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INDIANA ENSIFERA (ORTHOPERA)

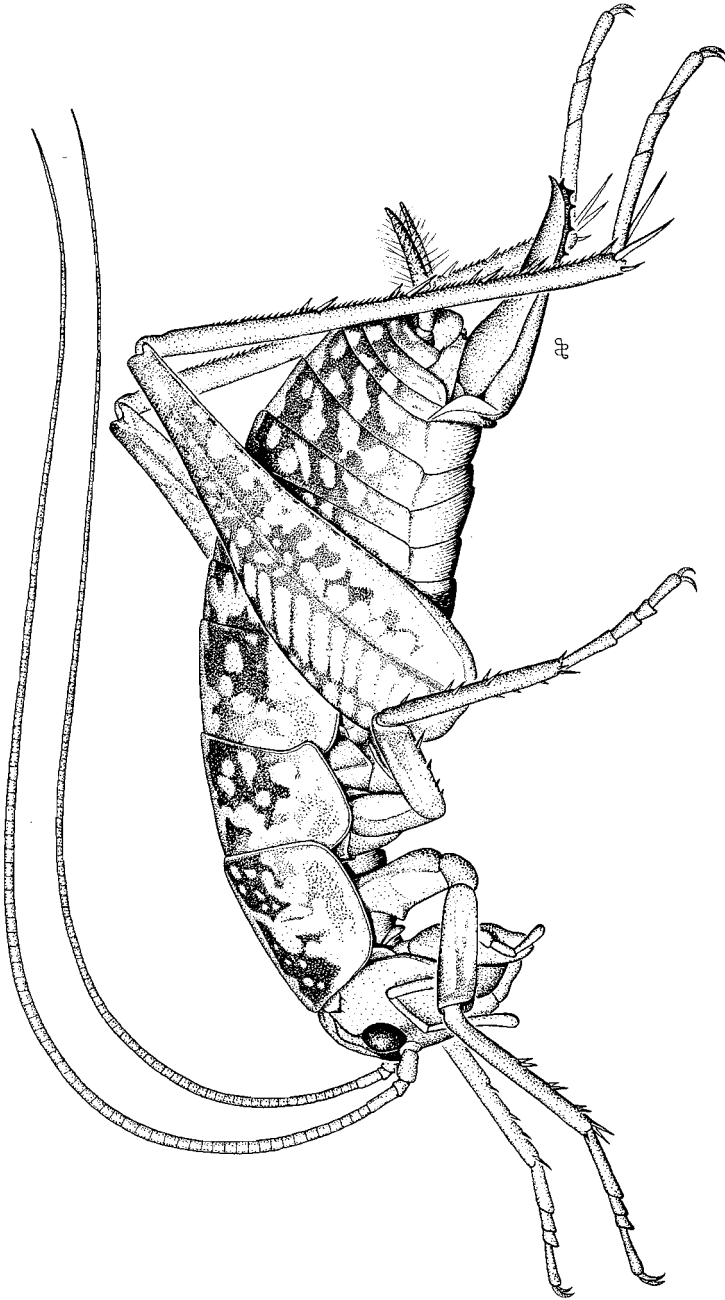
by

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Ceuthophitus sectus Scudder

INDIANA ENSIFERA (ORTHOPTERA)¹W. P. McCafferty and J. L. Stein²

A total of 67 species of long-horned grasshoppers and crickets were reported to occur in Indiana by Blatchley (1903) in his "Orthoptera of Indiana." Distributional information concerning these species was sparse and has not been significantly supplemented since that time. Subsequent works which have dealt either heavily or exclusively with the Indiana fauna include Fox (1915), Blatchley (1920), Cantrall and Young (1954), and Young and Cantrall (1956).

The study reported herein was instigated in order to synthesize and augment our knowledge of the ensiferan fauna of the state of Indiana, including a complete and current record of the geographic, temporal, and ecological distribution of the species. The results, moreover, incorporate considerable taxonomic changes since Blatchley's time, substantiate 10 new state records increasing the known number of state species to 83, implicate an additional eight species as possibly occurring in Indiana, and establish 400 new county records for 61 of the 83 Indiana species. Identification tables for all of these species were presented by Stein and McCafferty (1975).

The data were derived primarily from the study of over 3,800 museum specimens housed at Purdue University's Laboratory of Insect Diversity, the University of Michigan Museum of Zoology, and the Illinois Natural History Survey. Specimens were sexed and identified or verified, and the label data were recorded.

The style of presentation used is similar to that of Cantrall (1968). The annotated checklist includes for each species, and subspecies when appropriate, the complete taxonomic name, the common name, and brief statements concerning the seasonality of adults and ecological associations. Species verified by us as new state records are marked with an asterisk. Geographic distribution of each species in the form of plotted counties is indicated on individual Indiana maps which accompany each specific treatment. Open circles signify that there are previously existent county records from the literature. Solid circles signify that specimens taken from the county have been studied by the authors and are present in one of the collections mentioned above. A solid circle, alone, would therefore indicate a new county record. Readers are referred to Figure 1 for a complete labelling of county names.

For the purpose of attempting to draw correlations between specific distributions and natural features of the environment, the readers are referred to Lindsey (1966). This work dealt in depth for Indiana with such things as the historical geology, bio-climate, vegetation and floral areas, soil types, speleology, and mammalian distribution, all of which may possibly have either a direct or indirect bearing on the distribution of the ensiferan fauna. In addition, Chandler (1966) divided the state into regions and biotic zones based on certain elements of the insect fauna including the Hymenoptera, Coleoptera, Odonata, and Orthoptera in part. The "zones" are strongly correlated with floral areas and the Pleistocene geology of Indiana. A striking difference in fauna is sometimes apparent between a southern unglaciated area of Indiana and the remaining glaciated area of the state.

Blatchley (1903) had earlier estimated life zones in the state based primarily on the distribution of Orthoptera. Modifying Merriam's (1898) concepts, Blatchley concluded that the "Transition Zone" (Alleghanian fauna) overlapped the northern fourth of the state, the "Lower Austral Zone" (Austro-Parian fauna) covered the greater part of the southern third of the state, and the "Upper Austral Zone" (Carolinian fauna) covered essentially the entire state and mingled with the latter two faunas. Our data indicates that the number of species of Ensifera in the state that might be considered Alleghanian or

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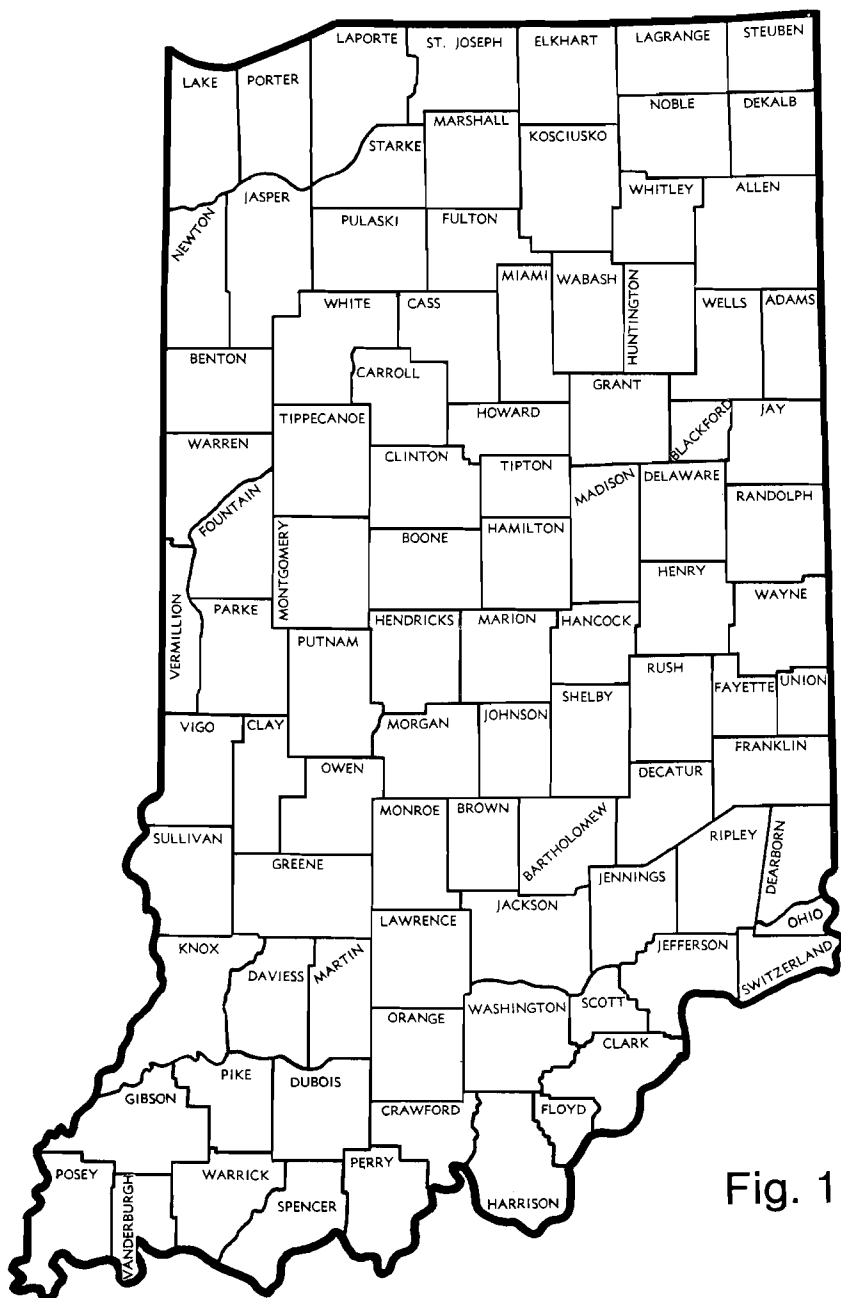


Fig. 1

Fig. 1. The counties of the State of Indiana.

Austroriparian is much smaller than Blatchley originally thought, due to many factors such as synonymy, original misidentification of species, and our much expanded distributional data. Nevertheless, there remains evidence that much of the current southern ensiferan fauna in Indiana has been derived from a previously more widespread preglacial fauna. Also, on the basis of distributional data, supposed northern extensions of the predominantly southern species are associated in most cases with large river valleys such as the Wabash and White. It could, furthermore, be inferred from this, that either postglacial dispersal has been more general but evidence of such obliterated by recent agricultural development, or that recent dispersal has indeed been via river valleys.

The biotic units of Indiana as proposed by Chandler (1966) do not appear to be applicable to the Ensifera because of either considerable overlap in species' distribution among zones or a wide disparity in collecting records. Hopefully, the raw distributional data concerning Indiana Ensifera are now complete enough for those who would wish to undertake a more thorough examination of the geographic affinities of each species. We would caution, however, that the total range of any species along with all available information concerning evolutionary origins are additional critical considerations in any comprehensive study of zoogeography.

Hebard (1934) and Cantrall (1968) published faunal accounts of Orthoptera species for the neighboring states of Illinois and Michigan respectively. These and various other treatments containing collecting records of Ensifera from areas in proximity to Indiana in adjacent states have indicated that eight species and one subspecies may eventually be found in Indiana. A list of these follows with the adjacent state distribution indicated parenthetically for each:

- Scudderia fasciata* Beutenmüller (Michigan and Ohio)
- Diastremmena apicalis* Brunner (Adventive: Illinois)
- Ceuthophilus pallidipes* E. M. Walker (Ohio and Michigan)
- Ceuthophilus silvestris* Bruner (Michigan)
- Ceuthophilus guttulatus nigricans* Scudder (Kentucky)
- Gryllus rubens* Scudder (Illinois)
- Oecanthus celerinictus* T. J. Walker (Illinois and Kentucky)
- Oecanthus laricis* T. J. Walker (Michigan and Ohio)
- Cyrtoxipha columbiana* Caudell (Illinois, Kentucky, and Ohio)

Family TETTIGONIIDAE

(The Katydids)

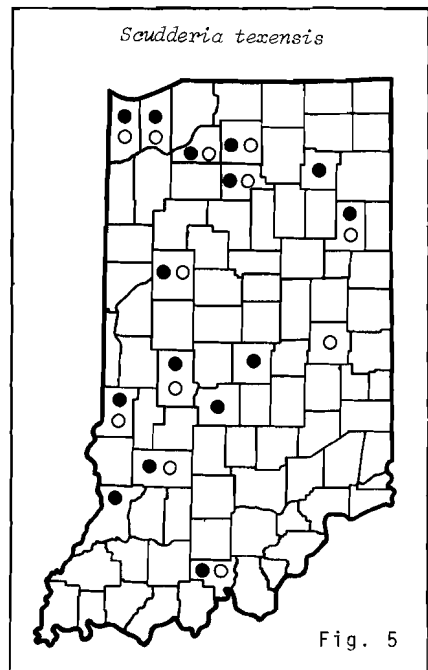
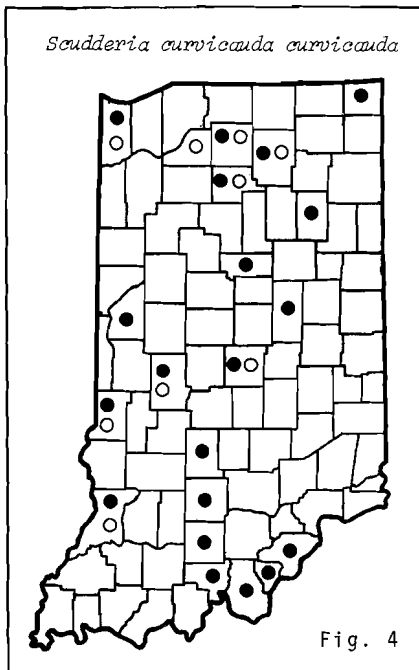
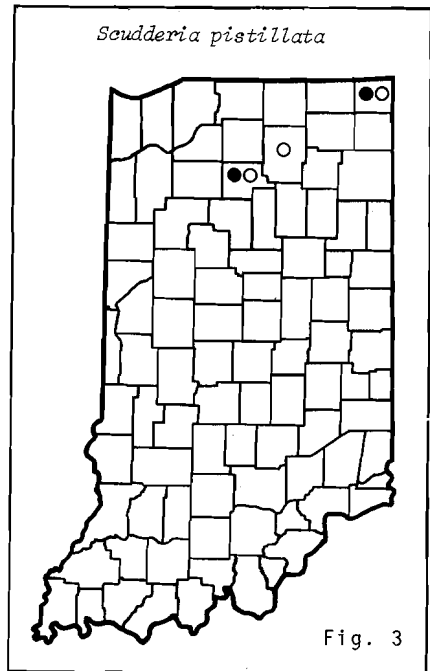
Subfamily PHANEROPTERINAE

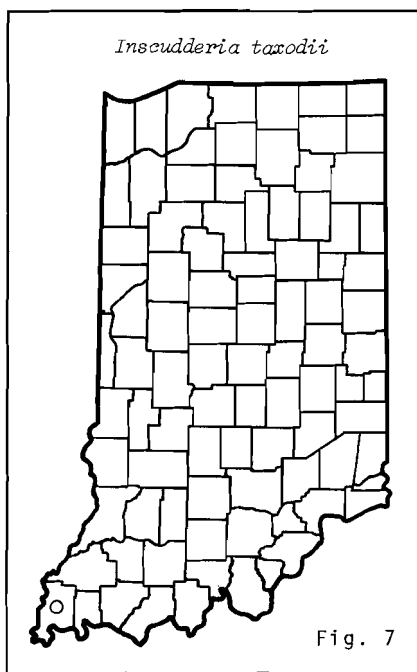
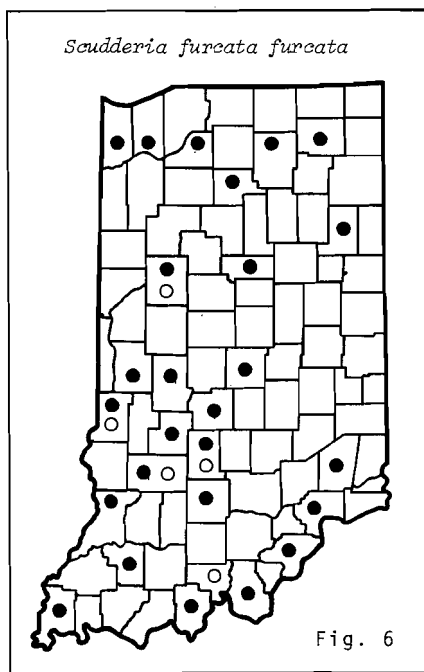
(Bush and Roundheaded Katydids)

Genus SCUDDERIA Stal

(Bush Katydids)

- *septentrionalis** (Serville) 1839. Northern Bush Katydid (Fig. 2). Records for the state are from August. The species is presumed to be much more widespread than is indicated but is rare in collections. It has been taken in deciduous wooded areas.
- pistillata** (Brunner) 1878. Broadwinged Bush Katydid (Fig. 3). Adults have been taken from late summer to early fall in the lakes region of northern Indiana. It has been taken primarily in low bushes and other plants associated with ponds and bogs.
- curvicauda curvicauda** (DeGeer) 1773. Curvetailed Bush Katydid (Fig. 4). Adults have been taken in late summer and early fall. Populations are present throughout Indiana and are usually found in association with marshy habitats.
- texasensis** Saussure and Pictet 1897. Texas Bush Katydid (Fig. 5). Adults of this rather widespread species have been collected in late summer and early fall. It is known from marshes, swamps, bogs, and low marginal vegetation.





furcata furcata Brunner 1878. Forktailed Bush Katydid (Fig. 6). Adults are known from late summer to early fall. This bush katydid is known more from marginal bushes and trees in the hilly areas of southern Indiana and from marshy to prairie habitats in the more northern areas.

Genus INSCUDDERIA Caudell

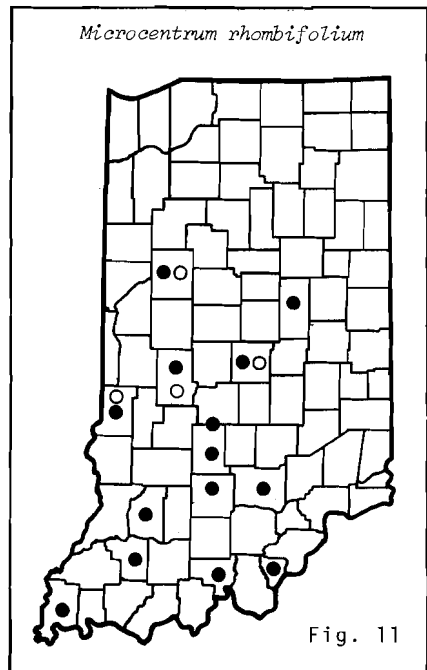
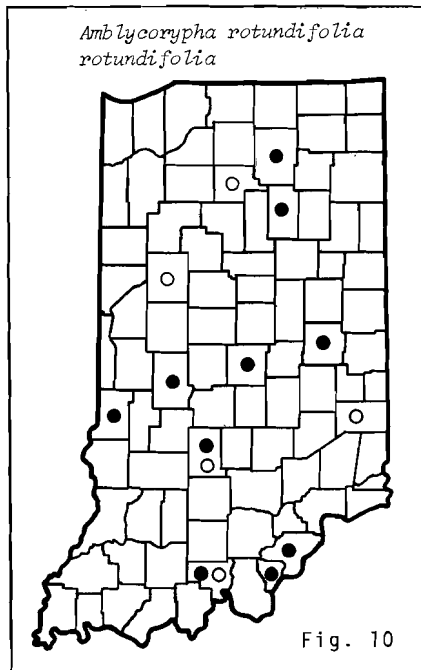
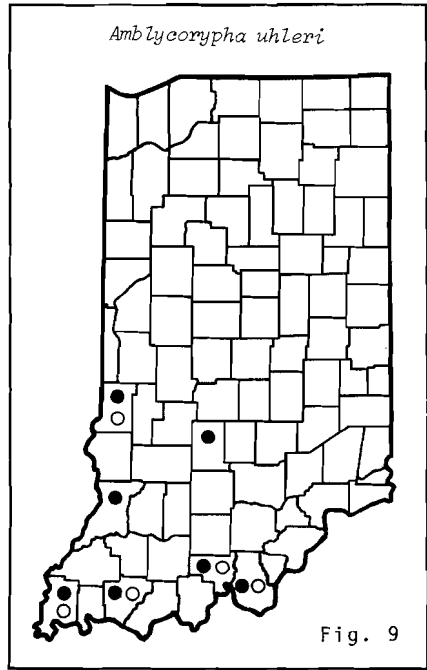
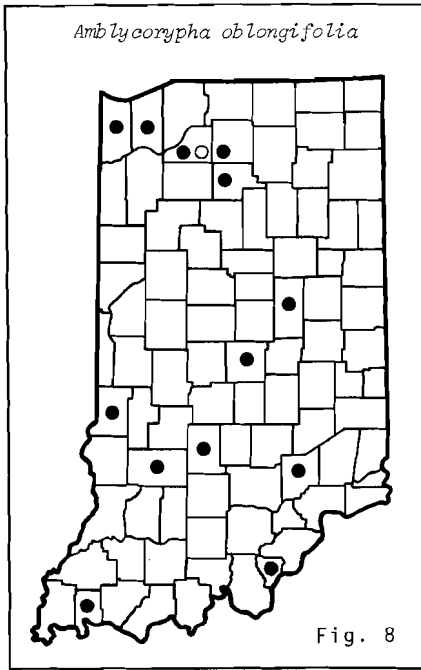
taxodii Caudell 1921. Cypress Katydid (Fig. 7). This species has been taken in early October in the state and is known only from the extreme southwestern corner. This species is associated with cypress swamps and so occurs only in this restricted ecological area of Indiana.

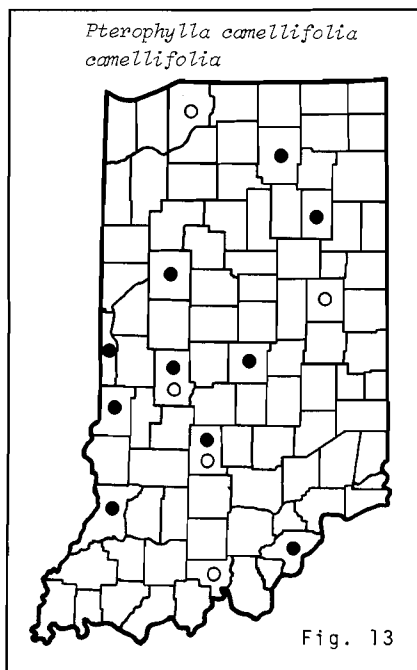
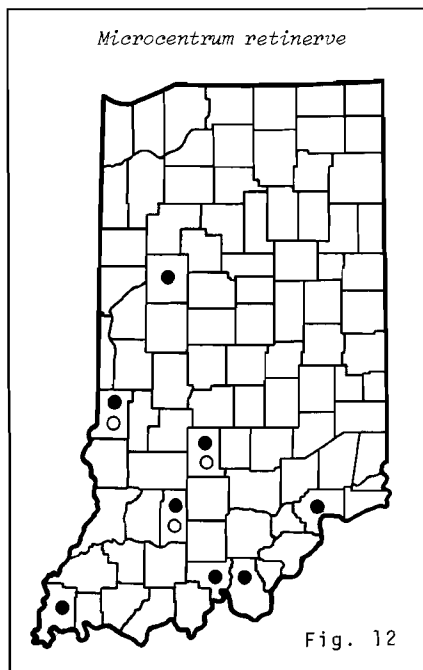
Genus AMBLYCORYPHA Stal (The Roundheaded Katydids)

oblongifolia (DeGeer) 1773. Oblongwinged Katydid (Fig. 8). Adults have been taken from late summer to early fall. This species should eventually be known from throughout the state. Its habitat ranges from marshy areas to marginal shrubbery and weedy fields.

uhleri Stal 1876. Uhler's Katydid (Fig. 9). Adults of this species are present in late summer and early fall. It has been taken only in the southern half of the state, associated with sedges and willows in the Wabash River Valley and grasses and oaks in other areas.

rotundifolia rotundifolia (Scudder) 1862. Roundwinged Katydid (Fig. 10). Adults have been taken in late summer and early fall throughout the state. It is commonly found on or close to the ground among grasses and weedy vegetation in open woodlands or damp ravines.





Genus **MICROCENTRUM** Scudder
(Bush Katydids)

rhombifolium (Saussure) 1859. Broadwinged Katydid (Fig. 11). Adults are known from late summer to mid fall. It evidently is a more central and southern species in Indiana, never having been taken in the northern counties. It is found associated with bushes and deciduous trees.

retinerve (Burmeister) 1838. Angularwinged Katydid (Fig. 12). Adults are present from late summer to early fall. The species is known more from the southern counties in Indiana where it has been taken on the ground or in low branches of shrubbery.

Subfamily **PSEUDOPHYLLINAE**
(The True Katydids)

Genus **PTEROPHYLLA** Kirby

camellifolia camellifolia (Fabricius) 1775. Northern True Katydid (Fig. 13). This common and widespread katydid is known from mid summer to early fall. It is found in the crowns of deciduous trees.

Subfamily **COPIPHORINAE**
(The Coneheaded Katydids)

Genus **NEOCONOCEPHALUS** Karny
(The Coneheaded Katydids)

exiliscanorus (Davis) 1887. Slightly Musical Conehead (Fig. 14). Adults have been taken in late summer and early fall. In Indiana it is known only from heavy thickets and grasses along the Ohio River.

nebrascensis (Brunner) 1891. Nebraska Conehead (Fig. 15). This species has been taken in late summer and early fall. It most likely will eventually be taken throughout most of the state, and has been found in tall grassy habitats.

***ensiger** (Harris) 1841. Swordbearing Conehead (Fig. 16). Adults have been taken from mid summer to early fall. This species is not known from southern Indiana. It is evidently associated with open fields and grasslands.

robustus (Scudder) 1862. Robust Conehead (Fig. 17). Adults are present from late summer to early fall. This species has been taken in grassy areas near water and appears to be more common to the river valleys of west central Indiana. In the north it is found in secondary field growth.

***bivocatus** Walker, Witesell, and Alexander 1973. Twovoiced Conehead (Fig. 18). Adults have been taken in October in sandy, grassy areas of the dunes area of extreme northwestern Indiana.

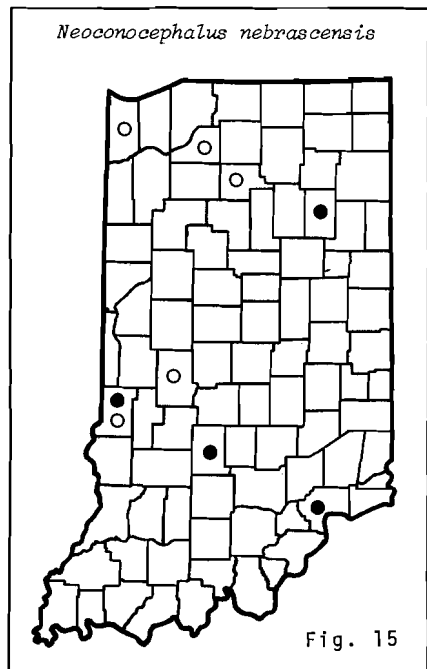
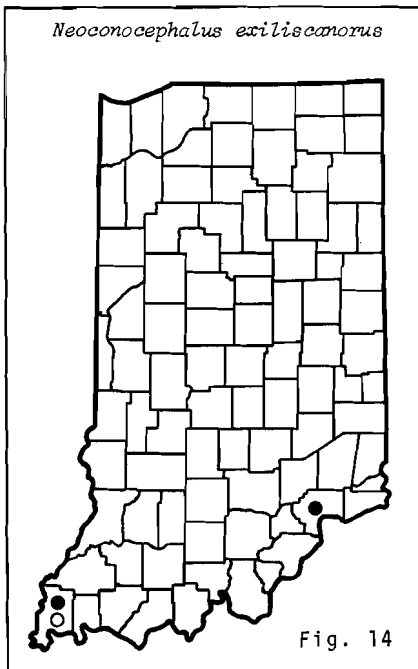
palustris (Blatchley) 1893. Marsh Conehead (Fig. 19). Adults are present from late summer to early fall. The species is locally abundant in marshy areas and pond margins in west central Indiana.

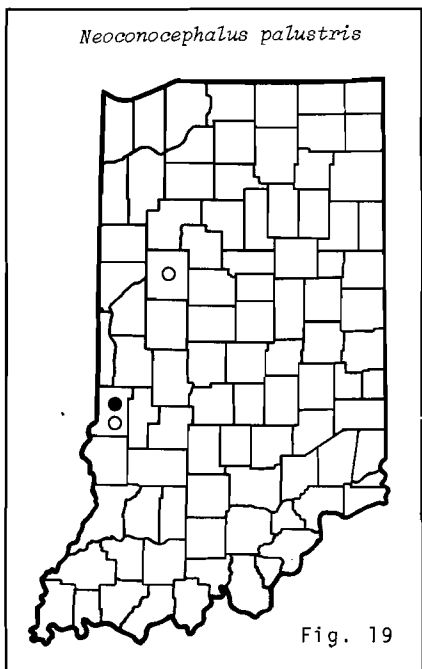
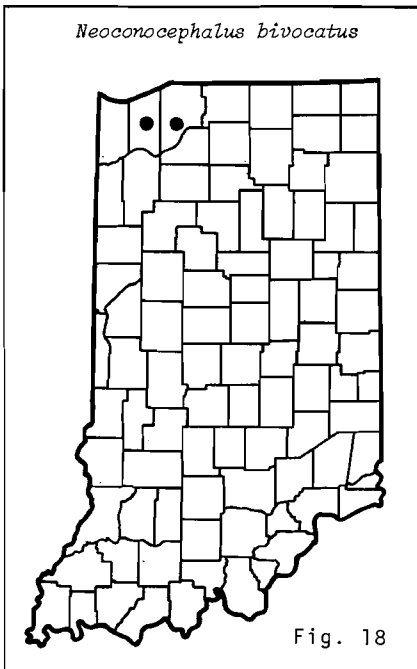
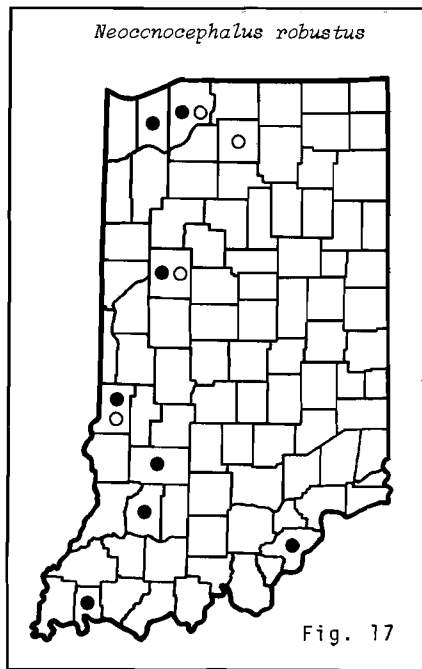
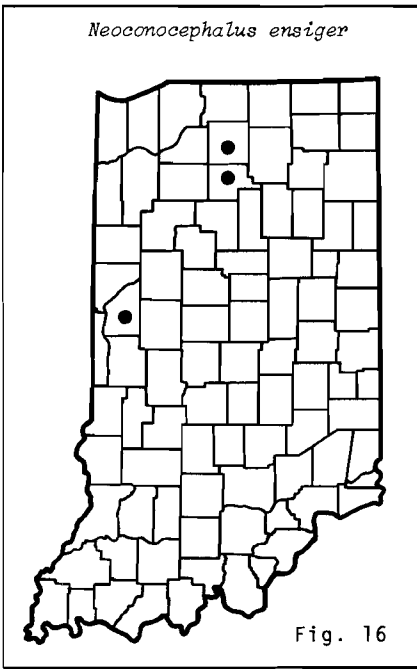
retusus (Scudder) 1879. Roundtipped Conehead (Fig. 20). Adults have been taken in late summer and early fall in marshy to more xeric fields throughout the southern half of Indiana.

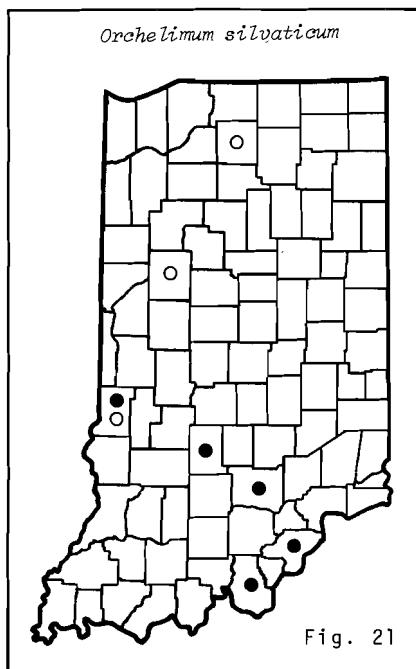
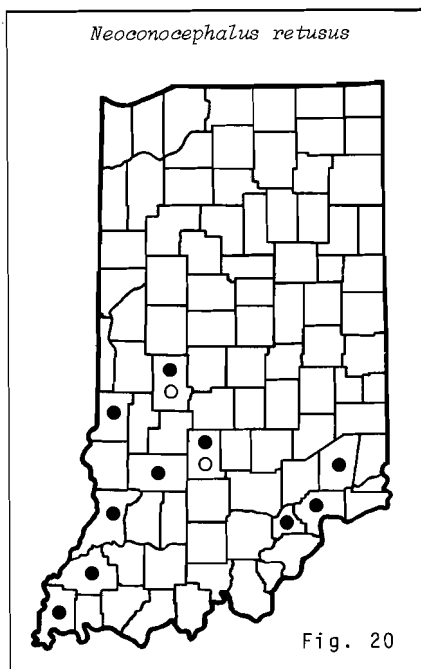
Subfamily CONOCEPHALINAE
(The Meadow Katydid)

Genus ORCHELIMUM Serville

silvaticum McNeill 1891. Longspurred Meadow Katydid (Fig. 21). Adults have been taken in late summer and early fall. This meadow katydid appears to be primarily a







southern Indiana species since more northern records in the state cannot be confirmed. It is found in open deciduous woodlands on all types of vegetation.

vulgare Harris 1841. Common Meadow Katydid (Fig. 22). A widespread species taken throughout the state from late summer to early fall. It is common in upland habitats along fence rows and in fields of grass, clover, or mixed weeds.

gladiator (Bruner) 1891. Gladiator Meadow Katydid (Fig. 23). Adults are present in late summer and early fall. This species occurs only in northern Indiana where it has been taken in association with marshy and grassy meadows.

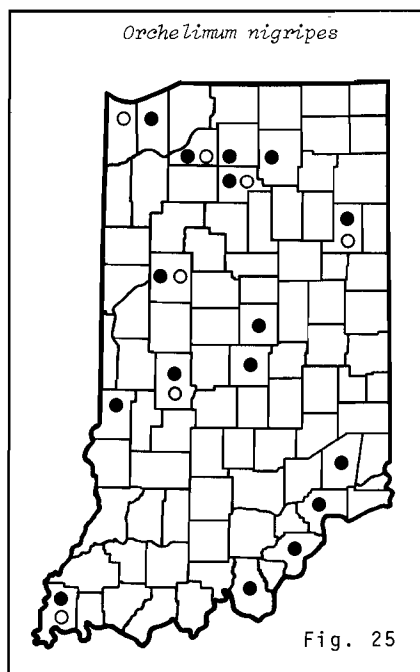
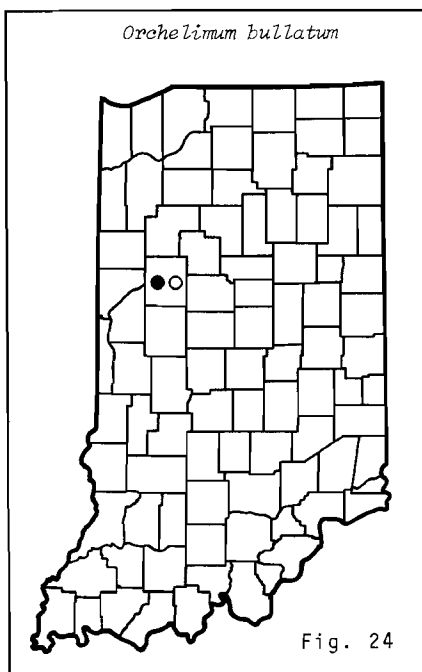
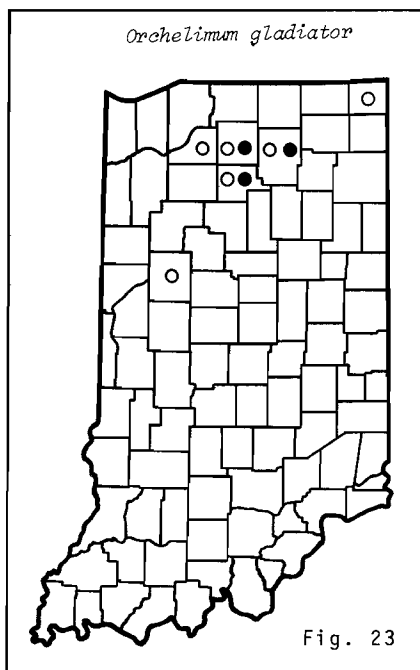
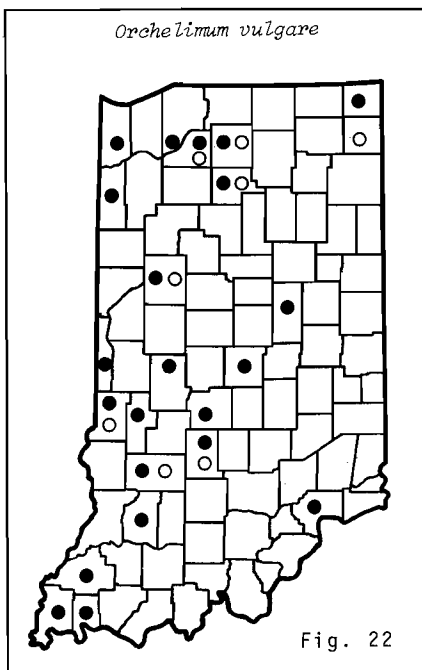
bullatum Rehn and Hebard 1915. Stout Meadow Katydid (Fig. 24). Adults occur in late summer and early fall. Specimens have been taken in isolated marshes in Tippecanoe County.

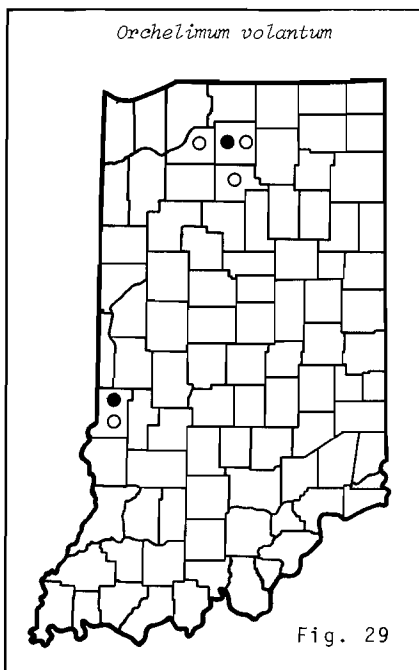
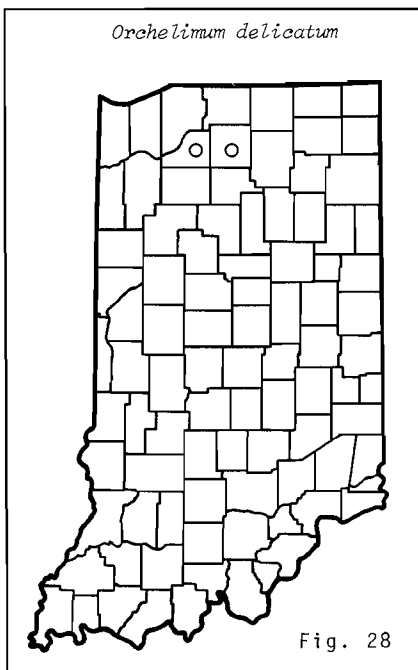
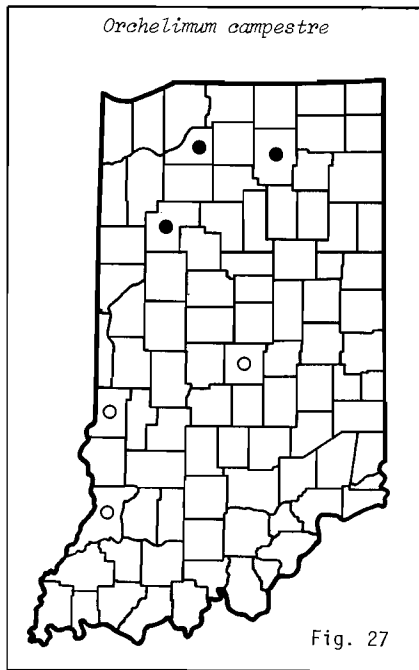
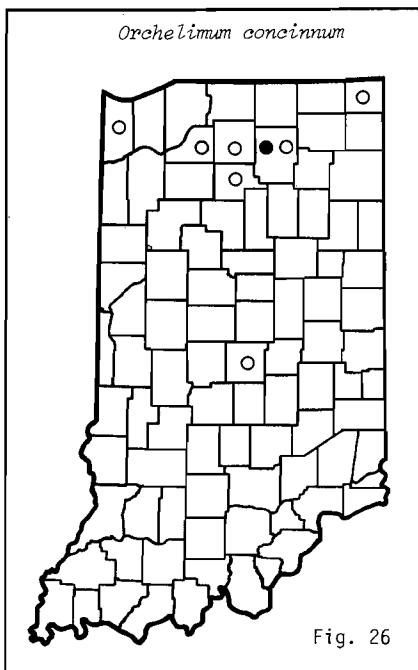
nigripes Scudder 1875. Blacklegged Meadow Katydid (Fig. 25). Adults are present in late summer and early fall. The species is common throughout Indiana in tall grasses and smartweed surrounding lakes, ponds, and marshes.

concinnum Scudder 1862. Stripefaced Meadow Katydid (Fig. 26). This species is found from late summer to early fall and is apparently restricted mostly to marsh or bog areas of the northern part of the state.

campestre Blatchley 1893. Duskyfaced Meadow Katydid (Fig. 27). This species is present from mid summer to early fall. Verified records are from marshy areas of northern Indiana. It reportedly has also been taken in areas of the Wabash and White River valleys.

delicatum Bruner 1892. Delicate Meadow Katydid (Fig. 28). Adults are present from late summer to early fall. This species is known only from the northern part of the state in the Kankakee Sand Ridge area.





volantum McNeill 1891. Nimble Meadow Katydid (Fig. 29). Adults are present from late summer to early fall. The species frequents emergent vegetation along ponds and streams.

Genus **CONOCEPHALUS** Thunberg

fasciatus fasciatus (DeGeer) 1773. Slender Meadow Katydid (Fig. 30). Adults of this common species are present from mid summer to mid fall. Throughout Indiana it may be found in timothy and clover pastures and bluegrass meadows, especially around water and in low areas.

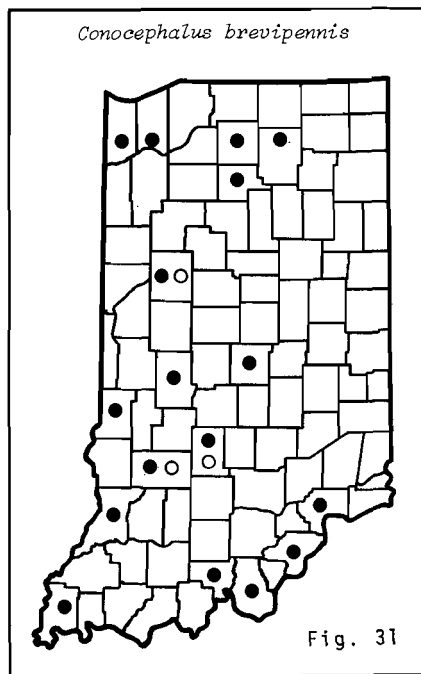
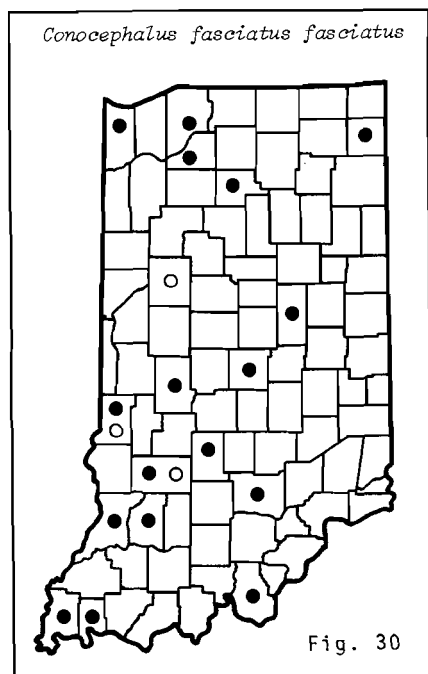
brevipennis (Scudder) 1862. Shortwinged Meadow Katydid (Fig. 31). This species is common from late summer to mid fall. It is taken throughout Indiana in habitats similar to that of *C. fasciatus*.

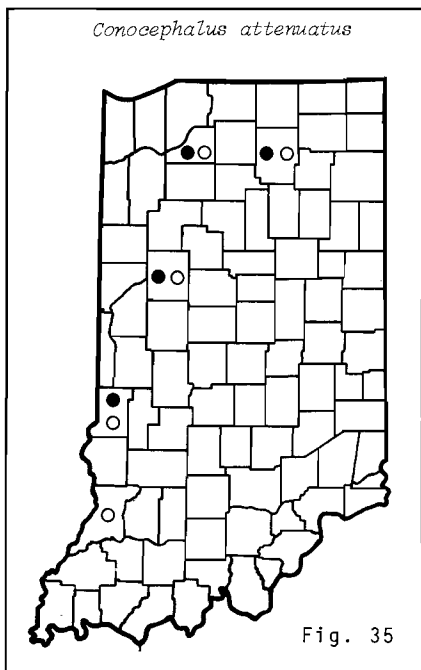
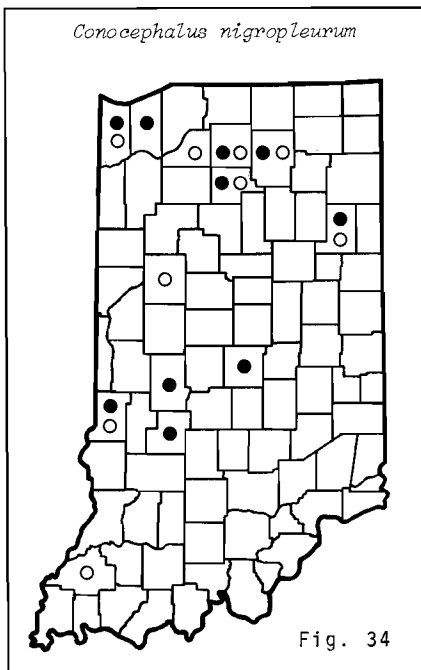
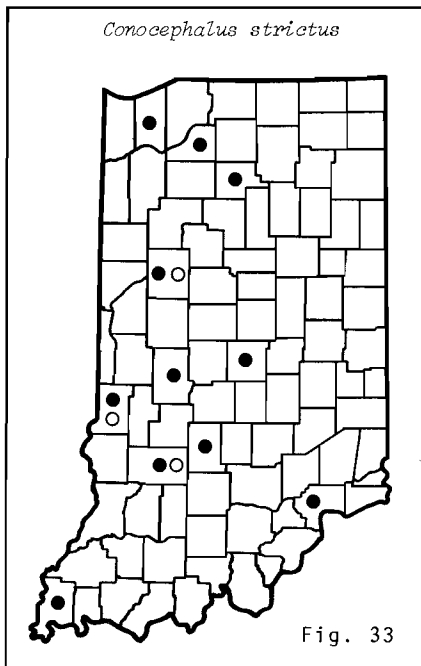
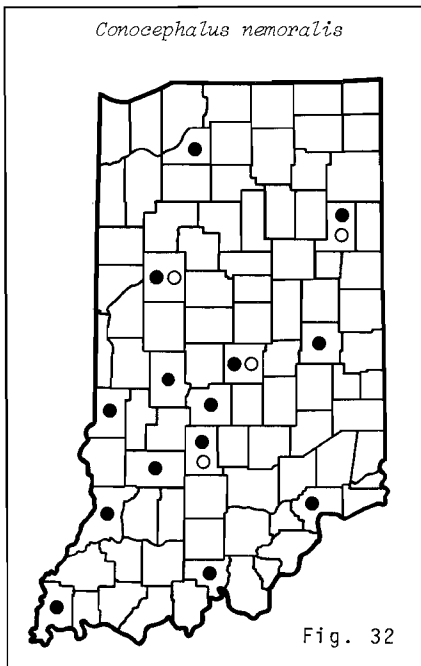
nemoralis (Scudder) 1875. Woodland Meadow Katydid (Fig. 32). Adults are present from late summer to early fall. This species has been taken throughout the state but is somewhat uncommon in the northern part. It inhabits roadside vegetation, fence row and marginal wooded areas.

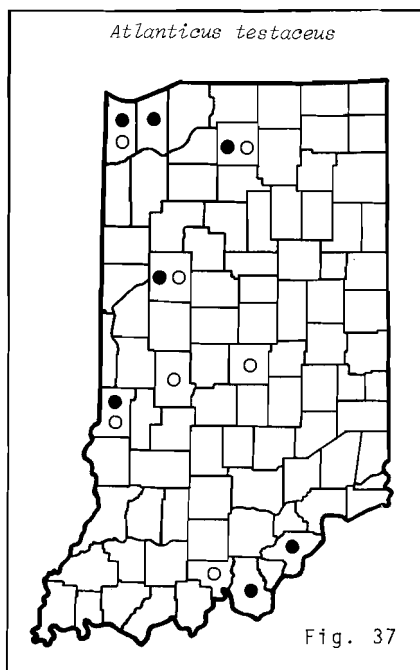
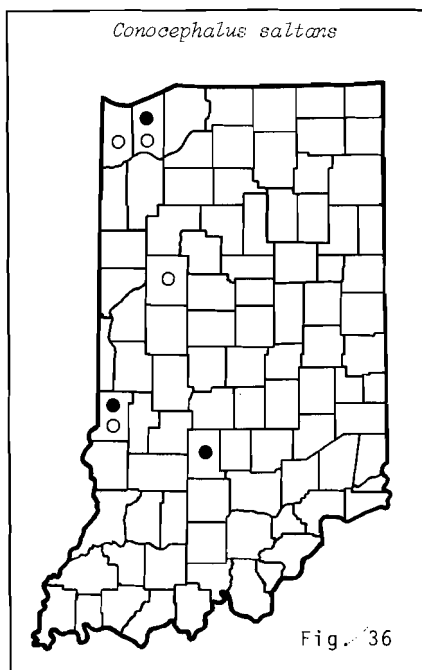
strictus (Scudder) 1875. Straightlanced Meadow Katydid (Fig. 33). Adults are present from late summer to early fall throughout Indiana. It is taken primarily in open field situations.

nigropleurum (Bruner) 1891. Black-sided Meadow Katydid (Fig. 34). Adults are present from mid summer to early fall. This species can be found over most of the state, but records are sparse for southern Indiana. It inhabits grasses and sedges in areas in proximity to water and also shrubby in marshy habitats.

attenuatus (Scudder) 1869. Longtailed Meadow Katydid (Fig. 35). Adults are present from late summer to early fall. This species is found around ponds, swamps, and marshes. In southern Indiana it has been taken in the Wabash River Valley.







saltans (Scudder) 1872. Prairie Meadow Katydid (Fig. 36). This species has been taken in late summer and early fall in central and northern Indiana. It has been taken in habitats ranging from open fields to cattail marshes.

Subfamily DECTICINAE
(The Shieldbearing Katydids)

Genus ATLANTICUS Scudder

testaceus (Scudder) 1900. Shortlegged Shield Bearer (Fig. 37). Adults of this species can be taken most of the summer. The species is taken primarily in the low marginal shrubbery or leaf litter of woodlands.

davisi Rehn and Hebard 1916. Davis' Shield Bearer (Fig. 38). Adults are present throughout the summer and early fall. This species has been taken only in the southern half of the state and mostly from sparsely wooded ravines.

Family GRYLLACRIDIDAE
SUBFAMILY GRYLLACRIDINAE

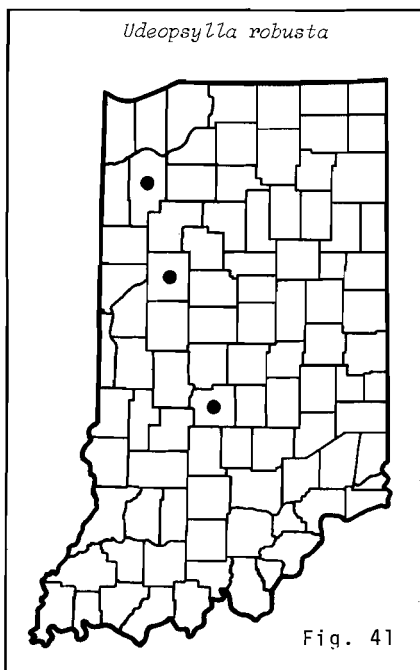
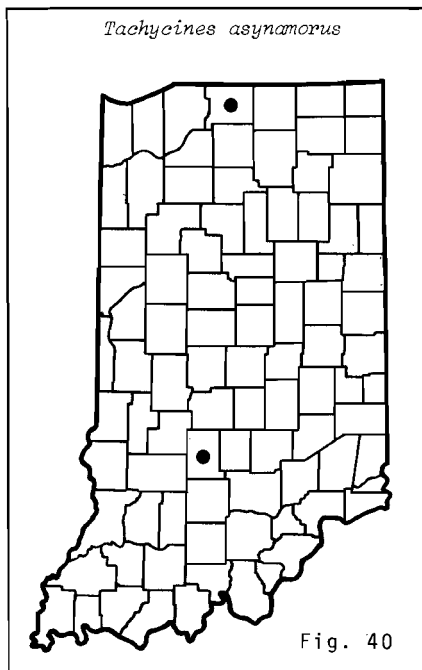
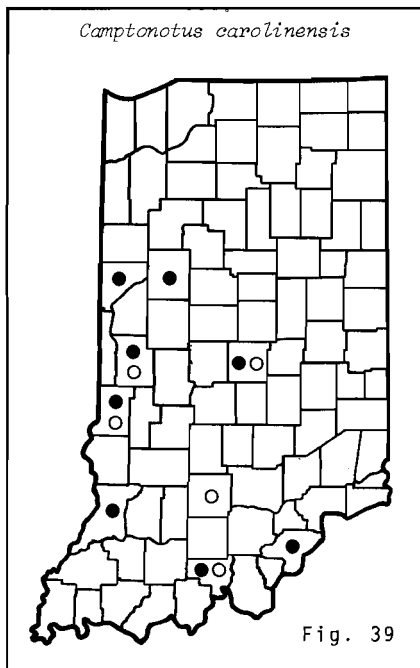
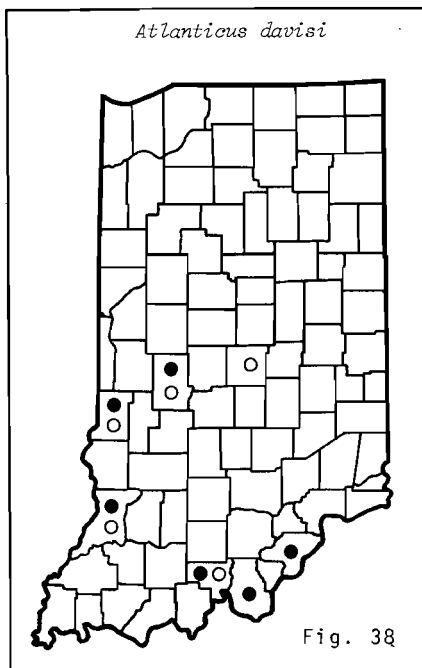
Genus CAMPTONOTUS Uhler

carolinensis Gerstaecker 1860. Carolina Leaf Roller (Fig. 39). Adults of this species have been taken in late summer and early fall. It is known from the southern two-thirds of the state in deciduous woodlands and associated shrubbery.

Subfamily RHAPHIDIPHORINAE
(The Camel Crickets)

Genus TACHYCINES Adelung

**asynamorus* Adelung 1902. Greenhouse Stone Cricket (Fig. 40). This adventive species may be taken year round where it has become established in greenhouses. It has been taken from only two greenhouses in the state.



Genus *UDEOPSYLLA* Scudder

***robusta** (Haldeman) 1850. Robust Camel Cricket (Fig. 41). Adults are present from late spring to early summer. This rather striking species has evidently become established in the western part of Indiana since 1920, and Indiana may be its present eastern-most distribution. In Lafayette, Indiana, specimens have been taken in gardens, under boards and porches, and in old stumps.

Genus *CEUTHOPHILUS* Scudder

brevipes Scudder 1862. Shortlegged Camel Cricket (Fig. 42). Adults are present from late spring through early fall. Known only from southern Indiana, this species inhabits caves and moist woodlands.

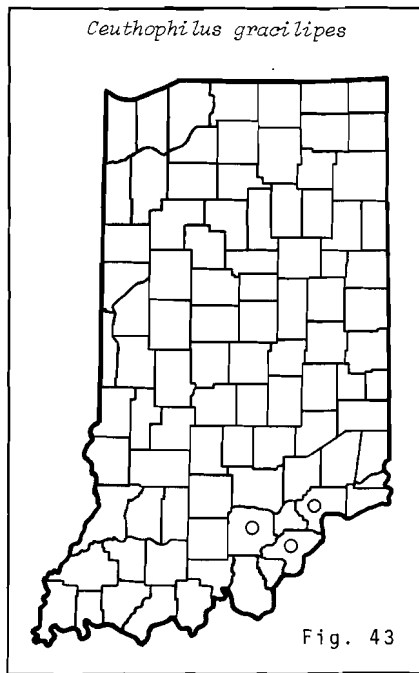
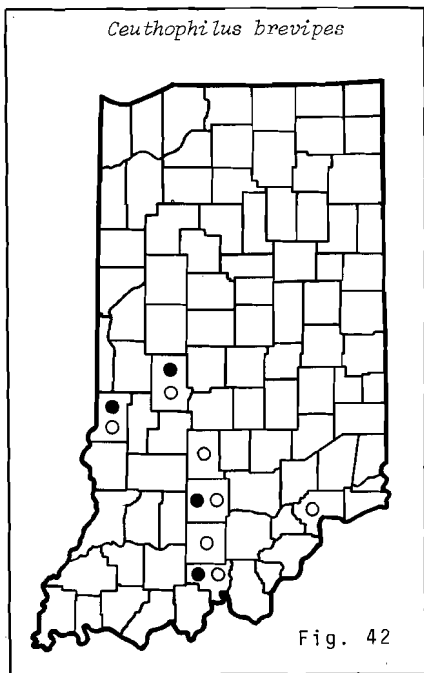
gracilipes (Haldeman) 1850. Slenderlegged Camel Cricket (Fig. 43). Adults are known to occur throughout the summer and early fall. In Indiana it is known only from southern counties. It inhabits woodlands and can be found in natural and man-made shelters.

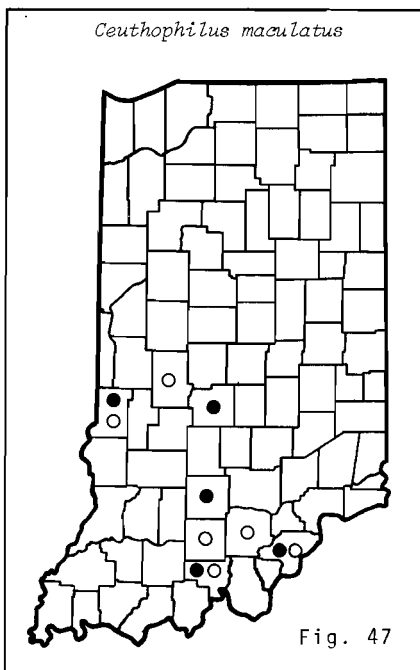
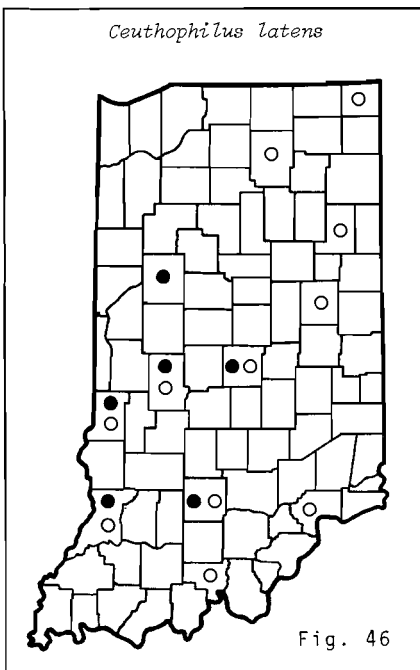
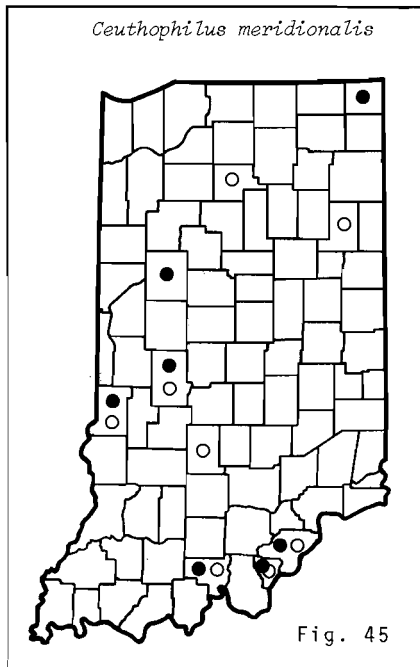
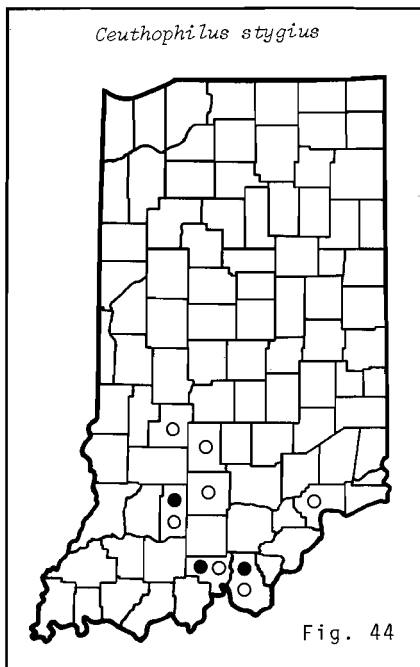
stygius (Scudder) 1861. Cave Camel Cricket (Fig. 44). Adults are present from mid to late summer. Known only from the southern half of the state, this species often frequents wet caves and rocky embankments.

meridionalis Scudder 1894. Striped Camel Cricket (Fig. 45). Adults have been taken from mid to late summer. It inhabits wooded areas throughout the state.

latens Scudder 1862. Black-sided Camel Cricket (Fig. 46). Adults are present from mid summer to early fall. This species is known from wooded areas throughout the state.

maculatus Harris 1941. Spotted Camel Cricket (Fig. 47). Adults are present throughout the summer and early fall. This species prefers xeric wooded areas. It has not been taken in northern Indiana.





tenebrarum Scudder 1894. Shaded Camel Cricket (Fig. 48). Adults of this species are present throughout the summer. It is most common in wooded areas and is restricted to southern Indiana.

seclusus Scudder 1894. Secluded Camel Cricket (Fig. 49). This species is present throughout the summer. This species is known from only one county in Indiana and probably does not occur in the northern half of the state. It has been taken in dry wooded areas.

uhleri Scudder 1862. Uhler's Camel Cricket. (Fig. 50). Adults have been taken in Indiana in late summer and early fall. The species is common throughout the state in wooded areas.

divergens Scudder 1862. Divergent Camel Cricket (Fig. 51). This species has been taken throughout the summer. It evidently prefers drier wooded areas.

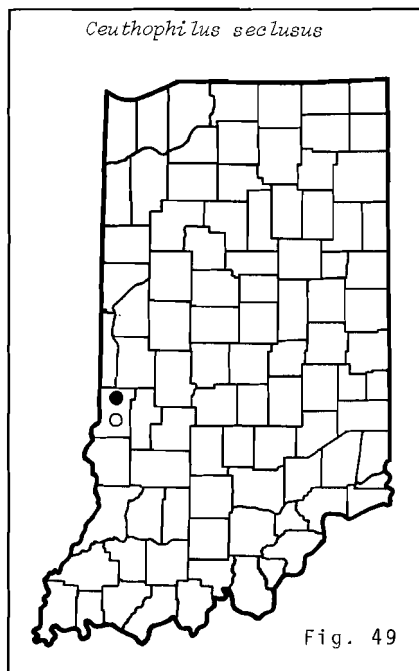
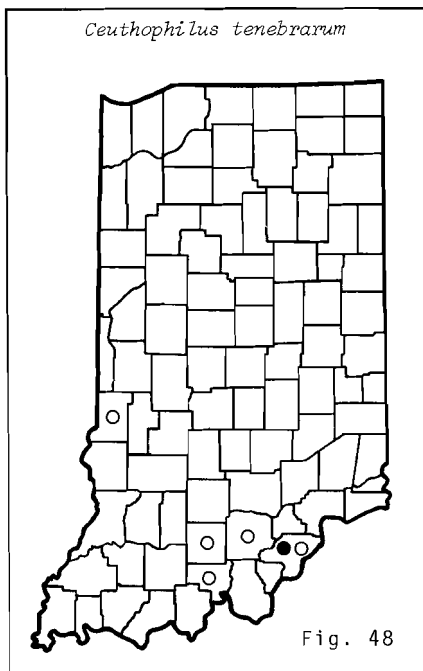
guttulosus guttulosus T. Walker 1869. Leaf litter Camel Cricket (Fig. 52). Adults of this species have been reported from early spring to mid fall. The species is associated with leaf litter in forested areas under which the soil contains rodent burrows.

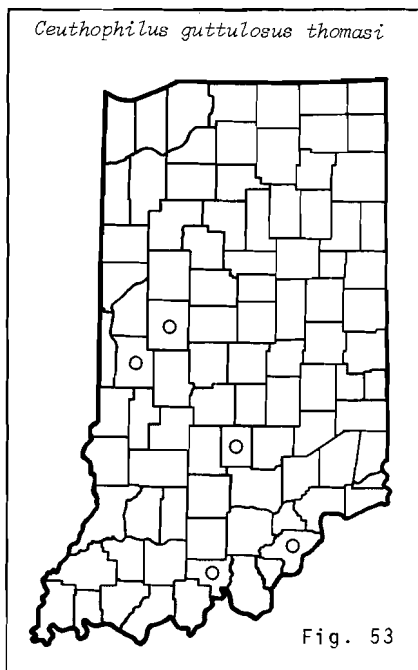
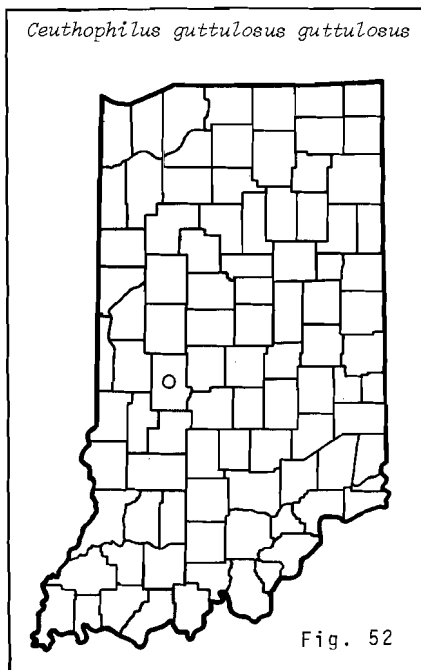
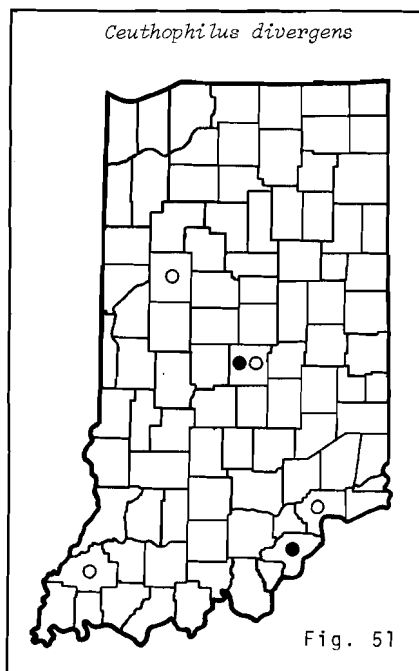
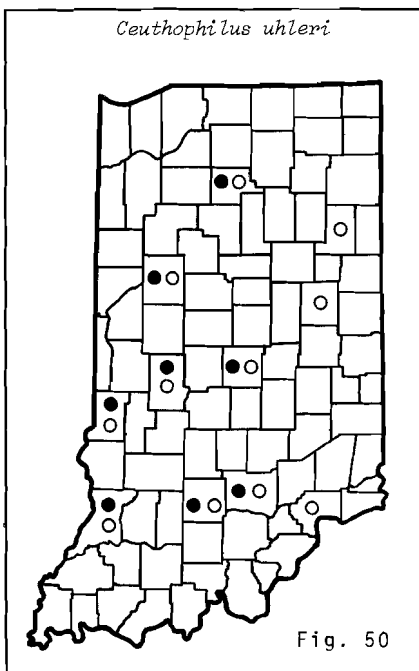
guttulosus thomasi Hubbell 1936. Thomas' Camel Cricket (Fig. 53). This subspecies apparently merges with *C. g. guttulosus* in Indiana.

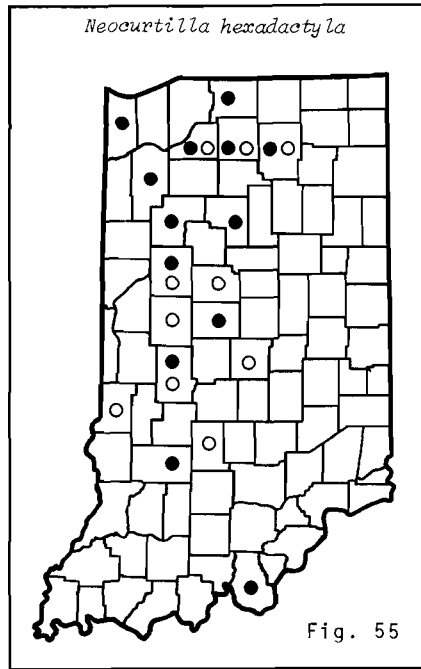
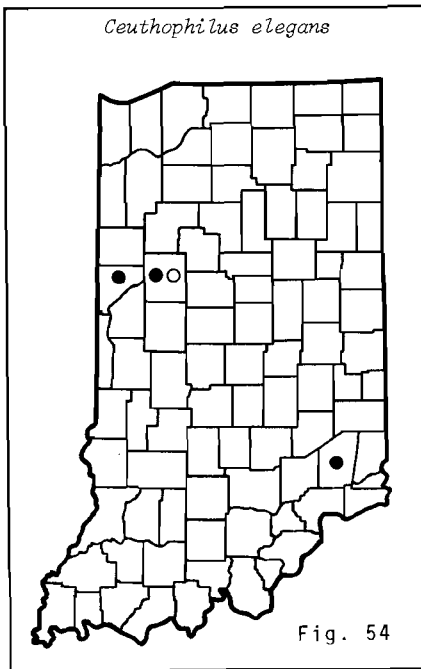
elegans Hubbell 1934. Elegant Camel Cricket (Fig. 54). Although adults apparently may be present throughout the year (Hubbell, 1936), Indiana specimens have been taken in the spring. The species has been taken in corn fields and wooded areas.

Family GRYLLOTALPIDAE
(The Mole Crickets)
Subfamily GRYLLOTALPINAE
Genus NEOCURTILLA Kirby

hexadactyla (Perty) 1832. Northern Mole Cricket (Fig. 55). Adults have been taken from mid summer through mid fall. This species is known throughout the state where it inhabits mud and sand banks of streams, ponds, and lakes.







Family GRYLLIDAE

(The Crickets)

Subfamily MYRMECOPHILINAE

(The Antloving Crickets)

Genus MYRMECOPHILA Latreille

pergandei Bruner 1884. Eastern Antloving Cricket (Fig. 56). Adults are present from late spring to early fall. This species is common in southern Indiana, but to the north it has been taken only in Tippecanoe County. The species occurs in ant nests, often of *Camponotus melleus* Say.

Subfamily GRYLLINAE

(The House and Field Crickets)

Genus MIOGRYLLUS Saussure

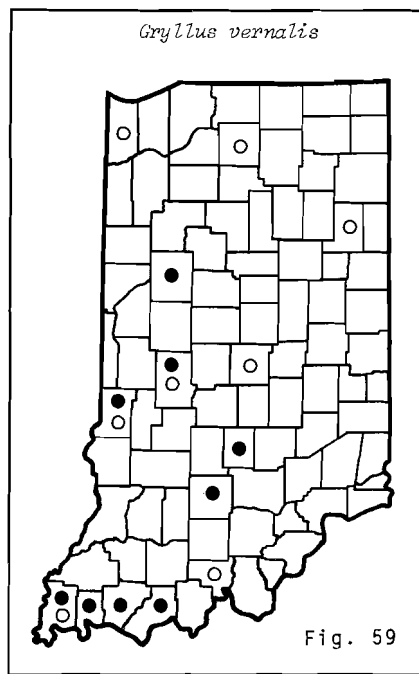
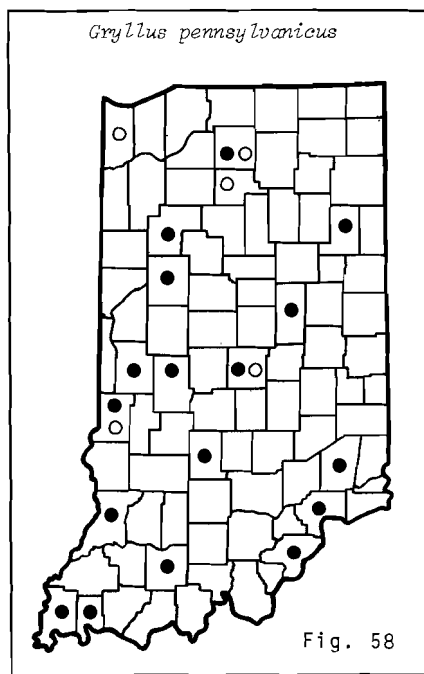
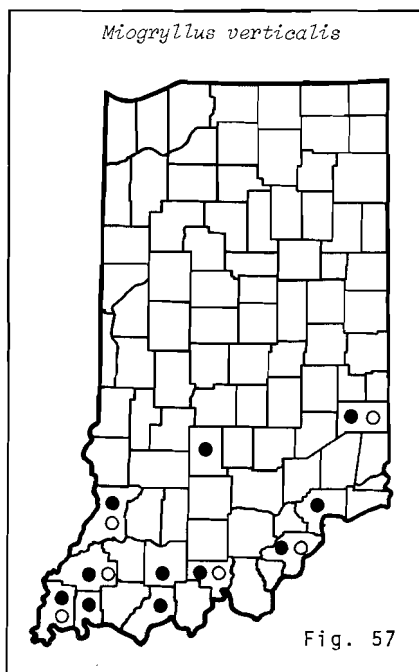
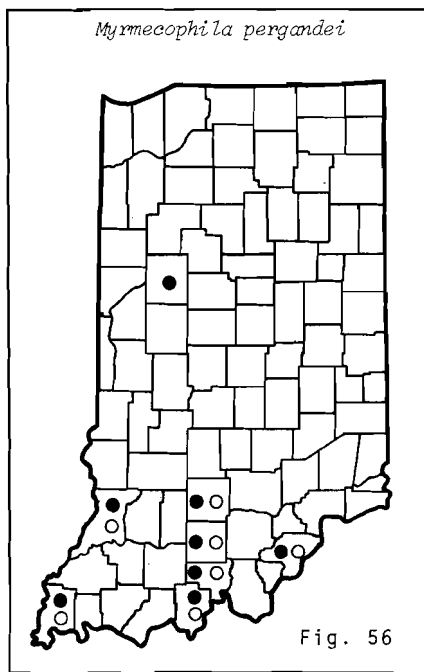
(Lesser Field Crickets)

verticalis (Serville) 1839. Stripeheaded Field Cricket (Fig. 57). Adults are present from late spring through early fall. This species is restricted to southern Indiana where it may be found most frequently under logs and rocks on wooded hillsides.

Genus GRYLLUS Linnaeus

(Field Crickets)

pennsylvanicus Burmeister 1838. Fall Field Cricket (Fig. 58). Adults present from mid summer to mid fall. This common cricket can be found throughout Indiana in open field environments.



vernalis Blatchley 1920. Smaller Spring Field Cricket (Fig. 59). Adults of this species are present in spring and early summer. Otherwise, its ecology and distribution are similar to that of *G. pennsylvanicus*, being almost ubiquitous.

***fultoni** (Alexander) 1957. Fulton's Field Cricket (Fig. 60). Adults are known to occur in late spring and early summer. In Indiana this species is known only from Crawford County in the south. Alexander (1957) stated that this species was expected to occur on dry, *Andropogon* covered slopes. Crawford County provides such habitats.

***veletis** (Alexander and Bigelow) 1960. Larger Spring Field Cricket (Fig. 61). Adults are present from late spring to early summer. This cricket has been found throughout the state and its habitat is similar to *G. pennsylvanicus*.

Genus *ACHETA* Linnaeus

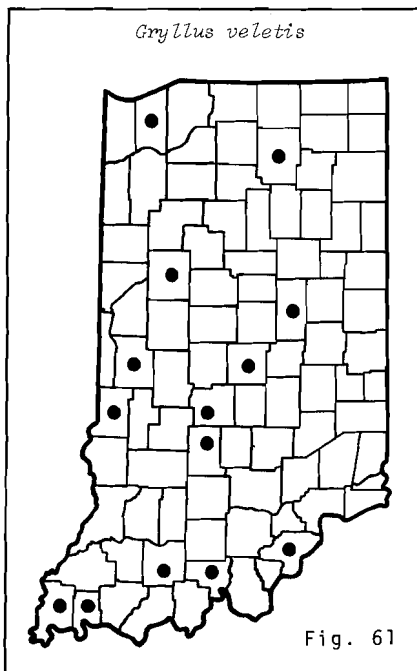
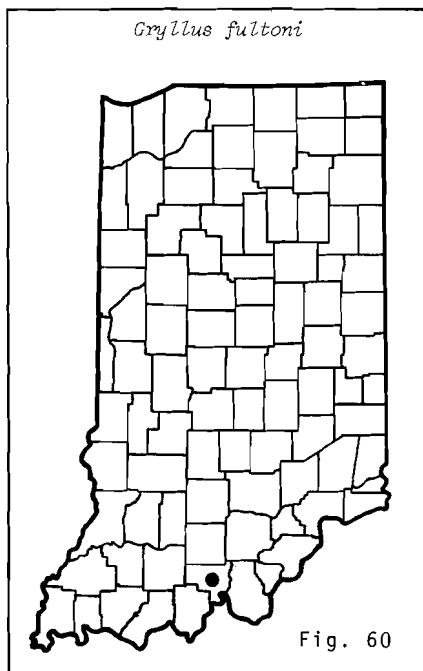
domesticus (Linnaeus) 1758. House Cricket (Fig. 62). Adults can be found throughout the year. This species is adventive and domestic, and probably occurs in every county of the state.

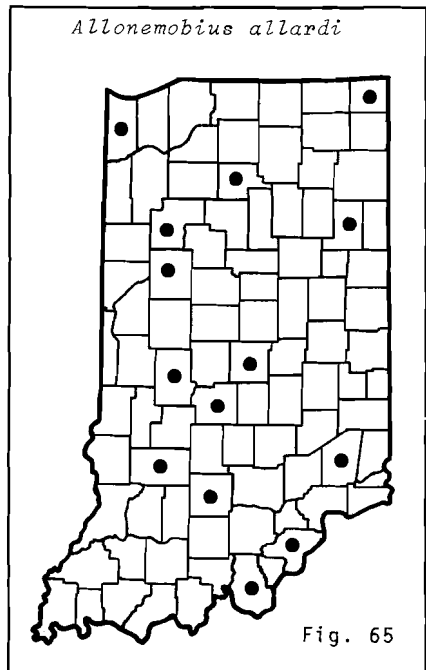
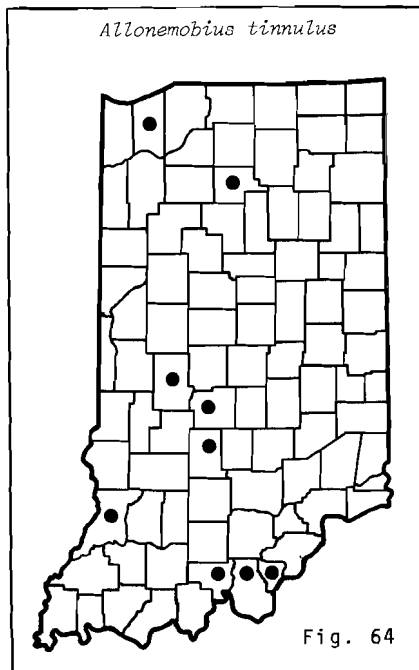
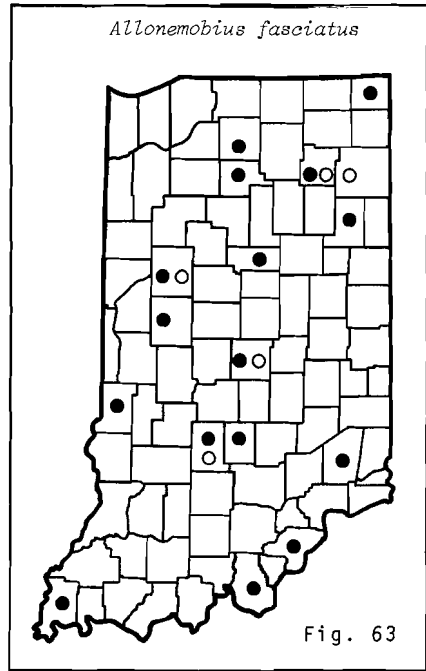
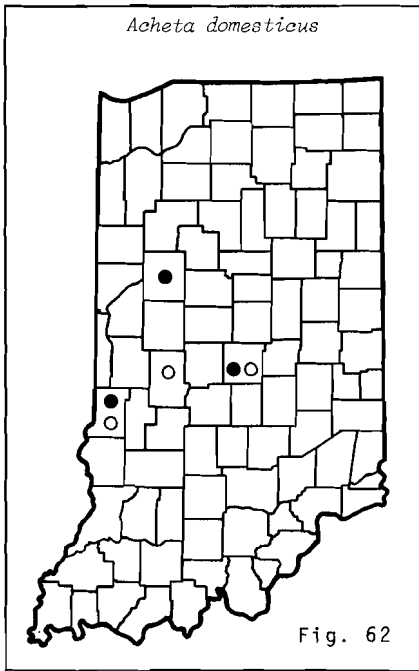
Subfamily NEMOBIINAE (The Ground Crickets)

Genus *ALLONEMOBIUS* Hebard

fasciatus (DeGeer) 1773. Striped Ground Cricket (Fig. 63). Adults are present from mid summer to mid fall. This relatively common species may be taken in most moist habitats near marshes, ponds, lakes, and streams.

***tinnulus** (Fulton) 1931. Tinkling Ground Cricket (Fig. 64). Adults are present in late summer and early fall. This species has been found over the state in deciduous wooded areas.





***allardi** (Alexander and Thomas) 1959. Allard's Ground Cricket (Fig. 65). Adults are present from late summer to mid fall. This species has been taken throughout the state in open field habitats.

maculatus (Blatchley) 1900. Larger Spotted Ground Cricket (Fig. 66). Adults are present from late summer to mid fall. This widespread species is known to occur in open woodlands.

griseus griseus (E. M. Walker) 1904. Gray Ground Cricket (Fig. 67). This species has been taken in late summer and early fall. Records of this ground cricket are relatively scarce and so far it has not been collected in northern Indiana, although it is expected to occur there. It occurs in upland, sandy soil environments.

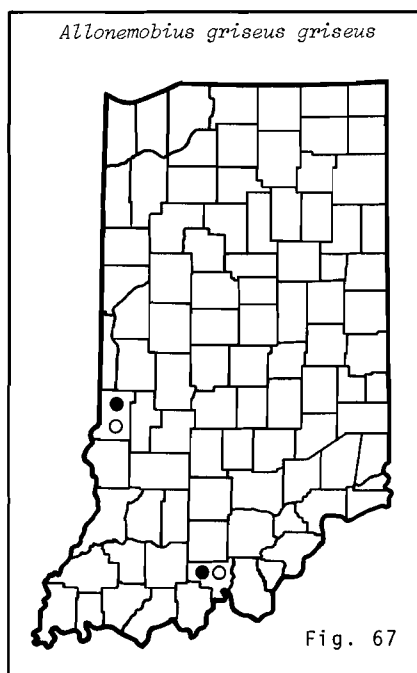
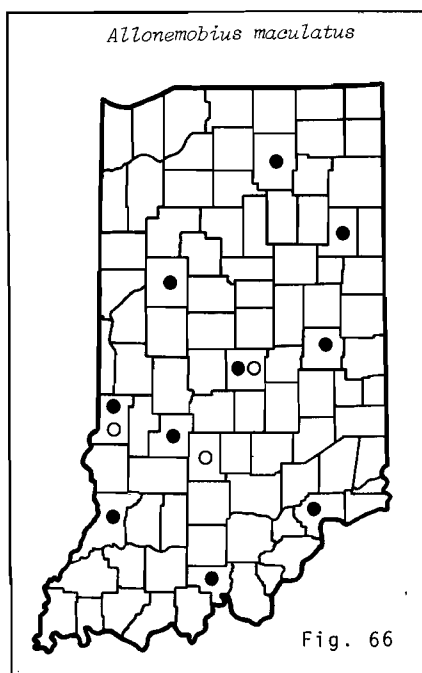
Genus NEONEMOBIUS Hebard

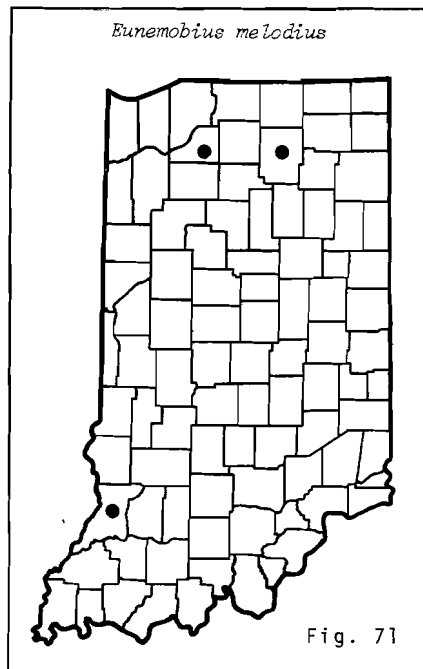
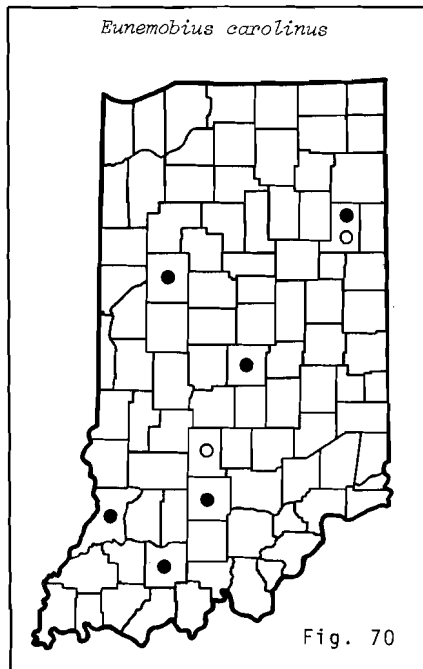
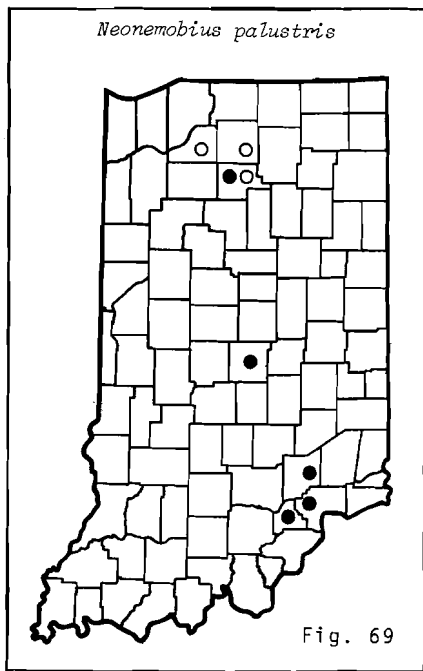
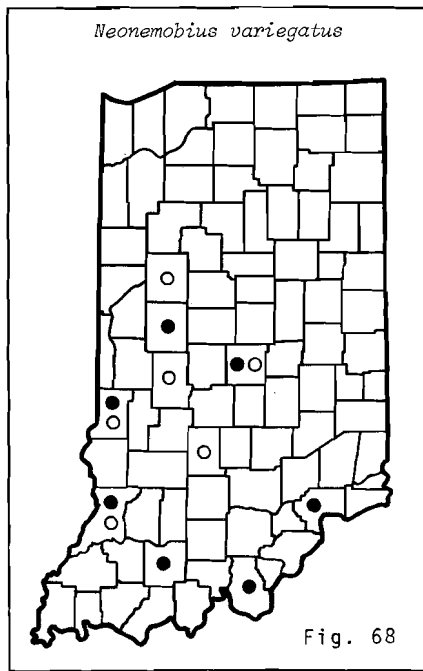
variegatus (Bruner) 1893. Smaller Spotted Ground Cricket (Fig. 68). Adults are present from late summer to early fall. The species occurs only in southern and central Indiana. It is known to inhabit grassy areas along streams and fence rows in open woods.

palustris (Blatchley) 1900. Marsh Ground Cricket (Fig. 69). Adults are present from mid summer to early fall. This species is known to inhabit sphagnum bogs (Johnstone and Vickery, 1970), and thus has a discontinuous distribution over the state.

Genus EUNEMOBIUS Hebard

carolinus (Scudder) 1877. Carolina Ground Cricket (Fig. 70). Adults have been taken from mid summer through mid fall. This species is known from scattered localities over most parts of the state and can be found in wet environments as in marshes or around the margins of ponds and streams.





**melodius* (Thomas and Alexander) 1957. Melodious Ground Cricket (Fig. 71). Adults are known from late summer to early fall. Scattered samples of this species have been taken in both northern and southern Indiana. It is found in marshy habitats.

confusus (Blatchley) 1903. Confusing Ground Cricket (Fig. 72). Adults are present from late summer to early fall. It has been taken in scattered localities throughout the state. Blatchley (1920) adequately described its habitat as low, damp woods, usually near water, and in leaf litter.

Subfamily OECANTHINAE
(The Tree Crickets)

Genus *NEOXABEA* Kirby

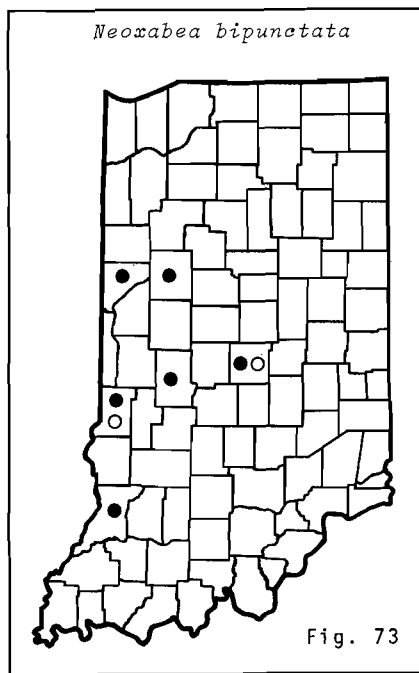
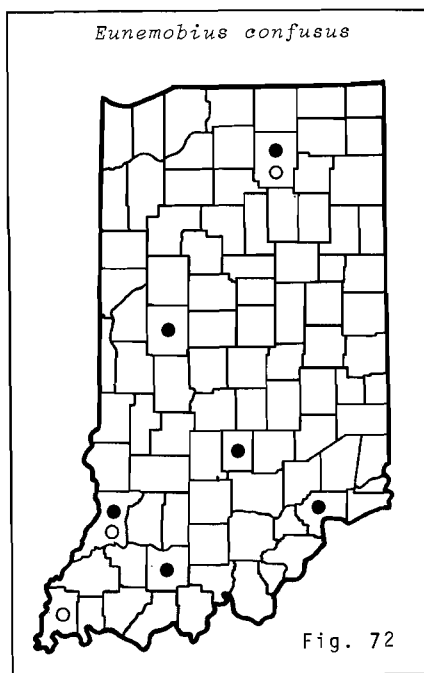
bipunctata (DeGeer) 1773. Twospotted Tree Cricket (Fig. 73). Adults are present in late summer and early fall. This species should occur throughout the state. It is most commonly taken on various deciduous trees and sometimes in vines and shrubs.

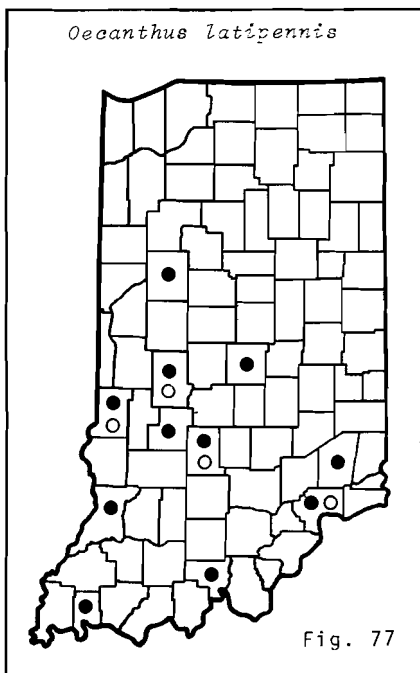
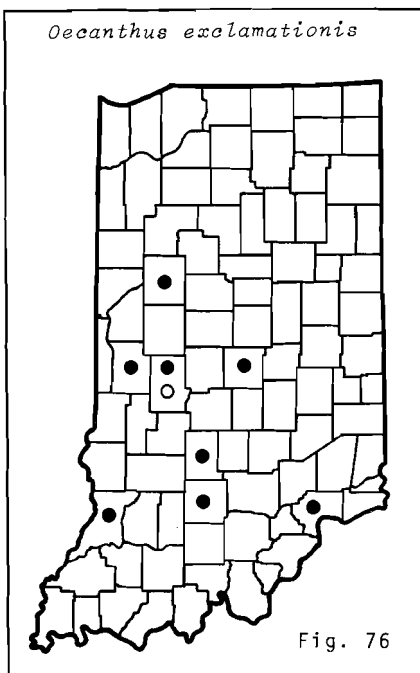
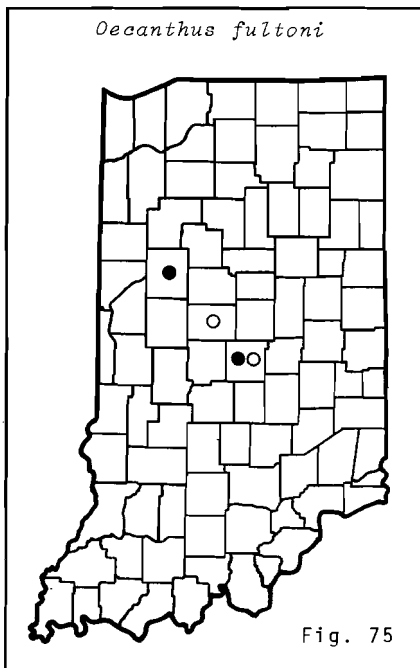
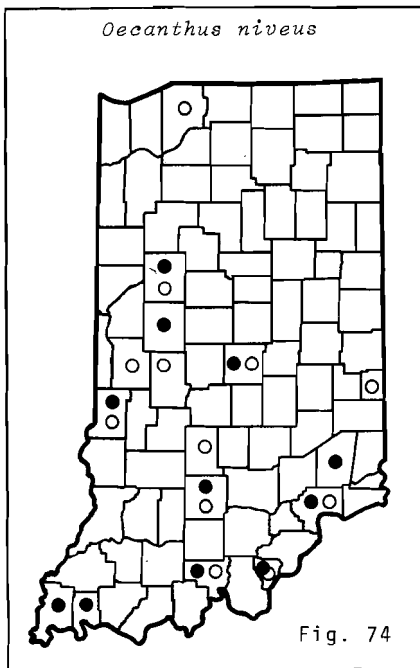
Genus *OECANTHUS* Serville

niveus (DeGeer) 1773. Narrowwinged Tree Cricket (Fig. 74). Adults are known from late summer to mid fall. This species frequents the crowns of several species of deciduous trees and also undergrowth.

fultoni T. J. Walker 1962. Snowy Tree Cricket (Fig. 75). Adults are known from mid summer to early fall. In Indiana this species has only been taken in the central region. Walker (1962) states that it may occur in shrubbery, vines, fruit trees, and fence rows.

exclamationis Davis 1907. Davis' Tree Cricket (Fig. 76). Adults are present in the late summer and early fall. This species, which is known mainly from central and southern Indiana, may be found in deciduous trees and undergrowth.





latipennis Riley 1881. Broadwinged Tree Cricket (Fig. 77). Adults are known from late summer and early fall. This species is known from much the same areas as *O. exclamatoris* in the state, but occurs in low growths of vegetation such as shrubbery, along fence rows, and in open fields.

nigricornis F. Walker 1869. Blackhorned Tree Cricket (Fig. 78). Adults are present from mid summer to early fall. This common species may be found throughout Indiana in open fields and weedy environments.

argentinus Saussure 1874. Argentina Tree Cricket (Fig. 79). There are evidently two generations a year in this species (Walker, 1963). In Indiana, we have taken adults throughout the summer and early fall. Known mainly from the southern part of the state, it is commonly found in weedy growths and lower portions of trees.

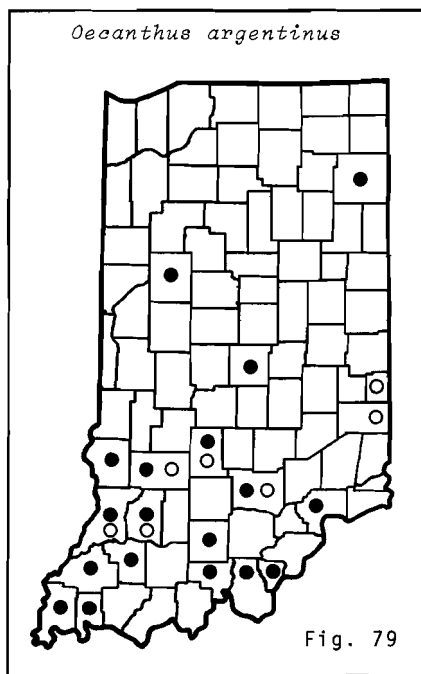
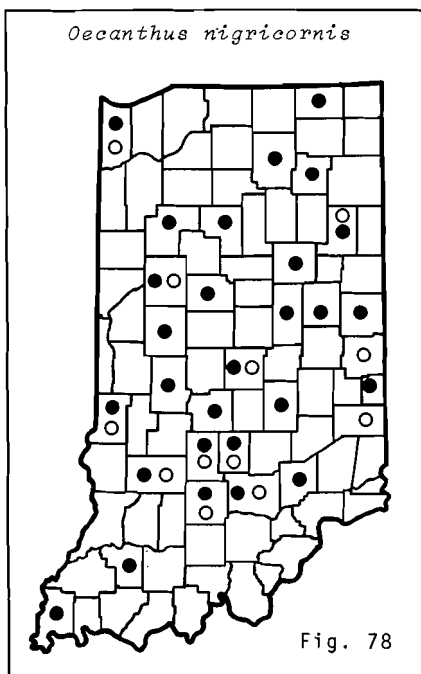
quadripunctatus Beutenmüller 1894. Fourspotted Tree Cricket (Fig. 80). This widespread species may be found in late summer and early fall. Its habitat is similar to that of *O. argentinus*.

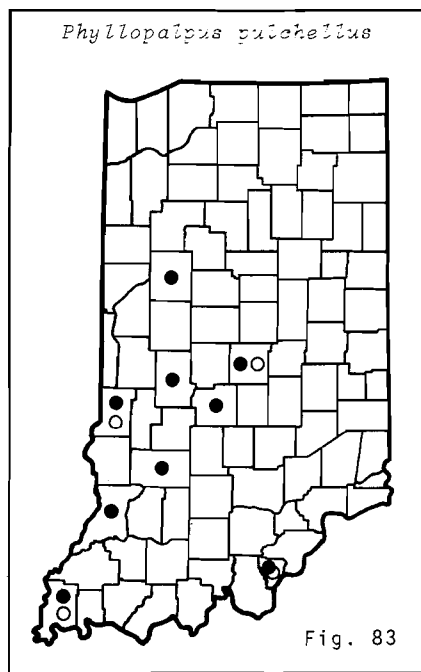
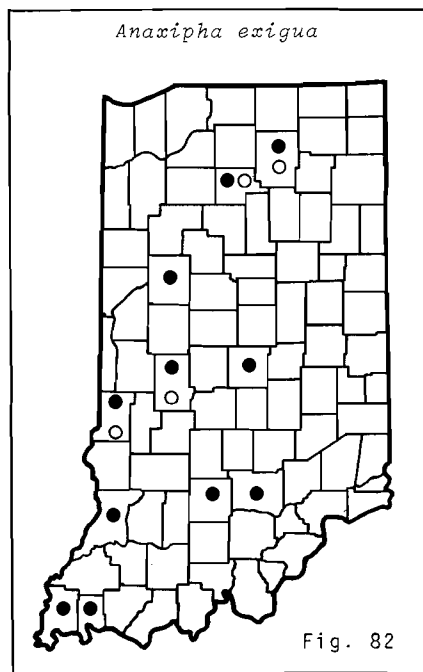
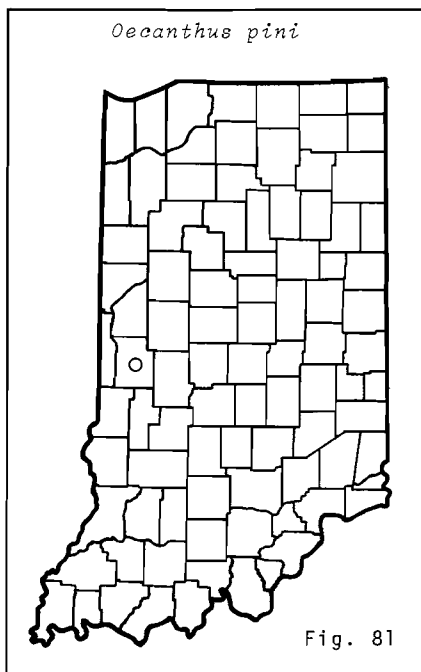
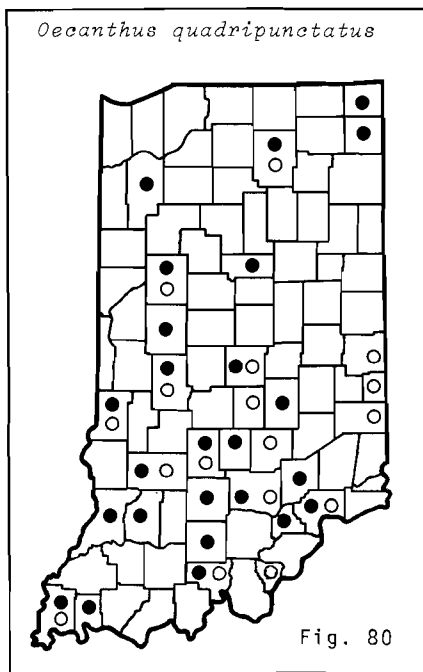
pini Beutenmüller 1894. Pine Tree Cricket (Fig. 81). Dr. R. D. Alexander (pers. comm.) has indicated to us that he has taken specimens in Parke County at Turkey Run State Park. This would represent a newly reported state record for the species. The species is normally associated with pines.

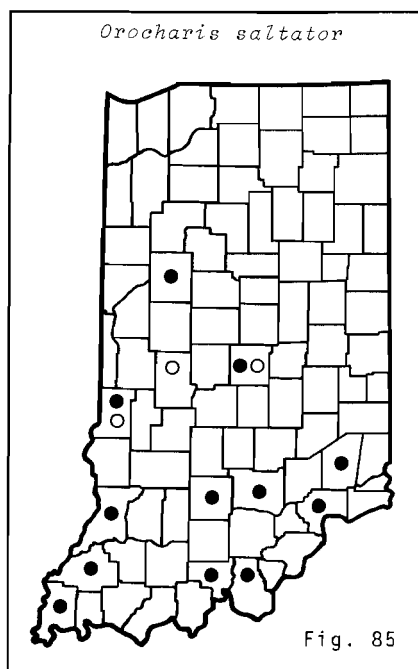
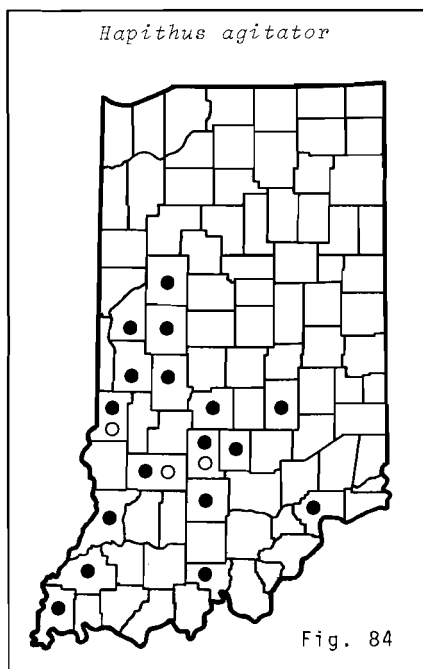
Subfamily TRIGONIDIINAE
(The Winged Bush Crickets)

Genus ANAXIPHA Saussure

exigua (Say) 1825. Say's Bush Cricket (Fig. 82). Adults are present from mid summer to early fall. This small cricket has been taken from much of the state where it frequents dense thickets and low moist habitats.







Genus *PHYLLOPALPUS* Uhler

pulchellus Uhler 1864. Handsome Bush Cricket (Fig. 83). Adults are present in late summer and early fall. This striking cricket is known mainly from the southern half of the state, the northern most record being from Tippecanoe County. It is found in undergrowth, grasses, and small trees, especially near water.

Subfamily ENEOPTERINAE (The Larger Brown Bush Crickets)

Genus *HAPITHUS* Uhler

agitator Uhler 1864. Restless Bush Cricket (Fig. 84). Adults are present in late summer and early fall. The species is known only from the southern two-thirds of the state where it may be found in a great many habitats ranging from upland woods to open fields and shrubs.

Genus *OROCHARIS* Uhler

saltator Uhler 1864. Jumping Bush Cricket (Fig. 85). Adults are present in late summer and early fall. This species is known only from the southern two-thirds of the state where it occurs in deciduous trees, herbaceous undergrowth, and shrubs.

LITERATURE CITED

- Alexander, R. D. 1957. The taxonomy of the field crickets of the eastern United States (Orthoptera: Gryllidae: *Acheta*). Ann. Entomol. Soc. Amer. 50:584-602.
 Alexander, R. D., A. E. Pace, and D. Otte. 1972. The singing insects of Michigan. Great Lakes Entomol. 5:33-69.

- Blatchley, W. S. 1903. The Orthoptera of Indiana. 27th Ann. Rept., Dept. Geol. Nat. Res. Indiana. 123-471.
- Blatchley, W. S. 1920. Orthoptera of northeastern America. The Nature Publ. Co. Indianapolis. 784 p.
- Cantrall, I. J. 1968. An annotated list of the Dermaptera, Dictyoptera, Phasmatoptera, and Orthoptera of Michigan. Mich. Entomol. 1:299-346.
- Cantrall, I. J. and F. N. Young. 1954. Contrasts in the orthopteran faunas of grasslands, forests, and transitional areas in southern Indiana. Proc. Ind. Acad. Sci., 1953. 63:157-162.
- Chandler, L. 1966. The origin and composition of the insect fauna. p. 345-361. In: Natural Features of Indiana. A. A. Lindsey, ed. Ind. Acad. Sci. Indianapolis.
- Fox, H. 1915. Notes on the Orthoptera and Orthoptera habitats in the vicinity of Lafayette, Ind. Proc. Ind. Acad. Sci., 1914:287-321.
- Hebard, M. 1934. The Dermaptera and Orthoptera of Illinois. Bull. Ill. Nat. Hist. Surv. 20:125-279.
- Hubbell, T. H. 1936. A monographic revision of the genus *Ceuthophilus* (Orthoptera: Gryllacrididae: Rhabdiphorinae). Univ. Fla. Biol. Sci. Ser. Publ. 2:1-551.
- Johnstone, D. E. and V. R. Vickery. 1970. Notes on the *palustris-cubensis* complex of the genus *Neonemobius* Hebard (Orthoptera: Gryllidae: Nemobiinae). J. Georgia Entomol. Soc. 5:233-241.
- Lindsey, A. A. (ed.). 1966. Natural Features of Indiana. Ind. Acad. Sci. Indianapolis. xxix + 600 p.
- Merriam, C. H. 1898. Life zones and crop zones of the United States. U.S. Dept. Agr., Div. Biol. Surv., Bull. No. 10:1-79.
- Stein, J. L. and W. P. McCafferty. 1975. Diagnostic tables to the long-horned grasshoppers and crickets of Indiana. Purdue Univ. Agr. Exp. Sta. Res. Bull. No. 921:1-20.
- Walker, T. J. 1962. The taxonomy and calling songs of the United States tree crickets (Orthoptera: Gryllidae: Oecanthinae) I. The genus *Neoxabea* and the *niveus* and *varicornis* groups of the genus *Oecanthus*. Ann. Entomol. Soc. Amer. 55:303-322.
- Walker, T. J. 1963. Taxonomy II. The *nigricornis* group of the genus *Oecanthus*. Ann. Entomol. Soc. Amer. 56:772-789.
- Young, F. N. and I. J. Cantrall. 1956. Orthoptera of relict prairie fragments in Greene County, Indiana. Proc. Ind. Acad. Sci., 1955. 65:111-115.