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Timothy J. Motley (4 June 1965–28 March 2013) and his passion for Ethnobotany and Pacific Islands flora[#]

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Abstract

Timothy Jay Motley was born June 4th, 1965, to Roy and Joan (née Schaeffer) Motley, in Paxton, Illinois, USA. He grew up on a farm in east-central Illinois, and attended Armstrong-Ellis Grade School. He entered Eastern Illinois University in Charleston, Illinois, where he completed a Bachelor of Science in 1987 and a Master of Science in Botany in 1989, having written a dissertation on Sweet Flag (*Acorus calamus*). In 1996 he earned a Ph.D. in Botany at the University of Hawaii, Manoa; his dissertation on evolutionary and reproductive biology of *Labordia* (Loganiaceae). While in Hawaii, he developed a particular interest for the Pacific islands flora and for ethnobotany, two passions that he pursued for the rest of his life. Shortly after finishing his doctorate, he worked at The New York Botanical Garden (NYBG) as Post-Doctoral Research Associate (1997−1998), Assistant Curator (1998−2004), Acting Chair (1999−2000; 2001−2002), and Project Head of Conservation Genetics in Island Systems (1998−2006) in the Lewis B. and Dorothy Cullman Program for Molecular Systematics Studies. While working for NYBG, he travelled widely in regions where his projects would take him, mostly in the South Pacific, and visited the Kingdom of Tonga, Rapa Iti, Bora Bora, Papua New Guinea, Guam, Pohnpei, Fiji, Mauritius, Reunion, Vanuatu, Philippines, Jamaica, New Zealand, New Caledonia, Hawaii, and Tahiti. In 2006, he was hired as the J. Robert Stiffler Distinguished Professor of Botany and Associate Professor in the Department of Biological Sciences, Old Dominion University, and as the Director of Science at the Norfolk Botanical Garden, Norfolk, Virginia. During this period, he continued his expeditions to study and collect plants in the South Pacific and beyond, including Ecuador, the Galapagos Archipelago, Singapore, Brunei Darussalam, Mexico, the Louisiade Archipelago, and yearly field trips to underexplored regions of China. Sadly, after suffering a sudden cardiac arrest, he passed away on March 28, 2013, at age 47, at the peak of his career, leaving his wife, young son, and numerous colleagues and friends. His numerous ongoing projects, which are currently being continued by his graduate students and colleagues around the world, assure that his scientific legacy, his loving character, and his integrity will never be forgotten.

Key words: Plant systematics, molecular phylogenies, *Hedyotis*, *Labordia*, Rubiaceae, Spermacoceae, Loganiaceae, Hawaii, Rapa Iti, Austral Islands

Timothy Jay Motley, known as "Tim" by his friends and colleagues, was born on June 4th, 1965, to Roy and Joan (née Schaeffer) Motley, in Paxton, Illinois, USA. He was the youngest of three brothers, after Gavin, and Jeremy. Tim grew up on a farm in East Central Illinois, between the small farming towns of Armstrong and Rankin, surrounded by corn, soybeans, and wheat. Tim enjoyed playing with his brothers, and together they created their own adventures around the farm. They did most of the typical things country kids do – climbed trees, explored buildings, fished, tried to catch and make pets of any small animal that happened to cross their path. One benefit they had was that their grandparents, two uncles, and an aunt lived on another farmstead only a quarter mile away, so they had another large space only a short walk or bike ride away in which to play. Tim developed an independent streak and his well-known sense of humor at an early age. Being the youngest, Tim got to do many things that his older brothers did, but, unfortunately for him, that meant he also had to help on the farm with chores at an earlier age. Despite having asthma, he cut weeds out of the soybean fields, baled straw, and helped feed the hogs in the evening. He learned how to drive tractors and pickup trucks before he was old enough to get his driving permit. Doing the hard work on the farm probably helped solidify both his work ethic and enjoyment of working independently.

Tim attended Armstrong-Ellis Grade School through 8th grade, at Armstrong, Illinois. As a young boy, he spent his mornings on school days waiting at the end of the long driveway (or sometimes running the 100 yards) to catch

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the school bus for the 45 minute route snaking from farm to farm and ultimately arriving at the school six miles away. Like generations of the family before him, he was a Chicago Cubs and Chicago Bears fan (baseball and football teams, respectively). He collected baseball cards (something he continued to do through high school and into college) and specialized in Ernie Banks (Chicago Cubs) cards and memorabilia. Tim enjoyed playing baseball and basketball through junior high and high school, although his asthma often affected his ability to recover after practice. Tim was an "A" student throughout school and a member of the National Honor Society. He was known for his compassion, friendliness, and sense of humor; Tim graduated from tiny Rankin Township High School in 1983 as valedictorian of his 11-person class.

Entering Eastern Illinois University in Charleston, Illinois, Tim was undecided about a field of study. A botany class with Dr. Arzini, who also encourage him, started Tim on the path to his life's work. Dr. Arzini had the ability to catch the attention of young students and to turn their interest to botany. Tim retained fond memories of Dr. Arzini, his courses always full of students, and his creative, non-conventional teaching. Knowing the direction he wanted to take in his professional life, Tim earned a Bachelor of Science in 1987, and a Master of Science in Botany in 1989 at Eastern Illinois University. His Master thesis was on Sweet Flag [*Acorus calamus* Linnaeus (1753: 324)], the subject of his first publication (Motley, 1994).

In 1989, Tim entered the Ph.D. program of the University of Hawaii (UH), Manoa. He originally went to UH to study ethnobotany; however, shortly after his arrival he was attracted by the study of evolution and floristics in Hawaii flora and in the Pacific. In Hawaii there are more endangered species of plants than in all other states of the USA combined, leading Tim to become intimately familiar with conservation issues and programs. By the time that he completed his dissertation, Tim was the Acting Director and Field Botanist for the Hawaii Branch of the Center for Plant Conservation. This position was central to many of the conservation efforts being conducted in Hawaii as it brought together plant conservationists from a number of other state (Division of Forestry and Wildlife, Division of Land and Natural Resources, and Hawaiian Heritage Program), federal (US Fish & Wildlife Service, National Park Systems, USGS-BRD), and private (The Nature Conservancy, and others) organizations to discuss the status of endangered species and develop strategies to preserve very rare plants from extinction. This initiative developed into the Genetic Safety Net program designed to develop emergency plans for some of the more critically endangered species (Hawaii has over 100 species with fewer than 20 individuals in the wild). Tim's background as a field biologist and his concern for the native biota was paramount in bringing together individuals from many different groups. He was able to discuss with them the issues being faced from all perspectives. Tim's doctoral dissertation focused on the genus *Labordia* Gaudichaud-Beaupré (1829: 449, tab. 60) (Loganiaceae). Before his studies, very little was known about the pollination, reproductive biology, and population genetics among species of this genus. Although the species have flowers structurally perfect (i.e., both male and female reproductive parts are present), he discovered that plants were functionally dioecious. He was able to make artificial hybrids among a number of species, a feat made possible by persistent field work as these species are widely allopatric in the rainforests of the islands. Tim's field work required hiking great distances often under difficult conditions to find plants in flower, harvesting pollen to be carried to some other remote population for pollination. Tim also conducted one of the first molecular genetic studies of populations carried out in the Hawaiian Islands. This baseline work on genetic variation among several *Labordia* species provided important data that numerous later students used for comparison. In addition, Tim examined the relationship of the Hawaiian species to the genus *Geniostoma* J.R. Forster & G. Forster (1775: 23) (Loganiaceae s.l. or Geniostomataceae) found in the south Pacific region using molecular analyses, and found that the Hawaiian species form a monophyletic group. It was during this period that Tim and I met, in 1993, as two of the five doctoral students selected to participate to the Flora of the Philippines workshops organized by the Botanical Research Institute of Texas, first at Dallas-Fort Worth, USA, and then at Manila, Philippines. During our two-week trip to the Philippines we travelled throughout Luzon Island, and visited Mount Pinatubo, where we saw the devastating effect of the volcanic eruption of 1991 on the surrounding forest. We also went collecting in several localities in Luzon Island with expeditions organized by local botanists. Tim earned a Ph.D. in Botany in 1996; his dissertation was entitled "*Biosystematics and reproductive biology of the endemic Hawaiian genus Labordia Gaud. (Loganiaceae)*".

Shortly after finishing his Ph.D., he started working at The New York Botanical Garden (NYBG) as a Post-Doctoral Research Associate (1997−1998) in the Lewis B. and Dorothy Cullman Program for Molecular Systematics Studies, where we became colleagues, as I worked at NYBG from 1996 to 2003. Over the following years he became Assistant Curator (1998−2004), Acting Department Chairman (1999−2000; 2001−2002), and Project Head of Conservation Genetics in Island Systems (1998−2005) of the Lewis B. and Dorothy Cullman Program for Molecular Systematics Studies. While working for NYBG, Tim travelled widely in regions where his projects would take him, mostly in the South Pacific, such as New Caledonia, Hawaii, Tahiti, and Rapa. In July 2001, as we were collaborating on a large project, we went for a trip to Jamaica, to collect all species of *Portlandia* (Rubiaceae), a genus with large attractive flowers, endemic to the island. One night, while seated in a local bar, we were wondering whether bats or hawk-moths

are the pollinators of *Portlandia albiflora* Britton & Harris ex Standley (1918: 12), a species with white, large flowers that produce their greatest fragrance during the night. We knew that this species was in cultivation at the Royal Botanic Garden of Kingston, because we visited the garden during the day. So, just before midnight we climbed the main gate of the garden, and walked to the plants. While we were watching the flowers with a small flashlight, we heard a bunch of large dogs barking and coming towards us. So, after looking at each other, and without a word, we ran towards the main gate (which was about 3 m tall), which we climbed and jumped in a blink of an eye. Shortly after, while we were standing on the sidewalk, six German Shepherds came to the gate, barking ferociously at us. We laughed and walked away, and still to this day the pollinators of these beautiful white flowers remain unknown. As years went by, we have often recalled this adventure and kept laughing at it every time.

Tim organized a particularly important floristic expedition to Rapa (also called Rapa Iti), Austral Islands (French Polynesia), funded by the National Geographic Society. The expedition lasted nearly two months, from March to May of 2002, and was conducted by a team of international botanists and ecologists. As a result of the botanical collections, the island floristic checklist was increased by 10%, along with the discovery of eight species unknown to science [*Elaphoglossum meyeri* Rouhan in Rouhan *et al.* (2008); *Melicope balgooyi* Appelhans, Wagner & Wood (2014: 78); *Bidens meyeri* Funk & Wood (2014); the other five species remain to be published].

While still living in New York, on September 10, 2004, Tim married fellow botanist Tatyana Lobova (who was also working at NYBG). At that time Tatyana was working on a project with Scott Mori and Cullen Geiselman on seed dispersal by bats, which led to the publication of a very beautiful and informative book (Lobova *et al.*, 2009).

In 2006, Tim was hired as the J. Robert Stiffler Distinguished Professor of Botany and Associate Professor at the Department of Biological Sciences at Old Dominion University (ODU) and Director of Science at the Norfolk Botanical Garden, Norfolk, Virginia, where he moved with his wife. Aside from his regular teaching activities, during his first years he devoted considerable time to build a molecular laboratory for plant systematic studies and supervise the construction of the Arthur and Phyllis Kaplan Orchid Conservatory, both at ODU. Tim mentored many undergraduate and doctoral students; some of them are currently finishing their doctoral degree. During this period, he continued his travels to study and collect plants in the South Pacific and beyond, including such places as Ecuador, the Galapagos Archipelago, Singapore, Brunei Darussalam, Mexico, the Louisiade Archipelago, and yearly field trips to underexplored regions of China. A short eulogy focusing on Tim's work in the Pacific Islands was contributed by Meyer (2014). Tim was a frequent speaker at botanical conferences, using the wonderful photographs he took during his expeditions. He learned the art of botanical photography from his Ph.D. advisor, Gerry Carr University of Hawaii, Manoa (currently Oregon State University, Corvallis). Renowned botanist and photographer, Gerry served as an inspiration for Tim.

His family gained a new member when his beloved son Anton was born on June 26, 2010. Tim was a wonderful father and a much devoted husband. While his activities at the university and botanical garden were quite demanding, he always found time to spend with his wife and son.

Many of Tim's colleagues are grateful for his contributions and collaborations; in testimony of this a specific epithet was dedicated to him, *Chiococca motleyana* Borhidi (2011: 268). This name was proposed by Borhidi following the research published by him and collaborators (Motley *et al.* 2005) showing that this species, previously positioned in another genus, belongs to *Chiococca* P. Browne (1756: 164).

Tim used his special sense of humor to entertain his friends and family, to stay upbeat under stressful conditions in the field, at work, or during his daily life. His social and diplomatic skills permitted him to coordinate programs and international collaborations with the greatest of ease. Aside from his many responsibilities, he also held positions as an Adjunct Professor in numerous institutions: City University of New York, Columbia University, New York University, Cooper Union, Yale University, School of Forestry, American Museum of Natural History, New York Botanical Garden, B. P. Bishop Museum, Honolulu, USA; Minzu University, Beijing, China; University of Madras, Chennai, India; Real Jardín Botánico, Madrid, Spain. These collaborations resulted in a considerable number of publications in the fields of plant systematics, ethnobotany, genetics, ecology, biogeography, floristics, and conservation biology. In plant systematics Tim was an internationally recognized specialist for the families Loganiaceae and Rubiaceae. He also studied several other plant families, such as Araliaceae, Cucurbitaceae, Moraceae and Amaranthaceae, while supervising graduate students. His bibliography up to 2014 (many publications are still in review or in press), is provided in Appendix 1. Sadly, after suffering a sudden cardiac arrest, he passed away on March 28, 2013, at age 47, at the peak of his career, leaving his wife, young son, and numerous colleagues and friends. His numerous ongoing projects, which are currently being continued by his graduate students and colleagues around the world, assure that his scientific legacy, his loving character, and his integrity will never be forgotten.

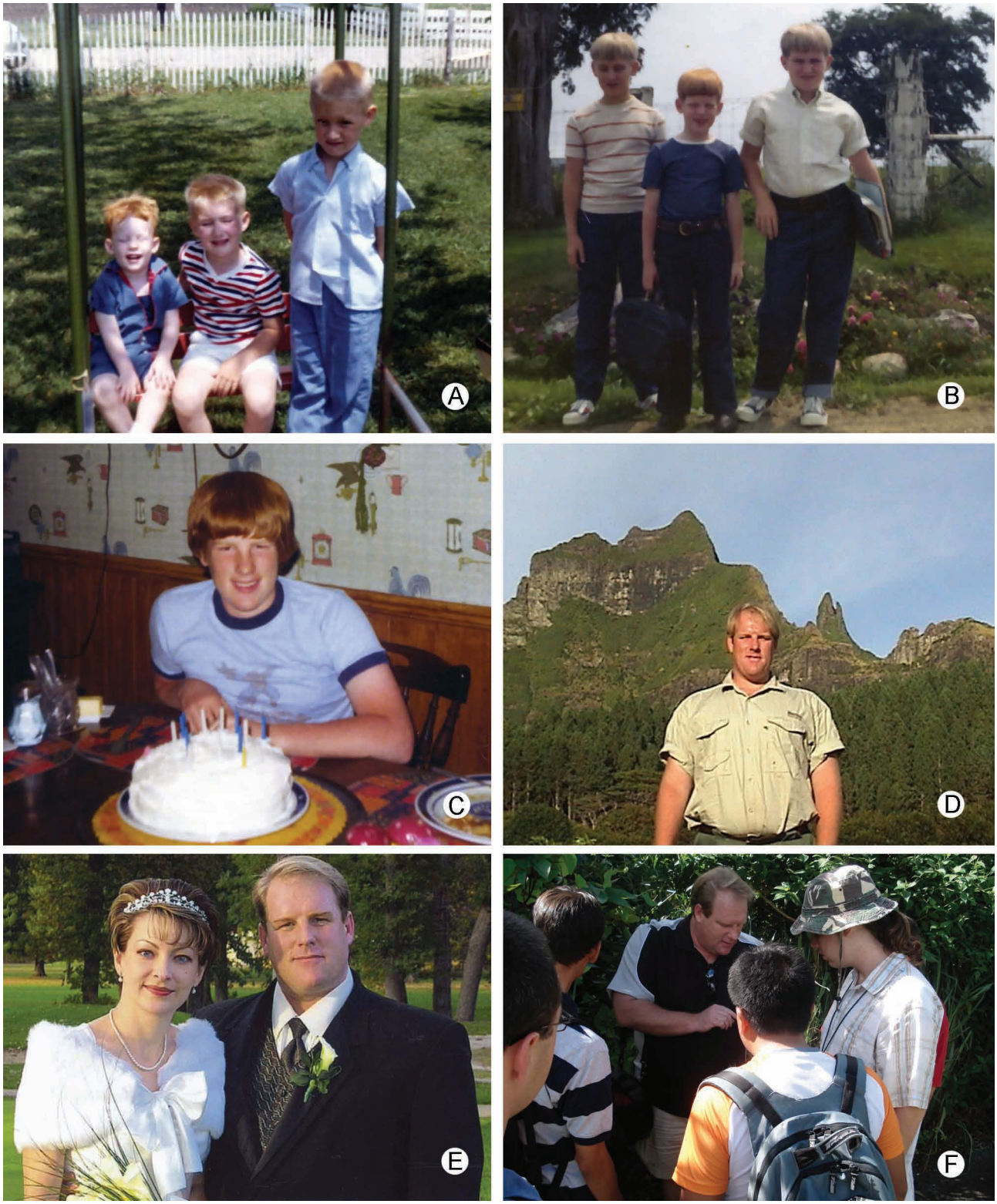

FIGURE 1. A. Tim two years old (on left), with his brothers Jeremy and Gavin. **B.** Tim eight years old (middle), on first school day of third grade, waiting for the bus with Jeremy and Gavin. **C.** Tim on his 14th birthday celebration. **D.** Tim with Rapa Iti on background, during the 2002 expedition. **E.** Tim and Tatyana on wedding day. **F.** Tim teaching, with students at Old Dominium University. A, B and C photos by Joan Motley, D photo by Roland Fenstemacher, E photo by Daniel Atha, F photo by Sushil Paudyal.

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Appendix 1 – Timothy Motley publications from 1994 to 2014

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