

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

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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>

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