

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed for Form Page 2.
Follow the sample format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME		POSITION TITLE		
Nicholi Vorsa		Professor of Plant Biology		
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>				
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY	
Rutgers University	B.S.	1972-1976	Plant Science	
Univ. of Wisconsin-Madison, Madison, WI	M.S.	1976-1978	Breeding & Genetics	
Rutgers University, New Brunswick, NJ	Ph.D.	1980-1985	Breeding & Genetics	

Positions and Employment

1985-1991 Assist. Professor of Horticulture, Rutgers University, New Brunswick, NJ
 1989-1991 Assoc. Director, Blueberry and Cranberry Research and Extension Center, Rutgers University, Chatsworth, NJ
 1991-1997 Assoc. Res. Professor of Plant Science, Rutgers University, New Brunswick, NJ
 1991 - Director, P.E. Marucci Center for Blueberry and Cranberry Res. and Ext. Center, Rutgers University, Chatsworth, NJ
 1997 - Professor, Dept. Plant Biology, Rutgers University, New Brunswick, NJ

Other Experience and Professional Memberships

1996-2000 Associate Editor, J. Amer. Soc. Hort. Sci. (Breeding & Genetics)
 1996-2001 Chair, National Clonal Germplasm Repository Technical Committee
 1995-present American Chemical Society
 2004-2005 Technical Expert Committee-AHRQ, U.S. Depart. Health and Human Services

Cultivar Releases

Highbush blueberry (in cooperation with USDA-ARS)- Duke (1988), Toro (1988), Nelson (1989), Sierra (1989), Sunrise (1990), Legacy (1993), Chanticleer (1997), Hannah=s Choice (1999), Clara=s Choice (1999); Cranberry NJS98-23 (Crimson Queen®), CNJ97-104-5 (Mullica Queen®), NJS98-35 (Demoranville®), CNJ95-20-20 (Scarlet Knight™), CNJ99-9-96 (Haines™), CNJ99-52-15 (Welker™)

Patents

Plant proanthocyanidins extract effective at inhibiting adherence of bacteria with P-type fimbriae to cellular surfaces August 19, 2003 (U.S. 6608102)
 Plant proanthocyanidins extract effective at inhibiting adherence of bacteria with P-type fimbriae to cellular surfaces (Australian patent No. 744527, issued 6/13/2002)
 US Patent 7,270,837 Anti-inflammatory cranberry flavonol extract preparations', Issued Sept 18, 2007; US Plant Patent PP18,252, 'Cranberry variety NJS98-23' (Crimson Queen®), Issued Nov 27 2007; US Plant Patent PP18,911, 'Cranberry variety NJS98-35' (Demoranville®), Issued June 10 2008

US Plant Patent PP19,434, 'Cranberry variety CNJ97-105-4' (Mullica Queen®), Issued Nov 11 2008; Cranberry variety NJS98-23', Canadian Breeders Rights Application Cert. # 3742, Grant-of-Rights Date January 2010; US Plant Patent PP22,541, Cranberry variety CNJ95-20-20 (Scarlet Knight™), Issued March 6, 2012; Cranberry variety CNJ97-105-4 (Mullica Queen), Canadian Breeders Rights Application (No. 6-5575), Grant-of-Rights Date: November 11, 2012. US Plant Patent No. PP27,657. Cranberry variety CNJ99-9-96, Feb 14, 2017; US Plant Patent No. PP27,709. Cranberry variety CNJ99-52-15, Issues Feb 28, 2017; Cranberry variety CNJ95-20-20 (Scarlet Knight®) Canadian Plant Breeder's Rights Application. No. 10-7001 (accepted) Cranberry variety NJS-35 (Demoranville®) Canadian Plant Breeder's Rights Application. No. 07-5731 (accepted)

Patent Applications:

Canadian Breeders Rights Applications, CNJ99-52-15 (Welker™) and CNJ99-9-96 (Haines™) Submitted.

Current Research Support

USDA-NIFA-AFRI-2016-09659 Grant 12221815 02/01/2017-01/31/2021 \$456,727
Vorsa (PD) - Targeting cranberry fruit chemistry to develop cultivars with novel phytochemical profiles for healthier, reduced 'added-sugar' products

Ocean Spray Cranberries, Inc. 11/15/2016-11/14/2017 \$154,954
Vorsa (PD)

Isolation of Individual Proanthocyanidin (PAC) Compounds and Fractions from Cranberry and Cocoa

Botanical Dietary Supplements Research Center 10/9/2016-10/23/2017 \$30,000
Vorsa (PD)

Beneficial effect of Bioactive Cranberry Flavonoids on Adipogenesis and Lipolysis

USDA-NIFA-AFRI 2013-67013-21107 09/01/2013- 08/31/2017 \$500,000
Genomic regions and genetic constellations associated with agronomic traits, fruit quality and disease resistance in the American cranberry

Cranberry Institute
Cranberry Breeding Vorsa (PI) 9/1/15 - 8/31/16 \$40,000

Completed Research Support (last 10 years)

NIH-NIDCR/Univ. Rochester 2RO1DE016139-04A2 7/01/10-6/30/15 \$558,622
Molecular basis for carries inhibiting effects of cranberry flavonoids
Role: Collaborator Subcontract

USDA-SCRI 2008-51180-04878 Vorsa (PD) 9/01/08-8/31/2013 \$997,679
Breeding and genetics of fruit rot resistance and polyphenolics in cranberry
Role: Project Director

Refereed articles (2011 – present)

1. Schlautman B., Covarrubias-Pazaran G., Diaz-Garcia L., Iorizzo M., Polashock J., Grygleski E., **Vorsa N.** and Zalapa J. 2017. Construction of a high-density American cranberry (*Vaccinium macrocarpon* Ait.) composite map using genotyping-by-sequencing for multi-pedigree linkage mapping. **G3** 7:1177-1189.
2. Daverdin, G., Johnson-Cicalese, J., Zalapa, J., **Vorsa, N.**, and Polashock J., 2017. Mapping and identification of fruit rot resistance QTL in American cranberry using GBS **Mol. Breeding**. 37:38. DOI 10.1007/s11032-017-0639-3
3. Covarrubias-Pazaran, G., Diaz-Garcia, L., Schlautman, B., Deutsch, J., Salazar, W., Hernandez-Ochoa, M., Grygleski, E., Steffan, S., Iorizzo, M., Polashock, J. and **Vorsa, N.** 2016. Exploiting genotyping by sequencing to characterize the genomic structure of the American cranberry through high-density linkage mapping. **BMC genomics** 17(1), p.1.
4. Wang Y., Singh, A.P., Nelson, H.N., Kaiser A.J., Reker N.C., Hooks T.L., Wilson T, and **Vorsa N.** Urinary clearance of cranberry flavonol glycosides in humans. 2016. **J Agric. Food Chem.** <http://dx.doi.org/10.1021/acs.jafc.6b03611>.
5. Wells-Hansen, L.D., Polashock, J.J., **Vorsa, N.**, Lockhart, B.E.L. and McManus, P.S. 2016. Identification of Tobacco streak virus in Cranberry and the Association of TSV with Berry Scarring. **Plant Disease** 100(4), pp.696-703.
6. Wang Y, AP Singh, W Hurst, J Glinski, H Koo, **N Vorsa**. 2016. Influence of degree-of-polymerization and linkage on the quantification of proanthocyanidins using 4-dimethylaminocinamaldehyde (DMAC) assay. **J. Agric. Food Chem.** 64(11):2190-9. doi: 10.1021/acs.jafc.5b05408.
7. Dongyeop K, G Huang, Y Liu, Y Wang, AP Singh, **N Vorsa**. H Koo 2015. Cranberry flavonoids modulate cariogenic properties of mixed-species biofilm through exopolysaccharides-matrix disruption. **PLoS ONE** 10(12): e0145844. doi:10.1371/journal.pone.0145844
8. Schlautman, B, G Covarrubias-Pazaran, L Diaz-Garcia, J Johnson-Cicalese, M Iorizzo, L Rodriguez-Bonilla, T Bougie, T Bougie, E Wiesman, S Steffan, J Polashock, **N Vorsa**, J Zalapa. 2015. Development of a high-density cranberry SSR linkage map for comparative genetic analysis and trait detection. **Mol Breeding** 35:177 DOI 10.1007/s11032-015-0367-5
9. Tadych, M., **N. Vorsa**, Y. Wang, M.S. Bergen, J. Johnson-Cicalese, J. F. White, Jr. 2015. Interactions between cranberries and fungi: the proposed function of organic acids in virulence suppression of fruit rot fungi. **Frontiers in Microbiology** 6:835. doi: 10.3389/fmicb.2015.00835
10. Schlautman, B., Fajardo, D., Bouige, T., Wiesman, E., Polashock, J., **Vorsa, N.**, Steffan, S., and Zalapa, J. 2015. Development and validation of 697 novel polymorphic genomic and EST-SSR markers in the American cranberry (*Vaccinium macrocarpon* Ait.). **Molecules** 20:2001-2013. doi:10.3390/molecules20022001
11. Wang Y., A. Han, E. Chen, R. K. Singh, C. O. Chichester, R.G. Moore, A. P. Singh and **N. Vorsa**. 2015. The cranberry flavonoids PAC DP-9 and quercetin aglycone induce cytotoxicity and cell cycle arrest and increase cisplatin sensitivity in ovarian cancer cells. **Int. J. Oncology** 46: 1924-1934
12. Johnson-Cicalese, J., J. Polashock, J. Honig, J. Vaiciunas, D.L. Ward and **N. Vorsa**. 2015. Heritability of Fruit Rot Resistance in American Cranberry. **J Amer. Soc. Hort. Sci.** 140(3):233–242.

13. Singh AP, Vorsa N, Wilson T. 2014. Cranberry Quercetin-3-Galactoside in Postprandial Human Plasma. **Int. J. of Food and Nutri. Sci.** (Ommega Publ.)1:1-3
14. Polashock J., Zelzion, E., Fajardo, D., Zalapa, J., Georgi, L., Bhattacharya, D., Vorsa, N. 2014. The American cranberry: first insights into the whole genome of a species adapted to bog habitat. **BMC Plant Biol** 2014, 14:165 doi:10.1186/1471-2229-14-165.
15. Carpenter, J.L., Caruso, F.L., Tata, A., Vorsa, N., Neto, C.C. 2014. Variation in proanthocyanidin content and composition among commonly grown North American cranberry cultivars (*Vaccinium macrocarpon*). **J Sci Food Agric** DOI 10.1002/jsfa.6618.
16. Georgi, L., J. Johnson-Cicalese, J. Honig, S. Parankush Das, V. D. Rajah, D. Bhattacharya, N. Bassil, L.J. Rowland, J. Polashock, N. Vorsa. 2013. The first genetic map of the American cranberry: exploration of synteny conservation and quantitative trait loci. **Theor Appl Genet.** 126:673–692 DOI 10.1007/s00122-012-2010-8.
17. Fajardo D., D. Senalik, M. Ames, H. Zhu, S.A. Steffan, R Harbut, J. Polashock, N. Vorsa, E. Gillespie, K. Kron, J.E. Zalapa. 2013. Complete plastid genome sequence of *Vaccinium macrocarpon*: structure, gene content, and rearrangements revealed by next generation sequencing. *Tree Genetics & Genomes* 9:489– 498.
18. Fajardo D., J. Morales, H. Zhu , S. Steffan, R. Harbut, N. Bassil, K. Hummer, J. Polashock, N. Vorsa, J. Zalapa. 2012. Discrimination of American cranberry cultivars and assessment of clonal heterogeneity using microsatellite markers. **Plant Mol Biol Rep.** DOI: 10.1007/s11105-012-0497-4.
19. Tadych M., M.S. Bergen, J. Johnson-Cicalese, J. Polashock, N. Vorsa, J.F. White Jr. 2012. Endophytic and pathogenic fungi of developing cranberry ovaries from flower to mature fruit: diversity and succession. **Fungal Diversity** DOI 10.1007/s13225-012-0160-2E.
20. Georgi, L., R.H. Herai, R. Vidal, M. Falsarella Carazzolle, G.alo Guimaraes Pereira, J. Polashock and N. Vorsa. 2011. Cranberry microsatellite marker development from assembled next-generation genomic sequence. **Mol Breeding** DOI 10.1007/s11032-011-9613-7.
21. Rodriguez-Saona, C., N. Vorsa, Ajay P. Singh, J. Johnson-Cicalese, Z. Szendrei, M.C. Mescher and C. J. Frost. 2011. Tracing the history of plant traits under domestication in cranberries: potential consequences on anti-herbivore defences. **J. Exp. Bot.** doi:10.1093/jxb/erq466 pp.1-12.
22. V. Shabrova, O. Tarnopolsky, A.P. Singh, J. Plutzky, N. Vorsa, L. Quadro. 2011. Insights into the Molecular Mechanisms of the anti-atherogenic actions of flavonoids in normal and obese mice. **PLoS ONE** 6(10): e24634. doi:10.1371/journal.pone.0024634.
23. Singh, A. P., T.S. Lange, K.K. Kim, L. Brard, T. Horan, R.G. Moore, N. Vorsa, R.K. Singh. 2011. Purified cranberry proanthocyanidines (PAC-1A) cause proapoptotic signaling, ROS generation, cyclophosphamide retention and cytotoxicity in high-risk neuroblastoma cells. **Int. J. Oncol.** DOI:10.3892/ijo.2011.1225.

Book Chapters

1. Vorsa, N., J. Johnson-Cicalese. 2011. American Cranberry, Chapter 6 *In* M.L. Badenes and D.H. Byrne (eds.), *Fruit Breeding, Handbook of Plant Breeding* 8, Springer Science & Business Media, LLC, p. 191-223, DOI 10.1007/978-1-4419-0763-9_6.

Abstracts and Presentations (since 2014)

1. Fong, S., Y. Wang¹, J. Johnson-Cicalese, and **N. Vorsa**. 2017. Loci impacting malic and citric acid content in cranberry fruit. Annual Nat. Assoc. Plant Breeders Meeting, August 7-10, 2017.
2. **Vorsa, N.**, G. Covarrubias-Pazaran, B. Schlautman, L. Diaz-Garcia, J. Polashock, J. Zalapa, G. Daverdin, J. Johnson-Cicalese. Annual Nat. Assoc. Plant Breeders Meeting, August 7-10, 2017.
3. Genomic regions associated with agronomic traits and disease resistance in the American cranberry Annual National Association of Plant Breeders Meeting, August 7-10, 2017
4. Daverdin, G, J Johnson-Cicalese, J Polashock, J Zalapa, **N Vorsa**. 2016. A GBS-based high density genetic map for detection of cranberry fruit rot resistance-QTL. PAG, Jan. 2016, San Diego, CA
5. Fong, S, Y Wang, AP Singh, J White, J Johnson-Cicalese, **N Vorsa**. 2015. Chlorogenic Acid's Contribution to Cranberry Fruit Rot Resistance. North American Cranberry Research and Extension Workers Conf., Bandon, OR, Aug 23-25.
6. Fong, S, M Tadych, J Johnson-Cicalese, **N Vorsa**. 2015 Relationship of Quinic and Benzoic Acid Levels with Fruit Rot Resistance in American Cranberry. North American Cranberry Research and Ext. Workers Conf., Bandon, OR, Aug 23-25.
7. Fong, S., M. Tadych, J. Johnson-Cicalese, and **N. Vorsa**. 2015. Relationship of Quinic and Benzoic Acid Levels with Fruit Rot Resistance in American Cranberry. NE-ASHS Annual Meeting, 6-7 January 2015, Newark, DE.
8. Johnson-Cicalese, J., **N. Vorsa**, J. Polashock, and J. Honig. 2014. Heritability of fruit rot resistance in American cranberry. NE-ASHS Annual Meeting, 6-8 January 2014, Philadelphia. HortScience 49(9):S5 (abstract).
9. Tadych, M., J. White, M. Bergen, J. Polashock, J. Johnson-Cicalese, **N. Vorsa**. 2014. The role of organic acids in suppression of cranberry fruit rot disease. NE-ASHS Annual Meeting, 6-8 January 2014, Philadelphia. HortScience 49(9):S10 (abstract).
10. **Vorsa, N.**, and J. Johnson-Cicalese. 2014. Self-fruitfulness of Rutgers' advanced blueberry breeding selections. NE-ASHS Annual Meeting, 6-8 January 2014, Philadelphia. HortScience 49(9):S9 (abstract).