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ON THE OCCURRENCE OF *OARISMA GARITA* (REAKIRT)
(LEPIDOPTERA: HESPERIIDAE) IN MANITOULIN DISTRICT, ONTARIO

Paul M. Catling¹

On 26 June, 1976, I stopped to examine plants and collect insects on the alvars or limestone barrens on Great La Cloche Island, north of Little Current in Manitoulin District, Ontario. I was especially interested to learn whether or not there were any insects of western affinity in this area since some of the plant species present are at, or near to, the eastern limits of their distribution (Catling *et al.*, 1975). It was mild and sunny, and insects were abundant. Within a few minutes I noticed a dark, fast-flying skipper that otherwise resembled *Thymelicus lineola* (Oclisenheimer). The dark colour and whitish veins on the hind wing beneath suggested *Oarisma powesheik* (Parker), a midwestern species known in Michigan since 1893 (McAlpine, 1972) and recently discovered further to the east and south within the state (Holzman, 1972; Wagner, 1976, pers. comm.). However, the relatively small size made this identification unlikely. I captured a few specimens, but had to leave the area without investigating the habitat, abundance and local distribution of the unfamiliar butterfly. The earliest opportunity for further investigation came a week later on 3 July, when I was again favoured with a warm sunny day. After collecting in a variety of habitats, I finally arrived on the alvar on the west side of highway 68 in the immediate vicinity of McGregor Bay, La Cloche Peninsula (ca. 46°02' North, 81°46' West). I collected several specimens of the strange little skipper and saw at least 20 within one half hour, then continued south on highway 68 onto Great La Cloche Island. Here south of the highway and the Canadian Pacific railway tracks, and south and west of Lewis Lake (ca. 46°00' North, 81°52' West), I found at least 10 more of the skippers in similar alvar habitat. Both of these locations are south of Espanola and north of Little Current in the North Channel, Manitoulin District, Ontario.

Upon returning home and consulting the literature, I was somewhat surprised to find that the skippers were clearly *Oarisma garita* (Reakirt), a common species of the northern and western Great Plains and Rocky Mountains, ranging from Washington and British Columbia east to Manitoba and Saskatchewan and south through Idaho, Montana, and the Dakotas to Mexico (MacNeill, 1975). The species has not been recorded previously from Ontario (Riotte, 1970, 1971, 1972). Dr. C. Don MacNeill of the Oakland Museum, California, has kindly confirmed this identification as *garita* (pers. comm.), which establishes a colony at least 650 miles east of any previously known, a remarkable extension of known range.

HABITAT

Since this occurrence apparently represents a significant disjunction, and is the first record for Ontario, it may be well to describe the area in some detail. The skippers were found exclusively in more or less flat calcareous barrens where the limestone bedrock was at or near the surface (Fig. 1). The plant associations appear as a mosaic dependent upon many factors, especially moisture regime. Vegetation varies greatly over short distances. The higher and drier areas of exposed rock are characterized by *Andropogon scoparius*, *Prunus depressa*, *Arctostaphylos uva-ursi*, *Juniperus horizontalis*, *Potentilla fruticosa*, *Liatris cylindracea*, *Carex scirpoidea*, *Carex richardsonii* and *Asclepias viridiflora* var. *linearis*. Somewhat lower areas are dominated by *Sporobolus heterolepis* and *Deschampsia cespitosa* with *Panicum lindheimeri* and *Scutellaria parvula*. In places where the ground is periodically inundated or where there is occasional seepage, *Eleocharis compressa*, *Carex viridula*, *Carex crawei*, *Allium schoenoprasum* var. *sibiricum*, *Agrostis hyemalis* var. *tenuis*,

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Fig. 1. Alvar habitat of *Oarisma garita* with *Sporobolus heterolepis* and *Eleocharis compressa* surrounded by *Pinus banksiana*. Photographed 3 July, 1976, McGregor Bay, La Cloche Peninsula.

Satureja arkansana and *Isanthus brachiatus* are characteristic. Permanently wet marshes are scattered over the area. These have *Cladium mariscoides*, *Carex lasiocarpa*, *Carex flava*, *Carex buxbaumii* and *Juncus balticus*. Where these permanent wetlands grade into drier ground as they do over large areas, a great many species are present in various combinations. *Danthonia spicata*, *Prunella vulgaris*, *Comandra richardsiana*, *Agropyron repens*, *Senecio pauperculus*, *Bromus kalmii* and *Carex granularis* are frequent here. Other species include *Geum triflorum*, *Castilleja coccinea*, *Poa compressa*, *Solidago ohioensis*, *Aster laevis* and *Aster ptarmicoides*. Scattered here and there, and surrounding the barren area are more or less open stands of *Pinus banksiana* and clumps of various shrubs such as *Rhus aromatica*, *Amelanchier alnifolia* var. *compacta* and *Amelanchier sanguinea*.

All of the skippers were seen in open areas, mostly along the marsh edges, visiting the flowers of *Prunella vulgaris* and *Asclepias incarnata*, and also in the areas dominated by *Eleocharis compressa* and *Sporobolus heterolepis* where they were frequently seen on flowers of *Satureja arkansana*. They generally flew within a few metres of the ground, their fast flight and dark colour making them difficult to follow.

Other lepidoptera common on the Cloche alvars on 3 July were *Thymelicus lineola* (Ochsenheimer), *Polites thermistocles* (Latreille), *Polites mystic* (Edwards), *Polites origines* (Fabricius), *Phyciodes tharos* (Drury), *Phyciodes batesii* Reakirt, *Coenonympha inornata* Edwards and worn *Chlosyne harrisii harrisii* (Scudder).

BIOGEOGRAPHICAL NOTES

Many of the older literature reports of *O. garita* in the eastern part of its range actually refer to *O. powesheik*. The latter is a larger and darker species, with the veins on the hind wing more distinctly whitened. A specimen from Illinois (ROM) has the

forewing 13.5 mm. long and the antennae 5.5 mm., while all *garita* from the Cloche area are much smaller with the forewing 11.5 mm. and the antennae 4.8 mm. Other differences are described by MacNeill (1975), who refers to *garita* as "common" in the northern and western Great Plains and Rocky Mountains. Johnson (1972) states that *powesheik* is the common species of the midwestern U.S., and that *garita* is essentially a more western species characteristic of the Rocky Mountains. Similarly, Irwin and Downey (1973) consider it probable that old references to *garita* in Illinois actually refer to *powesheik*, and that "it is unlikely that true *O. garita* occurs as far east as Illinois." It appears then that *garita* is at least rare and local, if not highly disjunctive, in the eastern part of its range. However, in view of recent movements of fauna from the west to the east (several birds are notable) and the small size of this insect, as well as the very incomplete knowledge of the status and distribution of insects, other than economically important species, in Ontario, it might be assumed that *garita* is spreading eastward. Among lepidoptera, *Euchloe ausonides* Lucas is believed to have recently extended its range eastward in Ontario (Tasker, 1970), and the western nearctic *Plebejus saepiolus* Boisduval appears to have recently pushed eastward into northern Ontario where it occurs in pasture lands and along highway verges, the larvae feeding on introduced clovers (*Trifolium* spp.). There are, however, insects having an extensive distribution in the western cordillera of the U.S. that extend eastward transcontinentally in Canada, and for which evidence for a recent eastward expansion resulting from human activity is far less convincing. An example is *Coenonympha inornata*. There are also a number of vascular plant species that are distributed over a large area of the western cordillera, with a disjunction into the upper Great Lakes region, which certainly appear to be relict rather than recent. Present biogeographical evidence then does not necessarily imply a recent eastward spread of *garita*.

If *garita* were extending its range to the east, it would likely be found in open habitats resulting from human activity, such as highway verges and pasture lands, further to the west. However, on the same day as this skipper was abundant in the Cloche area, it could not be found despite extensive search of roadsides, marshlands and wet and dry meadows near Espanola, Webbwood, and Massey in Sudbury District to the north and west. Nor could it be located with appropriate weather on 4 July, in natural meadow habitats at Oliphant and Cape Croker in Bruce County. The "usual" butterflies, such as *Polites thermistocles*, *Thymelicus lineola*, *Polites mystic*, *Phyciodes tharos*, were abundant in all of these places. It appears then that *garita* is not extending eastward, but rather the populations in the Cloche area may represent relicts from a once more continuous distribution connecting with western populations. The apparent restriction of *garita* in the Cloche area to the natural alvars, areas with unusual native vegetation, further suggests relict status. Although much more study will be necessary to determine beyond any doubt the extent of the disjunction, it need not prevent some speculation concerning the manner in which such a disjunctive occurrence might arise, and whether or not it is indeed relict.

Shapiro (1970) has suggested an eastward movement of *Plebejus melissa samuelis* Nabokov during the warmer and drier xerothermic period ca. 5,000 B.P. The alvar vegetation may have been more widespread during the xerothermic period, and some of the alvar plants in Manitoulin District are distinctly western (Catling *et al.*, 1975). The occurrence of prairie chickens [*Tympanuchus cupido* (Linnaeus)] on Manitoulin Island is another western feature of the area. Could *garita* be a xerothermic relict? This might explain eastern occurrences of the midwestern *powesheik*, but it does not seem an adequate explanation for the advent of an insect of an apparently cooler, more western and cordilleran environment.

The disjunction of vascular plant species of the western cordillera in the upper Great Lakes region has already been alluded to. Frequently this disjunction pattern involves the Gaspé peninsula as well. Presumably these plants are relicts of a once continuous arctic and subarctic or at least cool temperate environment that existed in these latitudes across much of North America for a brief interval, perhaps several hundred years, as the

continental glaciers melted back northward *ca.* 9,000-10,000 B.P. (Zoltai, 1968; Terasmae, 1968). The shorelines of the postglacial upper Great Lakes were continuous with Lake Agassiz to the west *ca.* 10,000 B.P. (Zoltai, 1968), and the gradually dropping water levels of these lakes exposing new land for colonization may have provided a corridor for the immigration of western fauna and flora that may have otherwise maintained its western distribution during the Wisconsin advance. The plants could have persisted as disjuncts in local areas where a cool environment was maintained. Although the Cloche area was inundated by glacial Lake Algonquin-Nipissing perhaps until 4,000 B.P. (Zoltai, 1968), other parts of Manitoulin District were gradually emerging and it is conceivable that *garita* existed in the immediate vicinity. Isostatic rebound resulting in the continuing emergence of new limestone barren habitats, and later the maintenance of these as open habitats by periodic fire, drought, and fluctuating lake levels, and finally the perpetuation of a cool environment by the moderating effect of a large body of water, might have maintained a suitable habitat for *garita* since early postglacial times.

If an appropriate environment were maintained in the area for 10,000 years, one wonders about the possibility of a gravid female wandering in or being blown in from the far west a number of times since then. Wagner (1972) has suggested long-distance spore dispersal by the prevailing winds from the west as one possible explanation for west to east disjunctions of homosporous vascular plants. *Pieris protodice* Boisduval and LeConte provides a good example of a butterfly species of the south and west that moves into local areas of southern Ontario, and establishes colonies for a few to several years, only to disappear when the ephemeral habitats with annual mustard species decline. However, this kind of wind blown or wandering disjunction seems unlikely with a local species of more or less stable habitats as *garita* appears to be.

One must exercise caution in assuming natural disjunction. The likelihood of transport by man is difficult to evaluate. Who has not carried a bothersome bee or fly several miles in a car, and what entomologist has not been impressed by the diversity of insects on the fronts of cars at service centres along the highway? It does seem possible, although unlikely, that a gravid female could travel by vehicle from the far west and establish a colony in the east. A purposeful introduction seems even less likely.

Is *garita* in the Cloche area disjunct 650 miles or more, and does this actually represent a postglacial relict? Are other insects disjunctive in this area? Definite answers will require more study of the Cloche area, and more information on the ecology and distribution of *Oarisma* spp. elsewhere.

The Cloche area is biologically unique and the Garita Skipper only adds to its unique quality, and at the same time poses some most interesting questions. Hopefully some examples of the alvars in the Cloche area will be preserved for biological research, maintenance of unique genetic material, and for their unusual diversity of flora and fauna.

DISPOSITION OF SPECIMENS AND ACKNOWLEDGMENTS

Of eight specimens of *garita* collected in the Cloche area, two were sent to Dr. C. Don MacNeill of the Oakland Museum, California, two were deposited in the collection of the Department of Entomology at the Royal Ontario Museum, Toronto, and three are in the private collections of P. M. Catling, M. C. Nielsen, and W. H. Wagner. My thanks to Prof. Wagner for his critical reading, to Dr. MacNeill for confirming the identification of specimens, to Mr. Nielsen for his correspondence, and to Miss K. L. McIntosh for assistance in the field.

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