THE LARGE-WINGED MITES OF FLORIDA

Arthur Paul Jacot

(Continued from page 31)

In determining the commonest species, the frequency of occurrence, that is the number of lots in which a species occurs, is used instead of the number of individuals because these animals tend to be colonial. For instance one lot has 115 individuals of one species. This also is in accord with experience in other groups. The commonest species are *Zetes elimatus louisianae*, *Galumna flagelliferum*, *G. curvum*, and *Z. weberi*, then follow, in order of frequency, *Z. minutus*, *Holokalumna coloradensis*, *Parakalumna robustum*. The others are local. Thus there is no outstandingly abundant species as in the Phthiracaridae (11). *Zetes* has by far the largest number of species—in the litter.

Of the forty-three lots, only thirteen yield three or more species. Lot G75, which was a rich lot for Phthiracarids, contains the largest number of species of Galumninae (seven), namely, *Protokalumna depressum*, *Parakalumna robustum*, *Zetes elimatus louisianae*, *Z. minutus*, *Holokalumna coloradensis*, *Galumna flagelliferum*, and *G. curvum*. Lot G115 (Wellborn) yielded the same species except that *Z. weberi* replaces *Z. elimatus*, and *P. depressum* is absent. *P. robustum* drops out to the southward.

By contrast, nine species (five of them found about Gainesville) have been taken from one locality in Connecticut.

Sixteen lots secured by Prof. J. R. Watson between December 1928 and March 1930, chiefly from the Gainesville region give the following occurrences:

1. *P. robustum*........................................ 11 (4) and two indiv. from Crystal R.
2. *P. robustum floridanum*............................. 1 (1)
3. *Z. eliminatus louisianae*............................ 4 (3) and one indiv. from Royal Palm
4. *Z. emarginatus*....................................... 1 (1) and three from Worthington
5. *Z. banksi*.............................................. 1 (1) and two other collectors!
6. *H. coloradensis*..................................... 3 (2)
7. *G. luceatum octopunctatum*.......................... 31 (5)
8. *G. flagelliferum*.................................... 4 (3)

It is interesting to note how these few additional lots yield two new records to the state list, even though 27 lots had already been secured from this locality (Gainesville region). This is
due to collecting from different niches, as on tree trunks and tree boles.

Finally, the twentieth species *Holokalumma floridale* was obtained from Cocoa, and the twenty-first *Zetes bradleyi* from near Tarpon Springs.

**ECOLOGICAL DATA**

None of the more severe habitats harbored Galumninae, thus they are not as resistant as *Pseudotritia arida*. There seems to be some habitat preference. For example *Zetes weberi* is associated with fallen live oak leaves and also long-leaf pine. As usual, dry pine and spruce litter is rather barren, except that *H. lyricum*, the longest bristled species, was found in this habitat. *Z. elimatus louisianae* and *Holokalumma coloradensis* seem to prefer drier habitats. *G. curvum* was found on a magnolia tree bole, so that again it shows a tendency to ascend vegetation. On the whole the species of this subfamily are more abundant on oak and long-leaf pine land. In one case (lot G67) shore bay debris yielded five species.

*Protokalumma depressum* x *pterotum*, only found in the horticultural grounds at Gainesville, is either a recent introduction or the offspring of two individuals introduced with plants. I have noted no other such hybrids from further north where both species occupy the same territory.

Collections from other habitats may yield other species. Compare Watson's lots with Grossman's.

**GEOGRAPHICAL DISTRIBUTION**

The distribution of the different species may be visualized by means of the following table:

1. *Protokalumma depressum* x ........................ Gainsville, hort. grounds
2. *Parakalumma robustum* ............................. w. Fla. to Tarpon Springs and White City

3. *P. robustum floridanum* ............................. n. peninsular
4. *Zetes macroptera matecumbei* .................. Key Largo, Lower Matecumbe
5. *Z. elegans* ........................................... Bradenton, Dunedin
6. *Z. bradleyi* .......................................... near Tarpon Springs
9. *Z. elimatus louisianae* ............................. peninsular, except a. tip
10. *Z. weberi* ........................................... all Fla.
11. *Z. weberi plumulae* .............................. Astor, Mulberry
12. *Z. minutus* .......................................... w. Fla. to Vero Beach
13. *Z. banksi* .......................................... Gainesville (probably n. Fla.)
14. *Holokalluma coloradensis* ............... w. Fla. to Vero Beach and Miami
15. *H. lyriceum* ........................................ Campville, Tarpon Springs
16. *H. floridus* ........................................ Cocoa
17. *Galumna lanceatum octopunctatum* Gainesville
18. *G. altum hispidum* .............................. Fort White, Gainesville
19. *G. curvum* ............................................. peninsular, s. to Fort Lauderdale
20. *G. flagelliferum* ..................................... peninsular
21. *G. flagelliferum circulum* .................... Cortez, Vero Beach, Miami

This distribution contrasts markedly with that of the Phthiracaridae (11). There are some very much localized species. All of the species, as far as can be judged from the present data, have come in from the north and west and spread chiefly down the east coast. For instance *Z. minutus* and *H. coloradensis* are not yet reported from the west coast. This was also the case with the abundant and ubiquitous *Pseudotritia ardua sinensis*. Thus, as in the Phthiracaridae, the chief element governing distribution within the state, seems to be physiographic.

To further check up on this factor, an analysis of the distribution of the passerine birds of Florida was made (8). The passerine birds were chosen as better known and less interfered with by man. Two distinct types of distribution were found: (1) tension zone of two subspecies, (2) southern limit of northern birds.

A species occupying the whole state often breaks into two subspecies between the Apalachicola and the Aucilla rivers. The Pine-woods Sparrow, Towhee, Cardinal and Crow stop at the Aucilla. On the other hand some of the peninsular species follow along the coast to Apalachicola, as the Boat-tailed Grackle, Florida Redwing and Florida Wren.

Northern species range south to the borders of the Lower Austral, that is to the middle of the peninsula. Those which extend to the center of the peninsula are the Acadian Flycatcher, Rough-winged Swallow, Southern Blue Jay, Chickadee, White-breasted Nuthatch, Catbird, Brown Thrasher, Yellow-throated Vireo, Red-eyed Vireo, Prothonotary Warbler, Parula Warbler, Blue Grosbeak, Towhee, Lecont’s Sparrow, Henslow’s Sparrow, Sharp-tailed Sparrow, Field Sparrow, Swamp Sparrow and Song Sparrow. This distribution is significant because it applies to many of the overwintering sparrows as well as to so many of the nesting birds. This midpeninsular boundary fluctuates with the species but it usually cuts diagonally across from northwest to southeast as in figures 41, 44, 47, 57, 58, and 60 (8). This
is the same avoidance of the west coast, and trend toward the
east coast, as was observed in the Galumninae.

At least one botanist (17) divides the peninsula across the
center (without mentioning definite boundaries or citing data).

The only clue to this distributional pattern was found in con-
nection with the distribution of craneflies (16, p. 27, last ¶). Refer-
tence to the phytogeographic map (17, p. 69) shows the
trend of hardwoods to be along northern Florida to the Alapaha
branch of the Suwannee River. Here this hardwood belt trends
southeastward. A glance at the state soil map (7) also brings
out this southeastward trend. The hammock land adjacent to
Bradenton also explains the larger number of Oribatoidea found
at this locality. Diptera were found to be much more abundant
in these hammocks and in the swamp woods than along the
coasts (15, p. 39, last ¶).

To summarize: the distribution of certain groups of animals
within the state seems to be largely dependent on the trend of
vegetation types which in turn are dependent upon physiography
and soil types.

The Florida species of Galumninae extend into the following
life zones: endemics (at least temporarily): Parakalumma robustum floridanum, Z. macroptera matucumbe, Zetes elegan-
tulus, Z. bradleyi, Z. emarginatus laevis, Z. weber, Z. weberi
plumalae, Holokalumma lyricum, H. floridae, G. alatum hispidum,
G. flagelliferum circulum (eleven); lower austral: Z. elimatus
louisianae, Z. banksi; upper austral: Z. minutus, H. coloradensis,
G. flagelliferum (three); transitional: Protokalumma depre-
ssum, Parakalumma robustum, Z. emarginatus, G. lanceatum
octopunctatum, G. curvum (five).

Eight hundred species of Florida diptera (15), 117 species
of Odonata (3), and 128 species of Craneflies of northern Flori-
da (16) were found to have the following life zone ratios:

<table>
<thead>
<tr>
<th></th>
<th>Diptera</th>
<th>Odonata</th>
<th>Craneflies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endemics</td>
<td>15%</td>
<td>17%</td>
<td>19%</td>
</tr>
<tr>
<td>Lower austral</td>
<td>12%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper austral</td>
<td>35%</td>
<td>67%</td>
<td>(Indiana)</td>
</tr>
<tr>
<td>Transitional</td>
<td>20%</td>
<td>35%</td>
<td>(Conn.)</td>
</tr>
<tr>
<td>Tropical</td>
<td>15%</td>
<td>23%</td>
<td>9%</td>
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<tr>
<td>Mex. and s. Calif.</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cosmopolitan</td>
<td></td>
<td></td>
<td>14%</td>
</tr>
</tbody>
</table>

Thus the enormously high ratio of endemic Galumninae seems
to be due to lack of knowledge of the distribution of these species
in the other southern states.
LITERATURE CITED


8. HOWELL, ARTHUR HOLMES, 1932, Florida Bird Life, N. Y., 579 pp., 58 pls., 72 txt. figs.


