Spider communities of Isla Santa Cruz (Galápagos, Ecuador)

LÉON BAERT, KONJEV DESENDER and JEAN-PIERRE MAELFAIT
Koninklijk Belgisch Instituut voor Natuurwetenschappen, Vautierstraat 29, B-1040 Brussels, Belgium

Abstract. The various vegetation zones of the central Galápaganoan island, Santa Cruz, have been sampled for spiders on three occasions, in 1982, 1986 and 1988. This paper deals with the synecological analyses (DECORANA, TWINSPAN) of the spider composition of the different vegetation zones of the island. There is an important variation in the composition of the spider communities of Santa Cruz coinciding mainly with altitudinal variation. As for plants, this relationship is different for the northern as compared to the southern side. Only on the southern slope are there agricultural activities and human settlements. Although this has led to an increase in the spider faunal diversity, the balance for nature conservation has clearly to be interpreted as negative.

Key words. Galápagos, Araneae, spider communities.

INTRODUCTION

In 1982 we started sampling campaigns in the Galápagos archipelago. The islands were visited on three occasions: 1982, 1986 and 1988 (Baert & Maelfait, 1986b; Baert, Maelfait and Desender, 1989a), during the warm/wet season, in the months of February, March and April. All major islands and volcanoes were sampled along an altitudinal gradient.

This study was started not only to have an idea of the spider species composition of the various islands belonging to that archipelago, but was also carried out in such a way that we could use the collected data for biogeographical and ecological analyses. At the start of this investigation, only a general list of the spiders of Galápagos was available (Roth & Craig, 1970).

From the material collected during our sampling campaigns, and after examination of nearly all existing collections made recently or in the past and deposited in various Institutions, we were able to discern 103 spider species, eighty of which are described in the literature. Of these eighty species, forty-six (58%) are known only from Galápagos, and a good deal of these are probably true endemics, although the spider fauna of the Central and Southern American mainland is far from well known. Some twenty-three species are still to be identified or described, a difficult and time-consuming task due to the lack of general revisions for most spider families and the lack of good descriptions and adequate drawings of the known neotropical species.

To start an ecological analysis of the spider fauna of the archipelago, we concentrated our efforts, in the first place, upon the centrally located island of Santa Cruz, as 76% of the total amount of spider species (seventy-eight species described or not) of the Galápagos occur on this island.

In general, six major vegetation zones can be discerned on the higher islands (exceeding an altitude of 500 m) of Galápagos. Those zones are all present and very clearly delimited on Santa Cruz, with its 875 m of elevation and its privileged position within the global climatological system of the archipelago. Moreover, on this island, we have been able to sample different altitudinal gradients, including more or less complete transects on the southern as well as the northern slope, and this on several occasions.

The spider species richness of the island may be explained by the existence of these fairly well-developed and clearly bound vegetation zones, along with its moderately old age (within the 0.7–1.5 x 10^7 years range) as compared to, for example, the much younger more western and northern islands (Simkin, 1984).

MATERIALS AND METHODS

Study area: Isla Santa Cruz

There is, on Santa Cruz, a definite increase in precipitation with altitude due to the highlands intercepting the cloud-carried moisture. Rainfall in the arid lowlands ranges between 0 and 300 mm annually, while in the highlands the range is between 300 and 1700 mm (Jackson, 1987). The climate also becomes cooler and more cloudy with increasing altitude. There is therefore a gradient or zonation, in plant communities. The altitudes reached by the various vegetation zones on the northern and southern slopes differ according to a different rainfall regime, the southern slope receiving more precipitation due to prevailing winds from the southeast. The following vegetation zones can be distinguished:

1. The Littoral Coastal Zone: a very small evergreen zone beginning at the seashore and reaching some metres
inland; directly influenced by salt. In this zone we find salt-marches, lagoons, mangroves, stands of Sesuvium, Spirobu-
lus–grasses and Cryptocarpus saltbushes.

2. The Arid Zone: a clearly xerophytic vegetation of spiny bushes, dominated by tree cacti (Opuntia, Jasmino-
cereus). This zone extends from the littoral zone up to approximately 80 m of altitude along the southern slope and up to 350 m of altitude along the northern slope of the island.

3. The Transition Zone: an evergreen zone composed of some xerophytic plants that have extended from the arid zone, intermingling with more mesophytic representatives of the moister Scalesia zone situated higher. Typical for this zone is the presence of epiphytes, lichens and bryophytes living on the trees. A well-developed understorey is present. This zone extends between 80 and 200 m of altitude along the southern slope, and between 350 and 500 m along the northern one.

4. The Scalesia Zone is characterized by the occurrence of the evergreen tree composite Scalesia. This zone extends between c. 200 m and 400 m of altitude along the southern slope, and can reach an altitude up to 600 m along the northern slope. On the inhabited islands, as Santa Cruz, this zone, as well as the previous one, are largely occupied by crop fields and pastures, and are called the culture zone. On Santa Cruz, the culture zone only occurs on the Southern slope.

5. The Miconia Zone: a vegetation belt almost exclusively composed of the evergreen bush Miconia. These shrubs are densely coated with epiphytes and can reach an upper limit of approximately 625 m according to the orientation of the slope; the zone is absent from the northern slope.

6. The Fern-Sedge Zone or Pampa. This vegetation belt is composed of perennial ferns, sedges and some herbs. Lycopodium and Sphagnum bogs may occur in very humid depressions. On higher altitudes (top zone) tree ferns grow. The lower limit is about 500 m of altitude in cleared areas, but it generally starts at about 600 m of elevation. This zone extends to the top.

For a schematic representation, and for more details on plant communities, we refer to Stewart (1911), Bowman (1961, 1963), Laruelle (1965), Wiggins & Porter (1971), Reeder & Riechert (1975), Hamann (1981) and Jackson (1987).

Methods

Forty different sites (Table 1, Fig. 1), distributed along a south/north altitudinal transect and spread over the different vegetation zones, were sampled in a standardized manner by means of handcatches (timed effort), pitfall trapping and sweeping. Sites were not however sampled at the same moment, but over the periods of three sampling campaigns (1982, 1986 and 1988). Furthermore, each sampling method yielded different data according to the vertical layer to which the sampling method fitted best (soil, soil surface, vegetation). The qualitative data obtained were pooled over the three years. An ordination technique (Detrended Correspondence Analysis or DCA), as well as a divisive classification technique (Two-Way IIndicator SSpecies ANA-
lysis or TWINSPLAN), were applied for the analysis of the data based on presence/absence of the species caught (sixty-three species). The programs DECORANA (Hill, 1979a) and TWINSPLAN (Hill, 1979b) were used as software.

Material


RESULTS AND DISCUSSION

Segregation of the sampling sites based on their spider fauna

The Detrended Correspondence Analysis (DCA) resulted in an ordination (Fig. 2) accounting for 63.4% of the total variation along the first and second axis together. The first axis can be interpreted as a gradient from low to high altitude, and consequently from dry to humid habitats (vegeta-
tion zones). The second axis separates natural against disturbed sites. The sites which are directly influenced by humans (sites located along southern slope, tourist sites, implantation sites of the CDRS) or by introduced animals (in this case the little fire ant, Wasmannia auropunctata), are situated under the horizontal axis of the ordination, while the more natural sites (sites located along the northern slope and highlands) are found above this axis. Although the amount of variation explained by the third axis (23.2%) approximates to the value of the second axis (26.2%), plotting the third axis against the first did not introduce new elements in our interpretations.

The classification of habitats of spiders, as interpreted from TWINSPLAN end groups, is given in Fig. 3, together with the characteristic species (indicator species given by TWINSPLAN indicated with a +) at each division.

The frequency of occurrence (number of localities) of the most important spider species in the eight habitat end groups as obtained and interpreted from the TWINSPLAN analysis are given in Table 2.

Eight end groups were recognized at the third division in the following dichotomous hierarchy (Fig. 3):

_Humid Habitats_ (end groups A, B, C and D): comprising the Transition, Culture, Scalesia, Miconia and Fern-Sedge zones (alt. > 140 m).

1. End group A: comprises the Fern-Sedge zone situated in the ‘Media Luna’ altiplano, a slightly ascending plain (between 600 and 700 m of altitude) south of Cerro Crocker. Indicator species are Neocautinella ochoei (species endemic to the archipelago) and Erigone atr (native species also occurring on the American mainland).

2. End group B: comprises the pampa zone on top of Cerro Crocker (825–875 m), the Scalesia and Miconia zones. Indicator species are Camillina galapagoensis, Calomysponia santacrucii and Olios galapagoensis as endemics and Scytodes hebraica sensu Roth, 1970 (probably a n.sp. according to pers. comm. Lehtinen).
<table>
<thead>
<tr>
<th>No.</th>
<th>Locality name</th>
<th>Zone specification</th>
<th>Altitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CDRS-buildings</td>
<td>Arid zone</td>
<td>S5m</td>
</tr>
<tr>
<td>2</td>
<td>CDRS</td>
<td>Littoral zone</td>
<td>S0m</td>
</tr>
<tr>
<td>3</td>
<td>CDRS-Barranco</td>
<td>Arid zone (semi-open dry deciduous forest)</td>
<td>S20m</td>
</tr>
<tr>
<td>4</td>
<td>Bahía Tortuga</td>
<td>Littoral zone</td>
<td>SW0-5m</td>
</tr>
<tr>
<td>5</td>
<td>Bahía Conway</td>
<td>Arid zone</td>
<td>NW0-2m</td>
</tr>
<tr>
<td>6</td>
<td>Bahía Tiburon</td>
<td>Littoral zone (laguna)</td>
<td>NW0-2m</td>
</tr>
<tr>
<td>7</td>
<td>Isla Venecia</td>
<td>Arid zone</td>
<td>NW2m</td>
</tr>
<tr>
<td>8</td>
<td>Caseta Occidente</td>
<td>Transition zone</td>
<td>SW170m</td>
</tr>
<tr>
<td>9</td>
<td>Caseta Tortuga</td>
<td>Transition zone with Scalesia</td>
<td>S150m</td>
</tr>
<tr>
<td>10</td>
<td>El Chato</td>
<td>Transition zone with Scalesia</td>
<td>SW190m</td>
</tr>
<tr>
<td>11</td>
<td>Southern slope</td>
<td>A.Z. (semi-open semi-dry deciduous forest)</td>
<td>S50m</td>
</tr>
<tr>
<td>12</td>
<td>Southern slope</td>
<td>Culture zone (forest)</td>
<td>S140m</td>
</tr>
<tr>
<td>13</td>
<td>Southern slope</td>
<td>Culture zone (open vegetation)</td>
<td>S230m</td>
</tr>
<tr>
<td>14</td>
<td>Southern slope</td>
<td>Culture zone (meadow)</td>
<td>S350m</td>
</tr>
<tr>
<td>15</td>
<td>Southern slope</td>
<td>C.Z. (meadow with Scalesia)</td>
<td>S500m</td>
</tr>
<tr>
<td>16</td>
<td>Los Gemelos</td>
<td>Scalesia-wood (left pitcrater)</td>
<td>S570m</td>
</tr>
<tr>
<td>17</td>
<td>Los Gemelos</td>
<td>Scalesia-wood (right pitcrater)</td>
<td>S570m</td>
</tr>
<tr>
<td>18</td>
<td>Los Gemelos</td>
<td>Clearing in Scalesia-wood (right crater)</td>
<td>S570m</td>
</tr>
<tr>
<td>19</td>
<td>Northern slope</td>
<td>Transition zone (closed deciduous forest)</td>
<td>N500m</td>
</tr>
<tr>
<td>20</td>
<td>Northern slope</td>
<td>Transition zone (closed deciduous forest)</td>
<td>N400m</td>
</tr>
<tr>
<td>21</td>
<td>Northern slope</td>
<td>A.Z. (semi-open semi-dry deciduous forest)</td>
<td>N350m</td>
</tr>
<tr>
<td>22</td>
<td>Northern slope</td>
<td>A.Z. (semi-open semi-dry deciduous forest)</td>
<td>N300m</td>
</tr>
<tr>
<td>23</td>
<td>Northern slope</td>
<td>A.Z. (semi-open dry deciduous forest)</td>
<td>N250m</td>
</tr>
<tr>
<td>24</td>
<td>Northern slope</td>
<td>A.Z. (semi-open dry deciduous forest)</td>
<td>N150m</td>
</tr>
<tr>
<td>25</td>
<td>Northern slope</td>
<td>A.Z. (open dry deciduous forest)</td>
<td>N50m</td>
</tr>
<tr>
<td>26</td>
<td>Bellavista trail</td>
<td>Culture zone (Aguayava orchard)</td>
<td>S350m</td>
</tr>
<tr>
<td>27</td>
<td>Bellavista trail</td>
<td>clearing in Miconia-wood</td>
<td>S500m</td>
</tr>
<tr>
<td>28</td>
<td>Bellavista trail</td>
<td>Miconia-wood</td>
<td>S550m</td>
</tr>
<tr>
<td>29</td>
<td>Media Luna area</td>
<td>Pampa</td>
<td>H600m</td>
</tr>
<tr>
<td>30</td>
<td>Highland</td>
<td>Pampa</td>
<td>H700m</td>
</tr>
<tr>
<td>31</td>
<td>Highland</td>
<td>Pampa</td>
<td>H750m</td>
</tr>
<tr>
<td>32</td>
<td>Highland</td>
<td>Lycopodium/Sphagnum bog</td>
<td>H825m</td>
</tr>
<tr>
<td>33</td>
<td>Crater bottom</td>
<td>Pampa</td>
<td>H800m</td>
</tr>
<tr>
<td>34</td>
<td>Cerro Crocker Top</td>
<td>Pampa</td>
<td>H875m</td>
</tr>
<tr>
<td>35</td>
<td>NE Highland</td>
<td>Pampa</td>
<td>HNE650m</td>
</tr>
<tr>
<td>36</td>
<td>NE Highland</td>
<td>Pampa</td>
<td>HNE680/700m</td>
</tr>
<tr>
<td>37</td>
<td>NE Scalesia</td>
<td>Scalesia-wood</td>
<td>NE570m</td>
</tr>
<tr>
<td>38</td>
<td>NE Scalesia</td>
<td>Pampa area surrounded by Scalesia-wood</td>
<td>NE570m</td>
</tr>
<tr>
<td>39</td>
<td>Bellavista area</td>
<td>Culture zone (orchards)</td>
<td>S200-400m</td>
</tr>
<tr>
<td>40</td>
<td>Northern slope</td>
<td>Transition zone</td>
<td>N560m</td>
</tr>
</tbody>
</table>

Characteristic species for both end groups are *Coryssocnemis conica, Sticticus uber*, Araneidae spec. 6 and *Trochoisa* spec. 4 as endemics, and *Oxyopes gracilis, Coleosoma floridanum* and *Laminacauda denticelis* as native species.

3. End group C: comprises the Transition zone (with or without Scalesia elements) along the S-SW slope of the island and a closed Aguayava-orchard in the Culture zone near Bellavista (alt. 350 m). As indicator species, we have the native species *Notiothyphantes excelsa*.

4. End group D: comprises the Transition zone along the northern slope of the island (between 140 and 500 m of altitude).

Characteristic species for both end groups are *Meioneta galapagosensis, Theotema galapagosensis* and *Trochoisa* spec. 3 as endemic species, and *Oonopidae* spec. 4 (probably an introduced species).

Dry and Coastal Habitats (end groups E, F, G and H): comprises the Littoral, the Arid coastal and Dry arid zones.

5. End group E: the locality comprising the CDRS-buildings is separated as an end group due to the presence of a number of synanthropic species: *Heteropoda venatoria, Scytodes longipes, Theridion rufipes* (probably an introduced species), and *Coryssocnemis insularis* (endemic).

6. End group F: comprises the Littoral and Arid coastal zone. Characteristic species are *Metepeira desenderi* (endemic), *Argiope argentata* and its kleptoparasite *Argyrodes elevatus* (both natives).

Indicator species for both end groups are *Metepeira desenderi, Metacyrba insularis* (both endemics), *Selenops galapagoensis* and *Argiope argentata* (both natives).

7. End group G: comprises the southern (up to 50 m of altitude) and northern (between 50 and 350 m of altitude)
arid zones. Characteristic species are *Meioneta galapagosensis* and *Meioneta arida* (both endemics).

8. End group *H*: comprises the localities situated in the northwestern coastal arid zone. The indicator species is *Argiope argentata*. A characteristic species is its cleptoparasite *Argyrodes elevatus*.

FIG. 1. Localities sampled on Isla Santa Cruz.

FIG. 2. Two-dimensional ordination (DCA) of the forty sampling sites. The site numbers used are explained in Table 1.
Indicator species for both end groups are *Meioneta arida* and *Camillina galapagoensis*.

The upper limits of the vegetation zones extend to higher altitudes along the northern slope as a result of the differential climatological circumstances, for instance less rainfall. This phenomenon also occurs in the spider fauna, as can be seen from the above classification. There is a significant negative correlation between the elevation and the DCA sample scores on both transects ($R_{(Spearman)}=-0.93$ for northern transect and $R_{(Spearman)}=-0.94$ for the southern transect). Handfitted curves (added on Fig. 4) seem, moreover, to suggest a different relationship for both transects.

A progressive araneofaunal change occurs along the northern slope according to the increasing altitude. The changes along the southern slope are very drastic for the first 200 m increase in altitude (Littoral, Arid, Transition and Culture zones), while they are relatively small for higher zones. The faunal composition of the Littoral zone, coastal Arid zone, and top zone along the northern and southern slopes are, on the other hand, comparable.
The zones with most spider species are the two altitudinal extremes, the coastal littoral zone (twenty-seven species) and the top zone (pampa zone) (twenty-four species). The poorest communities are found in the arid zones (five to thirteen species) and the Miconia zone (fourteen species), while the centrally located Transition, Culture and Scalesia zones are intermediate in species richness (respectively seventeen, twenty-two and twenty species). Obviously humidity, in the form of fog, must play an important part in the determination of species richness. This is corroborated by the higher number of species occurring along the more humid (higher rainfall) southern slope (fifty-six species), in contrast with the lower number of species occurring along the much drier northern slope (thirty species).

The richness of the Littoral zone can be explained by the fact that web-building species occurring in the adjacent arid zone find suitable space for web-building in the mangroves too (considered as part of the littoral vegetation), as well as in the low scrubs (e.g. the saltbush Cryptocarpus) that grows along the often small zones between beach and lagoon.

The spider species richness of the Culture zone is certainly due to the diversification of that zone as a result of human agricultural activities, yielding a higher diversity in vegetation structure and composition than the original Scalesia wood. In this zone we find vegetation types varying from open meadows to very closed orchards. The transformation of the original Scalesia zone into the culture zone, however, results in a qualitative impoverishment of the original fauna. Seven 'endemic' and two native species disappear, and are replaced by four 'endemic' species, coming from the lower arid zones, and by one native, three synanthropic and two introduced species, which obviously have a lower value for nature conservation and the maintenance of biodiversity overall.

The Arid and Transition zones are quite uniform in vegetation which could explain their lower spider species diversity.

A tremendous problem on Santa Cruz is the expansion of the introduced little fire ant (Wasmannia auropunctata). In Wasmannia-infested areas most of the arthropod fauna has disappeared (Lubin, 1984, 1985), and only those species

---

TABLE 2. The frequency of occurrence (number of localities) of the most important spider species in the eight habitat end groups as obtained and interpreted from the TWINSPPAN analysis. The species order is derived from the TWINSPPAN classification. The numbers before each species are those used in Fig. 3. Species endemic to the Galápagos are marked by an asterix.

<table>
<thead>
<tr>
<th>Twinspan end group:</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of localities:</td>
<td></td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>1</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

| 33. Scytodes hebraica (sensu Roth) | 3 | *? |
| 27. Oxyopes gracilis | 5 | 4 | *? |
| 47. Araneidae spec. 6 | 2 | 4 | *? |
| 16. Erigone atra | 3 | * |
| 17. Laminacuda dentichelis | 6 | 5 | * |
| 28. Coryssocemis conica | 6 | 7 | * |
| 52. Lycosidae spec. 4 | 6 | 7 | 2 | * |
| 56. Sticicus uberus | 3 | 4 | 1 | * |
| 2. Neocotula ochosai | 6 | 7 | 4 | 4 | * |
| 22. Leucauge biturcata | 4 | 5 | 4 | * |
| 21. Notioxyphantes excelsa | 3 | 5 | 7 | 1 | * |
| 57. Oonopidae spec. 1 | 2 | 4 | 4 | 4 | * |
| 25. Theotima galapagosensis | 1 | 1 | 3 | 4 | * |
| 60. Oonopidae spec. 4 | 3 | 6 | 7 | * |
| 36. Glenognatha maelfaiti | 4 | 3 | 5 | 1 | 1 | * |
| 11. Heteropoda venatoria | 1 | 3 | 2 | 1 | * |
| 24. Calomyscena santacrucis | 3 | 5 | 4 | 2 | * |
| 34. Scytodes longipes | 5 | 1 | * |
| 19. Meioneta galapagosensis | 2 | 6 | 6 | 4 | * |
| 4. Gasteracantha servillei | 4 | 2 | * |
| 51. Lycosidae spec. 3 | 3 | 6 | 3 | 1 | * |
| 12. Olios gallapogoensis | 3 | 1 | 2 | 1 | * |
| 14. Camillia galapagoensis | 4 | 1 | 1 | 4 | 2 | * |
| 30. Darwinoneon crypticus | 2 | 4 | 2 | 5 | 2 | * |
| 40. Coleosoma floridanum | 5 | 5 | 1 | 2 | 5 | * |
| 6. Neoscona cooksoni | 3 | 1 | 2 | 3 | 2 | * |
| 18. Meioneta arida | 1 | 5 | * |
| 2. Argiope argentata | 4 | 2 | * |
| 10. Tityna spatula | 1 | 3 | 3 | * |
| 38. Argyrodes elevatus | 1 | 4 | 1 | 2 | * |
| 5. Metepeira desenderi | 1 | 4 | * |
| 32. Metacyrba insularis | 1 | 2 | * |
| 44. Theridion rufipes | 1 | * |
| 29. Coryssocemis insularis | 1 | 1 | * |
can survive which are able to adapt to this aggressive ant species, such as Oonopidae and the ochroceratid Theotima galapagosensis.

CONCLUSION

There is important variation in the composition of the spider communities of Santa Cruz, coinciding mainly with altitudinal gradients. As in plants, this relation is different for the northern as compared to the southern side: on the northern slope, species of the arid zone extend to higher altitudes. Also, as a consequence of the differing vegetation zonation between southern and northern slopes, agricultural activities are confined to the southern slope, such as native fruit and sugar cane plantations, but especially pastures. It is on this slope that the spider fauna has evidently been mostly altered by human activities (agricultural fields, as well as settlements). Although this has led to an actual increase in the spider faunal diversity, the biodiversity quality of the fauna has decreased, and the balance for nature conservation has clearly to be interpreted as negative. Further expansion of cultivation or settlements should therefore be prevented.

ACKNOWLEDGMENTS

This investigation was financed by: (1) the Belgian Ministry of Education; (2) the National Foundation for Scientific Research (NFWO); and (3) the Léopold III Foundation. We received excellent cooperation from the Charles Darwin Research Station (Dir. Dr Günther Reck and his staff), the Parque Nacional de Galápagos (Intendente Ir. Humberto Ochoa and Lcdo Fausto Cepeda). We wish to thank the Ministerio de Agricultura y Ganadería, Programa Nacional Forestal for the permission they gave us to carry out our investigation programme. We also thank Professor G. Onoré (Universidad Católica de Quito) and our field assistants Sonia Sandoval, Sandra Abedrabbo and Maria Augusta Galarza for their valuable help in the fieldwork.

REFERENCES

Reeder, W.C. & Riechert, S.E. (1975) Vegetation along an altitudinal gradient, Santa Cruz, Galápagos Islands. Biotropica, 7, 162–175.
APPENDIX 1

Distribution of spider species over the sampled localities.

Anyphaenidae
(1) *Anyphaenoides pacifica* (Banks, 1902): 1, 8, 24.

Araneidae
(2) *Argiope argentata* (Fabricius, 1775): 2–7.
(3) *Cyclosa turbinata* (Walckenaer, 1841): 5.
(4) *Gasteracantha servillei* (Guérin, 1825): 3, 4, 8, 9, 26, 39.

Araneidae spec. 3: 1, 4.

Araneidae spec. 6: 17, 28, 34, 35, 37, 38.

Araneidae spec. 8: 1.

Clubionidae
(7) *Corinna wolleboeki* Banks, 1930: 1, 3, 12, 13, 23, 26, 40.

Ctenidae

Dictynidae
(9) *Phantina remota* (Banks, 1924): 2, 6.
(10) *Tivyna spathula* (Gertsch & Davis, 1937): 1, 2, 4, 6, 23–25.

Eusparassidae
(11) *Heteropoda venatoria* (Linnaeus, 1767): 1, 8, 13, 14, 18, 26, 39.
(12) *Olios galapagoensis* Banks, 1902: 1, 16, 17, 19, 20, 22, 32, 34.

Filistatidae

Gnaphosidae

Linyphiidae

Lycosidae
(51) Lycosidae spec. 3: 3, 4, 6, 7, 10, 12–16, 18–20, 27.
(52) Lycosidae spec. 4: 1–18, 28–39.

Metaetidae

Mimetidae

Mysmenidae

Ochroceratidae

Oecobiidae
(26) *Oecobius concinnus* Simon, 1892: 1, 4.

Oonopidae
(57) *Triarias stenaspis* Simon, 1891: 8, 9, 12–15, 18, 26–29, 31, 37, 38.
(58) Oonopidae spec. 2: 2.
(59) Oonopidae spec. 3: 23.
(60) Oonopidae spec. 4: 8, 9, 12–18, 19, 20, 26–28, 39, 40.
(61) Oonopidae spec. 5: 2.
(62) Oonopidae spec. 6: 2.
(63) Oonopidae spec. 8: 8, 10, 16, 18, 20.

Oxyopidae

Pholcidae
(28) *Coryssocnemis conica* Banks, 1902: 17, 18, 28–38.
(29) *Coryssocnemis insularis* Banks, 1902: 1, 34.
(53) Pholcidae spec. 3: 7.
(54) Pholcidae spec. 6: 25.

Salticidae
(31) *Frigga crocata* (C. L. Koch, 1846): 4, 6, 8, 17, 20, 39.
(32) *Metacybe insularis* (Banks, 1902): 1, 2, 4, 17.
(50) Salticidae spec. 4: 2, 8.

Scytodidae
(34) *Scytothes longipes* Lucas, 1845: 1, 13–15, 19, 40.

Selenopidae
(35) *Selenops galapagoensis* Banks, 1902: 1, 2, 4, 8, 18, 19, 35, 39, 40.

Tetragnathidae

Theridiidae
(38) *Argyrodes elevatus* Taczanowski, 1872: 2–7, 9, 24.
(39) *Argyrodes fictilium* (Hentz, 1850): 3.
(40) *Colesoma floridanum* Banks, 1900: 3, 4, 10, 17, 18, 21–25, 29–31, 34–38.
(41) *Latrodectus apicalis* Butler, 1877: 4.
(44) *Theridion rufipes* Lucas, 1846: 1.
(55) Theridiidae spec. 10: 37.

Thomisidae