

NABA Butterfly Count Column

Of Viceroy and Monarchs

by Ann Swengel

The count program affords scientists a wonderful opportunity to study butterfly distributions across remarkable distances and time periods — providing data that are well beyond the scope of a single butterfly to contribute. Leslie Ries and Sean Mullen demonstrated this for the mimicry complex that involves Pipevine Swallowtails (the “model” species) and the Red-spotted Admirals, which includes two subspecies: the more southerly Red-spotted Purple (the mimic) and the more northerly White Admiral (not a mimic). As they reported a few years ago in *American Butterflies* (Fall/Winter 2007, vol. 15 issue 3/4), the north-south shift from non-mimic (White Admiral) to mimic (Red-spotted Purple) begins even where there is a very low abundance of the model (Pipevine Swallowtail) at the northern edge of its range.

What about distribution patterns for that most famous of mimicry complexes, the Viceroy and milkweed butterflies? In much of North America, Viceroy mimics Monarchs, but farther south they resemble Queens. Although Monarchs occur throughout the southern United States, both as breeders and as migrants, Queens are often more abundant in these areas.

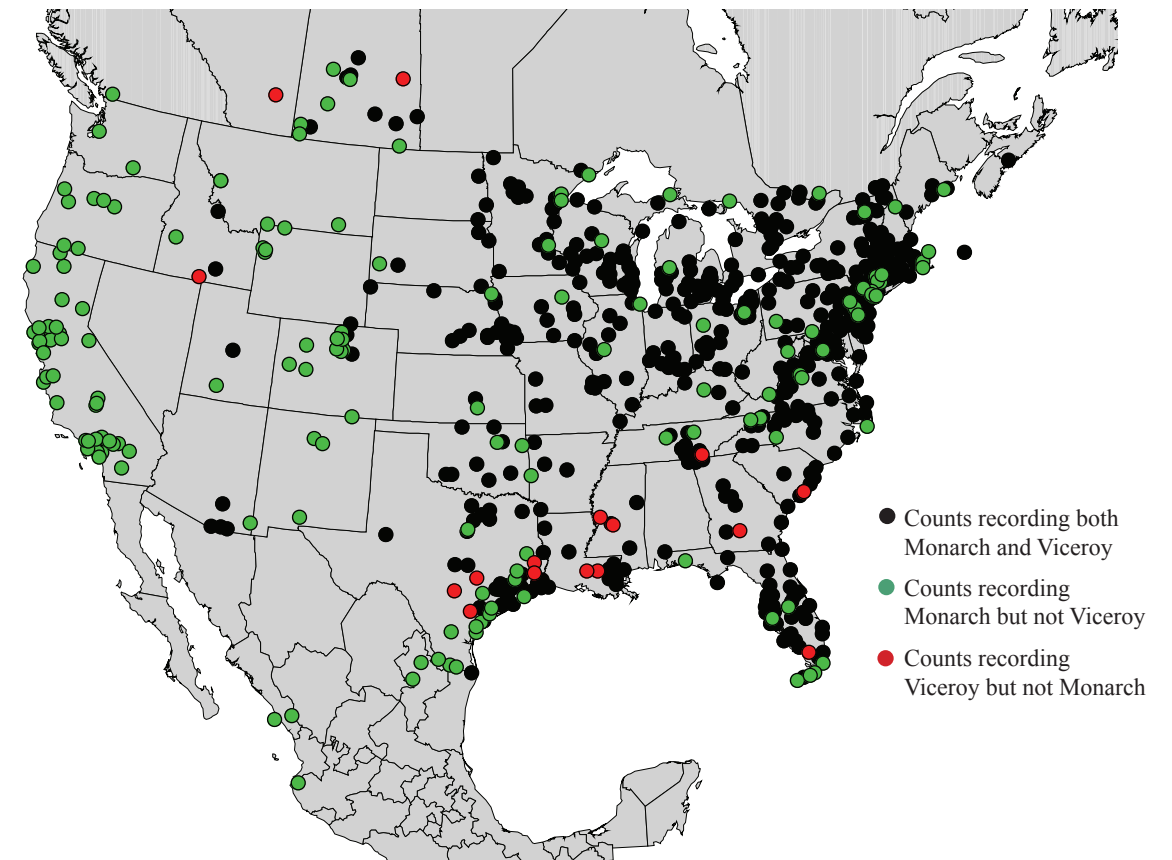
Results from the count program over about thirty years show the remarkable fit of this mimic’s occurrence within the models’. In the area covered by the count program, the Viceroy’s range fits well within that of the Monarch and of the Queen, which nests within the southerly range of Monarchs. In fact, the Monarch’s coverage of the continent is greater, especially in the West.

The majority of counts have recorded both

Monarchs and Viceroy at least once during the history of that particular count. Of the remaining counts (and here I’m excluding ones held only 1-2 years), more circles have reported Monarchs and no Viceroy than have reported Viceroy and no Monarchs, but Viceroy-only counts fall nearly within the geographic scope of Monarch-only counts. The Monarch-only counts do a good job of showing the geographic range over which all counts have reported Monarchs in North America. Viceroy counts have occurred on most counts in the eastern half of the continent but have occurred only sporadically farther west. This pattern roughly corresponds to the abundance of Monarchs which becomes spottier and scarcer farther west, especially in the mountains (see maps in the Fall 1998 and Summer 2001 count columns).

Of particular interest is what happens at the northern edge of Monarch occurrence. Viceroy apparently do not venture much beyond that. This suggests a very strong influence of the model (Monarch) on the mimic (Viceroy). This is in general agreement with what Leslie and Sean found for Pipevine Swallowtail and Red-spotted Admiral. At the northern edge of Monarch occurrence, where Monarchs are not found abundantly or regularly, the mimic (Viceroy) also occurs. But once the model is rarely found, the mimic also becomes rare. Since the Viceroy, and both models (Monarch and Queen), venture farther south into Mexico than the count program effectively covers, I’m not able to look at what happens at that range edge.

One method of scientific testing is through an experimental design, with a “treatment”



group and a “control” group. That method is well suited to laboratory and medicine. Another approach is to contrast the target species (here the Viceroy and its models) with an “outgroup.” I happened to choose the Red-spotted Admiral for this project (before reading Leslie and Sean’s article!). It is closely related to the Viceroy and widely occurring, but there is no apparent reason for its range to be affected by the presence, absence or abundance of milkweed butterflies.

Once again, most counts reported both Monarch and Red-spotted Admiral, and if only one species was reported, more counts reported Monarch than Red-spotted Admiral. However, Red-spotted Admirals extend notably farther north into Canada than either Monarchs and Viceroy as recorded in the counts.

By this contrast with the Viceroy-Monarch comparison, the outgroup comparison also

provides support for the hypothesis that the Viceroy’s range fitting neatly to the Monarch’s range, occurs not by chance.

It is also not by chance that I can portray these patterns to you. By each of us contributing our count results, all of us get to learn from all of our results.

TO ORDER THE COUNT REPORT

Price for the 2009 report is \$11 (NABA members) or \$16 (non-members).

Price for the 2010 report is \$7 (NABA members) or \$11 (non-members) if your order is received prior to March 1, 2011. Send your check or money order payable to NABA (in U.S. dollars) to: NABA Butterfly Count, 4 Delaware Road, Morristown, NJ 07960 USA. For more information, visit www.naba.org.