

# Index

Page citations in **boldface** below refer to **illustrations**.

- Abbott, John, 22  
*Abies religiosa* (Oyamel fir). *See also*  
Oyamel forest roosting grounds, 21,  
26, 27  
Ackery, Philip, 6  
African Wanderer butterfly, 4  
Altizer, Sonia, 65  
ants. *See* fire ants  
*Apocynaceae* (plant family). *See* dogbane  
plant family  
aposematic nature of Monarchs, 6, 12,  
13  
*Asclepiadaceae* (plant family). *See* milk-  
weed plants
- Bacillus thuringiensis*. *See* Bt toxin  
Bates, Henry W., 14  
black swallowwort, 54, 59, 60, **61**  
Brower, Lincoln, xiii  
Bt toxin and genetically modified pollen,  
68–69  
butterflies. *See specific exemplars* (e.g.  
Monarch butterflies)
- Calvert, Bill, 30, 43  
Carson, Rachel, 59  
climate change affecting butterflies,  
56–58, 72  
conservation (of the Monarch). *See*  
Monarch butterflies, conservation of
- Dalton, Stephen, 11  
*Danaus* butterflies, defining characteris-  
tics of, 3–5, **4**, 6  
*Danaus chrysippus*. *See* African  
Wanderer butterfly  
*Danaus erisimus*. *See* Soldier butterfly  
*Danaus gilippus*. *See* Queen butterfly  
Davis, Don, 2  
Dia de los Muertos (Day of the Dead),  
85  
dogbane plant family, 5  
“dog-strangling vine.” *See* black swallow-  
wort  
Don Valley park system, Toronto, 53  
Durden, Chris, 2
- El Niño, 57  
El Rosario, Mexico, 1, 20–22, 34  
Emmel, Tom, 22  
*Eucalyptus* (trees), 18
- fire ants, 43, 45
- Gibo, David, 80  
Gilbert, Larry, 45  
gliding. *See* Monarch butterflies, migra-  
tory gliding and
- habitat. *See* land use changes; milkweed  
plants; Monarch butterflies

- herbicides, 65–69  
*Homo sapiens*, 58
- land use changes affecting butterflies, 55, 58–59  
*Limenitis archippus*. See Viceroy butterfly  
*Lythrum salicaria*. See purple loosestrife
- migrations (Monarch). See Monarch butterflies
- “milkweed butterflies,” 3, 5–6
- milkweed plants, 5  
 ecological niches occupied by, 7, 16–17, 49, 51  
 eradication programs and, 59–62, 72  
 noxious chemistry in, xi, 6  
 suitability for monarch caterpillars of various, 16,  
 variation in the availability of, 39–43, 45  
 varieties of, 44
- mimicry & co-mimicry, 13–14, 15
- Monarch butterflies  
 adult stage of the, 11, 13  
 caterpillar stage of the, 3, 6–9, 9, 47–48  
 chemical defenses of. See aposematic nature of Monarchs  
 chemical threats to, 69, 72  
 conservation of, xii, 86–87  
 diapause in, 18, 34–35, 79–80  
 eastern vs. western populations of, 17–19  
 eggs of, 7, 7–8, 35, 38–39, 42, 45–46, 60, 64  
 energy management in. See Monarch butterflies, lipid mass in  
 estimating population sizes of, 30, 37, 46  
 flight characteristics of, 11, 13  
 gene flow in, 18–19, 73–74  
 generations among, 45, 72–73  
 habitat modification and, 59, 62  
 highway deaths of, 59  
 lifespan of, xi, 80  
 likelihood of breeding success by, 45–46  
 lipid mass in, 13, 34, 79–80  
 mating in, 16, 33, 34–35, 35  
 migratory distances covered by, 2, 86  
 migratory gliding and, 6, 11, 80, 86  
 navigation by, 80–81  
 northward migration by, 38–39, 49, 51  
 pathogens in, 62–65  
 predation upon, 43, 45, 55, 63, 64–65, 66–67  
 pupa stage of, 9–10, 11  
 roosting behavior of, 16–18, 20, 29, 83–85, 88–89  
 sexual dimorphism in, 13, 16, 32  
 southward migration by, 78–86  
 threats to the survival of, xii  
 variability in reproductive success of, 46
- Moraceae* (plant family). See mulberry plant family
- mulberry plant family, 5
- NAFTA, symbol for, 2
- National Geographic* (magazine), 29
- Nature* (journal), 66
- Nymphalidae* (butterfly family), 3
- Oberhauser, Karen, 65
- Ophryocystis elektroscirrha* (neogregarine protozoan parasite), 65
- Oyamel forest roosting grounds, 23–25, 26, 27, 28, 31
- conservation of, 29–32
- pesticides, 69, 70–71
- Petr, Dan, 22

- pheromones, 12, 83  
 Point Pelee National Park, 77  
 pollen, genetically modified. *See* Bt toxin  
 “puddling” behavior, 77  
 purple loosestrife, 54  
 Pyle, Robert, 2, 85
- Queen butterfly, 2–4, 6–8, 13–14, 65, 66
- Red Milkweed Beetle, 63  
 Ross, Gary Noel, 2
- Schappert, Pat (author’s wife), 21–22, 77  
 Sierra Chincua, Mexico, 1, 21, 26, 37  
 Skipper butterflies, 53–54  
 soaring. *See* Monarch butterflies, migra-  
 tory gliding and  
 Soldier butterfly, 2–4, 6–8, 12  
*Solenopsis* (fire ants). *See* fire ants  
 Stengl “Lost Pines” Biology Station,  
 Texas, 38
- swallowwort. *See* black swallowwort  
 Taylor, Orley “Chip”, 30  
 Texas, migrations to and in, 38–39, 42,  
 85  
*Thymelicus lineola* (European Skipper).  
*See* Skipper butterflies  
 Toronto Entomologists’ Association, 54  
 Urquhart, Fred, 2
- Vane-Wright, Dick, 6  
 Viceroy butterfly, 2–4, 14  
*Vincetoxicum* (*Cynanchum*) *nigrum*. *See*  
 black swallowwort
- websites (Monarch), 87  
 West Nile virus, 69  
 William of Orange, 2
- zoogeographic world regions, 5

# Photo Credits

pp. i: Patti Murray  
pp. ii (Frontispiece): Lisa Barker  
pp. x: John Hafernik (Corel)\*  
pp. xii: Lisa Barker  
pp. 4: Monarch: John Hafernik (Corel);  
Queen: Phil Schappert; Viceroy: Phil  
Schappert; African Wanderer: Phil  
Schappert; Soldier: Michael A. Quinn  
pp. 7: Michael A. Quinn  
pp. 9: left: Sue Allie; right: Michael A.  
Quinn  
pp. 10: left: Phil Schappert; top right:  
Michael A. Quinn; bottom right: Phil  
Schappert  
pp. 12: Lisa Barker  
pp. 15: Sue Allie  
pp. 20: Phil Schappert  
pp. 23: Phil Schappert  
pp. 24/25: Patti Murray  
pp. 27: Monarch Garden/Gary Stell  
pp. 28: Phil Schappert  
pp. 29: Monarch Garden/Gary Stell  
pp. 31: Monarch Garden/Gary Stell  
pp. 32: Michael A. Quinn  
pp. 33: Monarch Garden/Gary Stell  
pp. 35: Phil Schappert  
pp. 36: Lisa Barker  
pp. 40/41: Phil Schappert  
pp. 44: left: Phil Schappert; top right,  
middle, and bottom: Monarch  
Garden/Gary Stell  
pp. 47: Michael A. Quinn

pp. 48: Phil Schappert  
pp. 49: Phil Schappert  
pp. 50: Monarch Garden/Gary Stell  
pp. 52: Corel  
pp. 55: Michael A. Quinn  
pp. 56/57: Lisa Barker  
pp. 61: Phil Schappert  
pp. 63: top: Corel; bottom: Michael A.  
Quinn  
pp. 66: Michael A. Quinn (both)  
pp. 67: Phil Schappert  
pp. 70/71: Jean Claude Teyssier (Corel)  
pp. 74: Lisa Barker  
pp. 76: Gary Noel Ross  
pp. 79: Phil Schappert  
pp. 81: Phil Schappert  
pp. 82: Phil Schappert  
pp. 84: Sue Allie  
pp. 88/89: Patti Murray

Every attempt has been made to identify the source and copyright holder of the images contained within this book. In the event that any images have been misidentified, please forward changes to: Key Porter Books Ltd., 70 The Esplanade, Toronto, ON M5E 1R2.

\*Certain pictures provided on Corel Photo CD: 4 top (John Hafernik), 40/41, 47, 52, 63 (top), 70/71. Copyright 2004 Phil Schappert and its licensors. All rights reserved.