

NEUROPTERA: ASCALAPHIDAE

SCIENTIFIC CLASSIFICATION:

Kingdom: Animalia
Phylum: Arthropoda
Subphylum: Hexapoda
Class: Insecta
Subclass: Pterygota
Infraclass: Neoptera
Superorder: Endopterygota /Neuropterida
Order: Neuroptera
Suborder: Myrmeleontiformia
Superfamily: Myrmeleontoidea
Family: Ascalaphidae
Subfamilies: Albardiinae
Ascalaphinae
Uluodes Currie in Smith, (1900) 1899
macleayana (Guilding), 1825
quadripunctatus (Burmeister), 1839
floridana (Banks) 1906a:9
Haplogleniinae
Ascaloptynx Banks, 1915
appendiculatus (Fabricius), 1793

NEUROPTERA:

Adult **Neuroptera** are soft bodied insects, with mandibulate mouthparts with strong mandibles and maxillae, and small labium. Large lateral eyes, ocelli present or absent; antennae long and multi-articulate, usually filiform or moniliform. Tarsi have five segments and cerci are absent. Mesothorax and metathorax similar in structure, with four subequal membranous wings that usually have a great many crossveins and extra branches of the longitudinal veins. There are generally a number of crossveins (Fig. 1) along the costal border of the wing, between the C and Sc. The radial sector often bears a number of parallel branches. The front and hind wings in North America species are similar in shape and venation and are usually held roof-like over the body at rest.

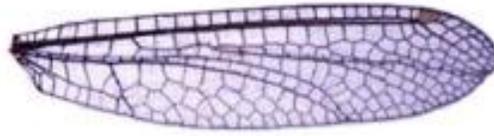


Fig. 1.(showing numerous crossveins)

Larvae with clearly defined head capsule; mandibles and maxillae usually elongate, slender, modified for sucking; thoracic segments with walking legs with 1-segmented tarsus usually bearing 2 claws; abdomen frequently bearing adhesive disks on last 2 segments, without cerci.

Pupae exarate, denticous, and enclosed in silken cocoon.

This order includes species which are mostly predaceous and beneficial to man. The aquatic forms serve as food for fish, and the terrestrial ones are very beneficial in their larval stages by preying upon aphids, ants, and other small insects.

LITERATURE-BASED KEY to the FAMILIES of Adult NEUROPTERA

- 1.Hind wings broader at base than front wings, with enlarged anal area that is folded fan wise at rest; longitudinal veins usually forking near wing margin; larvae aquatic (suborder Megaloptera).....2.
- 1.a. Front and hind wings similar in size and shape, hind wings without enlarged anal area that is folded fanwise at rest.3
- 2. Ocelli present; fourth tarsal segment cylindrical; body usually 25 mm or more long; wings hyaline or with smoky areasCorydalidae
- 2.a. Ocelli absent; fourth tarsal segment dilated and deeply bilobed; body usually less than 25 mm long; wings usually smokySialidae
- 3. Wings with few veins and less than 10 closed cells, Rs usually with only 2 branches; small to minute insects covered with whitish powder Coniopterygidae
- 3.a.Wings with many veins, Rs usually with more than 2 branches; wings not covered with whitish powder, size variable, but usually not minute.4
- 4. Prothorax elongate5
- 4.a. Prothorax of normal size, not elongate7

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Summer 2009 -For Dr. P. M. Choate, By: Gloria Trujillo**

- 5. Front legs raptorial, arising from anterior end of prothorax; mantid-like insects, widely distributed..Mantispidae
- 5.a. Front legs not raptorial, arising from posterior end of prothorax; western United States (suborderRaphidioptera) 6
- 6. Ocelli present; stigma in front wing with a crossvein; hind wings with Cu2 and 1A fused for short distance, basal m-cu transverse Raphidiidae
- 6.a. Ocelli absent, stigma in front wing without crossvein; hind wings with Cu2 and 1A separate, basal m-cu obliqueInocelliidae
- 7. Antennae clubbed or knobbed; insects with abdomen long and slender, resembling dragonflies or damselflies in general appearance (superfamily Myrmeleontoidea)8
- 7.a. Antennae filiform, moniliform, or pectinate, not clubbed or knobbed; usually not particularly resembling dragonflies or damselflies in appearance9
- 8. Antennae about as long as head and thorax together; hypostigmatic cell (cell behind the point of fusion of Sc and R1; very long, several times as long as wide, eyes entire Myrmeleontidae
- 8.a. Antennae nearly or quite as long as body with abrupt knob at apex; hypostigmatic cell short, not more than 2 or 3 times as long as wide; eyes entire (Haplgleninae) or divided horizontally (Ascalaphinae).**Ascalaphidae**
- 9. At least some, usually many, costal crossveins forked.10
- 9.a. All (or nearly all) costal crossveins simple.....13
- 10. Front wings apparently with 2 or more radial sectors.Hemerobiidae
- 10.a. Front wings with only 1 radial sector, which has 2 or more branches.....11
- 11. Front wings with a recurrent humeral vein, 16-34 mm long.12
- 11.a. Front wings without a recurrent humeral vein, 9-13 mm long Berothidae
- 12. Sc and R1 in front wing fused distally; Rs in front wing with many branches, crossveins between them forming a fairly distant gradate vein; free basal portion of MA in hind wing longitudinal; widely distributed Polystoechotidae
- 12.a. Sc and R1 in front wing not fused distally; Rs in front wing with only a few branches, crossveins between them scattered and not forming a distant Gradate vein; free basal part of MA in hind wing short and oblique, southern california Ithonidae

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- 13. Sc and R1 in front wing not fused near wing tip, Rs appearing unbranched; wings, at least in life, often greenish; very common insects Chrysopidae
- 13.a. Sc and R1 in front wing fused or separate apically, Rs appearing branched; wings not greenish; uncommon insects.14
- 14. Antennae pectinate in male, filiform in female; female with exerted ovipositor about as long as body; hind wing about as long as front wing in male, about two-thirds as long as front wing in female; front wing 3.0-5.5 mm..Dilaridae
- 14.a. Antennae filiform in both sexes; female without exerted ovipositor; hind wing with free basal part of MA present, longitudinal; wings elongate-oval, hind wing nearly as long as front wing; front wing 3.4-7.0 mm long.. . Sisyridae

FAMILY ASCALAPHIDAE

Common name: Owlflies

The family Ascalaphidae (owlflies) contains approximately 450 species assigned to 65 genera with wide distributional range in warm regions of the world.

Ascalaphids are very similar to large dragonfly-like insects, 1 3/8-1 5/8" (35-40 mm) long, have a sturdy thorax, large compound eyes that meet on the midline above the hairy head, and long, knobbed (clubbed) antennae which is as long as the body. Their wings bear many cross veins along the front margin and span about 2 1/2" (65 mm); hypostigmatic cell short. . The abdomen in a few species is held up, projecting into the air, to look like a broken twig. The larvae resemble antlions but do not dig sand traps. They conceal themselves under loose debris and ambush small insects of many kinds.

They are fairly common in the South and Southwest, but are quite rare in the North. Most species lay their eggs in groups on twigs, and a week or so after hatching the larvae climb down to the ground, where they live in litter. The larvae of a few species may be arboreal; others have a coloration that renders them inconspicuous. The larvae are predaceous with all the pre-tarsal claws approximately equal in development. They lie and wait for their prey with their large jaws wide open. The closing of the jaws on a prey is apparently triggered by contact, and the prey is usually paralyzed within seconds by the bite of the ascalaphid larva.

Pupation occurs in litter, in a silken cocoon, and last for a few weeks to a few months.

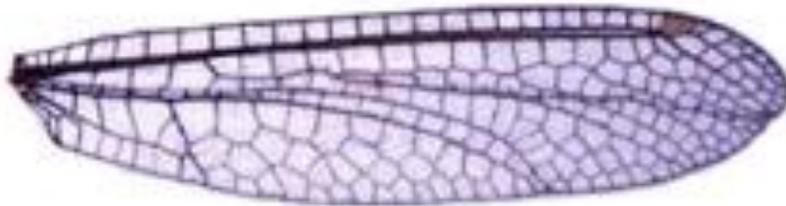
Some adults are diurnal, and some are nocturnal. Most North American species fly at dusk, flying up to 10 m above the ground by the time of complete darkness. The flight of the adult is strong and dragonfly-like, with periods of hovering and rapid flight, the adults feeding on small insects. Adults spend much of their time resting, usually head down on a

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vertical twig, with the body projecting from the twig at about a right angle– thus resembling a small twig. They apparently cannot fly off directly from a resting position, but warm up for several minutes, vibrating their wings. The adults of some species develop some color in the wings a few days after emergence.

This family has 3 subfamilies, Haplogleninae, Ascalaphinae, and Albardiinae with only one species: *Albardia furcata*, which is a single, very rare, large-sized Brazilian species. Two-thirds of the approximately 450 described species in the Ascalaphidae have been placed in the subfamily Ascalaphinae. The remaining approximately 90 species have been placed in the subfamily Haplogleniinae. Haplogleniine owlflies are easily differentiated from their ascalaphine counterparts by the absence of a (usually) distinct suture or sulcus that runs transversely across the eyes. Because haplogleniine (“entire-eyed”) owlflies lack this feature, they have been assumed to be a more ancestral group than the “split-eyed” ascalaphines, but that hypothesis has never been explicitly tested. While ascalaphine owlflies are distributed worldwide, extant haplogleniine owlflies have a less extensive distribution, being found primarily in the Neotropical, Afrotropical, and Palearctic biogeographical regions, but not in Australia or Europe (there is a one exception). A single species, *Ascaloptynx appendiculata* (Fabricius), is commonly found in the United States. Relatively little is known about the ecology or biology of the haplogleniines, and existing “knowledge” has been extrapolated from descriptions of just a few species that likely do not represent all members of the group.

The taxonomy of the group is in need of major revision. There are 6 species, in two genera, in North America, four species in two genera in Florida: *Ascaloptynx appendiculatus* (Fabricius), 1793:96 (as *Ascalaphus*), *Ululodes floridana* (Banks) 1906a:99 (as *Suhpalasca*), *Ululodes macleayana* (Guilding) 1825:140 (as *Ascalaphus*), and *Ululodes quadrimaculatus* (Say) 1824:305 (as *Ascalaphus*).



Front wing of an owlfly.

LITERATURE-BASED KEY Subfamilies of Adult ASCALAPHIDAE

1. Sturdy thorax, large compound eyes that meet on the midline above the hairy head, and long, knobbed (clubbed) antennae which is as long as the body. Their wings bear many cross veins along the front margin2
- 1.a. Short clubbed antennae, typical reticulate ascalaphid wing venation.Albardiinae
2. Compound eyes divided dorso-ventrally by a transverse furrowAscalaphinae
- 2.a. Compound eyes not divided Haplogleniinae

LITERATURE-BASED KEY TO FLORIDA SPECIES OF ASCALAPHIDAE

Ascaloptynx Banks, 1915 (only one species reported from Florida) and *Ululodes* sp. Currie in Smith, (1900) 1899 (3 species reported from Florida).

1. Short clubbed antennae, eyes entire, not divided by a transverse sulcus; wing petiolate, forewing with appendiculate projection on posterior margin near base; hind wing never incised in anal area; forewing length 32-44 mm. Larva with small tubercles anterior to the main scoli on abdominal segments III-IV. Body length circa 38 mm. Wingspan circa 70 mm. Leading edge of each wing has dark stripe of pigment--apparently distinctive.*Ascaloptynx apendiculatus* (Fabricius)
- 1.a. Short clubbed antennae, compound eyes divided dorsoventrally by a transverse furrow.. Wings not appendiculate; forewing length 20-33 mm (*Ululodes*).2
2. Both pair of wings with pterostigmas, or at least the veinlets of the stigmas3
- 2.a. Both pair of wings with apparent pterostigmas, very clear. Forewing length 20-25 mm.*floridana* (Banks)
3. Pterostigmas dark brown to black; hind wings never notched in posterior basal region, forewing length 25-28 mm *macleayana* (Guilding)
- 3.a. Pterostigmas white or cream colored; hind wings of males with a wide notch at the posterior basal region. Hind wings of female not notched, but often maculate; forewing length 28-33 mm..... *quadrimaculatus* (Say)

TAXONOMY/PICTURES OF FLORIDA SPECIES OF ASCALAPHIDAE

ASCALAPHIDAE: HAPLOGLENINAE: *Ascaloptynx appendiculatus* (Fabricius)
1793:96 (as *Ascalaphus*).

Holotype female, Carolina, U.S.A. (BMNH). =*Ptynx juvenilis* McLachlan 1891:509.

Type(s) (sex unknown), Texas, Belfrage (BMNH). =*Ptynx furciger* McLachlan 1891:509.

Five syntypes, Arizona, Morrison (BMNH).

DISTRIBUTION: MEXICO. USA: AL, AR, AZ, FL, GA, MS, OK, TN, TX, SC, VA.

FLORIDA COUNTIES: Alachua; Dade; Duval; Liberty; Monroe; Putnam.

There is considerable sexual dimorphism in many ascalaphids. Generally, females have relatively fat abdomens, at least when they are gravid and before they have laid their eggs.



Owlfly - *Ascaloptynx appendiculata* (Fabricius)

University of Florida Entomology and Nematology - ENY 6166 Insect Classification
Summer 2009 -For Dr. P. M. Choate, By: Gloria Trujillo

ASCALAPHIDAE: ASCALAPHINAE: *Ululodes quadrimaculatus* (Say) 1824:305 (as *Ascalaphus*).

Holotype female, Pennsylvania (MCZ).

=*Ascalaphus quadripunctatus* Burmeister 1839:1001.(after Weele 1908:247).

Type female, New York (MCZ).

=*Colobopterus excisus* Hagen 1887:153.

Holotype male, Florida, 1862, Uhler (MCZ).

=*Ulula albifrons* Banks 1901:172 (after Weele 1908:109).

Two syntype females, Phoenix, Arizona, 20.IX., Kunze (MCZ).

DISTRIBUTION: AL, AR, AZ, DE, FL, IA, IL, KY, LA, MD, MI, MS, NE, OH, OK, SC, TN, TX, VA, WV.

FLORIDA COUNTIES: Okaloosa; Santa Rosa; Taylor.

Brief description: In *U. quadrimaculatus*, at least, apparently only hindwings of the male are stalked. All four wings of female unstalked. In *U. quadrimaculatus*, the dorsal hair tuft on the abdomen and the "excavated" area at the base of the hind wing are diagnostic for the male. Many females have dark pigmented areas near the end of the hind wing, but many females lack this pigmentation, so it is not diagnostic. Generally in this species too, the forewing pterostigma is pale and the hind wing pterostigma is dark, though this character also shows some variation and can not be absolutely relied upon. Male has prominent tuft of black bristles on top of abdomen, near base. The Four-spotted Owlfly
Size: Aprox. 40mm. If it has Robust abdomen and bold spots is a female. The resting position is head down, abdomen protruded at about 45 degree angle, on barren twigs. The insects may be mistaken for short twigs by the casual observer. In this position, the wings are held against the substrate.



Female: *Ululodes quadrimaculatus* - ♀



University of Florida Entomology and Nematology - ENY 6166 Insect Classification
Summer 2009 -For Dr. P. M. Choate, By: Gloria Trujillo

Owlfly - *Ululodes quadrimaculatus* - ♂



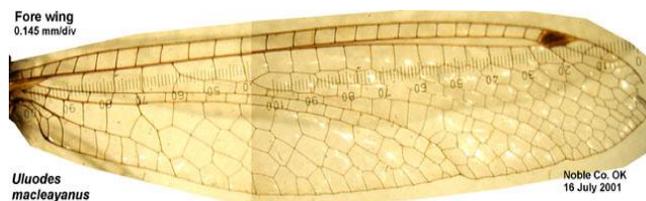
ASCALAPHIDAE: ASCALAPHINAE: *Ululodes macleayana* (Guilding) 1825:140 (as *Ascalaphus*).

Holotype male, Saint-Vincent, Antilles, VI.1824, Guilding (BMNH).

DISTRIBUTION: CARIBBEAN ISLANDS. USA: AL, AR, FL, GA, LA, MS, NC, OK, SC, NJ; TX.

FLORIDA COUNTIES: Alachua; Dade; Escambia; Gulf; Dixie; Hamilton; Highlands; Lake; Lee; Leon; Levy; Marion; Monroe; Okaloosa; Santa Rosa.

Brief description/pictures: This species has wings that are proportionately narrower than *U. quadrimaculatus*. Males with abdominal tufts and slender body



Ululodes macleayanus - ♂



ASCALAPHIDAE: ASCALAPHINAE: *Ululodes floridana* (Banks) 1906a:99 (as *Suhalasca*).

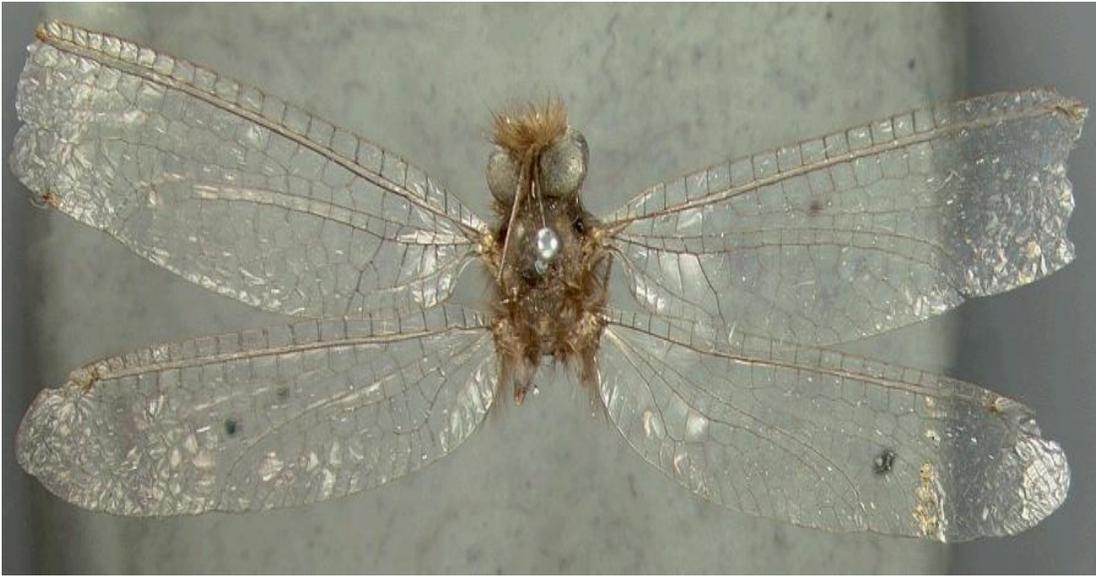
Holotype male, southern Florida (MCZ).

DISTRIBUTION: USA: FL, GA, SC.

FLORIDA COUNTIES: Alachua; Citrus; Dade; Highlands; Levy; Monroe.

Pictures: Eyes divided.





Ululodes floridana Banks, 1906

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Summer 2009 -For Dr. P. M. Choate, By: Gloria Trujillo**

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