Basic guide to identifying *Spartina alterniflora* marsh arthropods

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Appendix A (TABLE A1). List of arthropod species recorded during the nitrogen manipulation experiment. The trophic structure of the arthropod community found on Spartina alterniflora (hereafter Spartina) is numerically dominated by two congeneric planthopper species, Prokelisia dolus and P. marginata, which are host specific and extremely sensitive to changes in nitrogen in their host plants (Huberty and Denno 2006). The remaining herbivores in the system are rare relative to the abundant Prokelisia species and consist primarily of other planthoppers (e.g., Delphacodes penedectecta, Megamealus lobatus), leafhoppers (e.g., Sanctanus aestuarium), true bugs (e.g., Trigonotylus uhleri), stem-boring flies (e.g., Chaetopsis aenia) and scales (e.g., Eriococcus dennoi). The primary detritivores in the system are either saprophagous (e.g., the grass fly Incertella sp.) or feed on the fungi associated with detritus (e.g., the oribatid mites Hemileius sp. and Diapterobates sp.), but only rarely feed directly on detritus. Lastly, the algivores associated with the Spartina community consist primarily of species that feed on epiphyton associated with Spartina and on the marsh surface (e.g., the amphipod Orchestia grillus, the isopod Venzillo parvus, and the oribatid mite Ameronothrus marinus). The predators in the system can be either highly specialized (e.g., the mirid bug Tytthus vagus) or generalized (e.g. the orb-weaving spider Hyposinga variabilis) in feeding habit. The salt marsh also supports a number of predatory species that are intraguild predators (e.g., hunting spiders such as Pardosa littoralis and Clubiona sp.) as well as parasitoids that feed at both the third (e.g., the figitid parasitoid Leptopilina sp.) and fourth trophic level (e.g., the scelionid parasitoid Baeus sp.). The parasitoids in the system are primarily associated with either planthoppers (P. marginata and P. dolus) or the saprophagous Chloropid fly (Incertella sp.). Previous studies in this system have determined trophic relationships among the dominant species (Döbel and Denno 1994, Finke and Denno 2002, 2004, Ferrenberg and Denno 2003) and rare species were classified according to previous observations and the literature. The primary trophic groups of individual species/genera are listed as: A = Algivore, D = Detritivore, H = Herbivore, PA = Parasitoid, PR = Predator, or UK = Unknown.

For Detailed List See:
Increased primary production shifts the structure and composition of a terrestrial arthropod community. Ecology 91:3303-3311.
APPENDIX A List of arthropod species recorded during the nitrogen manipulation experiment (Ecological Archives E091-233-A1).
Class: Insecta
Order: Hemiptera
Order: Hemiptera
Suborder: Auchenorrhyncha
Family: Delphacidae

- Herbivorous
- Common name: delphacid planthopper
- All Delphacids have spur on hind tibia

- Prokelisia spp.: can be macropterous or brachypterous; lightly colored; slim form
Order: Hemiptera
Family: Delphacidae
Genus: *Prokelisia*

- Most abundant herbivore in *Spartina*
- Two species: *P. marginata* and *P. dolus* – distinguished by genital shape

Photo: C-K. Ho

Photo: C. Gratton
To ID *P. marginata* from *P. dolus* see..


http://ag.udel.edu/enwc/research/delphacid/Prokelisia.htm
Order: Hemiptera
Family: Delphacidae
Genus: *Delphacodes*

- macropterous or brachypterous
- Often mottled coloration on dorsal abdomen
- Dark genital cap on males

Photo: B. McCall
Order: Hemiptera
Family: Delphacidae
Genus: *Megamealus*

- Macropterous or brachypterous
- Usually dark brown with lighter 'stripe' down back
- Rust colored genital cap on males
- Similar size to *Delphacodes*
Delphacodes vs Megamealus

Prothorax suture curves around eye

Prothorax suture runs straight, mimics mesothorax.
Delphacodes vs Megamealus

Photo: C. Gratton

Photo: C. Gratton
Order: Hemiptera
Suborder: Heteroptera
Family: Miridae

- Herbivorous
- Slender body; elongated abdomen; long, fragile legs and antennae; piercing mouthparts; yellow-green coloration
- Two dorsal orange stripes, present in all instars
- *Trigonotylus* sp.
Order: Hemiptera  
Suborder: Auchenorrhyncha  
Superfamily: Membracoidea  
Family: Cicadellidae

- Herbivorous
- Common name: leafhoppers
- Characteristic triangulated head and rows of spines on tibias
Order: Hemiptera
Family: Cicadellidae

row of spines on hind tibia

Photo: B. McCall
Order: Hemiptera
Family: Blissidae
Genus: Ischnodemus

- Herbivorous
- Very dark bodies with lighter legs
- Juveniles are bright red
- Ischnodemus badius
Order: Hemiptera
Suborder: Heteroptera
Family: Miridae
Genus: Tytthus

- Delphacid egg predator
- long, fragile legs and antennae
- long, piercing mouthparts

Photo: C. Gratton
Order: Hemiptera
Family: Pentatomidae

• common name: stink bug
• not very common in DVAC samples

• Top – *Chlorochroa senilis*

• Bottom - *Oebalus pugnax* – feeds on grass
Class: Insecta
Order: Diptera
Order: Diptera  
Family: Chloropidae

- Common name: grass fly  
- Yellow and dark brown striped body, large red eyes  
- Most abundant fly in *Spartina* communities; stem-boring larvae  
- Likely *Intercella* sp.
Order: Diptera
Family: Cecidomyidae

- Common name: gall midges
- Highly reduced wing venation (~3 veins); Long, moniliform antennae
- Stem-boring larvae
Order: Diptera
Family: Dolichopodidae

- Common name: long-legged flies
- Long legs; Large body, usually metallic
- Stem-boring larvae
**Chaetopsis species**

About 7 species north of Mexico: 7 named species with two possible synonyms and two undescribed species from Florida

* C. *aenea* legs red, abdomen dark; **East coast salt marshes**

* C. *apicalis* wing markings greatly reduced; **East coast salt marshes**

* C. *debilis* legs red, base of abdomen orange, southern, possibly a pale form of *massyla*

* C. *fulvifrons* legs red, proximal wing band shortened; most of the US, possibly a color variant of *massyla*

* C. *magna* four wing bands, abdomen red, possibly a synonym of *major*

* C. *massyla* legs black, wing markings strong; fresh water marshes east of the Rockies

* C. *quadrifasciata* four wing bands, second short, FL

**References**

Johnson (1913) Insects of Florida. Bulletin of the American Museum of Natural History 32: 83 (key to five of the seven currently known species) ([Full text](#))


Alan Stone et al. 1965. A catalog of the Diptera of America North of Mexico, United States Department of Agriculture
Order: Diptera
Subsection: Acalyptratae
Family: Ulidiidae

- distinct markings on wings (three stripes)
- Stem-boring larvae
- *Chaetopsis aenea*
Order: Diptera  
Subsection: Acalyptratae  
Family: Ulidiidae

- distinct markings on wings (tips only)  
- Stem-boring larvae  
- *Chaetopsis apicalis*
Chaetopsis apicalis larvae and pupa.

Photos Shanze Li
Order: Diptera
Subsection: Acalyptratae
Family: Ulidiidae
Fig. 1. *Spartina* stem borers and their characteristic larval positions within *S. alterniflora* stems: 1 = *Calamomyia alterniflorae* (Diptera: Cecidomyiidae), 2 = *Mordellistena splendens* (Coleoptera: Mordellidae), 3 = *Languria taeata* (Coleoptera: Languriidae), 4 = *Chilo demotellus* (Lepidoptera: Pyralidae), 5 = *Thrypticus violaceus* (Diptera: Dolichopodidae). Arrows indicate direction of mining activity. Scale lines = 0.5 cm.
Class: Insecta
Order: Coleoptera
Order: Coleoptera  
Suborder: Polyphaga  
Family: Coccinellidae  
Genus: Naemia  

- predacious  
- Color fades in alcohol
Order: Coleoptera
Family: Curculionidae

- Common name: weevil
- A well-developed downward-curved snout (rostrum); antennae elbows, clubbed
- Most larvae and adults feed on all parts of plants
Class: Insecta
Order: Thysanoptera
Family: Thripidae

- Common name: thrips
- Elongate bodies; wings fringed with tiny hairs and reduced venation
- Small ~1mm
- Most are herbivorous – some fungivores, some predators
Class: Arachnida
Order: Araneae
Order: Araneae
Family: Clubionidae

- Common name: sac spider
- Large chelicerae
- Spinnerets point straight out from body line; may appear translucent
- Wandering predator
- Probably *Clubionia* sp.

Photo: J. Sheehan
Order: Araneae
Family: Linyphiidae

- Common name: sheet-web weaver
- Very small; Yellow-brown to brown coloration
- Characteristic toothed chelicerae
- Long legs with spines – family *Theridiidae* look similar hairy legs not spines

*Grammonota* sp. (note: G. Wimp says pics may be *Eperigone*)
Grammonota may be confused with Eperigone

- pattern on the abdomen is a little different between the two - The lateral stripes on Eperigone cover the length of the abdomen, while they only cover about one-half of the abdomen on Grammonota.

- key characters that separate them are related to the male pedipalps (you can't key females to genus) - Grammonota has a long, curly tailpiece that comes off of the embolus, whereas the embolus is simple in Eperigone.

- the pedipalps on male Grammonota are much shorter

- very large teeth on the chelicerae of Eperigone that are not quite so pronounced on Grammonota

- Both are Linyphiid spiders

Photo: C. Gratton
Order: Araneae
Family: Salticidae

- common name: jumping spider
- Large cephalothorax relative to elongated abdomen
- Large, muscular, elongated front legs adapted to jumping
- Good vision; generally recognizable by eye pattern – one large pair surrounded by smaller, two rows
Order: Araneae
Family: Salticidae

Photo: B. McCall
Order: Araneae
Family: Salticidae

- Elongate body
- *Marpissa* sp.
- Smaller individuals striped; larger individuals have low contrast striping
Order: Araneae  
Family: Lycosidae  

common name: wolf spider

**Hogna** sp.  
Larger; v-shaped stripe on cephalothorax  
(note: G. Wimp thinks this looks more like *Pardosa* due to the black mask; D. Lewis thinks this may be *Pirata* due to V-shaped stripe).

**Pardosa** sp.  
No markings down cephalothorax
Hogna does not usually have a bandit mask around the eyes.

Easiest way to distinguish between these two genera is with the females - Female Hogna have a double epigyynal hood and female Pardosa have a single epigyynal hood.
Order: Araneae  
Family: Tetragnathidae

- Common name: long-jawed orb weavers
- Narrow, elongated abdomen; elongated chelicera
- Characteristic small eyes – even diameter evenly spaced
- Very long hairy legs
- *Tetragnatha* sp.
Order: Araneae
Family: Tetragnathidae
Sexing Mature Spiders

Female Spider Pedipalps

Male Spider Pedipalps - bulbous at ends; curly stuff on the inside indicates sexual maturity
Miscellaneous
Class: Arachnida
Order: Pseudoscorpionidaes

- Visually appears like a scorpion without tail
- Very Small; less than 1 cm
- Predacious
Class: Entognatha  
Order: Collembola  

- Common name: springtail  
- Poduromorpha and Entomobryomorpha have an elongated body, while the Symphypleona have a globular body  
- wingless; collophore – ventral tube used for sticking in place; furcula - abdominal, tail-like appendage used for jumping
Subphylum: Crustacea
Class: Malacostraca
Order: Amphipoda

- Legs of different lengths
- Most are detritivores or scavengers
Class: Insecta
Order: Lepidoptera
Family: Noctuidae

• Stem-boring larva