

CropPol: A dynamic, open and global database on crop pollination

Alfonso Allen-Perkins^{1,2}  | Ainhoa Magrach^{3,4}  | Matteo Dainese⁵  |
 Lucas A. Garibaldi^{6,7}  | David Kleijn⁸  | Romina Rader⁹  | James R. Reilly¹⁰  |
 Rachael Winfree¹⁰  | Ola Lundin¹¹  | Carley M. McGrady¹² | Claire Brittain¹³ |
 David J. Biddinger¹⁴  | Derek R. Artz¹⁵  | Elizabeth Elle¹⁶  |
 George Hoffman¹⁷ | James D. Ellis¹⁸  | Jaret Daniels^{18,19}  | Jason Gibbs²⁰  |
 Joshua W. Campbell^{18,21} | Julia Brokaw²² | Julianna K. Wilson²³  |
 Keith Mason²³ | Kimiora L. Ward^{13,24} | Knute B. Gundersen²³ |
 Kyle Bobiwash^{16,20}  | Larry Gut²³ | Logan M. Rowe²³ | Natalie K. Boyle^{15,25} |
 Neal M. Williams¹³  | Neelendra K. Joshi²⁶ | Nikki Rothwell²⁷ |
 Robert L. Gillespie²⁸  | Rufus Isaacs²³  | Shelby J. Fleischer²⁵  |
 Stephen S. Peterson²⁹  | Sujaya Rao²²  | Theresa L. Pitts-Singer¹⁵  |
 Thijs Fijen⁸  | Virginie Boreux^{30,31}  | Maj Rundlöf³²  |
 Blandina Felipe Viana^{33,34}  | Alexandra-Maria Klein³¹  | Henrik G. Smith^{32,35} |
 Riccardo Bommarco¹¹  | Luísa G. Carvalheiro^{36,37}  | Taylor H. Ricketts^{38,39}  |
 Jaboury Ghazoul⁴⁰  | Smitha Krishnan^{40,41}  | Faye E. Benjamin¹⁰ |
 João Loureiro⁴²  | Silvia Castro⁴²  | Nigel E. Raine⁴³  |
 Gerard Arjen de Groot⁴⁴  | Finbarr G. Horgan^{45,46}  | Juliana Hipólito⁴⁷  |
 Guy Smagghe⁴⁸  | Ivan Meeus⁴⁸  | Maxime Eeraerts⁴⁸  | Simon G. Potts⁴⁹  |
 Claire Kremen⁵⁰  | Daniel García⁵¹  | Marcos Miñarro⁵² | David W. Crowder⁵³ |
 Gideon Pisanty^{54,55} | Yael Mandelik⁵⁵  | Nicolas J. Vereecken⁵⁶  |
 Nicolas Leclercq⁵⁶  | Timothy Weekers⁵⁶  | Sandra A. M. Lindstrom^{11,32,57}  |
 Dara A. Stanley⁵⁸  | Carlos Zaragoza-Trello¹  | Charlie C. Nicholson¹³  |
 Jeroen Scheper⁸  | Carlos Rad⁵⁹  | Evan A. N. Marks⁶⁰ | Lucie Mota⁴²  |
 Bryan Danforth⁶¹  | Mia Park⁶¹ | Antônio Diego M. Bezerra⁶²  |
 Breno M. Freitas⁶²  | Rachel E. Mallinger⁶³  | Fabiana Oliveira da Silva^{34,64}  |
 Bryony Willcox⁹  | Davi L. Ramos⁶⁵  | Felipe D. da Silva e Silva⁶⁶  |
 Amparo Lázaro⁶⁷  | David Alomar⁶⁷ | Miguel A. González-Estévez⁶⁷ |
 Hisatomo Taki⁶⁸  | Daniel P. Cariveau²²  | Michael P. D. Garratt⁴⁹  |
 Diego N. Nabaes Jodar⁷  | Rebecca I. A. Stewart^{32,36} | Daniel Ariza⁴⁸ |
 Matti Pisman⁴⁸  | Elinor M. Lichtenberg^{53,69}  | Christof Schüepp⁷⁰ |

†Deceased.

Felix Herzog⁷¹  | Martin H. Entling⁷⁰  | Yoko L. Dupont⁷²  |
 Charles D. Michener^{73†} | Gretchen C. Daily⁷⁴ | Paul R. Ehrlich⁷⁴ |
 Katherine L. W. Burns⁵⁸  | Montserrat Vilà^{1,75}  | Andrew Robson⁷⁶  |
 Brad Howlett⁷⁷  | Leah Blechschmidt⁴³ | Frank Jauker⁷⁸  |
 Franziska Schwarzbach⁷⁸ | Maike Nesper⁴⁰  | Tim Diekötter⁷⁹  |
 Volkmar Wolters⁷⁸  | Helena Castro⁴²  | Hugo Gaspar⁴²  | Brian A. Nault⁶¹  |
 Isabelle Badenhausser^{80,81}  | Jessica D. Petersen⁸² | Teja Tschardt⁸³  |
 Vincent Bretagnolle⁸⁴  | D. Susan Willis Chan⁴³  | Natacha Chacoff⁸⁵  |
 Georg K. S. Andersson^{32,35} | Shalene Jha⁸⁶  | Jonathan F. Colville⁸⁷  |
 Ruan Veldtman⁸⁸  | Jeferson Coutinho⁸⁹  | Felix J. J. A. Bianchi⁹⁰  |
 Louis Sutter⁹¹  | Matthias Albrecht⁷² | Philippe Jeanneret⁷²  | Yi Zou⁹²  |
 Anne L. Averill⁹³  | Agustin Saez⁹⁴  | Amber R. Sciligo⁵⁰  |
 Carlos H. Vergara⁹⁵ | Elias H. Bloom⁵³  | Elisabeth Oeller⁵³  |
 Ernesto I. Badano⁹⁶  | Gregory M. Loeb⁹⁷  | Heather Grab⁹⁸  |
 Johan Ekroos³⁵  | Vesna Gagic^{11,99}  | Saul A. Cunningham¹⁰⁰  |
 Jens Åström¹⁰¹  | Pablo Cavigliasso¹⁰²  | Alejandro Trillo¹  |
 Alice Classen¹⁰³  | Alice L. Mauchline⁴⁹  | Ana Montero-Castaño⁴³  |
 Andrew Wilby¹⁰⁴  | Ben A. Woodcock¹⁰⁵  | C. Sheena Sidhu¹⁰⁶  |
 Ingolf Steffan-Dewenter¹⁰³  | Ioannis N. Vogiatzakis¹⁰⁷  | José M. Herrera¹⁰⁸  |
 Mark Otieno¹⁰⁹  | Mary W. Gikungu¹¹⁰  | Sarah J. Cusser¹¹¹  |
 Thomas Nauss¹¹²  | Lovisa Nilsson³⁵  | Jessica Knapp^{32,113}  |
 Jorge J. Ortega-Marcos¹¹⁴  | José A. González¹¹⁴ | Juliet L. Osborne¹¹³  |
 Rosalind Blanche^{115†} | Rosalind F. Shaw¹¹³  | Violeta Hevia¹¹⁴  |
 Jane Stout¹¹⁶  | Anthony D. Arthur¹¹⁷ | Betina Blochtein^{6,118}  |
 Hajnalka Szentgyorgyi¹¹⁹  | Jin Li¹²⁰ | Margaret M. Mayfield¹²¹  |
 Michał Woyciechowski¹²² | Patrícia Nunes-Silva¹¹⁸  |
 Rosana Halinski de Oliveira¹¹⁸  | Steve Henry¹¹⁵ | Benno I. Simmons¹²³  |
 Bo Dalsgaard¹²⁴  | Katrine Hansen¹²⁴ | Tuanjit Sritongchuay¹²⁵  |
 Alison D. O'Reilly⁵⁸ | Fermín José Chamorro García^{126,127}  |
 Guiomar Nates Parra¹²⁶  | Camila Magalhães Pigozo¹²⁸  | Ignasi Bartomeus^{1,3} 

¹Estación Biológica de Doñana (EBD-CSIC), Sevilla, Spain

²Departamento de Ingeniería Eléctrica, Electrónica, Automática y Física Aplicada, ETSIDI, Universidad Politécnica de Madrid, Madrid, Spain

³Basque Centre for Climate Change-BC3, Edificio Sede 1, 1º, Parque Científico UPV-EHU, Barrio Sarriena s/n, 48940 Leioa, Spain

⁴IKERBASQUE, Basque Foundation for Science, Bilbao, Spain

⁵Eurac Research, Institute for Alpine Environment, Bolzano, Italy

⁶Consejo Nacional de Investigaciones Científicas y Técnicas, Instituto de Investigaciones en Recursos Naturales, Agroecología y Desarrollo Rural, Río Negro, Argentina

⁷Universidad Nacional de Río Negro, Instituto de Investigaciones en Recursos Naturales, Agroecología y Desarrollo Rural, Río Negro, Argentina

⁸Plant Ecology and Nature Conservation Group, Wageningen University & Research, Wageningen, The Netherlands

- ⁹School of Environment and Rural Science, University of New England, Armidale, Australia
- ¹⁰Department of Ecology, Evolution and Natural Resources, Rutgers University, New Brunswick, New Jersey, USA
- ¹¹Department of Ecology, Swedish University of Agricultural Sciences, Uppsala, Sweden
- ¹²Department of Applied Ecology, North Carolina State University, Raleigh, North Carolina, USA
- ¹³Department of Entomology and Nematology, University of California Davis, Davis, California, USA
- ¹⁴Department of Entomology, Pennsylvania State University Fruit Research and Extension Center, Biglerville, Pennsylvania, USA
- ¹⁵USDA-Agricultural Research Service, Pollinating Insects Research Unit, Logan, Utah, USA
- ¹⁶Department of Biological Sciences, Simon Fraser University, Burnaby, British Columbia, Canada
- ¹⁷Department of Crop and Soil Science, Oregon State University, Corvallis, Oregon, USA
- ¹⁸Entomology and Nematology Department, University of Florida, Gainesville, Florida, USA
- ¹⁹Florida Museum of Natural History, University of Florida, Gainesville, Florida, USA
- ²⁰Department of Entomology, University of Manitoba, Winnipeg, Manitoba, Canada
- ²¹USDA Agricultural Research Service, Northern Plains Agricultural Research Laboratory, Sidney, Montana, USA
- ²²Department of Entomology, University of Minnesota, St. Paul, Minnesota, USA
- ²³Department of Entomology, Michigan State University, East Lansing, Michigan, USA
- ²⁴National Park Service, Yosemite National Park, California, USA
- ²⁵Department of Entomology, Pennsylvania State University, University Park, Pennsylvania, USA
- ²⁶Department of Entomology and Plant Pathology, University of Arkansas, Fayetteville, Arkansas, USA
- ²⁷Northwest Michigan Horticultural Research Center, Michigan State University, Traverse City, Michigan, USA
- ²⁸Agriculture and Natural Resource Program, Wenatchee Valley College, Wenatchee, Washington, USA
- ²⁹AgPollen LLC, 14540 Claribel Road, Waterford, California, USA
- ³⁰ETH Zürich - Institute for Terrestrial Ecosystems - Ecosystem Management, Zurich, Switzerland
- ³¹University of Freiburg - Chair of Nature Conservation and Landscape Ecology, Freiburg, Germany
- ³²Department of Biology, Lund University, Lund, Sweden
- ³³Biology Institute, Federal University of Bahia, Salvador, Bahia, Brazil
- ³⁴National Institute of Science and Technology in Inter and Transdisciplinary Studies in Ecology and Evolution - INCT IN-TREE, Salvador, Bahia, Brazil
- ³⁵Centre for Environmental and Climate Research, Lund University, Lund, Sweden
- ³⁶Centre for Ecology, Evolution and Environmental Changes (cE3c), University of Lisbon, Lisbon, Portugal
- ³⁷Ecology Department, Universidade Federal de Goiás (UFG), Goiânia, Brazil
- ³⁸Gund Institute for Environment, University of Vermont, Burlington, Vermont, USA
- ³⁹Rubenstein School for Environment and Natural Resources, University of Vermont, Burlington, Vermont, USA
- ⁴⁰Department of Environmental Systems Science, ETH Zurich, Zurich, Switzerland
- ⁴¹Bioversity International, Bangalore, India
- ⁴²FLOWer Lab, Centre for Functional Ecology, Department of Life Sciences, University of Coimbra, Coimbra, Portugal
- ⁴³School of Environmental Sciences, University of Guelph, Guelph, Ontario, Canada
- ⁴⁴Alterra, Wageningen Environmental Research, Wageningen, The Netherlands
- ⁴⁵EcoLaverna Integral Restoration Ecology, County Cork, Ireland
- ⁴⁶Universidad Católica del Maule, Facultad de Ciencias Agrarias y Forestales, Escuela de Agronomía, Curicó, Chile
- ⁴⁷National Institute for Research in the Amazon (INPA), Coordination of Research in Biodiversity – COBIO, Manaus, AM, Brazil
- ⁴⁸Laboratory of Agrozoology, Department of Plant and Crops, Faculty of Bioscience Engineering, Ghent University, Ghent, Belgium
- ⁴⁹Centre for Agri-Environmental Research, School of Agriculture, Policy and Development, University of Reading, Reading, UK
- ⁵⁰Department of Environmental Science, Policy and Management, University of California, Berkeley, 137 Mulford Hall, Berkeley, California, USA
- ⁵¹Universidad de Oviedo y Unidad Mixta de Investigación en Biodiversidad (CSIC-Uo-PA), Spain
- ⁵²Servicio Regional de Investigación y Desarrollo Agroalimentario (SERIDA), Villaviciosa, Spain
- ⁵³Department of Entomology, Washington State University, Pullman, Washington, USA
- ⁵⁴Tel Aviv University, Tel Aviv, Israel

- ⁵⁵The Hebrew University of Jerusalem, Jerusalem, Israel
- ⁵⁶Agroecology Lab, Université Libre de Bruxelles (ULB), Brussels, Belgium
- ⁵⁷Swedish Rural Economy and Agricultural Society, Kristianstad, Sweden
- ⁵⁸School of Agriculture and Food Science, University College Dublin, Dublin 4, Ireland
- ⁵⁹Composting Research Group UBUCOMP, Universidad de Burgos, Faculty of Sciences, Burgos, Spain
- ⁶⁰BETA Technological Center, University of Vic–University of Central Catalonia, Vic, Catalonia, Spain
- ⁶¹Cornell University, Ithaca, New York, USA
- ⁶²Departamento de Zootecnia, Campus Universitário do Pici, Universidade Federal do Ceará, Centro de Ciências Agrárias, Fortaleza, CE, Brazil
- ⁶³University of Florida, Gainesville, Florida, USA
- ⁶⁴Universidade Federal de Sergipe (UFS), Campus do Sertão, Sergipe, Brazil
- ⁶⁵University of Brasilia, Brasilia, Brazil
- ⁶⁶Federal Institute of Mato Grosso, Campo Grande, Brazil
- ⁶⁷Instituto Mediterráneo de Estudios Avanzados (UIB-CSIC). Global Change Research Group, Esporles, Balearic Islands, Spain
- ⁶⁸Forestry and Forest Products Research Institute, Tsukuba, Ibaraki, Japan
- ⁶⁹Department of Biological Sciences, University of North Texas, Denton, Texas, USA
- ⁷⁰IES Landau Institute for Environmental Sciences, University of Koblenz-Landau, Germany
- ⁷¹Agroecology and Environment, Agroscope, Zürich, Switzerland
- ⁷²Department of Bioscience, Aarhus University, Roende, Denmark
- ⁷³Entomology Division, Natural History Museum, University of Kansas, Lawrence, Kansas, USA
- ⁷⁴Center for Conservation Biology, Department of Biology, Stanford University, Stanford, California, USA
- ⁷⁵Department of Plant Biology and Ecology, University of Seville, Sevilla, Spain
- ⁷⁶Applied Agricultural Remote Sensing Centre (AARSC), University of New England, Armidale, New South Wales, Australia
- ⁷⁷The New Zealand Institute for Plant and Food Research Ltd
- ⁷⁸Department of Animal Ecology, Justus Liebig University Giessen, Giessen, Germany
- ⁷⁹Department of Landscape Ecology, Kiel University, Kiel, Germany
- ⁸⁰INRAE, Unité de Recherche Pluridisciplinaire Prairies Plantes Fourragères, Lusignan, France
- ⁸¹UMR 7372, Centre d'Etudes Biologiques de Chizé, Université de la Rochelle & CNRS, Villiers en Bois, France
- ⁸²Minnesota Department of Natural Resources, St. Paul, Minnesota, USA
- ⁸³Agroecology, University of Göttingen, Göttingen, Germany
- ⁸⁴CEBC-CNRS, Villiers-en-Bois, France
- ⁸⁵Instituto de Ecología Regional (CONICET UNT), Tucumán, Argentina
- ⁸⁶University of Texas at Austin, Austin, Texas, USA
- ⁸⁷The Centre for Statistics in Ecology, the Environment and Conservation, Department of Statistical Sciences, University of Cape Town, Rondebosch, South Africa
- ⁸⁸South African National Biodiversity Institute
- ⁸⁹Instituto Federal de Educação, Ciência e Tecnologia da Bahia (IFBA)
- ⁹⁰Farming Systems Ecology, Wageningen University and Research, Wageningen, Netherlands
- ⁹¹Plant-Production Systems, Agroscope, Conthey, Switzerland
- ⁹²Department of Health and Environmental Sciences, Xi'an Jiaotong-Liverpool University, Suzhou, Jiangsu Province, China
- ⁹³Department of Environmental Conservation, University of Massachusetts, Amherst, Massachusetts, USA
- ⁹⁴INIBIOMA (CONICET-Universidad Nacional del Comahue), Bariloche, Rio Negro, Argentina
- ⁹⁵Department of Chemical and Biological Sciences, Universidad de las Américas Puebla, Cholula, Pue, Mexico
- ⁹⁶División de Ciencias Ambientales, Instituto Potosino de Investigación Científica y Tecnológica A.C., San Luis Potosi, Mexico
- ⁹⁷Department of Entomology, Cornell Agritech, Cornell University, Ithaca, New York, USA
- ⁹⁸School of Integrative Plant Science, Cornell University, Ithaca, New York, USA
- ⁹⁹Queensland Department of Agriculture and Fisheries, Ecosciences Precinct, Dutton Park, QLD, Australia

- ¹⁰⁰Fenner School of Environment and Society, the Australian National University, Canberra, Australian Capital Territory, Australia
- ¹⁰¹Norwegian Institute for Nature Research, Trondheim, Norway
- ¹⁰²Instituto Nacional de Tecnología Agropecuaria (INTA), Estación Experimental Agropecuaria Concordia. Programa Nacional Apicultura (PNAPI), Concordia, Argentina
- ¹⁰³Department of Animal Ecology and Tropical Biology, Biocenter, University of Würzburg, Würzburg, Germany
- ¹⁰⁴Lancaster Environment Centre, Lancaster University, Lancaster, UK
- ¹⁰⁵Centre for Ecology and Hydrology, Wallingford, UK
- ¹⁰⁶San Mateo Resource Conservation District, Half Moon Bay, California, USA
- ¹⁰⁷Faculty of Pure and Applied Sciences, Open University of Cyprus, Nicosia, Cyprus
- ¹⁰⁸Mediterranean Institute for Agriculture, Environment and Development, University of Évora, Évora, Portugal
- ¹⁰⁹Department of Agricultural Resource Management, University of Embu, Embu, Kenya
- ¹¹⁰Department of Zoology, National Museums of Kenya, Nairobi, Kenya
- ¹¹¹Kellogg Biological Station, Michigan State University, Hickory Corners, Michigan, USA
- ¹¹²Environmental Informatics, Faculty of Geography, University of Marburg, Marburg, Germany
- ¹¹³Environment and Sustainability Institute, University of Exeter, Penryn, Cornwall, UK
- ¹¹⁴Social-ecological Systems Laboratory, Department of Ecology, Universidad Autónoma de Madrid, Madrid, Spain
- ¹¹⁵CSIRO, Canberra, Australian Capital Territory, Australia
- ¹¹⁶Trinity College Dublin, Dublin, Ireland
- ¹¹⁷Department of Agriculture Water and the Environment, Canberra, Australian Capital Territory, Australia
- ¹¹⁸Programa de Pós-Graduação em Ecologia e Evolução da Biodiversidade, Escola de Ciência, Pontifícia Univ Católica do Rio Grande do Sul, Porto Alegre, Brazil
- ¹¹⁹Institute of Botany, Faculty of Biology, Jagiellonian University, Kraków, Poland
- ¹²⁰Data2action, Canberra, Australian Capital Territory, Australia
- ¹²¹The University of Queensland, The School of Biological Sciences, Brisbane, Queensland, Australia
- ¹²²Institute of Environmental Sciences, Faculty of Biology, Jagiellonian University, Kraków, Poland
- ¹²³Centre for Ecology and Conservation, College of Life and Environmental Sciences, University of Exeter, Penryn, UK
- ¹²⁴Center for Macroecology, Evolution and Climate, GLOBE Institute, University of Copenhagen, Copenhagen Ø, Denmark
- ¹²⁵Center for Integrative Conservation, Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Menglun, Mengla, Yunnan Province, China
- ¹²⁶Laboratorio de Investigaciones en Abejas (LABUN), Departamento de Biología, Universidad Nacional de Colombia-Sede Bogotá, Bogotá, Colombia
- ¹²⁷Programa de Pós-graduação em Ecologia e Recursos Naturais, Departamento de Biologia, Universidade Federal do Ceará, Fortaleza, CE, Brazil
- ¹²⁸University Jorge Amado, Salvador, Bahia, Brazil

Correspondence

Ignasi Bartomeus
Email: nacho.bartomeus@gmail.com

Funding information

2017-2018 Belmont Forum and BiodivERSA joint call for research proposals, under the BiodivScen ERA-Net COFUND programme, and with the funding organisations AEI, NWO, ECCyT and NSF

Handling Editor: William K. Michener

Abstract

Seventy five percent of the world's food crops benefit from insect pollination. Hence, there has been increased interest in how global change drivers impact this critical ecosystem service. Because standardized data on crop pollination are rarely available, we are limited in our capacity to understand the variation in pollination benefits to crop yield, as well as to anticipate changes in this service, develop predictions, and inform management actions. Here, we present CropPol, a dynamic, open, and global database on crop pollination. It contains measurements recorded from 202 crop studies, covering 3,394 field observations, 2,552 yield measurements (i.e., berry mass, number of fruits, and fruit density [kg/ha], among others), and 47,752 insect records from 48 commercial crops distributed around the globe. CropPol comprises 32 of the 87 leading global crops and commodities that are pollinator dependent. *Malus domestica* is the most represented crop (32 studies), followed by *Brassica napus*

(22 studies), *Vaccinium corymbosum* (13 studies), and *Citrullus lanatus* (12 studies). The most abundant pollinator guilds recorded are honey bees (34.22% counts), bumblebees (19.19%), flies other than Syrphidae and Bombyliidae (13.18%), other wild bees (13.13%), beetles (10.97%), Syrphidae (4.87%), and Bombyliidae (0.05%). Locations comprise 34 countries distributed among Europe (76 studies), North America (60), Latin America and the Caribbean (29), Asia (20), Oceania (10), and Africa (7). Sampling spans three decades and is concentrated on 2001–2005 (21 studies), 2006–2010 (40), 2011–2015 (88), and 2016–2020 (50). This is the most comprehensive open global data set on measurements of crop flower visitors, crop pollinators and pollination to date, and we encourage researchers to add more datasets to this database in the future. This data set is released for non-commercial use only. Credits should be given to this paper (i.e., proper citation), and the products generated with this database should be shared under the same license terms (CC BY-NC-SA).

KEYWORDS

agricultural management, bees, crop production, flower visiting insects, pollination, pollinator biodiversity

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT


Data and code are also available on Zenodo at: <https://doi.org/10.5281/zenodo.5546600>

ORCID

Alfonso Allen-Perkins  <https://orcid.org/0000-0003-3547-2190>

Ainhoa Magrach  <https://orcid.org/0000-0003-2155-7556>

Matteo Dainese  <https://orcid.org/0000-0001-7052-5572>

Lucas A. Garibaldi  <https://orcid.org/0000-0003-0725-4049>

David Kleijn  <https://orcid.org/0000-0003-2500-7164>

Romina Rader  <https://orcid.org/0000-0001-9056-9118>

James R. Reilly  <https://orcid.org/0000-0002-2355-3535>

Rachael Winfree  <https://orcid.org/0000-0002-1271-2676>

Ola Lundin  <https://orcid.org/0000-0002-5948-0761>

David J. Biddinger  <https://orcid.org/0000-0002-6855-8372>


Derek R. Artz  <https://orcid.org/0000-0003-2082-4974>

Elizabeth Elle  <https://orcid.org/0000-0002-0371-600X>

James D. Ellis  <https://orcid.org/0000-0003-0318-8646>

Jaret Daniels  <https://orcid.org/0000-0002-3245-6710>

Jason Gibbs  <https://orcid.org/0000-0002-4945-5423>


Julianna K. Wilson  <https://orcid.org/0000-0003-0807-5421>

Kyle Bobiwash  <https://orcid.org/0000-0002-0628-3481>

Neal M. Williams  <https://orcid.org/0000-0003-3053-8445>

Robert L. Gillespie  <https://orcid.org/0000-0003-1216-0733>

Rufus Isaacs  <https://orcid.org/0000-0001-7523-4643>

Shelby J. Fleischer  <https://orcid.org/0000-0001-5314-6538>

Stephen S. Peterson  <https://orcid.org/0000-0001-9090-6698>

Sujaya Rao  <https://orcid.org/0000-0002-7781-5000>

Theresa L. Pitts-Singer  <https://orcid.org/0000-0003-1471-3450>

Thijs Fijen  <https://orcid.org/0000-0002-4371-2708>

Virginie Boreux  <https://orcid.org/0000-0002-0450-6063>

Maj Rundlöf  <https://orcid.org/0000-0003-3014-1544>

Blandina Felipe Viana  <https://orcid.org/0000-0002-4924-1257>

Alexandra-Maria Klein  <https://orcid.org/0000-0003-2139-8575>

Riccardo Bommarco  <https://orcid.org/0000-0001-8888-0476>

Lúisa G. Carvalheiro  <https://orcid.org/0000-0001-7655-979X>

Taylor H. Ricketts  <https://orcid.org/0000-0001-9688-7977>

Jaboury Ghazoul  <https://orcid.org/0000-0002-8319-1636>

Smitha Krishnan  <https://orcid.org/0000-0002-2851-6813>

João Loureiro  <https://orcid.org/0000-0002-9068-3954>

- Silvia Castro*  <https://orcid.org/0000-0002-7358-6685>
- Nigel E. Raine*  <https://orcid.org/0000-0001-6343-2829>
- Gerard Arjen de Groot*  <https://orcid.org/0000-0001-7308-9200>
- Finbarr G. Horgan*  <https://orcid.org/0000-0003-3796-667X>
- Juliana Hipólito*  <https://orcid.org/0000-0002-0721-3143>
- Guy Smagghe*  <https://orcid.org/0000-0001-8334-3313>
- Ivan Meeus*  <https://orcid.org/0000-0002-4492-5967>
- Maxime Eraerts*  <https://orcid.org/0000-0003-2739-9704>
- Simon G. Potts*  <https://orcid.org/0000-0002-2045-980X>
- Claire Kremen*  <https://orcid.org/0000-0001-6909-4605>
- Daniel García*  <https://orcid.org/0000-0002-7334-7836>
- Yael Mandelik*  <https://orcid.org/0000-0002-9576-119X>
- Nicolas J. Vereecken*  <https://orcid.org/0000-0002-8858-4623>
- Nicolas Leclercq*  <https://orcid.org/0000-0002-3317-6622>
- Timothy Weekers*  <https://orcid.org/0000-0003-0458-857X>
- Sandra A. M. Lindstrom*  <https://orcid.org/0000-0002-8403-3509>
- Dara A. Stanley*  <https://orcid.org/0000-0001-8948-8409>
- Carlos Zaragoza-Trello*  <https://orcid.org/0000-0002-6824-3143>
- Charlie C. Nicholson*  <https://orcid.org/0000-0002-7164-0529>
- Jeroen Scheper*  <https://orcid.org/0000-0002-4314-996X>
- Carlos Rad*  <https://orcid.org/0000-0003-2538-2212>
- Lucie Mota*  <https://orcid.org/0000-0003-2768-461X>
- Bryan Danforth*  <https://orcid.org/0000-0002-6495-428X>
- Antônio Diego M. Bezerra*  <https://orcid.org/0000-0002-8070-5582>
- Breno M. Freitas*  <https://orcid.org/0000-0002-9932-2207>
- Rachel E. Mallinger*  <https://orcid.org/0000-0003-3782-1710>
- Fabiana Oliveira da Silva*  <https://orcid.org/0000-0002-6919-7716>
- Bryony Willcox*  <https://orcid.org/0000-0003-4306-1084>
- Davi L. Ramos*  <https://orcid.org/0000-0003-4870-3533>
- Felipe D. da Silva e Silva*  <https://orcid.org/0000-0001-9445-9493>
- Amparo Lázaro*  <https://orcid.org/0000-0001-5626-4134>
- Hisatomo Taki*  <https://orcid.org/0000-0002-2399-0049>
- Daniel P. Cariveau*  <https://orcid.org/0000-0002-3064-0071>
- Michael P. D. Garratt*  <https://orcid.org/0000-0002-0196-6013>
- Diego N. Nabaes Jodar*  <https://orcid.org/0000-0002-8572-9495>
- Matti Pisman*  <https://orcid.org/0000-0002-2343-5272>
- Elinor M. Lichtenberg*  <https://orcid.org/0000-0002-2729-4534>
- Felix Herzog*  <https://orcid.org/0000-0001-9472-4891>
- Martin H. Entling*  <https://orcid.org/0000-0002-3947-6407>
- Yoko L. Dupont*  <https://orcid.org/0000-0002-8811-2773>
- Katherine L. W. Burns*  <https://orcid.org/0000-0003-3273-7341>
- Montserrat Vilà*  <https://orcid.org/0000-0003-3171-8261>
- Andrew Robson*  <https://orcid.org/0000-0001-5762-8980>
- Brad Howlett*  <https://orcid.org/0000-0002-0694-135X>
- Frank Jauker*  <https://orcid.org/0000-0003-4137-9072>
- Maike Nesper*  <https://orcid.org/0000-0002-3762-105X>
- Tim Diekötter*  <https://orcid.org/0000-0003-4838-793X>
- Volkmar Wolters*  <https://orcid.org/0000-0002-7556-4578>
- Helena Castro*  <https://orcid.org/0000-0003-1818-1535>
- Hugo Gaspar*  <https://orcid.org/0000-0001-5448-8396>
- Brian A. Nault*  <https://orcid.org/0000-0003-2490-4277>
- Isabelle Badenhauer*  <https://orcid.org/0000-0002-6919-8647>
- Teja Tschamtko*  <https://orcid.org/0000-0002-4482-3178>
- Vincent Bretagnolle*  <https://orcid.org/0000-0002-2320-7755>
- D. Susan Willis Chan*  <https://orcid.org/0000-0003-1910-0768>
- Natacha Chacoff*  <https://orcid.org/0000-0002-1115-6989>
- Shalene Jha*  <https://orcid.org/0000-0001-7199-6106>
- Jonathan F. Colville*  <https://orcid.org/0000-0003-2176-3077>
- Ruan Veldtman*  <https://orcid.org/0000-0002-2258-6108>
- Jeferson Coutinho*  <https://orcid.org/0000-0002-0694-0760>
- Felix J. J. A. Bianchi*  <https://orcid.org/0000-0001-5947-9405>
- Louis Sutter*  <https://orcid.org/0000-0002-2626-216X>
- Philippe Jeanneret*  <https://orcid.org/0000-0002-6715-4632>
- Yi Zou*  <https://orcid.org/0000-0002-7082-9258>
- Anne L. Averill*  <https://orcid.org/0000-0002-4801-3623>
- Agustín Saez*  <https://orcid.org/0000-0002-6461-2888>
- Amber R. Sciligo*  <https://orcid.org/0000-0003-2437-8799>
- Elias H. Bloom*  <https://orcid.org/0000-0001-7024-6880>
- Elisabeth Oeller*  <https://orcid.org/0000-0003-3894-2880>
- Ernesto I. Badano*  <https://orcid.org/0000-0002-9591-0984>
- Gregory M. Loeb*  <https://orcid.org/0000-0001-9056-785X>
- Heather Grab*  <https://orcid.org/0000-0002-1073-8805>
- Johan Ekroos*  <https://orcid.org/0000-0003-1164-5472>
- Vesna Gagic*  <https://orcid.org/0000-0002-3214-7547>
- Saul A. Cunningham*  <https://orcid.org/0000-0003-0703-6893>
- Jens Åström*  <https://orcid.org/0000-0002-6114-0440>
- Pablo Cavigliasso*  <https://orcid.org/0000-0002-9901-5450>
- Alejandro Trillo*  <https://orcid.org/0000-0002-6944-0923>

Alice Classen  <https://orcid.org/0000-0002-7813-8806>
Alice L. Mauchline  <https://orcid.org/0000-0003-1168-8552>
Ana Montero-Castaño  <https://orcid.org/0000-0003-2631-0085>
Andrew Wilby  <https://orcid.org/0000-0001-9984-4956>
Ben A. Woodcock  <https://orcid.org/0000-0003-0300-9951>
C. Sheena Sidhu  <https://orcid.org/0000-0002-7190-3544>
Ingolf Steffan-Dewenter  <https://orcid.org/0000-0003-1359-3944>
Ioannis N. Vogiatzakis  <https://orcid.org/0000-0001-7071-6950>
José M. Herrera  <https://orcid.org/0000-0001-7968-3438>
Mark Otieno  <https://orcid.org/0000-0002-8509-3298>
Mary W. Gikungu  <https://orcid.org/0000-0002-4552-9325>
Sarah J. Cusser  <https://orcid.org/0000-0002-0100-026X>
Thomas Naus  <https://orcid.org/0000-0003-3422-0960>
Lovisa Nilsson  <https://orcid.org/0000-0001-6823-0433>
Jessica Knapp  <https://orcid.org/0000-0001-8829-8486>
Jorge J. Ortega-Marcos  <https://orcid.org/0000-0001-8636-1920>
Juliet L. Osborne  <https://orcid.org/0000-0002-9937-172X>
Rosalind F. Shaw  <https://orcid.org/0000-0001-5179-964X>
Violeta Hevia  <https://orcid.org/0000-0003-1623-4082>
Jane Stout  <https://orcid.org/0000-0002-2027-0863>
Betina Blochtein  <https://orcid.org/0000-0001-8452-1716>
Hajnalka Szentgyorgyi  <https://orcid.org/0000-0002-5753-800X>

Margaret M. Mayfield  <https://orcid.org/0000-0002-5101-6542>
Patricia Nunes-Silva  <https://orcid.org/0000-0002-9215-9822>
Rosana Halinski de Oliveira  <https://orcid.org/0000-0003-2956-4240>
Benno I. Simmons  <https://orcid.org/0000-0002-2751-9430>
Bo Dalsgaard  <https://orcid.org/0000-0003-2867-2805>
Tuanjit Sritongchuay  <https://orcid.org/0000-0003-0706-7673>
Fermin José Chamorro García  <https://orcid.org/0000-0002-2481-5656>
Guiomar Nates Parra  <https://orcid.org/0000-0002-0925-2357>
Camila Magalhães Pigozo  <https://orcid.org/0000-0001-9044-5780>
Ignasi Bartomeus  <https://orcid.org/0000-0001-7893-4389>

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

How to cite this article: Allen-Perkins, Alfonso, Ainhoa Magrath, Matteo Dainese, Lucas A. Garibaldi, David Kleijn, Romina Rader, James R. Reilly, et al. 2022. "CropPol: A Dynamic, Open and Global Database on Crop Pollination." *Ecology* 103(3): e3614. <https://doi.org/10.1002/ecy.3614>