

# Robbie Hart

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William L. Brown Curator and Associate Scientist  
Missouri Botanical Garden  
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## EDUCATION

2015 **Ph.D. in Biology (Ecology, Evolution and Systematics)**, University of Missouri-St. Louis  
2004 **B.A. in Linguistics**, Swarthmore College, PA  
2000 **Associate of Arts with Honors**, Peninsula College, WA

## POSITIONS HELD

2020 – ongoing **Director, William L. Brown Curator**, and **Associate Scientist** (William L. Brown Center, Missouri Botanical Garden, St. Louis). I lead a center of excellence within the Missouri Botanical Garden dedicated to the study of useful plants, understanding the relationships between humans, plants, and their environment, the conservation of plant species, and the preservation of traditional knowledge for the benefit of future generations. My own research focuses on high elevation plant ecology, climate change, and ethnobotany, with emphasis on building research around a Himalayan subnetwork of plots within the Global Observation Research Initiative in Alpine Environments (GLORIA) network. In our subnetwork, which spans Nepal, Bhutan and China, we monitor dynamics of and connections between vegetation, climate and ethnobotanical practice. I also work to further quantitative methods for analysis of local ecological knowledge, primarily drawing data from montane and alpine environments.

2016 – 2020 **Assistant Curator** (William L. Brown Center, Missouri Botanical Garden, St. Louis)  
Design and management of programs in high elevation plant ecology, climate change, and ethnobotany, particularly in Himalayan GLORIA network.

2013 – 2015 **Research Specialist** (William L. Brown Center, Missouri Botanical Garden).  
Research in high elevation plant ecology, climate change, and ethnobotany, including analyzing data for Himalayan GLORIA plots.

2008 – 2012 **Ph.D. Fellow** (National Science Foundation ‘Southwest China IGERT’)  
Research to understand ecological factors, livelihood strategies and governance structures impacting biodiversity and economic development in Himalayan China.

2006 – 2008 **Research Consultant** (Living Tongues Institute for Endangered Languages)  
Research, quantitative analyses, and editing focusing on endangered language diversity.

2006 – 2008 **Administrative Services Manager** (North Olympic Library System, Port Angeles WA)  
Development of grants, liaison with board and community, supervising administrative workers. Assisting in strategic planning, budgeting, labor negotiations, director hire, and rebranding.

2004 – 2006 **Research Assistant** (Swarthmore College, Swarthmore PA)  
Research, editing, and graphics for *When Languages Die* (David Harrison, Oxford University Press, 2007).

## **OTHER APPOINTMENTS**

- 2019 – ongoing **Honorary Adjunct Assistant Professor of Biology** (Washington University in St. Louis).
- 2019 – ongoing **Member, Division of Biology and Biomedical Sciences** (Washington University in St. Louis).
- 2017 – ongoing **Member, Graduate Faculty, Biology** (University of Missouri - St. Louis).

## **PUBLICATIONS**

### **Refereed journal articles** (\*student first author)

- 2020 IU Rahman\*, A Afzal, Z Iqbal, **R Hart**, EF Abd Allah, AA Alqarawi, MS Alsubeie, ES Calixto, F Ijaz, N Ali, R Kausar, M Shah, RW Bussmann (2020). ‘Response of plant physiological attributes to altitudinal gradient: Plant adaptation to temperature variation in the Himalayan region’. *Science of The Total Environment* **706**: 1357140.
- 2020 WL Applequist, JA Brinckmann, AB Cunningham, **R Hart**, M Heinrich, DR Katerere, T van Andel. ‘Scientists’ warning on climate change and medicinal plants.’ *Plants Medica* doi: 10.1055/a-1041-3406
- 2019 J Salick, Fang ZD and **R Hart**. ‘Rapid changes in eastern Himalayan alpine flora with climate change.’ *American Journal of Botany* 106 (4): 520-530. doi: 10.1002/ajb2.1263
- 2019 J Zenderland\*, **R Hart**, R Bussmann, NY Paniagua Zambrana, S Shikharulidze, Z Kikvidze, D Koikodze, D Tchelidze, M Khutsishvili, K Batatsashvili. ‘The Use of “Use Value”: Quantifying importance in ethnobotany’. *Economic Botany* 73:3 293-303. doi: 10.1007/s12231-019-09480-1.
- 2018 **R Hart** and J Salick. ‘Vulnerability of phenological progressions over season and elevation to climate change: Rhododendrons of Mt. Yulong’. *Perspectives in Plant Ecology, Evolution and Systematics* 34: 129-139. doi: 10.1016/j.ppees.2018.09.001
- 2018 **R Hart** and S Ranjitkar ‘Monitoring rhododendron flowering times in a changing climate’. *Rhododendrons International* 3.
- 2018 **R Hart** and RW Bussmann. ‘Trans-Himalayan transmission, or convergence? *Stauntonia* (Lardizabalaceae) as an ethnoveterinary medicine.’ *Medicina nei Secoli* 30: 141-160.
- 2018 NY Paniagua Zambrana, RW Bussmann, **R Hart**, AL Moya Huanca, GO Soria, MO Vaca, DO Álvarez, JS Morán, MS Morán, S Chávez, BC Moreno, GC Moreno, O Roca & E Siripi. ‘To list or not to list? The value and detriment of freelisting in ethnobotanical studies’. *Nature Plants* 4:201–204. doi: 10.1038/s41477-018-0128-7
- 2018 RW Bussmann, NY Paniagua Zambrana, C Romero, **R Hart**. ‘Astonishing diversity — the medicinal plant markets of Bogotá, Colombia’. *Journal of Ethnobiology and Ethnomedicine* 14:43. doi: 10.1186/s13002-018-0241-8
- 2018 NY Paniagua Zambrana, RW Bussmann, **R Hart**, AL Moya Huanca, GO Soria, MO Vaca, DO Álvarez, JS Morán, MS Morán, S Chávez, BC Moreno, GC Moreno, O Roca & E Siripi. ‘Research methods leading to a perception of knowledge loss—one century of plant use documentation among the Chácobo in Bolivia’. *Economic Botany*. doi:10.1007/s12231-018-9401-y
- 2018 RW Bussmann, NY Paniagua Zambrana, **R Hart**, AL Moya Huanca, GO Soria, MO Vaca, DO Álvarez, JS Morán, MS Morán, S Chávez, BC Moreno, GC Moreno, O Roca & E Siripi. ‘Who should conduct ethnobotanical studies? Effects of different interviewers in the case of the Chácobo Ethnobotany project’. *Journal of Ethnobiology and Ethnomedicine* 14:9. doi: 10.1186/s13002-018-0210-2
- 2017 **R Hart** and J Salick. ‘Dynamic ecological knowledge systems amid changing place and climate: Mt. Yulong rhododendrons’. *Journal of Ethnobiology* 37: 21-36. doi: 10.2993/0278-0771-37.1.21

## Publications — refereed journal articles, continued

- 2017 H Sher, RW Bussmann & **R Hart**. ‘Promoting Sustainable Use of Medicinal and Aromatic Plants for Livelihood Improvement and Biodiversity Conservation under Global Climate Change, through Capacity Building in the Himalaya Mountains, Swat District, Pakistan’. *Annals of the Missouri Botanical Garden* 102: 309-15. doi: 10.3417/D-16-00001A
- 2017 NY Paniagua Zambrana, RW Bussmann, **R Hart**, AL Moya Huanca, GO Soria, MO Vaca, DO Álvarez, JS Morán, MS Morán, S Chávez, BC Moreno, GC Moreno, O Roca & E Siripi. ‘Traditional knowledge hiding in plain sight – twenty-first century ethnobotany of the Chácobo in Beni, Bolivia’. *Journal of Ethnobiology and Ethnomedicine* 13:57. doi: 10.1186/s13002-017-0179-2
- 2016 **R Hart**, EM Georgian, & J Salick. ‘Fast and Cheap in the Fall: Phylogenetic determinants of late flowering phenologies in Himalayan *Rhododendron* (Ericaceae)’. *American Journal of Botany* 103: 198-206. doi: 10.3732/ajb.1500440
- 2016 RW Bussmann, NY Paniagua-Zambrana, S Sikharulidze, Z Kikvidze, D Kikodze, D Tchelidze, M Khutsishvili, K Batsatsashvili & **R Hart**. ‘A comparative ethnobotany of Khevsureti, Samtskhe-Javakheti, Tusheti, Svaneti, and Racha-Lechkhumi, Republic of Georgia (Sakartvelo), Caucasus’. *Journal of Ethnobiology and Ethnomedicine* 12: 43. doi: 10.1186/s13002-016-0110-2
- 2016 RW Bussmann, NY Paniagua Zambrana, LA Moya Huanca & **R Hart**. ‘Changing markets - medicinal plants in the markets of La Paz and El Alto, Bolivia’. *Journal of Ethnopharmacology*. doi: 10.1016/j.jep.2016.07.074
- 2016 RW Bussmann, NY Paniagua-Zambrana, S Sikharulidze, Z Kikvidze, D Kikodze, D Tchelidze, K Batsatsashvili & **R Hart**. ‘Medicinal and Food Plants of Svaneti and Lechkhumi, Sakartvelo (Republic of Georgia), Caucasus’. *Medicinal and Aromatic Plants*. doi: 10.4172/2167-0412.1000266
- 2016 H Sher, RW Bussmann, **R Hart** & HJ de Boer. ‘Traditional use of medicinal plants among Kalasha, Ismaeli and Sunni groups in Khyber Pakhtunkhwa province, Pakistan’. *Journal of Ethnopharmacology*. doi: 10.1016/j.jep.2016.04.059
- 2015 RJ Thoni & **R Hart**. ‘Repatriating a lost name: notes on McClelland and Griffith’s *Cobitis boutanensis* (Cypriniformes: Nemacheilidae)’. *Zootaxa* 3999: 291 – 294. doi: 10.11646/zootaxa.3999.2.8
- 2014 S Ranjitkar, R Kindt, NM Sujakhu, **R Hart**, W Guo, XF Yang, KK Shrestha, JC Xu & E Luedeling. ‘Separation of the bioclimatic spaces of Himalayan tree rhododendron species predicted by ensemble suitability models’. *Global Ecology and Conservation* 1: 2 – 12. doi: 10.1016/j.gecco.2014.07.001
- 2014 **R Hart**, J Salick, S Ranjitkar, and Xu JC. ‘Herbarium specimens show contrasting phenological responses to Himalayan climate’. *PNAS* 111: 10615 – 10619. doi: 10.1073/pnas.1403376111

## Publications — book chapters

- 2020 J Salick, B Staver and **R Hart**. ‘Indigenous knowledge and dynamics among Himalayan peoples, vegetation and climate change’. In *Changing Climate, Changing Worlds*, M Welch-Devine, A Sourdriil and BJ Burke (eds.). Springer.
- 2018 J Salick, A Byg, K Konchar and **R Hart**. ‘Coping with Climate: Innovation and Adaptation in Tibetan Land Use and Agriculture. In *Indigenous Knowledge and Climate Change*. D Nakashima and J Rubin (eds), pp. 123 – 141. Cambridge University Press.
- 2014 **R Hart**, W Law and P W Jackson. ‘Biocultural collections for conservation’. In *Curating Biocultural Collections*, J Salick, K Konchar and M Nesbitt (eds.), pp. 329 – 346. Kew Press.
- 2007 **R Hart**. ‘Written Word, Oral World’. In *Book of Peoples of the World*, Wade Davis, K. David Harrison and Catherine Herbert Howell (eds.), pp. 252-255. National Geographic Society.

### **Publications — books & theses**

2015 *Climate-driven Change in Himalayan Rhododendron Phenology*. Doctoral Dissertation, Department of Biology, University of Missouri - St. Louis.

2004 *Up and Down the Mountain*. BA Thesis, Department of Linguistics, Swarthmore College, PA.

### **Publications — book reviews**

2020 **R Hart**. 'Flora of the Pacific Northwest (C. L. Hitchcock and A. Cronquist, D.E Giblen et al., eds.)' *Economic Botany*

2016 **R Hart**. 'Food and Environment in Early and Medieval China. (E.N. Anderson).' *Economic Botany* 70: 92.

### **RESEARCH FUNDING**

2019 'Third Re-survey on DXS & RZL of the GLORIA Plan.' The Nature Conservancy-China (co-PI, with Fang Zhendong as PI) CNY 100,000.

2018 – 2019 'Grant workshop – climate change effects on Himalayan plants and people' Living Earth Collaborative (PI) \$1,960.

2018 – 2019 'Climate change impacts on Himalayan alpiners' Alpine Garden Society (PI) £2,500.

2017 – 2019 'Climate change across borders: transboundary patterns in Himalayan alpine vegetation and ethnobotany impacts' National Geographic Committee for Research and Exploration (PI) \$35,720.

2016 – 2017 'Climate change in the high Himalaya: effects on alpine vegetation and ethnobotany' National Geographic Committee for Research and Exploration (PI) \$35,322.

2012 – 2013 'Climate-driven change in Himalayan Rhododendron phenology' University of Missouri - St. Louis Biology Department Raven Fellowship (Dissertation Fellow) \$9,500.

2013 'A comparative ethnobotany of rhododendrons in northwest Yunnan, China' Garden Club of America Anne S. Chatham Fellowship in Medicinal Botany (PI) \$4,000.

2008 – 2011 'Biodiversity Conservation and Sustainable Development in Southwest China' National Science Foundation Interdisciplinary Graduate Education & Research Traineeship (Trainee) \$160,000 (amount to Hart including tuition reimbursement, stipend and associated research grants).

2011 'Climate driven phenological change in Himalayan rhododendrons' The Explorers Club (PI) \$1,000.

2010 'Climate change impacts on distribution, phenology and pollination of *Rhododendron*' University of Missouri TransWorld Airlines Scholarship (research and merit scholarship) (PI) \$7,000.

2009 – 2010 'Climate change impacts on phenology of Himalayan *Rhododendron* species' Whitney Harris World Ecology Center (PI) \$7,000.

### **RESEARCH EXPERIENCE**

2016 – 2019 **Northwest Yunnan, China, Central and Eastern Nepal, and Western Bhutan**  
Led ecological and ethnobotanical fieldwork at 17 mountain summits with methodology of the Global Observation Research Initiative in Alpine Environments (GLORIA) to track the effects of climate change on alpine plant communities and local ethnobotanical traditions. Collection of ecological data, collection and curation of botanical specimens; installation and analysis of data from temperature loggers.

2009 – 2013 **Mt. Yulong, Lijiang County, China**

Ph.D. fieldwork: ecological & ethnoecological research on phenology of montane plants; ethnobotany

with local communities; collection of botanical, entomological, and plant DNA specimens; experimental work on pollination, temperature, and phenology.

2009 – 2013 **Deqen, Weixi and Shangrila Counties, China**

Ecological and ethnobotanical fieldwork at 11 mountain summits with GLORIA methods to track the effects of climate change on alpine plant communities and local ethnobotanical traditions.

2003 **Ilam, Nepal**

Linguistic and sociolinguistic documentation of indigenous minority language Bantawa Rai.

## **TEACHING AND MENTORING EXPERIENCE**

### **Missouri Botanical Garden**

2014, 2016, 2018 Mentored National Science Foundation Research Experience for Undergraduates (NSF REU) students in ethnobotany and ecology projects

2015 – 2018 Guest lectures for NSF REU seminar series

2017 Taught workshop ‘R for ethnobotanical data analysis’

### **Washington University in St. Louis**

2019 – ongoing Dissertation advisor for James Lucas (Biology Dept.)

2014 – ongoing Co-organizer for ‘Ethnobiology Journal Club’ (Biology/Anthropology Depts.)

2011, 2015, 2019 Guest lectures for ‘Plants and People’ (Anthropology Dept.)

2017 Lab rotation host for James Lucas (Biology Dept.)

### **University of Missouri - St. Louis**

2016 – 2017 Committee member for Rinchen Namgay, M.S. 2017 (Biology Dept.)

2014, 2015 Guest lectures for ‘Global Climate Change’ (Biology Dept.)

2014 Co-taught workshop ‘Statistical Analysis in R’

2010, 2011 Mentored undergraduate research in climate change ecology

2009, 2010 Teaching Assistant for ‘General Biology’ lab and lecture (Biology Dept.)

### **Teaching and mentoring at other institutions**

2019 Guest lecture for ‘Global Biomes’, Advanced Inquiry Program at Miami University

2012, 2014, 2017, 2019 Guest lectures for ‘Ethnobiology’ at St. Louis University

2017 Taught ‘Estadística avanzada en etnoecología cuantitativa y el uso de R’ course at Universidad Nacional Mayor de San Marcos, Peru

2017 Guest lecture for ‘Taxonomy and Environment’, Tribhuvan University, Nepal

2016 Taught ‘Advanced quantitative methods for ethnoecology using R’ course at Universidad Mayor de San Andrés, Bolivia.

2016 Led ‘Monitoring climate impacts on mountain vegetation’ classroom & field-based training, Tribhuvan University, Nepal

2015 Co-taught ‘Traditional ecological knowledge and landscape stewardship’ field course, Lae Technical University, Papua New Guinea

2010 – 2012 Mentored undergraduates in ecological and ethnobotanical field research, Lijiang Alpine Botanic Garden, Yunnan, China

2003 – 2004 Teaching Assistant for ‘Linguistics field methods’ lab and discussion, and ‘Marine biology’ discussion and field, Swarthmore College.

## **CONFERENCE ACTIVITY**

2019 'Hosting the mountain: Naxi courtyard gardens as repositories of Himalayan flora'. 60th Annual Meeting of the Society for Economic Botany, Cincinnati, OH.

2019 1) 'Naxi courtyard gardens conserving Himalayan flora', 2) 'Ethnobiology Ethics Lab', 3) 'Applied Ethnobiology-Ethnobotany Practitioners, Professionals and Scholars'. 42nd Annual Conference of the Society of Ethnobiology, Vancouver, B.C., Canada.

2019 'Land and conservation: who let the bugs die out' panel. 29th Annual Conference of the Society of Environmental Journalists, Fort Collins, CO.

2018 'Dynamic ecological knowledge systems amid changing place and climate: Mt. Yulong rhododendrons'. 59th Meeting of the Society of Economic Botany, Madison, Wisconsin.

2017 1) 'Phenological progressions of Mt. Yulong Rhododendron flowering over season and elevation' and 2) 'Ethnobotany of climate change in the greater Himalayan Region: a 3000 km transect'. XIX International Botanical Congress, Shenzhen, China.

2017 'Ethnobotany of climate change in the greater Himalayan Region'. 58th Meeting of the Society of Economic Botany, Bragança, Portugal.

2017 'Connecting climate change and biocultural diversity - East Himalayan GLORIA'. Eastern Himalayan Naturenomics Forum, Guwahati, India.

2015 1) 'Change in the Himalayan climate II: alpine community composition', and 2) 'Sacred Mt. Yulong & Naxi perceptions of biodiversity conservation'. 3rd Global Change and the World's Mountains conference, Perth, Scotland.

2015 'Climate change in the high Himalaya: monitoring changes in alpine vegetation and ethnobotany'. Creating a Global Network of Mountain Observatories workshop, Gothic, Colorado.

2014 1) 'Mountain Ethnobiology' [session chair], 2) 'Climate impacts on *Rhododendron* phenology: insights from traditional ecological knowledge and natural history collections', and 3) 'GLORIA resurveys of three Himalayan target areas'. Mountain Observatories: a global fair and workshop on social-ecological systems. Reno, Nevada.

2014 1) 'Himalayan Climate Change and Ethnobotany' [session chair], 2) 'Climate change impacts on *Rhododendron* phenology: insights from historical collections, observational studies, and traditional ecological knowledge', and 3) 'Ethnobotany of climate change in the Eastern Himalaya: a 2,000 km transect, and two sites in Bhutan'. 14th Congress of the International Society for Ethnobiology, Bumthang, Bhutan.

2012 'Rhododendron phenologies changing with climate'. 13th Congress of the International Society for Ethnobiology, Montpellier, France.

## **INVITED TALKS**

2019 Kunming Institute of Botany, Chinese Academy of Sciences

2019 Washington University in St. Louis – Biology Department Seminar

2018 Washington University in St. Louis – Living Earth Collaborative Seminar

2018 Field Museum – Seventh John Armour Seminar

2018, 2014 St. Louis Ecology, Evolution and Conservation Retreat

2018, 2014 St. Louis University – Biology Departmental Seminar

2017 Ashoka Trust for Research in Ecology and the Environment, Bangalore

2017 University of Arkansas for Medical Sciences – College of Pharmacy Seminar Lecture Series

2017 Holden Arboretum – Scientist Lecture Series  
2015 Royal Botanic Garden Edinburgh  
2015 Washington University in St. Louis – Tibetan Plateau Symposium  
2013, 2010 Lijiang Alpine Botanic Garden, Chinese Academy of Sciences  
2011 Academy of Science St. Louis – Science Cafe

## **PROFESSIONAL**

### **Offices**

2019 – ongoing Secretary, Society for Economic Botany  
2018 – ongoing Ethics Committee, Society of Ethnobiology  
2018 – ongoing Steering Committee, Rhododendron Research Network  
2018 – ongoing Advisory Board, Southern Illinois University Interdisciplinary Research and Informatics Scholarship Center  
2013 – 2015 Executive Committee, Whitney R. Harris World Ecology Center

### **Grant review**

2019 – ongoing National Geographic Society Early Career Grants  
2018 – ongoing Award Committee, Chatham Fellowship in Medicinal Botany, Garden Club of America  
2018 – ongoing Chair, Schultes Award Committee, Society for Economic Botany  
2016 – 2018 Schultes Award Committee, Society for Economic Botany  
2014 – 2017 National Geographic Society Committee for Research and Exploration Grants  
2014, 2015 Whitney R. Harris World Ecology Center Student Grants  
2014 University of Missouri Research Board Grants

### **Peer review**

*American Journal of Botany; Alpine Botany; Annals of Botany; Arctic, Antarctic and Alpine Research; Journal of Biogeography; Biological Conservation; Climatic Change; Climate Research; Ecography; Ecology and Evolution; Economic Botany; Ecosphere; Environment and History; Journal of Ecology; Journal of Ethnobiology and Ethnomedicine; Frontiers in Plant Science; Global Change Biology; Human Ecology; Journal of Mountain Science, Mountain Resources and Development, New Phytologist; Novon; Oecologia; PLOS One; PNAS.*

### **Society Membership**

Botanical Society of America; Society for Economic Botany; Society of Ethnobiology  
Fellow National - Explorers Club; Biodiversity Fellow - Living Earth Collaborative

## **AWARDS AND HONORS**

2018 BioOne Ambassador Award  
2013 University of Missouri - St. Louis Biology Department Raven Fellowship  
2011 University of Missouri TransWorld Airlines Merit Scholarship  
2010 Graduate Teaching Excellence Award, University of Missouri - St Louis  
2001 – 2004 Swarthmore College Class of 1925 Scholarship