
INSECT MIGRATION STUDIES

Volume 31 1994

Annual Report

UNIVERSITY OF TORONTO . SCARBOROUGH CAMPUS

Annual Report to Research Associates

Insect Migration Association

1994

FINAL REPORT

UNIVERSITY OF TORONTO SCARBOROUGH CAMPUS

Scarborough Ontario Canada M1C 1A4

TO THE ASSOCIATES

Fred and Norah Urquhart

NOTE: WE ARE DISCONTINUING THE INSECT MIGRATION ASSOCIATION (IMA) UNDER THE AUSPICES OF THE UNIVERSITY OF TORONTO. HENCE THIS WILL BE THE LAST VOLUME OF IMS.

Although many thousands of migrating monarchs have been tagged over the past many years we have failed to obtain any meaningful data, worthy of scientific publication, from the central parts of the United States and Canada. We have concluded that we should concentrate only on those areas where we have little or no definitive data.

We would ask you to continue tagging this year using up the tags you now have on hand. No further tags will be issued except in the specific areas along the Atlantic coast, the Gulf of Mexico, the Caribbean Islands, Yucatan Mexico, and Florida.

All further correspondence should be directed to our home address as given in this report.

There will be no further requests for donations. Any expenses involved in the alar tagging mentioned above will be covered by us personally.

After considerable experimentation we were able to obtain an alar tag that would adhere to the wing membrane of the monarch. This was considered by one of our colleagues as the hoped for "break through" in solving the mystery of the migrations of this amazing little butterfly that has survived over the past millenia, through periods of drastic changes on the earth varying from desert-like conditions to series of ice ages, moving from breeding areas to overwintering sites in the manner of many migrating birds. How this migratory habit evolved in the monarch butterfly is of course, unknown. In some mysterious fashion the "instinct" to move in a particular direction, following the earth's magnetic lines of force, became encoded in the monarchs DNA.

When we started our investigations the task was simply to find out where the monarchs of the eastern population of North America spent the winter months and to locate the breeding areas of the western population that spent the winter months along the coast of California. This was accomplished with considerable accuracy.

Mexicans living in the mountains where the monarchs spent the winter months wondered where they came from. They imagined that they were the spirits of the dead. The IMA answered this mystery. People living in areas along the California coast wondered where the monarchs came from. After many years of alar tagging and numerous observations we were able to delineate the breeding areas in the valleys of the Rocky Mountains. As in the case of the eastern population, we were able to accurately trace the migratory routes.

Fifty-seven years have passed since the first alar tag was placed on the wing of a migrating monarch in 1937. Through persistence over the past many years, in field studies and laboratory experiments we have answered not only questions about the migrations but also numerous biological questions respecting morphology, development and factors involved in the life cycle.

Although a considerable amount of information was obtained prior to establishing the IMA it was as a result of the active and enthusiastic participation of the members of the association, established in 1950, that considerable information, previously unknown, gave the answer to the mystery of the migrating monarchs.

We wish to thank all members of the IMA who have contributed to the study of the life and migrations of this most remarkable travelling butterfly.

We sincerely trust that you will continue your interest in the monarch butterfly with particular reference to its preservation by planting milkweed in fields and gardens and setting aside conservation areas. We trust that the teachers will continue to introduce the wonders of the insect world using the monarch butterfly as an example.

Although the IMA, dedicated to the study of the monarch butterfly, will no longer exist, we sincerely trust that you will feel free to contact us at our home address: . .

1389 Military Trail
Scarborough
Ontario
Canada
M1C 1A7

PUBLICITY

The monarch butterfly continues to be a source of intense interest to nature lovers. Many newspaper articles about the monarch were sent to us this year including illustrated articles about Jim Kupcho, Woodbridge, N.J. and his tagging; also Faye Sutherland's class in Boise, Idaho releasing tagged monarchs.

Thanks to those associates who sent us these clippings:

Darlene Bamman, Mary Banet, Alice Davis, Dorothy Eischer, Gregory Glovas, Sophia Godbout, Mary Henshall, Joan Johnson, Elizabeth Karrow, Jim Kupcho, Kay Palmcook, Ralph Ramey, Richard Rowold, Jane Seibel, Joan Senghas, Faye Sutherland, Dorothy Yeager.

Articles were sent from the following papers:

Moberly-Monitor-Index & Evening Democrat; San Jose Mercury News; Richmond Times Dispatch; The Brownsville Herald; Fort Myers News Press; San Antonio Express; Friends of the Monarch Newsletter; Bay Journal; Detroit Free Press; Waterloo Chronicle; Kincardine Independent; The Review; Valley News Today; Sidney Weekly Journal; Sun News; The Reporter; Wildlife Conservation; Idaho Almanac; San Antonio Light; The Houston Post; The Topeka Capital Journal.

SPECIAL ACTIVITIES OF ASSOCIATES

Below are excerpts from the many fascinating letters received in 1993 showing the lively interest that our associates have in the monarch butterfly and its conservation:

Darlene Bamman, Jacksonville, Mo. reported that TV 17 of Columbia, Mo. (60 miles south of Jacksonville) did a newspiece about the monarch butterfly. Darlene collects dead butterflies from the roadside and uses them and wildflowers to make beautiful greeting cards.

Laura Banet, Fort Wayne, In. had European visitors who were much impressed to witness the metamorphosis of the monarch butterfly for the first time. Laura gave a lecture and demonstration to schoolchildren and also gave them milkweed seeds for spring planting.

Mary Banet, Calumet City, Il. visited the overwintering site of monarch butterflies at Natural Bridges, State Beach, California.

Nancy Bires, Hermitage, Pa. was very successful in "quickly" collecting larvae, she writes, "In fact my 2 year old found the most! I think that it is because he is so short he can look up and spot the ones on the under side of the leaves. My husband also looks whenever he goes to the garden to pick corn." Nancy gave 19 presentations to 1000 kindergarten students. She has a cage for monarch butterflies in the schoolyard.

cont'd

activities cont'd

Evelyn Dabbs, Mayesville, S.C. writes, "I'll continue to share larvae and chrysalids with school classes and interested individuals always encouraging their interest and sharing information on cultivating butterfly habitats."

Alexander Garden, aged 12, of Malta Il, writes, "My Dad checked through the kitchen window and saw the monarch. I ran and got my net and went outside. I scared the monarch up and it flew to one of the pine trees...Dad lifted me up on his shoulders and I caught the monarch in my net".

Marsha Hancock, Monroe, N.C. saw an article in a local magazine demonstrating how to eliminate the bag worm pest, erroneously illustrated by a sketch of a monarch butterfly larva. Marsha immediately took steps to correct this error. As a result the local E.M.C. produced an excellent article on the monarch and another was published by the original magazine. As a result she received 400 letters inquiring about the monarch. A local newspaper also ran an article producing more inquiries. She writes, "Such an explosion from one little article".

Todd Herbert, Muskegon, Mi. writes (as a result of studying the monarch) "My students have learned about migration, life cycles, the hazards of predation and dangers within nature, geography and much more...I've also written an article for the local newspaper and have received many inquiries and compliments".

Alta Horr, Dunbar, Ne. writes "Summer wasn't too great for butterflies Rain, rain, rain....but Linda, my daughter, who lives in Powhattan, Ks. caught the ones that roosted there...she brought 450 butterflies here to tag plus 99 later on."

Frane Jackson, Dallas, Tx. attended a special event at the Dallas, Tx Zoo where she saw Dale Clark, also of Dallas, release tagged monarch butterflies.

Donna Kessler, Audubon, Ia. gave monarch talks to several groups including Junior High School Science classes at Carroll, Ia. 25 miles north of Audubon.

Steven and DeAnne Lee, Waynesville, Oh. write, "We again did several programs for the public at our visitor center about monarchs and the tagging program."

Patricia Lovallo, Rochester, N.Y. presented a monarch program to campers in Lakeville, N.Y.

Sharon Morkin, Bloomington, Il. writes, "On Oct. 7th we celebrated with the annual 'Monarch Farewell Parade and Program. About 80 students were in their hand-painted costumes depicting the four stages of metamorphosis... In all our years of parading (over 20) never has it rained on our parade". Sharon has been doing presentations about butterfly gardening-"I have heard back that five different butterfly gardens have been started in the state of Illinois as a result of my presentation. Truly does the heart well. Always something exciting to look forward to in the world of butterflies and moths."

cont'd

activities cont'd

Catherine O'Neil, Whitmore Lake, Mi. reported that her grandson in 4th grade was very proud that he "was the only one that knew how to tell a male monarch". She writes, "In 1992 I grew milkweed from seed and transplanted them to my garden. I was pleased to see how big they grew this year and that's where I found my eggs and larvae".

Trudy Smith, Noank, Ct. gave monarch pupae to students at an elementary school in Bruce Mills, W.Va.. The children wrote to Trudy and sent drawings to her. She writes, "It sort of fills your heart with joy to know you have been somewhat instrumental for instilling an entirely new world into a young child's life...possibly an eventual entomologist!"

Doris Stifel, Toledo, Oh. was collecting eggs and larvae at a junkyard where she had to have the guard dogs confined in order to proceed safely.

Faye Sutherland, Boise, Id. sent us a collection of full colour photographs of Idaho state emblems including the monarch butterfly which Faye and her class were instrumental in having declared the state insect.

Edna Sutton, Richland Center, Wi. showed monarch butterfly slides to students at a local college and at the public library.

Merrill Tawse, Mansfield, Oh. writes, "I had several public groups that specifically asked for monarch tagging"....On. Sept. 3/93 just before 5.00p.m. the winds picked up, the sky darkened and the monarchs lifted up from the field and flew to the treeline due south from where I had been collecting. I went over and found a tree with several 100 monarchs clinging to the leaves".

Audrey Wilson, Cobourg, On. gave a slide presentation to Retired Superannuated Women Teachers.

Carol Williamson, Clearwater, Ks. writes, "My 5th graders are so interested in all this and our classroom teems with insects for about 2 months in the fall...these last 5-6 years have sent out about 100-125 real enthusiastic "young scientists".

Barbara Yeaman, Milanville, Pa. writes, "Ed even bought a dissecting microscope so we could observe the newly hatched caterpillars eating their eggshells and the minute hairs on the milkweed leaves. Our butterfly nursery on the front porch caught the interest of many friends and neighbours and several of them also began looking for caterpillars and raising monarchs".

Cyril Zewe, North Huntingdon, Pa. writes, "Looks like this is the last of the monarchs....I went over to Oak Park four or five times a day" (to look for them).

WINGED WONDER

A superbly illustrated article appeared in the May/June, 1993 issue of Canadian Geographic. The following is an excerpt from it.

"The Urquharts were always careful to explain and publicize what they were doing, however, and eventually built up a continent-wide army of research associates. They formed the Insect Migration Association, published a newsletter of results, got help from the National Research Council of Canada and the National Geographic Society in the U.S - and directed the tagging of more than four hundred thousand monarchs. Urquhart put a big map of North America on his wall and stretched black threads on it linking release and recapture points of tagged butterflies. By the early 1970s, the lines pointed unmistakably to Mexico."

We suggest that you obtain a copy of the magazine from your local library. The text is quite good and the illustrations give a very good summary of the life cycle of the monarchs, the path of migration

The primary purpose of the article was to publicize a large museum exhibit of the monarch in all its phases. This exhibit, costing over a million dollars, will be shown in various parts of North America. If you wish further details as to the nature of the exhibit and whether it would be available for exhibit in your local museum, write to:

Canadian Museum of Nature,
Ottawa, Ontario.
Canada, K1P 6P4

UNLOCKING THE SECRETS OF THE UNKNOWN: With National Geographic

Mention of our research on the monarch butterfly is embodied in one of the articles ("Adventures in Tracking") contained in this book.

Over the years the National Geographic Society sponsored our field expeditions, especially those in Mexico, with donations totaling eighty thousand dollars. Our research was brought to the attention of the lay public in a feature article in the August, 1976 issue.

Copies of this book may be obtained by writing to The Book Division, National Geographic Society, Washington, D.C.

PLEASE KEEP YOUR LEFTOVER TAGS

We would like you to keep any tags that you have left over at the end of the season for use next year.

The reason for this is that the tag numbers that are sent to you are kept on permanent record here at our office and will not be reissued to anyone else.

Since the adhesive on the tags is permanent and will remain sticky for many years, there should be no problem with its drying out. However, if you live in a dry climate, we recommend that you keep the tags wrapped in plastic film.

When you renew your membership with our group, please list the numbers of your tags that are left over so that we may verify the numbers on the tags of recaptured butterflies that are reported to us.

DEFECTIVE TAGS

Although most of the tags that we issue are clearly printed, occasionally some are sent out that do not have clearly printed numbers. This may happen especially if a large number of tags are sent to one associate.

In any case, please examine your tags carefully before using them in order to be sure that all of the numbers are easy to read.

If you have been sent tags that are defective in any way, that is the printing is not clear or the backing is not sticky, please return them to us and we shall replace them.

CREASE THE TAG BEFORE REMOVING FROM BACKING

If you bend the alar tag in half before removing it from the backing you will find that it is much easier to place the tag over the edge of the wing. Mary Lyons brought this method to our attention to inform the associates. This is the method that we have used with considerable success. Another method is to place half the tag on the underside of the wing and then bend it over. This, however, often leaves too much of the tag protruding from the margin of the wing. Whatever method you use, always be sure that all scales have been removed from the wing membrane in the area to which the tag will be applied.

If you need to contact us about ordering alar tags or for information about our research, please telephone one of the following numbers:

1-416-282-1678 Our home phone and leave a message on our answering tape.

MAGICAL MIGRATING MONARCHS

by

Judith and Lisa Levicoff

This is the most complete manual dealing with the study of insects, using the monarch butterfly as an example, I have ever seen.

To describe this book in short form I can do not better than to use the short description given by Judith.

"I have develop^ed an audio-visual, interactive, hands-on program, Magical Migrating Monarchs, which introduces children of all ages to the mysteries of the Monarch Butterfly, including their metamorphosis, migrating cycle and special habitat needs. Children will learn how to plant a perennial Butterfly Garden to attract and sustain these monarchs. They will then have a first hand opportunity to rear butterflies from egg to adult and then release them back into their natural world. The teachers and students then become part of a vast network of taggers worldwide who are tracking the monarch's migration route. Woven throughout the program is the role each one of us play in improving our environment. The creation of habitats also provides the children with a way to actively contribute to their own communities. The cross-curricular activities included in this program provide a multi-disciplinary approach to this project."

For further information write to:

Judith Levicoff,
Box 212,
Jenkintown, PA 19046

VARIATION IN MONARCH POPULATIONS DURING SUMMER OF 1993

Marked variation in monarch populations occurred during the past summer. Associates living in the same state reported both abundance and scarcity. This disparity can be attributed to the spotty weather conditions - heavy rainfall and cool temperatures in some areas and the reverse conditions in others. Where flood conditions occurred, such as along the Mississippi drainage, some associates reported marked destruction of milkweed while at the same time reporting monarchs as being abundant.

Overall, it would appear the monarch population was high in the east and low in the west.

All reports for the western population indicated a low population related to unusual wet, cool weather.

RECAPTURE RECORDS FOR 1993

In 1993 we had reported to us tagged monarch butterflies that were released by our associates and recaptured or reported - these observations involved 13 states of the U.S.A. This is a testament to the high degree of interest that people show in this remarkable insect.

We are pleased that many people who capture tagged migrants report the number of the tag to us and release the butterfly unharmed to continue its migration.

All of those whose tagged butterflies have been reported to us have been so informed. The captors of the tagged butterflies have been sent information about the migration and our research in general.

Tagged By	At	Recaptured At.
Todd Herbert	Muskegon, Mi.	Muskegon, Mi
Alta Horr	Dunbar, Ne	Latham, Ks.
" "	"	Lexington, Ok.
Linda Krupp	La Grange, Oh.	Jefferson City, Mo.
James Kupcho	Woodbridge, N.J.	Metuchen, N.J.
Brenda McKelvin	Clinton, Md.	Clinton, Md.
* L. Neenow	Middlebury, Vt.	Indian Mills, N.J.
Tami Nielsen	Chardon, Oh.	Alliance, Oh.
" "	" "	Chardon, Oh.
" "	" "	Mentor, Oh.
Mildred Reed	Bristol, Ct.	Bristol, Ct.
Jane Ruffin	Rosemont, Pa.	Gulf Shores, Al.
Linden Trial	Columbia, Mo.	Jefferson City, Mo.
Cyril Zewe	North Huntingdon, Pa.	Youngwood, Pa.
" "	" " "	Pittsburgh, Pa.

*aberrant flight

FIRST EGG OF MONARCH OBSERVED

Dorothy Yeager	Pearsall,Tx.	Mar.22/93
Alexander Garden	Malta,Ill.	June 23/93
Mary Henshall	Nampa,Id.	June 29/93

FIRST LARVA OF MONARCH OBSERVED

Dorothy Yeager	Pearsall,Tx.	Mar.29/93
Blanche Emerson	Dauphin Island,Al.	May 1/93

FIRST PUPA OF MONARCH OBSERVED

Dorothy Yeager	Pearsall,Tx.	May 10/93
----------------	--------------	-----------

LAST MONARCH OF THE SEASON OBSERVED

Alice Davis	Charlottesville,Va.	Oct.10/93
-------------	---------------------	-----------

Kevin Den Boer noted that there were more female monarchs in his area at Grandville,Mi. than males in late August, 1993.

SPECIAL DONORS

Many associates have generously contributed more than the requested donation to our research fund. These extra donations help to cover the expense involved in making long distance telephone calls in order to verify the information regarding some recaptured tagged monarch butterflies. The donations also help to pay for special mailing charges in order to expedite tags being sent to associates during the fall migration.

SIGHTING OF SPRING MIGRANTS

The sighting of spring migrants is always a great source of pleasure and satisfaction to which we all look forward. Thanks go to the associates who recorded this event so that we may follow mentally the wave of migrating monarchs coming north from Mexico.

Sophia Godbout was very fortunate to see a migrant at Brownsville, Tx. on February 20, 1993. This is exceptionally early as we found from reviewing our previous I.M.S. This report makes us wonder if it is possible that there are other overwintering sites in Mexico, possibly in the area of the mountain, Popocatepetl in the state of Mexico. If the migrant came from that location that might account for its very early arrival in Brownsville.

Sophia Godbout	Brownsville, Tx	Feb. 20/93
Dorothy Yeager	Pearsall, Tx.	Mar. 9/93
Ruth Addington	Abilene, Tx.	Apr. 1/93
Blanche Emerson	Dauphin Island, Al.	Apr. 2/93
Emily Pendleton	Montevallo, Al.	Apr. 11/93
Fred Armstrong	Neptune, N.J.	May 2/93
Jane Ruffin	Rosemont, Pa.	May 9/93
Alexander Garden	Malta, Il.	May 12/93
Richard Rowold	Wheatland, Ia.	May 27/93
Marsha Howard	Monroe, N.C.	June 5/93
Sophia Godbout	St. Paul, Mn.	June 8/93
Lee Ann Landstrom	Osseo, Mn.	June 11/93
Phyllis Perzanowski	Havre de Grace, Md.	June 20/93
* Mary Henshall, Id.	Nampa, Id.	June 24/93
Alice Davis	Charlottesville, Va.	June 26/93
Franne Jackson	Dallas, Tx.	June 28/93

* western population.

MOUNTAIN MONARCHS

In an article published in Wildlife Conservation, Sept-Oct, 1992, the author, Downs Matthews, wrote as follows:

"Forget the migrations of wildebeest across the Serengeti Plain. Never mind the gathering of fur seals on Pribilof beaches. Also the convocation of penguins in Antarctica. The most awesome wildlife spectacle in the world is the mass overwintering of 300 million monarch butterflies in the central highlands of Mexico. For sheer numbers, for unbelievable color, for satisfaction to both sense and soul, it has no peer."

It was as a result of the combined efforts of the members of the IMA that this phenomenon was brought to the attention of the general public. Had we not achieved this success it is highly probable that the population of the eastern population of the monarch butterfly might have been destroyed or greatly reduced in numbers as a result of removing trees during the winter months when the monarchs were gathered.

A number of newspapers and magazines are publishing accounts of the monarchs in Mexico but only a few, unlike this article, are aware of the work done by the IMA over the past many years since its inception in 1952.

MONARCH BUTTERFLY AND CONSERVATION

Although our primary objective is to map the migration routes of the monarch butterfly from breeding grounds to overwintering retreats, one of the major side effects of the study has been in the field of conservation. As a result of our combined efforts the lay public has been introduced to the importance of preserving habitats for the monarch butterfly and by so doing all animals associated with the monarch have likewise been protected. Our teachers have introduced the study of insects using the monarch butterfly as an example. Teachers have emphasized the importance of setting aside conservation areas for the growing of milkweed upon which the larvae of the monarch feed. They have established butterfly gardens so that the adult monarchs would have a plentiful supply of nectar thus helping the survival of other species of butterflies. Through lectures to various groups and by radio and television programs many butterfly gardens have been established throughout the United States and Canada. A large butterfly garden in Ontario has been named in our honour.

Having emphasized the importance of the overwintering monarchs to the local economy of Mexico many areas across the Transvolcanic Plateau have been set aside as strictly controlled conservation areas.

We can take pride in our accomplishments in research, conservation and teaching.

DEVELOPMENT OF THE ALAR TAGGING METHOD

The development of the method of applying a small piece of paper upon which is given instructions to a person capturing such a marked specimen now seems such a simple procedure. But it took many years of experimentation to develop the method. As a result, over the past many years the migrations of the monarch butterfly have been followed with considerable accuracy.

For information on the difficulties encountered in developing this method - size and weight of paper, water-proofing, kind of adhesive, printing, where to apply the tag on the monarch wing, etc - are given in the book: THE MONARCH BUTTERFLY - INTERNATIONAL TRAVELLER (pp. 122-127). published by Nelson-Hall, Chicago, Il.

A copy of this book may be available in your local library, or in the libraries of school and universities. Unfortunately the book is now out of print.