

## DISTRIBUTION OF THE POLYGYRIDAE (MOLLUSCA: PULMONATA) IN TENNESSEE

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### ABSTRACT

Geographic range maps are provided for each of the 75 species-group taxa of the Polygyridae known from Tennessee. The known distributions of polygyrid land snails in Tennessee are verified, and the known ranges of 27 species within the state are extended. The most speciose physiographic province is the Blue Ridge followed by the Cumberland Plateau. These two provinces are also the location of the highest incidence of polygyrid endemism in Tennessee.

### INTRODUCTION

Cartographic analysis of a species range is useful in understanding the distribution, evolution and ecology of that species. Vagvolgyi (1968) has successfully employed this technique in monographing the genus *Triodopsis*. The purpose of this study is to produce a distribution map for each species of the Polygyridae (land snails) known from Tennessee.

In discussing the distribution of North American terrestrial gastropod faunas, Binney (1885) designated the southern part of the Appalachian Mountains as the Cumberland Subregion. The concept of this subregion was defined on the basis of the terrestrial molluscan taxa restricted to the area. Pilsbry (1900) further subdivided the Cumberland Subregion into an eastern division (Smoky Mountains) and a western division (Cumberland Plateau) separated by the Tennessee River Valley, observing that each sector had its own unique species. Adams (1901) cited the two divisions of the Cumberland Subregion in his discussion of baseleveling and its faunal significance. Adams (1901) observations corroborated the differences in the land snail fauna of the two divisions noted by Pilsbry (1900).

Bickel (1968) compiled a list of the terrestrial and aquatic molluscan species known from Tennessee. Hubricht (1973) listed county distributions for each terrestrial species he collected in this state, and Pilsbry (1940) presented more precise locality data, including type-localities. Regional studies which provided additional distribution data include Byrd et al. (1940). Hubricht (1964) provided county distributions for extant species of Pleistocene fossil land snails. Fossil material was not included in the present study with the exception of *Stenotrema morsum* (Hubricht 1977) which is currently believed to be extinct. The polygrid

systematic scheme employed here closely follows Hubricht (1973, 1974).

### METHODS

The authors searched for land snails in many of Tennessee's counties between 1978 and 1980. Live specimens were collected by careful examination of leaf litter and turning over fallen logs and other debris. The records of living animals were augmented by careful examination of leaf litter samples according to methods outlined in Coney et al. (1981). Some range extensions were obtained from an ecological survey of a four county area in southeastern Tennessee (Coney et al., in press). Other county range extensions were procured from an examination of the Paul Adams Collection, Zooarchaeology Section, Department of Anthropology, University of Tennessee, Knoxville.

Specimens representing new county records are deposited in the Academy of Natural Sciences of Philadelphia; the Paul Adams Collection at the University of Tennessee, Knoxville; Department of Biology, East Tennessee State University; and in the authors' cabinets. The physiographic provinces of Tennessee used here follow Fenneman (1938).

### DISCUSSION

Seventy-six new county records are reported here for 27 of the 75 species of Polygyridae known in Tennessee (Fig. 1). No new species were added to the fauna. An examination of Figure 1 will result in the discovery of several facts about the distribution of polygyrids in Tennessee. The distributions of 14 species appear to be statewide. Twelve species are known only from the eastern half of the state (from Nashville to the Blue Ridge Mountains; while only one species (*Stenotrema leai alciae*) occurs primarily in the western half of Tennessee. The Blue Ridge Mountains in extreme eastern Tennessee contain at least 18 endemic polygyrid species and this physiographic province exhibits more diversity and endemism within the Polygyridae than any of the other physiographic provinces in Tennessee. There are only six species which appear to be restricted in their distribution to the Ridge and Valley Province of eastern Tennessee; however, this lack of endemism might be expected as the numerous rivers could serve as mechanisms for passive dispersal of land snails. The Cumber-

land Plateau is second only to the Blue Ridge Mountains in the number of endemic taxa, with 12 species which appear to be restricted to this province. The Interior (or Nashville) Basin has 10 species which appear to occur primarily within its limits. The distribution maps for the Tennessee polygyrids clearly illustrate two (Smoky Mountains, Cumberland Plateau) and possibly a third division (Nashville Basin) of the Cumberland Subregion. No species of the Polygyridae appear to be restricted to the Western Highland Rim and only two species are found exclusively in the Mississippi Valley region of Tennessee.

Because of the agriculturally based economies of many of the western counties of Tennessee, much of the land has been cleared and farmed. Lack of suitable habitat for land snails and few endemic species are probably the primary reasons for the dearth of molluscan collections reported from this region.

#### ACKNOWLEDGEMENTS

We thank Paul W. Parmalee, Department of Anthropology, University of Tennessee for making the Paul W. Adams Collection available to us. George M. Davis, Samuel L. H. Fuller and Robert Robertson, Academy of Natural Sciences of Philadelphia, read and criticized this manuscript. We also appreciate the efforts of Clement W. Welsh and Robert Bohannon, who contributed collections from Moore and Jefferson counties, respectively. Cynthia Bogan graciously typed drafts of the manuscript.

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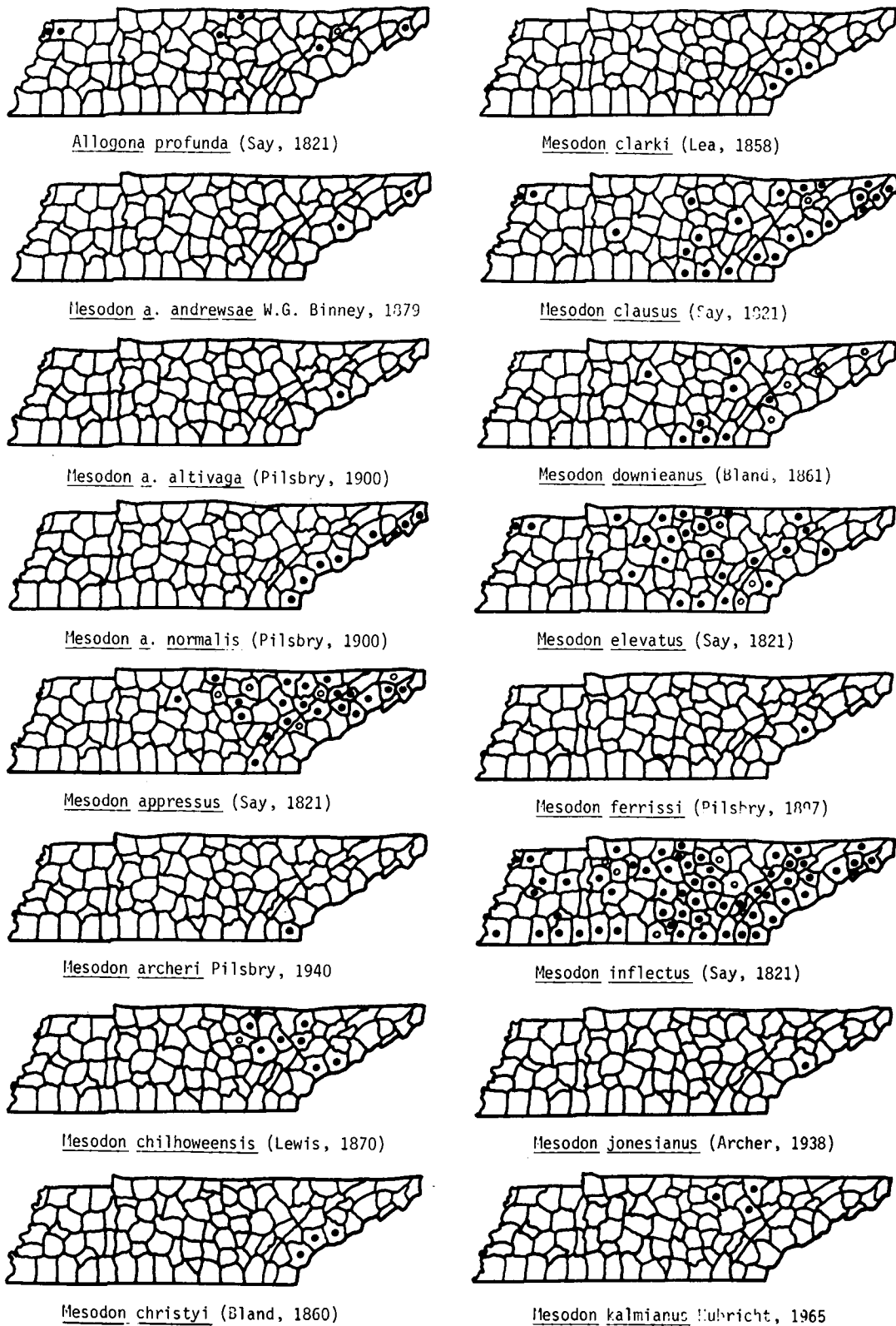
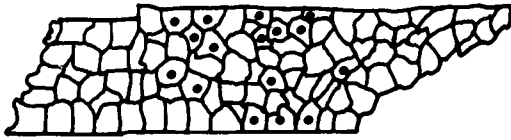
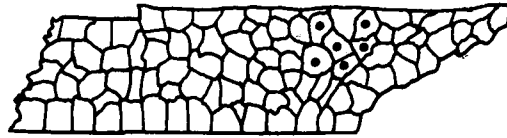


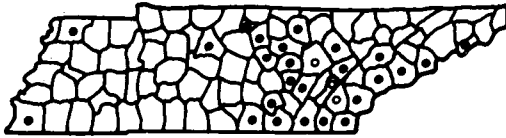
FIG. 1. Distribution of the Polygyrid species in Tennessee. New county records are plotted as open circles and previously documented county records are represented by solid circles.



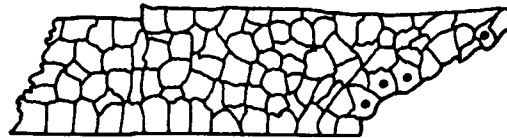
Mesodon laevior Pilsbry, 1940



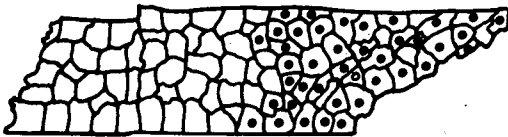
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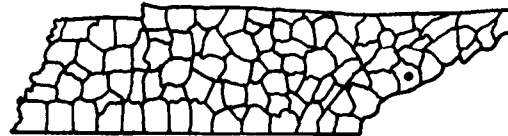
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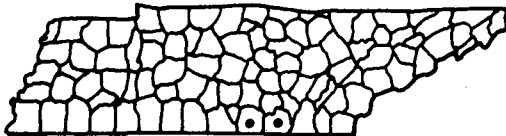
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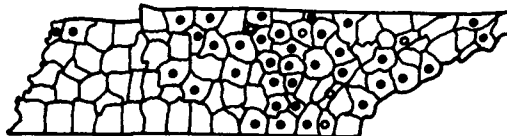
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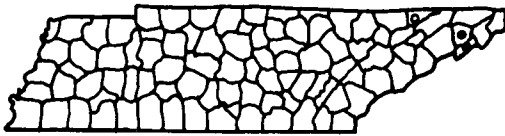
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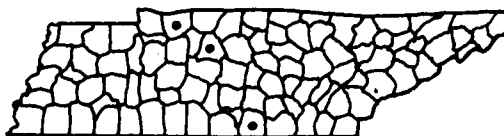
Mesodon sanus (Clench & Archer, 1933)



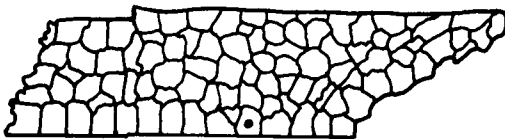
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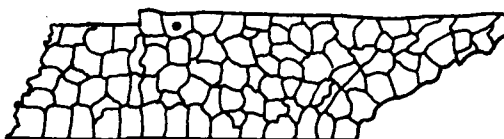
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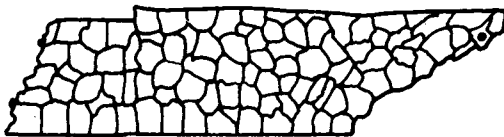
Polygyra f. fatiqiata Say, 1829



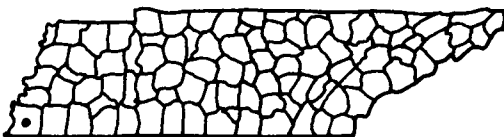
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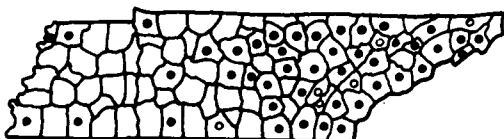
Polygyra f. internuntia Pilsbry, 1940



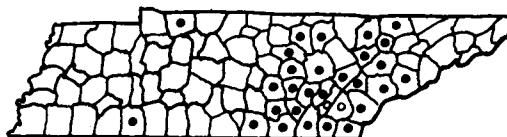
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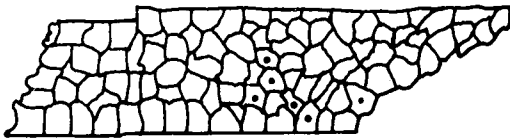
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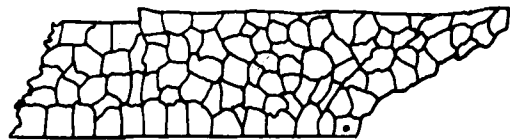
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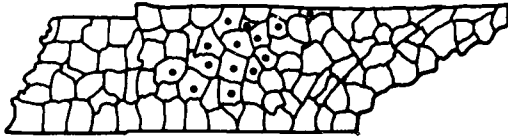
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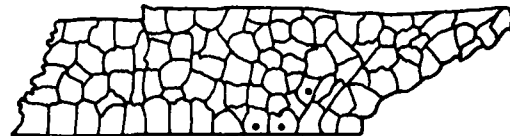
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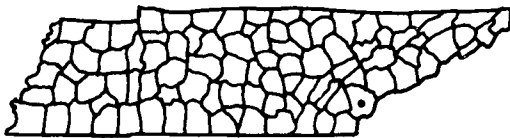
Stenotrema cohuttense (Clapp, 1914)



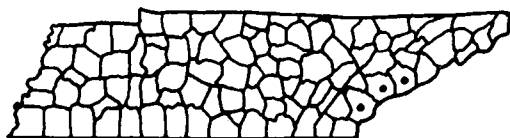
Polygyra troostiana Lea, 1839



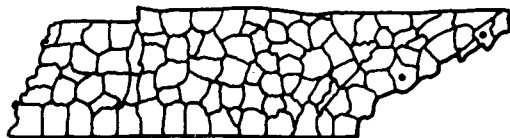
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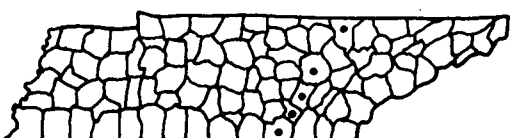
Praticolella lawae (Lewis, 1874)



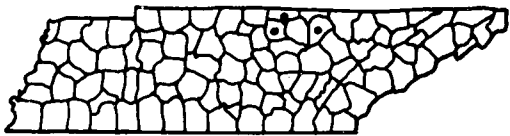
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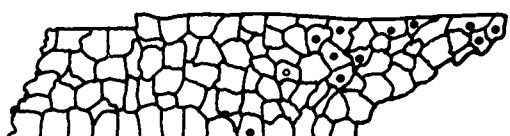
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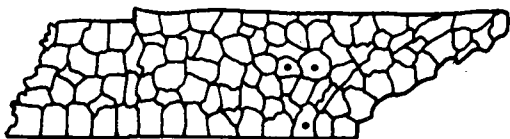
Stenotrema edgarianum (Lea, 1841)



Stenotrema angellum Hubricht, 1958



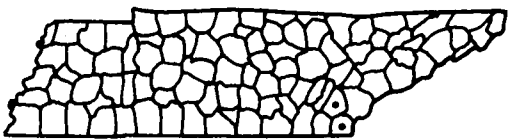
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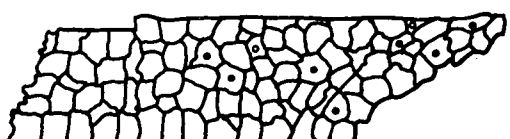
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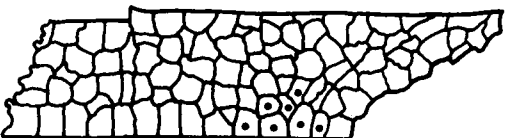
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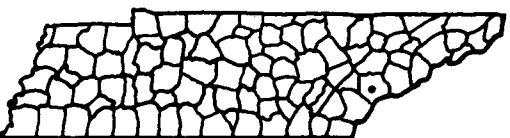
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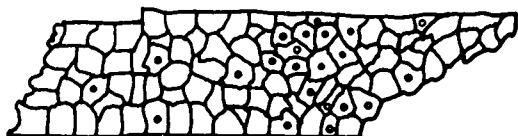
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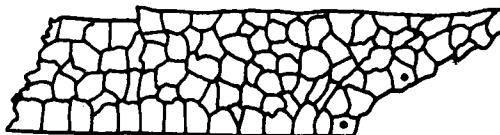
Stenotrema calvescens Hubricht, 1961



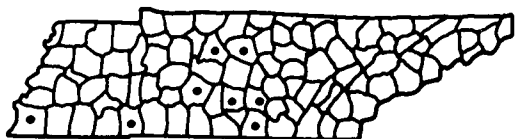
Stenotrema f. montanum Archer, 1939



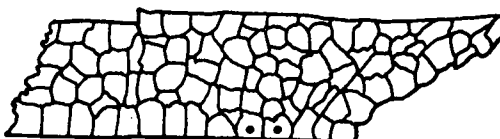
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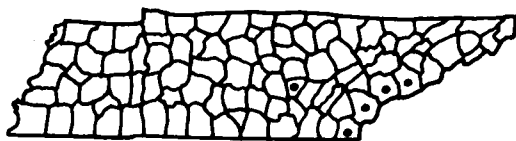
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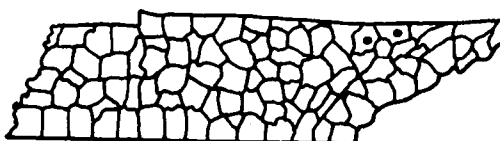
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*Stenotrema turbinella* (Clench & Archer, 1933)



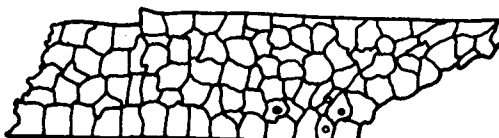
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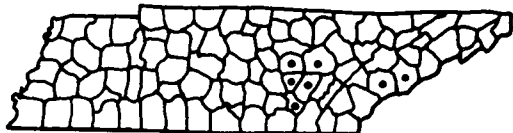
*Stenotrema waldense* Archer, 1938



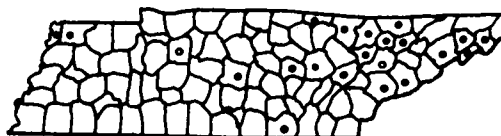
*Stenotrema morosum* Hubricht, 1977



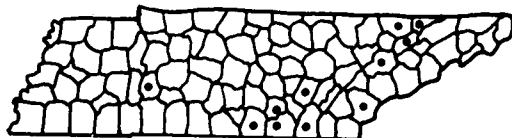
*Triodopsis alabamensis* (Pilsbry, 1902)



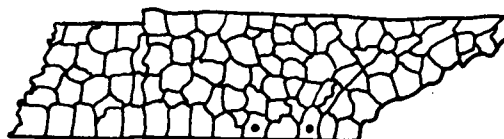
*Stenotrema pilula* (Pilsbry, 1900)



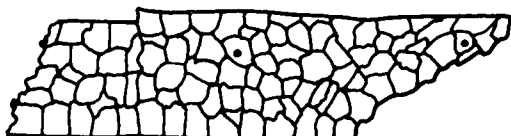
*Triodopsis a. albolabris* (Say, 1816)



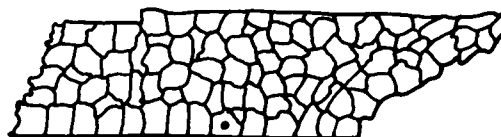
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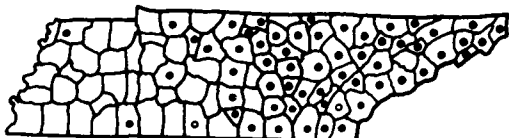
*Triodopsis a. alleni* (Sampson, 1883)



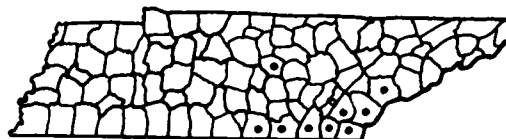
*Stenotrema stenotrema nudum* Pilsbry, 1940



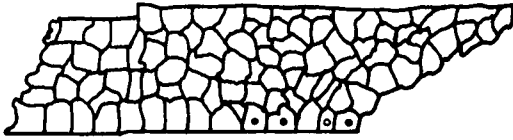
*Triodopsis a. fuscolabris* (Pilsbry, 1903)



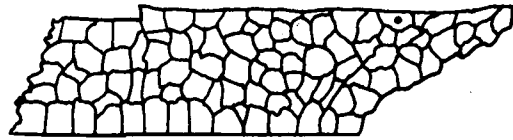
*Stenotrema s. stenotrema* (Pfeiffer, 1842)



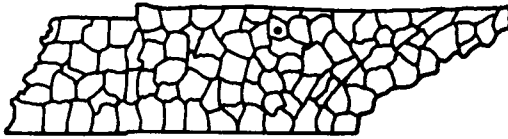
*Triodopsis a. major* (Binney, 1837)



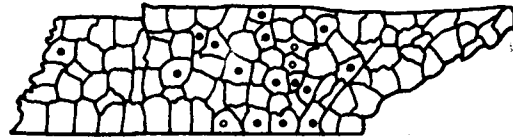
*Triodopsis caroliniensis* (Lea, 1834)



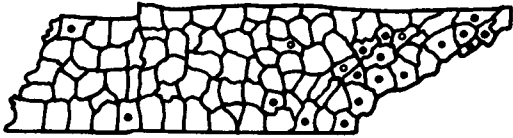
*Triodopsis h. claibornensis* Lutz, 1950



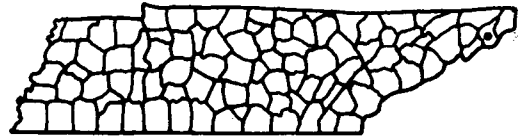
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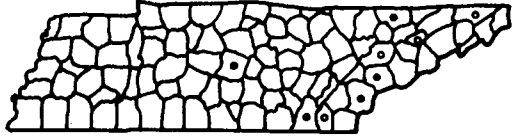
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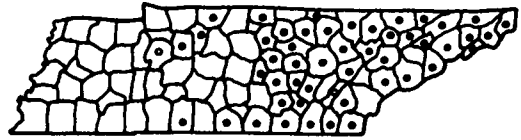
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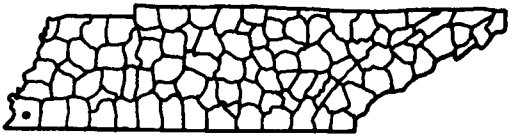
*Triodopsis rugosa anteridon* Pilsbry, 1940



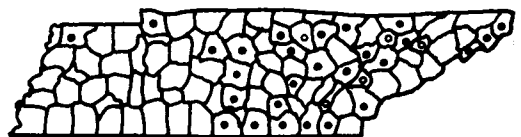
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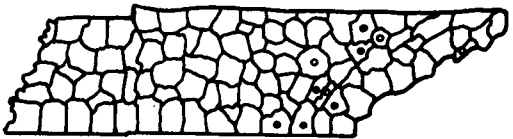
*Triodopsis tridentata* (Say, 1816)



*Triodopsis fosteri* (F.C. Baker, 1932)



*Triodopsis vulgata* Pilsbry, 1940



*Triodopsis h. hopetonensis* (Shuttleworth, 1852)

