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## AN ANNOTATED LIST OF THE ORTHOPTERA OF BEAVER ISLAND, LAKE MICHIGAN

R. G. Bland<sup>1</sup>

### ABSTRACT

Thirty-six species of Orthoptera were collected from Beaver Island in northern Lake Michigan. Species distribution was Tetrigidae, 4; Acrididae, 16; Tettigoniidae, 8; Gryllacrididae, 1; and Gryllidae, 7.

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Beaver Island (Charlevoix County, Michigan) is located approximately 52 km northwest of Charlevoix in northern Lake Michigan. It is 21 km long and 11 km wide with an area of 135 square km. The relatively undisturbed habitats include sand beaches with dune vegetation, upland fields, meadows, cedar swamps, bogs, and mixed deciduous and coniferous forests.

Little is known about orthopterans on islands of the Great Lakes. Pettit & McDaniel (1918) and Cantrall (1968) listed 15 species from Isle Royale but only 3 species from Beaver Island. Several references have included Michigan species as part of broader geographical studies (Blatchley 1920, Otte 1981 & 1984, Vickery & Kevan 1986) but do not refer to Beaver Island. The paucity of recorded species on the island was likely due to minimal collecting. Thus, the objective of this study was to determine which orthopteran species occurred on Beaver Island.

Collecting was done from 20 July to 7 August and 9 to 11 September 1987, and 4 to 6 June 1988. A few specimens collected by students in the 1960's and by the author in 1975 and 1980 were also recorded. A variety of habitats were sampled by sweeping and included dune vegetation, gravel pits, dry upland fields, agricultural fields, mowed grass, damp meadows, shorelines of lakes, shrubby edges of bogs, and mixed deciduous and coniferous woods. Pitfall traps containing molasses or antifreeze were placed in the above habitats and molasses-oatmeal trails were occasionally used. Katydid stridulating at night were stalked and captured.

Thirty-six species of Orthoptera were collected out of approximately 62 species listed from nearby counties of the Upper and Lower Peninsula of Michigan (Cantrall 1968, Vickery & Kevan 1986). An asterisk next to a species indicates a new Charlevoix County record.

### Family TETRIGIDAE

#### Subfamily TETRIGINAE

*Tetrix arenosa angusta* (Hancock). 5 June–10 Sept. This commonly collected species occurred in the greatest diversity of habitats for tetrigids and was the most variable in

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structure and colored markings, a characteristic common in this family (Rehn & Grant 1961).

*Tetrix ornata ornata* (Say). 4 June–10 Sept.

*Tetrix subulata* (L.). 5 June–15 Sept. This species was as abundant as *T. arenosa angusta*.

#### Subfamily BATRACHIDEINAE

*Tettigidea lateralis* (Say). 5 June–11 Sept. Nearly 85% of the specimens collected at Green's Lake in June were infested with larvae of an undescribed *Leptus* sp. (Erythraeiidae), a bright pinkish-red mite. The infestation occurred in a damp to wet habitat dominated by two species of Cyperaceae (sedges): *Eleocharis* sp. (spike rush) and clumps of *Scirpus* sp. (bulrush). Iris (*Iris* sp.) were also present.

Tetrigids were encountered most frequently along the damp, flat shorelines of pools (e.g., in gravel pits, swamps), marshes, and shallow lakes. Shoreline vegetation was primarily short sedges and grasses, mosses, and organic debris. Tetrigids also frequented mixtures of damp, short, grass and broad-leaf vegetation growing on new logging trails at forest openings.

#### Family ACRIDIDAE

##### Subfamily GOMPHOCERINAE

*Chloealtis conspersa* (Harris). 20 July–6 August. Specimens were collected primarily in pitfall traps under trees along a field edge or in rank vegetation of fields.

*Chorthippus curtipennis curtipennis* (Harris). 12 July–11 Sept. This species was a very common acridid in lowland fields.

*Pseudopomala brachyptera* (Scudder). 20 July–2 August.

##### Subfamily OEDIPODINAE

*Arphia pseudonietana pseudonietana* (Thomas). 10 Sept. Groups of individuals occurred on extremely dry upland habitats consisting of sparse grass and broad-leaf herbs or grass and reindeer lichen.

*Chortophaga viridifasciata* (DeGeer). 4 June–12 August. This was the only adult acridid observed in early June except for a few freshly-molted *Melanoplus borealis borealis* (Fieber).

*Camnula pellucida* (Scudder). 20 July–11 Sept. This acridid was the most abundant species; it occurred in all upland, moist lowland, and agricultural fields.

*Dissosteira carolina* (L.). 21 July–7 August.

*Spharagemon collare* (Scudder). 7 August–10 Sept. The few individuals observed occurred in a small corn field and a recently abandoned, weedy agricultural field.

*Trimerotropis huroniana* E. M. Walker. 20 July–11 Sept. Individuals frequented the sparsely vegetated sand dunes of Lake Michigan shorelines.

##### Subfamily MELANOPLINAE

*Booneacris glacialis canadensis* (E. M. Walker). 3 August–11 Sept. Individuals were captured on leatherleaf along the birch and maple edge of the nearly dry, remnant bog of Green's Lake.

*Melanoplus bivittatus* (Say). 22 July–5 August.

*Melanoplus borealis borealis* (Fieber). 4 June–6 August. Individuals were netted or

collected from pitfall traps in rank vegetation of fields or under trees at field edges. The first adults were collected 14 days before the earliest collecting record listed by Cantrall (1968).

*Melanoplus confusus* Scudder\*. July 23.

*Melanoplus femurrubrum femurrubrum* (DeGeer). 27 July–10 Sept.

*Melanoplus islandicus* Blatchley. 30 July–11 Sept. Individuals were captured in a habitat of grass, broad-leaf ground cover, and moss at forest edges, as well as sunlit forest openings alongside a trail above Iron Ore Creek.

*Melanoplus sanguinipes sanguinipes* (F.). 20 July–10 Sept. This species reached a peak in late August and early September to become nearly as abundant as *C. pellucida*.

Cantrall (1968) listed approximately 14 species found in nearby mainland counties that might be expected to occur on Beaver Island but were not collected in my study. In particular, the yellow wings and crepitation of *A. sulphurea* (F.) would have made this species easy to locate in June if present, and the same for *S. bolli* Scudder in sandy fields, roadsides, or forest edges in August and September. *Trimerotropis verruculata* (Wm. Kirby) would have produced loud crepitations around gravel pits near wooded areas (Vickery & Kevan 1986). *Orphulella speciosa* (Scudder), *M. dawsoni* (Scudder), and *M. keeleri luridus* (Dodge) were missing species common on the sandy, grassy wasteland of the surrounding mainland, and *M. fasciatus* was not found in sunlit, woodland openings of *Vaccinium* or other low shrubs as expected. *Encoptolophus sordidus* (Burmeister) is a common September mainland species also not observed.

#### Family TETTIGONIIDAE

##### Subfamily PHANEROPTERINAE

*Scudderia curvicauda* (DeGeer)\*. 20 July–10 Sept.

*Scudderia furcata furcata* Brunner. 31 July–25 Sept.

*Scudderia pistillata* Brunner. 20 July–10 Sept.

*Scudderia* spp. were collected primarily from shrubs and broad-leaf herbs of upland and lowland grassy fields.

##### Subfamily COPIPHORINAE

*Neoconocephalus ensiger* (Harris)\*. 29 July–10 Sept.

##### Subfamily CONOCEPHALINAE

*Conocephalus fasciatus* (DeGeer). 22 July–10 Sept. This species ranged from dry, upland fields to damp, shoreline vegetation.

*Conocephalus saltans* (Scudder). 21 July–10 Sept. Individuals occurred in dry, upland fields.

*Orchelimum gladiator* Bruner. 20 July–30 Sept. This species was most common in damp meadows of tall sedges and grasses.

##### Subfamily DECTICINAE

*Atlanticus monticola* Davis\*. 20 July–22 Sept. This species was collected from low branches of small hemlock and oak trees in open areas, as well as pitfall traps placed among bracken ferns near maple woods, under a maple tree, and in a weedy corn field. The other Michigan species, *A. testaceous* (Scudder), was not found.

Family GRYLLACRIDIDAE

Subfamily RHAPHIDOPHORINAE

*Ceuthophilus maculatus* (Harris)\*. 17 July–7 August. Several individuals were collected at night from inside an old stump. Otherwise, the same pit traps that captured *A. monitcola*, and another next to a fallen log, yielded most of the specimens. Four additional species, *C. brevipes* Scudder in particular, may occur on the island based on their ranges (Cantrall 1968).

Family GRYLLIDAE

Subfamily GRYLLINAE

*Gryllus pennsylvanicus* Burmeister. 22 July–11 Sept.  
*Gryllus veletis* (R. D. Alexander & Bigelow). 5 June–2 July.

Subfamily NEMOBIINAE

*Allonemobius* (= *Nemobius*) *allardi* (R. D. Alexander & E. S. Thomas). 21 July–30 Sept. The first adult was collected 7 days before the earliest date listed by Cantrall (1968).  
*Allonemobius* (= *Nemobius*) *fasciatus* (DeGeer). 31 July–10 Sept.  
*Allonemobius* (= *Nemobius*) *griseus* (E. M. Walker). 2 August–10 Sept.  
*Eunemobius* (= *Nemobius*) *carolinus carolinus* (Scudder). 11 Sept.

Subfamily OECANTHINAE

*Oecanthus quadripunctatus* Beutenmüller. 5 August–10 Sept.

The six species of Gryllinae and Nemobiinae represent all species naturally occurring in northern Michigan. They were collected from pitfall traps in a variety of upland and lowland habitats. *O. quadripunctatus* was common on low shrubs and broad-leaf herbs of fields and roadsides. *O. nigricornis* F. Walker was not collected but its habitats (Vickery & Kevan 1986) occur on the island and most likely it is present.

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