

thoughtful men. How did this remarkable system originate? Does this meteorite have any thing to say in answer to this question? The oldest meteorites are as old as the earth, and the earth is as old as the Solar System, hence the events that formed one must have formed all. Planets, many of the meteorites, and perhaps other members of the Solar System are products of one great cataclysm. What forces brought about this cataclysm? At present no definite answer can be given to this question, but undoubtedly they were of such nature that small bodies as well as large were formed, meteorites as well as worlds. Perhaps the best guess that can be made today is found in the Planetesimal Hypothesis. What of tomorrow? Who knows what revelations this meteorite will make when its language is better known?



The HesperIIDae of Dallas County, Texas

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Little is known concerning the HesperIIDae of the Southwest. In Texas, various early naturalists made extensive collections of insects, but none specialized on Lepidoptera. Among those who collected Lepidoptera in Texas are Jacob Boll, an early naturalist, and Dr. Eugene Murray-Aaron of Chicago and his brother. Dr. Murray-Aaron's findings were published in *Papillo*, volume 4, 1886, and Jacob Boll's in "*Preis-Verzeichniss uber Naturalien gesammelt 1875 in Texas von Herrn J. Boll.*"

This family of butterflies is significant in the interpretation of the phylogeny of the Rhopalocera and the Heterocera. Certain morphological characters of the HesperIIDae—shape of the antennae, and pronounced development of tibial spines and tongue—closely resemble the structural features of the sphingids. They are also stout-bodied, with large heads and prominent eyes, and have hooked or pointed antennae placed wide apart at their bases. The labial palpi are short, thick and hairy, giving a clumsy appearance. In

resting insects, the lower wings are often spread horizontally, while the anterior pair are raised nearly vertically above the back. In coloration (with the exception of some tropical species) they are usually plain, with tawny-yellow, brown and black predominating. One genus, *Goniurus*, bears swallow tails. The flight of these insects, with few exceptions, is rapid, and the distance covered relatively short. The characteristic jerking manner in which they fly, darting about from place to place, has given this group the common name of "skippers." Most species frequent flowers, and the blossoms of dewberry (*Rubus trivialis*), roadside aster (*Aster* sp.), redbud (*Cersis canadensis*), clover (*Trifolium* sp.), and various other shrubs and herbs usually swarm with them.

The feeding habits, and the occurrence and distribution of this group in the Southwest are little known; perhaps less than about any other family of butterflies. Specific identification of the group is difficult, especially in the genus *Erynnis*. Only when it is possible to breed and raise specimens of this genus will questions concerning the validity of certain species be settled.

The usual methods of collecting Lepidoptera were employed. When the butterfly was safely in the net, the thoracic region was gently pressed by thumb and forefinger, thus stunning the insect; it was then placed in a cellophane envelope, and afterwards this envelope placed in a large cyanide jar. Specimens were then expanded on a drying board, and when properly dry, given locality-labels. Difficult species were determined by Dr. Eugene Murray-Aaron of Chicago or by Mr. J. F. G. Clarke of the United States National Museum, Washington, D. C.

This survey extended from September, 1936, to June, 1937, and from September, 1937, through April, 1938. As many diverse habitats as Dallas County affords were studied, and field-notes on habits, habitat, "flower preference," and seasonal distribution were taken.

The best habitat for fall collecting in the Dallas vicinity was found to be an uncultivated field, one and a half miles northeast of Vickery. On the west, parallel with the field,

was a twelve-foot railroad embankment, and on the north and east a wooded area; this locality, therefore was protected somewhat from heavy winds so frequent in this region. False purple thistle (*Eryngium leavenworthii*), broomweed (*Amphiachyris dracunculoides*) and giant ragweed (*Ambrosia trifida*) bloomed in profusion. The most favorable habitat for spring collecting was an open field, located about three miles north of the campus of Southern Methodist University, and protected by woods on the south and east. As the wind is prevailingly from the south in the spring, the woods afforded a windbreak for the skippers. They fed on the blossoms of redbud and dewberry, which grew abundantly. Collecting in this habitat was more profitable during the early spring of 1938 than during the same period of 1937. The earlier periods of warm weather of 1938 probably account for the greater abundance of species and individuals.

List of Species*

SUB-FAMILY URBANINAE

467. *Epargyreus tityrus* (Fabr.)

Distribution.—Not common in Dallas vicinity. Ranges from Canada to the Isthmus of Panama.

Habits.—Strong rapid, irregular, low flight. Attracted to butterflyweed (*Asclepias tuberosa*), lilac (*Syringa* sp.) and clover. Wings held parallel above back. Frequently nocturnal.

469. *Goniurus proteus* (L.)

Distribution.—Not common in Dallas region. Chiefly tropical in range although it has ranged northeast to New York City.

Habits.—Peculiar hovering, erratic flight, very rapid followed by slow movements. Found in butterfly bush (*Poinciana gilliesii*) and *Pblox*.

479. *Achalarus lyciades* (Gey.)

Distribution.—Rare in this locality. Found chiefly in Middle and South Atlantic states.

*Classification and catalogue numbers are taken from "Check List of the Diurnal Lepidoptera of Boreal America", by Wm. Barnes and F. H. Benjamin. Acknowledgements are due Associate Professor E. P. Cheatum, under whose direction the investigations were made; Associate Professor W. M. Longnecker for identifications of host plants; Professor S. W. Geiser for suggestions and critical reading of the manuscript. Thanks also are due Dr. Eugene Murray-Aaron, Research Associate, Division of Entomology, Field Museum of Natural History; Mr. J. F. Gates Clarke of the Bureau of Entomology and Plant Quarantine, United States National Museum; Mr. F. M. Brown, Director of the Colorado Biological Survey, all of whom have given valuable aid in identification, distribution and technique.

Habits.—Direct, rapid flight, near the ground. Clover as well as cultivated plants (*Zinia* and *Pblox*) attract this species.

486. *Thorybes pylades* (Scud.)

Distribution.—Common in Dallas County. Ranges over the entire United States.

Habits.—A strong, rapid flyer, keeping usually near the ground. Attracted to dewberry, redbud and wild plum (*Prunus* sp.).

487. *Thorybes daunus* (Cram.)

Distribution.—Abundant in Dallas vicinity during late May and early June. Ranges from Connecticut southward along the Atlantic coast and westward into Texas.

Habits.—Similar to the preceding species. Abundant in open woods where redbud and wild plum are in bloom.

490. *Thorybes confusus* (Bell)

Distribution.—Rare in Dallas County. Range confined to southern states.

Habits.—Rapid flyer. The only specimen collected was feeding on redbud.

501. *Urbanus syrichtus* (Fabr.)

Distribution.—Abundant in this species from the Dallas region in 1875. Abundant around Monterrey, N. L., Mexico.

Habits.—Rapid flyer, usually remaining near ground surface.

503. *Urbanus tessellata* (Scud.)

Distribution.—Abundant in this locality. Ranges from Canada to the Gulf, and from the Atlantic westward.

Habits.—Males fly swiftly and directly from flower to flower; females less active. Attracted to many flowers; frequents wet places.

513. *Pholisora catullus* (Fabr.)

Distribution.—Rather common in this locality. Ranges throughout the whole of temperate North America.

Habits.—Quick in its movements, somewhat pugnacious toward other butterflies. Visits dewberry, butterfly bush and *Pblox*.

516. *Pholisora bayburstii* (Edw.)

Distribution.—Not abundant around Dallas but common over most of the Gulf states.

Habits.—Not as rapid on the wing as *P. catullus* (Fabr.). Roadside aster, *Pblox*, and dewberry are the flowers most often visited.

524. *Erynnis brizo* (Bdv. & Lec.)

Distribution.—Rare in this locality. Occurs generally distributed throughout the United States from Canada to the Gulf of Mexico and from the Atlantic to the Pacific.

Habits.—Very active on the wing, flying from side to side in sudden, jerky movements. Attracted to false garlic, dewberry and redbud.

528. *Erynnis persius* (Scud.)

Distribution.—Rare in Dallas County. Ranges from New England to Georgia, and westward as far as the Rocky Mountains.

Habits.—Restless on the wing; flying swiftly, especially when disturbed. Unlike most *Erynnis*, this species favors open meadows for its flights.

531. *Erynnis juvenalis* (Fabr.)

Distribution.—This is the most common species of the genus in the Dallas Region. Ranges from Quebec to Florida and westward as far as Arizona and California.

Habits.—Very active in spring; quick to fly at other butterflies. Less active in the fall. Redbud, asters, false garlic, dewberry and giant ragweed are excellent host plants.

533. *Erynnis boratius* (Scud. & Burg.)

Distribution.—Not common in Dallas County. Ranges from New England to Florida and westward.

Habits.—Rapid flyer, travels in a zigzag manner, darting from flower to flower. Frequents open meadows instead of woods.

538. *Erynnis tristis* (Bdv.)

Distribution.—Common in the spring months. Previously reported only from western Texas, Arizona and southern California.

539. *Erynnis funeralis* (Scud. & Burg.)

Distribution.—Common in the spring months. Previously reported only from western Texas, Arizona and southern California.

Habits.—Bold, erratic and swift in flight. The narrow forewings and white fringed hind wings makes recognition easy. Attracted to redbud.

SUB-FAMILY HESPERIINAE

546. *Ancyloxypha numitor* (Fabr.)

Distribution.—Occurs abundantly during late summer and early fall in the Dallas region. Ranges from Quebec to eastern Florida, and westward to the Rocky Mountains.

Habits.—The flight is feeble, perhaps the least powerful of any North American Hesperid. Usually found resting or flying over marsh grasses.

552. *Copaodes aurantiaca* (Hew.)

Distribution.—Common in Dallas County, during September and October. Ranges from northern Texas and Arkansas westward to southern California.

Habits.—Males are more active than females. Roadside aster, butterfly bush and *Abelia* are flowers often frequented.

553. *Copaodes minima* (Edw.)

Distribution.—Abundant around Dallas during September, October and early November. Ranges from Florida to Arizona and southward into Mexico.

Habits.—Similar to *C. aurantiaca* (Hew.). Rests frequently on blades of grass; flies short distances and returns to original spot of departure.

582. *Hylephila phylaenus* (Dru.)

Distribution.—Common in this region. Ranges from Connecticut to Patagonia and to the Pacific.

Habits.—Rapid, zigzag flight. Attracted to *Phlox*, butterfly bush, *Abelia* and false purple thistle (*Eryngium leavenworthii*).

588. *Polites verna* (Edw.)

Distribution.—Rare; only one specimen collected. Ranges from New England to Virginia, west to Colorado, and north to Alberta.

Habits.—Rapid flyer, and feeds on false purple thistle (*Eryngium*).

590. *Polites themistocles* (Latr.)

Distribution.—Abundant. Ranges from Canada to the Gulf of Mexico; and from the Atlantic to New Mexico and the Dakotas.

Habits.—Rapid on the wing; feeds on the flowers of false purple thistle, giant ragweed and roadside aster.

599. *Atalopedes campestris* (Bdv.)

Distribution.—Very common. Ranges from New York to Florida and from the Atlantic to the Pacific.

Habits.—Flight, irregular and bold, darting from one flower to another. Attracted to many flowers.

600. *Catia otbo* (A. & S.)

Distribution.—Common during September. Ranges from southern Canada to the Bahamas and westward to the Rocky Mountains.

Habits.—Retiring; flight short and low. Attracted to false purple thistle and a few other flowers.

603. *Atrytone logan* (Edw.)

Distribution.—Rather common during September. Ranges from southern New England south to Florida and west to Wyoming, Montana and Texas.

Habits.—Rapid, low flight. City gardens are the best collecting places for this species.

604. *Atrytone arogos* (Bdv. & Lec.)

Jacob Boll (1875) lists this species from Dallas County although it has been taken by writer.

605. *Atrytone vestris* (Bdv.)

Distribution.—Not common near Dallas. Ranges from Quebec to Florida and westward to the Pacific.

Habits.—Rapid flight; attracted to giant ragweed, false purple thistle and broom weed.

612. *Poanes viator* (Edw.)

Distribution.—Rare in this section. Ranges over most of the Gulf States.

Habits.—Rapid flyer; feeds on *Eryngium*.

615. *Poanes zabulon* (Bdv. & Lec.)

Distribution.—Not common around Dallas. Ranges widely over the Atlantic states.

Habits.—Males show a pugnacious attitude, whereas, the females are retiring. Attracted to giant ragweed and false purple thistle.

631. *Amblyscirtes vialis* (Edw.)

Distribution.—Not common around Dallas. Occurs more frequently in the Atlantic states; it ranges westward to Texas and Nevada.

Habits.—Swift on wing; alights near or on the ground, close to such flowers as *Forsythia*, roadside aster and *Abelia*.

633. *Amblyscirtes celia* Skin.

Distribution.—Very rare in Dallas County. Normal range central and western Texas.

Habits.—Rapid flyer, remaining three or four inches from the ground. Roadside aster and *Forsythia* serve as host plants

637. *Amblyscirtes comus* (Edw.)

Distribution.—Rare in the vicinity of Dallas. Ranges over Texas and Arizona.

Habits.—Cautious, flying rapidly at the slightest disturbance. Can be collected on false garlic and *Forsythia*.

648. *Lerema accius* (A. & S.)

Distribution.—Not common in this region. Ranges from Connecticut to Florida, westward to Texas.

Habits.—The flight of this skipper is rapid. Feeds upon giant ragweed and false purple thistle.

650. *Lerodea eufala* (Edw.)

Distribution.—Very common. Ranges from Arkansas southward over all the Gulf states.

Habits.—Very rapid on the wing. Feeds upon a host of flowers such as *Zinnia*, *Pblox*, *Abelia*, roadside aster, butterfly weed, butterfly bush, false purple thistle, giant ragweed and broom weed.

653. *Calpodex etblius* (Cram.)

Distribution.—Not common around Dallas. Ranges over the Gulf states, and as far north as South Carolina.

Habits.—Flies rapidly, and usually in a straight line. Frequents such flowers as *Petunia*, *Pblox* and *Canna*. Of economic importance, since the larvae destroys the leaves of the *Canna*.

SUB-FAMILY MEGATHYMINAE

660. *Megathymus yuccae* (Bdv. & Lec.) variety (?)

Distribution.—Very rare around Dallas. Ranges from Colorado southward into Texas and Arizona. Range not very clearly known.

Habits.—Rapid flight; alights with wings held downward. Individuals seen in this locality were flying around redbud bushes late in the afternoon.

Some systematists have placed this sub-family of *Hesperiidae* with a family of diurnal moths, the *Castniidae*. Anatomical and morphological study of the structure

of the antennae, neuration of the wings and the tibial spines on the second and third pair of legs, clearly associates this group with the other subfamilies of the *Hesperiidae*; and in the light of such evidence it seems logical to include this group in the family *Hesperiidae*.

Summary

1. Thirty-six species representing twenty-one genera have been collected during this study, which extends from September, 1936, to the middle of April, 1938, excluding June, July and August of 1937.

2. The following species appear to be recorded from Texas for the first time: *Erynnis persius* (Scud.), *Polites verna* (Edw.), and *Megathymus yuccae* (Bdv. & Lec.) variety (?).

3. The following species are recorded from the vicinity of Dallas for the first time: *Goniurus proteus* (L.), *Erynnis persius* (Scud.), *Erynnis funeralis* (Scud. & Berg.), *Copaeodes aurantiaca* (Hew.), *Copaeodes minima* (Edw.), *Atrytone logan* (?) (Edw.), *Poanes viator* (Edw.), *Amblyscirtes celia* Skin., *Amblyscirtes comus* (Edw.), *Lerema accius* (A. & S.), *Calpododes ethlius* (Cram.), and *Megathymus yuccae* (Bdv. & Lec.) variety (?).

4. To the writer's knowledge field notes on the habits, habitats, and flower "preferences" of the following species are herein reported for the first time: *Erynnis funeralis* (Scud. & Burg.), *Copaeodes aurantiaca* (Hew.), *Copaeodes minima* (Edw.), *Amblyscirtes celia* Skin., *Amblyscirtes comus* (Edw.), *Lerema accius* (A. & S.) and *Lerodea eufala* (Edw.).

5. During the spring, the most common species was *Atalopedes campestris* (Bdv.); during the fall, *Lerodea eufala* (Edw.) predominated.

6. The species least abundant in this locality were *Megathymus yuccae* (Bdv. & Lec.) variety (?), and *Goniurus proteus* (L.).

7. Only one species of any economic importance was found, *Calpododes ethlius* (Cram.), the larvae of which feed on *Canna*. It was not found abundantly in Dallas County, however.

8. Open meadows appear to be the "preferred" habitat, with twenty-seven of the thirty-six species collected in such places.

9. The flower "preferences" of the skippers during the spring were the dewberry (*Rubus trivialis*) and redbud (*Cercia canadensis*); while during the fall, the most frequented plant species was false purple thistle (*Eryngium leavenworthii*) and *Abelia* sp.

10. There was no significant difference in the numbers of species found during spring and fall.

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