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NOTES ON BUTTERFLY DISTRIBUTIONS IN SOUTHERN COSTA RICA (LEPIDOPTERA: PAPILIONOIDEA)

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ABSTRACT.– Extensions of geographic and/or elevational ranges are given for forty species of Costa Rican Papilionidae, Pieridae, and Nymphalidae. The work is based on studies on the Pacific slope of southern Costa Rica and provides butterfly distributions that expand on those treated in DeVries (1987), Brown (1988), and Austin (1992).

KEY WORDS: Adelpha, *Aeria*, *Archaeoprepona*, *Archonias*, *Caligo*, *Catoblepia*, *Catonephele*, *Ceratinia*, *Chloreuptychia*, *Chlosyne*, *Cissia*, *Consul*, *Cyllopsis*, *Diaethria*, *Dismorphia*, elevation, *Epiphile*, *Eurema*, *Eurytides*, *Hamadryas*, *Heliconius*, *Hypanartia*, *Lycorea*, *Memphis*, Mesoamerica, Neotropical, Nymphalidae, *Opsiphanes*, Panama, *Papilio*, Papilionidae, *Pierella*, *Pyrrhogyra*, *Phoebis*, Pieridae, *Pycina*, range extension, *Smyrna*, trapping, *Taygetis*, *Tegosa*.

The natural history of Costa Rican butterflies of the families Papilionidae, Pieridae, and Nymphalidae is relatively well-known, thanks to the epic work of DeVries (1987). His book describes the geographic distribution and habits of species from these families in considerable detail. Refining information on these aspects of butterfly natural history is important for the development of methods to inventory and monitor butterflies as indicators of tropical biodiversity (Brown, 1991; Daily and Ehrlich, in prep.; Sparrow *et al.*, in press).

Here we report new information on geographic and elevational ranges of a variety of species. We surveyed the butterfly fauna in the vicinities of the Wilson Botanical Garden (WBG), operated by the Organization of Tropical Studies, and the Las Alturas Biological Station, established by Stanford University's Center for Conservation Biology and now run by the Costa Rican *Centro para la Biologia de la Conservación*. Both sites are located on the south Pacific slope in Puntarenas Province, near the Panama border. The WBG is about 5 km south of San Vito, adjacent to the only large (>200ha) forest patch in an agricultural landscape dotted with smaller patches. Butterfly sampling occurred in various patches within a 15km radius of the WBG, all at 1200-1300m elevation. Las Alturas is about 32km northeast of the WBG at an elevation of 1550m on the southern flank of the Talamanca mountains. The research station is adjacent to >400,000ha of contiguous forest in the Zona Protectora Las Tablas and other units comprising La Amistad Biosphere Reserve. Sampling sites at Las Alturas range from 1300m to 2000m in elevation, across an area of 5,000ha. Both sites fall primarily within Holdridge's (1967) premontane wet forest life zone, with lower montane and montane wet forest represented at the higher elevations at Las Alturas. Research was carried out during various periods from January to April, in the years 1990-1993.

Our methods include netting and extensive bait-trapping with rotten fruit; many records are either from sightings or captures and releases, since some of us did not have permits to retain specimens. In the following, *rare* = trapped or seen, on average, two or fewer times per season; *uncommon* = trapped or seen 3-6 times per season; and, *common* = trapped or seen more than 6 times per season. Voucher specimens for some records are deposited in the Museo Nacional de Costa Rica in San Jose. Comments on ranges generally apply to those reported in DeVries (1987), although reference is made in some cases to DeVries (1990) and Austin (1992).

PAPILIONIDAE

Papilio rhodostictus Butler & Druce

A single individual captured on a road through primary forest at Las Alturas at an elevation of approximately 1500m. Previously known only from single specimens from Corcovado and Carrillo.

Eurytides protesilaus Linnaeus

Common in January along the forest edge at Las Alturas at 1550m; approximately a 350m upward elevational extension.

PIERIDAE

Dismorphia amphiona Cramer

Present but rare around 1600m at Las Alturas; an upward extension of 400m.

Archonias tereas Godart

In primary forest around 1600m at Las Alturas, rare; an upward extension of over 500m.

Phoebis sennae Linnaeus

Common in pasture, second growth, and along forest edges around 1550m at Las Alturas; an upward extension of over 300m.

Eurema gratiosa Doubleday & Hewitson

In primary forest light gaps around 1600m at Las Alturas, rare; an upward extension of 400m.

NYMPHALIDAE

Charaxinae

Archaeoprepona phaedra Godman & Salvin

Known previously only from the Costa Rican Talamancas in vicinity of Volcan Chiriquí (across the Panama border). One male was trapped and released and a second individual seen on a trap in the WBG forest.

Consul electra Westwood

Uncommon around 1550m at Las Alturas, but periodically trapped; an upward extension of over 100m.

Memphis laura Druce

One individual trapped at WBG. Apparently the third record from Costa Rica; the first two were reported from Finca La Selva on the north Atlantic plain (DeVries, 1987).

Memphis niedhoeferi Rotger, Escalante & Coronado

A single fresh female trapped in forest at WBG. This species was previously known only from Mexico and from near Turrialba, Costa Rica, on the Atlantic slope at 600m.

Nymphalinae

Smyrna blomfildia Fabricius

In pasture/forest edge habitat at Las Alturas, uncommon, around 1550m; an elevational extension of over 300m.

Pycina zamba Doubleday & Hewitson

A single individual caught going over a ridge top at 2000m above Las Alturas; an upward extension of 300m.

Hamadryas fornax Hübner

Trapped in primary and secondary forests between 1350 and 1600m at Las Alturas. Uncommon in 1993, rare other years, may undergo periodic population expansions; an upward extension of 600m.

Epiphile grandis Butler

DeVries (1987) reported that males of this southern Talamancan endemic are attracted to fresh mammal dung and that he had seen only one female alive. In three years, we have taken two males and two females at fruit-baited traps between 1550 (a slight downward extension) and 1800m at Las Alturas.

Pyrrhogyra crameri Aurivillius

The Wilson Garden record of this species, which is common on the Osa Peninsula, represents an upward range extension of 300m.

Catonephele mexicana Jenkins & de la Maza

Rare in primary forest around 1600m at Las Alturas; an upward elevational extension of 400m.

Catonephele numilia Cramer

Rare along the pasture/primary forest edge around 1550m at Las Alturas; an upward extension of more than 500m.

Diaethria anna Guérin-Méneville

Two individuals of this poorly known species were taken along the pasture/forest edge around 1550m at Las Alturas.

Adelpha melanthe Bates

In primary forest above 1550m at Las Alturas, rare; a slight upward extension of 150m.

Hypanartia lethe Fabricius

This species is uncommon at the pasture edge at Las Alturas around 1550m; about 200m above the elevational band usually reported.

Heliconius doris Linnaeus

Common in secondary forest between 1300 and 1500m at Las Alturas; roughly a 300m upward range extension.

Heliconius charitonius Linnaeus

Common at the forest edge at Las Alturas around 1550m; a 350m extension above its reported elevational limit.

Chlosyne janais Drury

Uncommon in primary forest at Las Alturas around 1600m; a 400m upward extension.

Chlosyne hippodrome Geyer

Uncommon in primary forest at Las Alturas around 1600m; a 600m upward extension.

Tegosa anieta Hewitson

Common above Las Alturas in primary forest light gaps up to 1800m; an upward extension of 400m.

Danainae

Lycorea cleobaea Godart

Found in primary forest near edges at Las Alturas around 1550m; an upward range extension of 150m.

Ithomiinae

Aeria eurimedia Cramer

Uncommon in primary forest at Las Alturas around 1600m; an upward extension of 800m.

Ceratinia tutia Hewitson

The record of this species from the WBG represents a slight upward extension of 200m.

Brassolinae

Opsiphanes tamarindi Felder & Felder

New to the Wilson Garden list, where it is rare and at the upper limit of its range.

Opsiphanes cassina Felder & Felder

Uncommon in primary forest habitat at Las Alturas around 1600m, where it represents a slight upward extension of 200m.

Catoblepia orgetorix Hewitson

A forewing of this species was found in the forest of the Wilson Garden and a fresh female was trapped about a kilometer away. This species is uncommon but trapped periodically in primary forest at Las Alturas around 1600m. It is reported by DeVries (1987) as occurring from sea level to 500m on the Atlantic slope, but its presence on the south Pacific slope was known to at least one collector in the San Vito area.

Caligo atreus Kollar

Common at 1600m in primary forest at Las Alturas, rare between 1600 and 1800m; a 500m upward extension.

Satyrinae

Pierella helvetia Hewitson

Rare in primary forest around 1600m at Las Alturas; a slight upward range extension of 200m.

Cyllopsis pephredo Godman

Rare in primary forest at Las Alturas around 1600m; an upward range extension of 400m.

Taygetis virgilia Cramer

Rare at WBG, also reported by DeVries (1990) in his list for the Wilson Garden; an extension of 200m over the range reported in his book (DeVries 1987).

Taygetis salvini Staudinger

Rare in primary forest at Las Alturas around 1600m; a 600m upward extension.

Chloreuptychia arnaea Fabricius

Trapped repeatedly in the "*Cascada*" patch adjacent to the WBG and taken at Las Alturas around 1550m. The latter record is 600m above the reported elevational limit.

Cissia labe Butler

Uncommon in secondary forest, overgrown clearings, and edge habitat at Las Alturas around 1550m; a 300m upward extension.

Cissia metaleuca Boisduval

Common at both the WBG and Las Alturas around 1500m. The latter represents a 500m upward extension.

Cissia ocirrhoe Fabricius

The Pacific phenotype (described in Austin 1992) is common in primary and secondary forest at Las Alturas around 1300m; an extension of 100m above the elevational range reported by DeVries (1987) and 300m above that reported by Austin (1992).

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