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FOUR NEW PIERIDAE FROM THE WEST INDIES

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During recent studies on the West Indian fauna, the following new forms were encountered. Portions of the type series of all are in the collection of the American Museum of Natural History.

Phoebis (Aphrissa) orbis browni, new subspecies

MALE: Average size larger than that of *orbis orbis* from Cuba. Fore wing above with yellow triangular area deeper in color and more prolonged apically. Ground color of under side yellower and with reddish markings less strongly contrasting than in the majority of Cuban specimens; reddish subterminal line, however, better developed in the new subspecies. Outer margin of hind wing more strongly convex than that of *orbis orbis*.

FEMALE: Decidedly larger than Cuban females. Black border of fore wings continued for a varying distance along costa. Under side with brownish markings less extensive than in typical *orbis*, at least in the material examined; nacreous scaling along outer margin of both fore and hind wings considerably more pronounced than in Cuban specimens.

MALE GENITALIA: Very similar to those of typical *orbis*, but with the reflexed dorsal process of the valve shorter, not extending past the costa of the valve, and with the base of this process broader.

HOLOTYPE MALE: Pivert, Haiti, 250 feet, April 1, 1922; genitalia slide B1180, F. M. Brown; in the American Museum.

ALLOTYPE FEMALE: Pétionville, Haiti, July 3, 1930; in the American Museum (collection F. E. Church).

PARATYPES: One male, Fond Parisien, Haiti, February 11-18, 1922; genitalia preparation 609, E. Munroe. One female,

Chacquey, Dominican Republic, February 26, 1930 (Stillman); genitalia slide B1357, F. M. Brown. Both in American Museum. One male, Barahona, Dominican Republic, June 7, 1940 (Needham); in Cornell University collection.

This subspecies appears to be confined to the Island of Hispaniola. It is named for Mr. F. Martin Brown in recognition of his important contributions to the classification of the genus *Phoebis*.

Phoebis (Aphrissa) statira hispaniolae, new subspecies

MALE: Head black above, with several red spots; palpi yellow; antennae with dark shaft and pale fulvous club. Thorax black above, clothed with long, gray hairs giving a greenish effect; beneath yellow. Wings above bright yellow, mealy area somewhat paler than unmodified part of wings, but not contrastingly so in the majority of specimens; rarely the mealy area almost white. The usual sex patch above RS of hind wings, varying from whitish to pale pinkish brown in different individuals. Beneath, both pairs of wings almost uniform yellow, except for the posterior region of the fore wings, which becomes whitish towards the inner margin. Fore wings with an inconspicuous yellow or orange discocellular spot, often bordered externally by a faint brown line; a similar spot on the hind wings, lacking the brown line. Occasionally the fore wings above have an extremely narrow black apical border.

FEMALE: Wings rather pale yellow; antennae lacking the fulvous tips. Fore wings above with a large black discocellular spot, and with a distinct apical and distal marginal line; beneath with a rusty discocellular spot and faint, interrupted, rusty, postmedial and terminal lines. Hind

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wings beneath with a white discocellular spot and a faint, interrupted, rust-colored, postmedial line.

This subspecies, occurring in Hispaniola and perhaps in Puerto Rico, belongs to a subspecies group which also includes *statira cubana*, *statira floridensis*, and the Central American *statira jada*. The new subspecies is larger than any of these and differs especially in the bright yellow ground color of the male fore wing beneath, the remainder of the wing not being contrastingly duller than the cell as it is in the other subspecies. From *Phoebis neleis*, with which it has been confused by some authors, *hispaniolae* and all *statira* subspecies may be distinguished by the absence of the pink spot at the base of the hind wings beneath, which is characteristically present in members of the *neleis-orbis* complex. So far as the writer is aware, *neleis* does not occur in Hispaniola, being confined to Cuba, the Bahamas, and (according to Carpenter and Lewis) the Cayman Islands.

The male genitalia of *hispaniolae* are essentially similar to those of the other subspecies of *statira*.

HOLOTYPE MALE: Sanchez, Dominican Republic, June 24-26, 1915; in the American Museum.

ALLOTYPE FEMALE: Sanchez, Dominican Republic, June 30-July 4, 1915; in the American Museum.

PARATYPES: Six males, same locality and month as holotype. One male, San Lorenzo, Dominican Republic, June 24-26, 1915. All the above types in the American Museum. Genitalia preparations 575, E. Munroe, and B1183, F. M. Brown, made from among these paratypes.

One male, "San Domingo. Gift of H. C. Fall." One male, "San Domingo, A. G. Weeks Collection"; M. C. Z. slide no. 292. These two paratypes are in the Museum of Comparative Zoology, Cambridge, Massachusetts.

Not included in the type series is one female in the American Museum, reared in Puerto Rico (at Rio Piedras?) by G. N. Wolcott on *Melicocia bijuga* L. This specimen does not appear to differ in any important respect from *hispaniolae*, but in

the absence of further material the status of the Puerto Rican *statira* population must remain in doubt.

Eurema (Abaeis) nicippiformis, new species

MALE: Palpi yellow, more or less flushed with pink; vertex pink; antennae with club and upper surface of shaft pinkish brown, lower surface of shaft with segmental light and dark bands. Upper surface of wings orange, with a blackish marginal band; fore wing with a varying degree of blackish suffusion in the costal area, the suffusion never heavy; veins yellow scaled; a slender black discocellular bar; dark border of wings narrower than in *nicippe*, especially in cell A_1 and along the inner margin; fringe pinkish, becoming yellow towards the tornus. Hind wing orange with yellow anal area; veins concolorous with remainder of wing, except for a weak dusting of yellow and black scales about the base of Cu; dark marginal area about half the width of that of most individuals of *nicippe*, more or less crenulated internally but entirely lacking the conspicuous projection into cell M_2 characteristic of that species. Under side indistinguishable from that of *nicippe*. The male resembles the corresponding sex of *nicippe*, but can be distinguished immediately from typical individuals of that species by the narrow and regular marginal band. Mr. Ralph Chermock states (personal communication) that a similar narrow and regular band frequently occurs in Californian specimens of *nicippe*. The writer has not examined such specimens and is therefore unable to judge how closely they approach *nicippiformis* in this character.

FEMALE: Closely similar to that of *nicippe*, from which it differs in the following respects:

1. The veins of the fore wings above are yellow scaled, contrasting with the orange ground color; in *nicippe* these veins are almost invariably orange scaled, concolorously with the ground.

2. The discocellular bar of the fore wings above is longer and relatively narrower than in *nicippe*.

3. The dark costal shading of the fore

wings and the dark marginal band of the hind wings and fore wings are less extensive than in the majority of specimens of *nicippe*.

4. The dark subterminal spots in cells M_3 and Cu_1 of the hind wings beneath are much less pronounced than those which form an oblique interrupted bar from cell M_1 to cell Cu_2 . In *nicippe* these two groups of spots are of the same order of intensity in any one individual.

MALE GENITALIA: Costa of valve approximately at right angles, distal margin approximately parallel, and ventral margin approximately at 70° to the base. Distal process and lobe "e" (terminology of Klots) directed inward at right angles to the body of the valve, and crossed scissor-wise; space between distal process and lobe "b" rather narrow and angular, but with the extreme apex of the indentation rounded. Lobe "a" about one-half the length of the distal process; the latter pointed, shorter and broader than lobe "e." Lobe "b" with no dorsal tooth at its base. Uncus pointed, free part rather long and decurved. Sacculus about same length as valve.

The male genitalia of *Eurema nicippe* differ in the following respects from those of *E. nicippiformis*. The costa of the valve in *nicippe* is at an angle of about 75° to the base, the distal margin at about 10° , while the ventral margin is angled at the middle, with the basal part at about 65° , the distal part at about 50° to the base of the valve. The distal process and lobe "e" are bent at less than right angles to the body of the valve; they are crossed, but not so closely appressed as in *nicippiformis*. Lobe "e" is pointed, nearly as long as, and broader than, the distal process, but not so broad as in *nicippiformis*. The space between the distal process and lobe "b" is broad and U-shaped; lobe "b" has a distinct dorsal tooth at its base. The free part of the uncus is somewhat broader than in *nicippiformis*.

HOLOTYPE MALE: Ravine of Pétionville, Haiti, ca. 1600 feet, January 24-29 1922; genitalia preparation 611, E. Munroe; in the American Museum.

ALLOTYPE FEMALE: Pétionville, Haiti, November 7, 1933 (Ducasse); in Carnegie Museum, Pittsburgh.

PARATYPES: One male, Monte Christi, Dominican Republic, May 6, 1915. One male, Dessources, Haiti, March 2, 1922. One female, Rio Yaque, 10 miles south of Monte Christi, Dominican Republic, March 12, 1931 (Stillman). These three in the American Museum. Two males, one female, Delmar, Haiti, October 30, 1933 (Ducasse); male genitalia preparations 612 and C5, E. Munroe. One female, Port-au-Prince, Haiti, November 6, 1933 (Ducasse). Two females, Port-au-Prince region, Haiti, October 28, 1933 (Ducasse). These six in the Carnegie Museum, Pittsburgh.

This species is so close to *E. nicippe* that the writer at first supposed it to be only a subspecies. He now considers it to be specifically distinct for the following reasons:

1. The genitalic differences between the two, although subtle, are at least as large as those characterizing valid species in several other groups of the genus, notably in the *dina*, *daïra*, and *salome* groups.

2. The range of true *nicippe* includes and extends beyond that of *nicippiformis*. The writer has examined specimens of *nicippe* from Cuba, Hispaniola, Jamaica, and Puerto Rico, although the species appears to be of regular occurrence only in the first of these islands.

Eurema (Pyrisitia) euterpiformis, new species

Terias euterpe HALL (1925) nec Ménétrés (1832).

MALE: Of about the size and general appearance of *Eurema lisa*. Head black above, with a number of long scales of a deep wine color; palpi yellow, faintly pink beneath; antennae dark reddish brown. Thorax black above, with some grayish hairs; beneath yellow; legs straw colored. Abdomen with dorsum black to the mid-lateral line, ventral half yellow. Fore wings above brilliant clear yellow, lacking the greenish tint characteristic of most yellow species of the genus, but on the other hand without any orange flush; base narrowly, but rather conspicuously, dusted with black; costa narrowly, but distinctly, black; outer margin with a black border,

about as wide as that of *lisa* in the paratypes, somewhat narrower in the holotype, but in all specimens as wide at inner margin as at M_3 , instead of being strongly attenuated behind as in *E. lisa* and *E. neda* (*nise*, *sensu* Klots). Hind wings above of the same clear yellow; a short streak of black dusting extends from base into anal area; black border narrow, becoming more attenuated posteriorly, extending approximately from RS to Cu_2 . Both wings beneath yellow, paler and greener than above; a minute black dot on the middle discocellular of each wing, a further one at the base of the humeral vein of the hind wing; hind wings beneath faintly dusted with black scales, and with a small reddish brown patch before the tip of SC.

FEMALE: Unknown.

MALE GENITALIA: Tegumen dorsally incomplete; uncus with central part membranous except at tip, so that it assumes a V shape, instead of a Y shape as in all other *Eurema* species known to the writer. Saccus rather short, clavate, with a scoop-shaped, rather well-sclerotized anterior process, extending under the bases of the valves. Valve deeper than long, with a long slender dorsal ligament; costa evenly and very gently curved, at an average angle of more than 80° to the base; outer and ventral margins meeting at a barely perceptible angle, both rather evenly curved; distal process short and extremely narrow, that of right valve (in the holotype) with two small teeth, that of the left valve with one; lobe "d" long, slender, sharply pointed, almost at right angles to the body of the valve, but directed slightly caudad; lobe "e" similar, but a trifle shorter and more slender, and directed at almost the same angle cephalad; lobe "b"

less than half the length of "e," situated directly over it; lobe "a," although slender, is the longest and stoutest of the lobes.

HOLOTYPE MALE: Kenscoff, Haiti, 4826 feet, "3/10/35"; genitalia preparation 562, E. Munroe; in the American Museum.

PARATYPES: One male, Ennery, Haiti, 2500 feet, August (Bates). One male, Furcy, Haiti, 5500 feet, September (Bates). Both in the Museum of Comparative Zoölogy, Cambridge, Massachusetts.

This species is known only from Hispaniola, where it is apparently confined to the higher altitudes; in addition to the localities cited above, Hall records it from pine forests of La Vega, Dominican Republic.

Although *euterpiformis* clearly belongs to the *dina* group, its more precise affinities are obscure. The strong superficial resemblance to *lisa* led Hall to misidentify the species as *euterpe* Ménétriés, but, as pointed out by Comstock (1944, p. 523), Ménétriés' 1834 figure clearly represents a male of *lisa* of the dark West Indian type. The new species may be distinguished from both *lisa* and *neda*, which it most closely resembles externally, by the configuration of the marginal band of the fore wings, as pointed out in the description. The male genitalia, on the other hand, resemble most closely those of the superficially dissimilar *Eurema laeae* of Cuba, with which they agree in the proportions of the valve and the shape of the anterior process of the saccus, but from which they differ in the shorter and stouter saccus, in the shorter and broader dorsal ligament of the valve, and particularly in the unique character of the shape of the uncus.

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