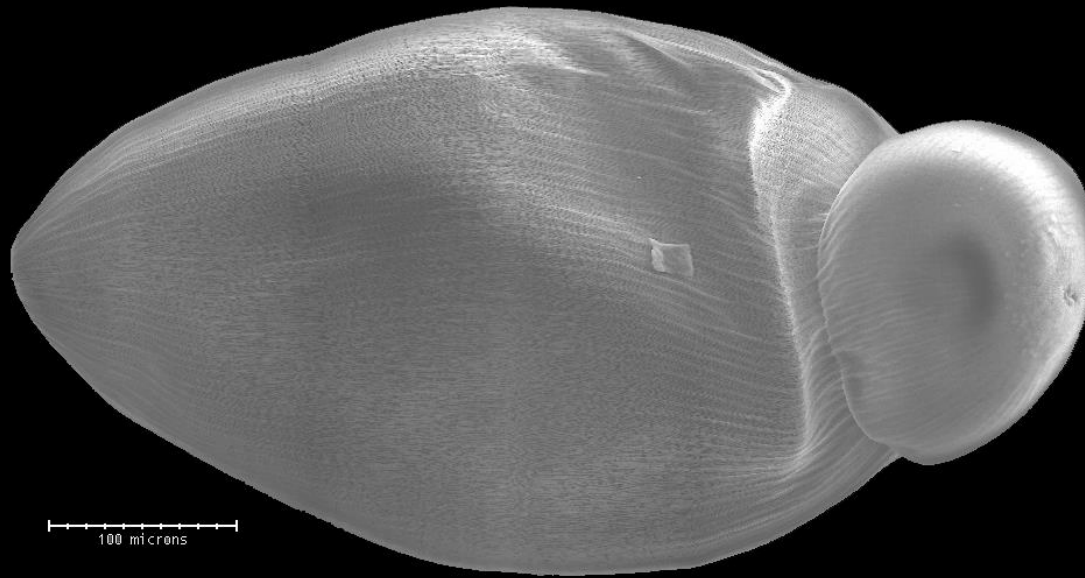


Immune Response of Field Crickets
(*Gryllus firmus*) to Eugregarine
Parasites (Apicomplexan Protozoa)



Ashley Shaw

Outline

- Sexual Selection Theory
- Insect Immunity
- The Host
- The Parasite
- Hypothesis and Predictions
- Methods
- Results and Graphs
- Conclusions and Discussion

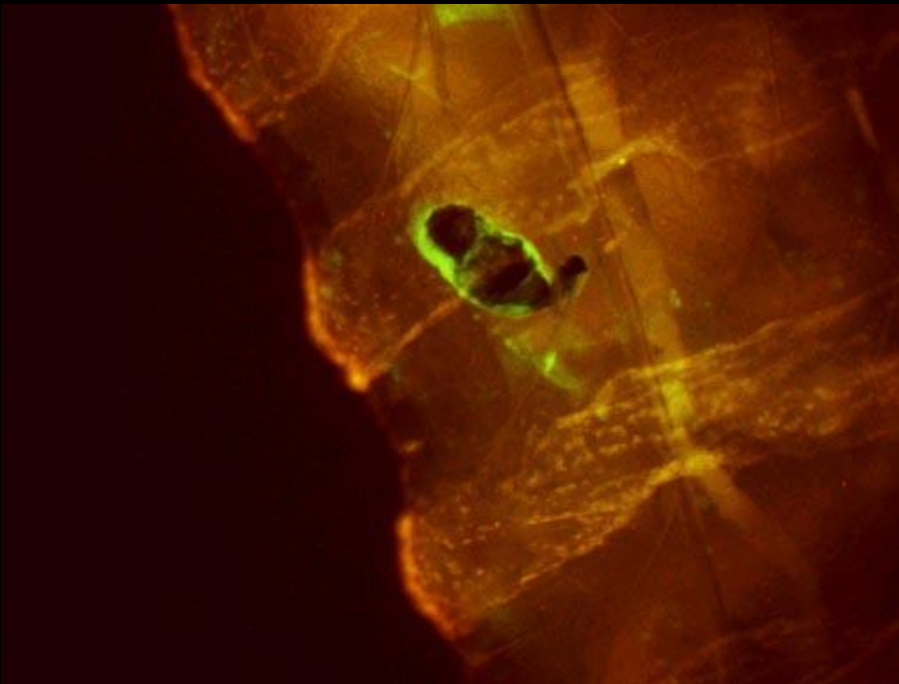


Sexual Selection



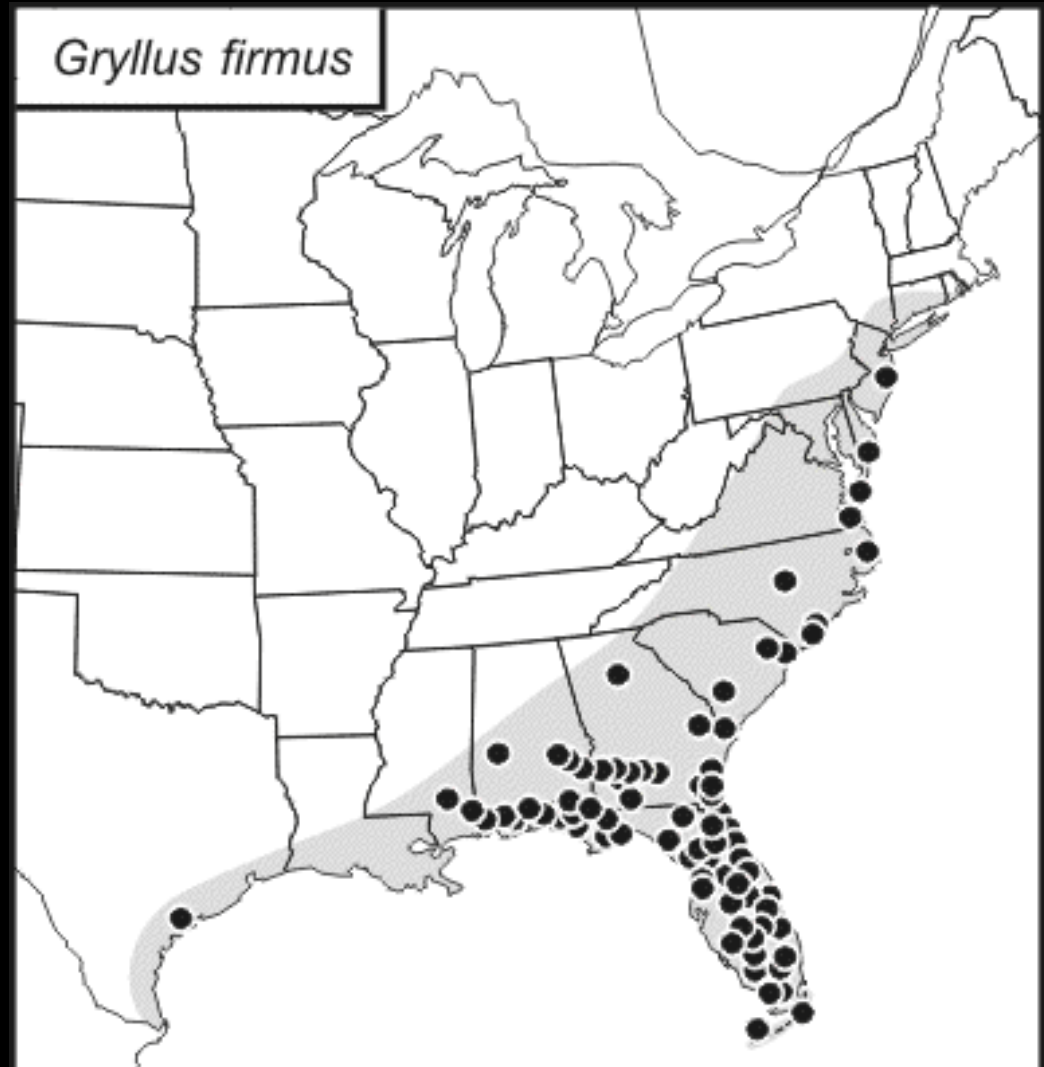
Insect Immune System

- Haemocytes and Humoral system
- Encapsulation



Sand Field Crickets

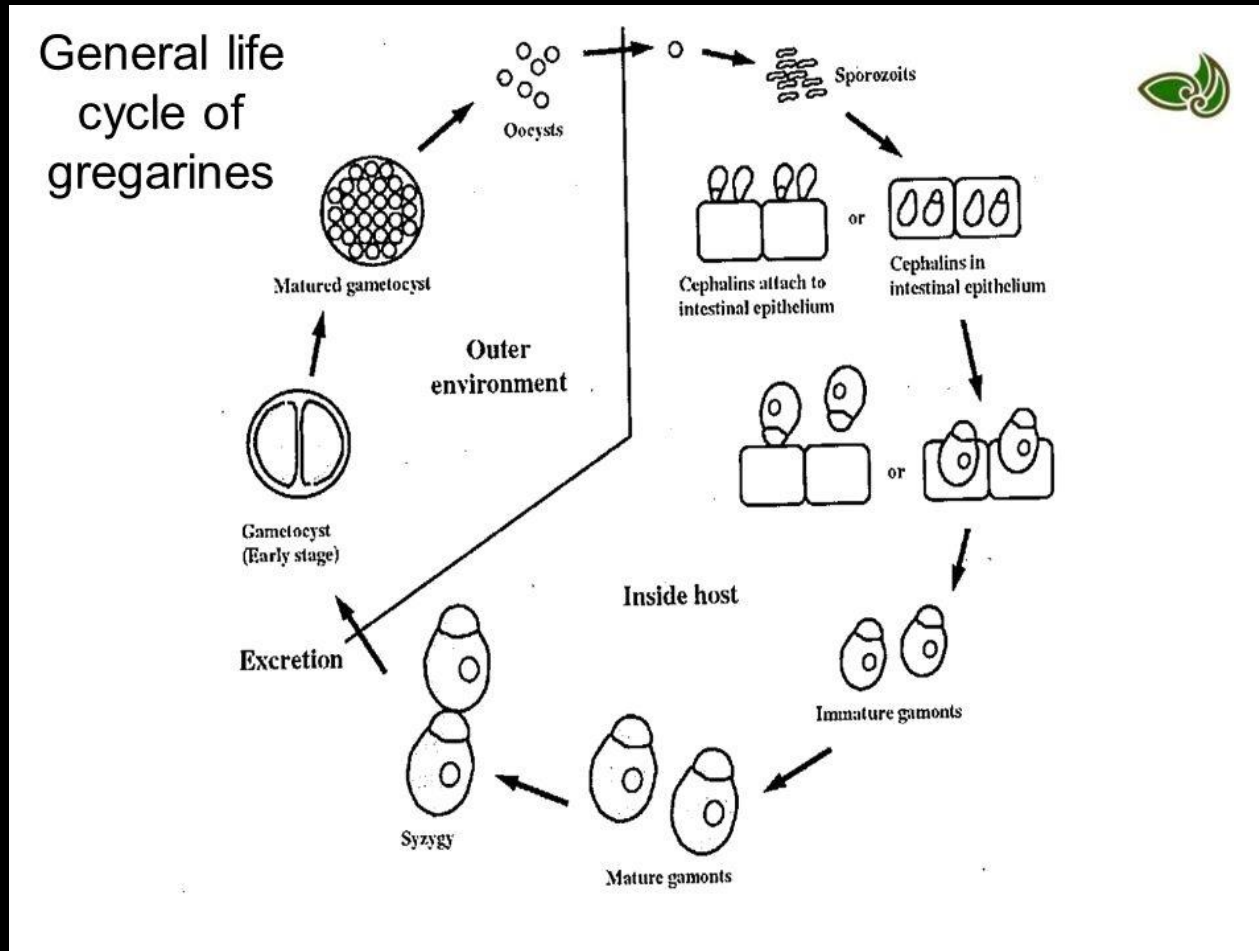
- Habitat
- Used in research



Apicomplexan protozoa

Gregarina

Class Sporozoa, Order Gregarinida

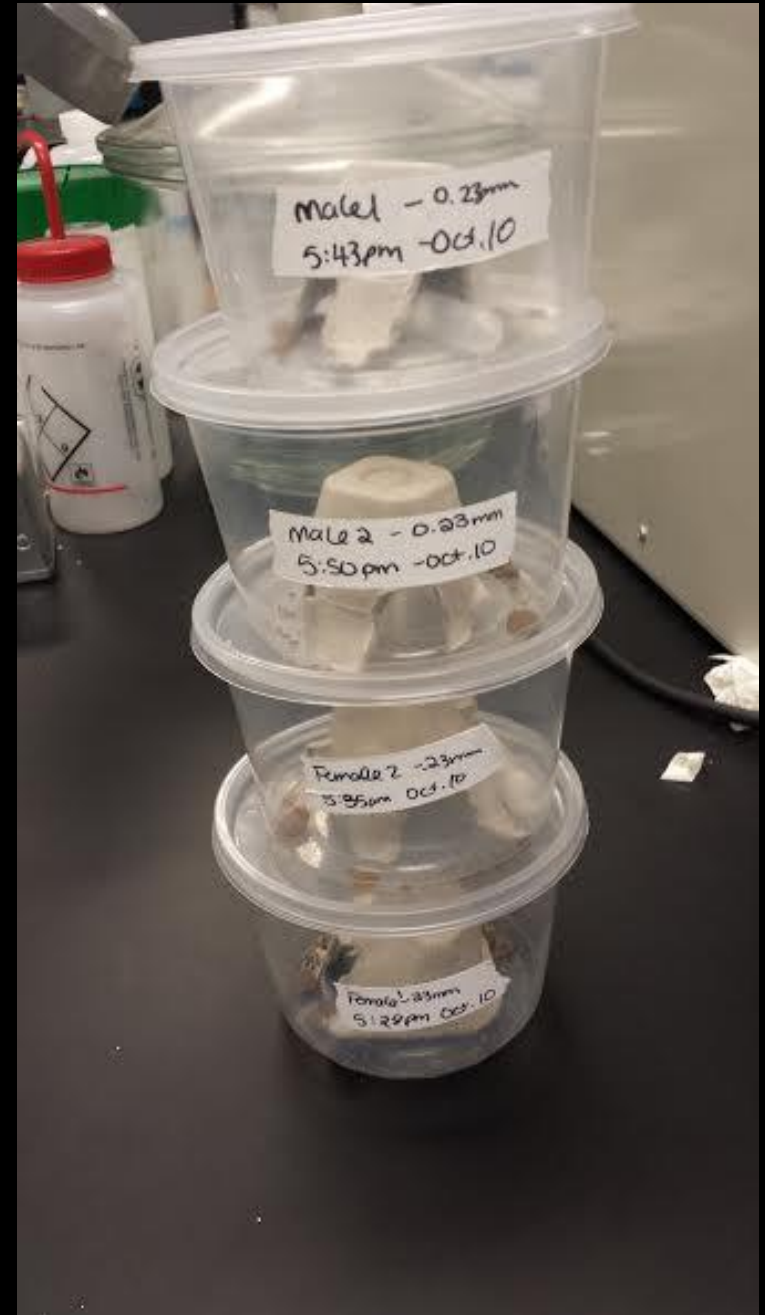


Hypothesis and Predictions

- According to sexual selection theory, there will be a differential investment in energy in regards to defense against parasites between males and females.
- Females would then have a higher encapsulation response in comparison to males.

Methods

- Nylon Implant
- Time Intervals (Hours):
24, 48, 72, 96, >96

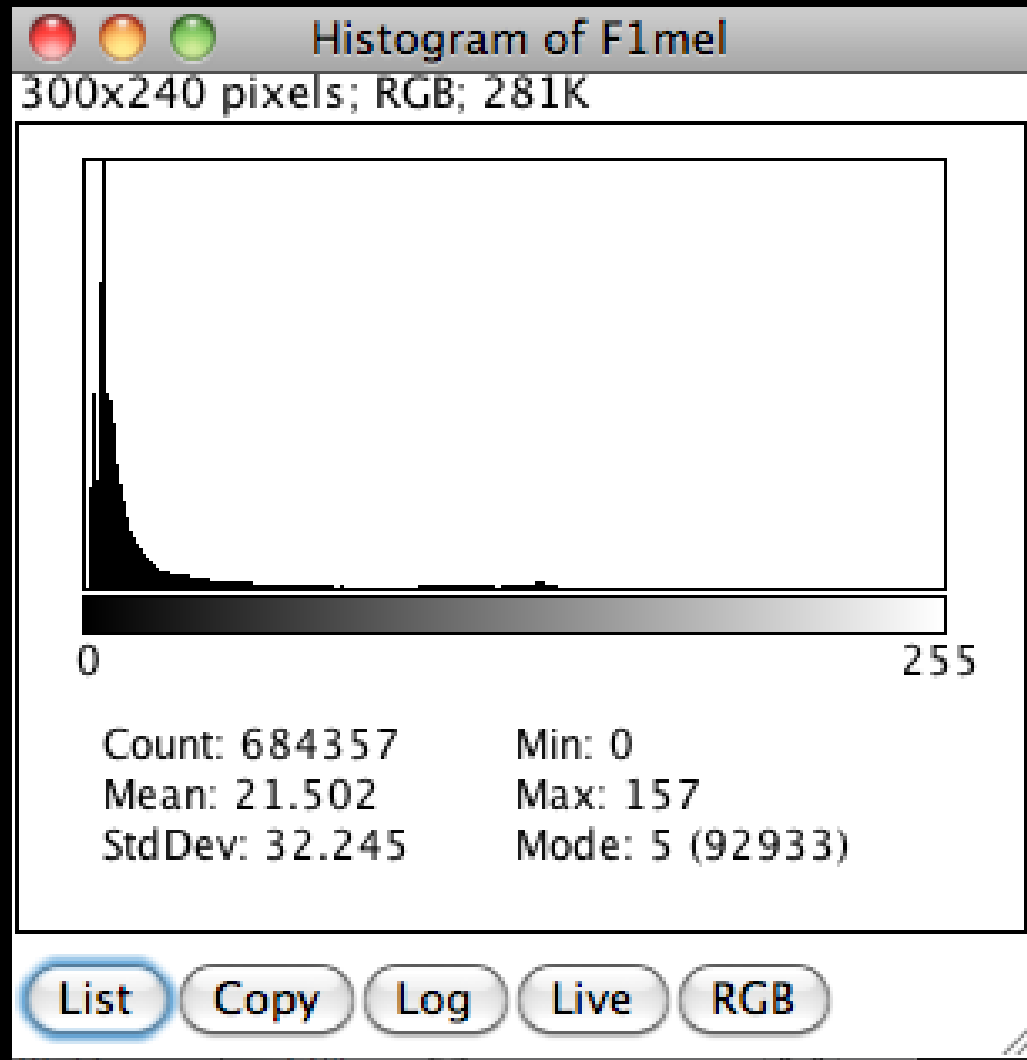




Nylon Lines



Image - J

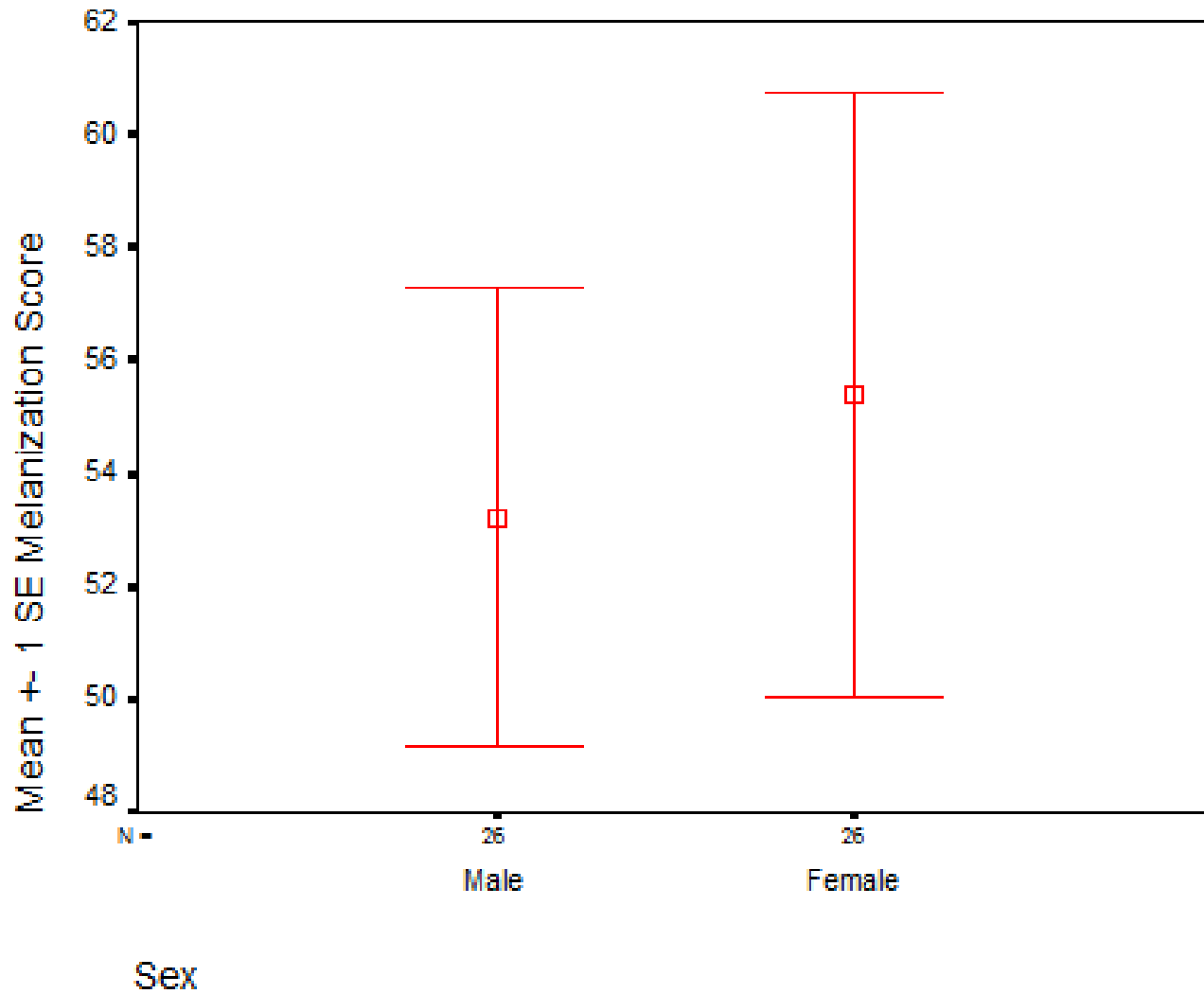


Results

- The following graphs represent some initial findings



Melanization vs. Sex



Conclusions

- Implications on sexual selection theory?
- Parasites controlling host's immunity? Grooming behaviour?
- Decrease of intestinal parasites at 48 hours or more
- Positive correlation between parasite number and body size

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- Crickets 1 – 60
- Marcus, Erin, and Lizelle

References

- Adamo, S. A., Jensen, M., & Younger, M. (2001). Changes in lifetime immunocompetence in male and female *Gryllus* (formerly *G. integer*): trade-offs between immunity and reproduction. *Animal Behaviour*, 62(3), 417-425.
- Adamo, S. A. (2004). How should behavioural ecologists interpret measurements of immunity?. *Animal Behaviour*, 68(6), 1443-1449.
- Bailey, N. W., Gray, B., & Zuk, M. (2011). Exposure to sexual signals during rearing increases immune defence in adult field crickets. *Biology letters*, 7(2), 217-220.
- Bailey, N. W., Gray, B., & Zuk, M. (2008). Does immunity vary with population density in wild populations of Mormon crickets. *Evolutionary Ecology Research*, 10, 599-610.
- Siva-Jothy, M. T., Tsubaki, Y., Hooper, R. E., & Plaistow, S. J. (2001). Investment in immune function under chronic and acute immune challenge in an insect. *Physiological Entomology*, 26(1), 1-5.
- Vincent, C. M., & Bertram, S. M. (2010). Crickets groom to avoid lethal parasitoids. *Animal Behaviour*, 79(1), 51-56.
- Zuk, M., Simmons, L. W., Rotenberry, J. T., & Stoehr, A. M. (2004). Sex differences in immunity in two species of field crickets. *Canadian Journal of Zoology*, 82(4), 627-634.
- Zuk, M. (1987). The effects of gregarine parasites, body size, and time of day on spermatophore production and sexual selection in field crickets. *Behavioral ecology and sociobiology*, 21(1), 65-72.
- (Images)
- http://science.psu.edu/alert/photos/miscphotos/Marden_Image2SEMgamont.jpg
- <http://entoweb.okstate.edu/ddd/insects/fieldcricket.htm>
- <http://www.earthmamasworld.com/c-is-for-cricket-learning-about-crickets-free/>
- http://images.slideplayer.us/7/1738494/slides/slide_14.jpg
- <http://www.geocities.ws/jumacro/imagee/fig5.jpg>
- <http://www.nature.com/nrmicro/journal/v2/n8/images/nrmicro957-i1.gif>
- http://www.scielo.org.ar/scielo.php?script=sci_arttext&pid=S0327-95452003000200005
- <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0078905>
- <http://bugguide.net/images/cache/7ZDLQZTLJLQH0RDZSRYZ0R3ZQR2LLZCZRZCZQRCZMRQHIZNLFLBLFLELORTZFL2L0RULFLOZLZPL7Z9LSRPLHZDLOZ.jpg>
- <http://entnemdept.ifas.ufl.edu/walker/buzz/481md.gif>
- http://s1272.photobucket.com/user/TulaKrystal2/media/FatDragonflies3_zpsd945877a.png.html
- http://www.molbiol.umu.se/digitalAssets/12/12686_capsule.jpg