

THE DISTRIBUTION, HABITAT, AND ECOLOGY OF SHREWS
(SORICIDAE: *BLARINA*, *SOREX*, AND *CRYPTOTIS*) IN KENTUCKY

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ABSTRACT

Distribution information is updated on eight species of Kentucky shrews. Pygmy shrews (*Microsorex hoyi*) and southeastern shrews (*Sorex longirostris*) are more widespread than previously thought. Common shrews (*Sorex cinereus*) and long-tailed shrews (*Sorex dispar*) have very limited distributions in Kentucky. Smoky shrews (*Sorex fumeus*) prefer mesic forests while southeastern shrews occupy floodplain habitats, where those two species are sympatric. No sympatric populations of northern (*Blarina brevicauda*) and southern (*B. carolinensis*) short-tailed shrews have been found in Kentucky; the Tennessee River appears to be an effective barrier, separating the ranges of these two species in Kentucky.

INTRODUCTION

Since the publication by Caldwell and Bryan in 1982, there have been several new records of long-tailed shrews (*Sorex* spp. and *Microsorex hoyi*) in Kentucky. This paper updates those records and provides county distribution maps for the three species of short-tailed shrews: the least shrew, *Cryptotis parva*; and the northern and southern short-tailed shrews, *Blarina brevicauda* and *B. carolinensis*. Information on habitat segregation in species of sympatric *Sorex* is also provided.

Based on a study of the morphology and distribution of *Blarina* in Nebraska, Genoways and Choate (1972) elevated *B. carolinensis* to specific status. More recently *B. brevicauda* and *B. carolinensis* have been found to be sympatric and distinct species in Illinois (Ellis et al. 1978) and Virginia (Tate et al. 1980). Since 1980 researchers have been looking for sympatric populations of these two species in Kentucky, and I report here some preliminary results of those investigations.

METHODS

Pitfall trapping is generally accepted as the most effective method of collecting shrews. Pitfall traps have been placed in most Kentucky counties either by me, by John R. MacGregor, or by field biologists of the Kentucky Department of Fish and Wildlife Resources. In addition, MacGregor and I have searched for shrews in discarded bottles from throughout Kentucky. In a few locations bottles have been placed as traps, both in lieu of and in conjunction with pitfalls. Searching discarded bottles is an especially effective method for determining distributions of the ubiquitous *Blarina* spp. (For a discussion of "bottling" for small mammals, see Pagels and French [1987].)

Skull measurements of *Blarina* were made under a binocular dissecting microscope equipped with an ocular micrometer.

RESULTS AND DISCUSSION

Distribution maps of the eight shrew species known from Kentucky are presented in Figure 1. A brief discussion of each species follows.

Sorex cinereus (common shrew). Several new sites (but no new counties) have been added to the known distribution of *Sorex cinereus* in Kentucky. The Bell County record for *S. cinereus* noted in Caldwell and Bryan (1982) is in error; we have no verified records from that county.

Sorex dispar (long-tailed shrew). Despite pitfall trapping and bottle searches in apparently appropriate habitats, we still have but one county record for *Sorex dispar*. It is by far the rarest and most habitat-specific of Kentucky shrews.

Sorex fumeus (smoky shrew). *Sorex fumeus* occurs in a variety of habitats on the Cumberland Plateau of eastern Kentucky. Toward the western edge of its range, it is increasingly restricted to rich, mesic forests.

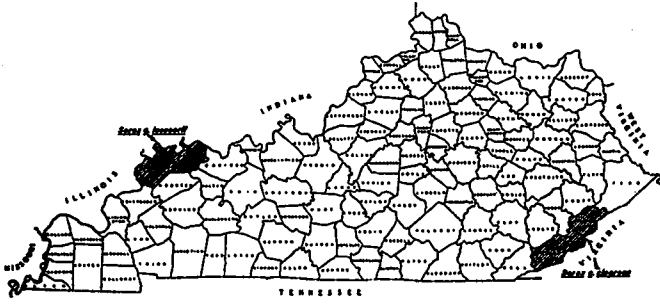
Sorex longirostris (southeastern shrew). *Sorex longirostris* occurs throughout Kentucky, but is uncommon on the Cumberland Plateau. West of the Cumberland River (Lake Barkley), where *S. fumeus* does not occur, *S. longirostris* occupies a variety of habitats, including mesic forests. It is the only long-tailed shrew in the mesophytic forests of the Mississippian Plateau. On the Cumberland Plateau *S. longirostris* is restricted to floodplain forests and moist, weedy fields.

Table 1 presents data from pitfall trapping along the Kentucky River in the central part of the state. These data, and the occurrence of both species in different habitats at the edges of their ranges, suggest

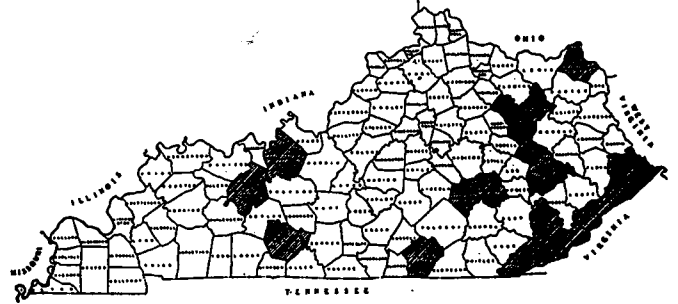
Table 1. Number of specimens taken by pitfall trapping of sympatric shrews along the Kentucky River in Franklin County, Kentucky, 1980-1984. Trap success is in parentheses.

Species	Mesic forest	Riverbank woods	Riparian fields and edges
<i>Sorex fumeus</i>	23 (.023)	1 (.001)	1 (.0001)
<i>Sorex longirostris</i>	0	2 (.002)	6 (.019)
<i>Blarina brevicauda</i>	7 (.007)	15 (.013)	26 (.015)
Trap Nights	1,019	1,151	1,703

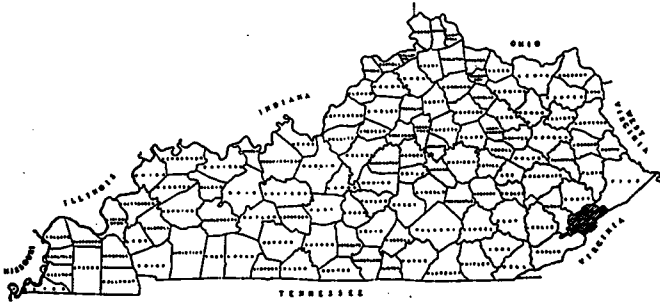
COMMON SHREW
Sorex cinereus



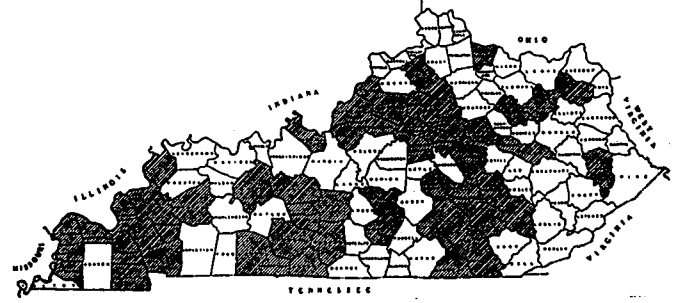
PYGMY SHREW
Microsorex hoyi



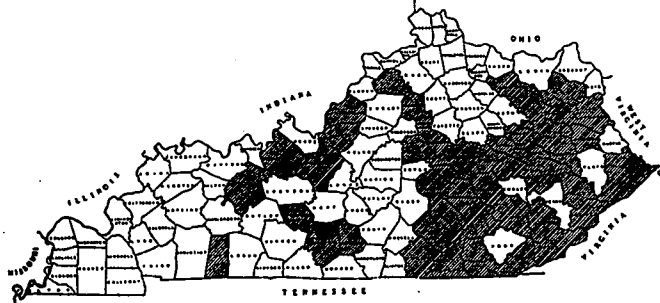
LONG-TAILED SHREW
Sorex dispar



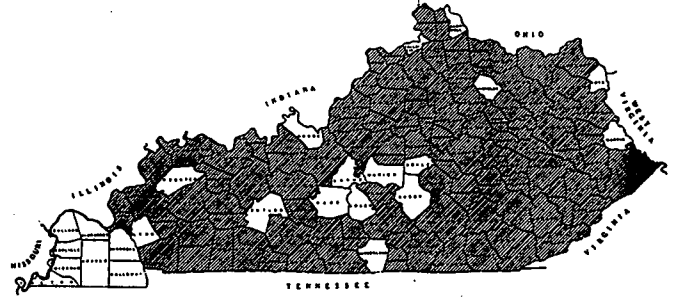
LEAST SHREW
Cryptotis parva



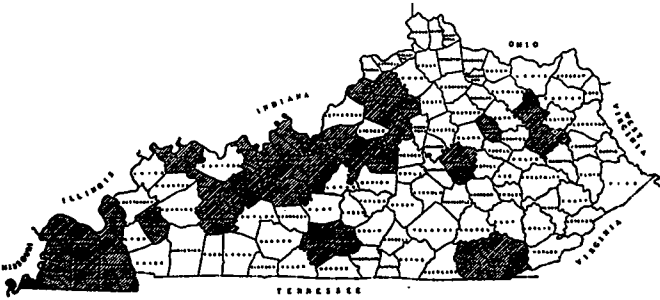
SMOKY SHREW
Sorex fumeus



NORTHERN SHORT-TAILED SHREW
Blarina brevicauda



SOUTHEASTERN SHREW
Sorex longirostris



SOUTHERN SHORT-TAILED SHREW
Blarina carolinensis

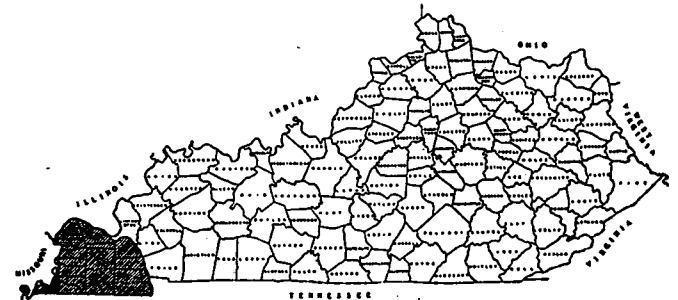


Figure 1. The distribution of eight shrew species in Kentucky.

that *S. longirostris* is a habitat generalist where *S. fumeus* does not occur, but is excluded from the limited microhabitat of the mesic forest floor by the larger *S. fumeus* when they coexist. In areas of sympatry *S. longirostris* must occupy the less desirable, floodprone areas. The deep, insulating litter layer of rich mesophytic forests is an optional habitat that may provide a buffer to both drought and cold that would otherwise depress the reproductive success of shrews. Cudmore and Whitaker (1984) have reported similar distributions in Indiana. They and I have found *Microsorex* (= *Sorex*) *hoyi* and *S. fumeus* occurring together on the mesic forest floor, perhaps reflecting the fact that the two species eat different foods. Whitaker and Cudmore (1987) found that *S. fumeus* eats more earthworms and centipedes, while *M. hoyi* prefers beetles and spiders.

***Microsorex hoyi* (pygmy shrew).** *Microsorex hoyi* is under federal status review for possible listing as a protected species. Once considered quite rare, we now have records of this tiny insectivore from 17 Kentucky counties, in a variety of habitats. Though never taken in large numbers, that may be due to its difficulty of capture rather than its actual rarity.

***Cryptotis parva* (least shrew).** *Cryptotis parva* is known from most Kentucky counties, and probably occurs in all. It is usually a species of weedy fields. I found especially large numbers of it in discarded bottles on the Big Clifty Prairie in the Interior Low Plateau of central Kentucky. In eastern Kentucky it has often been collected from grasslands associated with reclaimed strip mines. More interestingly, it has also been taken from floodplain forest in eastern Kentucky, often in the same traps as *S. longirostris*.

These species are the most common shrews in Kentucky in their respective ranges, and occur in every habitat investigated. I have taken each in discarded bottles, some found on the gravel shoulders of major highways. They are often abundant on highway fill slopes under a cover of crown vetch (*Coronilla varia*) and fescue (*Festuca* sp.).

Diagnostic characters for separating the two species of *Blarina* that are known from Kentucky have been reported by Genoways and Choate (1972), Ellis et al. (1978), French (1981), and others. But for comparing animals found in discarded bottles, usually only skull characters are available, and the abundance of broken crania makes many morphometric measurements impossible. The bony palates of shrews are not as fragile as other parts of their skulls, and persist in bottles or pitfalls for long periods without appreciable damage. For that reason palatal length (Blair et al. 1968), a parameter little used by previous investigators, may be one of the most useful skull measurements for the field biologist in distinguishing between *B. brevicauda* and *B. carolinensis*. In measurements of over 200 *Blarina* specimens (*B. brevicauda* N = 133, *B. carolinensis* N = 73) from Kentucky, there was no overlap in the value of this character between the allopatric populations of the two species. For the purposes of this paper, those animals with palatal lengths of 8.7 mm or less are considered to be *B. carolinensis* (mean = 8.40 mm), and those with palatal lengths of 8.8

mm or greater are considered to be *B. brevicauda* (mean = 9.45 mm). Tate et al. (1980) also found no overlap in palatal length in a sample of 167 specimens of the two species from Virginia.

The Tennessee River (and Kentucky Lake) appears to be an effective barrier separating these two species in Kentucky. John MacGregor and I have collected hundreds of *Blarina* skulls from bottles in western Kentucky, and none from west of the Tennessee River had palatal lengths greater than 8.7 mm, while none from east of that river had palatal lengths less than 8.8 mm. In several locations we collected skulls from habitats near opposite ends of bridges over the Tennessee River (and Kentucky Lake) with the same results. We have yet to find a locality in Kentucky where *B. brevicauda* and *B. carolinensis* are sympatric.

Although it is apparent that *B. brevicauda* and *B. carolinensis* are distinct species, there has been no detailed work on *Blarina* in Kentucky since Rippey (1967). There is also the remote possibility that another species, *B. hylophaga*—considered distinct by some (Moncrief et al. 1982)—occurs in far western Kentucky. Certainly more investigations are needed on this genus in Kentucky and throughout the Southeast.

ACKNOWLEDGMENTS

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