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Spiders (Araneae) collected with Berlese-sampler by the Hungarian Soil Zoological Expedition in Ecuador, 1988

By

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Abstract. The Hungarian Academy of Sciences as well as the Department of Systematic Zoology and Ecology of Eötvös University (Budapest) had organized a number of Soil Zoological Expeditions to Ecuador. One of them was directed to Ecuadorian mountain rain forests in 1988. In the course of this expedition several samples were collected. The spiders were obtained by Berlese-sampler and determined by the author. Among 110 specimens of spiders – belonging to 13 families – a lot of juvenile and indeterminable individuals were found. Adult specimens were in 18% present. Depth of determination was kept on family level. Compositions of spider families found in different habitat types (moss, litter, soil and others) are compared. Some interesting Chelicerata are also included in summarizing table.

Sampling sites were located throughout the Ecuadorian mountain forests. Sampling was carried out at 46 sites from different habitats; altogether 100 samples were taken (Table 1) by Dr. A. Zicsi, Dr. Cs. Csuzdi and the Székely family. The material obtained by Berlese-samplers was preserved in metil-alcohol, it was sorted in Hungary and determined by the author in Budapest and Karlsruhe. The spiders are preserved in the collection of Department of Systematic Zoology and Ecology of Eötvös University (Budapest, Hungary) and, in part, in the Staatliches Museum für Naturkunde (Karlsruhe, Germany).

Collecting by Berlese-sampler is generally a good method for the small soil-inhabiting invertebrates. The spiders, however, especially the larger ones which move rapidly, often don't remain in the samples, consequently only the small spiders can be caught with Berlese-sampler. This method seems to be useful for the families Dipluridae, Ochyroceratidae, Caponiidae, Oonopidae, Symphytognathidae, Anapidae and Mysmenidae.

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Results

Altogether 110 spider specimens were found in the studied sites with the Berlese-sampler: 20 adults and subadults (together 18%) and 90 juveniles (82%).

Most of the juvenile spiders were unidentifiable; in these cases only the names „Mygalomorphae" or „Araneomorphae" are used in the table (Table 2). Determination depth of adult and the other older spiders has been kept on family levels. The spiders observed belong to 13 families which are as follows: Scytodidae (4 juv.), Ochyroceratidae (5 juv. + 2 ad.), Segestriidae (1 juv.), Oonopidae (6 juv. + 3 ad.), Theridiidae (5 juv. + 10 ad.), Theridiosomathidae (1 ad.), Linyphiidae (1 ad.), Anyphaenidae (1 juv. + 1 ad.), Zodariidae (1 juv.), Ctenidae (2 juv.), Heteropodidae (1 juv.), Thomisidae (1 ad.), Salticidae (4 juv. + 1 ad.). In addition, 60 juvenile, unidentifiable spiders were detected: 12 mygalomorph and 48 araneomorph spiders.

There were a number of habitats where no spider could be observed; most of the spiders (9 specimens) were found in sample 12, which was moss from branches lying on the ground, above the lagoon San Marcos.

The results of the comparison of different habitat types from the collecting sites are seen in Table 3.

Fig. 1 shows the spider family distribution in the individual habitat types. Most of the spiders came from moss, although the litter was also a relatively rich habitat type for them. Other types of habitats were poorer in spiders. In the soil no adult spiders have been detected, only three juvenile and unidentifiable individuals.

The specimens of the families may occur in different habitat types. Some families (Theridiosomatidae, Linyphiidae, Anyphaenidae, Zodariidae, Ctenidae, Heteropodidae, Thomisidae) were represented only in one habitat type, the others in more than one (Fig. 2). The most interesting species belonged to the families Ochyroceratidae and Oonopidae. These small, tropical spiders were present in moss, litter and in wood debris (see the "other" category), but the majority of both families could be found in litter.

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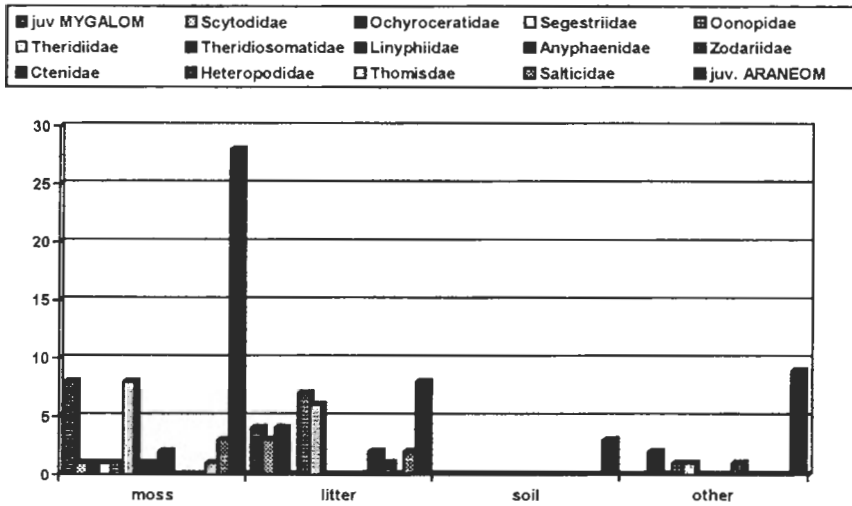

Fig. 1. Distribution of spider families in the habitat types.
(On the vertical axis the number of individuals is indicated)

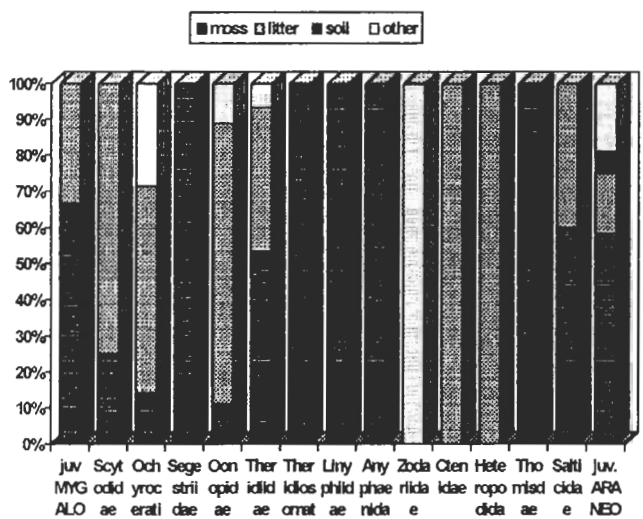

Fig. 2. Percentage distribution of the spider families according to the different habitat types

Table 1. List of the collecting sites in Ecuador

Samples	Date: 1988	Sample type	Habitat and locality
			Providence Pichincha
1.	21.04.	moss	above Quinto, 3200-3400 m a.s.l., 46 km leaving Quinto to Santo Domingo
2.		litter	same place
3.		soil	same place
4.	21.04.	moss	close to a rapid, between Quinto and Santo Domingo
5.		litter	same place
6.		soil	same place
7.	23.04.	grassy level	meadow with couch-grass, below Olmedo
8.		soil	same place
9.	23.04.	moss	grassy, shrubby vegetation, slope of the volcano Cayambe, 4200 m a.s.l.
10.		grassy level	same place
11.		soil	same place
12.	23.04.	moss	from branches lying on the ground, above the lagoon San Marcos
13.		moss	walls of a road cut, same place
14.		moss-cushion	slope of the bank, same place
15.	24.04.	moss	lakeshore (leaving the waterfall), 71 km from Quito to Santo Domingo
16.		litter	same place
17.		soil	same place
			Providence Chimborazo
18.	25.04.	moss	Chrunchi, 7 km approaching town
19.		litter	same place
			Providence Canar
20.	25.04.	litter	below shrubs, 12 km to El Tambo
			Providence Azuay
21.	26.04.	litter	an access road, below shrubs, 26 km leaving Cuenca
22.		grass	same place
23.		soil	same place
24.	26.04.	*Sphagnum*	plateau, 4000 m a.s.l., 52 km from Cuenca, on the road to Loja
25.		litter	same place
26.		soil	same place
			Providence Loja
27.	26.04.	moss	leaving Saraguro, 175 km from Cuenca
28.		litter	same place
29.		soil	same place
30.	27.04.	mixed litter, soil and grass	5 km leaving Loja, towards Vilcabama
31.	27.04.	moss	12 km leaving Loja, on the way to Vilcabama
32.		litter	same place
33.		soil	same place
34.	28.04.	litter	valley of a creek, 6 km leaving Yangana to Zumba
35.	01.05	litter	dry, shrubby area, 35 km leaving Loja, on the way to Machala
36.		tussocks	same place
37.	01.05.	moss	at the bridge, 85 km from Loja, leaving Zambi
38.		litter	same place
39.		soil	same place
			Providence El Oro
40.	02.05.	litter	patch of primary forest, 11 km from Santa Rosa, to Loja
41.		bromelias	same place
42.	02.05.	tussocks, tuff	leaving Pasaje, 54 km from Santa Rosa
43.		succulent	same place
44.	02.05.	tussocks	dry area, leaving Pasaje, 64 km from Santa Rosa
45.		soil	same place
46.	02.05.	moss	mountain slope, 15 km leaving Santa Isabel
47.		litter	same place
48.		soil	same place
			Providence Azuay
49.	02.05.	litter	between Giron and Victoria de el Portete
50.		grass	same place
51.		soil	same place

Table 1. (Continued)

Samples	Date 1988	Sample type	Habitat and locality
52.	03.05.	moss	leaving Chordeleg, 39 km from Cuenca
53.		litter	same place
54.	03.05.	moss	slope of bank, 2 km leaving Sigsig
55.		litter	same place
			Providence Canar
56.	04.05.	moss	between El Tambo and Zhud, 84 km from Cuenca
57.		litter	same place
58.		soil	same place
			Providence Loja
59.	30.04.	soil	52 km from Loja, on the way to Cuenca
			Providence Tungurahus
60.	04.05.	soil, lower lay.	leaving Riobamba, near Mocha Pata
61.		soil, upper lay	same place
			Providence Pichincha
62.	06.05.	moss	from trees, on the slopes of the volcano Cayabe, above the lagoon San Marcos
63.	07.05.	bromelias	79 km from Quinto, leaving the church, at an Indian dwelling
			Providence Napo
64.	09.05.	moss	from trees, cut primary forest patch, leaving Borja, to Lago Agrio
65.		litter	same place
66.		tussocks	same place
67.		wood debris	same place
68.		bromelias	same place
69.		soil	same place
70.	09.05.	moss-cushion	hillside, on the way to Lago Agrio, 3 km leaving Las Palmas
71.		litter	same place
72.	09.05.	moss	near the bridge of Rio Marker, on the way to Lago Agrio
73.	10.05.	moss	primary forest patch, leaving San Vicente
74.		litter	same place
75.		soil	same place
76.	10.05.	litter	patch of primary forest, leaving Lago Agrio, 8 km towards Dureno
77.		wood debris	cut forest patch on the same place
78.	10.05.	litter	of coffee plantation, 25 km leaving Lago Agrio
79.		litter	nearby primary forest patch, same place
80.		moss	same place
81.	10.05.	litter	primary forest patch on the riverside of Rio Aguarico, leaving Dureno
82.	10.05.	litter	primary forest patch at the second bridge, leaving Dureno
83.	10.05.	litter	primary forest patch, 2.5 km on accede road, to Ago Agrio
84.	11.05.	moss	primary forest cut, 48 km leaving Lago Agrio, towards Quinto
85.		litter	same place
86.		wood debris	same place
87.	11.05.		primary forest patch, between Lago Agrio and Quinto, 70 km from Lago Agrio
88.	11.05.	moss	primary forest between Lago Agrio and Quinto, 80 km from Lago Agrio
89.		litter	same place
90.	11.05.	bromelias	cut primary forest, 1 km leaving Reventador
91.	11.05.	moss	meadow, above Papallacta, in about a distance of 7 km
92.		litter	same place
93.		soil	same place
94.	11.05.	litter	of a pachonal, about 9 km above Papallacta
95.	11.05.	moss	near the summit, between Papallacta and Pifo
			Providence Pichincha
96.	13.05.	moss	leaving El Chaupi, on the way to El Refugio finca
97.		litter	same place
98.	13.05.	soil	paramo vegetation, above El Chaupi on the slope of Iliniza
99.		chusion-pl.	same place
100.		moss	from the ground, higher on the slope of Iliniza, on 4400 m a.s.l., 2 km further

Table 2. Spiders and other Chelicerata from Ecuadorian mountain forests, from Berlese-samples, 21. 04. - 13. 05. 1988.

The sample is: ☐ moss, ▨ litter, ▤ soil, ☐ something else

Samples	Ordo or subordo	Spider family	Male	Female	Total Juv.	Total Adult	Total Spiders/habit.	Total Spiders/coll.site	Other Chelic.
1.	OPILIONIDEA						-		1
2.		Ctenidae			1				-
	MYGALOMORPHAE				2				-
	SCHIZOMIDA								1
	OPILIONIDEA								3
		Ochyroceratidae			2				-
		Oonopidae			1		6		-
3.							-	6	-
4.		Anyphaenidae		1		1			-
		Segestriidae			1		2		-
5.	MYGALOMORPHAE				1		1		-
6.							-	3	-
7.							-		-
8.							-		-
9.	OPILIONIDEA								1
	ARANEOMORPHAE				5		5		-
10.	OPILIONIDEA								2
	ARANEOMORPHAE				6		6		-
11.	ARANEOMORPHAE				1		1	12	-
12.	ARANEOMORPHAE				9		9		-
13.	ARANEOMORPHAE				4		4		-
14.	ARANEOMORPHAE				1		1	14	-
15.		Oonopidae			1		1		-
16.		Oonopidae			2		2		-
17.							-	3	-
18.							-		-
19.							-	-	-
20.							-	-	-
21.							-		-
22.							-		-
23.							-	-	-
24.		Theridiidae			1		1		-
25.							-		-
26.							-	1	-
27.		Theridiidae			3		3		-
28.							-		-
29.	ARANEOMORPHAE				1		1	4	-
30.							-	-	-
31.		Scytodidae			1		1		-
32.	OPILIONIDEA								2
		Ochyroceratidae	1		1	1			-
	ARANEOMORPHAE				1		3		-
33.							-	4	-
34.							-	-	-
35.							-		-
36.							-	-	-
37.							-		-
38.		Oonopidae	s1			s1			-
		Theridiidae	1			1			-
	ARANEOMORPHAE				1		3		-
39.								3	-

Table. 2. (Continued)

Samples	Ordo or subordo	Spider family	Male	Female	Total Juv.	Total Adult	Total Spiders/Shabit.	Total Spiders/coll.site	Other Chelic.
40.		Theridiidae		1		1	1		-
41.	ARANEOMORPHAE				1		1	2	-
42.							-		-
43.							-	-	-
44.	ARANEOMORPHAE				2		2		-
45.							-	2	-
46.							-		-
47.		Scytodidae			2		2		-
48.							-	2	-
49.	OPILIONIDEA								1
	ARANEOMORPHAE				1				-
		Scytodidae			1		2		-
50.		Ochyroceratidae			1		1		-
51.							-	3	-
52.							-		-
53.	MYGALOMORPHAE				1				-
		Heteropodidae			1				-
		Salticidae			1		3	3	-
54.	MYGALOMORPHAE				6		6		-
55.		Ctenidae			1		1	7	-
56.		Salticidae			1		1		-
57.							-		-
58.							-	1	-
59.							-	-	-
60.							-		-
61.							-	-	-
62.		Theridiidae		1		1	1	1	-
63.							-	-	-
64.							-		-
65.							-		-
66.							-		-
67.		Ochyroceratidae	1			1	1		-
68.		Theridiidae		1		1	1		-
69.							-	2	-
70.	ARANEOMORPHAE				5				-
	MYGALOMORPHAE				1				-
		Salticidae			1				-
	OPILIONIDEA								1
		Theridiidae	1			1	8		-
71.	ARANEOMORPHAE				1		1	9	-
72.		Anyphaenidae			1				-
		Thomisidae		1		1			-
		Linyphiidae	1			1	3	3	-
73.		Ochyroceratidae			1		1		-
74.							-		-
75.							-	1	-
76.		Theridiidae			1				-
		Oonopidae			2		3		-
77.							-	3	-
78.	OPILIONIDEA								1
	SCHIZOMIDA						-		2
79.		Oonopidae		1		1	1		-
80.	ARANEOMORPHAE				1		1	2	-
81.	ARANEOMORPHAE				2		2	2	-
82.							-	-	-
83.		Theridiidae	s1			s1	1	1	-

Table 2. (Continued)

Samples	Ordo or subordo	Spider family	Male	Female	Total Juv.	Total Adult	Total Spiders/habit.	Total Spiders/coll.site	Other Chelic.
84.		Theridiidae		1		1	1		-
85.							-		-
86.		Oonopidae	s1			s1	1	2	-
87.		Zodariidae			1		1	1	-
88.	OPILIONIDEA MYGALOMORPHAE	 Salticidae	 s1		1	 s1	 2		7 - -
89.							-	2	-
90.							-	-	-
91.		Theridiidae Theridiosoma-tidae	s1	1		1 s1	 2		- -
92.	ARANEOMORPHAE	 Salticidae Theridiidae	 s1		1 1	 s1	 3		- - -
93.	ARANEOMORPHAE				1		1	6	-
94.	ARANEOMORPHAE				1		1	1	-
95.							-	-	-
96.	ARANEOMORPHAE				2		2		-
97.	OPILIONIDEA ARANEOMORPHAE	 Theridiidae	 	 1	1	 1	 2	4	1 - -
98.							-		-
99.							-	-	-
100.							-		-
								110	23

Table 3. Summ-up of spider individuals in similar habitats from different collecting sites

Spider families	Moss	Litter	Soil	Other	Total
juv. MYGALOM.	8	4			12
Scytodidae	1	3			4
Ochyroceratidae	1	4		2	7
Segestriidae	1				1
Oonopidae	1	7		1	9
Theridiidae	8	6		1	15
Theridiosomatidae	1				1
Linyphiidae	1				1
Anyphaenidae	2				2
Zodariidae				1	1
Ctenidae		2			2
Heteropodidae		1			1
Thomisidae	1				1
Salticidae	3	2			5
juv. ARANEOM.	28	8	3	9	48
Σ spider individ/ habitat type	56	37	3	14	Σ110
Σ spider families/ habitat type	10	7	-	4	Σ13

Average number of spiders/ habitat type	(56/28)	(37/32)	(3/21)	(15/11)
	2,00	1,15	0,14	1,36

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