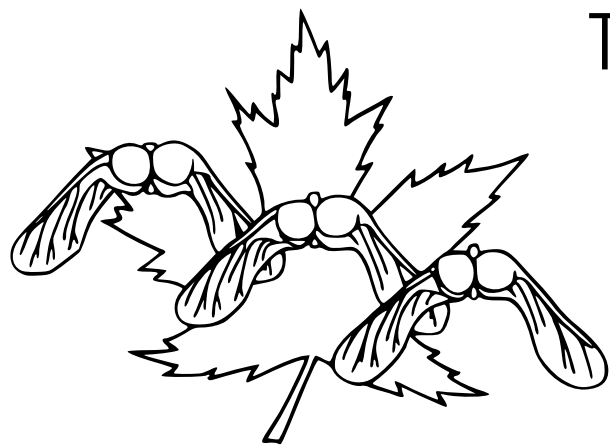




The Canadian Botanical Association Bulletin

Bulletin de l'Association Botanique du Canada

Vol. 50 Number 2 October/octobre 2017



Drosera linearis ©Hugues Massicotte

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The Canadian Botanical Association Bulletin

The CBA Bulletin is issued three times a year (March, September and December) and is freely available on the CBA website. Hardcopy subscriptions are available for a fee.

INFORMATION FOR CONTRIBUTORS

All members are welcome to submit texts in the form of papers, reviews, comments, essays, requests, or anything related to botany or botanists. For detailed directives on text submission please contact the Editor (see below). For general information about the CBA, go to the web site: www.cba-abc.ca

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Published in Peterborough, October 12th 2017

ISSN 0008-3046 (paper)
ISSN 1718-8164 (electronic)

NEXT ISSUE

Texts for the next issue, 50(3), must be received by December 1, 2017

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Bulletin de l'Association Botanique du Canada

Le Bulletin de l'ABC paraît trois fois par année, normalement en mars, septembre et décembre. Il est envoyé à tous les membres de l'ABC.

SOUMISSION DE TEXTES

Tous les membres de l'Association sont invités à envoyer des textes de toute nature concernant la botanique et les botanistes (articles, revues de publication, commentaires, requêtes, essais, etc.). Tous les supports de texte sont acceptés. Pour des renseignements détaillés sur la soumission de textes, veuillez consulter le rédacteur (voir ci-dessous). Infos générales sur l'ABC à l'URL suivant: www.cba-abc.ca

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Publié à Peterborough, le 12 octobre 2017

ISSN 0008-3046 (papier)
ISSN 1718-8164 (électronique)

PROCHAIN NUMÉRO

La date de tombée des textes du prochain numéro, le no 50(3), est le 1 décembre 2017

PRESIDENT'S MESSAGE

From July 4-8, 2017, "The Hidden World of Plants/Le Monde Secret des Plantes" was revealed during the 53rd Annual Meeting of CBA-ABC at Wilfrid Laurier University (WLU) in Waterloo, Ontario. Those members in attendance will testify that it was a well-organized conference with a very full program, providing lots of choice to satisfy diverse interests. There were 85 delegates that attended the 16 posters and 42 talks (including 13 student talks in the Lionel Cinq-Mars Award competition, alone) which began with a thought-provoking plenary lecture by Dr. Jan Sapp, followed by an outstanding introductory symposium that bore the name of this year's theme, plus symposia organized by each of the Plant Development and the Ecology Sections. This year's Weresub Lecturer was Dr. Greg Thorn (Western Univ.). A juried exhibition of the Botanical Artists of Canada, a botanical drawing workshop, and a round-table discussion about the threatened dense blazing star (*Liatris spicata*), also took place.

Of the association's major awards, a Lawson Medal was awarded to each of John Sheard, Univ. of Saskatchewan (Category A) and Roy Turkington, Univ. of British Columbia (Category B). Frédérique Guinel of WLU was this year's recipient of the Mary Elliott Service Award, and René Belland, Univ. of Alberta, received the Magister Teaching Award (see photos and award citations in this issue). I am indebted to Geraldine Allen, Simon Chuong, and Kate Frego for their insightful analyses and tireless work on this year's Awards Committee. In addition, many student awards for conference presentations, research, refereed scientific publications, and travel to assist attendance at the Waterloo conference (see photos and details in this issue), were announced at the banquet. Thanks are extended to all applicants and participants, as well as to the many association members who served on numerous judging panels.

The association's thanks are once again extended to auctioneer extraordinaire Hugues Massicotte supported by Christian Lacroix and Linda Tackaberry for leading another financially successful auction and to all who contributed botanical memorabilia. The beneficiary is the Macoun Travel Bursary that helps subsidize graduate-student travel to annual meetings. Mini-tours and an excellent banquet meal at Royal Botanical Gardens in Burlington rounded out the conference leading to various final-day excursions (e.g., a ginseng research station; Inglis Falls and Bruce Peninsula National Park; Grand River rafting).

Organization of this excellent meeting involved faculty of botany at two nearby universities, the University of Waterloo (UW) and WLU. On behalf of the CBA-ABC, it is indeed my pleasure to thank Frédérique Guinel, chair (Vice-Présidente, CBA-ABC) of the Local Organizing Committee and its members Mihai Costea, Matt Smith, Kevin Stevens (WLU) and Simon Chuong, Susan Lolle, Barbara Moffatt (UW), for their energetic planning and on-site assistance throughout the conference. Furthermore, over a dozen student volunteers, plus other individuals helping with core activities such as field trips and banquet, also deserve our



thanks for their contributions to this conference's success.

A turnover in several CBA-ABC posts occurred during this event, including Daya Dayanandan who had kindly served as our Webmaster for 10 years!! As their terms as Director ended, we acknowledge the past service of Warren Cardinal-McTeague (student rep, east), Yolande Dalpé and Julissa Roncal (both east), and Melanie Jones and Erica Wheeler (both west). We also thank Christine Petersen and Rafael Otfinowski for their past service as co-chairs of the Teaching Section, plus CBA-ABC President-Elect, Julian Starr, for chairing the Systematics & Phytogeography Section. Finally, we recognize Frédérique Guinel for her dedicated, continuous 7-year commitment (two years each as Présidente Elue, Présidente, Présidente Sortante, followed this past year as Vice-Présidente) to CBA-ABC leadership! Newly elected to the executive are Zoe Panchen as Webmaster, Richard Caners (director, west), Nicole Fenton (director, east), Julissa Roncal (a second term as director, east), Patrick van Aderkas (director, west), and Kirsten Reid (student rep, east). Incoming co-chairs of the Systematics & Phytogeography Section are Geraldine Allen and Deb Metsger, whereas the Teaching Section chair is currently vacant. The complete 2017-18 board of directors and section chairs is published in this issue.

In June 2017, about two weeks prior to the CBA-ABC annual meeting, members of the association's executive were made aware of an alarming announcement from the Mayor's office in Montreal indicating that the administrative structure for the Montreal Botanical Gardens (MBG) was going to be changing imminently. Such a change would threaten the research mandate for the MBG. Letters in both official languages were drafted quickly for the Mayor's office, plus to various Montreal newspapers, and also CBA-ABC members were invited to sign an online petition. All of this activity in the city and across the country led the Mayor to reverse the decision about administrative changes for MBG, thus maintaining the *status quo*. I am especially indebted to fellow executive members Julian, Frédérique, and John, for their rapid help on this significant item, and to all CBA-ABC mem-

bers who made their opinions known at that critical time. Involvement of the CBA-ABC made an important difference!

Looking ahead, make sure to plan by saving the dates (July 21-25, 2018) for next year's CBA-ABC conference to be held jointly with the Botanical Society of America and affiliated societies at Rochester, Minnesota, U.S.A. Current CBA-ABC Past-President, John Markham, is serving as Vice-President involved with coordinating the association's planning activities for next year's conference. And if you are stationed in western Canada, a joint Western Regional Meeting of the Canadian Botanical Association – Canadian Society of Plant Biologists has been planned for December 8-10, 2017, in Winnipeg. John is also heavily involved with that

conference.

In the next issue [50(3)] of the *Bulletin*, watch for the official call for applications and nominations for the CBA-ABC Special Project Fund and major awards (Lawson, Elliott, Magister), plus the numerous student publication and research awards. Until that time, all the very best for a beautiful autumn 2017. And for those partial to the Rosaceae ... Why did the strawberry complain to the cinquefoil? Because its reproductive strategy had been stolon.

Respectfully,

Art Davis, University of Saskatchewan

ANNOUNCEMENTS

Updating the CBA Website

As the new CBA-ABC webmaster, one of my goals is to modernise and update our CBA-ABC website so that it has both a modern look and feel and is easier to maintain going forward. If there are any members that have suggestions or request for the updated website (both technical and artistic!) or have some stunning botanical photos that they would

be willing to include on the website, please contact me at zoe.panchen@dal.ca. I will also take this opportunity to thank the outgoing CBA-ABC Webmaster, Daya Dayanandan, for creating and running the CBA-ABC website for the past 10 or more years.

Zoe Panchen



Mihai Costea leading a field trip at the 2017 CBA conference. ©Hugues Massicotte

HIGHLIGHTS FROM THE 53RD ANNUAL CONFERENCE OF THE CBA-ABC 2017, WILFRID LAURIER UNIVERSITY, WATERLOO

The Local Organizing Committee would like to thank all the participants who came to the meeting this past July. Over the week of July the 4th, the weather could not have been better, adding to a conference which was without question a great success. It was nice to see new faces among the familiar ones and to chat with everyone at the various social events we had organized.

Eighty-five botanists and 12 botanical artists were in attendance. The student contingent was particularly strong with 28 participants. New this year, we dedicated an entire session to the Lionel Cinq-Mars competition, making it easier for everyone, particularly the judges, to hear all the presentations by those vying for this award. The session was followed by the poster presentations which were dominated by students participating in the Iain and Sylvia Taylor Award competition.

The Hidden World of Plants was the theme of the conference and a focus of the talks by all the guest speakers. Jan Sapp from York University presented us with the concept of a plant being a symbiome rather than an individual organism. Greg Thorn from Western, while delivering the Weresub Lecture, made us realize that our classification of North American mushrooms was biased by that of their European counterparts. The three symposia were truly amazing both in scope and quality. The talks were thought-provoking and many of the illustrations shown, ranging from the cell to the whole organism, could be considered works of art. This was particularly apparent in the two presentations given by Roger Hangarter from Indiana University.

Unique to this conference was a round-table discussion, moderated by Art Fredeen from the University of Northern British Columbia, which centered on a species at risk in Ontario, the dense blazing star. Participating in this session were two Indigenous representatives from the Six Nations of the Grand River, two botanical artists and two plant biologists. These individuals not only shared their knowledge on the plant itself but also discussed the approach they take in studying/using it. For this event, we welcomed the Botanical Artists of Canada, who had coordinated the opening of their annual juried exhibition to overlap with the CBA conference at Laurier. The botanical drawings on display in the Robert Langen Gallery were stunning in their detail and biological accuracy, and it was a pleasure to have this artistic



Simon Chuong, Tim Dickinson and Frédérique Guinel at the CBA auction.
©Hugues Massicotte

dimension added to the meeting. The day ended with a barbecue where Hugues Massicotte, our favorite auctioneer, worked his wonders to raise money for our student travel funds.

The conference ended with our Banquet hosted by the Royal Botanical Garden in Burlington. Before dinner, participants were able to wander and relax in the garden after three intensive days of work. This was followed by a delicious meal, complemented by lively discussion, which ended on a decadent dessert! For those who participated in the field-trips, the meeting continued into the following day. Under a radiant sun, two groups strolled along the trails of Bruce Peninsula and those of Backus Wood; another group rafted on the gentle waves of the Grand River taking in many beautiful scenic views. All came back tired but were very happy with a day well spent.

Thanks again for joining us in Waterloo. We were truly happy to have you among us! Hopefully we will see you next year in Rochester, Minnesota, where we will join our American Botanical colleagues to share our latest findings and renew old friendships.

Sincerely,

Simon Chuong, Mihai Costea, Susan Lolle,
Barbara Moffatt, Matt Smith, Kevin Stevens,
and Frédérique Guinel

THE LAWSON MEDAL

THE Lawson Medal is the association's most prestigious honour, and for the first year since 2006, our association awarded two Lawson Medals, one in each category.

Category A, Outstanding Contribution – Professor Emeritus John Sheard

In Category A, which pertains to a single outstanding contribution to botanical knowledge (such as a monograph, book, or series of papers), the Lawson Medal is awarded to Professor Emeritus John W. Sheard of the Department of Biology, University of Saskatchewan in Saskatoon. Professor Emeritus Vipen Sawhney prepared the nomination strongly supported by letters from 7 lichenologists around the globe (Austria, Britain, Finland, Norway, plus North America including New York Botanic Garden, Oregon, plus within Canada).

John trained as a lichenologist, by 1965 completing his B.Sc., M.Sc. and Ph.D. degrees in rapid succession at the Imperial College, London University. During its centennial year, John came to Canada as a postdoctoral fellow to conduct research in the lab of Dr. Ernie Brodo at the National Museum of Natural Sciences, in Ottawa. The next year (1968), he joined the faculty at the University of Saskatchewan and rose through the ranks to Full Professor by 1978. John “retired” in 2000, but in truth, retirement has not yet happened owing to his scientific career exceeding well over 50 years for he is regularly into the Department, actively continuing his research program! His productivity also continues, with three papers published in 2016, two more in 2017, with another manuscript submitted recently.

Dr. Sheard is being recognized specifically for his monograph published in 2010 by the NRC Research Press in Ottawa, entitled “The lichen genus *Rinodina* (Ach.) Gray (Lecanoromycetidae, Physciaceae) in North America, north of Mexico”. This is a richly illustrated compendium of 96 spp., including 5 that are newly described, and within this revision, 30 species names have been relegated to synonymy. Ecologically, these crustose lichens are highly significant, both in Canada and worldwide, where they may grow on various substrates. The letters of support were unified in outlining that *Rinodina* is not only an extremely diverse genus, but its members are extremely difficult to treat.

Quoting one such letter from North America: “Before John’s work on the group it was, to put it mildly, an absolute unworkable mess. John spent the better part of a career - decades of research time - meticulously transforming that mess into one of the most well-documented and broadly supported taxonomies in lichen-forming fungi”, by synthesizing “his decades of tireless work into a single taxonomic monograph of a major genus across an entire continent.” Wrote one supporter from Scandinavia: “In one fell swoop, John has lifted this difficult genus out of taxonomic obscurity and, to be sure, made it over into one of the *better known* genera of crustose lichens – this is a tremendous accomplishment.” Indeed, in recognition of Dr. Sheard’s outstanding taxonomic advancement of this group, a species (*Rinodina sheardii* Tonsberg) has been named after him.



John Sheard Receiving the Lawson Medal from CBA President Art Davis
©Hugues Massicotte

A long list of superlatives was extracted from the supporting letters: “brilliant”, “outstanding”, “beautifully illustrated”, “a work of distinction and true scholarship”, “one of the finest monographs on any lichen genus”, and “the single most outstanding contribution to lichen knowledge published in modern times.” Supporters of Dr. Sheard’s nomination also applauded that “his identification key is carefully done and easy to follow”, and that each species description is accompanied by an accurate distribution map. Accordingly, Dr. Sawhney wrote that “This monumental treatise is not just a taxonomic exposé of *Rinodina*”, but also “covers aspects of ecology, reproduction, and phytogeography” and will continue to serve as “a major resource to scientists working in this field.”

On behalf of the CBA-ABC, it was my pleasure to present the Lawson Medal for Category A to Professor Emeritus John Sheard at the CBA-ABC banquet held at the Royal Botanical Gardens in Burlington, Ontario, on July 7, 2017.

Category B, Lifetime Achievement - Professor Emeritus Roy Turkington

This year's recipient of the Lawson Medal for Category B (lifetime achievements) is Professor Emeritus Robert A. (Roy) Turkington, retired plant population ecologist of the Department of Botany and the Biodiversity Research Centre at University of British Columbia in Vancouver. The nomination package was prepared by Professor Emeritus Iain Taylor supported by letters from scientists across Canada and in the U.S.A.

As a Northern Irishman, Roy trained at the New University of Ulster in Coleraine, obtaining his B.Sc. in 1972. He then transferred directly from a M.Sc. to the Ph.D. program which he completed in 1975 under the supervision of Professor John Harper, recognized as the leading grassland ecologist of that era. Soon after, Roy spent a very productive year of research (1976-77) as a postdoctoral researcher in the lab of Professor Emeritus Paul Cavers at University of Western Ontario, leading to 6 publications! Paul wrote that "Roy brought to Canada his reputation as a totally dedicated scientist with an enormous and effective work ethic." Roy joined the Department of Botany at University of British Columbia as plant ecologist in fall 1977. As Iain put it, "And so began a spectacular career that had him working in Western Ontario, the Fraser River Valley, the Yukon, the Negev Desert, and briefly in the Serengeti", with additional work while on trips across Russia, and in southern China. All of this activity naturally led to his increasing international reputation. As Paul wrote, the high esteem held in Roy "can be seen in the many invited lectures he has given around the world." He became Full Professor in 1990.

Professor Emeritus Turkington's areas of research were many, and included plant population dynamics, with interest in disturbance factors such as herbivory and fire, and interrelationships of neighbouring plants as competitors; the life history of invasive species, plant microevolution, soil nutrients, restoration, and climate change; and his interest in the structure of plant communities, including work on pastures (especially legumes), natural grasslands (savanna) including deserts, plus in boreal forests and alpine regions. This wealth of experience he brought to service on editorial boards of eight scientific journals (including *Canadian Journal of Botany*), and was also a member of an NSERC Grant Selection Committee.

By the end of 2016, Professor Emeritus Turkington's *curriculum vitae* (CV) lists over 150 papers published! One prominent publication from his Ph.D. dissertation (Turkington & Harper 1979) was recognized recently as belonging to the top 100 most influential papers ever published by the British Ecological Society (1913-2012), as part of the BES centenary celebrations. This paper demonstrated for the first time that biotic interactions among neighbours influenced selective pressure on competitive ability and plant

performance. Roy's CV also highlights two papers published with his graduate students that had received the CBA-ABC's Stan Rowe Award in Ecology.

One of his Ph.D. students, Professor Lauchlan Fraser wrote that on the day (June 30, 2015) of Roy's official retirement, "a special symposium was held at UBC involving a full day of original research talks and reminiscences from his former students and colleagues." These talks were collated into a Special Issue [217(11)] of *Plant Ecology* published in 2016, entitled *Plant-Eye-View Perspective on Traits, Populations, and Communities*, thereby honouring Roy's career accomplishments. This event marked completion of a remarkable 37-year career, followed earlier in 2017 by the dissertation defence of his final Ph.D. candidate, thereby yielding the final tally from Roy's lab of an astounding 29 graduate students (14 Ph.D., 15 M.Sc.) supervised or co-supervised. Accordingly, Lauchlan pointed out "In light of Roy's notable academic achievements, perhaps Roy's biggest legacy to the science of plant ecology is the mentorship he has provided to the many graduate students who have populated his lab" and to having taught "thousands of undergraduate students the science of ecology and the joys of plant ecology." Professor Andrew MacDougall, another Ph.D. student, wrote "Indeed, it is remarkable to me that so many of Roy's Ph.D. students became tenured professors at schools across Canada." Interspersed among all of this graduate supervision and undergraduate teaching was the training of 4 postdoctoral fellows, plus visits by 6 sabbaticants and other scientists who travelled to work in his lab.

Wrote Professor Deborah Goldberg, "Roy embodies what is best about academia – brilliance and compassion, rigor and fun!"

Whereas Professor Emeritus Turkington was unable to accept the Lawson Medal in Waterloo owing to a previous commitment overseas, he had sent some messages including "Wow! I wasn't expecting this nor was it even on my radar. I feel very humbled to be honoured in such a way as this. In my defence, I have been fortunate to have had many very fine students who made it very easy for me to look good! Again, my thanks to you and your committee for awarding me this honour!"

Joan and Paul Cavers attended the CBA-ABC banquet held at the Royal Botanical Gardens in Burlington, whereby Paul (Roy's postdoctoral supervisor) provided several interesting notes about Roy's career upon acceptance of the Lawson Medal. Since that time, on behalf of the CBA-ABC, the medal has been delivered to Roy in British Columbia in person - Thank you, Paul and Joan!

And finally, to thank all those who initiated the nomination process and by writing letters of support, whether the nomination was a success or not, for this year.

MAGISTER TEACHING AWARD – DR. RENÉ BELLAND

This is the newest major award offered by CBA-ABC, instituted to recognize excellence in botanical teaching sustained for more than 10 years, including a proven commitment and effectiveness in instruction, plus a dedication to teaching improvement. Marking the second occasion that the Magister Teaching Award has been bestowed, the Awards Committee enthusiastically selected Dr. René J. Belland of the Department of Renewable Resources, University of Alberta in Edmonton. The nomination was prepared by Professor Ellen Macdonald and contained several testimonials from students and colleagues alike.

Following his B.Sc. at the University of Alberta in 1978, René trained as a bryologist at Memorial University in St. John's, Newfoundland, obtaining his M.Sc. in 1981 describing the mosses of the Bonne Bay region and his Ph.D. in 1985 studying the disjoint bryophyte component of the Gulf of St. Lawrence region.

Dr. Belland has taught several courses following his appointment in 1999, and since 2008, has instructed these four undergraduate courses in particular, within the Department of Renewable Resources:

2nd year – “*Spring Field School*”, an intensive 2.5 days on plant identification and vegetation sampling;

3rd year – “*The Mosses of Alberta – Identification and Conservation*”;

4th year – “*Conservation and Management of Endangered Species*”;

and 4th year – “*Special Topics in Renewable Resources*”, which has included various topics such as Arctic revegetation of bryophytes, and multivariate study of moss distributions.

Furthermore, since 1996 where he has served as Assistant Director (Research) / Data Systems Manager at the Devonian Botanic Garden, René has taught numerous workshops introducing the mosses of Alberta, and the monitoring of rare species.

Ellen wrote “His passion for his subject matter is truly contagious and he has done an outstanding job of igniting this passion in students” by connecting students with material both inside and outside the classroom. René regularly gives his time to students beyond the structured schedule of lectures and labs, holding a study session each Friday morning wherein students can meet him for extra one-on-one help about the mosses of Alberta as they study for lab quizzes. This class of 20-22 students is fully enrolled within 10 minutes of the start of registration!

One noteworthy demonstration of students’ appreciation of René’s dedicated instruction was displayed (see photo) at the final exam in April, 2015, when students arrived wearing identical t-shirts with a moss drawing and the motto “Bryophyte acolyte”. Dr. Belland was provided with a similar shirt bearing “Moss Boss” (as he is affectionately nicknamed by the students), plus an engraved knife for moss collecting.

For his major capstone class on endangered species, Dr. Belland draws on his extensive expertise with COSEWIC

(Committee on the Status of Endangered Wildlife in Canada) for which he co-chaired the “Mosses and Lichens” Species Specialist Subcommittee from 1999-2008, and presently leads since then. Students form teams that prepare a Status Report for an endangered species throughout the term, with René meeting these teams very regularly to trouble-shoot and provide guidance. Several supporters of this nomination emphasized the enormous amounts of time that he spends meeting with each group (often 8-10 per course), beyond class time. Dr. Belland then holds a mock COSEWIC meeting at which the teams present a status designation for their species, followed by preparation of a Recovery Plan for the species. This allows students to place their academic studies in a real-world context, providing opportunities for critical thinking, and written and oral communication, thereby fostering life-long skills for their future careers.

Among the nomination’s supporting letters, Dr. Belland was described as “being a gifted, passionate educator who sets students alight with new appreciation for botany and conservation”, and that his goal in teaching is “to engage and empower students to be lifelong learners in botany.” At course’s end, other students stated “I looked forward to coming to class every day and really just wish it could continue,” and “Everything was expertly organized and I will cherish my notes forever and ever.” A departmental colleague described René as “engaging, dynamic, rigorous, and fair. He is articulate, patient, and intelligent. He clearly knows how to connect with his students and to draw them into whatever he is trying to teach,” which another colleague referred to as “the magic” of René’s instruction and reported as “drawing them (the students) along through capillarity rather than pressure from below. Students emerge from that course on fire for principles of botanical biodiversity!”

Not surprisingly, Dr. Belland’s consistently outstanding proficiency in teaching has been recognized regularly by the University of Alberta with annual honours as “Teacher of the Year” for five straight years (2011-2016) received from the Faculty of Agricultural, Life, and Environmental Sciences, as well as twice in the past three years from the Environmental & Conservation Studies Student Association. Professor MacDonald indicated that René’s annual teaching evaluations by students are first-rate, and always a wide margin ahead of the top 25% percentile.

Although delighted to receive this news about the Magister Teaching Award, René had previous commitments to a workshop in New Brunswick that overlapped with CBA-ABC’s annual meeting. Hence, we are grateful to Dr. Richard Caners who completed his Ph.D. under René’s co-supervision, for accepting the award (a framed print of “Moss” by Terry Perham) and transporting it to Alberta for presentation to Dr. Belland.

Students at University of Alberta adorning moss-inspired T-shirts at Dr. Belland’s final exam in April, 2015. (photo: E. MacDonald).

MARY ELLIOTT SERVICE AWARD – PROFESSOR FRÉDÉRIQUE GUINEL

This year's recipient of the Mary Elliott Service Award, recognizing an individual for meritorious service performed for the association, is Professor Frédérique Guinel of the Department of Biology, Wilfrid Laurier University, in Waterloo, Ontario. The nominator was Professor John Markham.

Dr. Guinel completed a M.Sc. degree in 1981 at l'Université Pierre et Marie Curie and her Ph.D. degree at Carleton University in Ottawa in 1987, followed by various postdocs and research associate positions in Canada and the U.S.A., before joining the faculty at Laurier. As described by an Awards Committee member, Frédérique's dedication to the CBA-ABC has been exemplary: "Her contributions have been consistent, long-term, and both broad and deep". She has been a "perfect example of limitless active work for the CBA overall."

In many capacities, Frédérique has made significant contributions to the betterment of the CBA-ABC. From 1994-1997, she served as an Associate Editor of the *CBA-ABC Bulletin*, including producing articles for publication there in 2009 and 2011. She also served as a CBA-ABC Director (2001-03), and has chaired the Teaching Section. On countless occasions, she served at annual meetings as a judge of student presentations for the Iain & Sylvia Taylor Poster Award and for the Lionel Cinq-Mars Award competitions. When doing so, she has consistently provided detailed, constructive comments that are compiled with those of other judges when feedback is passed anonymously to student presenters after the conferences. Her approach in this activity has been very encouraging to promote advancement in students' presentation skills. Dr. Guinel has also helped to organize symposia for CBA-ABC annual meetings, including one in 2013 entitled "*New Frontiers in Tree Biology*" leading to a special issue published in the journal *Botany*.

Undoubtedly all CBA-ABC members are aware of the outstanding leadership role that Dr. Guinel has undertaken from 2010-2016 inclusive, wherein she served consecutively as Présidente-Élue, Présidente, and Présidente Sortante (each post for a 2-year term). During those years, major accomplishments included an intensive period involving the association's renewal of its not-for-profit status and bringing the association's bylaws in line with current federal regulations. A law firm had to be hired to ensure compliance with government directives. Frédérique spent many hours in that process on our association's behalf, and it is because of her dedication to that work, the association is well set up today. These events also led to updates of our association's record-keeping activities, plus our CBA-ABC Policy Manual that provides informative guidelines with respect to the duties that each executive member needs to undertake, when members begin a term. Dr. Guinel also served as president during the association's 50th anniversary celebrations held at the Montreal Botanical Gardens in summer 2014, helping to mark it as a very memorable occasion.



Frédérique Guinel Receiving the Mary Elliott Service Award from CBA President Art Davis ©Hugues Massicotte

Immediately following those six years of top-level executive activity, this past year Frédérique was our association's Vice-Présidente, chairing the local organizing committee that prepared the July 4-8, 2017 conference at Wilfrid Laurier University. Reacting to the proposed upheaval in administration for the Montreal Botanical Gardens (MBG), within two weeks of the start of that conference, Dr. Guinel utilized her strong bilingual skills to translate into French the CBA-ABC's letter extolling the importance of maintaining the scientific rigour of the MBG, so that the letter could be sent in both official languages to the Montreal Mayor's office and to *La Presse*.

Accordingly, Awards Committee members summarized that "She is a passionate, dedicated and enthusiastic botanist who is extremely effective at executing and performing many CBA-related tasks and continues to promote its profile via outreach and member-recruitment activities." And another added "She has served in so many capacities, all of which have contributed to the growth and maintenance of the CBA as a vibrant meeting place for botanists old and new."

In keeping with past tradition, during the awards ceremony at the CBA-ABC banquet held at the Royal Botanical Gardens in Burlington, ON, Dr. Guinel received a unique woodcraft representing the Mary Elliott Service Award. We thank Dr. David Sweet (a colleague of Professor Emeritus Iain Taylor) at the University of British Columbia, for creating this year's Elliott Award.

CBA-ABC ANNUAL AWARDS

CBA-ABC Special Project Fund



Christian Lacroix and Denis Barabé Receiving the Special Project Award from CBA President Art Davis ©Hugues Massicotte

Inaugural Award Recipients: Dr. Christian Lacroix (University of Prince Edward Island) and Dr. Denis Barabé (Université de Montréal / IRBV)

Project: Funding toward cost of illustrations/figures for their forthcoming text "Phyllotactic Patterns: From Genes to Models"

Taylor A. Steeves Award in Structure and Development

Award Recipient: Adrian Dauphinee, Ph.D. candidate, Department of Biology, Dalhousie University, Halifax

Paper: "Remodelling of lace plant leaves: antioxidants and ROS are key regulators of programmed cell death", by A. Dauphinee, J.I. Fletcher, G.L. Denbig, C.R. Lacroix, A.H.L.A.N. Gunawardena. *PLANTA* (2017) DOI 10.1007/s00425-017-2683-y.

Porsild-Consaul Award in Systematics and Phyto-geography

Award Recipient: Dr. Frieda Beauregard, Agriculture and Environmental Sciences, McGill University, Montréal

Paper: "Rapid latitudinal range expansion at cold limits unlikely for temperate understory forest plants", par F. Beauregard et Sylvie de Blois. *ECOSPHERE* (2016) 7: 1-17.

Stan Rowe Award in Ecology

Award Recipient: Dr. Marion Barbé, postdoctoral scientist, Ministry of Forestry, Wildlife & Parks, Université de Québec in Abitibi-Temiscamingue

Paper: "So close and yet so far away: long-distance dispersal events govern bryophyte metacommunity assembly", par M. Barbé, Nicole J. Fenton, et Yves Bergeron *Journal of Ecology* (2016) 104: 1707-1719.

Honourable Mention: Marie-Pierre Beauvais, M.Sc. candidate, Univ de Montréal / IRBV

Paper: "Beta diversity declines while native plant species richness triples over 35 years in a suburban protected area", par M.-P. Beauvais, Stéphanie Pellerin, et Claude Lavoie. *Biological Conservation* (2016) 195: 73-81.

Luella Weresub Award in Mycology

Award Co-Recipient: Mr. Brent Robicheau, Department of Biology, Acadia University, Wolfville

Paper: "The complete mitochondrial genome of the conifer needle endophyte, *Phialocephala scopiformis* DAOMC 229536 confirms evolutionary division within the fungal *Phialocephala fortinii* s.l. – *Acephala applanata* species complex", by B.M. Robicheau, Alexander P. Young, Kurt Labutti, Igor V. Gregorio, Allison K. Walker. *Fungal Biology* (2017) 121: 212-221.

Award Co-Recipient: Mr. Eric Vukicevich, Department of Biology, University of British Columbia-Okanagan, Kelowna

Paper: "Cover crops to increase soil microbial diversity and mitigate decline in perennial agriculture – A review", by E. Vukicevich, Tom Lowery, Pat Bowen, José Ramon Urbez-Torres, and Miranda Hart. *Agronomy for Sustainable Development* (2016) 36: 48 DOI 10.1007/s13593-016-0385-7

Laurie Consaul Northern Research Scholarship

Award Recipient: Mr. Christian Norton, M.Sc. candidate, co-supervised by Dr. Alain Cuerrier, IRBV / Université de Montréal, and Dr. Luise Hermanutz, Memorial University, St. John's

Thesis Title: "Inuit plant knowledge in Hopedale and Postville, Nunatsiavut: comparative ethnobotany and its relationship between climate change and health sovereignty"

John Macoun Travel Bursary

Recipients for 2017:

- Mr. Mohammad I. Abo Gamar, Ph.D. candidate, Dalhousie University – Mount Saint Vincent University
- Ms. Samantha Godfrey, M.Sc. candidate University of Ottawa – Canadian Museum of Nature
- Mr. Étienne Léveillé-Bourret, Ph.D. candidate University of Ottawa
- Ms. Ashley Martel, M.Sc. candidate St. Mary's University – Mount Saint Vincent University

Keith Winterhalder Undergraduate Travel Award

Award Recipient: Ms. Saskia Hart, University of Northern British Columbia, Prince George

Iain and Sylvia Taylor Poster Award

Award Recipient: Ms. Victory Coffey, Dept of Biology, University of Winnipeg, Winnipeg

Poster: "Legacy effects of forest establishment on prairie plant and seedbank communities in a northern rough fescue prairie", by V. Coffey and Rafael Otfinowski

Honourable Mention: Dane Goh, Dept of Biology, Wilfrid Laurier University, Waterloo

Poster: "Cytokinin stimulates mycorrhizal colonization in pea", by D. Goh, Z. Said Mohamed Farah, S. Mulholland, L. Spichal, and F.C. Guinel

Lionel Cinq-Mars Award

Award Co-Recipient: Mr. James Jones, Dept of Biology, Wilfrid Laurier University, Waterloo

Talk: "Exploring the impact of a carbonatite rock deposit on a Northern Ontario forest ecosystem", by J. Jones, M. Lynch, T. Charles, P.A. Antunes, and F.C. Guinel.

Award Co-Recipient: Mr. Étienne Léveillé-Bourret, Dept of Biology, University of Ottawa

Talk: "*Sumatroscripus*: taxonomic revision and the discovery of a new monotypic Southeast Asian sedge tribe (Cariceae-Dulichieae-Scirpeae clade, Cyperaceae)", by É. Léveillé-Bourret, J.R. Starr, B.A. Ford, T.K.T. Nguyễn, and A.T. Vũ.



Étienne Léveillé-Bourret and Samantha Godfrey receiving awards from CBA President Art Davis ©Hugues Massicotte

REGIONAL UNDERGRADUATE AWARDS



Dylan Ziegler, winner of the Best Plant Science Poster at the BC Regional Undergraduate Conference, with his supervisor Cynthia Ross Friedman

This year our association sponsored undergraduate regional awards for best poster presentation at the British Columbia Regional Undergraduate Conference held at Thompson Rivers University, Kamloops, from the 31st of March to the 1st of April 2017, and best oral and poster presentations at the 47th Science Atlantic Biology Conference held at St. Francis Xavier University, Antigonish, Nova Scotia, from the 10th to 12th of March 2017.

The winner for the BC Regional Award for Best Poster was Dylan Ziegler of Thompson Rivers University for his poster entitled “A mistletoe of the highest honour: Evolution of the optimized body form of dwarf mistletoes” (supervised by Cynthia Ross Friedman). The abstract for his research is as follows:

“Mistletoes are, broadly speaking, hemiparasitic flowering plants that parasitize various plants and occupy numerous geographic regions, with representative species across a high-cosmopolitan range. Parasitic relationships of the epiphytic mistletoes establish them as important species ecologically, where the growth deformities they induce in their hosts provide crucial shelter to small animals. Additionally, many mistletoes fruit with edible berries and are an important resource for birds and rodents. Despite these keystone ecological functions, much of mistletoe phylogeny remains unresolved. Current angiosperm phylogenetic organization divides all mistletoe species between two families, the Loranthaceae and Santalaceae, based almost entirely on molecular data. Interestingly, the accepted sister taxa (*Nuytsia*, *Gaiadendron*, and *Atkinsonia*) have highly developed body forms, possessing conspicuous flowers, leaves, true roots, and adopt a terrestrial growth habit with low host-specificity. In contrast, modern mistletoes are epiphytic with high host specificity, and possess modified root systems (haustoria) specialized for invading the host’s vasculature. Using environmental scanning electron microscopy, I investigate the anatomical features of the genus *Arceuthobium* (the dwarf mistletoes), the most diminutive mistletoe genera, and com-

pare anatomical and developmental trends in other mistletoes. *Arceuthobium* represents the most substantive evolutionary reduction of the mistletoes, and thus is an important indicative genus of the modification the body form the group has undergone. In comparing floral structure, branching, and resource allocation, I will describe the complex history of mistletoes. *Arceuthobium*, given its reduced features and optimized body form for parasitism, appears to be the latest diverging genus, reaffirming its position as the most specialized mistletoe.”

Honourable Mentions were also given to Robyn McArthur of Thompson Rivers University for her poster entitled “Inhibition of *Pseudogymnoascus destructans*, the causative agent of white-nose syndrome, by environmental microorganisms”, and to Kurt Leffers from the University of the Fraser Valley for his poster entitled “Investigating lifespan and healthspan effects of Canada-grown *Lonicera caerulea* on *C. elegans*”.



Emily Evans, winner of the Best Oral Presentation in Plant Science at the Science Atlantic Conference

In the Atlantic Region, Emily Evans of Acadia University was award the prize for Best Oral Presentation on a botanical theme for her presentation entitled “Mixed mating and its ecological impact on an endangered plant”. The abstract for her research with co-authors Rodger Evans and Kirk Hillier is as follows:

“Through its links to demography and population genetics, the reproductive biology of a species is an important intrinsic factor that can be used to predict the future viability of a population. The objective of this study was to provide a comprehensive understanding of the unique mixed mating system utilized by an endangered plant, illuminating potential associated ecological repercussions. *Crocianthemum canadense* (Rockrose) is a small perennial herb listed as critically imperiled under the Nova Scotia Endangered Species Act. Rockrose exhibits a unique mixed mating system called dimorphic cleistogamy, whereby a single plant produces both cross-pollinating open flowers and self-pollinating closed flowers temporally separated within a single season. To assess the seasonal transition from one floral type to the

other, several floral characteristics were compared using microscopic analyses and observations of seed production in field-based exclusion trials. Seed germination characteristics were also compared between flower types to determine if a difference in fitness existed between progeny from crossed versus self-pollinated flowers. Results indicate that flowers gradually change in morphology and reproductive strategy within a season, with transitional states between obligate cross pollinating and obligate self-pollinating flowers. Seeds from late-season closed flowers had a lower percentage germination than open flowers, revealing a possible decrease in fitness of progeny from closed flowers. An increase in the infestation rate of open flowers by larvae of *Mompha capella* was also documented. By consuming seeds from open flowers predispersal, the florivorous moth may decrease the proportion of genetically-recombined seeds distributed within infested populations and ultimately pose risks for the adaptability and success of future Rockrose populations."

The prize for the Best Poster Presentation on a botanical theme from the Atlantic Region went to Adam Palayew of Mount Allison University for his poster entitled "The use of ITS2 secondary structure to recognize diatom species" (an abstract was not available).



Adam Palayew, winner of the Best Plant Science Poster at the Science Atlantic Biology Conference

Each of the three winners described above received an award certificate and a check for 100\$ from CBA-ABC. Congratulations to all our winners and best of luck with your future careers in botany!

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Barbara Moffatt, Matt Smith, Frédérique Guinel and Art Davis, some of the 2017 CBA conference organizers ©Hugues Massicotte

SYLVIE LALIBERTÉ (1954-2017): UN TÉMOIGNAGE



Sylvie dans les Laurentides (2010)

C'est vraiment avec tristesse que j'écris ce témoignage à propos de notre collègue que plusieurs d'entre vous ont connue puisqu'elle a participé régulièrement aux réunions de la CBA/ABC durant de nombreuses années. Autour des années 2000, elle fut membre du conseil d'administration et a joué un rôle actif dans la section enseignement qui commençait à prendre de l'essor. Bien qu'elle ne participait plus depuis quelques années aux activités de l'ABC, elle aimait bien avoir des nouvelles des membres avec qui elle avait collaboré.

J'ai connu Sylvie lorsqu'elle était étudiante à la maîtrise à l'Université de Montréal. Sa maîtrise (1983), réalisée sous la direction du Pr. Joachim Vieth, portait sur le sujet difficile de la croissance primaire et secondaire de la tige des Agavaceae (Cordylina). Par après, elle a complété un doctorat (1989), portant sur la morphologie et l'ultrastructure de système in vitro de plantes ligneuses (Mélèze) sous la direction du Pr. Maurice Lalonde à l'Université Laval. Son doctorat en main elle entra comme professeure au Département des sciences biologiques de l'Université du Québec à Montréal (UQAM). Parallèlement à son enseignement, elle développa un programme de recherche original sur l'embryogenèse des conifères, en utilisant plusieurs approches (culture in vitro,

cytométrie en flux, microscopie, culture de protoplastes) pour caractériser les cycles cellulaires liés à la croissance des embryons. Avec ses étudiants gradués elle a mis au point différentes méthodes de micropropagation des variétés de Mélèze, ce qui a permis l'étude détaillée de l'embryogenèse somatique dans ce genre.

Dans sa carrière, Sylvie a toujours accordé une grande place à l'enseignement. Elle c'est grandement impliquée dans l'enseignement de la biologie végétale selon l'apprentissage par problèmes (APP) à l'UQAM. Sylvie a toujours soutenu les étudiants dans leur cheminement. Comme l'écrit Suzanne Forget qui a enseigné avec elle durant plus de vingt à l'UQAM : « On peut dire sans aucun doute que Sylvie était entièrement dévouée à son enseignement, au bien-être et à la réussite des étudiants. Toujours disponible pour les rencontrer, les encourager et les aider lorsque certains vivaient des situations difficiles, elle s'efforçait de leur trouver de l'aide auprès des différentes instances de l'université ». Cette ouverture envers les étudiants, elle l'avait aussi envers tous ceux qui la côtoyaient, autant dans sa vie professionnelle que personnelle.

Depuis de nombreuses années, Sylvie et moi avons

l'habitude de nous rencontrer régulièrement pour partager un repas, plutôt bien arrosé. Ces rencontres occasionnaient souvent des discussions animées sur des sujets d'actualité, bien entendu, mais aussi sur des questions scientifiques et artistiques. Les collègues qui se sont quelquefois joints à nous se souviennent avec plaisir de certaines discussions que nous avons eues tous ensemble. Sylvie défendait son opinion avec cohérence et fermeté, quel que soit le sujet. Elle changeait rarement d'idée, tout en respectant l'opinion de son interlocuteur, et avait toujours le don d'aller chercher un argument inattendu et percutant. Passionnée de littéra-

ture et lectrice à l'esprit aiguisé, elle savait parler des personnages romanesques en essayant le plus souvent de faire ressortir leurs bons côtés. D'ailleurs, cette approche elle l'avait aussi dans la vie, puisque malgré les contraintes de sa maladie elle a toujours gardé une vision positive du futur.

Je suis convaincu que tous les membres de l'ABC qui ont connu Sylvie se souviendront d'elle comme une personne brillante, cultivée et généreuse.

Denis Barabé
Chercheur émérite

Institut de recherche en biologie végétale (IRBV)

SYLVIE LALIBERTÉ (1954-2017) – IN MEMORIAM

It is with sincere sadness that I write these words in memory of our colleague, whom many of you knew, since she was a regular participant at CBA / ABC meetings for many years. In the first decade of this millennium, she was a board member and played an active role in the teaching section, which was beginning to blossom. Although she had not been involved in CBA activities for the past several years, she enjoyed hearing about the latest developments from members with whom she had collaborated.

I met Sylvie when she was a master's student at the Université de Montréal. Her master's thesis (1983), supervised by Prof. Joachim Vieth, was on a difficult topic, the primary and secondary growth of Agavaceae (Cordyline) stems. She then completed her PhD. (1989), on the morphology and in vitro system ultrastructure of ligneous plants (Tamarack), supervised by Prof. Maurice Lalonde at Université Laval. Upon completion of her doctoral degree, she became a professor in the Department of Biological Sciences at the Université du Québec à Montréal (UQAM). Parallel to teaching, she developed an original research program on the embryogenesis of conifers, using several different methods (in vitro culture, flow cytometry, microscopy, protoplast culture) to characterize the cell cycles linked to embryonic growth. With the assistance of her graduate students, she perfected different methods of micropropagation of varieties of Tamarack, which facilitated in-depth study of the somatic embryogenesis of this genus.

Throughout her career, Sylvie always attached great importance to teaching. She was very involved in teaching plant biology through learning by problem solving (PBL) at

UQAM. She was consistently supportive of students' academic progress. As Suzanne Forget, a colleague of hers for over twenty years at UQAM, has written, "Sylvie was totally devoted to teaching, to the well-being and success of students. She was always available to meet with them, she encouraged and assisted them when they were going through a difficult time, and she would move mountains to obtain assistance for them through other university services." The generosity she demonstrated towards students was also evident in her relationships with everyone around her, in both her professional and personal life.

For many years, Sylvie and I used to meet regularly for a meal, of course accompanied by a good wine. Our meetings often led to animated discussions on current topics as well as scientific and artistic questions. Colleagues who sometimes joined us remember with delight certain discussions we had together. Sylvie defended her opinions firmly and clearly, no matter what the subject. She rarely changed her mind, yet was always respectful of others' opinions, and she had a gift for raising unexpected and persuasive arguments. Passionate about literature and an avid reader, she spoke knowledgeably about fictional characters, most often to note their good qualities. This same approach was also evident in her own life, since, despite the limits that illness imposed, she maintained a positive outlook.

I am certain that all CBA members who knew Sylvie remember her as a brilliant, cultured and generous person.

Denis Barabé
Chercheur émérite
Institut de recherche en biologie végétale, IRBV

TOP CANADIAN ORNAMENTAL PLANTS. 17. CARNATIONS

Ernest Small^{1,2}

As will be evident from the many impressive illustrations presented here, the carnation and its relatives are simply gorgeous. Known as the “divine flower,” the carnation has been admired for over 2,000 years and has become a staple of the flower trade.

Names

Scientific names: The genus name *Dianthus* is based on the Greek *dios*, divine, referring to the God Zeus, and *anthos*, flower, an allusion to beauty and fragrance so heavenly to be fit for the gods.

English names: Carnation (a word of obscure origin, often applied to many of the species of *Dianthus*, but most particularly to *D. caryophyllus* and its horticultural hybrids). *Caryophyllus* is based on the Greek *karyon* (a nut) + *phylon* (a leaf), literally “nut-leaved,” an allusion to an old name of the Indian clove tree (*Eugenia caryophyllata*) applied because the flower is often strongly scented of cloves. Other common English names for this and other frequently cultivated species are presented later.

French names: Oeillet.

D. caryophyllus: oeillet des fleuristes, oeillet giroflée, oeillet commun.

D. barbatus: oeillet de poète (oeillet du poète, oeillet des poètes), oeillet barbu, oeillet de Girardin.

D. chinensis: oeillet de Chine.

D. plumarius: oeillet mignardise, oeillet plumarius.

Symbolism

Carnations are the national flowers of Monaco, Slovenia, and Spain, the provincial flowers of the autonomous community of the Balearic Islands, and the state flower of Ohio. Carnations have represented people's movements such as labour initiatives and socialist causes, and in Portugal red carnations came to represent a coup d'état in 1974. In Christianity, carnations became associated with holiness, especially Mary in her role as mother of Christ, a relationship which subsequently led to carnations becoming symbolic of Mother's Day. Carnations are often worn on other holidays, such as Parent's Day (in Korea), St. Patrick's Day and May Day, and are employed for sentimental occasions such as weddings and funerals. Carnations are a common funeral flower (symbolically expressing sympathy) in some countries, and accordingly are sometimes considered unlucky in France.

Wild *Dianthus* species

TAXONOMY & DISTRIBUTION

The genus *Dianthus* is estimated to have over 300 species. Most are native to Eurasia, many in the Mediterranean re-



Figure 1: An 1895 nursery catalogue showing the broad range of ornamental carnations.

gion and the mountains of southern Europe. A few are in the African mountains, and *D. repens* of arctic North America is the only one native to the Americas. The species often hybridize readily in nature. Although some are introduced in various countries, on the whole their invasiveness is limited, and the cultivated species are not notably weedy.

HABITATS

Wild *Dianthus* are usually found in dry, sunny locations, usually on soil influenced by limestone. Most grow in rocky sites or open meadows, but a few are found in open woodlands.

¹Science and Technology Branch, Agriculture and Agri-Food Canada, Saunders Bldg., Central Experimental Farm, Ottawa ON, K1A 0C6

²©Government of Canada. Verbatim redistribution for personal, non-commercial use is permitted.



Figure 2: Paintings (public domain) illustrating the symbolic association of carnations with feminine purity and aristocracy. **Left:** Painting (ca. 1729; housed in Prado Museum, Madrid) by Jean Ranc, showing Queen Bárbara de Braganza of Spain, holding carnations. Numerous such portraits of royal and noble women holding carnations were painted in past centuries. **Right:** Woman dressed in a costume representing carnations. Source: Grandville, J.J. 1867. *Les fleurs animées*, vol. 1.

MORPHOLOGY

Most species of *Dianthus* are perennial, tufted herbs, many with somewhat woody bases, and a few are shrubs. Height ranges from less than 15 cm to more than 1 m. The leaves are usually linear. The flowers of cultivars are available in solid colours, bicolours, “picotees” (solid colours with paler or white-edge petals), streaks, flecks, multi-coloured, “eyed” (with dark centres), and variegated (sectors of the petals with different hues). Carnations are also very popular flowers to dye (a practice that is offensive to right-thinking botanists; “just because you can doesn’t mean you should”). The corolla of carnations often exhibit a very attractive ruffled crowding of petals, that is complemented by scalloping of the margins.

Domesticated *Dianthus* species

The classical Greeks and Romans are believed to have cultivated *Dianthus* species, although most selections and hybrids have been generated within the last several centuries. There are over 30,000 cultivar names for *Dianthus* in the “International *Dianthus* Register” (including supplements), which is maintained by the Royal Horticultural Society in London. Wild species have five petals, while numerous cultivars have doubled flowers with dozens of petals.

The name “pink” is often applied to garden species, and is ambiguous. In practice, “pinks” are low-growing, clump-forming garden *Dianthus* plants, often with dainty flowers, sometimes with attractive foliage, and often pleasantly scented. Pinks come in many colours, but rarely blue or yellow. The word “Pinks” without qualification may refer to a class of domesticated *Dianthus* species, particularly those mentioned next, except for *D. caryophyllus*. The name pink by itself most often refers to *D. plumarius* (also known as garden pink and common pink). *Dianthus caryophyllus* (carnation) is also known as clove pink and cottage pink; and *D. chinensis* is known as China pink, Indian pink and rainbow pink. Many interpret the name “pink” as reflecting this common flower colour in the genus (conversely, the colour pink has been said to be based on the floral hue). More commonly, the word has been claimed to be based on the frilly margins of the petals of many of the species, seemingly trimmed with pinking shears

(the Old English *pynken* on which “pinking shears” is based refers to notching or piercing).

The vague phrase “fancy carnations” refers to forms with particularly interesting multi-colouration within flowers, and perhaps also attractive shape and/or size. So-called “annual” cultivars, frequently grown from seed, include *D. barbatus* and *D. chinensis*, both biennials or short-lived perennials (which mostly lack sufficient hardiness to overwinter in cold climates). Annual cultivars flower prolifically, and despite the smaller flowers than those of border carnations mentioned next, they are very popular. The expression “border carnations” refers to garden forms (basically of *D. caryophyllus*) that are generally tall, with large attractive flowers, grown from cuttings, and intended (at least in warm-temperate climates) to be grown as perennials. Many of these cultivars require staking, and they have become less popular. “Perpetual flowering carnations” (sometimes called tree carnations, American carnations and greenhouse carnations) are forms that have long flowering periods, and are designed for the cut-flower trade. Derived largely from *D. caryophyllus* and *D. chinensis*, they are grown mainly in greenhouses. They usually have flowers about 7.5 cm (3 inches) across, but some have flowers 10 cm (4 inches) wide. Cut-flower “spray carnations” have smaller flowers than most perpetual flowering carnations, with many flowers on a stem. Although mainly grown by commercial flower producers, perpetual flowering carnations are popularly grown by dedicated amateurs to exhibit in competitive flower exhibitions. “Mini carnations” (small-flowered forms that make superb bouquets) have become popular recently.

DIANTHUS CARYOPHYLLUS

Most commonly called “carnation,” the species is also known as clove pink, cottage pink, gillyflower (a name of obscure origin; it has been suggested “gilly” is based on “July”), and picotee (usually referring to forms with petal edges differently coloured from most of the blade). This native of southern Europe and Mediterranean islands is the most important ancestor of modern cultivars of the genus. It was collected in the Pyrenees in the 15th century, becoming popular in Europe by the 16th century. Because the species has been



Figure 3: Street art in Lisbon, the red carnation in the soldier's gun barrel representing the 1974 “Carnation Revolution” in Portugal. © Jeanne Menjoulet (CC BY 2.0).

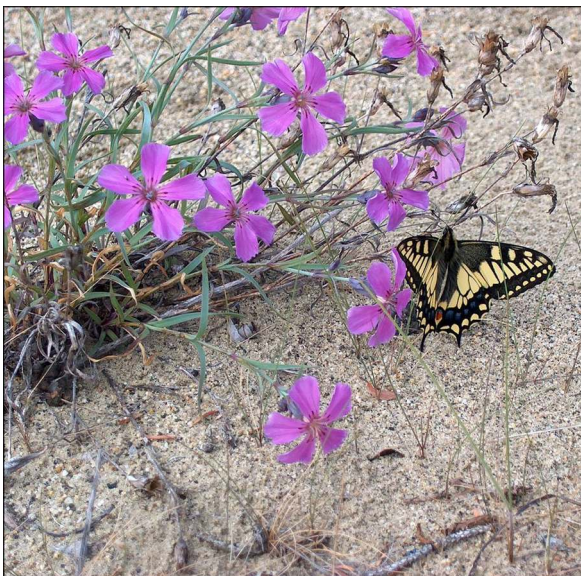


Figure 4: *Dianthus repens* in Western Arctic National Parklands, Alaska. ©<https://www.flickr.com/people/41585865@N06> (CC BY 2.0).

widely introduced its original natural distribution is uncertain. It grows wild in some Mediterranean locations, notably Greece, Italy, Sicily and Sardinia. Carnation flowers are easily recognized by their characteristic fused sepals that form a tube. Both single- and double-flowered forms (with up to 80 petals in a flower), and a very wide variety of colour forms have been bred. “Standards” have a single large flower per stem (up to 10 cm or 4 inches in diameter), whereas “sprays” have many small flowers.

DIANTHUS BARBATUS

Known as sweet William (“sweet” for the fragrance, “William” based on a mispronunciation of the French *œillet*), this is probably the most common species of *Dianthus* encountered in gardens. It is the major species of the genus used as a summer bedding annual. It originated in Europe and has been grown in Great Britain since the 16th century. Wild forms are capable of growing as perennials in the warmer parts of eastern Canada, but the cultivars are less cold-hardy and are grown as annuals. Unlike most *Dianthus* species, sweet Williams have dense heads of many flowers.

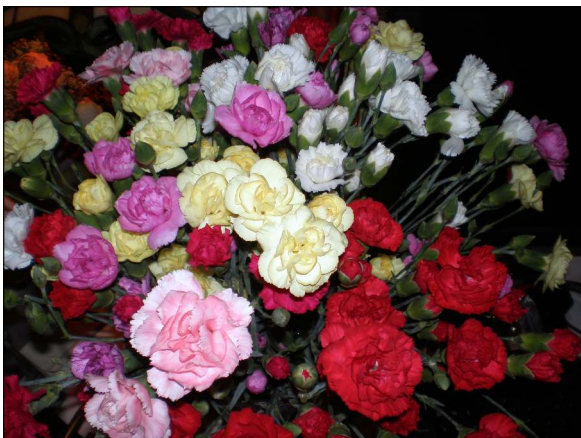


Figure 5: Mini carnations.” © Kaz Andrew (CC BY SA 2.0).

DIANTHUS PLUMARIUS

This “species” includes a group of hybrids usually called pink, garden pink and common pink. The cultivars are based on *D. plumarius* as the main parent, and have been grown since the 16th century, having originated in southern Russia. The wild species is native to southern Europe east to the Caucasus.

DIANTHUS CHINENSIS

This species is known as China pink (it grows wild in the hills of eastern Asia and the coast of Manchuria, and cultivated forms originated in China), Indian pink (it occurs in Northern India) and rainbow pink (for the variegated colours of some forms). It is too frost tender to grow as a perennial in most of Canada and is commonly grown as an annual. Most cultivars are of hybrid origin, with *D. chinensis* as one of the parents.

ROCKERY SPECIES

These dwarf rock garden plants are usually of alpine origin. The main species are *D. alpinus* (from the Austrian Alps (introduced to Britain about 1759) and *D. gratianopolitanus* (*D. caesioides*) from Southwestern France (introduced to Great Britain in 1792).

The cut flower industry

William Sim, A Scots emigré to the United States, developed large-flowered, constantly (“perpetual”) flowering, and more or less scentless carnations (“Sim forms”) which became the basis of the international cut-flower carnation industry. These are the kinds most often found in bouquets, wreaths and buttonholes, and marketed by florists and supermarkets. Because of their attractiveness, cheapness, and long vase life, carnations are a leading cut flower, and among the most popular inclusion in floral arrangements. The carnation is often used as one of the cut flowers employed to adorn parade floats. Transgenic carnations are available with an antisense gene lowering ethylene production (which shortens flower life), extending flower longevity well beyond the normal week or so.

CARE OF CUT CARNATIONS

A bouquet of carnations may have closed buds, which will open over the next few days. Stems should be trimmed at a 45° angle using a sharp knife (for better water absorption) just above a node and excess leaves removed before placement in a clean vase of water. Cut-flower food should



Figure 6: Paintings of *Dianthus caryophyllus* cultivars. **Left:** Single-flowered forms. Source: *Revue Horticole*, series 4, vol. 94, 1922. **Right:** Double-flowered forms. Source: Von Regel, E. (editor). 1890. *Gartenflora*, vol. 39, t. 1320.



Figure 7: Carnation flowers, showing their prominent fused sepal tubes. Also note the epicalyx, a group of sepals clasping the base of the main calyx. **Left:** photo by Max Pixel (public domain). **Right:** © Mike Beales (CC BY ND 2.0).

be added. Every 2 or 3 days stems should be recut, water changed, and more food added. The vase should be kept away from drafts, direct sun, excessive heat, and ethylene (from wilting plants and ripening fruits and vegetables, which can prematurely age the flowers). Cut carnations have been known to last up to 3 weeks.

THE CUT-FLOWER TACKINESS REPUTATION

In recent decades, cut-flower carnations in North America acquired an undesirable reputation as a budget (i.e. cheap) flower that reflects badly on both gifters and giftees (“a flower for mother-in-laws”), reaching a social status not much higher than dandelions. Some florists have simply refused to supply carnations for weddings and other events. The problem has been simply that carnations became so cheap and ubiquitous that they no longer reflected value. For corsages, carnations came to be viewed as much less desirable than orchids, gardenias or roses. Today, carnations are retrieving their popularity. Professional florists who prepare displays strongly recommend that to avoid the cheapness factor, carnation blooms need to be massed very closely together, hiding the stems. Another technique is to surround the lower stems with other ornamentals bearing small or delicate leaves and/or flowers. It’s also best to use recently bred, spectacular carnation cultivars.

BOUTONNIÈRES

A boutonnière (based on the French for buttonhole) is a floral decoration, usually a showy flower, worn on a coat or jacket by men for formal occasions, especially proms and weddings. Although occasionally worn by women (corsages are preferable), the boutonnière is the only masculine

concession to wearing flowers. Traditionally the stem of the flower is pushed through the lapel buttonhole on the left side, to be worn over the heart. Today, almost no jacket is made that has a suitable buttonhole, and boutonnières are usually simply pinned to the jacket. A carnation is the most traditional species, white for very formal occasions, or alternatively red. Carnations with insignificant fragrance are often used for boutonnières for men. Irish literary figure Oscar Wilde (1854–1900), who was gay, habitually wore a green boutonnière, and ever since the symbol has been used to suggest homosexuality (although dyed green boutonnières are sometimes worn on St. Patrick’s Day simply to reflect the association of the colour with Ireland). The popularity of boutonnières has waned in the 21st century.

HOUSEPLANTS

Carnations are not usually grown as houseplants, although they can be. “Pot carnations” are typically dwarf forms with numerous small flowers. Their soil should be kept moist, but not overwatered. Although more commonly grown outdoors, they can be kept indoors.

Edibility and toxicity

Carnation flowers are considered edible. Reflecting its alternative name “clove pink,” the flowers and foliage can have a clove-like aroma. However, only the petals should be consumed (other floral parts are bitter), and before adding these



Figure 8: *Dianthus barbatus*. **Left:** Painting. Source: Step, E., and Bois, D. 1896–1897. Favourite flowers of garden and greenhouse, vol. 1, t 35. **Right:** Photo. © Céréales Killer (CC BY SA 3.0).

Figure 9: *Dianthus plumarius*. Source: Step, E., and Bois, D. 1896–1897. Favourite flowers of garden and greenhouse, vol. 1, t 38.



Figure 10: *Dianthus chinensis* paintings. **Left:** Single-flowered forms. Source: Von Regel, E. (editor). 1859. *Gartenflora*, vol. 8, t. 248. **Right:** Double-flowered forms. Source: Houtte, L. van. 1845. *Flore des serres et des jardins de l'Europe*, Vol. 13, t.O.

to a food preparation, it is wise to test their taste. Carnations from florists and nurseries may have traces of toxic chemicals, and should not be eaten. Flowers should also be examined for content of insects. The petals can be candied ("crystallized") or pickled, but this defeats the goal of featuring their unique taste properties. They are employed as an edible garnish in salads, and to flavour butters, lemonade, vinegars, preserves and syrups. The classical Romans spiced wine with wild carnation flowers, and carnations are one of the ingredients employed to flavour the French liqueur Green Chartreuse since the 17th century.

Carnations were employed in traditional folk medicine in Europe for coronary, gastrointestinal and nervous disorders, but this is not a guarantee that consumption is safe, since many rather toxic plants have been used in herbal treatments. Workers who handle large amounts of *Dianthus* species sometimes develop occupational allergic contact dermatitis and/or pulmonary conditions. Veterinary websites list *Dianthus* species as toxic to dogs, cats, and horses. Generally, the genus is not considered to be significantly dangerous.

Economics

Dianthus species are widely grown and marketed as cut flowers, potted flowering plants, and bedding plants. Colombia has become the world's largest producer of cut-flower carnations (the capital, Bogota, has been said to be the Capital of Carnations). Israel, Kenya, Spain, and the American states of California and Colorado also produce significant crops.

Many species of *Dianthus* are quite fragrant, some with a spicy odour. The petals of carnations contain small amounts of essential oil, which is extracted for use in perfumes (5 kg of flowers are required to produce 1 g of oil). Some well-known perfumes which contain carnation oil include Elizabeth Arden, Gucci No. 1, Lauren by Ralph Lauren, Red Door by Elizabeth Arden, and Yves Saint Laurent Opium.

Cultivation

Most garden *Dianthus* species are excellent subjects for gardens and borders, and are not difficult to cultivate.



Figure 11: *Dianthus alpinus*. Source: Von Regel, E. (Editor). 1855. *Gartenflora*, vol. 4, t. 110.

PURCHASING AND PROPAGATING

The most important carnation cultivars are hybrids that are perpetuated vegetatively, and planting stock is usually available in nurseries. Many *Dianthus* species grow well from seed, but plants may not flower until the second year. Carnations grow easily from cuttings from the suckers formed around the base of the stem (or, less preferably, from the side shoots of the flowering stem, or the main shoots before they have developed flower buds).

SOIL CONDITIONS

The major *Dianthus* species discussed in this review do best in well-drained, neutral to slightly alkaline loam soil. Nutrient-rich soils with humus are suitable. Clays and soggy soils should be avoided.

LOCATION

Full sun and wind-protected sites are recommended. Most ornamental *Dianthus* species are short, and need to be situated where they will not be obscured by other plants, such as in containers placed on decks and patios.

MAINTENANCE

Deadheading encourages continued flowering (alternatively, flowering stems may simply be brought indoors as a cut flower). After several years, dividing and replanting may be necessary to maintain vigour. Gardeners sometimes have difficulty distinguishing the linear leaves of *Dianthus* species from those of weedy grasses, and removal of the latter needs to be done with care. A variety of pests (including rabbits) and diseases affect garden *Dianthus* species, but no more than other common ornamentals.



Figure 12: Carnations are an ideal cut flower for decorating the surface of exhibits. **Left:** Carnation flower wheel, shown at Melbourne International Flower and Garden Show, 2010. © Rexness (CC BY SA 2.0). **Right:** Viking floral float, photo by Man vyi (public domain).



Figure 13: "Vase with Carnations" painted by Vincent van Gogh in 1886.

Curiosities of Science and Technology

- The blue pigment delphinidin, which determines blue and violet flower colouration in numerous species, is absent in *Dianthus*, and breeding a truly blue or purple carnation has not been possible by conventional means. In the early 1990s, the company Florigen employed genetic engineering to transfer genes from petunia and snapdragon flowers to produce blue-mauve carnations, first commercialized as the cultivar Moondust.
- Crayons produced by the Crayola Company come in up to 200 variations. One of these, "Carnation Pink," was introduced in 1949, and is still one of the inclusions in the company's popular 24-crayon pack. New introductions generally are accompanied by retirements of older hues ("Dandelion" is being retired this year from the 24-pack).
- Carnation Evaporated Milk traces to a company founded in 1899 in the state of Washington, the Pacific Coast Condensed Milk Company, which provided a sterile dairy product before refrigeration was commonly available. In 1901, the company founder noticed a display of cigars bearing the name carnation, and transferred the word to his milk product, eventually adding carnation flowers to his cans' labels. Carnations are edible, as noted in the text, but the only association between them and milk is this curious history of clever advertising.
- In 2016, 17-year-old Hayden Godfrey of Sky View High School in Utah, purchased 900 carnations for \$450.00, and provided one for every girl in the school on Valentine's Day.



Figure 14: Boutonnières at the turn of the 19th to the 20th century (public domain drawings). Note that these are always worn on the heart side. Left source: https://en.wikipedia.org/wiki/Frock_coat. Right source: https://commons.wikimedia.org/wiki/File:Tuxedo_%26_bowler_hat_1896.jpg.

Key publications

Note: Carnations and other cultivated species of *Dianthus* are extremely popular in Great Britain, where dozens of books have been published on the subject. Only a selection of recent books are listed here.

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- Holley, W.D., and Baker, R. 1963. Carnation production: including the history, breeding, culture and marketing of carnations. W.C. Brown, Dubuque, IA. 142 pp.

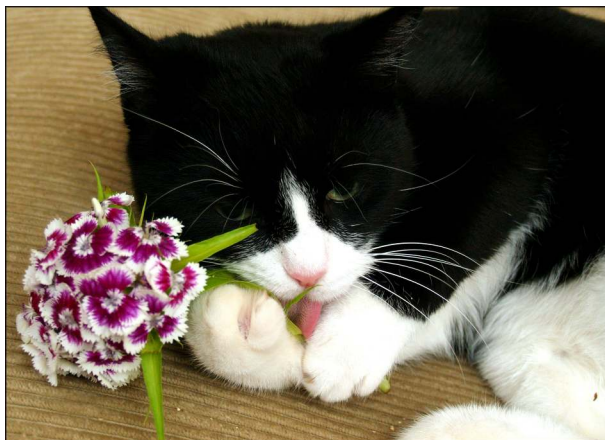


Figure 15: Cat chewing sweet William (reportedly toxic to felines). © Tommy Hemmert Olesen (CC BY ND 2.0).



Figure 16: The blue-mauve carnation cultivar Moondust, produced by genetic engineering. © Pagemoral (CC BY SA 3.0).

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Key websites

Australian Government, Department of Health, Office of the Gene Technology Regulatory. 2011. The Biology and Ecology of *Dianthus caryophyllus* L. (Carnation) – www.ogtr.gov.au/internet/ogtr/publishing.nsf/Content/biologycarnation-toc

Greenhouse production of *Dianthus*. Alabama Cooperative Extension System. www.aces.edu/pubs/docs/A/

ANR-1313/ANR-1313.pdf

Carnation (*Dianthus*) diseases. Penn State University - Cooperative Extension. extension.psu.edu/pests/plant-diseases/all-fact-sheets/carnation-diseases

Acknowledgements

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Figure 17: Vintage valentine card (public domain) drawn by E.H. Clapsaddle (1865–1934), American artist regarded as the most prolific postcard artist of her time. Scan© by Donald Harrison, UpNorth Memories (CC BY NC ND 2.0).