# Chapter 2 Draft

Here I'm going to try to understand our data a bit better and state our hypothesis.

First I start with an abstract that could be our guide for hypothesis testing and analyses.

## Abstract (draft)

Plant pollinator interactions are a keystone process for ecosystem functioning. However, we lack comprehensive information from both plants and pollinators that can inform from this mutualistic interaction worldwide. In order to tackle this, we have selected 30 networks distributed across the world and looked for key floral traits of plant-pollinator interactions for a total of 1600 species. Here we look how these floral traits shape the different plant-pollinator networks and the main fuctional groups of insect pollinating species. Giving the different nature of the data collated we do not compare across networks and we focus on the main general patterns/results within network. We have conducted our analysis at 3 levels, 1) unique networks, 2) metawebs and by 3) grouping both. We find that specific traits are associated with different guilds of floral visitors within these networks. We also highlight the lack of information about traits and the reproductive biology of the plant species of these networks. Our work shows the importance of deepen in species traits in order to understand key processes that can be seen with network metrics and highlights the importance of elemental ecology for species conservation.

*What sort of data do we have?*

There are approximately 1600 species from 30 different networks. All of these networks are phytocentric (built from plants). The different plant-pollinator communities have been studied with very different sampling effort and methodologies. Therefore, our aim is not to compare across studies but to create a general picture of how floral traits shape the different pollinator taxa and network metrics. Here, we combine the studies with multiple years of sampling and multiple sites within an area in metawebs. These networks give a broader perspective of the sampling area and inform about the regional species pool (Noreika et al. 2019). The data of these networks is quantitative (visitation) or qualitative (binary), there are in total 19 and 11 networks/metawebs of each, respectively.

| Id | Longitude | Latitude | Country | Year | Networks | Plant spp | Pollinator spp | Network size | Sampling method | Sampling | Data type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bartomeus 2008 | 3.296797 | 42.315336 | Spain | 2005 | 3 | 18 | 37 | 666 | Plots with transects | Phytocentric | Quantitative |
| Fang 2012 | 99.63806 | 27.90139 | China | 2008-2010 | 3 | 130 | 247 | 32110 | Plots | Phytocentric | Quantitative |
| Inouye 1990 | 135.866667 | 35.166667 | Japan | 1984-1987 | 4 | 114 | 883 | 100662 | Transects | Phytocentric | Quantitative |
| Inouye 1988 | 148.266667 | -36.45 | Australia | 1983-1984 | 1 | 40 | 85 | 3400 | Plots | Phytocentric | Quantitative |
| Kaiser-Bunbury 2009 | 57.443254 | -20.452076 | Republic of Mauritius | 2003-2004 | 2 | 96 | 184 | 17664 | Plots | Phytocentric | Quantitative |
| Kaiser-Bunbury 2014 | 55.43333 | -4.666667 | Republic of Seychelles | 2007-2008 | 6 | 37 | 341 | 12617 | Transects | Phytocentric | Quantitative |
| Kato 2000 | 129.493741 | 28.377248 | Japan | 1996-1999 | 16 | 110 | 609 | 66990 | Transects | Phytocentric | Quantitative |
| Kevan 1970 | -71.3 | 81.816667 | Canada | 1967 | 1 | 20 | 91 | 1820 | Randow census walks | Phytocentric | Qualitative |
| Lundgren 2005 | -52 | 71 | Greenland | 2002 | 1 | 17 | 26 | 442 | Randow census walks | Phytocentric | Quantitative |
| Olesen 2002 1 | 57.43 | -20.25 | Republic of Mauritius | 1998-1999 | 1 | 17 | 26 | 442 | Plots | Phytocentric | Quantitative |
| Mcmullen 1993 | -90.600747 | -0.290164 | Ecuador | NA | All islands | 105 | 54 | 5670 | - | Phytocentric | Qualitative |
| Bartomeus 2008 | 3.296797 | 42.315336 | Spain | 2005 | 3 | 13 | 37 | 481 | Plots with transects | Phytocentric | Quantitative |
| Primack 1983 1 | 171.566667 | -42.95 | New Zealand | 1976-1978 | 1 | 18 | 60 | 1080 | Randow census walks | Phytocentric | Qualitative |

| Id | Longitude | Latitude | Country | Year | Networks | Plant spp | Pollinator spp | Network size | Sampling method | Sampling | Data type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Primack 1983 2 | 171.78466 | -43.02823 | New Zealand | 1976-1978 | 1 | 41 | 139 | 5699 | Randow census walks | Phytocentric | Qualitative |
| Primack 1983 3 | 171.720224 | -43.099531 | New Zealand | 1976-1978 | 1 | 49 | 118 | 5782 | Randow census walks | Phytocentric | Qualitative |
| Ramirez 1989 | -61.716667 | 5.583333 | Venezuela | NA | 1 | 48 | 49 | 2352 | Randow census walks | Phytocentric | Qualitative |
| Ramirez 1992 | -67.416667 | 8.933333 | Venezuela | 1983,1984,198 | 1 | 28 | 53 | 1484 | Randow census walks | Phytocentric | Qualitative |
| Robertson 1929 | -89.8968771 | 39.278958 | United States | 1997-1899 | NA | 456 | 1044 | 476064 | - | Phytocentric | Qualitative |
| Small 1976 | -75.5 | 45.4 | Canada | 1973 | 1 | 13 | 34 | 442 | 10h per spp | Phytocentric | Quantitative |
| Souza 2018 | -57.885 | -21.701111 | Brazil | 2008-2009 | 1 | 62 | 89 | 5518 | Plots | Phytocentric | Quantitative |
| Traveset 2013 | -91.012863 | -0.6907 | Ecuador | 2010-2011 | 1 | 60 | 220 | 13200 | Randow census walks | Phytocentric | Quantitative |
| Bartomeus 2015 unp. | NA | NA | Spain | 2015 | 16 | 57 | 277 | 15789 | Transects | Phytocentric | Quantitative |
| Bek 2006 | 10.216667 | 56.066667 | Denmark | 2003 | 1 | 37 | 225 | 8325 | Plots | Phytocentric | Qualitative |
| Olesen 2002 2 | -31 | 39.4 | Azores | 2000 | 1 | 10 | 12 | 120 | Plots | Phytocentric | Quantitative |
| Bundgaard 2003 | 10.233333 | 56.066667 | Denmark | 2003 | 1 | 16 | 44 | 704 | Plots | Phytocentric | Qualitative |

| Id | Longitude | Latitude | Country | Year | Networks | Plant spp | Pollinator spp | Network size | Sampling method | Sampling | Data type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chacoff 2011 | -68.015892 | -32.008985 | Argentina | 2006-2009 | 4 | 59 | 196 | 11564 | Plots | Phytocentric | Quantitative |
| Dicks 2002 | 1.575532; 1.097873 | 52.762395; 52.413173 | England | 2001? | 2 | 23 | 80 | 1840 | Plots | Phytocentric | Quantitative |
| Dupont 2009 | 9.1; 9.266667 | 56.1; 56.066667 | Denmark | 2005 | 2 | 31 | 329 | 10199 | Plots | Phytocentric | Quantitative |
| Elberling 1999 | 18.5 | 68.35 | Sweden | 1994 | 1 | 24 | 118 | 2832 | Plots with transects | Phytocentric | Quantitative |
| Dupont 2009 2 | -20.5 | 74.5 | Greenland | 1996-1997 | 1 | 31 | 76 | 2356 | Random census walks | Phytocentric | Qualitative |

**PLOT 1**

Here I show the percentage or orders from the different species without consider visitation and just richness of species. Therfore, if we have a network with 4 species from from different orders, each will appear as 25% within the stack bar of the barplot.
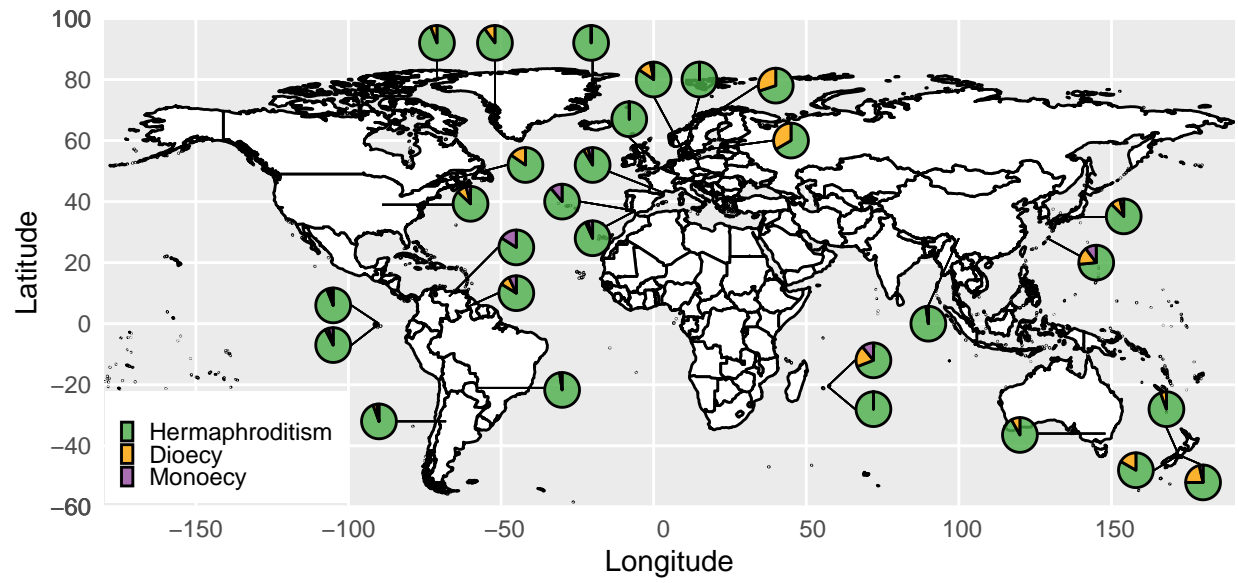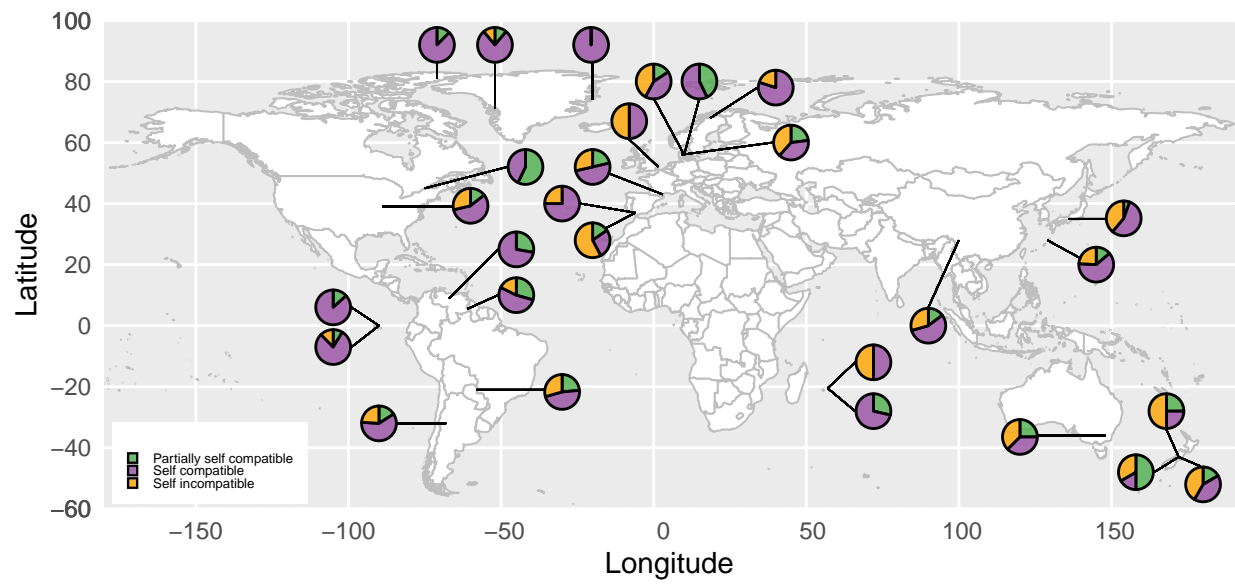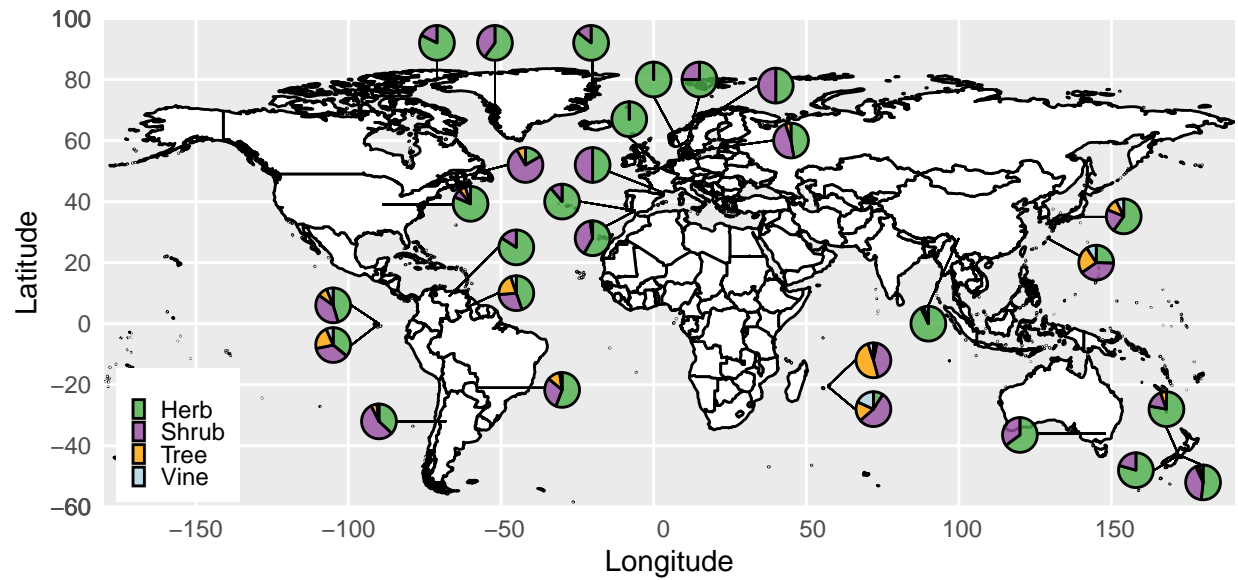
*
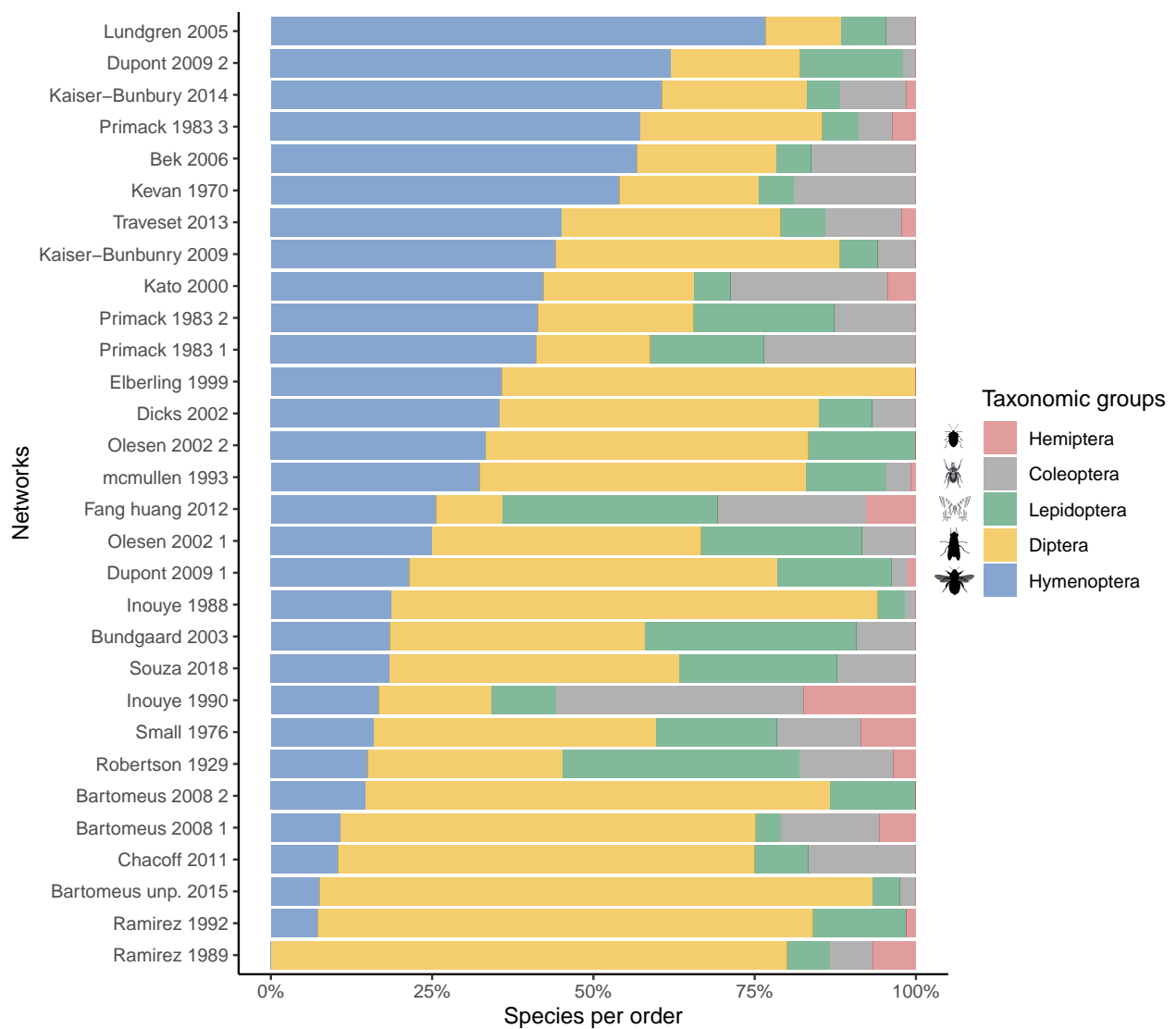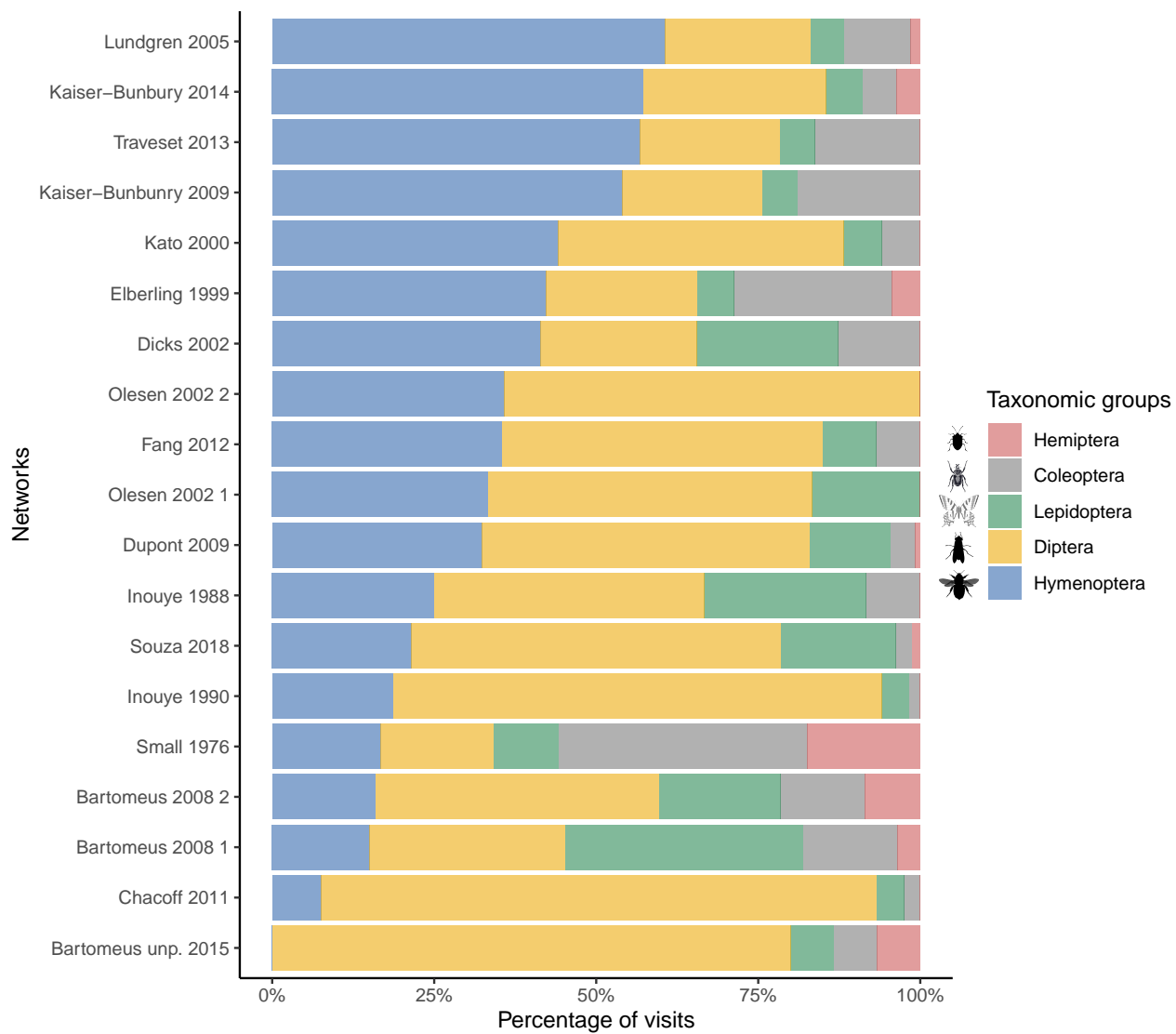
*PLOT 2**

## Breeding systems

## Compatibility system

**PLOT 4**

### Life form



# REFERENCES

Noreika, Norbertas, Ignasi Bartomeus, Marie Winsa, Riccardo Bommarco, and Erik Öckinger. 2019. "Pollinator Foraging Flexibility Mediates Rapid Plant-Pollinator Network Restoration in Semi-Natural Grasslands." *Scientific Reports* 9 (1). Nature Publishing Group: 1–11.