

Herbivory in Spiders

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28.1 Introduction

- Spider=generalist predators
- Nectar (Vogelei & Greissi 1989)
- Pollen (Smith & Mommsen 1984)
- Nectar as a supplement to animal prey (Jackson et al. 2001)
- Tips of an ant-acacia leaflet (Meehan et al. 2009)
- Omnivores or carnivores? 雑食か肉食か

28.2 Pollen Feeding

- *Araneus diadematus* spiderlings (Smith & Mommsen 1984)--- This suggest that orb-web spiders as they reguraly recycle their webs can use pollen as an additional food resource.
- Pollen and fungus spores abundant
- Linyphidae web also have the potential to intercept pollen grains . Laboratory feeding trials, 80% and 90% of individuals of the two linyphiid spider species *Frontinella communis* and *Tennesseellum formicum*, **fed** respectively.

Pollen feeding (continued)

- Spiderlings of *Thomisus onustus* were starved or fed on pollen
- Pollen feeding as supplementary resource use
- Also evidence for some spiders to ignore pollen in their web (Carrel et al. 2000).
- Fungi have different organic chemical composition and content of toxic metabolites; some useful, some deleterious

Survival time of *Thomisus onustus* spiderlings

Survival time (in days)		
Feeding treatment	n	Mean
Starvation control group	12	21.4
Pollen of <i>Erigeron annuus</i>	12	34.9
Pollen of <i>Bellis perennis</i>	15	43.9
Sucrose solution (30%)	13	129.4
<i>Drosophila melanogaster</i>	12	No death

28.3 Nectar Feeding

- More literature --- thomisids (Beck & Connor 1992; Pollard et al. 1995), salticids (Jackson et al. 2001), several wandering spiders (Taylor & Forster 1996).
- Chen et al. (2010) tested for fructose- fructose **positive**; Oxyopidae, Thomisidae, Pisauridae, Salticidae, Lycosidae, Tetragnathidae, Araneidae, Nephilidae, Agelenidae. **negative**; Linyphidae, Clubionidae, Theridiidae.
- ハナグモ (216頭) では 42.9%より 87.5% , 幼体26.5%より成体66.7%がよりポジティブ

Nectar Feeding (continued)

- *Misumenoides formosipes* は蜜食で寿命が延びた。 は蜜食が稀だった (Pollard et al.)
- 90種のハエトリで蜜食を記録, 初期幼体のサブリである。
- 徘徊性のクモの活動性を増す証拠がある。イズツグモ科の *Hibana futilis* は蜜の刺激を記憶する。
- ハナグモの成長を早め, 産卵間隔を短縮し, 卵数を増やす。蜜の有効成分は糖だけではない。

28.4 Exploitation of Ant-Plant Mutualism

- アリ植物共生の搾取
- *Bagheera kiplingi* --- leaf tips of ant-acacias
- The jumping spiders not only use the plant resources but also feed on ant larvae.
- These spiders occur almost exclusively on ant occupied acacias, where they breed year-round and generally build their nest and the distal tips of older leaves that have low rates of ant patrol (Meehan et al. 2009)

28.5 Spider-Plant Mutualism

- Jumping spiders (*Eris* sp. & *Metaphidippus* sp.) on *Chamaecrista nictitans* collect nectar in addition to feeding on herbivores, ants, bees, and other spiders. They prefer plants with nectar.
- The plants with resident jumping spiders set significantly more seeds than plants with no spiders.

28.6 Conclusion

- サプリとしての蜜は多くの科で見られたし、網を張るクモの花粉食も数少ないながらも研究された。餌が乏しいときには生存に有効である。
- その有効の程度に関してはアイソトープを使うといった研究からのデータが必要だろう。
- クモと蜜食から進んだ共生関係の例は、もっと見つかるのではないだろうか。