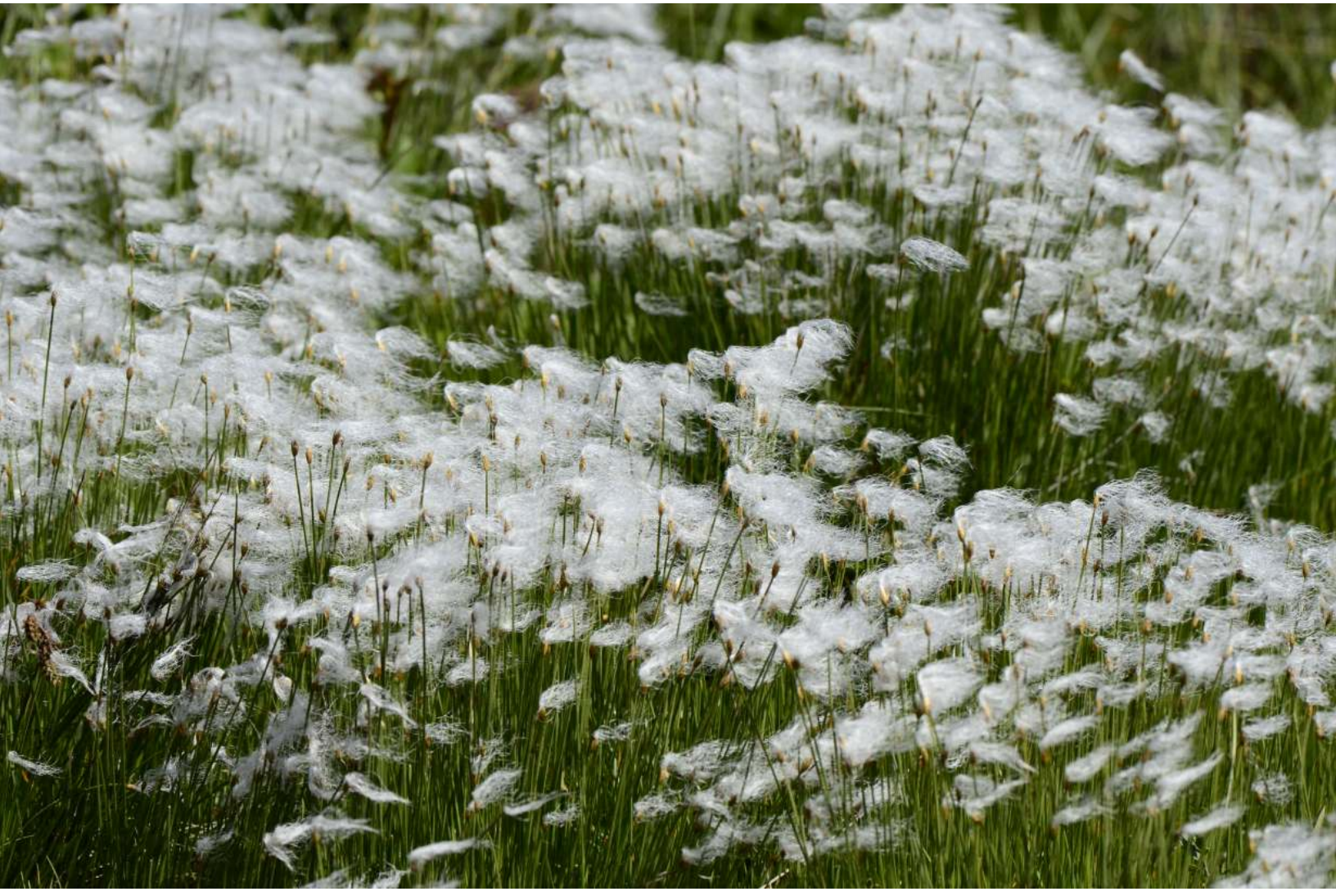
The Canadian Botanical Association Bulletin

Bulletin de l'Association Botanique du Canada

Vol. 50 Number 3, December/decembre 2017



Trichophorum alpinum (Linnaeus) Persoon ©Tyler Smith

Highlights in this issue:

President's Message page 47

Women in Science: Carrie Derick page 53

Top Ornamental Plants: Hydrangea page 58

In this issue:

President's Message 47

Seasons Greetings from Plant Canada 48

Concours: Chercheur scientifique – Phycologue 49

Competition: Research Scientist – Phycologist 50

Call for Nominations and Applications for 2018 CBA/ABC Awards 51

Reflections on Women Scientists: Carrie Derick 53

Fascination of Plants Day, May 18, 2017 56

Top Canadian Ornamental Plants. 17. Hydrangea 58

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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Next issue

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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 natureconcernant 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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Prochain numéro

La date de tombée des textes du prochain numéro, le no 51(1) , est le 1 mars 2017

President's Message

Since the fall 2017 issue of the Bulletin, Saskatoon has experienced temperatures a bit above average for this time of year. Currently the ground is solidly white but with < 0.2 m of snow. So, hopefully there will be more around the corner for outdoor activities planned ahead for the holidays!

I would like to highlight that, following our successful annual conference held at Wilfrid Laurier University in Waterloo, our next annual meeting of CBA-ABC will take place as a joint meeting with the Botanical Society of America and its affiliated societies at Rochester, Minnesota, U.S.A., from July 21-25, 2018. These joint meetings are a great way for Canadian botanists to experience new research paths and ideas that arise as synergy with our American colleagues. Interesting symposia have already been announced and much planning is underway, such that this will be an excellent meeting – and close to our international border – such that we look forward to seeing you there!! Our thanks are extended to John Markham who is serving as CBA-ABC's Vice-President for our association's planning of this meeting, including a site visit that he made to the conference venue in October, 2017.

On page 51 of this issue, please also see the annual call for nominations for the CBA-ABC's Major Awards (Lawson, Elliott, and Magister). Please consider nominating one of your deserving colleagues. Also, please see this issue's announcement, and its various deadlines throughout spring 2018, for the multiple Student Awards that the CBA-ABC is able to offer annually.

Moreover, spring 2018 marks the second call for CBA-ABC's Special Project Fund. Please see page 52 for the criteria and details about this opportunity for CBA-ABC to support a worthy botanical cause.

Also, this is an early reminder that the next international "Fascination of Plants Day" will occur on May 18, 2018. It is never too early to start planning for this very enjoyable activity, which can take many forms! In this issue (page 56), please see the various images representing some Canadian exhibits for "Fascination of Plants Day" held May 18, 2017 at the University of British Columbia and University of Saskatchewan.



It is a gratifying way to participate globally in a day that highlights plants, as one interacts with the general public and/or personnel on your institution's campus during promotion of "things botanical", including discussions about the vital importance of plants as food, clothing, shelter, and habitat, as we go about our daily lives.

Finally, I wish to take this opportunity to thank the CBA-ABC membership and especially the Board members, old and new, for all their help in so many ways, during 2017. It has been a very enjoyable and interesting year, and I look forward to our Board's annual teleconference discussions in late January, 2018.

In the meantime, all best wishes for a peaceful and restful holiday season leading to a fulfilling and rewarding New Year in 2018. Winter will pass along quickly enough, such that our nation's deciduous trees (and tamaracks / larches) will soon be relieved!

Respectfully,

Art Davis
University of Saskatchewan

Seasons Greetings from Plant Canada

Dear members of Plant Canada,

The end of the year is a time to take stock and reflect—not just on how far we've come, but also on our goals for the year to come.

Some of the Plant Canada's achievements during 2017 include: Plant Canada sponsored two cash awards for student presentations – to a graduate student (BSA and CSPB Alberta Regional group meeting) and to an elementary student for a science fair project in Lethbridge, AB; Equality and Diversity Policy for Plant Canada was developed by Plant Canada BOD; Plant Canada, which was incorporated on July 31, 2015, held its second annual meeting of members on October 19 , 2017 and Plant Canada members approved amendments to the PC by-law; in June 2017, I met with some of the members of the Executive Boards of Global Plant Council and American society of Plant Biologists in Honolulu, Hawaii, USA.

I represented Plant Canada and my employer at National Plant Health Network to develop a strategy for Canada. I am pleased to say that the federal-provincial-territorial ministers of agriculture endorsed the Plant and Animal Health Strategy for Canada. This is an important milestone.

On behalf of Plant Canada, I extend my thanks to the current PC Board, the members in each of the seven societies under Plant Canada umbrella, and the previous PC board for your contributions through out the year.

Our goals for 2018 include obtaining charity status for Plant Canada, appointment of an auditor and find ways to raise funds and promote Plant Canada and its goals in Canada.

Most Importantly, please mark your calendars, Plant Canada 2019 meeting will be held from July 7-11, 2019 at the University of Guelph, Guelph, ON. I look forward to your continued support with all the initiatives.

Please take some much deserved time over the holidays to relax and recharge with your family and friends.

I wish you peace, happiness and prosperity during the holiday season and for the coming year.

Sincerely,

Deena Errampalli
President, Plant Canada
December 2017

Concours: Chercheur scientifique – Phycologue

MRS-01
Poste permanent
73 676 $ à 88 920 $ par année
Lieu de travail: Gatineau (secteur Aylmer) au Québec

Le Musée canadien de la nature (MCN) est à la recherche d'un phycologue dynamique, innovant et créatif pour concevoir, réaliser et mener un programme indépendant et coopératif de recherche systématique sur le terrain et à partir des collections d'algues; pour publier des résultats de recherche scientifique; pour appuyer et guider le développement et l'utilisation de la collection d'algues de l'Herbier national du Canada; et pour travailler avec les autres membres du personnel du Musée au développement et à la production d'expositions et de programmes de sensibilisation et d'éducation. Le candidat retenu se joindra à la Section de botanique du MCN, qui comprend une équipe de huit employés affectés à la recherche et aux collections. La personne aura accès à d'excellentes infrastructures de recherche, y compris un laboratoire de systématique moléculaire, de puissants microscopes et la plus grande et la plus complète collection d'algues au Canada.

REMARQUE: Une procédure de promotion formelle en fonction des réalisations est en place pour faire avancer la carrière des chercheurs du MCN. Le poste est aussi doté d'un excellent programme d'avantages sociaux.

Admissibilité
Employés du Musée canadien de la nature et aux membres du grand public possédant les qualifications suivantes.

Formation
Ph.D. en biologie, avec spécialisation en taxonomie et systématique des algues.

Exigences Linguistiques
Le français et l'anglais sont essentiels.
Bilingue impératif: BBB/BBB

Expérience
Le candidat doit avoir démontré son expertise en matière de taxonomie morphologique et moléculaire et de phylogénie des algues, avoir publié et mener un programme de recherche, y compris sur le terrain. L'expérience avec les algues du Canada ou de l'Arctique serait souhaitable, de même qu'une expérience de travail dans le contexte muséal. Le candidat doit avoir de l'expérience dans l'obtention d'aide extérieure pour des projets de recherche. Le candidat doit être à l'aise avec une approche collaborative et multidisciplinaire.

Remarque
La candidature doit comporter:

- Une lettre d'accompagnement décrivant l'expérience de recherche passée et présente, un plan de recherche à long terme et les façons dont cette recherche pourrait enrichir et utiliser la collection d'algues au MCN de même que les campagnes d'échantillonnage que cette recherche pourrait comprendre;
- Un curriculum vitae;
- Trois lettres de recommandation pourraient être demandées aux candidats à une date ultérieure.

Faire Parvenir Votre Demande Par Courriel À: competition@mus-nature.ca

Veuillez indiquer le numéro de concours: **2090-CMN-17-OC-041**.

Énoncé de qualités disponible en contactant l'adresse courriel ci-dessus.

Pour tous autres renseignements concernant le poste et/ou le musée, veuillez communiquer avec: Dr. Lynn Gillespie, 613-364-4075. lgillespie@mus-nature.ca

Pour plus d'informations sur le Musée et ses programmes, visitez notre site Web à: www.nature.ca

Veuillez noter que nous communiquerons uniquement avec les candidats retenus pour la prochaine étape de la sélection.

Le Musée canadien de la nature s'est engagé à instaurer des processus de sélection et un milieu de travail inclusifs et exempts d'obstacles. Si l'on communique avec vous au sujet du présent concours, veuillez faire part à la conseillère en ressources humaines de vos besoins en matière de mesures d'adaptation, le cas échéant, pour assister à une entrevue ou participer au processus de sélection.

Le Musée souscrit au principe de l'équité en matière d'emploi.

Date Limite: le 31 janvier 2018 à 17 h.

Competition: Research Scientist – Phycologist

MRS-01
Permanent Position
$73,676 - $88,920 per year
Work location : Gatineau (Aylmer sector) in Québec

The Canadian Museum of Nature (CMN) is seeking a dynamic, innovative and creative phycologist to conceive, design and conduct a program of independent and collaborative, field and collection-based systematic research on algae; to publish results of scientific research; to contribute to and provide advice on the development and use of the National Herbarium of Canada algae collection; and to work with other museum staff on the development and production of exhibits, outreach and educational programs. The successful candidate will join the CMN's Botany Section, which includes a team of eight research and collection staff. He/she will have access to excellent research infrastructure, including a molecular systematics laboratory, high-powered microscopy facilities, and the largest and most comprehensive algae collection in Canada.

NOTE: A formal procedure for promotion based on achievements is in place to develop the career path of CMN's research scientists. An excellent benefits package comes with the position.

Open To

Employees of the Canadian Museum of Nature and the general public who meet the following qualifications.

Education

Ph.D. in biological sciences, with a specialization in the taxonomy and systematics of algae.

Language Requirements

English and French are essential.
Bilingual imperative: BBB/BBB.

Experience

The candidate must have demonstrated expertise in morphological and molecular taxonomy and phylogenetics of algae, with a proven publication record and an active research program, including fieldwork. Experience with the algae of Canada and/or the Arctic would be an asset, as would experience working in a museum context. The candidate should have experience in obtaining external support for research projects. The candidate must be comfortable with a collaborative and multi-disciplinary approach to projects.

Note

The application should include:

- a cover letter describing past and present research experience as well as a proposed long-term research plan, the ways in which this research would contribute to and utilize the CMN algae collection, and the fieldwork this research may include;
- a curriculum vita;
- Three letters of recommendation may be requested from candidates at a later date.

Send Your Complete Application By Email To: competition@mus-nature.ca

Please state competition: NO. **2090-CMN-17-OC-041**

Statement of qualifications available by contacting the email address above.

For additional information regarding the position and/or the museum, please contact: Dr. Lynn Gillespie, 613-364-4075. lgillespie@mus-nature.ca

For information on the Museum and its programs, see our web site at: www.nature.ca

Please note that only candidates who are selected for the next stage of the selection process will be contacted.

The Canadian Museum of Nature is committed to developing inclusive, barrier-free selection processes and work environments. If contacted regarding this competition, please inform the Senior Advisor, Human Resources should you require accommodation to attend an interview or participate in the selection process.

The Museum supports employment equity.

Closing Date: January 31, 2018 at 5 p.m.

Call for Nominations and Applications for 2018 CBA/ABC Awards

Each year the Canadian Botanical Association / L'Association Botanique du Canada provides awards to botanists studying in Canada, and/or to Canadian botanists studying abroad. Many of the awards are available to non-Association members. Applications and nominations are now open for the following:

CBA-ABC Major Awards

The Lawson Medal is most prestigious award of the CBA-ABC. It recognizes excellence in the contribution by an individual to Canadian botany.

The Mary Elliott Service Award is given to an individual for meritorious service to CBA-ABC.

The Magister Award is given for teaching excellence in plant science within Canada.

For more information about these major CBA-ABC awards, please see www.cba-abc.ca

Nomination deadline: February 28, 2018.

CBA-ABC Student Awards

PUBLISHED PAPERS

These awards are given to students for a paper they have published in the last year:

Porsild-Consaul Award, $1000: awarded for the best paper in phytogeography or systematics.

Stan Rowe Award, $500: awarded for the best paper in plant ecology (see 51 for additional details).

Taylor Steeves Award, $500: awarded for the best paper in plant development or structure (see page 52 for additional details).

Luella Weresub Award, $1000: awarded for the best paper in mycology or lichenology.

Application deadline: April 15, 2018.

For Presentations at the Annual CBA-ABC Meeting

Lionel Cinq-Mars Award, $500: awarded for the best oral presentation.

Iain and Sylvia Taylor Award, $500: awarded for the best poster presentation.

Application deadline: May 1, 2018.

For Travel to Participate at the CBA-ABC Meeting

These awards provide modest funds to assist travel costs by graduate (**Macoun Travel Bursary**) or undergraduate (**Winterhalder Travel Award**) students presenting talks or posters at the annual CBA/ABC meeting.

Value: $150-500

Application deadline: May 1, 2018.

For Research Travel Related to Canada's North

Laurie Consaul Northern Research Scholarship, $1000

Application deadline: February 28, 2018.

For further information and the application procedures for these CBA-ABC student awards, please see www.cba-abc.ca.

Stan Rowe Plant Ecology Award

This award was established to celebrate the life and work of Stan Rowe, eminent Canadian Plant Ecologist. Student award winners receive a one year membership in the Canadian Botanical Association, along with a $500 prize.

Criteria of the Award:

- Subject related to plant ecology – Canada
- Important field component
- Based on work done within a graduate degree
- Published within 2 years of graduation
- The paper must have been published during the year preceding the annual meeting of the CBA/ABC
- Students do not have to be CBA members to be eligible.
- No candidate may submit a paper for more than one CBA award.

To apply submit to Nicole Fenton (Nicole.fenton@uqat.ca) or André Arsenault (andre.arsenault2@canada.ca):

- CV including current address and email;
- Letter of presentation highlighting your role in the study and paper, with supporting letters from the other authors;
- Letter of support from your supervisor indicating that the work was undertaken as part of a graduate program;
- A copy of the paper or proof of the paper plus a letter from the editor of the journal stating that the paper is in press within the eligible publication date.

The Judging Committee reserves the right to make no award if submissions are not considered of sufficiently high quality, or to share the award between two applicants if their papers appear to be of equal merit. The winner will be notified, and the award will be presented during the Annual Meeting of the CBA, the winner is encouraged to attend.

Taylor Steeves Plant Development Award

Students conducting research in plant development, structure or morphology are encouraged to submit applications for this award. The award honours Taylor A. Steeves (1926-2011), whose many research and teaching accomplishments and contributions to the CBA were remembered in the December 2011 Bulletin (Vol. 44, No. 3). For further information or to submit applications or nominations, please contact Simon Chuong (University of Waterloo, email below).

Complete applications should be received by April 1st 2018. A complete application consists of:

- a copy of the published research (undertaken while the candidate was a student)
- the candidate's curriculum vitae
- a statement indicating that the candidate is enrolled in a degree program, or has completed the relevant degree program
- separate statements from the candidate, supervisor and any co-authors indicating the contributions made by each to the final publication.

It should be noted that terms of this award require eligible students have graduated from or are currently enrolled in a Canadian University. The judging committee considers originality, scientific significance, presentation and use of language. The judging committee consists of the Chair of the Plant Development section and two others. Any members interested in serving as judges should contact:

Simon Chuong, schuong@uwaterloo.ca
Department of Biology, University of Waterloo

Moira Galway, mgalway@stfx.ca
Department of Biology, St. Francis Xavier University

CBA-ABC Special Project Fund

Explanation of the fund: The CBA-ABC is financially sound and has a mandate to promote botany in Canada. The purpose of the Special Project Fund is to support botanists, promote botanical research and education, and to raise the profile of the CBA-ABC.

Potential uses of the Special Project Fund include:

- Travel support for research early in a graduate student's program.
- Support of publically accessible botanical resources, including collections.
- Botany education projects.
- Seed money to support collaborative research initiatives among labs.

Funding level and applicant eligibility: Each year up to half of the CBA-ABC's profits from its annual meeting will be available for the Special Project Fund. The funding level for the award will normally be recommended at the Incoming Board meeting, but ideally will be a minimum of $1,000 per year and ultimately decided by the CBA-ABC Executive. Applicants must be CBA-ABC members in good standing. Applicants are eligible for funding in subsequent years, but priority will be given to new applicants.

Adjudication: The CBA-ABC Awards Committee will make award decision(s) from the applications received by the annual deadline (e.g., February 1st) posted with the annual call for applications, in the CBA-ABC Bulletin. Awards will be judged based on the following criteria:

- Support of CBA-ABC student members in need.
- Provision of funding to CBA-ABC members for projects that lack other funding sources.
- Raising the profile of the CBA-ABC.
- Providing outreach to the general public.

Application procedure

An application shall include:

- Name and position of the applicant.
- A brief (one page) description of the project.
- A budget, including a description of other funding sources.
- A description of how the project relates to the award criteria listed above.
- A plan for disseminating the results of the project.

The completed application should be submitted to art.davis@usask.ca by February 1, 2018.

Article for CBA-ABC Bulletin: Within 12 months of receipt of funds from the Special Project Fund, award recipient(s) shall submit a formal one-page report about their project and its outcomes, for publication in the CBA-ABC Bulletin.

Reflections on Women Scientists Today Drawn from Looking at Carrie Derick, Canada's First Woman University Professor

T. A. Dickinson & F. C. Guinel

On 14 January 2017, the Google Doodle[1] seen in Canada represented a woman examining a plant and seeing various aspects of its structure. What was that all about? It was a celebration of the 155th birthday of botanist Carrie Matilda Derick (1862–1941), the first woman to be appointed a full professor at a Canadian university. As they say, who knew? Certainly, neither of us, and quite possibly not many other members of the CBA/ABC. However, while it may appear that Professor Derick has largely been forgotten, it is worth noting that this has not been the case in Montreal[2], and especially at McGill University. Carrie Derick is memorialized by the McGill Alumnae with a scholarship of $2,000 in her name for "a distinguished woman student" in the Faculty of Science. Since 1999, Graduate and Postdoctoral Studies at McGill awards the "Carrie M. Derick Award for Graduate Supervision and Teaching" to faculty who are in their first ten years as supervisors. Recent web pages on the university website recount Derick's accomplishments[3]. Earlier this year, the Redpath Museum hosted a theatrical celebration of Montreal women in the arts and sciences that included a short play, "Campo San Angelo," by Colleen Curran that imagined a 1920 encounter in Venice between Derick and the Canadian painter Emily Coonan[4].

Derick's story is one of considerable academic accomplishment and social activism, combined with the invidious effects of sexism. It seems worth recounting briefly here, in its own right, and as an opportunity to examine just how much progress has been made by women academics in Canada. Derick was born in Clarenceville, close to the U.S. border in Quebec's Eastern Townships. She attended Clarenceville Academy and, at the age of 15, she began teaching there. After an interlude of teacher training in Montreal at the McGill Normal School, Derick spent 1881-1883 as the Principal of the Clarenceville Academy and then took a teaching position in Montreal. In 1884 McGill University admitted its first class of women undergraduates, following a donation by Sir Donald A. Smith (later Lord Strathcona) that was made to enable McGill to enroll female undergraduates. Derick entered McGill in 1887 and got her B.A. with first class honors in 1890, along with prizes in classics, botany, zoology, and the Logan Gold Medal in natural history.

These accomplishments led the American David Penhallow, McGill's first Macdonald Chair of Botany, to lure Derick away from teaching in a girls' school to become his assistant. She was hired in 1892 as a part-time demonstrator in botany for $250 a year. She also enrolled as a postgraduate student, and obtained her M.A. in 1896. Penhallow recommended the new M.A. for promotion to a full-time appointment as Lecturer in Botany, but the McGill Governors chose to offer her only a demonstratorship at $750 a year, the same salary as given to a man with only a bachelor's degree. Derick accepted a new appointment, as "Lecturer in Botany and Demonstrator in the Botanical Laboratory", only after Sir Donald A. Smith provided the funds needed to offer Derick a salary of $1,000 a year.



Figure 1: Carrie M. Derick circa 1920. ©McGill News / McGill University Archives, PR001202

Derick spent the summers of 1896 and 1897 at the Woods Hole Marine Biological Laboratory, where she studied holdfast development in red algae, work she completed

[1] www.google.com/doodles/carrie-dericks-155th-birthday

[2] Curran, P. (2011). Honouring Carrie Derrick, Canada's first female professor on International Women's Day. Montreal Gazette 8 March 2011. montrealgazette.com/news/local-news/honouring-carrie-derrick-canadas-first-female-professor-on-international-womens-day accessed 10 December 2017.

[3] Birker, I. (2017). Carrie Derick: Pioneering Educator. publications.mcgill.ca/reporter/2017/03/carrie-derick-blazing-the-trail-for-female-professors-and-researchers/ accessed 10 December 2017.

[4] Wright, K. (2017). Women's Work: Staged readings by Colleen Curran & Peggy Curran. Festival Bloomsday Montréal. bloomsdaymontreal.com/womens-work-staged-readings-colleen-curran-peggy-curran/ accessed 10 December 2017.

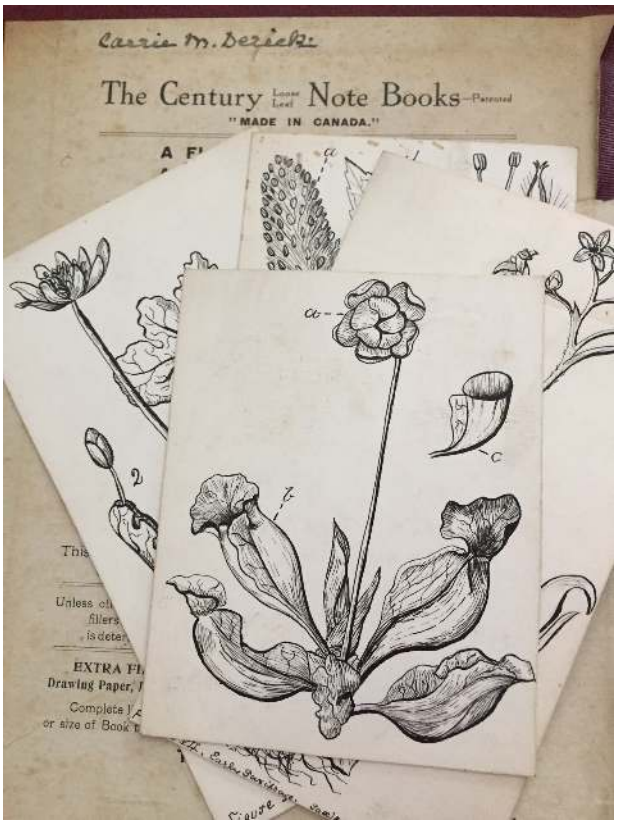


Figure 2: Sketches for one of the articles in the series "Flowers of the Field and Forest" by "C. M. D." published in the *Family Herald and Weekly Star*, Montreal, Summer 1900, and reissued as a pamphlet in 1901. archive.org/details/cihm_78160 accessed 30 November 2017. Photo courtesy of and ©Peggy Curran 2017.

at McGill and published in 1899[1] in a paper cited as recently as 1976. During 1901 and 1902, Derick took an 18-month leave of absence to study in Germany. She visited labs and gardens at the Universities of Berlin and Munich, and studied at Bonn for two semesters. Despite the research she performed there, Derick received no recognition as the University of Bonn did not at that time grant Ph.D. degrees to women. During this time she also wrote popular essays on plants and other topics, and took part in activities in support of working women and women's suffrage[2].

In 1904 Derick was appointed Assistant Professor of Botany, and in 1909 she was asked to serve as Acting Chair of the Botany Department when Penhallow became ill. He died the following year, and Derick continued as Acting Chair. In 1912, however, McGill sought to fill Penhallow's position and advertised in Europe and the United States for suitable candidates. Derick was told she could also apply and she did, but in the end, despite support within the university and from its patrons, the American botanist Francis E. Lloyd was appointed. The situation was uncomfortable for both Lloyd, who expected to have an assistant, and Derick, who understandably felt unappreciated. The university attempted to make amends by appointing Derick Professor of Morphological Botany, a title that grated on her as it ignored her teaching and research interest in the new science of Genetics.

In 1920, Derick was also appointed Lecturer in Social Service, and, in 1928 Professor of Comparative Morphology and Genetics. She retired in 1929 and was recognized as Professor Emeritus of Comparative Morphology and Genetics. She died in Montreal in 1941. Derick's education, appointment, and career all exemplify the difficulties and frustrations encountered by women in Canada in the early 1900s who sought higher education and endeavoured to have academic careers in their own right and on a par with men.

Unfortunately, despite the pioneering efforts of Derick and other women at McGill and elsewhere, the sexist barriers to women's participation in Canadian science generally, and in Canadian botany in particular, were not broken down until the Second World War and the dramatic social changes that followed it. Even today, achieving equity is a work in progress that has become even more complex because it involves eliminating barriers of class, color, and culture as well. Students and young scientists may be surprised that some institutions hired their "first woman professor" only in the past 25 years. Presentation of some of the information available on Professor Derick, at the annual conference of the CBA/ABC held at Wilfrid Laurier University in July this year[3], was intended to remind Canadian botanists of an important academic foremother. The presentation also included references to some of the challenges that remain, and took note of some of the efforts being made to address these challenges. It is quite encouraging to read, for example, the reports released in November 2017 by Statistics Canada. They include information on Canadian universities from 2016-2017 and reveal an increased representation of women in full-time teaching staff, (almost 40%, up from 36.6% in 2010-2011), and a continuing increase in the proportion of the median male salaries now earned by female faculty (full professors, to 95.3%; associate and assistant level staff both up to 97.7%)[4]. Although progress has been made in reducing the gap in appointments and salary in terms of gender ratio, much remains to be done. We are all concerned because at the core of a better and stronger society is an equitable, diverse, and inclusive research community.

In our Association, despite a sense of a supportive and welcoming environment regardless of gender, we still face at least a perception of imbalance. At the AGM held at Laurier this year, we all heard the concern expressed that the goal of gender parity on committees has not been truly respected. Why is this perception still there? The answer may

[1] Derick, C. M. (1899) Notes on the development of the holdfasts of certain Florideae. Bot. Gaz. 28(4): 246-263. Plates 21-23. doi.org/10.1086/327908 accessed 30 November 2017.

[2] These activities are described in Gillett, M. (1990) "Carrie Derick (1862—1941) and the Chair of Botany at McGill," pp.74-87 in *Despite the Odds*, M. Gosztonyi Ainley ed., Véhicule Press, Montreal.

[3] For the slides used in this presentation see the bottom of the page at labs.eeb.utoronto.ca/dickinson/NABFH-I/#Derick.

[4] "Number and salaries of full-time teaching staff at Canadian universities, 2016-2017," The Daily, 28 November 2017. www.statcan.gc.ca/daily-quotidien/171128/dq171128b-eng.htm accessed 29 November 2017.

lie in numbers. While one of us thought that there was an obvious gender disparity in the CBA/ABC award recipients, the other performed a simple statistical analysis. In fact men and women get similar proportions of the three kinds of awards; there are just fewer females getting awards of any kind (18 compared to 73).

However, it is true that females tend to get proportionally more Mary E. Elliott awards, and fewer Lawson Medals. What could be the explanation? Females, because of their socialization, or because of the realities of their work situations, are perhaps more willing to devote time to service activities than to focus exclusively on achieving a brilliant career. The eligibility criteria for the CBA/ABC Lawson Medal may appear daunting to females ("outstanding", "cumulative lifetime contribution") because often females do not see themselves as excellent, and many take time off to raise children. It appears to us that there is little consideration in these criteria for gender-related accomplishments. It is time to revisit these criteria that were put in place 50 years ago, in order to better take into account the lives of scientists and academics today. No longer can anyone spend most of their time working in a lab or doing fieldwork unless it is done at the expense of one's personal life, given the many other demands made by administrators and granting agencies. Both men and women are expected to excel in practically everything but, in reality, women often face disproportionately greater competing demands from family and society. We might instead consider stressing the novelty and value of a researcher's insights, in addition to counting up publications and students.

In conclusion, we hope that this report on Carrie Derick will lead to discussion among the members of the association, and that it will lead to positive and constructive changes. The CBA/ABC has been an excellent and respectful forum where students, the scientists of tomorrow, have always been nurtured. If we are to move forward, we should include our students in the discussion so that they are the ones who, by their open minds and behaviour, make the changes.

In addition to the sources noted above, we are indebted to Pam Foster and Rosa Barker, CAUT Equity Office; Gordon Burr and Lori Podolsky, McGill Archives; Peggy and Colleen Curran, Montreal; and Ingrid Birker, Redpath Museum, McGill. Nancy Dengler, Anne Bruneau, and the late Usher Posluszny shared ideas and information about Carrie Derick and other women in Canadian botany.

Fascination of Plants Day, May 18, 2017



Jarnail Chandi (right) at the Fascination of Plants Day Exhibit at UBC



Santokh Singh (center) and Jarnail Chandi (right) at the Fascination of Plants Day Exhibit at UBC



Dylan Johnston (left), Kelton Braun (center) and Art Davis (right) at the Fascination of Plants Day Exhibit at the University of Saskatchewan



The Fascination of Plants Day Exhibit at the University of Saskatechewan

Top Canadian Ornamental Plants. 17. Hydrangea

Ernest Small[1,2]

Hydrangeas are admired for their large, long-lasting flower clusters in attractive colours. They are among the most popular of ornamental shrubs, some cultivars producing spectacular floral displays. In recent years hydrangea has also become a major potted plant, marketed in stores for holiday gifts and for use as short-term houseplants. Worldwide, hydrangeas generate hundreds of millions of dollars annually, and in Canada they are among the leading floral retail commodities. As will be noted, the determination of flower colour in some species by soil pH represents one of the most curious phenomena in nature.

Names

Scientific names: The genus name *Hydrangea* is based on Greek *hydor*, water + *angeion*, vessel or container, alluding to the shape of the mature, dehisced capsule.

Common names: Like many popular ornamentals, the common name (hydrangea) is the same as the genus name. The occasional name "hortensia" (a standard name in Europe and the French name) has the same etymological origin as *Hydrangea*. English and French common names for the five species highlighted are presented later. In warmer climates outside of Canada, "hydrangea" unqualified usually refers to *H. macrocarpa* (which is usually called "hortensia" in Europe). Since *H. paniculata* is the most widely grown species in Canada, "hydrangea" is more likely to refer to this species.

Symbolism

Hydrangeas bloom abundantly during the rainy season in Japan (June and early July), and accordingly often symbolize early summer. In Japanese tradition, hydrangea flowers represent deep or heartfelt emotion as well as a fickle or changeable heart (reflecting the instability of flower colour). In feudal Japan, warriors despised hydrangeas because changing colours came to symbolize unstable loyalty. In Western countries, hydrangeas have come to symbolize gratitude, grace and beauty on the positive side, and on the negative side vanity and boastfulness (perhaps reflective of the abundance and beauty of the flowers), and frigidity when the flowers are blue (allegedly because in Medieval times it was believed that young women who grew or picked hydrangeas would never find a husband). Alabama designated the oak-leaf hydrangea (*H. quercifolia*) as its "official state wildflower" in 1999 (camellia is the "state flower" of Alabama). Unofficially, hydrangea is considered to be the floral symbol of Brittany (France).

Wild *Hydrangea* species

Some taxonomists consider *Hydrangea* to include as many as 1,000 species, but most of these are usually placed in seven other genera. *Hydrangea* in a narrow sense only includes several dozen species (the exact number recognized depending on authority). Interpreting the genus in this restricted sense, it is made up of shrubs, small trees and vines.



Figure 1: *Hydrangea macrophylla* growing on a hillside by a shrine in Japan. ©Aiko Matsuoka (CC BY SA 3.0).

The species native to temperate areas of eastern Asia and North America are deciduous and the main source of the cultivars. The species native to subtropical Central America and western South America are evergreen. Five species (all deciduous) are indigenous in the US. None is native to Canada, but *H. paniculata* is introduced in Ontario, and *H. arborescens* in Ontario, New Brunswick and Nova Scotia.

Domesticated *Hydrangea* species

Hydrangea species have been cultivated and domesticated as ornamentals in China and Japan at least for centuries. In 1789 the famous British naturalist Sir Joseph Banks imported *H. macrophylla* into England from China, this species destined to become the predominant source of cultivars

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Figure 2: Massed blooms of *Hydrangea macrophylla*. Source: Pixabay (public domain).



Figure 3: Canadian stamps issued in 2016, showing recent hydrangea cultivars. **Left:** *Hydrangea macrophylla* 'Endless Summer'. **Right:** *H. arborescens* 'Annabelle'. © Canada Post.

in the genus. Subsequent eighteenth and nineteenth century plant collectors brought other Asian species and garden forms to Europe and North America. About the same time, the eastern North American species *H. arborescens* and *H. quercifolia* were brought to the Old World. Breeding has been continuing in both the Old and New Worlds, but to date the majority of cultivars arose in Europe and Asia.

Hydrangeas grown outdoors usually form rounded shrubs 1–3 m tall. The most common cultivated *Hydrangea* species are four deciduous shrubs: *H. arborescens*, *H. macrophylla*, *H. paniculata*, and *H. quercifolia*. Cultivars of several other species are available, but are much less significant commercially, and are not mentioned further in this review. However, the vine *H. anomala* subsp. *petiolaris* has also acquired appreciable popularity, and is discussed. The genus includes at least 1,000 cultivars (the majority in *H. macrophylla*), and some interspecific hybrids have been generated for garden cultivation. The five species mentioned here can all be grown in Canada, at least in the warmer regions, but the relatively cold-hardy *H. paniculata* is the predominant Canadian *Hydrangea*.

Hydrangeas are best known for their attractive inflorescences. Like the Asteraceae (Compositae; daisy family), these are usually made up of a combination of small, inconspicuous fertile flowers in the centre of the cluster and large, showy (pollinator-attracting) infertile flowers surrounding the central sterile ones. (Small flowers such as in the Asteraceae and Hydrangeaceae are often informally termed "florets.") The showiness of the sterile flowers resides mostly in the petaloid sepals (an enlarged calyx is present, a corolla is not and sexual organs, if present, are rudimentary). The fertile flowers produce nectar, the infertile ones do not. Wild populations have inflorescences composed mostly or entirely of small, fertile flowers. Domestication has produced many cultivars in which most or all of the flowers are of the large, showy, sterile type. Inflorescences in which most of the flowers are large, showy and sterile and clustered into a pom-pom shape are referred to as "mopheads" and "hortensias," in contract to the "lacecap" category which has retained central small fertile flowers. Large, globe-shaped puffy mophead blooms (named for the alleged resemblance to a mop head) are what most people associate with hydrangeas. Lacecap inflorescences tend to be flattened rather than spherical, and many lacecap cultivars have differently coloured fertile and sterile flowers. Lacecaps have been claimed to be named for their likeness to Colonial ladies' headcoverings. The outer flowers are often much larger than the sterile flowers, primarily made up of four or five sepals. The flowers of some cultivars have been doubled, i.e., in addition to the petaloid sepals, the true petals and stamens have been mutated to increase the number of petaloid structures. While white is the most common floral colour in wild *Hydrangea* species, in cultivars flowers may also be pink, blue, purple, red, and occasionally yellow. In some cultivars, flower colour (or at least depth of shade) changes with maturity. "Remontant" cultivars re-bloom (usually in later summer).

Hydrangea macrophylla

This, by a considerable margin the most widely cultivated species of *Hydrangea* in the world, is known as: bigleaf hydrangea, common hydrangea, florist's hydrangea (potted forms used as houseplants), French hydrangea (reflecting the importance of France in the past as a source of cultivars), garden hydrangea, hortensia (the predominant name in Europe), house hydrangea, and snowball hydrangea (French names: hortensia, hortensia à grandes feuilles). It is native to Japan and Korea, commonly growing 1–2 m (3–6 feet) in height (occasionally more than 3 m or up to 10 feet), and spreads to 2.6 m (8 feet). *Hydrangea macrophylla* subsp. *serrata* (mountain hydrangea, often separated as the species *H. serrata*) has somewhat smaller flowers and leaves.



Figure 4: The two basic inflorescence forms in *Hydrangea*. **Left:** Mophead (all florets sterile, large and showy). **Right:** Lacecap (central florets fertile, small and inconspicuous; outermost florets sterile, large and showy). Source of photos: Pixabay (public domain).



Figure 5: Cultivars of *Hydrangea macrophylla*. © Camelotrose (CC BY SA 3.0).

Hydrangea macrophylla is popular because it is easily cultivated, requires little maintenance, has few pests and diseases, is tolerant of shade and sun, can be grown in acid and slightly alkaline soil, and provides outstandingly beautiful flowers. There are many seaside biotypes in Japan that are very salt-tolerant. Unfortunately, most cultivars are insufficiently cold hardy to produce a good flowering display outdoors in most of Canada. The flower buds (produced in late summer and fall) are susceptible to low winter temperatures and are too tender when they sprout in the spring to survive heavy frosts. Planting in a sheltered location may help. Where it can be grown, pruning should be avoided or limited once flower buds begin to develop, or none will be available to bloom the next season. Several new cultivars, most notably 'Endless Summer', develop their flowers not only on old wood but also on new wood (the current year's growth), and so are not completely dependent on mild weather during both winter and spring to produce good floral displays.

Hydrangea paniculata

Known as panicle hydrangea, panicled hydrangea, PG hydrangea, and hardy hydrangea (French names: hortensia paniculé, hortensia en panicule), this species is native to cool temperate and subtropical regions of Japan, Sakhalin (Russian island north of Japan), and eastern and southern China, where it grows as a shrub or small tree as high as 8 m (26 feet). Cultivars of *H. paniculata* are usually 1–2.5 m (3 –8 feet) in height, and tend to have cone-shaped inflorescences, unlike the usually spherical inflorescences of *H. macrophylla* (see figures). *Hydrangea paniculata* was collected from Japan and named in 1829 by the German physician and botanist Philipp Franz von Siebold, who was subsequently banned from the country. Thirty years later he was allowed to return, and collected the cultivar 'Grandiflora', now generally known as 'PeeGee'. Although now old-fashioned, it is still the world's most popular cultivar of *H. paniculata*, and the most widespread hydrangea grown outdoors in Canada. (Because it is often used for the purpose in Canada, it has been called "cemetery flower.") Panicle hydrangea is frequently trained as a small tree. *Hydrangea paniculata* flowers on new wood developed in the spring, and may be pruned in winter or early spring. Compared to the more popular *H. macrophylla*, it is more drought-tolerant, thrives better in both full sun and partial shade, and also has a broader tolerance to soil conditions, withstanding not only acidic but somewhat alkaline soil. Most importantly insofar as Canada is concerned, *H. paniculata* is much more cold-tolerant than *H. macrophylla*, capable of surviving -30°C, and unlike *H. macrophylla* its buds are not susceptible to early spring frosts. Dirr (2004) stated that "*Hydrangea paniculata* is as easy to culture as crabgrass."



Figure 6: Cultivars of *Hydrangea paniculata*. **Left:** 'Vanilla Fraise'. © Leonora (Ellie) Enking (CC BY SA 2.0). Right: 'Limelight'. © Michelle Oshen (CC BY SA 2.0).



Figure 7: *Hydrangea quercifolia*. **Left:** 'Snowflake'. © Krzysztof Ziarnek Kenraiz (CC BY SA 4.0). **Right:** Colourful foliage in autumn. © University of Washington Botanic Garden (CC BY 2.0).

Hydrangea quercifolia

Oakleaf hydrangea (so named for the leaves which are lobed somewhat like red oaks; French names: l'hydrangea quercifolia, hortensia à feuilles de chêne) is native to the southeastern U.S. and is marginally cold-hardy. It can grow in the warmest parts of eastern Canada (it produces good flowering displays in Toronto). Unlike most cultivated hydrangeas which have uninteresting foliage colour in the autumn, *H. quercifolia* develops a striking range of reds, oranges and deep maroon leaf hues in the fall. The shrubs commonly grow 2 to 2.5 m (6–8 feet), but tend to spread wider than their height from root suckers. Large, white to cream-colored flowers are produced in early to mid-summer, these sometimes turning pink to rose with age. The flowers develop on old wood, and pruning if necessary is best done after flowering, not in late summer or fall which would remove potential buds.

Hydrangea arborescens

This species is known as seven-bark (for the layers of bark which peel away easily), smooth hydrangea, tree hydrangea, and wild hydrangea (French names: hortensia en arbre, hortensia de Virginie, hydrangelle arborescente). It is native to eastern US woodlands, and has become introduced in eastern Canada. The plants are usually 1-2 m (3– 6.5 feet) tall, occasionally 3 m (10 feet). Flowering is on new wood of the current season, and so the plants can be pruned in early spring without fear of removing flower buds. The species can be grown in the warmer regions of southern Canada, including the southern Prairie Provinces. Most cultivars are white-flowered, but pink forms are available.



Figure 8: *Hydrangea arborescens*. **Left:** © Kor!An (CC BY SA 3.0). **Right:** from Curtis, W. 1799. Botanical Magazine, vol. 3, plate 437.

Hydrangea anomala* subsp. *petiolaris

Climbing hydrangea (French: hortensia grimpant) is a woody deciduous vine native to woodlands and forests of eastern Siberia, Japan, China and South Korea. It grows over shrubs and trees by twining and by aerial rootlets that develop along the stems. The rootlets can adhere to brick and vinyl siding so tenaciously that they are impossible to remove. Although slow to develop, this vine produces vigorous, sprawling growth that can be almost shrub-like. Climbing hydrangea is employed as an ornamental vine and as a groundcover. Flowering occurs on old wood, so to promote good floral displays pruning is best done after flowering. However, when growing vigorously, it is advisable to prune whenever necessary to prevent stray stems from developing where they are unwanted. Climbing hydrangea is hardy in the southernmost areas of eastern Canada. It is tolerant of different soil types but does best in well-drained substrates.

Environmental control of flower colour

One of the first chemistry lessons that students learn is that litmus paper becomes blue under alkaline conditions (pH >7.0), and red in an acidic environment (pH <7.0). Curiously, the reverse often occurs with respect to *Hydrangea* flower hues in respect to soil pH. Blue and pink are principal floral colours of *Hydrangea* cultivars, some of which are famous for having the capacity to develop one or the other colour depending on the soil in which they grow. The colour produced in such species (most notably *H. macrophylla*) has been found to be determined by a cultivar's inherent ability to produce pigment, aluminum (aluminium) availability in the soil or substrate, and the biotype's ability to uptake aluminum. Blue colour results when aluminum complexes with a pigment (the anthocyanin delphinidin 3-glucoside) in the sepals. When the pH of the growth medium is acidic



Figure 9: *Hydrangea anomala* subsp. *petiolaris*. **Left:** Vine climbing on a brick wall. © Leonora (Ellie) Enking (CC BY SA 2.0). **Right:** Close-up of flowering stems. © A. Barra (CC BY SA 3.0).



Figure 10: Potted *Hydrangea macrophylla*. **Left:** © Dalibri (CC BY SA 2.0). **Right:** © Freak222 (CC BY SA 3.0).

(4.5–5.5), flower colour tends to become blue because aluminum is generally highly available at a low pH. At pH $\geq$ 6.0, flower colour tends to be pink. Between pH 5.5 and 6.0, the colour could be pink, blue, lavender, or a mixture of pink and blue on the same plant. However, some species, and some cultivars simply cannot be made to develop blue flowers regardless of soil pH, some will only develop scattered blue flowers within an inflorescence, and some will produce rather unattractive floral shades.

Blue is the world's most popular colour, the preference for it showing up across cultures. It is no accident that the sexist preference for baby boys is associated with blue garments, and the traditional powder blue of the majority of cultivated hydrangeas is consistent with this favouritism. Psychologists have explained the preference for blue as perhaps reflecting the calmness of blue skies and blue oceans. Nevertheless, red is the world's most "attractive" colour, consistent with lips and nipples being reddish, but so is blood, the sight of which is alarming, which may explain why pink (a softened red: attractive but not overly so) has become traditionally associated with baby girls (indeed with women).

Nursery growers have reported that they sell on average ten blue hydrangeas for every pink one, so controlling flower colour is crucial. (Nevertheless, in Asia, pink hydrangeas seem to be increasing in popularity.) For many varieties of *H. macrocarpa* grown in containers, development of blue flowers requires particular substrate conditions. Soil pH is usually maintained at 4.5 to 5.5. Some growth media may have very little aluminum, and so just influencing pH may not affect flower colour in plants potted in such material. For some biotypes, care must be taken to regulate fertilizers and water quality to avoid deficiencies of minerals such as calcium, magnesium and aluminum, and to also avoid metal toxicities. For home growers, to produce pink flowers it may suffice to simply add lime to raise soil pH, or to produce blue flowers add sulphur to lower pH. A quick-and-dirty procedure to produce blue flowers in susceptible cultivars is to drench the soil around the plant with a gallon (4 L) of water in which 1 tablespoon of alum (aluminum sulphate) has been dissolved. Or, to make flowers pink, dissolve 1 tablespoon of hydrated lime instead. Fertilizers low in phosphorus will tend to produce pink flowers, since this element ties up aluminum. Those expecting to see colour changes overnight will be disappointed: generally soil conditions must be provided well before and sometimes during flower development.



Figure 11: Painting (public domain) entitled "Young woman with hydrangeas" by the French artist Elisabeth Sonrel (1874–1953).

The cut flower industry

Hydrangea is employed as a cut flower crop, popular because of the large size of the flowers and the variety of colours available. The inflorescences are often used in bouquets and floral decorations for weddings, parties, and other events. The flowering stems have excellent vase life, and dry well for dried flower arrangements. Worldwide, about 1,200 ha have been planted to produce cut hydrangea. The most important countries of production are Colombia and The Netherlands.

Houseplants

Potted hydrangeas are increasingly being sold in supermarkets, especially for holidays. In both Europe and North America, there is high demand for potted hydrangeas at Christmas, Easter and Mother's Day. In Europe, more than 60 million pots are sold annually, with production centred in The Netherlands, Germany and France. Most of these so-called "florist hydrangeas" are *H. macrophylla*, grown to bloom very early and abundantly. They may be dwarf forms, or simply cultivated to be small. In warm regions, they can be planted outdoors once the flowers fade, but in most of Canada they will not survive winter.

Edibility and toxicity

Some species of *Hydrangea* are considered to be toxic because of the presence of cyanogenic glycosides. Hydrangeas have a very minor reputation as an intoxicant when smoked, which could simply be the result of cyanide poisoning. Hydrangeas are reportedly poisonous to dogs, cats, horses and cows.

Amacha is a Japanese beverage prepared from fermented leaves of *H. macrophylla*. A similar herbal tea, sugukcha, is available in Korea. These preparations are sweet because of the presence of phyllodulcin, which is hundreds of times as sweet as table sugar, and is under investigation for control of obesity and diabetes.

Medicinal uses

Preparations of hydrangea roots and rhizomes are sometimes employed to treat kidney and bladder conditions, allegedly because of diuretic properties (which increase the flow of urine). As well, such preparations have been used to treat kidney stones and enlarged prostate. Foliage decoctions have been employed to treat intestinal ailments. These traditional herbal medicinal treatments have not been validated and should be avoided. The antimalarial potential of leaf compounds in *Hydrangea* is under investigation, as is the potential of root compounds to treat autoimmune diseases like multiple sclerosis.

Cultivation

Where winter temperatures permit, hydrangeas are not difficult to grow.

Purchasing and Propagating

Most commercial propagation of hydrangea cultivars is by stem cuttings or tissue culture. Accordingly, most plants will be purchased in the form of pot-grown specimens ready for transplanting. The hole should be excavated to be as deep as the root ball (place the root ball at the same depth as in the pot) and three times its width. Back fill with soil amended with organic matter to promote good drainage.

Soil conditions

In gardens, the best soils for hydrangeas are fertile sandy or silt loams with more than 1% organic matter, although with proper watering they will grow well in clay soils. A soil pH of 5.0–6.5 is usually recommended. Soils should be well-drained but maintained moist.

Location

Like most other shrubs, hydrangeas should be transplanted to spaces large enough to allow maximum development, to minimize pruning. In Canada, sunny or partly shady situations are suitable (shade will reduce flower display). In colder regions of Canada, locations providing protection from wind and temperature fluctuations are desirable.

Curiosities of science and technology

- Philipp Franz Balthasar von Siebold (1796–1866), a German physician and botanist who taught Western medicine in Japan, coined the scientific name of the bigleaf hydrangea as "*Hydrangea otakusa* Siebold et Zuccarini" (although the correct name is now considered to be *H. macrocarpa* (Thunb.) Ser.). The epithet *otakusa* has been interpreted as a reference to the name of the courtesan known as Kusumoto Taki who became von Siebold's mistress (marriage with foreigners was not permitted in Japan at the time). Their daughter Kusumoto Ine became the first female doctor of Western medicine in Japan.

- Portugal's Faial Island in the Azores became widely known as "Blue Island" after Portuguese poet Raul Brandão in the early 20th century marvelled at the abundant flowering hydrangeas established there.



Figure 12: Heirloom postcard (public domain) featuring hydrangea.

- According to Japanese tradition, when Buddha was born nine dragons poured amrita (nectar of immortality) over him. In commemoration of this, herbal tea made from hydrangea is ceremoniously poured over a statue of Buddha on April 8, thought to be his birthday.

- In 2009, the chef of a pricey restaurant in Japan seasoned a dish with hydrangea leaves, which as noted earlier are toxic, producing cyanide when ingested. The diners experienced severe vomiting and the chef was prosecuted (http://blog.alientimes.org/2011/06/hydrangea-ajisai-%E7%B4%AB%E9%99%BD%E8%8A%B1-in-japanese-history-and-culture-revisited/).

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Figure 13: "Two Little Fraid Cats," a hand-coloured lithograph published by Currier & Ives in 1863 (public domain) showing two cats in hydrangea blooms, cowering in fear of a mouse.

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