**Table S1.** Studies included in the analyses. If possible, we indicated spatial scales of the assemblage data explicitly, such as the length of the transects or plot size. If this information is not available, or if the studies did not standardize sampling area, we used other metrics such as sampled time and number of trees sampled.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Study | Mean abundance | Mean species richness | Scales of assemblage | Contact |
| Adgc01 (González-Chaves *et al.*, 2020) | 13.0 | 6.0 | Netting (Coffee visitors): 50m transect | Adrian González-Chaves,  Jean Paul Metzger |
| Amad01 (Amado de Santis & Chacoff, 2020) | 72.8 | 17.5 | Netting (Floral visitors): 1ha plot | A. A. Amado De Santis |
| Arm01 (Armas-Quiñonez *et al.*, 2020) | 252.0 | 30.0 | Netting (Floral visitors): 30m\*20m plot | Ek Del-Val,  Gabriela Armas-Quiñonez |
| Avil01 (Ávila-Gómez *et al.*, 2019) | 297.4 | 19.9 | Pan: 36 traps at 9 locations 100m apart, forming a 200m\*200m plot | Eva Samanta Ávila-Gómez |
| Baldi01 (Sárospataki *et al.*, 2009; Batary *et al.*, 2010) | 18.4 | 11.3 | Sweep nets: 60 sweeps along 2 95m transects  Netting (all bees): 2 95m transects | András Báldi |
| Ball01 (Ballare *et al.*, 2019) | 314.7 | 31.7 | Pan: 50 traps at an X formation, 1m apart (i.e., a ~17m\*17m plot)  Vane: 4 traps at the center of the plot, hung at 1m high for 5 days | Kimberly M. Ballare |
| balz021 | 13.7 | 3.3 | Netting (Floral visitors): 15m transect | Mario V. Balzan |
| balz03 (Balzan, 2017) | 12.0 | 5.0 | Netting (Floral visitors): 2m\*1m plot | Mario V. Balzan |
| Bana01 (Banaszak-Cibicka & Żmihorski, 2020) | 315.7 | 47.7 | Netting (All bees): 200m\*1m transect | Weronika Banaszak-Cibicka |
| Bana02 (Banaszak-Cibicka *et al.*, 2018) | 214.9 | 35.5 | Pan: 3 traps within 200m\*1m transect  Netting (All bees): 200m\*1m transect | Weronika Banaszak-Cibicka |
| Bana03 (Banaszak-Cibicka & Żmihorski, 2012) | 295.3 | 43.5 | Pan: 4 traps  Netting (All bees): 30 minutes  All conducted within 50m\*50m plots | Weronika Banaszak-Cibicka |
| Bass01 (Basset *et al.*, 2008) | 122.0 | 17.7 | Malaise: 1 trap  Pan: 4 traps  All pan traps 10m distant from the malaise trap (20m\*20m plots) | Yves Basset |
| Bate01 (Bates *et al.*, 2011) | 49.0 | 15.4 | Pan: 9 traps at 3 locations  Netting: 30 minutes\*2 visits. | Adam J. Bates |
| Baum011 | 21.3 | 7.4 | Netting (Floral visitors): 30 minutes within 1ha plot | Jessica M. Baumann,  Nicholas S. G. Williams |
| Beal01 (Beal-Neves *et al.*, 2020) | 67.0 | 7.0 | Netting (Floral visitors): Sampling flower visitors within 1 ha circular plots. Sampling time varied from 15 to 19 hours between sites. | Mariana Beal-Neves,  Pedro Maria de Abreu Ferreira,  Betina Blochtein |
| benj01 (Cariveau *et al.*, 2013; Garibaldi *et al.*, 2013) | 72.3 | 11.7 | Netting (Blueberry visitors): 200m transect | Faye Benjamin |
| Bill01 (Billeter *et al.*, 2008) | 66.0 | 16.3 | Combined window-glass and yellow-pan trap: 2 sets (25-50m apart) | Regula Billeter |
| Bird01 (Birdshire *et al.*, 2020) | 155.9 | 19.8 | Pan: 3 traps at 1 location  Netting (All bees): 30 minutes within 25m of the location | Kristen R. Birdshire |
| bomm01 (Bommarco *et al.*, 2012) | 16.5 | 3.5 | Netting (All bees): 150m\*4m transect | Riccardo Bommarco |
| bore011 | 24.0 | 6.7 | Netting (Apple visitors): 20m | Alexandra-Maria Klein |
| Bros01 (Brosi *et al.*, 2008) | 38.5 | 12.3 | Netting (All bees): 20m\*20m plot | Berry Brosi |
| Bros02 (Miljanic *et al.*, 2019) | 86.1 | 15.0 | Netting (All bees): 2 200m\*2m transects  Pan: 15 traps evenly distributed along the middle 100m of each transect | Berry Brosi |
| burk01 (Burkle *et al.*, 2020) | 1168.0 | 64.3 | Pan: 4 33m transects with 6 traps each. | Laura A. Burkle |
| burk02 (Simanonok & Burkle, 2014) | 35.5 | 5.6 | Netting (Floral visitors): For each flowering plant species, a semi-circular plot (~625m2) was observed.  Total number of plots varied with number of flowering species in each survey. Total number ranged from 44 to 128 plots | Laura A. Burkle |
| burk03 (Burkle *et al.*, 2013) | 154.6 | 26.9 | Timed search (Floral visitors): Total time ranged from 520 to 4279.5 minutes in site. | Laura A. Burkle |
| burk04 (Burkle & Knight, 2012) | 574.4 | 23.4 | Netting (Floral visitors): Transect covered the whole area (456-71246m2) | Laura A. Burkle |
| burk05 (Heil & Burkle, 2018) | 28.3 | 12.3 | Netting (Floral visitors): 25m diameter circular plot (~491m2) | Laura A. Burkle |
| burk06 (Burkle *et al.*, 2019) | 64.7 | 27.1 | Netting (Floral visitors): 25m diameter circular plot (~491m2) | Laura A. Burkle |
| cari012 | 42.6 | 11.3 | Netting (Bluerry visitors): 60m | Dan Cariveau |
| Cast01 (Sánchez-Echeverría *et al.*, 2016) | 19.0 | 1.0 | Netting (*Opuntia heliabravoana* visitors): 50m transect | Ignacio Castellanos,  Karina Sánchez-Echeverría |
| Carv01b (Carvalheiro *et al.*, 2010) | 53.7 | 7.2 | Netting (Mango visitors): 60m\*2m transect.  Methodology provided in the reference, but the data is from mango plantation margins. | Luísa G. Carvalheiro |
| Cely01 (Cely-Santos & Philpott, 2019) | 271.6 | 18.4 | Netting (All bees): 100m\*100m plot | Marcela Cely-Santos |
| conn01a (Connelly *et al.*, 2015) | 14.5 | 5.5 | Netting (Strawberry vistors): 2 20m transects | Heather Grab,  Greg Loeb |
| conn01b (Connelly *et al.*, 2015) | 62.8 | 14.5 | Pan: 10 traps (1m apart) within a 5m\*5m plot | Heather Grab,  Greg Loeb |
| conn02 (Grab *et al.*, 2018) | 181.9 | 19.4 | Netting (Strawberry visitors): 2 10m\*15m plots | Heather Grab,  Greg Loeb |
| conn04 (Grab *et al.*, 2018) | 432.3 | 9.5 | Netting (Floral visitors): 10m\*4m | Heather Grab,  Greg Loeb |
| cunn0052 | 612.7 | 10.6 | Vane: 1 or 2 vane traps (separated by < 500m) | Saul Cunningham |
| cunn009 (Lentini *et al.*, 2012) | 46.4 | 7.0 | Vane: 1 trap | Saul Cunningham |
| Cunn02 (Cunningham *et al.*, 2013) | 115.9 | 18.2 | Malaise: 1 trap | Saul Cunningham |
| cuss01 (Cusser *et al.*, 2018) | 37.7 | 8.8 | Netting (Cotton visitors): 4 parallel evenly-spaced 50m\*1m transects within a 50m\*50m plot | Sarah Cusser |
| Cuss02 (Cusser *et al.*, 2015) | 74.8 | 12.9 | Netting (Cotton visitors): 3 50m\*10m transects within a 50m\*50m plot. | Sarah Cusser |
| danf01(Russo *et al.*, 2015) | 89.6 | 20.4 | Netting (Apple visitors): 100m | Mia G. Park |
| Drom01 (Dromgold *et al.*, 2020) | 22.0 | 4.0 | Pan: 3 traps randomly placed in each site (26m2-832m2) | Nicholas S. G. Williams |
| Ducl01 (du Clos *et al.*, 2020) | 72.0 | 20.7 | Pan: 3 traps every 10m along a transect (100m)  Netting (All bees): 100m transect (same as pan trap) | Brianne Du Clos |
| Enriq01 (Enríquez *et al.*, 2015) | 117.6 | 14.7 | Netting (Pumpkin visitors): 144m2 | Eunice Enríquez |
| Forr01 (Forrest *et al.*, 2015) | 266.3 | 35.1 | Netting (Floral visitors): ~1.8ha plot | Jessica Forrest |
| Four01 (Normandin *et al.*, 2017; McCune *et al.*, 2020) | 757.6 | 63.4 | Pan: each cluster contained 3 traps spaced 1m apart. The number of clusters within sites ranged from1-15. | Frédéric McCune,  Valérie Fournier |
| Fowl01 (Fowler, 2015) | 96.9 | 23.8 | Pan: 6 sets of 4 traps within 100m2  Netting (all bees): 30 minutes\*2 visits. Area was not specified. | Robert Fowler |
| frei01 (Allen‐Perkins *et al.*, 2022) | 859.0 | 9.3 | Netting (Cherry visitors): 50m transect | Antonio Diego M. Bezerra,  Breno Freitas |
| frei02 (Allen‐Perkins *et al.*, 2022) | 215.0 | 7.0 | Netting (Cotton visitors): 50m transect | Antonio Diego M. Bezerra,  Breno Freitas |
| gain01 (Day, 2013) | 72.1 | 23.1 | Pan: 5 clusters of 3 traps at every 10m interval. 2 parallel transects separated by 50m (i.e., 50m\*40m = 2000m2) | Hannah Gaines Day,  Claudio Gratton |
| Gesl01 (Geslin *et al.*, 2016) | 107.0 | 18.9 | Pan: 1 set of 3 pan traps on a wooden pole. | Benoît Geslin,  Isabelle Dajoz |
| Gonz01 (Escobedo-Kenefic *et al.*, 2020) | 73.2 | 11.8 | Netting (All bees): 4hr walk within a ~1-1.2 ha area. | Patricia Landaverde-González,  Natalia Escobedo |
| Guen01 (Guenat *et al.*, 2019) | 10.5 | 5.5 | Pan: 5 clusters of 3 traps were set out on one occasion.  Note that the catches were extremely low (< 10 individuals in each sampling location), thus we pooled data across locations within the same land use from the same town. In total, data from two towns were used. The locations from the two towns were separated by ~200m and ~500m. | Solène Guenat |
| Guti01P (Gutiérrez-Chacón *et al.*, 2018) | 99.9 | 20.9 | Netting (All bees): one 150m\*4m transect  Pan: 4 sets of 3 traps every 50m on the 150m transect.  Bait: 2 traps on the 150m transect extremes. | Catalina Gutiérrez-Chacón |
| Hall01 (Hall *et al.*, 2019) | 340.0 | 12.1 | Vane: 1 trap | Mark A. Hall |
| Hanl013 | 138.9 | 10.8 | A total of 1600m have been surveyed in each site. | Michael E. Hanley |
| Henn01 (Hennig & Ghazoul, 2011, 2012) | 23.0 | 5.0 | Plots (Floral visitors): 2m\*2m | Ernest Ireneusz Hennig |
| Hermy01 (Verboven *et al.*, 2014) | 14.6 | 4.2 | Netting (All bees): 50m | Martin Hermy |
| Hipo01 (Hipólito *et al.*, 2018) | 34.0 | 6.5 | Netting (Coffee visitors): 50m\*25m | Juliana Hipólito |
| holz01a (Holzschuh *et al.*, 2012) | 14.0 | 6.0 | Netting (Cherry visitors): 4 plots with 3 trees 1.5-2m apart. Plots randomly distributed in each site (1.16ha-5.04ha) | Andrea Holzschuh |
| holz01b (Holzschuh *et al.*, 2012) | 28.7 | 8.5 | Netting (All bees): 50m\*2m | Andrea Holzschuh |
| holz02 (Holzschuh *et al.*, 2007) | 38.6 | 6.1 | Netting (All bees): 1 95m “edge” transect and 1 95m “centre” transect in each field. Field size 0.6-12.5 ha. | Andrea Holzschuh |
| hopf1 (Hopfenmüller *et al.*, 2014) | 161.6 | 50.8 | Netting (All bees): ~0.1ha | Sebastian Hopfenmüller |
| Hung01 (Hung *et al.*, 2019) | 508.4 | 38.6 | Pan: 30 traps forming a X formation, each trap 5m-10m apart (~85m\*85m) | Keng-Lou James Hung |
| isaa012 (Isaacs & Kirk, 2010) | 30.7 | 3.7 | Netting (Blueberry visitors): In each survey, floral visitors of sections of blueberry fields (~10 brushes) were recorded. 10 sections were surveyed in each survey, with their size ranging from 0.05-6.79 ha. Each site was sampled twice. | Rufus Isaac |
| javo012 | 539.5 | 12.6 | Netting (Blueberry visitors): 100m\*1m transect | Steve Javorek |
| jha01 (Jha & Vandermeer, 2010) | 88.9 | 18.6 | Pan: 30 traps across 2 intersecting 50m transects (50m\*50m) | Shalene Jha |
| klat01 (Bjorn K. Klatt, 2013) | 51.0 | 9.3 | Netting (Strawberry visitors): Conducted in strawberry fields. Transects were at a length of 100 strawberry plants. 3 transects were used.  The total observation time per transect was 120 minutes (30 minutes per transect walk). | Bjorn K. Klatt,  Teja Tscharntke |
| klei012 | 118.6 | 7.5 | Pan: Ten traps, 5 at the orchard edge and 5 50/100m from the edge. | Alexandra-Maria Klein |
| Kohl01 (Kohler *et al.*, 2008) | 34.3 | 5.3 | Netting (All bees): 275/300m\*1m transect | Jort Verhulst |
| Kova01 (Kovács-Hostyánszki *et al.*, 2016) | 36.7 | 15.5 | Netting (All bees): 2 parallel 100m\*3m transects, at least 50m from each other. | Anikó Kovács-Hostyánszki |
| krem01(Kremen *et al.*, 2004) | 139.9 | 4.6 | Netting (Watermelon visitors): 2 to 4 50m transects. All transects started 5 to 10m from the edge of the field. | Claire Kremen |
| krem03(Williams *et al.*, 2011) | 333.9 | 46.9 | Netting (Floral visitors): 1.8 ± 0.04 ha on average. | Claire Kremen |
| Land01P (Landsman *et al.*, 2019) | 194.0 | 22.3 | Pan: 5 trap clusters in each site. Each cluster has 3 traps.  Maximum distance between clusters of the same site < 500m. | Deborah A. Delaney |
| Landa01(Escobar‐González *et al.*, 2023) | 86.8 | 12.0 | Netting (All bees): 1 4hr walk | Patricia Landaverde-González |
| Latt01 (Makinson *et al.*, 2017) | 17.8 | 4.0 | Netting (Floral visitors): Selected 4 flowering patches in each site and observed floral visitors for 15 minutes each.  The area of each sampled garden ranged from 6.1m2 to 1720m2. | Tanya Latty |
| leon01 (Leong *et al.*, 2016) | 601.0 | 17.4 | Pan: 15 traps, 5m apart | Misha Leong |
| Lerman01 (Lerman & Milam, 2016; Lerman *et al.*, 2018) | 283.6 | 35.0 | Pan: Ten clusters of 3 traps distributed near lawn flowers of each site. Site area ranged from 0.03 to 0.18ha.  Netting (All bees): 15 minutes\*5 visits\*2 years. | Susannah B. Lerman |
| Liuy01P (Wu *et al.*, 2021) | 107.9 | 15.5 | Pan: 3 parallel 40m transects at distances of 10m. Each transect had 3 traps. | Yunhui Liu |
| Liuy02P (Wu *et al.*, 2019) | 197.3 | 22.9 | Pan: 3 parallel 40m transects at distances of 10m. Each transect had 3 traps. | Yunhui Liu |
| Mach01 (Machado *et al.*, 2021) | 24.4 | 11.5 | Bait: 1 odor bait  Pan: 3 traps were established 1m apart.  Netting (All bees): 20m transect | Ana Carolina Pereira Machado,  André Rodrigo Rech |
| Main01 (Main *et al.*, 2019) | 215.5 | 37.3 | Vane: 6 vane traps placed in a linear row. Spacing varied by the length of field margins (96-571m).  Netting (All bees): 200m\*4m | Anson R. Main,  Elisabeth B. Webb,  Doreen Mengel |
| mall01 (Mallinger *et al.*, 2016) | 199.3 | 14.6 | Pan: Ten traps were placed 2m apart in 2 parallel rows spaced 3m apart (~8m\*3m = 24m2)  mall01 and mall02 were considered separate studies due to different sampling years and sampling efforts in each year. This also facilitate comparisons with natural habitats, which was only surveyed in 2013, while some orchads were sampled in 2010, 2012 and 2013.  mall01 contains all orchard data from sampling conducted in 2010 and 2012. | Rachel Mallinger |
| mall02 (Mallinger *et al.*, 2016) | 73.6 | 15.8 | Pan: Ten traps were placed 2m apart in 2 parallel rows spaced 3m apart (~8m\*3m = 24m2)  mall02 contains natural habitat and orchard data from 2013 samples. | Rachel Mallinger |
| mand01 (Pisanty & Mandelik, 2015) | 25.3 | 10.7 | Pan: 12 traps at 5m intervals. | Gideon Pisanty,  Yael Mandelik |
| mand02 (Pisanty & Mandelik, 2015) | 30.9 | 10.9 | Pan: 12 traps at 5m intervals (55m).  Netting (All bees): Searching within a 25m\*25m plot.  Traps were placed on 1m poles in mand02 (which focused on sunflower fields), but on the ground in mand03 (watermelon fields). Thus they were considered as separate studies. | Gideon Pisanty,  Yael Mandelik |
| mand03 (Pisanty & Mandelik, 2015) | 23.0 | 9.1 | Pan: 12 traps at 5m intervals (55m).  Netting (All bees): Searching within a 25m\*25m plot. | Gideon Pisanty,  Yael Mandelik |
| Mans01 (Kohler *et al.*, 2020) | 117.7 | 14.3 | Pan: 33 traps were placed every 3m along 3 36m transects | Jessamyn S. Manson |
| Marq011 | 10.0 | 5.0 | Netting (Floral visitors): 60m transect. | Bruno Ferreira Marques |
| Marshall01 (Marshall *et al.*, 2006) | 16.5 | 4.6 | Netting (All bees): 15-minute search at the field boundary and center. 3 visits.  Sweep net: 20 sweeps at the boundary and center. 3 visits. | E. J. P. Marshall |
| Matt01 (Matteson *et al.*, 2008) | 61.4 | 20.2 | Pan: 1 trap every 500m2.  Netting (All bees): 10 person minutes every 500m2.  Area ranged from 224 to 2188m2 | Kevin Matteson |
| Meng01 (Meng *et al.*, 2012) | 98.2 | 16.5 | Vane: 1 trap | Ling-Zeng Meng |
| Meyr01a (Meyer *et al.*, 2005) | 18.3 | 3.7 | Netting (*Hippocrepis comosa* visitors): ≤ 4m2 plot (2m\*2m)  Separated into two studies because of very different methods and sampling years with Meyr01b. | Birgit Jauker,  Ingolf Steffan-Dewenter |
| Meyr01b (Meyer *et al.*, 2005) | 16.3 | 5.0 | Netting (*Hippocrepis comosa* visitors): 0.4m\*0.4m | Birgit Jauker,  Ingolf Steffan-Dewenter |
| Meyr02 (Jauker *et al.*, 2013) | 123.1 | 26.4 | Netting (All bees): Transect length varied, averaging at 15.7 ± 6.2m SD. Transect width was 4m.  4-12 transects within sites. Site area ranged from 3.1ha to 51.3ha. | Birgit Jauker,  Ingolf Steffan-Dewenter |
| Mont01 (Montoya‐Pfeiffer *et al.*, 2020) | 19.2 | 8.8 | Pan: 18 traps  Bait: 9 traps | Paula María Montoya-Pfeiffer |
| mora01 (Morandin & Winston, 2005, 2006) | 68.4 | 16.2 | Pan: 3 traps per clusters.  2 clusters were placed at field centers (500m from edges). 200m apart  5 clusters on the field edges, with 3 on the edge and 2 20m into the field. | Lora Morandin |
| Morr01 (Morrison *et al.*, 2017) | 129.0 | 10.1 | Pan: 3 traps per cluster. 5 trap clusters were placed at 10m apart. | Jane Morrison,  Jordi Izquierdo,  Jose L. Gonzalez-Andujar |
| Nali01 (Nalinrachatakan *et al.*, 2022) | 39.6 | 9.8 | Netting (All bees): Area was not specified, but indicated as “Point netting”. Total time ranged from 1/3 to 50 hours. | Pakorn Nalinrachatakan,  Natapot Warrit |
| neam012 | 22.0 | 6.5 | Netting (Squash visitors): 2 15-minute sampling in each farm  Data based on observations (without netting) are available but excluded due to very coarse taxonomy. | Lisa Neame |
| Norf01 (Norfolk *et al.*, 2014, 2015) | 30.8 | 8.7 | Netting (Floral visitors): 10m\*10m | Markus P. Eichhorn |
| otie01P (Otieno *et al.*, 2015) | 33.8 | 10.3 | Netting (Pigeon pea visitors): 5 100m\*4m transects, each separated by ≥ 10m. | Mark Otieno |
| Phil01a (Quistberg *et al.*, 2016; Egerer *et al.*, 2017) | 21.9 | 8.7 | Netting (Floral visitors): Searching inside the 20m\*20m plot and within 20m of it. | Stacy Philpott,  Robyn D. Quistberg,  Monika Egerer |
| Phil01b (Quistberg *et al.*, 2016; Egerer *et al.*, 2017) | 57.4 | 7.9 | Pan: 3 clusters, each with 3 traps, were placed 5m apart in a 20m\*20m plot. | Stacy Philpott,  Robyn D. Quistberg,  Monika Egerer |
| Phil02a (Plascencia & Philpott, 2017; Cohen *et al.*, 2022) | 72.3 | 14.7 | Netting (Floral visitors): Searching inside the 20m\*20m plot and within 20m of it. | Stacy Philpott,  Montserrat Plascencia,  Monika Egerer |
| Phil02b (Plascencia & Philpott, 2017; Cohen *et al.*, 2022) | 31.8 | 6.2 | Pan: 3 clusters, each with 3 traps, were placed 5m apart in a 20m\*20m plot. | Stacy Philpott,  Montserrat Plascencia,  Monika Egerer |
| pott01(Carré *et al.*, 2009) | 59.9 | 8.8 | Netting (All bees): 6 15m\*4m transects.  Pan: 2 clusters of 3 traps. Traps within clusters were 5m apart.  All collections were conducted within a 50m\*25m plot. | Simon G. Potts |
| Power01 (Power & Stout, 2011) | 24.1 | 4.1 | Netting (All bees): 2 100m\*2m transects, 1 along the edge and 1 in the center of the sampled field. 2 fields were sampled (i.e., 4 transects). | Eileen F. Power,  Jane C. Stout |
| Pren01 (Prendergast *et al.*, 2020) | 95.5 | 11.5 | Pan: Ten clusters of 3 traps. Each cluster separated by >30m.  Timed search: A total of 18hr search within 0.2ha to 1.3 ha | Kit Prendergast |
| Pren02 (Prendergast *et al.*, 2021) | 124.5 | 26.4 | Pan: 29 traps (5m apart) were randomly distributed  Vane: 4 traps  All trapping conducted within a 100m\*100m plot. | Kit Prendergast |
| pufa011 | 17.0 | 6.4 | Netting (Apple visitors): 15 or 30 trees observed within each farm. | Gesine Pufal,  Alexandra-Maria Klein |
| Quin01 (Quintero *et al.*, 2010) | 58.0 | 6.0 | Pan: 8 traps 50-80m apart along a transect within a sampling plot. 2 plots per site separated by 200m. | Carolina Laura Morales |
| Rade01 (Rader *et al.*, 2014) | 411.8 | 4.0 | Flight intercept/Pan traps: 4 traps arranged 2m apart on a stake. | Romina Rader |
| Reyn01 (Reynolds *et al.*, 2022) | 22.4 | 6.8 | Netting (Floral visitors): 15m\*15m plot | Victoria Reynolds |
| Richards01a (Richards *et al.*, 2011) | 1105.0 | 48.0 | Pan: 30 traps at 10m intervals.  This paper was separated into 3 “studies” as the distribution of sampling efforts among sites were inconsistent between sampling methods. | Miriam H. Richards |
| Richards01b (Richards *et al.*, 2011) | 795.2 | 41.5 | Netting (All bees): 30 minutes over the entire 1ha site | Miriam H. Richards |
| Richards01c (Richards *et al.*, 2011) | 262.2 | 33.0 | Netting (Floral visitors): 5 minutes observations in patches of the most abundant flowers. | Miriam H. Richards |
| rick01 (Ricketts, 2004) | 58.5 | 9.3 | Timed observations (Coffee visitors): ~200-400 coffee flowers observed for 10 minutes. 2 observations were conducted simultaneously on different plants. Each site was sampled for 3 days. | Taylor Ricketts |
| saba01 (Sabatino *et al.*, 2010) | 183.1 | 13.1 | Netting (Floral visitors): Ten 1m radius plots distributed within a 0.5ha sampling area. | Malena Sabatino |
| saez01 (Sáez *et al.*, 2012) | 14.5 | 3.5 | Netting (Sunflower visitors): Sampling was conducted at 1m, 5m, 25m, 50m, and 100m from 1 field margin. | Agustin Saez |
| Samn02 (Samnegård *et al.*, 2015) | 46.3 | 17.7 | Pan: 3 traps ≥ 5m apart  Vane: 2 traps  All within 100m\*100m plots | Ulrika Samnegård,  Kristoffer Hylander |
| sard01 (Sardiñas & Kremen, 2015) | 207.9 | 8.3 | Transects (Sunflower visitors): 4 points along 200m transects. 2 transects per site.  Vane: 1 blue trap | Hillary Sardinas |
| Satu01 (Saturni *et al.*, 2016) | 48.0 | 10.3 | Timed search (Coffee visitors): Observed 10 coffee shrubs for ten minutes each.  All observed shrubs >100m apart, and are located within a circular area with a 1 km radius | Fernanda Teixeira Saturni |
| sche01 (Scheper *et al.*, 2015; Holzschuh *et al.*, 2016) | 69.4 | 10.0 | Netting (all bees): 2 150m\*1m transects | Jeroen Scheper,  David Kleijn |
| Schu01 (Schüepp *et al.*, 2012) | 73.9 | 9.1 | Malaise: 1 trap | Martin H. Entling |
| scil01 | 45.6 | 7.3 | Netting (Strawberry visitors): 1 hour of netting conducted twice at each site. | Amber Sciligo |
| sidh01 (Sidhu, 2013) | 193.0 | 2.6 | Netting (Cucurbit visitors): 50m transect | Sheena Sidhu |
| spie01 (Spiesman *et al.*, 2019) | 112.3 | 29.2 | Pan: 5 clusters equally spaced along a 100m transect. | Brian Spiesman,  Ashley Benett  Claudio Gratton |
| Srit01 (Sritongchuay *et al.*, 2019) | 688.9 | 25.1 | Netting (Floral visitors): 5 150m transects within 150m\*50m plots. | Tuanjit Sritongchuay |
| stef01 (Bartomeus *et al.*, 2014) | 38.5 | 10.0 | Netting (Strawberry visitors): 150m\*4m transect. | Ingolf Steffan-Dewenter |
| Stei01 (Stein *et al.*, 2017, 2018) | 4048.2 | 59.3 | Pan: 240-288 traps in 60m\*90m plots | Katharina Stein,  Drissa Coulibaly |
| Stew01 (Stewart *et al.*, 2018) | 368.7 | 3.4 | Netting (Floral visitors): 2m\* 2m plots for 15 minutes.  Number of plots ranged from 1 to 36. | Alyssa B. Stewart |
| Stew02 (Stewart & Waitayachart, 2020) | 841.9 | 6.1 | Netting (Floral visitors): 2m\* 2m plot observed for 15 minutes. Locations were not fixed over time.  Total time varied from 9.25 to 68.5 hours. | Alyssa B. Stewart |
| Stoj01 (Mudri-Stojnić *et al.*, 2012) | 74.1 | 10.2 | Netting (Floral visitors): 4 1-hour visits.  Site size ranged from 2-6 ha. | Sonja Mudri-Stojnić |
| taki01 (Taki *et al.*, 2009, 2010) | 20.8 | 4.8 | Netting (Common buckwheat visitors): 0.5m\*0.5m plot. | Hisatomo Taki |
| Taki02 (Taki *et al.*, 2013) | 261.9 | 32.2 | Pan: 2 pan traps in the center of each forest stand. | Hisatomo Taki |
| Taki03 (Taki *et al.*, 2018) | 30.6 | 10.5 | Sweep net: Sweeping 100 times per ha along each transect, walking 1m per sweep. Transects covered the entire area of each site, ranging from 1.3 to 10 ha. | Hisatomo Taki |
| Tang01 (Tangtorwongsakul *et al.*, 2018) | 165.9 | 7.4 | Netting (All bees): 4 50m\*1m transects within 1ha.  Pan: 30 traps within 1ha. | Pornpimon Tangtorwongsakul |
| Thre01 (Threlfall *et al.*, 2015) | 22.1 | 3.1 | Pan: 6 traps within 20m\*30m plots  Sweep net: 200 sweeps within 20m\*30m plots. | Caragh G. Threlfall,  Nicholas S. G. Williams |
| Tino011 | 64.3 | 5.9 | Netting (Floral visitors): 2 30m\*3m transects. | Carla Faleiro Tinoco,  Luisa G. Carvalheiro |
| Toni01 (Tonietto *et al.*, 2011) | 46.2 | 12.1 | Pan: 15 traps (1-5m apart) | Rebecca Tonietto |
| tuel01 (Tuell *et al.*, 2009) | 205.0 | 35.6 | Pan: 5 trap pairs (5m apart)\*2 transects (24m apart) | Julianna K. Wilson |
| Turo01 (Turo *et al.*, 2021) | 32.5 | 17.0 | Malaise: 1 trap  Pan: 7 traps in a 7\*15m grid | Katherine J. Turo |
| Vaid01 (Fitch *et al.*, 2019) | 122.0 | 30.9 | Pan: 6 traps in a 4m\*2m rectangle.  Netting (All bees): 2 30-minute sessions, 1 in the morning and another in the afternoon. Sampling was repeated 4 times (i.e. 30-minute\*2 sessions\*4 surveys). | Chatura Vaidya,  Gordon Fitch,  Paul Glaum |
| Verga01 (Vergara & Badano, 2009) | 15.0 | 4.7 | Netting (Coffee visitors): 4 coffee plants | Carlos H. Vergara |
| Vide01 (Vides-Borrell *et al.*, 2019) | 80.4 | 26.6 | Netting (All bees): 180 person-hours (90 minutes per person) per plot in each visit. The total sampling effort was 54 person-hours per plot. | Eric Vides-Borrell,  Rémy Vandame |
| West01 (Hass *et al.*, 2018) | 31.5 | 9.5 | Netting (Floral visitors): 1 90m\*4m transect | Catrin Westphal,  Annika Hass,  Svenja Bänsch |
| wick021 (Scheper *et al.*, 2015) | 134.0 | 23.4 | Pan: 3 traps per cluster. The number of clusters in each survey varied from 2 to 5. | Jennifer B. Wickens |
| will011 | 88.0 | 7.1 | Netting (Watermelon visitors): 50m transect | Neal M. Williams |
| Wils01 (Wilson & Jamieson, 2019) | 99.3 | 31.9 | Pan: 4-6 stations (≥5m apart), depending on visits. However, this is standardized across sites  Netting (All bees): 4 25m2 transects | Caleb J. Wilson,  Mary A. Jamieson |
| winf01 (Winfree *et al.*, 2008) | 64.2 | 10.9 | Netting (Watermelon visitors): 50m transect | Rachael Winfree |
| winf02 (Winfree *et al.*, 2008) | 19.9 | 7.5 | Netting (Tomato visitors): 50m transect | Rachael Winfree |
| winf031 | 84.3 | 15.8 | Netting (All bees): 4 40m transects | Rachael Winfree |
| winf05 (Winfree *et al.*, 2008) | 14.6 | 5.4 | Netting (Muskmelon visitors): 50m transect | Rachael Winfree |
| Youn01 (Hamblin *et al.*, 2018) | 196.0 | 33.3 | Pan: 12 traps (5m apart)  Vane: 1 trap  Netting (All bees): 20 minutes\*11 times | Elsa Youngsteadt |
| Zou01 (Zou *et al.*, 2017b,a) | 190.6 | 12.0 | Pan: 4 traps arranged as a 20m\*20m square | Yi Zou |

1 At the time of publication, data were not publicly available from the agency or personnel responsible for the work. A summary of the methods can be found below.

2 Details of the unpublished data can be found in (Kennedy *et al.*, 2013).

3 Details of the unpublished data can be found in (Hudson *et al.*, 2014) (AD1\_2011b\_Hanley).

P No consent was obtained from data contributors for the public release of the dataset. Please contact the data owners directly.

**Summary of sampling strategies in unpublished studies**

Here, we briefly described the sampling strategies of each unpublished study that has not been included in any public database. In all studies, we extracted the geographic coordinates of each assemblage, the sampling methods (all bees / floral visitors only / floral visitors of targeted plant species only) and efforts , and species abundance data.

balz02

Mario V. Balzan (unpublished data) investigated the structure of flower visiting webs in field margins of Malta (Central Mediterranean) in 2014. The margins consist of several flowering forbs; all flower-visiting bees were recorded in 12 sites. These were visited on a single day between 10:00 and 15:00 in low wind conditions. Flower visitation of bees at each transect was reported.

Baum01

Bee sampling was conducted by Jessica M. Baumann and Nicholas S. G. Williams (unpublished data) during the late summer months of February and March 2014 across 32 sites in four urban green space types: golf courses, residential gardens, botanic gardens and remnant heathlands in Melbourne, Australia. Starting from the center of the plot the collector walked slowly among any potentially attractive resource patches and collected bees via sweep netting from plants in flower. Surveying time depended on plot size, with 30-minute observation periods allocated for the 600m2 plots in golf courses and remnants, which was then scaled accordingly for the variably sized residential garden plots (i.e., a residential garden plot of 200 m2 was surveyed for 10 minutes). However, the yield of bees through these plot-restricted methods was low. Bee sampling was subsequently modified to a variable transect approach within a ~1 ha area around the original plots to target floral resources within each urban green space type over a 30-minute sampling period. Observations were made only on sunny or partly cloudy days when the temperature was above 20ºC, and the wind speed was less than 4 m/s.

bore01

Pollination data were collected by Virginie Boreux and Alexandra-Maria Klein (unpublished data) in 2015 in Germany on 27 apple orchards (14 organic and 13 conventional) selected in the vicinity of Lake Constance. 20m transects were walked for 5 minutes at the peak flowering time of the Braeburn variety, 3 times a day (morning, midday, and afternoon), at the edge (within the first 20m) and inside the plantation (20-40m). The number and species of the individuals spotted on apple flowers were recorded.

Marq01

Bruno Marques and Jeanne Caldeira (unpublished data) systematically collected bees in Goiânia city at 6 sites with varying degrees of urbanization, between September and November 2019. Sites are spontaneously grown herbaceous vegetation, most of which consisted of the widespread exotic species *Tridax procumbens*. In each site, bee specimens were collected along 60m transects at around 09:30 and around 15:30. In the morning, temperature between sites varied between 27 to 34 °C, and site relative humidity between 37 to 70%. In the evening, site temperature varied between 28 to 36 °C, and site relative humidity was between 23 to 55%. Only floral visitors were captured.

pufa01

Gesine Pufal and Alexandra-Maria Klein (unpublished data) assessed the effect of landscape context and management on the flower visitor communities and pollination success of the apple varieties Elstar and Boskoop in 2015. Sixteen sites (10 conventional and 6 organics) were selected within a 20 km radius around Freiburg in Breisgau, Germany, within a complex agricultural landscape. Flower observations were conducted on April 7th and 8th, 2015, during peak flowering but under varying weather conditions with 15 x 2 min per site and apple variety. The temperatures varied between 15. and 24.5ºC.

scil01

Amber Sciligo (unpublished data) collected abundance data 2 times per season on each site using two collection methods, pan-trapping (21 pans per site, open for 5 hrs) and netting on strawberry flowers (1 hr per site). Overall, 17 sites were sampled in Central Coast, California. Sampling was conducted in 2012.

Tino01

Carla Faleiro Tinoco (unpublished data) compared flower visitor communities in restored (for at least 8 years) and natural areas in Mato Grosso, Brazil. Managed bees were not present in these areas. 14 pairs of areas were sampled in 2019, in which each pair consisted of a restored area and a nearby natural area. In each area, floral visits were observed in two 3x30 m transects (one transect on the edge and the other inside) for 10 minutes on each species of flowering plant in the morning (between 8 am and 10 am) and in the afternoon (between 2pm and 4pm). The sampling of the same transects was carried out on two field trips, one in the dry season and the other in the rainy season.

will01

In 2010-2012, Neal M. Williams (unpublished data) sampled nine watermelon farms in California. In each year, each farm was sampled through walking 50 m transects over three days. All bees visiting watermelon flowers were netted for 30 minutes per day.

wick02

In 2013, Jennifer B. Wickens (unpublished data) deployed pan traps in 53 sites in Southeast England, consisting of croplands, field margins, and semi-natural grasslands. Pan traps were bowls of water with a drop of detergent spray painted white, blue or yellow and set as a triplet (equilateral triangle arrangement) to create one pan trap station. At each site, two to five pan trap stations were set before 09:00 and collected after 18:00 in each trapping session. In total, four trapping sessions were conducted at each site on good weather days from April to August each year. Data based on trapping from 2011 and 2012 and hand-netting in 2011-2013 were not considered due to >5% of bees not identified to at least genus levels.

winf03

Rachel Winfree (unpublished data) studied floral enhancements on private land in New Jersey. The enhancements were paired with a nearby control plot (100-700m away). Bees were collected four times during the summer of 2012 along a transect. In each plot, there were a total of 4 - 40m transects. Each transect was sampled for 10 minutes in the morning and 10 minutes in the afternoon. All bees were caught using a hand net with the timer halted to process bees. Specimens were identified by John S. Ascher.

References

Allen‐Perkins, A., Magrach, A., Dainese, M., Garibaldi, L.A., Kleijn, D., Rader, R., Reilly, J.R., Winfree, R., Lundin, O. & McGrady, C.M. (2022) CropPol: A dynamic, open and global database on crop pollination. *Ecology*, **103**, e3614. doi: https://doi.org/10.1002/ecy.3614

Amado de Santis, A.A. & Chacoff, N.P. (2020) Urbanization affects composition but not richness of flower visitors in the Yungas of Argentina. *Neotropical Entomology*, **49**, 568–577. doi: https://doi.org/10.1007/s13744-020-00772-z

Armas-Quiñonez, G., Ayala-Barajas, R., Avendaño-Mendoza, C., Lindig-Cisneros, R. & Del-Val, E. (2020) Bee diversity in secondary forests and coffee plantations in a transition between foothills and highlands in the Guatemalan Pacific Coast. *PeerJ*, **8**, e9257. doi: https://doi.org/10.7717/peerj.9257

Ávila-Gómez, E.S., Meléndez-Ramírez, V., Castellanos, I., Zuria, I. & Moreno, C.E. (2019) Prickly pear crops as bee diversity reservoirs and the role of bees in *Opuntia* fruit production. *Agriculture, Ecosystems & Environment*, **279**, 80–88. doi: https://doi.org/10.1016/j.agee.2019.04.012

Ballare, K.M., Neff, J.L., Ruppel, R. & Jha, S. (2019) Multi‐scalar drivers of biodiversity: Local management mediates wild bee community response to regional urbanization. *Ecological Applications*, **29**, e01869. doi: https://doi.org/10.1002/eap.1869

Balzan, M. V (2017) Flowering banker plants for the delivery of multiple agroecosystem services. *Arthropod-Plant Interactions*, **11**, 743–754. doi: https://doi.org/10.1007/s11829-017-9544-2

Banaszak-Cibicka, W., Twerd, L., Fliszkiewicz, M., Giejdasz, K. & Langowska, A. (2018) City parks vs. natural areas-is it possible to preserve a natural level of bee richness and abundance in a city park? *Urban Ecosystems*, **21**, 599–613. doi: https://doi.org/10.1007/s11252-018-0756-8

Banaszak-Cibicka, W. & Żmihorski, M. (2020) Are cities hotspots for bees? Local and regional diversity patterns lead to different conclusions. *Urban Ecosystems*, **23**, 713–722. doi: https://doi.org/10.1007/s11252-020-00972-w

Banaszak-Cibicka, W. & Żmihorski, M. (2012) Wild bees along an urban gradient: winners and losers. *Journal of Insect Conservation*, **16**, 331–343. doi: https://doi.org/10.1007/s10841-011-9419-2

Bartomeus, I., Potts, S.G., Steffan-Dewenter, I., Vaissiere, B.E., Woyciechowski, M., Krewenka, K.M., Tscheulin, T., Roberts, S.P.M., Szentgyörgyi, H. & Westphal, C. (2014) Contribution of insect pollinators to crop yield and quality varies with agricultural intensification. *PeerJ*, **2**, e328. doi: https://doi.org/[10.7717/peerj.328](https://doi.org/10.7717/peerj.328)

Basset, Y., Missa, O., Alonso, A., Miller, S.E., Curletti, G., de Meyer, M., Eardley, C., Lewis, O.T., Mansell, M.W. & Novotny, V. (2008) Changes in arthropod assemblages along a wide gradient of disturbance in Gabon. *Conservation Biology*, **22**, 1552–1563. doi: https://doi.org/10.1111/j.1523-1739.2008.01017.x

Batary, P., Baldi, A., Sarospataki, M., Kohler, F., Verhulst, J., Knop, E., Herzog, F. & Kleijn, D. (2010) Effect of conservation management on bees and insect-pollinated grassland plant communities in three European countries. *Agriculture, Ecosystems & Environment*, **136**, 35–39. doi: https://doi.org/10.1016/j.agee.2009.11.004

Bates, A.J., Sadler, J.P., Fairbrass, A.J., Falk, S.J., Hale, J.D. & Matthews, T.J. (2011) Changing bee and hoverfly pollinator assemblages along an urban-rural gradient. *PloS one*, **6**, e23459. doi: https://doi.org/10.1371/journal.pone.0023459

Beal-Neves, M., Vogel Ely, C., Westerhofer Esteves, M., Blochtein, B., Lahm, R.A., Quadros, E.L.L. & Abreu Ferreira, P.M. (2020) The influence of urbanization and fire disturbance on plant-floral visitor mutualistic networks. *Diversity*, **12**, 141. doi: https://doi.org/10.3390/d12040141

Billeter, R., Liira, J., Bailey, D., Bugter, R., Arens, P., Augenstein, I., Aviron, S., Baudry, J., Bukacek, R. & Burel, F. (2008) Indicators for biodiversity in agricultural landscapes: a pan‐European study. *Journal of Applied Ecology*, **45**, 141–150. doi: https://doi.org/10.1111/j.1365-2664.2007.01393.x

Birdshire, K.R., Carper, A.L. & Briles, C.E. (2020) Bee community response to local and landscape factors along an urban-rural gradient. *Urban Ecosystems*, **23**, 689–702. doi: https://doi.org/10.1007/s11252-020-00956-w

Bjorn K. Klatt (2013) Bee pollination of strawberries on different spatial scales – from crop varieties and fields to landscapes. [Ph.D. thesis]. Universität Göttingen.

Bommarco, R., Marini, L. & Vaissière, B.E. (2012) Insect pollination enhances seed yield, quality, and market value in oilseed rape. *Oecologia*, **169**, 1025–1032. doi: https://doi.org/10.1007/s00442-012-2271-6

Brosi, B.J., Daily, G.C., Shih, T.M., Oviedo, F. & Durán, G. (2008) The effects of forest fragmentation on bee communities in tropical countryside. *Journal of Applied Ecology*, **45**, 773–783. doi: https://doi.org/10.1111/j.1365-2664.2007.01412.x

Burkle, L.A., Delphia, C.M. & O’Neill, K.M. (2020) Redundancy in wildflower strip species helps support spatiotemporal variation in wild bee communities on diversified farms. *Basic and Applied Ecology*, **44**, 1–13. doi: https://doi.org/10.1016/j.baae.2020.02.005

Burkle, L.A. & Knight, T.M. (2012) Shifts in pollinator composition and behavior cause slow interaction accumulation with area in plant–pollinator networks. *Ecology*, **93**, 2329–2335. doi: https://doi.org/10.1890/12-0367.1

Burkle, L.A., Marlin, J.C. & Knight, T.M. (2013) Plant-pollinator interactions over 120 years: loss of species, co-occurrence, and function. *Science*, **339**, 1611–1615. doi: https://www.science.org/doi/full/10.1126/science.1232728

Burkle, L.A., Simanonok, M.P., Durney, J.S., Myers, J.A. & Belote, R.T. (2019) Wildfires influence abundance, diversity, and intraspecific and interspecific trait variation of native bees and flowering plants across burned and unburned landscapes. *Frontiers in Ecology and Evolution*, **7**, 252. doi: https://doi.org/10.3389/fevo.2019.00252

Cariveau, D.P., Williams, N.M., Benjamin, F.E. & Winfree, R. (2013) Response diversity to land use occurs but does not consistently stabilise ecosystem services provided by native pollinators. *Ecology Letters*, **16**, 903–911. doi: https://doi.org/10.1111/ele.12126

Carré, G., Roche, P., Chifflet, R., Morison, N., Bommarco, R., Harrison-Cripps, J., Krewenka, K., Potts, S.G., Roberts, S.P.M. & Rodet, G. (2009) Landscape context and habitat type as drivers of bee diversity in European annual crops. *Agriculture, Ecosystems & Environment*, **133**, 40–47. doi: https://doi.org/10.1016/j.agee.2009.05.001

Carvalheiro, L.G., Seymour, C.L., Veldtman, R. & Nicolson, S.W. (2010) Pollination services decline with distance from natural habitat even in biodiversity‐rich areas. *Journal of Applied Ecology*, **47**, 810–820. doi: https://doi.org/10.1111/j.1365-2664.2010.01829.x

Cely-Santos, M. & Philpott, S.M. (2019) Local and landscape habitat influences on bee diversity in agricultural landscapes in Anolaima, Colombia. *Journal of Insect Conservation*, **23**, 133–146. doi: https://doi.org/10.1007/s10841-018-00122-w

du Clos, B., Drummond, F.A. & Loftin, C.S. (2020) Noncrop habitat use by wild bees (Hymenoptera: Apoidea) in a mixed-use agricultural landscape. *Environmental Entomology*, **49**, 502–515. doi: https://doi.org/10.1093/ee/nvaa001

Cohen, H., Egerer, M., Thomas, S.-S. & Philpott, S.M. (2022) Local and landscape features constrain the trait and taxonomic diversity of urban bees. *Landscape Ecology*, **37**, 583–599. doi: https://doi.org/10.1007/s10980-021-01370-z

Connelly, H., Poveda, K. & Loeb, G. (2015) Landscape simplification decreases wild bee pollination services to strawberry. *Agriculture, Ecosystems & Environment*, **211**, 51–56. doi: https://doi.org/10.1016/j.agee.2015.05.004

Cunningham, S.A., Schellhorn, N.A., Marcora, A. & Batley, M. (2013) Movement and phenology of bees in a subtropical Australian agricultural landscape. *Austral Ecology*, **38**, 456–464. doi: https://doi.org/10.1111/j.1442-9993.2012.02432.x

Cusser, S., Neff, J.L. & Jha, S. (2015) Land use change and pollinator extinction debt in exurban landscapes. *Insect Conservation and Diversity*, **8**, 562–572. doi: https://doi.org/10.1111/icad.12139

Cusser, S., Neff, J.L. & Jha, S. (2018) Land-use history drives contemporary pollinator community similarity. *Landscape Ecology*, **33**, 1335–1351. doi: https://doi.org/10.1007/s10980-018-0668-2

Day, H.R.G. (2013) Do bees matter to cranberry? the effect of bees, landscape, and local management on cranberry yield. [Ph.D. thesis]. University of Wisconsin-Madison.

Dromgold, J.R., Threlfall, C.G., Norton, B.A. & Williams, N.S.G. (2020) Green roof and ground-level invertebrate communities are similar and are driven by building height and landscape context. *Journal of Urban Ecology*, **6**, juz024. doi: https://doi.org/10.1093/jue/juz024

Egerer, M.H., Arel, C., Otoshi, M.D., Quistberg, R.D., Bichier, P. & Philpott, S.M. (2017) Urban arthropods respond variably to changes in landscape context and spatial scale. *Journal of Urban Ecology*, **3**, jux001. doi: https://doi.org/10.1093/jue/jux001

Enríquez, E., Ayala, R., Gonzalez, V.H. & Núñez-Farfán, J. (2015) Alpha and beta diversity of bees and their pollination role on *Cucurbita pepo* L.(Cucurbitaceae) in the Guatemalan cloud forest. *The Pan-Pacific Entomologist*, **91**, 211–222. doi: https://doi.org/10.3956/2015-91.3.211

Escobar‐González, D., Landaverde‐González, P., Casiá‐Ajché, Q.B., Morales‐Siná, J., Cardona, E., Mejía‐Coroy, A. & Enríquez, E. (2023) Fruit production in coffee (*Coffea arabica* L.) crops is enhanced by the behaviour of wild bees (Hymenoptera: Apidae). *Austral Entomology*,. doi: https://doi.org/10.1111/aen.12673

Escobedo-Kenefic, N., Landaverde-González, P., Theodorou, P., Cardona, E., Dardón, M.J., Martínez, O. & Domínguez, C.A. (2020) Disentangling the effects of local resources, landscape heterogeneity and climatic seasonality on bee diversity and plant-pollinator networks in tropical highlands. *Oecologia*, **194**, 333–344. doi: https://doi.org/10.1007/s00442-020-04715-8

Fitch, G., Glaum, P., Simao, M.-C., Vaidya, C., Matthijs, J., Iuliano, B. & Perfecto, I. (2019) Changes in adult sex ratio in wild bee communities are linked to urbanization. *Scientific Reports*, **9**, 1–10. doi: https://doi.org/10.1038/s41598-019-39601-8

Forrest, J.R.K., Thorp, R.W., Kremen, C. & Williams, N.M. (2015) Contrasting patterns in species and functional‐trait diversity of bees in an agricultural landscape. *Journal of Applied Ecology*, **52**, 706–715. doi: https://doi.org/10.1111/1365-2664.12433

Fowler, R.E. (2015) An investigation into bee assemblage change along an urban-rural gradient. [Ph.D. thesis]. University of Birmingham.

Garibaldi, L.A., Steffan-Dewenter, I., Winfree, R., Aizen, M.A., Bommarco, R., Cunningham, S.A., Kremen, C., Carvalheiro, L.G., Harder, L.D. & Afik, O. (2013) Wild pollinators enhance fruit set of crops regardless of honey bee abundance. *Science*, **339**, 1608–1611. doi: https://www.science.org/doi/10.1126/science.1230200

Geslin, B., le Féon, V., Folschweiller, M., Flacher, F., Carmignac, D., Motard, E., Perret, S. & Dajoz, I. (2016) The proportion of impervious surfaces at the landscape scale structures wild bee assemblages in a densely populated region. *Ecology and Evolution*, **6**, 6599–6615. doi: https://doi.org/10.1002/ece3.2374

González-Chaves, A., Jaffé, R., Metzger, J.P. & Kleinert, A. de M.P. (2020) Forest proximity rather than local forest cover affects bee diversity and coffee pollination services. *Landscape Ecology*, **35**, 1841–1855. doi: https://doi.org/10.1007/s10980-020-01061-1

Grab, H., Poveda, K., Danforth, B. & Loeb, G. (2018) Landscape context shifts the balance of costs and benefits from wildflower borders on multiple ecosystem services. *Proceedings of the Royal Society B*, **285**, 20181102. doi: https://doi.org/10.1098/rspb.2018.1102

Guenat, S., Kunin, W.E., Dougill, A.J. & Dallimer, M. (2019) Effects of urbanisation and management practices on pollinators in tropical Africa. *Journal of Applied Ecology*, **56**, 214–224. doi: https://doi.org/10.1111/1365-2664.13270

Gutiérrez-Chacón, C., Dormann, C.F. & Klein, A.-M. (2018) Forest-edge associated bees benefit from the proportion of tropical forest regardless of its edge length. *Biological Conservation*, **220**, 149–160. doi: https://doi.org/10.1016/j.biocon.2018.02.009

Hall, M.A., Nimmo, D.G., Cunningham, S.A., Walker, K. & Bennett, A.F. (2019) The response of wild bees to tree cover and rural land use is mediated by species’ traits. *Biological Conservation*, **231**, 1–12. doi: https://doi.org/10.1016/j.biocon.2018.12.032

Hamblin, A.L., Youngsteadt, E. & Frank, S.D. (2018) Wild bee abundance declines with urban warming, regardless of floral density. *Urban Ecosystems*, **21**, 419–428. doi: https://doi.org/10.1007/s11252-018-0731-4

Hass, A.L., Liese, B., Heong, K.L., Settele, J., Tscharntke, T. & Westphal, C. (2018) Plant-pollinator interactions and bee functional diversity are driven by agroforests in rice-dominated landscapes. *Agriculture, Ecosystems & Environment*, **253**, 140–147. doi: https://doi.org/10.1016/j.agee.2017.10.019

Heil, L.J. & Burkle, L.A. (2018) Recent post-wildfire salvage logging benefits local and landscape floral and bee communities. *Forest Ecology and Management*, **424**, 267–275. doi: https://doi.org/10.1016/j.foreco.2018.05.009

Hennig, E.I. & Ghazoul, J. (2011) Plant–pollinator interactions within the urban environment. *Perspectives in Plant Ecology, Evolution and Systematics*, **13**, 137–150. doi: https://doi.org/10.1016/j.ppees.2011.03.003

Hennig, E.I. & Ghazoul, J. (2012) Pollinating animals in the urban environment. *Urban Ecosystems*, **15**, 149–166. doi: https://doi.org/10.1007/s11252-011-0202-7

Hipólito, J., Boscolo, D. & Viana, B.F. (2018) Landscape and crop management strategies to conserve pollination services and increase yields in tropical coffee farms. *Agriculture, Ecosystems & Environment*, **256**, 218–225. doi: https://doi.org/10.1016/j.agee.2017.09.038

Holzschuh, A., Dainese, M., González‐Varo, J.P., Mudri‐Stojnić, S., Riedinger, V., Rundlöf, M., Scheper, J., Wickens, J.B., Wickens, V.J. & Bommarco, R. (2016) Mass‐flowering crops dilute pollinator abundance in agricultural landscapes across Europe. *Ecology Letters*, **19**, 1228–1236. doi: https://doi.org/10.1111/ele.12657

Holzschuh, A., Dudenhöffer, J.-H. & Tscharntke, T. (2012) Landscapes with wild bee habitats enhance pollination, fruit set and yield of sweet cherry. *Biological Conservation*, **153**, 101–107. doi: https://doi.org/10.1016/j.biocon.2012.04.032

Holzschuh, A., Steffan‐Dewenter, I., Kleijn, D. & Tscharntke, T. (2007) Diversity of flower‐visiting bees in cereal fields: effects of farming system, landscape composition and regional context. *Journal of Applied Ecology*, **44**, 41–49. doi: https://doi.org/10.1111/j.1365-2664.2006.01259.x

Hopfenmüller, S., Steffan-Dewenter, I. & Holzschuh, A. (2014) Trait-specific responses of wild bee communities to landscape composition, configuration and local factors. *PloS ONE*, **9**, e104439. doi: https://doi.org/10.1371/journal.pone.0104439

Hudson, L.N., Newbold, T., Contu, S., Hill, S.L.L., Lysenko, I., De Palma, A., Phillips, H.R.P., Senior, R.A., Bennett, D.J. & Booth, H. (2014) The PREDICTS database: a global database of how local terrestrial biodiversity responds to human impacts. *Ecology and Evolution*, **4**, 4701–4735. doi: https://doi.org/10.1002/ece3.1303

Hung, K.J., Ascher, J.S., Davids, J.A. & Holway, D.A. (2019) Ecological filtering in scrub fragments restructures the taxonomic and functional composition of native bee assemblages. *Ecology*, **100**, e02654. doi: https://doi.org/10.1002/ecy.2654

Isaacs, R. & Kirk, A.K. (2010) Pollination services provided to small and large highbush blueberry fields by wild and managed bees. *Journal of Applied Ecology*, **47**, 841–849. doi: https://doi.org/10.1111/j.1365-2664.2010.01823.x

Jauker, B., Krauss, J., Jauker, F. & Steffan-Dewenter, I. (2013) Linking life history traits to pollinator loss in fragmented calcareous grasslands. *Landscape Ecology*, **28**, 107–120. doi: https://doi.org/10.1007/s10980-012-9820-6

Jha, S. & Vandermeer, J.H. (2010) Impacts of coffee agroforestry management on tropical bee communities. *Biological Conservation*, **143**, 1423–1431. doi: https://doi.org/10.1016/j.biocon.2010.03.017

Kennedy, C.M., Lonsdorf, E., Neel, M.C., Williams, N.M., Ricketts, T.H., Winfree, R., Bommarco, R., Brittain, C., Burley, A.L. & Cariveau, D. (2013) A global quantitative synthesis of local and landscape effects on wild bee pollinators in agroecosystems. *Ecology Letters*, **16**, 584–599. doi: https://doi.org/10.1111/ele.12082

Kohler, F., Verhulst, J., van Klink, R. & Kleijn, D. (2008) At what spatial scale do high‐quality habitats enhance the diversity of forbs and pollinators in intensively farmed landscapes? *Journal of Applied Ecology*, **45**, 753–762. doi: https://doi.org/10.1111/j.1365-2664.2007.01394.x

Kohler, M., Sturm, A., Sheffield, C.S., Carlyle, C.N. & Manson, J.S. (2020) Native bee communities vary across three prairie ecoregions due to land use, climate, sampling method and bee life history traits. *Insect Conservation and Diversity*, **13**, 571–584. doi: https://doi.org/10.1111/icad.12427

Kovács-Hostyánszki, A., Földesi, R., Mózes, E., Szirák, Á., Fischer, J., Hanspach, J. & Báldi, A. (2016) Conservation of pollinators in traditional agricultural landscapes–new challenges in Transylvania (Romania) posed by EU accession and recommendations for future research. *PLoS ONE*, **11**, e0151650. doi: https://doi.org/10.1371/journal.pone.0151650

Krauss, J., Gallenberger, I. & Steffan-Dewenter, I. (2011) Decreased functional diversity and biological pest control in conventional compared to organic crop fields. *PloS ONE*, **6**, e19502. doi: https://doi.org/10.1371/journal.pone.0019502

Kremen, C., Williams, N.M., Bugg, R.L., Fay, J.P. & Thorp, R.W. (2004) The area requirements of an ecosystem service: crop pollination by native bee communities in California. *Ecology Letters*, **7**, 1109–1119. doi: https://doi.org/10.1111/j.1461-0248.2004.00662.x

Landsman, A.P., Ladin, Z.S., Gardner, D., Bowman, J.L., Shriver, G., D’Amico, V. & Delaney, D.A. (2019) Local landscapes and microhabitat characteristics are important determinants of urban–suburban forest bee communities. *Ecosphere*, **10**, e02908. doi: https://doi.org/10.1002/ecs2.2908

Lentini, P.E., Martin, T.G., Gibbons, P., Fischer, J. & Cunningham, S.A. (2012) Supporting wild pollinators in a temperate agricultural landscape: Maintaining mosaics of natural features and production. *Biological Conservation*, **149**, 84–92. doi: https://doi.org/10.1016/j.biocon.2012.02.004

Leong, M., Ponisio, L.C., Kremen, C., Thorp, R.W. & Roderick, G.K. (2016) Temporal dynamics influenced by global change: bee community phenology in urban, agricultural, and natural landscapes. *Global Change Biology*, **22**, 1046–1053. doi: https://doi.org/10.1111/gcb.13141

Lerman, S.B., Contosta, A.R., Milam, J. & Bang, C. (2018) To mow or to mow less: Lawn mowing frequency affects bee abundance and diversity in suburban yards. *Biological Conservation*, **221**, 160–174. doi: https://doi.org/10.1016/j.biocon.2018.01.025

Lerman, S.B. & Milam, J. (2016) Bee fauna and floral abundance within lawn-dominated suburban yards in Springfield, MA. *Annals of the Entomological Society of America*, **109**, 713–723. doi: https://doi.org/10.1093/aesa/saw043

Machado, A.C.P., Barônio, G.J., de Oliveira, F.F., Garcia, C.T. & Rech, A.R. (2021) Does a coffee plantation host potential pollinators when it is not flowering? Bee distribution in an agricultural landscape with high biological diversity in the Brazilian *Campo Rupestre*. *Journal of the Science of Food and Agriculture*, **101**, 2345–2354. doi: https://doi.org/10.1002/jsfa.10857

Main, A.R., Webb, E.B., Goyne, K.W. & Mengel, D. (2019) Field-level characteristics influence wild bee functional guilds on public lands managed for conservation. *Global Ecology and Conservation*, **17**, e00598. doi: https://doi.org/10.1016/j.gecco.2019.e00598

Makinson, J.C., Threlfall, C.G. & Latty, T. (2017) Bee-friendly community gardens: Impact of environmental variables on the richness and abundance of exotic and native bees. *Urban Ecosystems*, **20**, 463–476. doi: https://doi.org/10.1007/s11252-016-0607-4

Mallinger, R.E., Gibbs, J. & Gratton, C. (2016) Diverse landscapes have a higher abundance and species richness of spring wild bees by providing complementary floral resources over bees’ foraging periods. *Landscape Ecology*, **31**, 1523–1535. doi: https://doi.org/10.1007/s10980-015-0332-z

Marshall, E.J.P., West, T.M. & Kleijn, D. (2006) Impacts of an agri-environment field margin prescription on the flora and fauna of arable farmland in different landscapes. *Agriculture, Ecosystems & Environment*, **113**, 36–44. doi: https://doi.org/10.1016/j.agee.2005.08.036

Matteson, K.C., Ascher, J.S. & Langellotto, G.A. (2008) Bee richness and abundance in New York City urban gardens. *Annals of the Entomological Society of America*, **101**, 140–150. doi: https://doi.org/10.1603/0013-8746(2008)101[140:BRAAIN]2.0.CO;2

McCune, F., Normandin, É., Mazerolle, M.J. & Fournier, V. (2020) Response of wild bee communities to beekeeping, urbanization, and flower availability. *Urban Ecosystems*, **23**, 39–54. doi: https://doi.org/10.1007/s11252-019-00909-y

Meng, L., Martin, K., Liu, J., Burger, F. & Chen, J. (2012) Contrasting responses of hoverflies and wild bees to habitat structure and land use change in a tropical landscape (southern Yunnan, SW China). *Insect Science*, **19**, 666–676. doi: https://doi.org/10.1111/j.1744-7917.2011.01481.x

Meyer, B., Gaebele, V. & Steffan-Dewenter, I.D. (2005) Patch size and landscape effects on pollinators and seed set of the horseshoe vetch, *Hippocrepis comosa*, in an agricultural landscape of central Europe. *Entomologia Generalis*, **30**, 173–185.

Miljanic, A.S., Loy, X., Gruenewald, D.L., Dobbs, E.K., Gottlieb, I.G.W., Fletcher, R.J. & Brosi, B.J. (2019) Bee communities in forestry production landscapes: interactive effects of local-level management and landscape context. *Landscape Ecology*, **34**, 1015–1032. doi: https://doi.org/10.1007/s10980-018-0651-y

Montoya‐Pfeiffer, P.M., Rodrigues, R.R. & Alves dos Santos, I. (2020) Bee pollinator functional responses and functional effects in restored tropical forests. *Ecological Applications*, **30**, e02054. doi: https://doi.org/10.1002/eap.2054

Morandin, L.A. & Winston, M.L. (2006) Pollinators provide economic incentive to preserve natural land in agroecosystems. *Agriculture, Ecosystems & Environment*, **116**, 289–292. doi: https://doi.org/10.1016/j.agee.2006.02.012

Morandin, L.A. & Winston, M.L. (2005) Wild bee abundance and seed production in conventional, organic, and genetically modified canola. *Ecological Applications*, **15**, 871–881. doi: https://doi.org/10.1890/03-5271

Morrison, J., Izquierdo, J., Plaza, E.H. & González-Andújar, J.L. (2017) The role of field margins in supporting wild bees in Mediterranean cereal agroecosystems: Which biotic and abiotic factors are important? *Agriculture, Ecosystems & Environment*, **247**, 216–224. doi: https://doi.org/10.1016/j.agee.2017.06.047

Mudri-Stojnić, S., Andrić, A., Jozan, Z. & Vujić, A. (2012) Pollinator diversity (Hymenoptera and Diptera) in semi-natural habitats in Serbia during summer. *Archives of biological sciences*, **64**, 777–786. doi: https://doi.org/10.2298/ABS1202777S

Nalinrachatakan, P., Chatthanabun, N., Thanoosing, C. & Warrit, N. (2022) Database and digitization of bees in Thailand. https://www.gbif.org/dataset/cb0ab16c-7589-4a44-80d0-30bae8c952ef.

Norfolk, O., Eichhorn, M.P. & Gilbert, F. (2014) Culturally valuable minority crops provide a succession of floral resources for flower visitors in traditional orchard gardens. *Biodiversity and Conservation*, **23**, 3199–3217. doi: https://doi.org/10.1007/s10531-014-0775-6

Norfolk, O., Eichhorn, M.P. & Gilbert, F.S. (2015) Contrasting patterns of turnover between plants, pollinators and their interactions. *Diversity and Distributions*, **21**, 405–415. doi: https://doi.org/10.1111/ddi.12295

Normandin, É., Vereecken, N.J., Buddle, C.M. & Fournier, V. (2017) Taxonomic and functional trait diversity of wild bees in different urban settings. *PeerJ*, **5**, e3051. doi: https://doi.org/10.7717/peerj.3051

Otieno, M., Sidhu, C.S., Woodcock, B.A., Wilby, A., Vogiatzakis, I.N., Mauchline, A.L., Gikungu, M.W. & Potts, S.G. (2015) Local and landscape effects on bee functional guilds in pigeon pea crops in Kenya. *Journal of Insect Conservation*, **19**, 647–658. doi: https://doi.org/10.1007/s10841-015-9788-z

Pisanty, G. & Mandelik, Y. (2015) Profiling crop pollinators: life history traits predict habitat use and crop visitation by Mediterranean wild bees. *Ecological Applications*, **25**, 742–752. doi: https://doi.org/10.1890/14-0910.1

Plascencia, M. & Philpott, S.M. (2017) Floral abundance, richness, and spatial distribution drive urban garden bee communities. *Bulletin of Entomological Research*, **107**, 658–667. doi: https://doi.org/10.1017/S0007485317000153

Power, E.F. & Stout, J.C. (2011) Organic dairy farming: impacts on insect–flower interaction networks and pollination. *Journal of Applied Ecology*, **48**, 561–569. doi: https://doi.org/10.1111/j.1365-2664.2010.01949.x

Prendergast, K.S., Leclercq, N. & Vereecken, N.J. (2021) Honey bees (Hymenoptera: Apidae) outnumber native bees in Tasmanian apple orchards: Perspectives for balancing crop production and native bee conservation. *Austral Entomology*, **60**, 422–435. doi: https://doi.org/10.1111/aen.12521

Prendergast, K.S., Menz, M.H.M., Dixon, K.W. & Bateman, P.W. (2020) The relative performance of sampling methods for native bees: an empirical test and review of the literature. *Ecosphere*, **11**, e03076. doi: https://doi.org/10.1002/ecs2.3076

Quintero, C., Morales, C.L. & Aizen, M.A. (2010) Effects of anthropogenic habitat disturbance on local pollinator diversity and species turnover across a precipitation gradient. *Biodiversity and Conservation*, **19**, 257–274. doi: https://doi.org/10.1007/s10531-009-9720-5

Quistberg, R.D., Bichier, P. & Philpott, S.M. (2016) Landscape and local correlates of bee abundance and species richness in urban gardens. *Environmental Entomology*, **45**, 592–601. doi: https://doi.org/10.1093/ee/nvw025

Rader, R., Bartomeus, I., Tylianakis, J.M. & Laliberté, E. (2014) The winners and losers of land use intensification: Pollinator community disassembly is non‐random and alters functional diversity. *Diversity and Distributions*, **20**, 908–917. doi: https://doi.org/10.1111/ddi.12221

Reynolds, V.A., Cunningham, S.A., Rader, R. & Mayfield, M.M. (2022) Adjacent crop type impacts potential pollinator communities and their pollination services in remnants of natural vegetation. *Diversity and Distributions*, **28**, 1269-1281. doi: https://doi.org/10.1111/ddi.13537

Richards, M.H., Rutgers-Kelly, A., Gibbs, J., Vickruck, J.L., Rehan, S.M. & Sheffield, C.S. (2011) Bee diversity in naturalizing patches of Carolinian grasslands in southern Ontario, Canada. *The Canadian Entomologist*, **143**, 279–299. doi: https://doi.org/10.4039/n11-010

Ricketts, T.H. (2004) Tropical forest fragments enhance pollinator activity in nearby coffee crops. *Conservation Biology*, **18**, 1262–1271. doi: https://doi.org/10.1111/j.1523-1739.2004.00227.x

Russo, L., Park, M., Gibbs, J. & Danforth, B. (2015) The challenge of accurately documenting bee species richness in agroecosystems: bee diversity in eastern apple orchards. *Ecology and Evolution*, **5**, 3531–3540. doi: https://doi.org/10.1002/ece3.1582

Sabatino, M., Maceira, N. & Aizen, M.A. (2010) Direct effects of habitat area on interaction diversity in pollination webs. *Ecological Applications*, **20**, 1491–1497. doi: https://doi.org/10.1890/09-1626.1

Sáez, A., Sabatino, M. & Aizen, M.A. (2012) Interactive effects of large-and small-scale sources of feral honey-bees for sunflower in the Argentine Pampas. *PLoS ONE*, **7**, e30968. doi: https://doi.org/10.1371/journal.pone.0030968

Samnegård, U., Hambäck, P.A., Eardley, C., Nemomissa, S. & Hylander, K. (2015) Turnover in bee species composition and functional trait distributions between seasons in a tropical agricultural landscape. *Agriculture, Ecosystems & Environment*, **211**, 185–194. doi: https://doi.org/10.1016/j.agee.2015.06.010

Sánchez-Echeverría, K., Castellanos, I. & Mendoza-Cuenca, L. (2016) Abejas visitantes florales de Opuntia heliabravoana en un gradiente de urbanización. *Biológicas*, **18**, 27–34.

Sardiñas, H.S. & Kremen, C. (2015) Pollination services from field-scale agricultural diversification may be context-dependent. *Agriculture, Ecosystems & Environment*, **207**, 17–25. doi: https://doi.org/10.1016/j.agee.2015.03.020

Sárospataki, M., Báldi, A., Batáry, P., Józan, Z., Erdős, S. & Rédei, T. (2009) Factors affecting the structure of bee assemblages in extensively and intensively grazed grasslands in Hungary. *Community Ecology*, **10**, 182–188. doi: https://doi.org/10.1556/ComEc.10.2009.2.7

Saturni, F.T., Jaffe, R. & Metzger, J.P. (2016) Landscape structure influences bee community and coffee pollination at different spatial scales. *Agriculture, Ecosystems & Environment*, **235**, 1–12. doi: https://doi.org/10.1016/j.agee.2016.10.008

Scheper, J., Bommarco, R., Holzschuh, A., Potts, S.G., Riedinger, V., Roberts, S.P.M., Rundlöf, M., Smith, H.G., Steffan‐Dewenter, I. & Wickens, J.B. (2015) Local and landscape‐level floral resources explain effects of wildflower strips on wild bees across four European countries. *Journal of Applied Ecology*, **52**, 1165–1175. doi: https://doi.org/10.1111/1365-2664.12479

Schüepp, C., Rittiner, S. & Entling, M.H. (2012) High bee and wasp diversity in a heterogeneous tropical farming system compared to protected forest. *PLoS ONE*, **7**, e52109. doi: https://doi.org/10.1371/journal.pone.0052109

Sidhu, S. (2013) Farmscape and landscape-level effects on Cucurbit pollinators on small farms in a diversified agroecosystem. [Ph.D thesis]. The Pennsylvania State University.

Simanonok, M.P. & Burkle, L.A. (2014) Partitioning interaction turnover among alpine pollination networks: spatial, temporal, and environmental patterns. *Ecosphere*, **5**, 1–17. doi: https://doi.org/10.1890/ES14-00323.1

Spiesman, B.J., Bennett, A., Isaacs, R. & Gratton, C. (2019) Harvesting effects on wild bee communities in bioenergy grasslands depend on nesting guild. *Ecological Applications*, **29**, e01828. doi: https://doi.org/10.1002/eap.1828

Sritongchuay, T., Hughes, A.C., Memmott, J. & Bumrungsri, S. (2019) Forest proximity and lowland mosaic increase robustness of tropical pollination networks in mixed fruit orchards. *Landscape and Urban Planning*, **192**, 103646. doi: https://doi.org/10.1016/j.landurbplan.2019.103646

Stein, K., Coulibaly, D., Stenchly, K., Goetze, D., Porembski, S., Lindner, A., Konaté, S. & Linsenmair, E.K. (2017) Bee pollination increases yield quantity and quality of cash crops in Burkina Faso, West Africa. *Scientific Reports*, **7**, 1–10. doi: https://doi.org/10.1038/s41598-017-17970-2

Stein, K., Stenchly, K., Coulibaly, D., Pauly, A., Dimobe, K., Steffan‐Dewenter, I., Konaté, S., Goetze, D., Porembski, S. & Linsenmair, K.E. (2018) Impact of human disturbance on bee pollinator communities in savanna and agricultural sites in Burkina Faso, West Africa. *Ecology and Evolution*, **8**, 6827–6838. doi: https://doi.org/10.1002/ece3.4197

Stewart, A.B., Sritongchuay, T., Teartisup, P., Kaewsomboon, S. & Bumrungsri, S. (2018) Habitat and landscape factors influence pollinators in a tropical megacity, Bangkok, Thailand. *PeerJ*, **6**, e5335. doi: https://doi.org/[10.7717/peerj.5335](https://doi.org/10.7717/peerj.5335)

Stewart, A.B. & Waitayachart, P. (2020) Year-round temporal stability of a tropical, urban plant-pollinator network. *PloS ONE*, **15**, e0230490. doi: https://doi.org/10.1371/journal.pone.0230490

Taki, H., Murao, R., Mitai, K. & Yamaura, Y. (2018) The species richness/abundance–area relationship of bees in an early successional tree plantation. *Basic and Applied Ecology*, **26**, 64–70. doi: https://doi.org/10.1016/j.baae.2017.09.002

Taki, H., Okabe, K., Makino, S., Yamaura, Y. & Sueyoshi, M. (2009) Contribution of small insects to pollination of common buckwheat, a distylous crop. *Annals of Applied Biology*, **155**, 121–129. doi: https://doi.org/10.1111/j.1744-7348.2009.00326.x

Taki, H., Okabe, K., Yamaura, Y., Matsuura, T., Sueyoshi, M., Makino, S. & Maeto, K. (2010) Effects of landscape metrics on Apis and non-Apis pollinators and seed set in common buckwheat. *Basic and Applied Ecology*, **11**, 594–602. doi: https://doi.org/10.1016/j.baae.2010.08.004

Taki, H., Okochi, I., Okabe, K., Inoue, T., Goto, H., Matsumura, T. & Makino, S. (2013) Succession influences wild bees in a temperate forest landscape: the value of early successional stages in naturally regenerated and planted forests. *PloS ONE*, **8**, e56678. doi: https://doi.org/10.1371/journal.pone.0056678

Tangtorwongsakul, P., Warrit, N. & Gale, G.A. (2018) Effects of landscape cover and local habitat characteristics on visiting bees in tropical orchards. *Agricultural and Forest Entomology*, **20**, 28–40. doi: https://doi.org/10.1111/afe.12226

Threlfall, C.G., Walker, K., Williams, N.S.G., Hahs, A.K., Mata, L., Stork, N. & Livesley, S.J. (2015) The conservation value of urban green space habitats for Australian native bee communities. *Biological Conservation*, **187**, 240–248. doi: https://doi.org/10.1016/j.biocon.2015.05.003

Tonietto, R., Fant, J., Ascher, J., Ellis, K. & Larkin, D. (2011) A comparison of bee communities of Chicago green roofs, parks and prairies. *Landscape and Urban Planning*, **103**, 102–108. doi: https://doi.org/10.1016/j.landurbplan.2011.07.004

Tuell, J.K., Ascher, J.S. & Isaacs, R. (2009) Wild bees (Hymenoptera: Apoidea: Anthophila) of the Michigan highbush blueberry agroecosystem. *Annals of the Entomological Society of America*, **102**, 275–287. doi: https://doi.org/10.1603/008.102.0209

Turo, K.J., Spring, M.R., Sivakoff, F.S., Delgado de la flor, Y.A. & Gardiner, M.M. (2021) Conservation in post‐industrial cities: How does vacant land management and landscape configuration influence urban bees? *Journal of Applied Ecology*, **58**, 58–69. doi: https://doi.org/10.1111/1365-2664.13773

Verboven, H.A.F., Uyttenbroeck, R., Brys, R. & Hermy, M. (2014) Different responses of bees and hoverflies to land use in an urban–rural gradient show the importance of the nature of the rural land use. *Landscape and Urban Planning*, **126**, 31–41. doi: https://doi.org/10.1016/j.landurbplan.2014.02.017

Vergara, C.H. & Badano, E.I. (2009) Pollinator diversity increases fruit production in Mexican coffee plantations: The importance of rustic management systems. *Agriculture, Ecosystems & Environment*, **129**, 117–123. doi: https://doi.org/10.1016/j.agee.2008.08.001

Vides-Borrell, E., Porter-Bolland, L., Ferguson, B.G., Gasselin, P., Vaca, R., Valle-Mora, J. & Vandame, R. (2019) Polycultures, pastures and monocultures: Effects of land use intensity on wild bee diversity in tropical landscapes of southeastern Mexico. *Biological Conservation*, **236**, 269–280. doi: https://doi.org/10.1016/j.biocon.2019.04.025

Williams, N.M., Cariveau, D., Winfree, R. & Kremen, C. (2011) Bees in disturbed habitats use, but do not prefer, alien plants. *Basic and Applied Ecology*, **12**, 332–341. doi: https://doi.org/10.1016/j.baae.2010.11.008

Wilson, C.J. & Jamieson, M.A. (2019) The effects of urbanization on bee communities depends on floral resource availability and bee functional traits. *PloS ONE*, **14**, e0225852. doi: https://doi.org/10.1371/journal.pone.0225852

Winfree, R., Williams, N.M., Gaines, H., Ascher, J.S. & Kremen, C. (2008) Wild bee pollinators provide the majority of crop visitation across land‐use gradients in New Jersey and Pennsylvania, USA. *Journal of Applied Ecology*, **45**, 793–802. doi: https://doi.org/10.1111/j.1365-2664.2007.01418.x

Wu, P., Axmacher, J.C., Li, X., Song, X., Yu, Z., Xu, H., Tscharntke, T., Westphal, C. & Liu, Y. (2019) Contrasting effects of natural shrubland and plantation forests on bee assemblages at neighboring apple orchards in Beijing, China. *Biological Conservation*, **237**, 456–462. doi: https://doi.org/10.1016/j.biocon.2019.07.029

Wu, P., Tscharntke, T., Westphal, C., Wang, M., Olhnuud, A., Xu, H., Yu, Z., van der Werf, W. & Liu, Y. (2021) Bee abundance and soil nitrogen availability interactively modulate apple quality and quantity in intensive agricultural landscapes of China. *Agriculture, Ecosystems & Environment*, **305**, 107168. doi: https://doi.org/10.1016/j.agee.2020.107168

Zou, Y., Bianchi, F.J.J.A., Jauker, F., Xiao, H., Chen, J., Cresswell, J., Luo, S., Huang, J., Deng, X. & Hou, L. (2017a) Landscape effects on pollinator communities and pollination services in small-holder agroecosystems. *Agriculture, Ecosystems & Environment*, **246**, 109–116. doi: https://doi.org/10.1016/j.agee.2017.05.035

Zou, Y., Xiao, H., Bianchi, F.J.J.A., Jauker, F., Luo, S. & van der Werf, W. (2017b) Wild pollinators enhance oilseed rape yield in small-holder farming systems in China. *BMC Ecology*, **17**, 1–7. doi: https://doi.org/10.1186/s12898-017-0116-1