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## STUDIES IN THE CASTNIIDAE.

### III. MIROCASTNIA

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During a visit to this Museum a few years ago, Gordon Small brought along a rather small and striking female castniid from Cerro Jefe, Panama. This specimen was distinguished by a prominent blue-violet patch across the hindwing disc and a reddish-fulvous hair tuft at the end of the abdomen. Thus it was apparently the same species or closely related to a unique female described by Rothschild (1919) as *Castnia (Schaefferia) subcoerulea*. A year later while collecting with Stan Nicolay, Mr. Small took a pair in copula. Upon examination the male had fulvous discal band and extradiscal area on the hindwing and compared favorably with *Hista pyrrophygoides* (Houlbert, 1917). The obvious dimorphism is unlike anything else in the Castniinae save the genus *Ceretes*. Further investigation of the type material at the British Museum (Nat. Hist.) and examination of other species within these apparently closely related genera, has resulted in the assignment of a new genus, *Mirocastnia*, to this rather unusual species complex as well as the description of a new species from Panama which follows.

#### Mirocastnia, new genus

Figs. 1 (wing venation), 2, 3, 4 (legs), 5 (palpus), 6, 7 (antenna)

*Athis* Houlbert, 1918, Etudes de Lep. Comp. XV:75, 286, not Hubner, [1819], Verz. bek. Schmett. (7): 101.

*Schaefferia* Houlbert, 1918, Etudes de Lep. Comp.:75, 421, not Absolon, 1900, Zool. Ana. 23:615, 265.

*Castnia (Schaefferia)* Rothschild, 1919 (in part), Nov. Zoo. XXVI:18.

*Hista* Oiticica, 1955 (in part), Rev. Brasil Ent. (3): 140, 152.

*Feschaeria* Oiticica, 1955 (in part), Rev. Brasil Ent. (3): 149, 155.

Type species *Mirocastnia smalli*, new species (see below).

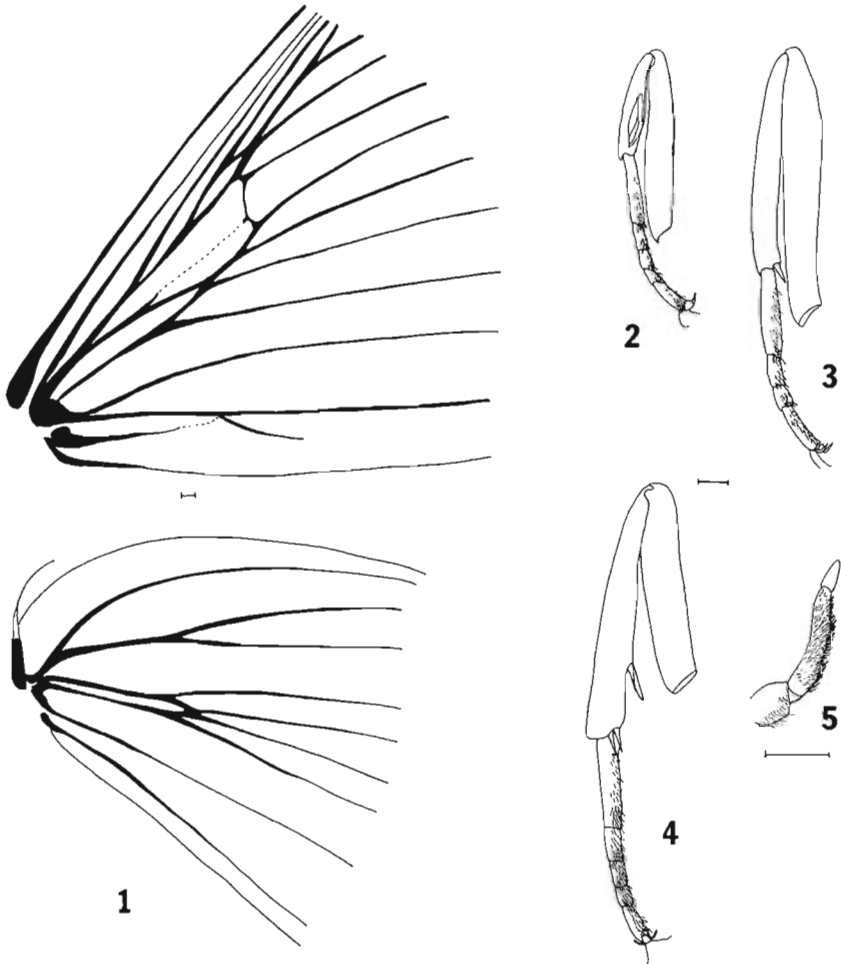
Antenna more than half the length of forewing costa, comprised of 42-44 segments: club prominent which with apiculus occupies terminal third of antenna; apiculus (Figs. 6,7) with numerous setae distad. Palpi (Fig. 5) three segmented, with pronounced spicules and hair sockets and clothed with fine setae and scales.

Foreleg (Fig. 2), femur with epiphysis clothed in velvety hairs and tapered distad; tibial and tarsal segments with tapered spines proximad, gradually becoming blunted toward distal end segments, especially on tarsus. Midleg (Fig. 3) and hindleg (Fig. 4) with tibial spurs; all legs with developed tarsal claws and a characteristic ochreous col-

or of sclerotization.

Forewing apex acute, arcuate along lateral margin posteriad, especially in male; both sexes with semi-hyaline transverse band from mid-costa to near lateral margin (yellowed in male, white in female);  $Cu_{1a}$  arises equidistant between  $Cu_{1b}$  and  $M_3$  (Fig. 1);  $R_3$  and  $R_4$  branch one-fifth distance from radial cell; cell length less than one-half as long as forewing apex with cell open; discocellular veins of  $M_2$  arising more distad than that of  $M_3$ . Hindwing with prominent fulvous discal markings in male and iridescent blue markings in female;  $Cu_2$  arises closer to base than to  $Cu_{1a}$  and  $Cu_{1b}$ ;  $Cu_2$  and  $M_3$  arise equidistant from base.

Male genitalia (Fig. 17); saccus reduced; valvae elongate along costa with prominent cleft along sacculus distad; juxta lightly to moderately sclerotized; penis moderately sclerotized, recurved, but miniaturized.



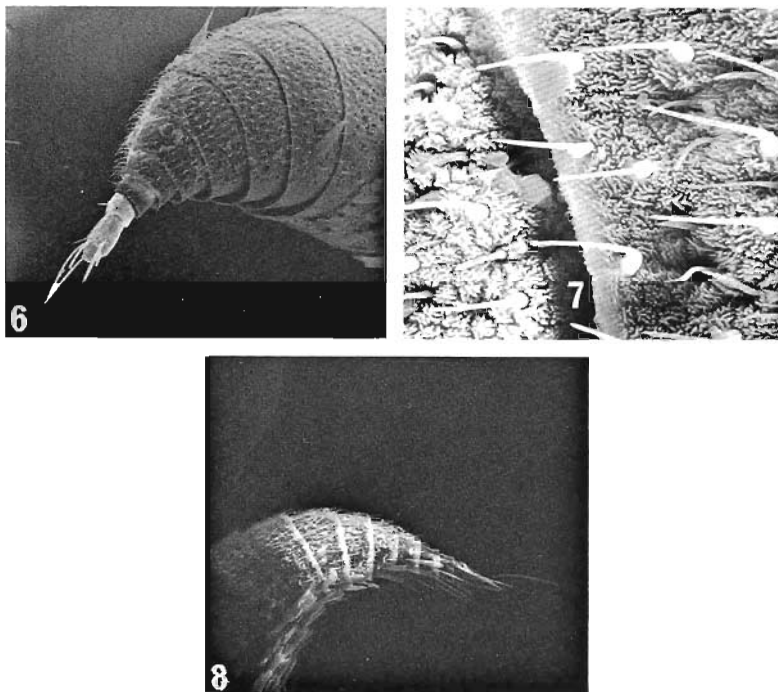
Figures 1-5. *Mirocastnia M. smalli*, new species ♂. (1), wing venation, 2, foreleg, 3, mesothoracic leg, 4, metathoracic leg and 5, palpus (Slide no. 3958, J. Y. Miller) (figs. 1-4, scale line = 1 mm.; fig. 5, scale line = 0.5 mm.)

Female genitalia (Figs. 19, 20): Posterior apophyses one-third longer than anterior apophyses; bursa copulatrix, bulla seminalis and ductus bursae (in part) transparent with no external morphological convolutions; spiculate signa absent. Sterigma with diagnostic sclerotized design; simple dorsad; pleural setal patch adjacent to lamella antevaginalis diagnostic.

Immature stages: Unknown. Eggs (*in situ*) the characteristic, longitudinally, fluted "wheat" shape.

Superficially the wing maculation and general color, especially of the forewing, is similar to a number of brightly colored neotropical hesperiidae, and the reddish-fulvous hair tuft at the end of the abdomen is characteristic of the hesperiid subfamily, Pyrrhopyginae. Thus the species name of *pyrrhopygoides* was indeed appropriate. Houlbert (1918) in his generic revision placed *pyrrhopygoides* in the genus *Athis*, a name already applied by Hübner [1819] to another species complex in the Castniinae. As it will be seen in a forthcoming paper, Houlbert's genus *Athis* (= *Hista* Oiticica, 1955) became somewhat of a refuse can for a number of species, with at least four genera represented. Thus I believe that Houlbert's original designation of *pyrrhopygoides* was based strictly upon the hindwing maculation and its general association with such species as *hegemon* and *boisduvalii* within the generic grouping. With the unrelated subsequent description of *subcoerulea* (Rothschild, 1919) and its placement in the "subgenus" *Schaefferia* (= *Feschaeria*, Oiticica, 1955), the association of the sexes was made even more difficult.

Morphologically the genus *Mirocastnia* lies in a somewhat intermediate position between *Feschaeria* and true *Hista*. Superficially the general appearance, especially in the male hindwing is characteristic of *H. boisduvalii* whereas the forewing maculation of both sexes lends more credence to *Feschaeria* as the closest relative. Labial palpi (Fig 5)



Figures 6-8. 6,7 *Mirocastnia smalli* ♀, 6, apiculus (50x), 7, apiculus sixth segment (150x) illustrating the various types of sensillae present. 8, *Feschaeria amycus*, apiculus (50x)

are similar within the three genera, but the distal segment is longer proportionately in *Mirocastnia* than in either *Feschaeria* or *Hista*. There is no comparative size differential in the thoracic legs among the three genera under consideration. The tarsus in *Mirocastnia* has tapered blunt spines especially distad (Figs. 2,3,4); the blunt heavy spines predominate along the entire tarsus in *Hista* and *Feschaeria*. The large, dense scales so apparent on the tarsus in *Feschaeria* are absent in *Mirocastnia*.

Examination of the antennal club and apiculus showed some interesting comparisons. As Sellier (1972, 1974) has illustrated in numerous papers on the subject, the "nudum" of Rhopalocera and Heterocera is not devoid of embellishment. At least two types of trichoid sensillae are present in *Mirocastnia* (Fig. 7), *Feschaeria* (Fig. 8) and *Hista*. The basiconic sensillae in *Mirocastnia* are significantly reduced in size on segment six (all counts from terminus of apiculus) when compared on the same segment with representatives of the other two genera. *Feschaeria amycus* (Fig. 8) exhibits numerous flattened scales on the recurved portion of the apiculus to the end segment, while these scales are absent in segments 2-4 of the apiculus in *Hista* and 2-6 of *Mirocastnia*. No sexual dimorphism in the morphology of the antennal structures was evident in *Mirocastnia*. Further studies are in progress to ascertain the significance of various antennal sensillae as taxonomic characters in the Castniinae.

Both sexes of *Mirocastnia* are easily separable genitally from other members of *Hista* and *Feschaeria*. In the males of the later two genera, the saccus is well developed and the valvae stout and rounded along the cucullus. In *Mirocastnia* the saccus is markedly reduced and the valvae elongate along the costa with a prominent cleft along the sacculus posteriad. The female exhibits a characteristic sclerotic pattern on the sterigma with an associated pleural setal patch. The ductus bursae is simple as in *Hista* but lightly sclerotized near antrum. The heavily sclerotized spiral ductus bursae commonly found in many of the Castniinae including *Feschaeria* is absent. The bursa copulatrix, bulla seminalis and ductus bursae (in part) are completely transparent in all species within *Mirocastnia* with little or no morphological convolutions on the external surface. Spiculose signa found in *Hista*, *Feschaeria* and a number of other Castniinae are absent. Thus the genitalic characters are especially important in the separation of *Mirocastnia* from its two theoretically closely aligned congeners.

The distribution of the species within this genus (Fig. 9) is basically Andean (Ecuador and Peru) with the new species *smalli* found in Panama. *Hista* and *Feschaeria* are

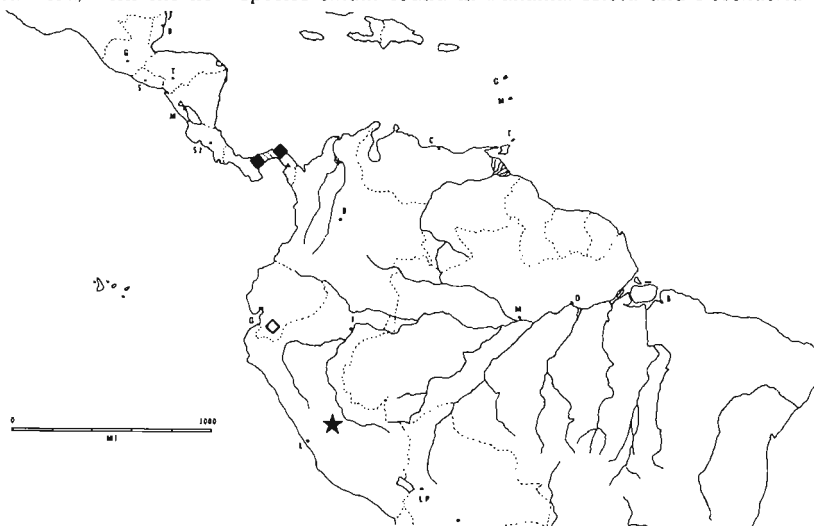


Figure 9. Present known distribution of the genus *Mirocastnia*. Open diamond = *M. pyrrophygoides*, closed diamond = *M. smalli*, and closed star = *M. canis*.

generally found in eastern South America, especially in Brasil. With so few specimens represented in *Mirocastnia* at the present time, no conclusions can be drawn concerning the biogeography of the genus.

Since there is so much confusion surrounding this generic complex, the known species are hereby redescribed along with the description of the new species, *Mirocastnia smalli*. With the paucity of material in the genus and since the confirmation of sexual dimorphism was first recognized in *M. smalli*, this newly described species is designated as the type of the genus *Mirocastnia*. The generic name is derived from the Latin "miror" which is to marvel or to be amazed.

Key to the Species of *Mirocastnia*, J. Miller

1. Forewing transverse semi-hyaline band yellowed; hindwing with fulvous along distal half ..... 2
- 1'. Forewing transverse semi-hyaline band transparent or overscaled with white; prominent iridescent blue scale patch across median hindwing ..... 3
2. Hindwing above with pronounced pale ochreous marking in  $Cu_2-1A$  and  $1A-2A$ ; rayed fuscous-warm brown admixed with rust along lateral margin from  $M_1-M_3$  to anal angle ..... *pyrrhopygoides* (Houlbert) ♂
- 2'. Hindwing above with a reduced pale, ochreous marking in  $Cu_2-1A$  and blackish-brown along the entire lateral margin; isolated fulvous spots in  $Cu_{1a}-Cu_{1b}$  and  $Cu_{1b}-Cu_2$ ; additional dull buff marking end transverse band in  $1A-2A$  on forewing below ..... *smalli*, n. sp. ♂
3. Hindwing above with rust-chocolate brown rayed markings along lateral margin; hindwing below, rayed markings duller with prominent powder blue basad and chocolate to warm brown at anal angle; rust-chocolate brown forewing apex below; abdominal segments 4-8 ringed with fawn anterior each segment ..... *canis* (Lathy) ♀
- 3'. Hindwing above without lateral rayed markings; forewing apex below blackish-brown sprinkled faintly with rust; hindwing sprinkled lightly with iridescent powder blue scales; abdominal segments 4-8 warm brown anterior each segment ..... 4
4. Ground color wings above blackish-brown with two prominent semi-hyaline, circular markings in  $M_3-Cu_{1a}$  and  $Cu_{1a}-Cu_{1b}$  on hindwing above and below; forewing below with no faint dull buff admixed with fuscous marking at distal end transverse band in  $1A-2A$  ..... *pyrrhopygoides* (Houlbert) ♀
- 4'. Ground color wings above blackish-brown with semi-hyaline, bluish, crescent shaped markings in  $M_3-Cu_{1a}$  and  $Cu_{1a}-Cu_{1b}$ ; forewing below with pale buff admixed with fuscous marking at distal end transverse band in  $1A-2A$  ..... *smalli*, n. sp. ♀

*Mirocastnia pyrrhopygoides* (Houlbert), new combination

Plate I (♂, ♀). Text figures, 10 (♂ genitalia), 11, 12 (♀ genitalia)

*Castnia pyrrhopygoides* Houlbert, 1917: 72 (♂). TL- Zaruma, Ecuador. Lectotype here designated, BMNH.

= *Castnia* (*Schaefferia*) *subcoerulea* Rothschild, 1919:18 (♀). TL "Ecuador" Holotype BMNH.

Male: Head and thorax above dark brown; abdomen above, dark brown ringed with muted fulvous, especially posteriad with reddish-fulvous hair tuft end abdomen. Head below fuscous, palpi buff; thorax fuscous overscaled with buff; legs clothed in buff admixed with fulvous on distal margins. Abdomen below fawn ringed with pale fulvous end segments, shading to reddish-fulvous posteriad. Antennae above dark brown, fulvous on club and apiculus; below, buff proximad shading to fulvous admixed with buff distad.

Forewing above, ground color warm olivaceous brown, darkened basad and along anal margin, shading lighter toward lateral margin; markings: prominent yellowed semi-hyaline transverse band from costal margin  $Cu_{1b}$ - $Cu_2$ ; lighter semi-hyaline somewhat yellowed apical markings, one each in  $R_3$ - $R_4$  to  $M_2$ - $M_3$  with largest in  $M_2$ - $M_3$ ; distal margin of apical band heavily outlined in warm brown.

Hindwing above, dark brown basad and especially along anal margin with a discal spotband into  $M_1$ - $M_3$ ; distal two-thirds of wing along costa and lateral margins yellowed-fulvous; pale yellow rayed marking in  $Cu_2$ -1A and 1A-2A; veins darkened in yellowed-fulvous area, especially along lateral margin; lateral margin etched in reddish-brown shading to rust in  $Cu_{1b}$ - $Cu_2$  and  $Cu_2$ -1A.

Forewing below with markings as above; basal half wing dark warm brown, lighter along anal and lateral margins; warm brown overlain with rust at apex and along lateral margin to  $Cu_{1a}$ - $Cu_{1b}$ ; apical markings and transverse band overlain with sparse fulvous scales with distal margin of apical markings heavily outlined in dark brown. Retinaculum clothed in fulvous.

Hindwing below, ground color basad dark brown overlain with fulvous and buff basad and along anal fold; dark brown discal marking above reproduced below in brown overscaled with reddish-brown; reddish-brown along lateral margin, darkened at anal angle; fulvous area as above somewhat reduced in disc and admixed with rust; veins darkened in reddish brown.

Fringes: Forewing above, dark brown, lighter at anal angle; below, reddish-brown at apex shading to light warm brown in  $M_2$ - $M_3$  and toward anal angle. Hindwing above, dark brown along anal and lateral margins with fulvous at anal angle; fulvous admixed with buff  $M_3$ - $Cu_{1a}$ ; below, reddish-brown darkened at 1A-2A; reddish-brown admixed with buff in  $M_3$ - $Cu_{1a}$  to  $Cu_2$ -1A and reddish brown admixed with fulvous at anal angle.

Female: head and thorax above dark brown; abdomen, dark brown and darkened posteriad end segments with dull reddish-fulvous hair tuft end abdomen. Below, head fuscous with palpi clothed in buff heavily admixed with white; eye ringed with white; thorax fuscous overscaled with iridescent powder blue scales especially on prothorax and on tibia; other thoracic segments and leg segments clothed in reddish-brown. Abdomen below, dark reddish-brown; anterior three segments lightly sprinkled with iridescent powder blue scales with remainder of segments ringed distad with dull rust-brown shading to fulvous and tawny posteriad. Antenna above, blackish-brown below blackish-brown mixed with fuscous proximad and shading to reddish-fulvous distad.

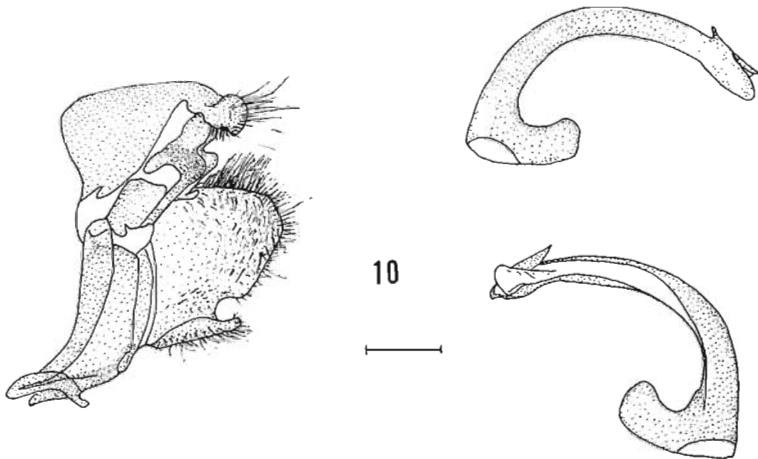
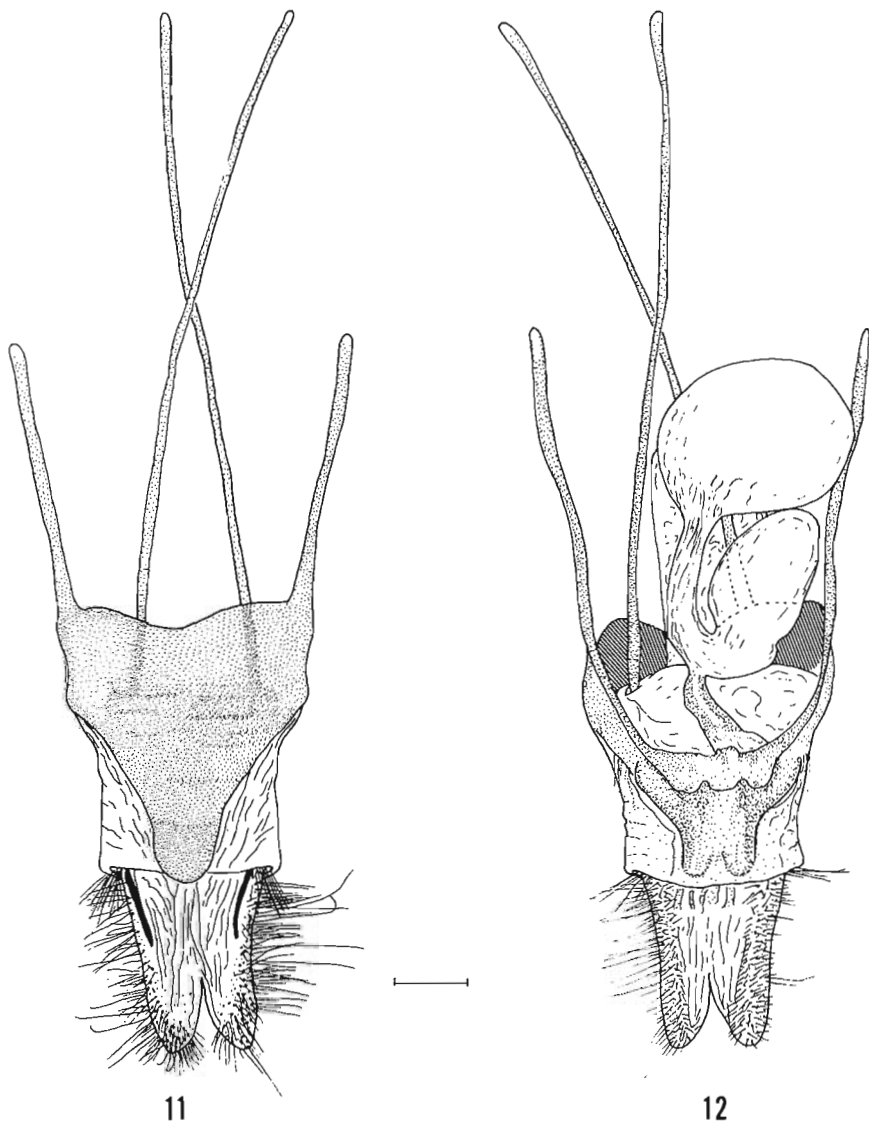


Figure 10. *Mirocastnia pyrrhopygoides* ♂ genitalia. (gen. prep. MV-3437, Lectotype, J. Y. Miller; scale line = 1 mm.)

Forewing above, ground color blackish-brown with markings as in male but semi-hyaline areas are overscaled with white; transverse band extends almost to anal angle. Hindwing above, ground color blackish-brown with a prominent iridescent powder blue patch from near costal margin, across cell to 1A-2A and a pair of semi-hyaline markings overscaled with iridescent powder blue in  $M_3-Cu_{1a}$  and  $Cu_{1a}-Cu_{1b}$ .

Forewing below with ground color blackish-brown basad, lighter along costal and



Figures 11-12, *Mirocastnia pyrrhopygoides* (= *Castnia subcoerulea* Rothschild), ♀ genitalia. 11, dorsal view, 12, ventral view. (gen. prep. MV-3436, J. Y. Miller; scale line = 1 mm.)

lateral margins; distal half of wing toward apex lightly sprinkled with iridescent powder blue scales; semi-hyaline markings as above. Forewing fringe above blackish-brown, lighter at anal angle; below, blackish-brown with blackish-brown admixed with fuscous  $M_2$ - $M_3$  to  $Cu_2$ -1A.

Hindwing below, ground color blackish-brown overscaled with reddish-brown, lighter along costal margin in  $Sc + R_1$  and  $Rs-M_1$ ; a reddish-brown admixed with fulvous circular patch in  $Sc + R_1$ - $Rs-M_1$ , one half distance from base; blackish-brown overscaled with iridescent powder blue basad, especially in cell and along anal margin; distal half of wing sparsely sprinkled with iridescent powder blue scales. Fringes above and below blackish-brown, admixed with buff  $M_1$ - $M_3$  to  $Cu_2$ -1A; reddish-brown along anal margin and at anal angle.



Plate I, *Mirocastnia*. Top, *Mirocastnia pyrrophygoides*. Lectotype ♂ (left half), upper (left) and under (right) surfaces; ECUADOR: Zaruma. Right half, ♀ *M. pyrrophygoides* (= *Castnia subcoerulea*), upper (left) and under (right) surfaces; "Ecuad." Center, *Mirocastnia canis*. Holotype ♀ upper (left) and under (right) surfaces; PERU: Rio Perene. Bottom left, *Mirocastnia smalli*. Holotype ♂, upper (left) and under (right) surfaces; PANAMA: PANAMA: Cerro Jefe ca 900 m.: 11.iii.1977, G. B. Small. Bottom right, *M. smalli*. ♀ Paratype, upper (left) and under (right) surfaces; PANAMA: PANAMA: Cerro Campana, 3500': 2.vii.1970, G. B. Small.



FWL Lectotype of *pyrrhopygoides* 34.5 mm. The FWL of the remaining specimens are 26.6 mm. and 30.3 mm. The female FWL is 29.88 mm. which is somewhat smaller than the 33 mm. as listed by Rothschild in the original description.

The male genitalia as illustrated (Fig. 10) and somewhat miniaturized with a reduced saccus and prominent cleft along the sacculus. Juxta completely sclerotized. Female genitalia (Figs. 11, 12) with the characteristic patterned sterigma, distinct associated pleural setal patch and transparent corpus bursae and bulla seminalis.

The male was described originally from three specimens from the type locality of Zaruma, Ecuador and collected by M. de Mathan, 1891 (Oberthür Colln., BMNH). A BMNH Lectotype label in addition to the following label has been placed on the specimen (ital., handwritten portion), Lectotype/*Castnia/pyrrhopygoides/ Houlbert/* designated by Jacqueline Y. Miller/ 1977." Paralectotype labels have been placed on the remainder of the series.

The Hon. Walter Rothschild described the female under the name *Castnia (Schaefferia) subcoerulea* from a single specimen and it bears a written type label as well as the BMNH Holotype label. The locality label reads simply "Ecuad."

To my knowledge there are no further specimens of *pyrrhopygoides* extant in other collections. Although the male and female association of the above species was unknown at the time of the respective description, evidence presented below supports the relationship at this time.

#### *Mirocastnia canis* (Lathy), new combination

Plate I (♀), Text Figures, 13, 14 (♀ genitalia)

=*Schaefferia canis* Lathy, 1923:225 (♀). TL Rio Perene, Peru BMNH

This species was described from a single female which remains unique in collections today.

Female: Head and thorax above, blackish-brown; abdomen, segments blackish-brown ringed with buff admixed with fulvous especially distad; dull reddish-fulvous hair tuft end abdomen. Below head, blackish-brown with frons, palpi, thorax, tibia and anterior two segments abdomen clothes in fawn overscaled heavily in iridescent powder blue; eye ringed with white; legs proximad clothed in fuscous; remainder abdomen fawn shading to dull reddish-brown with reddish-brown sprinkled with fulvous posteriad. Antennae above and below blackish-brown with dull dark reddish-brown on club below.

Forewing above: ground color dark blackish-brown sprinkled with iridescent olive-green scales especially basad and along anal margin; velvety reddish-brown at apex, sparsely sprinkled with white along lateral margin; semi-hyaline markings overscaled with white as in *pyrrhopygoides* with the apical markings somewhat reduced and transverse band does not extend into 1A-2A.

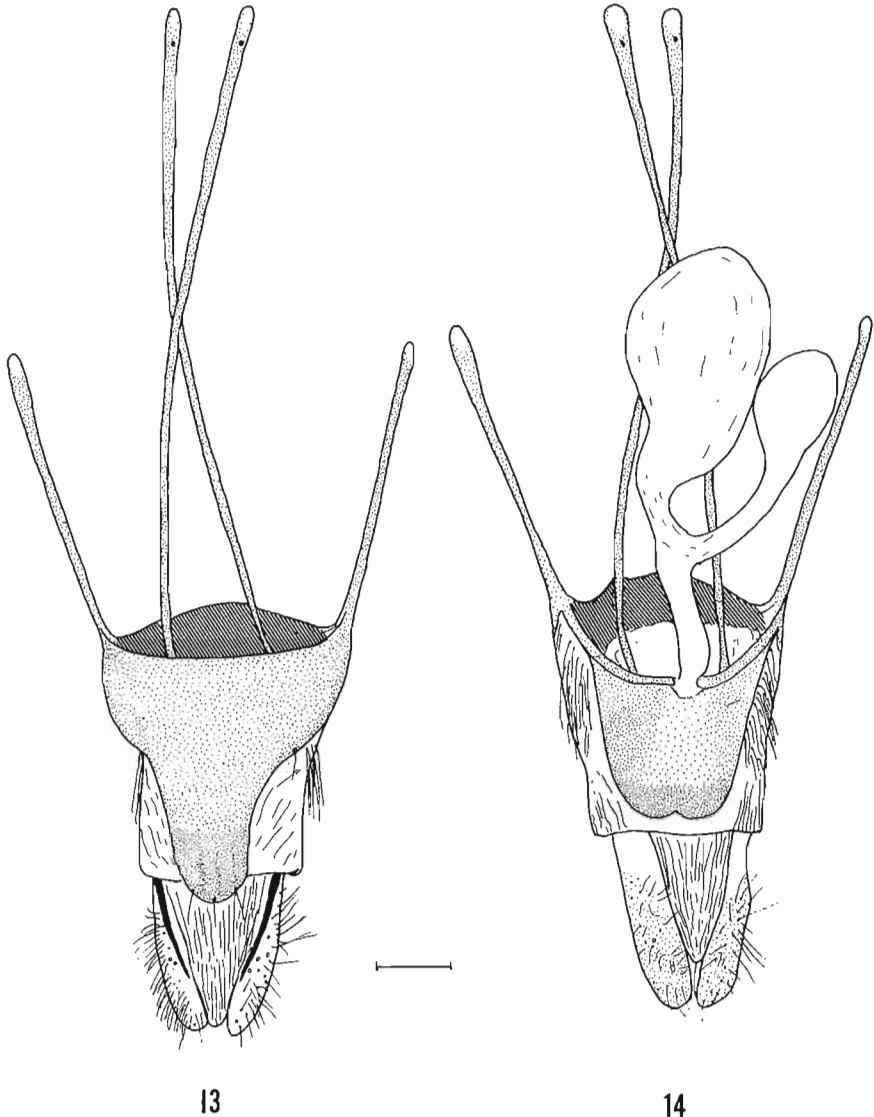
Hindwing above: ground color blackish-brown sprinkled sparsely with dull reddish-brown scales and with a dull reddish-brown rayed marginal band. Iridescent powder blue marking somewhat larger than in *pyrrhopygoides* and *smalli* with markings in  $Cu_{1a}-Cu_{1b}$  and  $Cu_{1b}-Cu_2$  elongate and almost coalesced with the discal iridescent powder blue band.

Forewing below with markings as above; ground color blackish-brown shading to reddish-chocolate brown along the costa to apex and along lateral margin to  $M_2-M_3$ ; wing basad sprinkled with iridescent powder blue with retinaculum clothed in fawn; transverse band extends to  $Cu_{1b}-Cu_2$ . Fringe above blackish-brown sprinkled with buff to transparent scales at anal angle; below blackish-brown sprinkled with rust along costa and along lateral margin to anal angle; fuscous sparsely sprinkled with buff and clear scales at anal angle.

Hindwing below: Ground color dull reddish-brown with rayed marginal band lighter and fainter than above; darker reddish-brown along anal fold and especially at anal angle; iridescent powder blue basad from costal margin across end cell and three-

fourths down anal margin; elongate semi-hyaline markings as above but overscaled with white. Fringes above blackish-brown mixed with rust along costal, anal and in part lateral margins; blue-white from  $M_1$ - $M_3$  to 1A-2A. Below, reddish-brown along costal and lateral margins to  $M_1$ - $M_3$  with blue-white from  $M_1$ - $M_2$  to 1A-2A; darker reddish-brown along anal margin and at anal angle.

Genitalia as illustrated (Figs. 13, 14). The pleural setal patch dorsad is more prominent and denser than in either *smalli* or *pyrrhopygoides* with the sclerotized pattern



Figures 13-14. *Mirocastnia canis* Lathy, ♀ genitalia. 13, ventral view and 14, dorsal view. (gen. prep MV-3435, J. Y. Miller; scale line = 1 mm.)

associated with the ostium bursae diagnostic. Ductus bursae faintly sclerotized distad with remainder ductus bursae, corpus bursae and bulbus seminalis membranous and signa absent. Additional setae are found along lamella postvaginalis than in either *pyrrhopygoides* or *smalli*.

This species was described from a single female. FWL is 29.4 mm. The left forewing below along the costal margin has been repaired with a fuscous wing.

The type specimen bears the following labels: "Rio Perene/Peru Watkins"; a Lathy type label; "Schaefferia/canis Lathy/ Specimen typicum"; another BMNH label, "Joicey Bequest/ Brit. Mus./ 1934-1120."

Lathy noted the close resemblance of *canis* to *pyrrhopygoides* (= *subcoerulea*), but the expanse of iridescent powder blue markings is greater in the present species and the reddish-chocolate brown rayed marginal markings are lacking in both *pyrrhopygoides* and *smalli*. The very prominent iridescent powder blue patch based on hindwing below conveniently separates *canis* from *pyrrhopygoides* and *smalli*. Although unknown, I would expect the male of *M. canis* to exhibit the same color combinations as in the other two species perhaps with the additional rayed reddish-chocolate brown marginal markings.

#### *Mirocastnia smalli*, new species

Plate I (♂, ♀). Text Figures 1 (venation), 2, 3, 4 (legs) 5 (palpus), 6, 7 (antenna), 15, 16 (♂ genitalia), 17, 18 (♀ genitalia), 19, 20 (hindwing scales)

Overall general appearance of species generally darker and somewhat smaller than *M. pyrrhopygoides*.

Male: Head, thorax and anterior three segments abdomen dark brown; remaining abdominal segments dark brown ringed with fulvous posteriad each segment; terminal hair tuft fulvous admixed with dark brown. Below, head fuscous; palpi fuscous admixed with buff; thorax and legs proximad, fuscous admixed with buff; legs distad reddish-brown; abdomen, anterior segments, fuscous admixed with buff, ringed end segment with fulvous, gradually shading to reddish-fulvous ringed with fulvous end segments.

Forewing above: ground color dark blackish-brown with yellowed-fuscous semi-hyaline transverse band broader than in *pyrrhopygoides*; apical markings as in *pyrrhopygoides*. Hindwing above, general wing maculation and color (Fig. 19) as in *pyrrhopygoides* with pale yellow areas in  $Cu_2-1A$  and  $1A-2A$  markedly reduced and sometimes absent in the latter; lateral margin outlined heavily in blackish-brown, coalescing with the median blackish-brown discal band to isolate two fulvous spots in  $Cu_{1a}-Cu_{1b}$  and  $Cu_{1b}-Cu_2$ ; faint tinge of reddish-brown along lateral margin in  $Cu_2-1A$ .

Forewing below: yellowed semi-hyaline markings as above; ground color solid warm brown from base to transverse band and along anal margin with green iridescence in cell; dark warm brown overscaled with reddish-brown at apex and along lateral margin and significantly darker at apex than in *M. pyrrhopygoides*; additional buff overscaled with fuscous marking on transverse band distad in  $1A-2A$ . Retinaculum clothed in dull fulvous. Fringes above and below dark brown with buff from  $Cu_2-1A$  to anal angle.

Hindwing below with general markings as in *pyrrhopygoides*, but with reddish-brown ground color basad darkened; isolated fulvous spots in  $M_1-M_3$ ,  $M_3-Cu_{1a}$ ,  $Cu_{1a}-Cu_{1b}$  and  $Cu_{1b}-Cu_2$ , brown marking in  $1A-2A$  in *pyrrhopygoides*, blackish-brown in *smalli*. Fringes above blackish-brown sprinkled with fulvous along costs, shading to blackish-brown mixed with buff along lateral margin; blackish-brown with rust along anal margin and at anal angle; fringes below, reddish-brown mixed with fulvous along lateral margin with reddish-brown at anal angle; dark brown sprinkled with reddish-brown along anal margin.

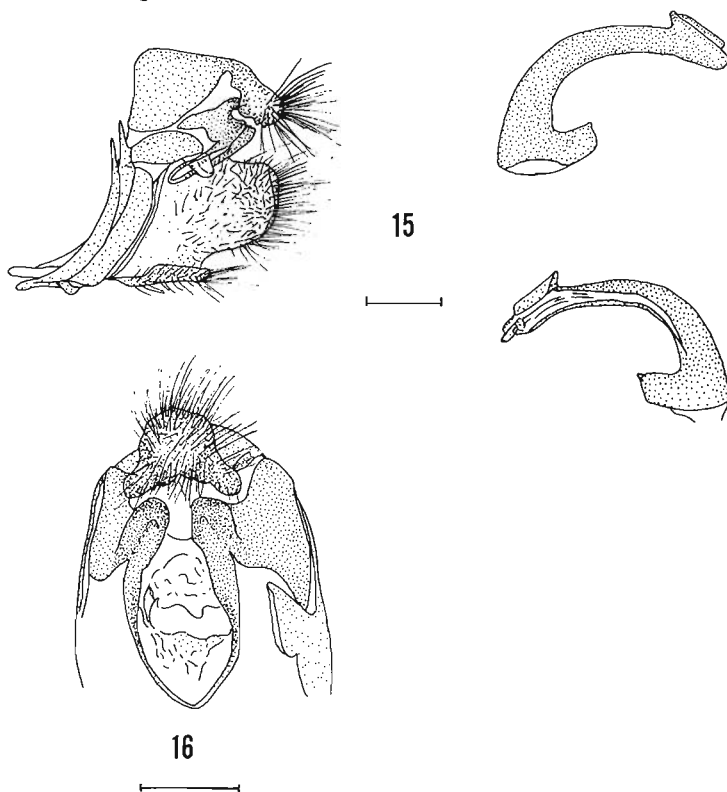
Female: Head, thorax and abdomen above, blackish-brown; below, head fuscous with eye ring and palpi buff. Thorax fuscous overscaled in iridescent powder blue-buff proximad. Abdomen warm brown shading to darker brown end segments ringed with a fringe of buff; reddish-fulvous hair tuft end abdomen.

Forewing above, ground color blackish-brown with semi-hyaline markings as in male

but overscaled with white and transverse band extends to almost anal angle. Hindwing above as in female *pyrrhopygoides* but ground color and iridescent blue patch darkened (cornflower blue, Fig. 20); iridescent blue shades to white along costa margin; semi-hyaline markings overscaled with iridescent blue markedly reduced to crescent-shaped especially in  $Cu_{1a}$ - $Cu_{1b}$  and  $Cu_{1b}$ - $Cu_2$ ; discal markings in  $M_1$ - $M_3$  and  $M_3$ - $Cu_{1a}$  coalesced with discal iridescent blue marking.

Forewing below: ground color blackish-brown, sprinkled basad with iridescent blue and white, gradually shading to warm brown at apex; retinaculum clothed in buff with some green iridescence in cell; frenulum, five bristles; semi-hyaline markings as above with additional buff overscaled lightly with fuscous marking end transverse band near anal angle in 1A-2A. Fringes above and below blackish-brown shading to buff from  $Cu_2$ -1A to anal angle.

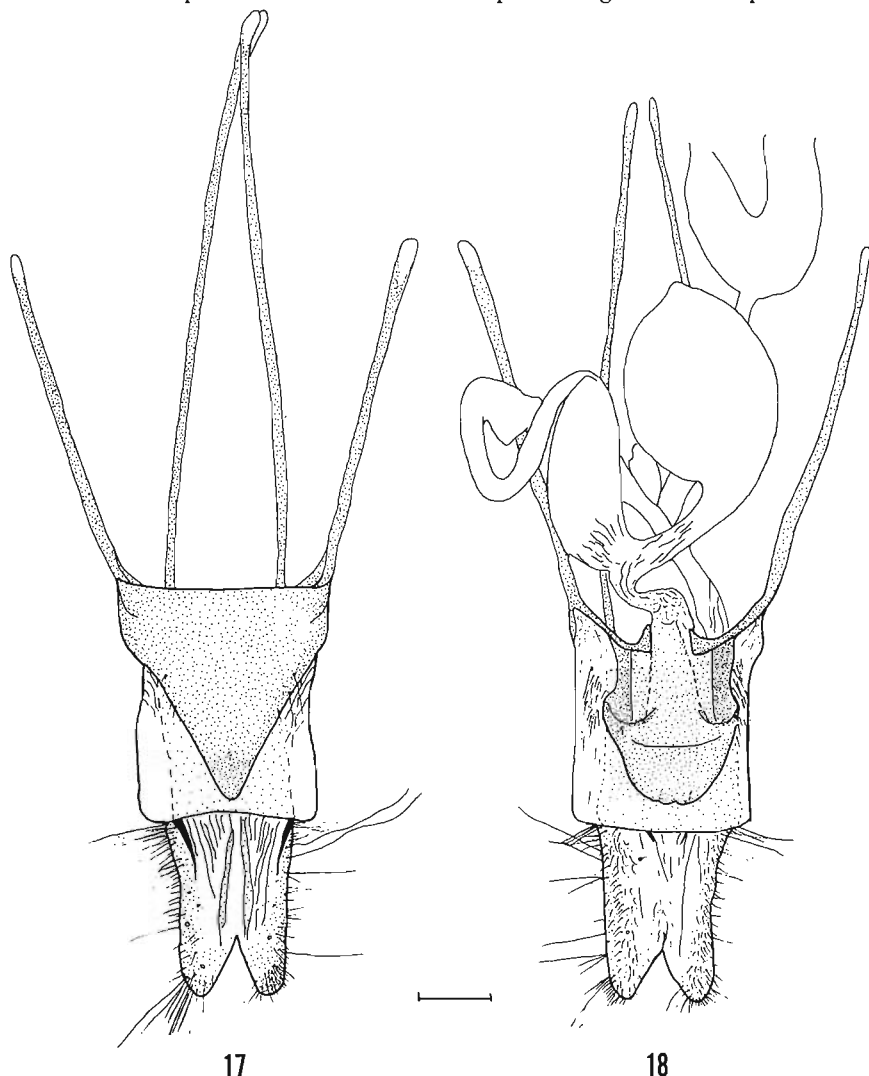
Hindwing below: ground color dark reddish-brown sprinkled with iridescent blue scales basad and along anal fold; markings in  $M_1$ - $M_3$  and  $M_3$ - $Cu_{1a}$  markedly reduced as above; reddish-fulvous circular patch in  $Sc + R_1$ - $Rs$  aligned with markings in  $M_1$ - $M_3$  and  $M_3$ - $Cu_{1a}$ ; faint sprinkling of iridescent blue scales aligned with iridescent blue markings in  $Cu_{1a}$ - $Cu_{1b}$  to give indication of an extradiscal spotband; faint reddish-brown marginal band especially in  $Cu_{1a}$ - $Cu_{1b}$  to anal angle. Fringes above, blackish-brown shading to buff from  $Rs$ - $M_1$  to  $Cu_2$ -1A; blackish-brown along anal margin and at anal angle. Fringes below, dark reddish-brown shading to buff from  $Rs$ - $M_1$  to  $Cu_2$ -1A; anal margin and anal angle blackish-brown.



Figures 15-16, *Mirocastnia smalli*, new species, ♂ genitalia. (gen. prep. MV-4062, J. Y. Miller; scale line 15 = 1 mm.; 16 = 0.5 mm.)

Genitalia: Male (Fig. 15, 16): uncus shallowly bifid sparsely covered with setae and scales; juxta almost completely sclerotized. Valva with costa proximad apparently convex but intervening area membranous with associated setal and scale patch; cuillier somewhat spatulate and covered with long to moderate setae on external and internal margins; sacculus moderately sclerotized with distal margin excavate; saccus bifid and forshortened. Penis recurved and moderately sclerotized with aedeagus simply ornamented.

Female (Figs. 17, 18): Posterior apophyses two-thirds length of anterior apophyses; antrum and one-half ductus bursae lightly sclerotized; remainder ductus bursae, bulla seminalis and corpus bursae membranous with spiculose signa absent. Papillae anales



Figures 17-18. *Mirocastnia smalli*, new species. ♀ genitalia. 17, dorsal and 18, ventral views. (gen. prep. MV-3995, J. Y. Miller; scale line = 1 mm.)

lightly to moderately sclerotized, heavily clothed in setae with longer setae proximad. Sterigma with prominently raised, lightly sclerotized plate and associated pleural setal patch more numerous than in *pyrrhopygoides*; plate dorsad triangular, moderately sclerotized with fewer setae along distal margin of lamella postvaginalis than in *canis*.

Described from 11 specimens, seven males and four females, collected by Gordon B. Small from various localities in Panama.

HOLOTYPE ♂: PANAMA: PANAMA: Cerro Jefe ca. 900m.: 11.iii.1977; PARATYPES: 1 ♂, 1 ♀, same locality and date as Holotype: same locality as Holotype: 1 ♂, 21.iii.1977, 1 ♀, 22.iii.1977, 1 ♀, 13.v.1977; 1 ♀, PANAMA: PANAMA: Cerro Campana, 2500': 2.vii.1970; PANAMA: CHIRIQUI: Cerro Colorado, 1450 m.: 1 ♂, 9.viii.1979; 2 ♂, 10.vii.1979; 1 ♂, 26.viii.1979.

FWL Holotype ♂, 21.5 mm. FWL other ♂ Paratypes range from 21.5-26 mm. with an average of 24.2 mm. FWL ♀ Paratypes range from 19.5 - 29 mm. with an average of 26.3 mm.

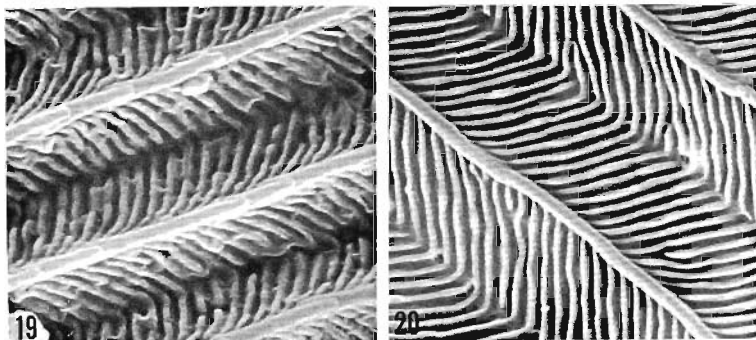
The Holotype male and one female Paratype are deposited in the Allyn Museum of Entomology. The remaining six male and three female Paratypes are deposited in the private collection of Gordon B. Small.

It is with great pleasure that I name this species for Gordon B. Small, who has contributed immensely to our knowledge of Central American Lepidoptera and who collected the type series.

Most of the specimens collected have been taken in an area near Cerro Jefe, a semi-cloud forest habitat, 37 km. northeast of Panama City. According to Small the specimens were collected near the top of the mountain which rises to 980 m. The forest is comprised of a fan palm *Colpothrinax cookii* Robert W. Read and various trees with moss cover in addition to a number of Bromeliaceae with *Chusquea* sp. and *Olyra standleyi* Hitchcock in the understory. The butterfly fauna in general is depauperate with some *Pedaliodes* (Satyridae) and *Argyrogrammana* (Riodinidae). Specimens of *Mirocastnia smalli* are found on the wing from March through August. The general flight pattern is quite similar to some Hesperiididae. They rest and light frequently on bare twigs and the fronds of *C. cookii*, which is known only from Guatemala and Panama. Although some species have been associated with various species of Palmae, the distribution of *Colpothrinax* does not coincide with that of *Mirocastnia*. Small has observed a female frequenting a bromeliad high in these palms and thus Bromeliaceae is more than likely the larval foodplant.

#### Acknowledgements

This study as well as others in progress would not be possible without the close cooperation of collectors and museum personnel. I am indebted to the staff of the Dept.



Figures 19-20, *Mirocastnia smalli*. 19, ♂ hindwing fulvous scale (5,000x). 20, ♀ hindwing iridescent blue scale (5,000x).

of Entomology, British Museum (Nat. Hist.) and especially to Allan Watson, for making the collections and type material available for study. Additional comparative material was obtained from the Strecker collection, Field Museum of Natural History, on loan to this institution. Gordon B. Small, Jr. provided specimens for description as well as habitat information. Dr. Robert Dressler, Smithsonian Tropical Research Institute, Balboa, Canal Zone, Dr. Robert W. Read, Smithsonian Institution, Washington, D. C. and Mrs. Libbe Besse, Marie Selby Botanical Gardens, Sarasota, Fla., provided assistance on botanical identifications and distributions. Photographs for this paper were prepared by our Director, A. C. Allyn. Special thanks are due Dr. J. F. Gates Clarke, U. S. National Museum, Mr. Donald J. Harvey, Mr. Allyn and especially my husband, Lee, for their comments, many of which have been incorporated into this manuscript. This study was supported in part by a grant through the National Museum Act. (#FC-705-91400).

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