Last of all, I would like to thank the numberous students who have cooperated in procuring specimens for me from this area.

## MATERIALS AND METHODS

1. Salamanders and frog larvae were caught in pools by the use of seine and dip nets.
2. Adult salamanders were found under or in logs.
3. Frogs which were near or in pools were caught by hand.

At this time I would like to briefly describe the method taught to me by Dr. C. Creaser. One hand is gently moved in front and about three feet above the frog. While it focuses its attention on that hand, the other hand comes swiftly down and ~~caught~~ catches the frog. This method has been found to be highly effective for these swift moving animals.

4. Amphibian larvae were observed in the laboratory by keeping them in finger bowls of various sizes. Potamogeton and Anacharis (Elodea) served as the main oxygenating plants. Only lake water was used for the animals personally observed by me, unless it is otherwise noted.

5. Adult amphibians were kept in large finger bowls with moss or rotten pieces of wood serving as its habitat. Sufficient water was put into the containers and glass covers were used to prevent excess evaporation.

6. Food for them was procured in a number of different ways. Small land invertebrates served as food for the terrestrial and aquatic forms. Plankton caught with the use of the Birge cone net were fed to larval forms as part of their food. Small dead pieces of mammalian tissue, such as muscle, and liver were taken by salamander larvae, that is if the pieces were gently moved in front of them.

7. The specimens, after they were sacrificed, were preserved in 4% formalin solution.

OBSERVATIONS

Triturus viridescens viridescens (Raf.)

Field Note 1:

Seven mature and nine larval Triturus were caught by the herpetology class at the Sedge Point Pool on July 1, 1949. Three efts were also found in the woods adjacent to the pool. The adults ranged from 69.1 to 99.0 mm. long with an average of 79.5 mm. The red efts measured 40.0, 49.6, and 55.3 mm. long with an average of 48.3 mm. in length.

On August 4, 1949, a 25 mm. larva transformed in the laboratory. This individual has not eaten since it ~~has~~ lost its gills (As of August 8, 1949). Moving pieces of meat did not seem to entice it to eat.

Field Note 2:

One red eft was found under a damp log at Duncan Bay on July 22, 1949 by Gene Nakamura. This seemed like a rather peculiar place to find it, for there were no pools that would seemingly support the larval forms in the very nearby surrounding vicinity.

Field Note 3:

One adult was caught by Miss Sophia Holley at Wilderness Park on August 1, 1949. She told me that she had found it under a thin board at the edge of a beach pool. This pool was relatively free of aquatic vegetation; however, a semi-aquatic genus of plants, Triglochin, was found scattered in the edge of the pool and the areas closely surrounding the podl. The temperature for the day was about 50 degrees F. It is

also interesting to note that this is a new area record for this species.

Upon further examination of this individual, it was noted that half of the number of red spots were incompletely encircled with black rings, indicating according to Bishop (1942) the possibility of intergrades between the T.v. viridescens and T.v. louisianensis.

Discussion:

Insofar as the general eating habits of the animals are concerned, the aquatic larvae and mature adults fed readily on plankton and pieces of earthworms and meat of various sorts.

This area as shown by Bishop (1942) is very close to the hybridization vicinity between the T.v. viridescens and T.v. louisianensis. Most of the specimens from Duncan Bay, Sedge Point Pool and Wilderness Park have similar incomplete black rings around the red spots; however, two animals from Sedge Point had complete black rings in the region just posterior th the head. None of the specimens examined were completely devoid of the black rings, as one might expect if this were in an area of intergradation between the two subspecies. Since there aren't sufficient specimens on hand, I cannot make any conclusions.

Ambystoma maculatum (Shaw)

Field Note 1:

Eight larvae were caught in a seine net at the Sedge Point Pool on July 1, 1949. The average size of them was 37.6 mm. long. They fed well on plankton, pieces of earthworm, hamburger, Peromyscus meat and liver, and small insects (exclusive of Coleoptera and Formicidae).

On July 18, 1949, one member of the group absorbed its gills; a week later on July 25th, bluish specks appeared on the lateral surfaces of the body. At that time it was surmised that the species of this was A. jeffersonianum; however, on August 5, 1949, it was noticed that golden somewhat parallel dorso-lateral spots appeared in place of the blue specks. Its size as of August 7, 1949 was 39 mm.

Field Note 2:

One larva was found in Bryant's Bog on July 8, 1949 by Gene Nakamura. It is still in his possession. It was incidentally caught with a dip net.

Discussion:

It is interesting to add that the final identification of this species depended upon it developing the parallel yellow spots. Since we have not, to my knowledge, procured any known Ambystoma jeffersonianum larvae, I could not make an actual comparison of the two species. More work will be done on this part of the work later on.

Hemidactylium scutatum (Schlegel)

Field Note 1:

Seven larvae were caught at Bryant's Bog on July 8, 1949 by the herpetology class. Measurements were made immediately after they were caught and their sizes ranged from 15.6 to 19.3 mm. (See Drawing) They were kept for two weeks and then killed. They fed readily on plankton cuaght in Douglas Lake.

Field Note 2:

Three larvae were caught in Bryant's Bog on July 10, 1949. The sizes ranged from 16.3 to 18.7 mm. long. They were killed immediately after they were brought back to the laboratory.

Field Note 3:

One adult was caught by John D. Lattin on July 12, 1949 while he was on a plant ecology field trip. It was found on the SE shore of Mud Lake in Cheboygan County under a rotten log on a sphagnum bed which was about 40 feet from the edge of the water, and just beyond the high shrub line made up of Chaemaedaphne. It measured 65.5 mm. long.

This is a new record in the vicinity of Douglas Lake.

Discussion:

The identification of these larval forms is not very difficult. The characteristic usually used in the identification of this species is its 4-4 toe ratio; however, in the field it is sometimes very difficult to see this ratio of toes. Of the specimens observed, it was noted that the lense of the eyes protruded conspicuously, and that the body was slender, and a dull rust color. The Hemidactylium larva may be confused with the Triturus larva; however, the latter does not have the conspicuously bulging eyes or a rust color. In addition, it has a 4-5 toe ratio, even though the 5th hind toe is extremely short and inconspicuous.

Plethodon cinereus cinereus (Green)

Field Note 1:

On June 22, 1949, Dr. C.W. Creaser brought in two specimens of mature Plethodon. These were found in the U.B.S. sawmill woodpile. One was a gray phase and the other was the red-backed phase.

Field Note 2:

One adult was found by me in the woods near Sedge Point on July 1, 1949. It was found under a rotten log in a forest that was essentially mixed and very difficult to tell insofar as to what forest association it belonged. There were, however, a greater percentage of Pinaceous than deciduous trees in that particular area.

Field Note 3:

Two adults were caught by the herpetology class on July 8, 1949, in the woods adjacent to the Bryant's Bog. These specimens were not kept.

Field Note 4:

On July 19, 1949, while on a field trip to Alanson, Emmet County, Michigan for an albino red squirrel, I happened to find three adults within a large rotten deciduous log. The property belongs to Mr. Banwell, and he has managed to keep the forest in its natural condition. It was a typically virgin beech-maple forest.

Field Note 5:

On August 4, 1949, I accompanied Mr. Wm. Bruitt to Monroe Lake in Cheboygan County. While he was setting his traps for the herpetology class the following day, I found four mature redbacked phase Plethodon within some rotten stumps. Again the forest was a good beech-maple association.

Discussion:

On July 10, 1949, seven Plethodon embryos were brought in by Miss Grace Thomas. On the 12th, one ~~egg~~ Embryo (See drawing) was separated from the rest and the capsule was removed. The embryo was then placed in a coasting dish filled with UBS well water. At the time of removal from the egg sac, the yolk was extremely

large. At that time, the embryo was 16.5 mm. long.

A daily examination of the animals was made for a two week period. On July 24, 1949, there was a sufficient change in its gross morphology to warrant noting it. The size of the yolk had decreased considerably. So much so that from a dorsal view it was only noticeable as a slight bulge in the abdominal region. (See drawing) From the ventral view, the yellow yolk, though smaller, was still very conspicuous. This was due to the contrast in colors of the yellow yolk to the reddish-brown ground color. At this time the dorsal red band was very distinctive. This red band was a light tan color on July 12th.

Following this, on July 29th, three other embryo sacs from the same group of eggs were excapsulated, and the amazing thing noted was the comparative sizes of the individual which was excapsulated the three weeks before and the ones that were excapsulated on the 29th. The yolk of the individual which lived in the water for two weeks was 20.6 mm. long , most of the yolk was used up, and it had a fairly stout body. The average size of the individuals excapsulated on the 29th was 18.6 mm, the yolk was considerably larger and rounder, and the body was thinner than the previously decapsulated one. From these observations, I made the conclusion that the individuals within the capsules were cramped, and could not get sufficient oxygen for metabolism; hence, did not develop as fast as the organism in the open water. The difference in the composition of its own fluid as compared to the UBS well water did not seem to hinder its development.

These observations were stopped when one of the newly excapsulated individuals was injured and placed in a coasting dish with the other uninjured ones. The injured one died during the evening and its toxic fluids seemed to have killed the others.

Bufo terrestris americanus (Holbrook)

Field Note 1:

Eggs were found in the pool at the corner of Michillemakinax and Henry St. in Makinaw City, June 23, 1949 by Dr. C.W. Creaser. The toads were heard calling after 9:00 P.M.

Field Note 2:

One recently metamorphosed toad was caught while it was hopping along the beach at Wilderness Park near one of the Beach pools. It was found by me while on a botanical field trip on July 30, 1949.

Field Note 3:

One recently metamorphosed toad was caught by me on August 4, 1949 in the woods near Monroe Lake in Cheboygan County. The habitat was a typical beech-maple forest.

Discussion:

It is of interest to mention that the specimens from Wilderness Park and Monroe Lake had two warts within each black spot. They also had clear ventral regions. These characteristics would seem to indicate that they were the Bufo woodhousii fowleri; however, since they were immature individuals, no conclusive verification could be made on those observations. They were probably just the B.t. americanus .

Pseudacris nigrita triseriata (Wied)

Field Note 1:

Only one specimen of this species was caught this year. It was found by Jerome Miller, asstudent of mammalogy, on June 28, 1949 in Cheboygan County T 36N, R 3W, S 1. in a deep cedar bog, near a standing water pool. No measurements were made as to its possibility of being a short legged form, the P.n. septentrionalis. On the other hand with a casual glance it did not seem to have the comparatively short body/leg ratio when mentally compared to typical P. n. septentrionalis I have seen in other places.

Hyla crucifer crucifer (Wied)

Field Note 1:

"One spring peeper was heard singing in the sewage pool behind the car parking area from June 21 to the 26th by C.W. Creaser." (Vandergrift-field note).

Field Note 2:

Eight larvae with hind legs, of which three of them had additional fore-legs and tails were caught at Bryant's Bog on July 8, 1949. These were caught with a dip net. Three recently metamorphosed tailless animals were also caught in the same pool.

Field Note 3:

Four larvae with hind legs only were caught at Bryant's Bog. In addition, two recently metamorphosed H. crucifer's were also found in the same pool. The edge of the pool is line with Chaemaedaphne.

Discussion:

From the period of July 14 to 21 most of the tadpoles metamorphosed; however, all of them died soon after they

transformed because of the inavailability of the proper food.

Hyla versicolor versicolor (Le Conte)

Field Note 1:

One the morning of June 22, 1949, a dead specimen of H. versicolor was found on the road near cabin 10 in Manville. It had been killed by an automobile the previous evening.

Field Note 2:

Three larvae were caught at the Sedge Point Pool on July 1, 1949 by the herpetology class. One of the larvae transfomred on July 19, 1949. As of August 2, 1949 the one remaining larva had not gotten the use of its fore-legs. On August 7, 1949, it was sacrificed.

Discussion:

It is usually quite readily distinguished in the field because it has a rust colored tail.

Rana catesbeiana (Shaw)

Field Note 1:

~~One~~ Several frog was heard singing at the mouth of the Maple River on the evening of June 24, 1949 by C.W. Creaser.

Field Note 2:

One larva of this species was caught with a seine net at Wilderness Park on July 13, 1949 by the Ichthyology class. On July 28, 1949 the skin in the region of the forelimbs was bulged out. On July 29, 1949, the forelegs came out. It was killed on August 7, 1949, and which time its tail was considerably shorter and the body had become much stouter. Because only one specimen was caught, I could not make a study of its mouth parts, and still try to study its development; consequently, further work on this species will be done later. I have found

that MS 222 is extremely good in anesthetizing amphibians; however, it was not available at the station.

Rana pipiens (Schreber)

Field Note 1:

Two large larvae with the average size of 86.9 mm. were caught by the Ichthyology class at Wilderness Park on July 13, 1949. At first these were tentatively identified as R. clamitans because of the enormous size; more will be said about them in the discussion. These were caught along with a tadpole of Rana catesbeiana.

Field Note 2:

Two R. pipiens were caught by Roger Mitchell on Bois Blanc Island on July 31, 1949. They were found in a stream near Echo Lake near Point aux Pines.

Field Note 3:

I saw a large number of this year's progeny on the sandy beach of Monroe Lake in Cheboygan County on August 4, 1949. Adults were also seen in the beech-maple forest about 50 feet from the shore line of the lake.

Discussion:

At this time I would like to comment more thoroughly on the work done with the larvae from Wilderness Park.

One specimen was sacrificed on July 14, 1949. A careful examination of its mouth parts was made, drawn, (See drawing) and compared to the publication of Wright (1929, 1949). The mouth-part drawing seemed to fit the description of the R. clamitans. On the other hand, the abdominal region was not pigmented; consequently, the intestine could readily be seen through the skin; this characteristic, according to Wright (1949), fits R. pipiens.

The second specimen was kept alive until August 2, 1949. The fore-legs were first noticed on July 25, 1949. Several days later the spots of typical R. pipiens were noticed. By August 2, the tail and body had noticeably decreased in length (see measurements below).

Measurements Table

| Parts of Body measured | Specimen # 1 July 14, 1949 | Specimen # 2 July 14 | Specimen # 2 August 2 |
|---|---|---|---|
| Body length | 33,6 mm. | 32.6 mm. | 26.8 mm. |
| Tail length | 53.6 mm. | 53.1 mm. | 33.9 mm. |
| total length | 87.2 mm.. | 85.7 mm. | 60.7 mm. |
| Hind leg length | 28.2 mm. | 29.5 mm. | 34.6 mm. |
| Fore leg length | -------- | -------- | 13.5 mm. |

Rana sylvatica cantabrigensis (Baird)

Field Note 1:

Two individuals were caught and then released by me while on a botanical field trip through the gorge on July 13, 1949. The gorge was deep and very cool with much sphagnum serving as a base.

Field Note 2:

One specimen of this species was caught by Roger Mitchell on July 31, 1949 on Bois Blanc Island near Echo Lake. It was found in the woods on top of a rotten Populus log.

SUMMARY

A lengthy discussion was made with the larval forms of the salamanders and frogs because the larval forms were opportunely available. Since I have not made any extensive studies in this phase of herpetology, I stressed its investigation.

## CONCLUSION

Much of this report was spent on describing the development of larval forms of the amphibia. The rest of the paper was devoted to field notes. New area records have been found; however, no new species have been discovered.

## Literature cited

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