

# 中国苹果园传粉昆虫多样性 调查与评估

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**land-use intensification**



**climate change**



**alien species and diseases**

## **Landscape:**

- **the more specialized pollinator species tend to be most vulnerable to habitat change**
- **Intensive crop management often includes the use of pesticides that can harm pollinators**



hand

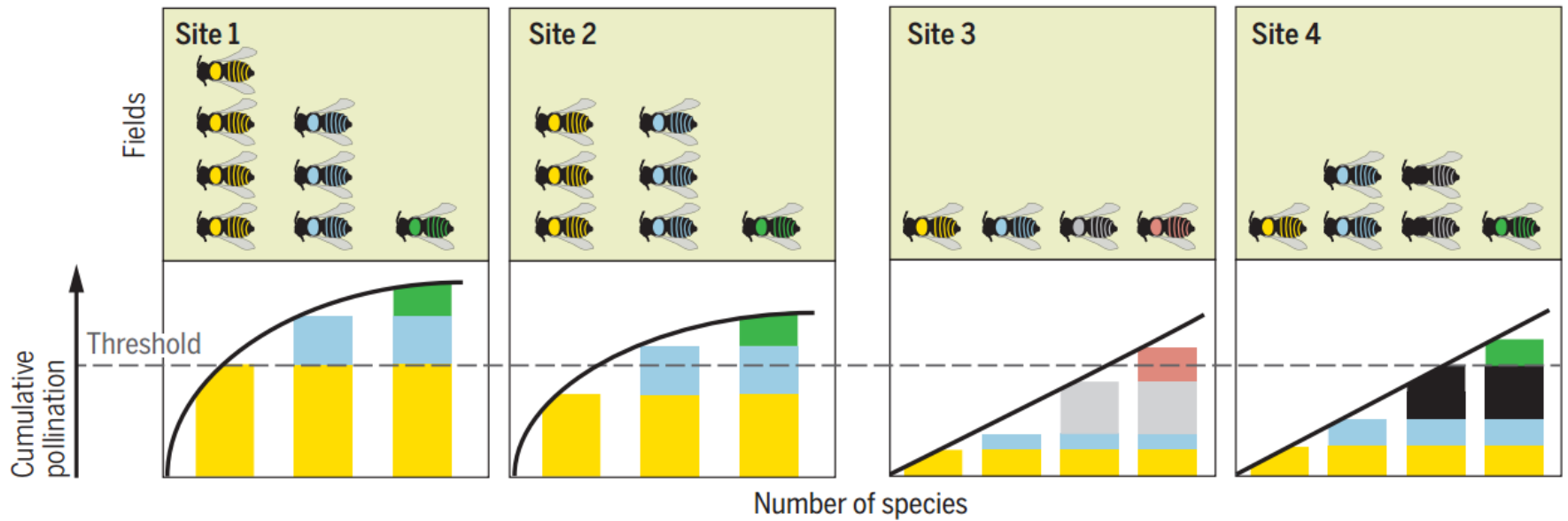
insects

exclusion of insects

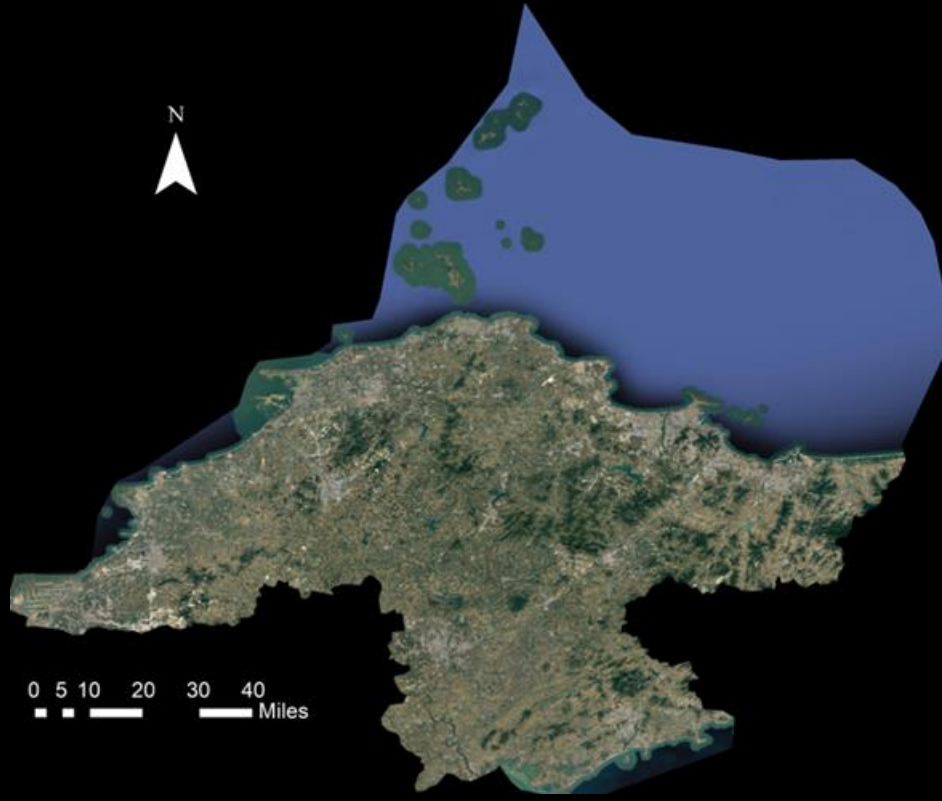
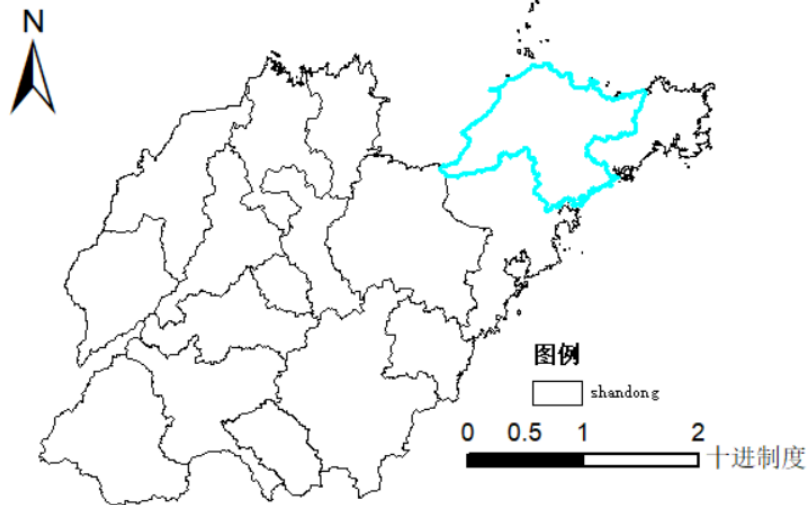
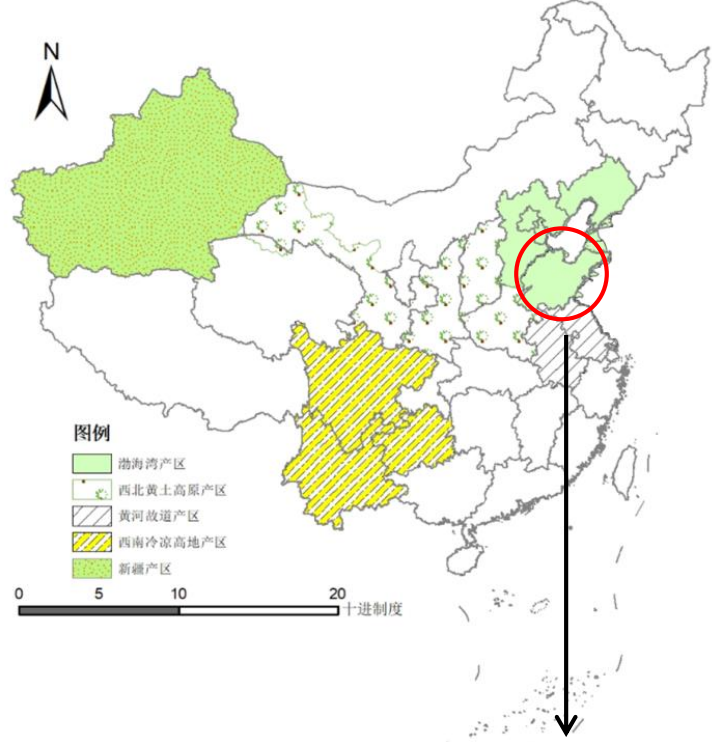
(Photo: Alexandra-Maria Klein, University of Freiburg)

# Bee diversity needed for pollination

Pollinating species vary from site to site; numbers of individuals indicate abundances at the site for each species type.



- **to provide crop pollination in natural systems, the number of bee species must increase by at least one order of magnitude compared with that in field experiments;**
- **mechanisms that emerge only at large scales;**
- **Maintaining ecosystem services in nature requires many species, including relatively rare ones.**



# 调查点介绍



平原周边有水源

丘陵周边种植多种果树

平原周边为大块农田

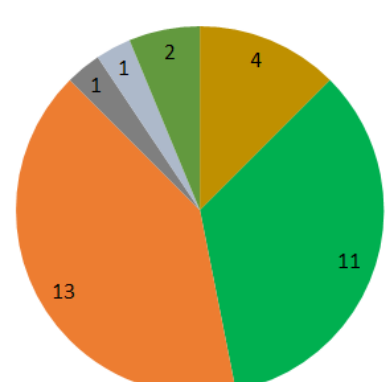
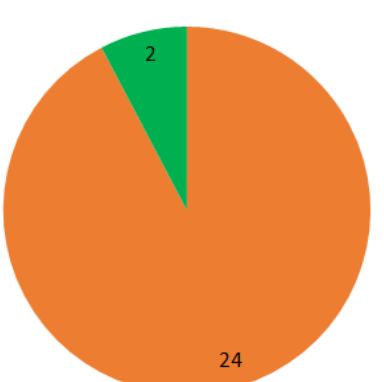
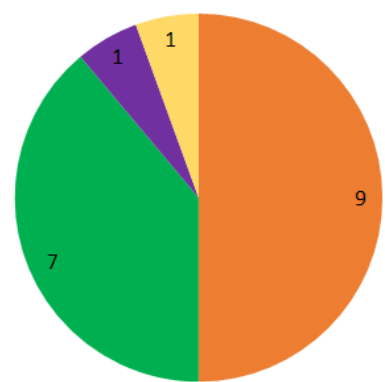
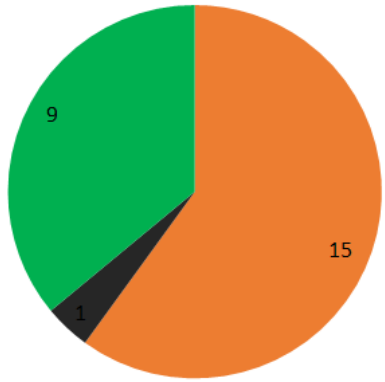
平原周边有小块农田

# 调查方法

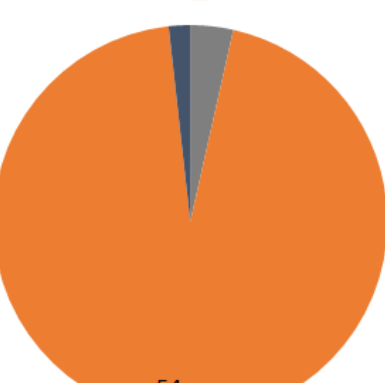
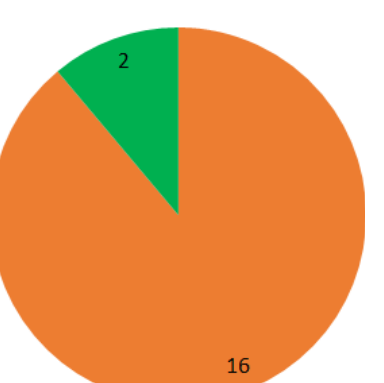
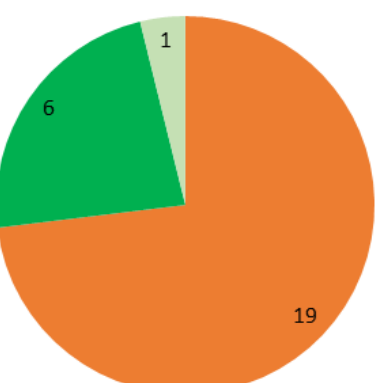
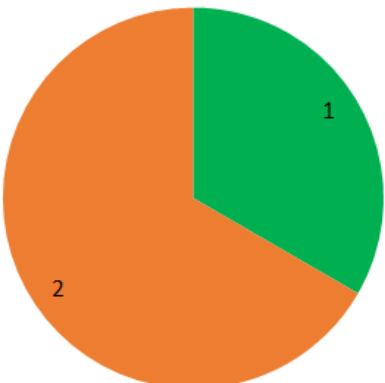




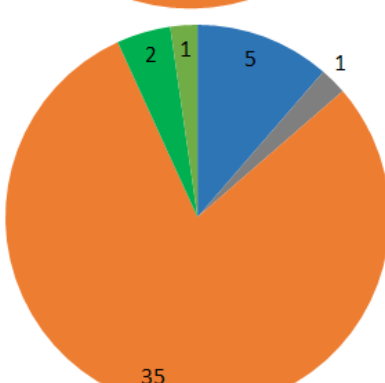
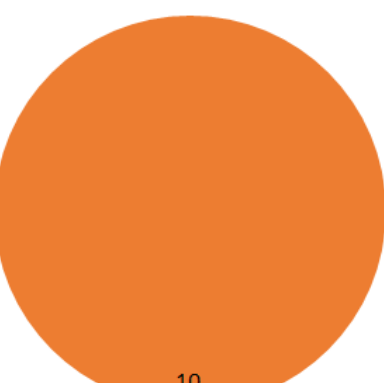
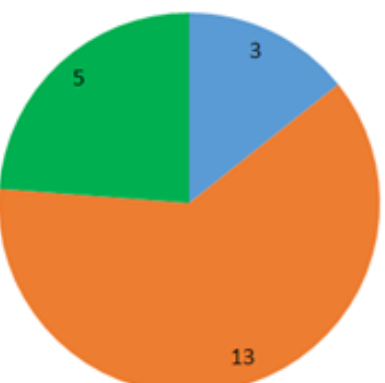
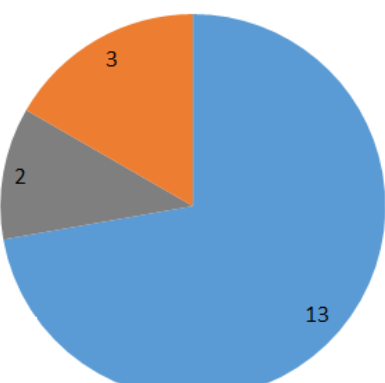
4.26



4.27



4.28



- *Pieris rapae*
- *Osmia excavata*
- *Apis mellifera*
- *Xylocopa appendiculata*
- *Cephonodes hylas*
- *Eristalis tenax*
- *Gametis jucunda*

大屯圈

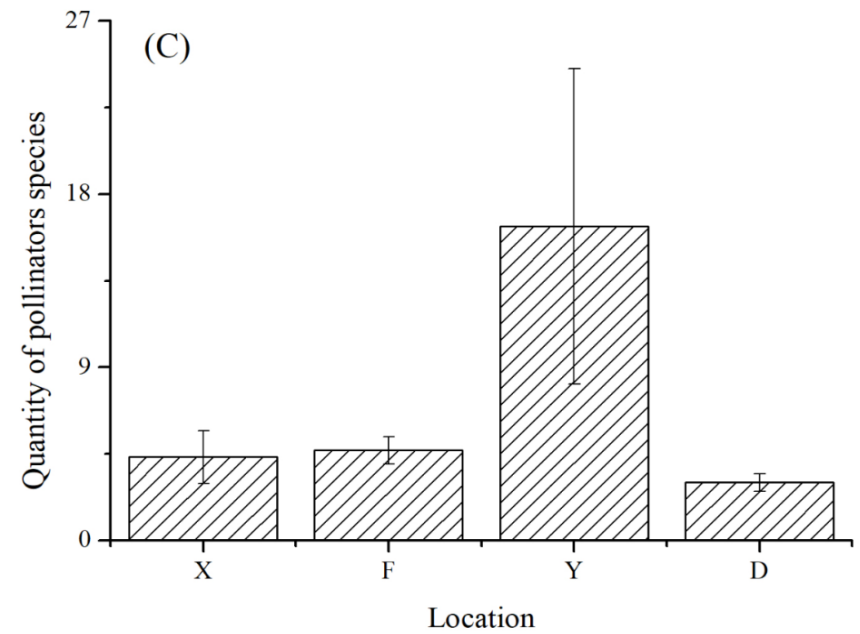
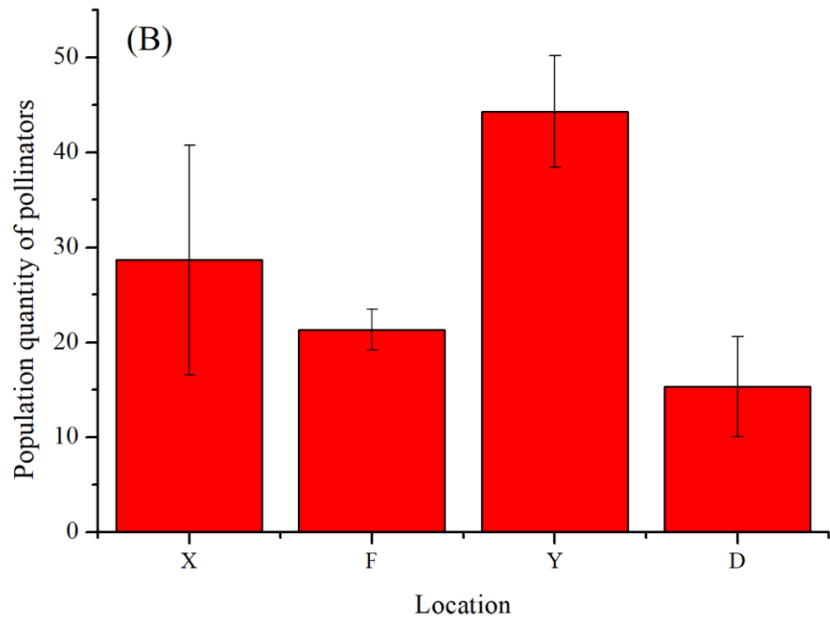
范家庄

新福

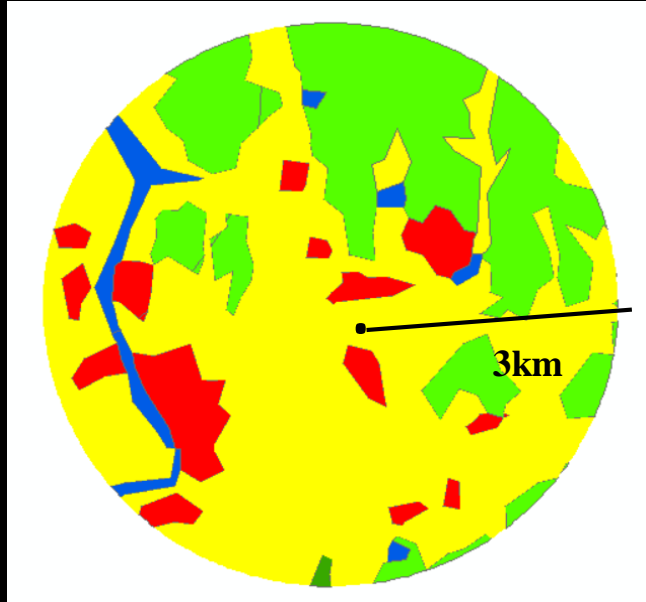
义和乔



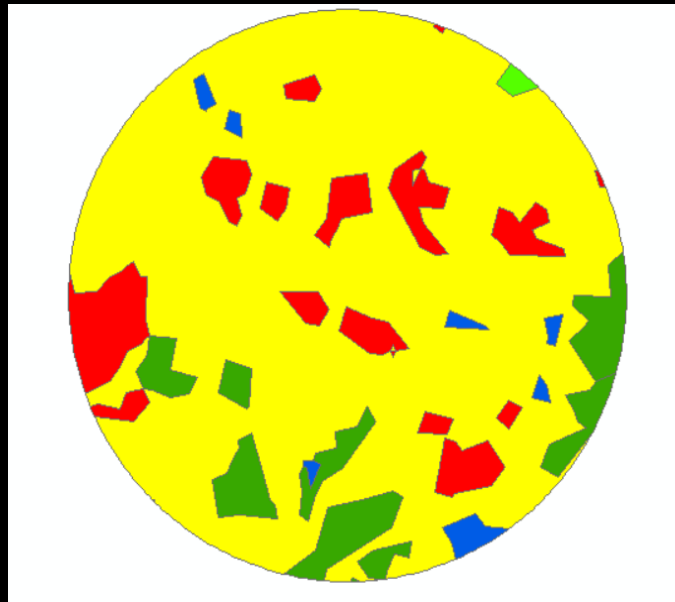




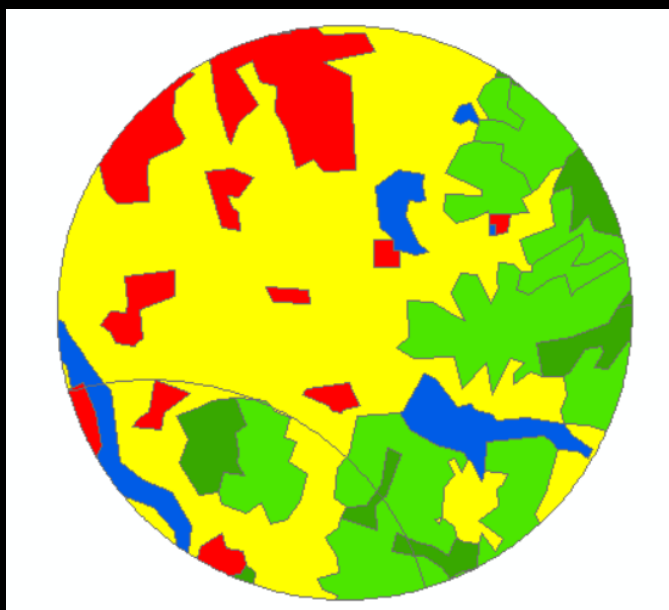
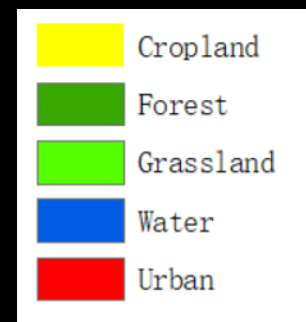
- 义和乔的物种丰富度与种群数量显著高于其他样点



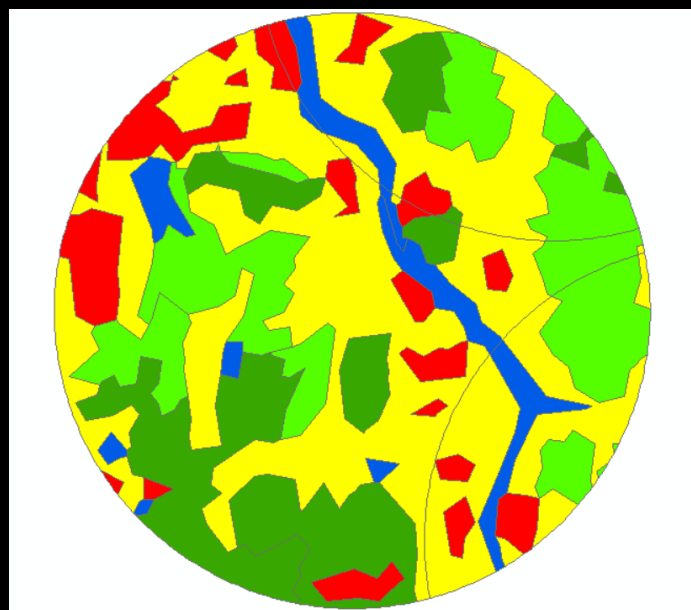
**Datunjuan**



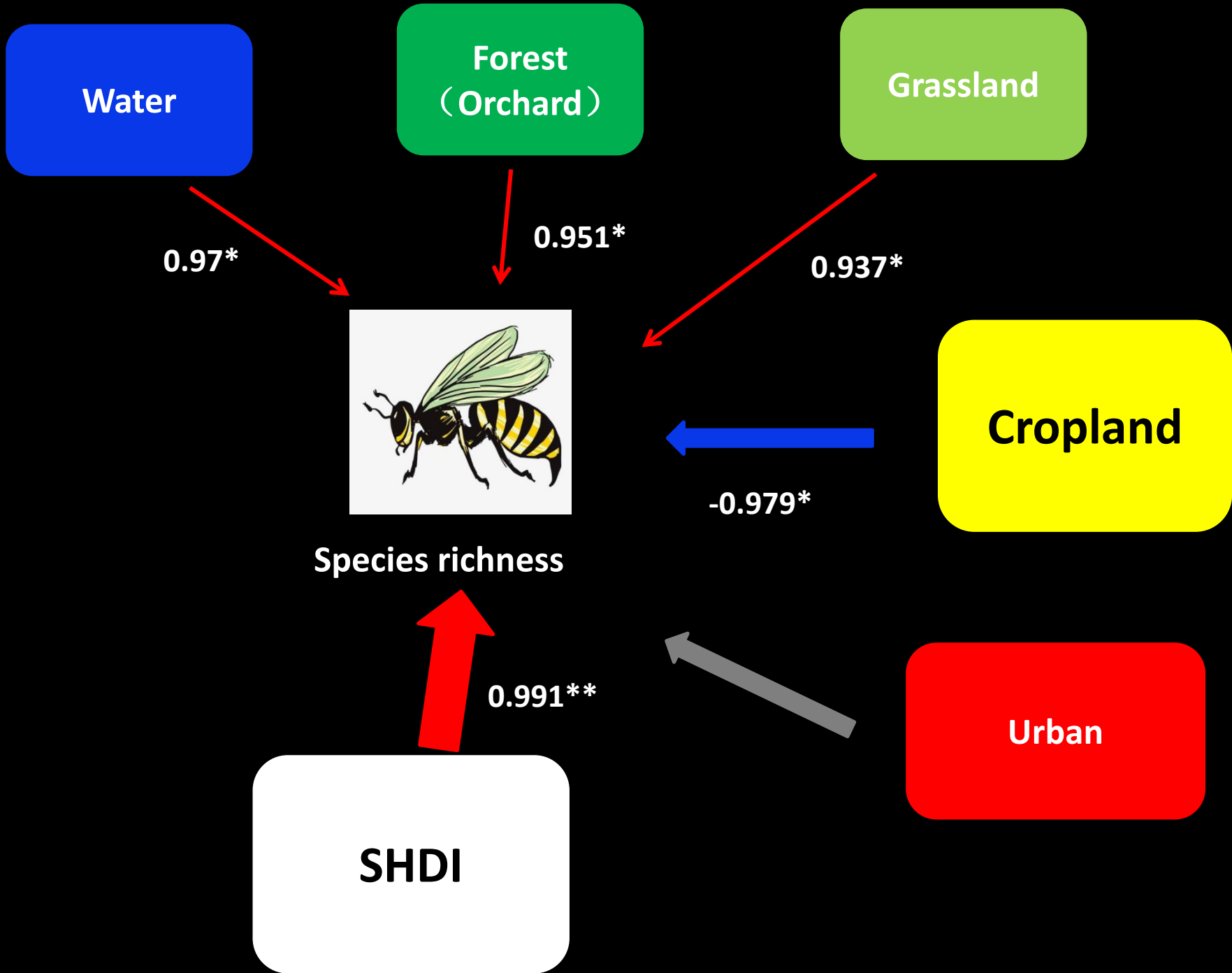
**Fanjiazhuang**



**Xinfu**



**Yihekuang**



Water

Forest  
(Orchard)

Grassland

0.956\*

0.950\*



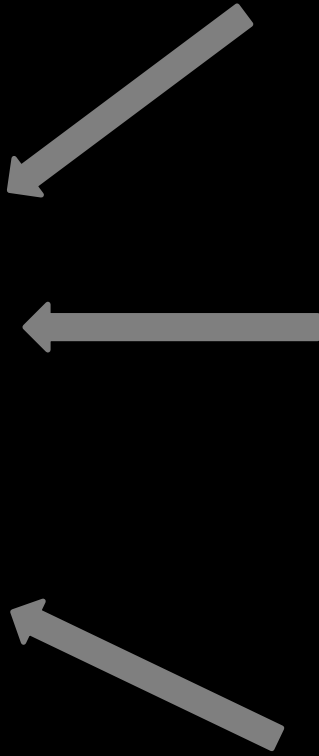
Population quantity

0.986\*\*

SHDI

Cropland

Urban



**Thanks !**