LAND SNAILS FROM NORTHERN MISSOURI

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INTRODUCTION

The state of Missouri has a rich land snail fauna. However, the knowledge of those species comprising the fauna and the details of their distribution are far from adequate. As pointed out by Miles (1969) and, more recently, Hubricht (1972a), the details of the northern fauna are particularly scanty. Locality records from north of the Missouri River are scattered in the literature, most reports having concerned the southern half of the state. A partial review of the literature devoted to Missouri land snails is included here.

The present study was initiated to contribute to our knowledge of the distribution of land snail species in all of northern Missouri. The records presented here are from the northeastern part of the state. Data from the northwest will hopefully be tabulated soon. All of the specimens listed herein have been deposited in the Mollusk Collection of the University of Missouri - Kansas City with the exception of those from locality no. 40 which are in the collection of the senior author.

HISTORICAL ACCOUNT

F. A. Sampson was the earliest serious student of Missouri land snails. His first paper (Sampson, 1883a) included a brief discussion of shells collected in the vicinity of Lamar in Barton County and near Springfield in Greene County. A second paper reported 51 species of snails, including aquatics, from near Sedalia, Pettis County, Missouri (Sampson, 1883b). Sampson also contributed other shorter reports on snails collected in Pettis County in 1885 and 1890.

Pilsbry (1891) published a short report on zonitids from Arkansas, and un the paper he mentioned *Helix appressa* Say (=*Mesodon appressus*) from Boonville, Missouri. The next year, Sampson (1892) reported *Mesodon andrewsae* Binney from St. François County. A year later in a long list of North American collections, Stearns (1893) reported eight species of land snails from Stone County in southern Missouri.

The first paper supplying records of a wider scope was by Sampson (1894) in which he reported 11 species from 14 southern counties. Four years later a short paper on snails from Iron County appeared (Baker, 1898). This was the last paper devoted to Missouri gastropods before 1900, although a short paper by Pilsbry (1899) on species of *Polygyra* from Arkansas contained a few records from extreme southern Missouri.

Pilsbry, in 1903, reported a few Missouri records in another work devoted mainly to Arkansas, and Greger (1905) published the first paper containing records from northern Missouri (Callaway County). Then Pilsbry and Ferriss (1906) published a major paper devoted to land snails of Missouri, Arkansas, and 'Indian Territory' (Oklahoma). In regard to Missouri, this work dealt mostly with the southern part of the state, although there were a few records listed from north of the Missouri River (notably from Boone, Callawwy, and St. Charles Counties).

Six years later, Sampson produced two more short reports. The first (Sampson, 1912a) concerned records of some polygyrids and included measurements of *Polygyra albolabris* (Say) (=*Triodopsis*) from Jackson County and elsewhere. The second was a more extensive report of locality records from seven counties in southeast Missouri (Sampson, 1912b).

A year later, Sampson (1913) contributed what could be called the most important and extensive paper on Missouri snails. This consisted of locality data and notes on most of the species known to occur in the state at that time. This report was the last major paper devoted to Missouri gastropods. It is particularly important because it included more data on the northern fauna than had been published previously and was the only source of information in this regard until recently.

Since 1913, most information in the literature pertaining to Missouri snails has been brief. Samp-

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son (1914) published a short paper concerning fossil shells from Providence and Lupus. Greger (1916, 1917) published papers referring to fossil species of Missouri gastropods. Baker (1932) mentioned a collecting trip but gave no data, and Hubricht (1941) published a study dealing with Mollusca from caves in the Ozarks. It included aquatic as well as terrestrial forms.

Nearly all of the records in the works discussed thus far were summarized by Pilsbry (1940, 1946, and 1948), and the number of reports since his monumental work has been few, and, as before, devoted to southern and central Missouri. Dowdy (1950), in a report on ecological studies of invertebrates, mentioned several species collected from the flood plain of the Osage River in central Missouri. Hubricht (1962) described a new species of *Helicodiscus* (*H. notius* Hubricht) and listed six Missouri counties where it had been found, including St. Charles and Boone. In the same year, Branson (1962) reported four species of polygyrids from Jasper County in southern Missouri.

Hubricht has contributed two other short papers. In the first (Hubricht, 1963) he discussed the genus *Discus* in the state, while in the second, (Hubricht, 1964a) he gave several southern localities for *Strobilops aenea* Pilsbry. He also published a long list of records on the Pleistocene fauna of parts of Missouri and Illinois (Hubricht, 1964b). This last paper is most interesting as it indicates that the Pleistocene fauna of northeastern Missouri has survived to the present essentially unchanged.

A brief paper by Grimm (1968) reported *Catinella oklahomarum* Grimm from Barry County. In the same year, a rather extensive study of terrestrial gastropods from part of Jackson County was completed (Hershey, 1968). A year later, attention was turned to the northern part of the state with two short preliminary reports (Miles, 1969; Miles and Reeder, 1969). Recently Hubricht (1972a) reported all of the Missouri land snails in his collection, mostly from southern and central Missouri and (Hubricht, 1972b) discussed fossil *Gastrocopta* including some Missouri records.

A perusal of all of these reports brings home the paucity of information on northern Missouri land snails. Only the works of Sampson (1913) and Miles and Reeder (1969) reported substantial information with regard to Recent land snail distribution north of the Missouri River.

GAZETTEER

The following is a list of localities in northeastern Missouri from which the specimens of the present study were collected. They are listed by counties, the latter arranged alphabetically. Each locality is assigned a number from one through 67. These assigned numbers are used in the Accounts of Species to indicate the localities where each species occurred.

1. Adair Co. On Chariton River, 1.0 mi E Novinger.
2. Adair Co. Thousand Hill State Park, 4.0 mi W and 3.0 mi S Kirksville.
3. Audrain Co. On state rt. J, 6.4 mi W of U.S. Rt. 54.
4. Audrain Co. North city limits of Mexico (on Missouri Rt. 15).
5. Audrain Co. 1.2 mi W and 3.9 mi N Mexico (on Missouri Rt. 15).
6. Boone Co. 0.5 mi E Boone-Howard County line on U.S. Rt. 40.
7. Boone Co. 2.5 mi E and 0.5 mi N Hallsville (on Missouri Rt. 124.
8. Boone Co. 0.6 mi S and 3.6 mi E Rocheport (junction of Interstate 70 and state rt. O).
9. Callaway Co. 1.8 mi W Wainwright (on Missouri Rt. 94).
10. Callaway Co. 4.0 mi S and 0.2 mi W Toledo (on state rt. O).
11. Callaway Co. 3.7 mi W and 0.3 mi S Portland (on Missouri Rt. 94).
12. Callaway Co. 3.0 mi S and 3.8 mi E Toledo (on state rt. O).
13. Callaway Co. Auxvasse River. 1.3 mi E and 0.7 mi N Kingdom City (on U.S. Rt. 54).
14. Knox Co. 1.7 mi N Shelby County line (on Missouri Rt. 15).
15. Knox Co. 3.0 mi N of Missouri Rt. 156 on Missouri Rt. 15.
16. Lincoln Co. 0.6 mi S and 0.8 mi E Truxton (on state rt. A).
17. Lincoln Co. 3.1 mi W and 3.7 mi N Troy (on state rt. H).
18. Lincoln Co. 2.5 mi W and 3.3 mi N Troy (on state rt H).
19. Lincoln Co. Cuivre River State Park, 2.0 mi E and 2.0 mi N Troy (On Missouri Rt. 147).
20. Lincoln Co. Cuivre River State Park, 3.2 mi 3 and 2.0 mi N Troy (on Missouri Rt. 147).
21. Lincoln Co. 3.5 mi S and 0.8 mi E Elsberry (junction of state route M and Missouri Rt. 79).
22. Lincoln Co. 0.8 mi W and 2.7 mi N Elsberry (on Missouri Rt. 79).
23. Marion Co. 1.3 mi S Hester (on state rt. A).
24. Marion Co. 1.8 mi W Palmyra (on Missouri Rt 168).
25. Marion Co. approx. 2.0 mi NW Woodland (on state rt. E).
26. Marion Co. 2.5 mi S and 0.5 mi W Woodland (on state rt. E).
27. Marion Co. 2.8 mi N Ralls County line (on Missouri Rt. 79).
28. Monroe Co. 3.3 mi E and 2.5 mi N Granville (on Missouri Rt. 15).
29. Monroe Co. 0.2 mi S and 3.2 mi E Middle Grove (northern junction of state rt. M and Missouri Rt. 151).
30. Monroe Co. 2.5 mi S Paris (on Missouri Rt. 15).
31. Monroe Co. 1.5 mi S and 4.7 mi E Paris (on Missouri Rt. 154).
32. Monroe Co. 0.7 mi S and 1.6 mi W Florida (on state rt. U).
33. Monroe Co. Mark Twain State Park, 0.3 mi S and 0.3 mi E Florida.
34. Monroe Co. 2.3 mi S and 2.3 mi W Florida (on Missouri Rt. 154).
35. Monroe Co. Mark Twain State Park, 0.5 mi S and 0.5 mi E Florida.
36. Monroe Co. 6.5 mi S and 0.8 mi E Paris (on state rt. D).

37. Monroe Co. 1.2 mi W and 0.6 mi N Santa Fe (on state rt. D).
38. Montgomery Co. 4.0 mi E Wellesville (on state rt. CC).
39. Montgomery Co. 1.0 mi S and 1.0 mi E Big Spring (on Missouri Rt. 19).
40. Montgomery Co. Graham Cave State Park, just E of Danville exit on Interstate Rt. 70).
41. Montgomery Co. on state rt. Y, 6.0 mi E Missouri Rt. 19.
42. Pike Co. 1.7 mi S and 3.4 mi W Frankford (on state rt. C).
43. Pike Co. 2.0 mi SE Louisiana (on Missouri Rt. 79.
44. Pike Co. 3.0 mi S and 3.5 mi E. Louisiana (on Missouri Rt. 79).
45. Pike Co. 3.7 mi S and 4.5 mi E Louisiana (on Missouri Rt. 79).
46. Pike Co. Cuivre River, 1.0 mi S and 1.3 mi W Ashely (on Missouri Rt. 161).
47. Pike Co. 2.4 mi S and 1.0 mi E Ashely (on state rt. KK).
48. Ralls Co. 4.1 mi S and 2.0 mi W Huntington (on state rt. A).
49. Ralls Co. 6.0 mi N Perry (on state rt. J).
50. Ralls Co. 4.6 mi N Perry (on state rt. J).
51. Ralls Co. 0.5 mi W and 2.4 mi N Perry (on state rt. J).
52. Ralls Co. 3.8 mi S and 3.6 mi E Center (on state rt. F).
53. Ralls Co. 4.1 mi E and 2.0 mi N New London (junction of state rt. T and Missouri Rt. 79).
54. Randolph Co. Junction of U. S. Rt. 24 and state rt. Y (near Monroe County line.)
55. Randolph Co. Approx. 1.5 mi E Levick Mill (on state rt. J).
56. Schuyler Co. 0.5 mi W of U.S. Rt. 136 on state rt. AA.
57. Schuyler Co. 0.8 mi E Chariton River on U.S. Rt. 136 (near Livonia).
58. Shelby Co. 1.4 mi N of Shelbina (at city park).
59. Shelby Co. 3.7 mi N of Shelbyville on Missouri Rt. 15.
60. Shelby Co. 6.2 mi N Duncan's Bridge (on state rt. J).
61. Shelby Co. North Fork of Salt River, 4.3 mi S Shelbyville (on Missouri Rt. 15).
62. Warren Co. 1.2 mi N Warrenton on Missouri Rt. 47.
63. Warren Co. 0.7 mi S and 0.5 mi E New Truxton (on state rt. A).
64. Warren Co. 0.3 mi S and 0.3 mi W Case (on Missouri Rt. 94).
65. Warren Co. 2.5 mi W and 1.0 mi N Treloar (on Missouri Rt. 94).
66. Warren Co. 0.3 mi NE Treloar (on state rt. N).
67. Warren Co. North city limits of Holstein (on state rt. N).

ACCOUNT OF SPECIES

Family Pupillidae

Gastrocopta armifera (Say): Adair (2); Boone (7); Callaway (9); Lincoln (21); Monroe (28, 37); Ralls (50); Shelby (58).
Gastrocopta contracta (Say): Adair (2); Boone (7, 8); Lincoln (21); Monroe (28); Montgomery (38); Pike (46); Shelby (61).
Pupoides albilabris (Adams): Adair (2); Ralls (50).

Family Strobilopsidae

Strobilops labyrinthica (Say): Audrain (3); Lincoln (21); Monroe (33); Montgomery (38); Ralls (49, 50, 52); Randolph (54); Warren (62, 63).

Family Succineidae

Catinella vermeta (Say): Audrain (3); Knox (15).
Succinea concordialis Gould: Boone (6).
Succinea ovalis Say: Adair (1, 2); Shelby (61); Warren (64).

Family Endodontidae

Anguispira alternata (Say): Audrain (4); Knox (14); Lincoln (16, 17, 19, 20); Marion (24, 26); Monroe (28, 29, 30, 31, 34, 35, 37); Montgomery (38, 39); Pike (42, 46, 47); Ralls (51); Schuyler (57); Warren (64, 65).
Anguispira kochi (Pfeiffer): Callaway (9); Lincoln (20); Montgomery (40).
Discus patulus (Deshayes): Warren (67).
Helicodiscus parallelus (Say): Adair (2); Marion (23, 27); Monroe (31, 32, 37); Montgomery (38); Ralls (51); Schuyler (56).

Family Zonitidae

Retinella electrina (Gould): Adair (1, 2); Audrain (5); Knox (14); Shelby (60); Warren (67).
Retinella indentata (Say): Adair (1, 2); Audrain (3, 5); Boone (6, 8); Callaway (12, 13); Knox (15); Lincoln (21); Marion (23, 26, 27); Monroe (31, 32, 33, 35, 37); Montgomery (38, 39, 41); Pike (47); Ralls (50, 51, 53); Randolph (54); Schuyler (56); Shelby (59, 61); Warren (62, 65, 66, 67).
Paravitrea capsella (Gould): Lincoln (20).
Paravitrea simpsoni (Pilsbry): Lincoln (17, 19).
Euconulus chersinus (Say): Warren (62).
Euconulus fulvus (Müller): Warren (64).
Ventridens ligera (Say): Monroe (34); Montgomery (39).
Ventridens demissus (Binney): Boone (6).
Zonitoides arboreus (Say): Adair (1); Audrain (3, 4, 5); Boone (7, 8); Callaway (10, 12, 13); Knox (15); Lincoln (16, 18, 19, 21); Monroe (29, 30, 31, 32, 37); Montgomery (38, 39); Pike (43, 46, 47); Ralls (50, 51, 53); Randolph (54); Schuyler (56, 57); Shelby (58, 59, 60, 61); Warren (66, 67).

Family Haplotrematidae

Haplotrema concavum (Say): Callaway (11, 13); Lincoln (19, 22); Marion (23, 24, 27); Monroe (33); Pike (42); Schuyler (57); Warren (65).

Family Polygyridae

Stenotrema fraternum (Say): Boone (8); Callaway (11); Lincoln (17, 19, 20); Marion (27); Montgomery (39, 41); Pike (42); Ralls (49, 50, 51, 53); Warren (64, 65, 66, 67).
Stenotrema hirsutum (Say): Adair (2); Boone (8); Marion (27); Monroe (30); Ralls (53).
Stenotrema leai aliciae (Pilsbry): Adair (1, 2); Knox (15); Lincoln (21); Monroe (29); Montgomery (38); Shelby (59, 60, 61).

Allogona profunda (Say): Lincoln (2); Marion (27).
Mesodon clausus (Say): Adair (2); Boone (6); Marion (23, 24); Monroe (28); Pike (47); Shelby (58).
Mesodon elevatus (Say): Lincoln (19); Marion (27); Montgomery (40); Pike (42, 43, 44, 45, 46); Ralls (52).
Mesodon inflectus (Say): Callaway (9, 10, 11, 12, 13); Lincoln (17, 19); Monroe (31); Montgomery (39, 41); Warren (62, 65, 66, 67).
Mesodon thyroidus (Say): Audrain (4); Callaway (11); Lincoln (19, 20, 21, 22); Marion (23, 24, 26); Monroe (29, 31, 32, 34); Montgomery (41); Pike (42, 44, 45, 46); Ralls (49, 52, 53); Randolph (55); Warren (62).
Triodopsis albolabris alleni (Sampson): Callaway (10, 12); Lincoln (20); Marion (23, 24, 25); Monroe (32, 33, 34); Ralls (49, 53).
Triodopsis fosteri (F.C. Baker): Lincoln (20, 22); Marion (24, 27); Monroe (35); Pike (43, 44); Warren (64).
Triodopsis multilineata (Say): Marion (27).

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