

SATURNIIDAE OF "LOS ALTOS DE CHIAPAS," MÉXICO (LEPIDOPTERA: BOMBYCOIDEA)

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ABSTRACT.— A faunal study for the family Saturniidae, of "Rancho Nuevo", San Cristóbal de Las Casas, Chiapas, México is presented in this paper. Thirteen species of nine genera were found in the area. The fauna is compared with those of other Mexican localities in published papers.

RESUMEN.— Se estudiaron las mariposas de la familia Saturniidae, de "Rancho Nuevo", San Cristóbal de Las Casas, Chiapas, México, encontrándose 13 especies repartidas en nueve géneros. Se compara esta fauna, con otras del país y se señalan los Indices de Similitud.

KEY WORDS: Arsenurinae, biodiversity, Central America, Ceratocampinae, distribution, fauna, Hemileucinae, Mesoamerica, Neotropical, Saturniinae, zoogeography.

This is the second of a series of papers on the Lepidoptera fauna of "Rancho Nuevo," San Cristóbal de las Casas, Chiapas, México dealing with the family Saturniidae. The description of the study area is as follows (see also Beutelspacher, 1995): location is in central Chiapas, at 16°40'13"N and 92°33'49"W. The climate in the area is subhumid temperate. Warmest months are June and July, with an average temperature 15.5°C; the coldest months are December and January, averaging 12.3°C. The annual average temperature is 14.4°C. Average annual precipitation is 1187mm, with winter rain at less than 5% of the annual amount. Altitude is 2650m.

Two main vegetation associations are found in the area: pine and oak forests. Pine forest is located in drier areas with shallow soils. Dominant species of the pine forests are *Pinus strobus* L., *P. ayacahuite* Eremb. ex Schlecht, *P. oocarpa* Schiede, and *P. pseudo-strobus* Lindl. (Pinaceae). In the oak forests, *Quercus acatenangensis* Trel. (Fagaceae) is the most frequent species.

METHODS

Specimens were collected during ten-day periods around the new moon each month, from September 1992 to August 1993. A screen with a black light trap was used to collect the specimens, which were killed with ethyl acetate killing jars. The specimens were taken to the lab in plastic boxes and in glassine envelopes, where they were spread for study. Identifications were made by comparison with material of the Colección Nacional de Insectos, Instituto de Biología, Universidad Nacional Autónoma de México (UNAM), México City, and with descriptions and keys in the works of Lemaire (1978, 1988), but some material was further studied at the Natural History Museum (NHM), London, England, and at the National Museum of Natural History (NMNH), Smithsonian Institution, Washington, DC, USA. The systematic arrangement follows Beutelspacher and Balcázar's catalog (1994).

The Saturniidae fauna of "Rancho Nuevo" was compared with that of seven faunistic studies: Soconusco, Chiapas (Hoffmann, 1933), Huitzilac, Morelos (Beutelspacher, 1986), Las Minas, Veracruz (Beutelspacher, 1978), Chamela, Jalisco (Beutelspacher, 1982a), Cahuaré, Chiapas (Beutelspacher, 1982b), Valle de México (Beutelspacher, 1994), Tacámbaro, Michoacán (Balcázar & Revuelta, 1989). The comparative faunal study was performed using Simpson's similarity index and the clustering strategy was UPGMA following Balcázar's suggestions (1993). The analysis was made with the computer program Ntsys (Rohlf, 1989).

RESULTS

A total of 13 species of 9 genera were found in the study area, 2 of which are considered endemics to the area: *Syssphinx gomezi* Lemaire and *Coloradia casanovai* Beutelspacher. The months when adult specimens of the species were collected, and their number, are pointed out in the following list.

Family SATURNIIDAE Subfamily CERATOCAMPINAE

1. *Syssphinx gomezi* Lemaire
Rev. Fr. Ent., (n.s.) 6:112 (1984).
V (1).
2. *Anisota dissimilis* (Boisduval)
Adelocephala dissimilis Boisduval, Ann. Soc. Ent. Belg., 15:93
(16) (1872).
V (1).

Subfamilia HEMILEUCINAE

3. *Coloradia casanovai* Beutelspacher
SHILAP Revta. Lepid., 21(82):89-92, 2 fig. (1993).
VIII (2), IX (1), X (1).
4. *Automeris zozine* Druce
Biol. Centr. Amer. Lepid. Het., 1:179, Pl. 17, fig. 8 (1886).
V (1).
5. *Leucanella contempta windi* Lemaire
Bull. Soc. Ent. France, (n.s.) 77:229, Pl. 1, fig. 4 (1973).
IV (2), V (11).
6. *Hylesia hubbelli* Lemaire
Ann. Soc. Ent. France, (n.s.) 18(1):87, fig. 4, 63 (1982).
V (2), VI (2).
7. *Hylesia frigida* Schaus
Ann. Mag. Nat. Hist., (8) 7:624 (1911).
I (5), II (13), III (12), IV (4), V (11), VI (9), VII (2), VIII (18), IX
(7), X (4), XI (4), XII (4).
8. *Paradirphia semirosea* (Walker)
Dirphia semirosea Walker, List. Lepid. Ins. Brit. Mus., 6: 1359
(1855).
V (9), VI (7), VII (2), VIII (1).
9. *Paradirphia coprea* (Draudt)
Phricodia coprea Draudt, In Seitz, D. Gross Schmett., 6: 781, Pl.
117 D, E (1930).
VI (18), IX (1).

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
<i>Syssphinx gomezi</i>					■							
<i>Anisota dissimilis</i>					■							
<i>Coloradia casanovai</i>								■	■	■		
<i>Automeris zoizine</i>					■							
<i>Leucanella c. windi</i>				■	■							
<i>Hylesia hubbelli</i>					■	■						
<i>Hylesia frigida</i>	■	■	■	■	■	■	■	■	■	■	■	■
<i>Paradirphia semirosea</i>					■	■	■	■				
<i>Paradirphia coprea</i>						■	■		■			
<i>Rothschildia orizaba</i>					■	■						
<i>Eupackardia calleta</i>								■	■			
<i>Copaxa lavendera</i>		■	■	■	■	■				■	■	
<i>Copaxa cydippe</i>		■		■	■	■			■		■	■
Taxa	1	3	2	4	9	7	2	5	5	4	2	1

Fig. 1. Taxa present in "Rancho Nuevo", and their distribution along the year.

	HUIT.	MINAS	CHAM.	SOC.	CAHU.	R. N.	V. M.	TAC.
HUITZILAC	1.000							
MINAS	0.211	1.000						
CHAMELA	0.000	0.082	1.000					
SOCONUSCO	0.000	0.140	0.133	1.000				
CAHUARE	0.000	0.000	0.348	0.000	1.000			
R. NUEVO	0.400	0.227	0.000	0.080	0.000	1.000		
VALLE MEX.	0.417	0.167	0.000	0.000	0.000	0.200	1.000	
TACAMBARO	0.105	0.186	0.200	0.083	0.235	0.080	0.069	1.000

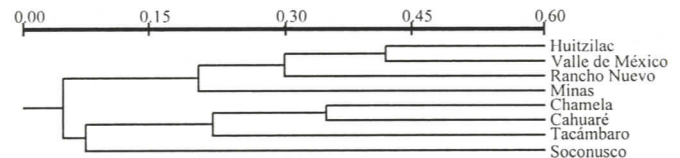
Fig. 2. Simpson's index matrix for the Mexican localities compared.

Subfamilia SATURNIINAE

10. *Rothschildia orizaba* (Westwood)
Saturnia orizaba Westwood, Proc. Zool. Soc. London, 21: 158, Pl.32, fig.2 (1853).
 V (1), VI (5).
11. *Eupackardia calleta* (Westwood)
Saturnia calleta Westwood, Proc. Zool. Soc. London, 21: 161, Pl. 33, fig. 2 (1853).
 VIII (2), IX (1).
12. *Copaxa lavendera* (Westwood)
Saturnia lavendera Westwood, Proc. Zool. Soc. London, 21:160, Pl.32, fig. 3 (1853).
 II (1), III (1), IV (2), V (1), VI (1), VIII (3), X (1).
13. *Copaxa cydippe* (Druce)
Attacus (?) cydippe Druce, Ann. Mag. Nat. Hist., (6) 13: 178 (1894).
 II (1), IV (8), VI (2), IX (4), X (4) XI (3).

A species richness peak, based on the presence of adults, was found in May-Jun, and the lowest species richness in Dec-Jan. Surprisingly, no representatives of the subfamily Arsenurinae were collected, and the only two species of Ceratocampinae were collected only in May (Fig. 1). The absence of Arsenurinae is probably indebted to the relatively high elevation (Lemaire, pers. comm.). While most Hemileucinae and Saturniinae appear to be bi- or multivoltine in "Rancho Nuevo," only *Hylesia frigida* was collected all year around.

During the faunal comparison, only one phenogram was found with a good cophenetic correlation index (0.89) (Fig. 2-3). But the clusters are based almost exclusively on the presence of widespread

Fig. 3. Phenogram for the Mexican localities compared using Simpson's index ($r = 0.89$).

taxa, hence the low values of the similarity indexes. The most similar areas are Huitzilac and Valle de México the closest localities geographically, which share 5 taxa all of them widely distributed in Mexican mountains. Rancho Nuevo clusters with these two localities, although quite removed, again due to the sharing of taxa found in montane areas.

Other taxa reported for the "Altos de Chiapas" but which were not collected during this study are: *Hemileuca mexicana* (Druce), *Automeris windiana* Lemaire, *Rothschildia roxana* Schaus, *Copaxa sophonria* Schaus, and *Antheraea godmani* (Druce).

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Fig. 4. CERATOCAMPINAE (upper left): *Syssphinx gomezi* Lemaire (top); *Anisota dissimilis* (Boisduval) (left center); HEMILEUCINAE: *Automeris zozine* (Druce) (right center); *Coloradia casanovai* Beutelspacher (lower left); *Leucanella contempta windi* Lemaire (lower right).

Fig. 5. HEMILEUCINAE (upper right): *Leucanella contempta windi* Lemaire (top); *Hylesia hubbelli* Lemaire (left center); *H. frigida* Schaus (right center); *Paradirphia semirosea* (Walker) (lower left); *P. coprea* (Draudt) (lower right).

Fig. 6. SATURNIINAE (lower left): *Rothschildia orizaba* (Westwood) (top); *Eupackardia calleta* (Westwood) (center); *Copaxa lavendera* (Westwood) (lower left); *C. cydippe* (Druce) (lower right).



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