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STUDIES IN THE CASTNIIDAE. IV. DESCRIPTION OF A NEW GENUS, *INSIGNIOCASTNIA*

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ABSTRACT: A new genus, *Insigniocastnia*, and species, *taisae*, are described. Comparative morphological examination of these taxa indicates that this genus is closely related to *Hista* and *Athis*, and significant differences are discussed.

KEY WORDS: *Athis, Hista, Mirocastnia, taisae*, Ecuador

In 2005, Dr. Mark Simon obtained three specimens of a very unusual castniid from Ecuador. The wing coloration and pattern are remarkably uncomplicated as compared with other described taxa, and since the series was all males, there were few clues to its generic association. An additional 12 specimens have been subsequently collected with no females to date. Extensive comparative examination of the described genera, type specimens, and subsequent dissections have resulted in the assignment of a new genus, *Insigniocastnia*, to this new species.

***Insigniocastnia*, new genus**

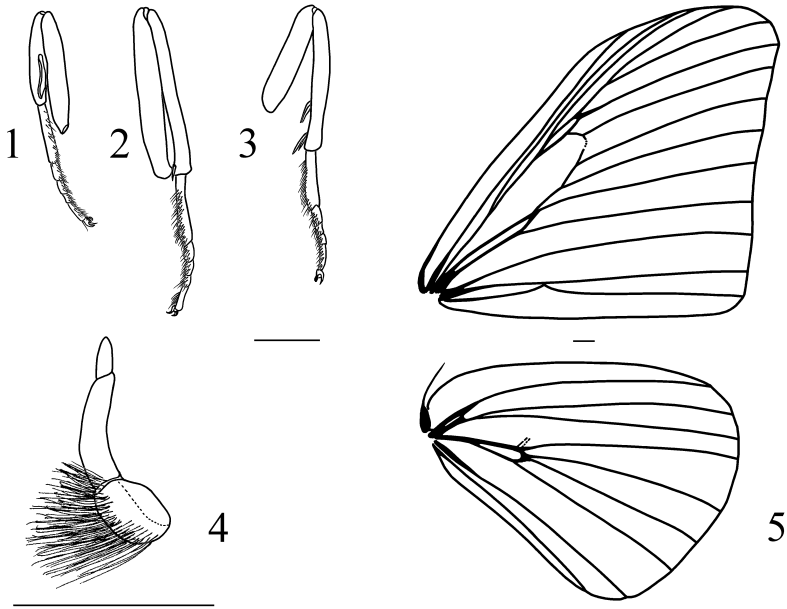
Figs. 1, 2, 3, (legs), 4 (palpus), 5 (wing venation)

Type species, *Insigniocastnia taisae*, new species (see below)

Antenna, more than one-half the length of the forewing costa, comprised of 43 segments; apiculus short, about one-eighth of the expanded club, and nudum. Labial palpi erect (Fig. 4), with proximal segment about equal 2x the length of the distal segment.

Prothoracic leg (Fig. 1), tibia with thin epiphysis more than one-half length of the tibia, and tibia two-thirds length proximal tarsomere; mesothoracic leg (Fig. 2) with tibia and femur equal in length and single pair of tibial spurs; metathoracic leg with femur 0.85x length of the tibia, tibia with two pairs of prominent spurs; tarsi with prominent

spines on all segments, dark rust on the prothoracic leg with black spines on the mid- and hindleg; posttarsal claw distinct with pulvilli and very well developed triangular arolium.



Figures 1-5, *Insigniocastnia*. *I. taisae*, new species. (1), prothoracic leg, (2) mesothoracic leg, (3) metathoracic leg, (4) palpus (line = 0.5 mm), and (5) wing venation. (Dissection M-7916; ii. 2006). All other figures line = 1 mm.

Forewing warm brown with a darker, diffused rectangular marking near end cell; apex rounded, somewhat lobate along the lateral margin; origin of M_1 arises three-fourths distad of the medial radial cell with the origin of M_2 closer to M_3 than to M_1; end forewing cell nearly equidistant between the base and apex; cubital accessory cell approximately one-half length of forewing cell; origin of Cu_{1b} equidistant between Cu_{1a} and Cu_{2a}; 2A arises as a branch of 1A and 3A and is longer than in most Castniidae. Hindwing with prominent reddish fulvous disc and equally large, distinct black band along lateral margin; origins of Rs and M_1 approximately one-half distance to end cell; M_3 and Cu_2 arise near end of cell with Cu_{1a} and Cu_{1b} beyond cell.

Ventrad, forewing dull fulvous, reddish fulvous at base, along subcosta and radius, shading to rust at apex and along lateral margin to M_2-M_3; posterior lateral margin overscaled with dark brown from M_3-Cu_{1a} to anal angle; veins darkend in M_2, M_3, and Cu_{1a}; bright fulvous raised scale tuft along cubitus below retinaculum, and a prominent blackish-brown rectangular mark near end cell. Hindwing, ground color bright reddish fulvous with prominent black band along lateral margin reduced slightly and with faint iridescent blue spot in Cu_2-1A. Additional spots may be evident.

Male genitalia (Figs.8-10): uncus markedly reduced but appearing quadrate in dorsal view; socii present but decreased in size; gnathos not heavily sclerotized; saccus equal in length to the sacculus; penis lightly sclerotized, and recurved.

Female: Unknown.

Immature stages and associated hostplant unknown.

The generic name is derived from the Latin *insignio,* which is defined as distinguished, extraordinary or remarkable. It is indeed a very distinctive member of the Castniidae and truly remarkable that this genus and species were not described previously.

The general wing coloration is uncomplicated and distinctly different, but superficially reminiscent of either *Athis* or *Hista* as defined in Oiticica (1955), and previously reviewed by Houlbert (1917, 1918), Rothschild (1919), Talbot and Prout (1919), or by Miller (1986). The wing coloration of the type species, *Insigniocastnia taisae,* is warm brown, slightly darker along the wing margins but without any hyaline markings, darker postmedian (lateral or oblique) lines, or patches characteristic of both *Athis* or *Hista*. The forewing is not produced as in *Athis, Hista*, or *Mirocastnia* (Miller, 1972*;* Miller, 1980)*,* but rounded. The hindwing, with the bright reddish-fulvous disc outlined with the broad black band along the lateral margin, is quite distinct, yet similar to *Athis rutila*. However, the black marginal band is thinner in *A. rutila* (R. Felder & Rogenhofer) than in *Insigniocastnia*, the forewing has a lateral postmedian line toward the apex, and both wings are overall broader in *Athis rutila*. There is no pronounced extradiscal spotband present as in representative species of *Athis* or *Hista*. On the hindwing below, the black lateral marginal band in *Insigniocastnia* is slightly reduced and laved with reddish-fulvous in M_1-M_3. There are also faint iridescent blue spots (not contiguous) on this marginal band.

The morphology of the labial palpi is quite distinct in comparison to either *Athis* or *Hista* in the respect that the distal segment is a full separate segment and is about one-half the length of the proximal segment with the proximal segment about four-fifths the length of the second segment. In both *Athis* and *Hista*, the second segment is a little more than twice the length of the proximal segment.

The origin of the epiphysis on the prothoracic leg is at the midpoint of the tibia, with the length of the epiphysis about one-half the tibial length. The tibia is three-fourths the length of the femur with the tarsus equal in length to the femur. The femur and tibia are equal in length on the mesothoracic leg with the tarsus approximately four-fifths the length of the femur and tibia. On the metathoracic leg, the femur is approximately four-fifths the length of the tibia with two pairs of articulated spurs. The tarsus is nearly equal in length to the femur and tibia.

The male genitalia of *Insigniocastnia* are distinct. The uncus is markedly reduced, tegumen quadrate distad, and socii and gnathos are weakly developed in comparison with those of *Athis, Hista,* or *Mirocastnia.* The length of the saccus is nearly equal in comparison to the length of the sacculus. The penis of *Athis* and *Hista* are heavily sclerotized and quite elongate with the aedeagus extended. However, based on the hindwing configuration, *Insigniocastnia* is more closely aligned with *Athis* and *Hista.*

The geographic distribution for this genus is currently restricted to lowland Esmeraldas, Ecuador. This is quite remarkable inasmuch as numerous collectors have devoted years to collecting in this province without having collected or observed this species.

Insigniocastnia taisae, new species

Figs. 6 (dorsal view), 7 (ventral view), 8-10 (♂ genitalia)

Male: Head above, dark rust brown admixed with bluish-green scales; eyelash sparsely etched in tawny; antennae, dark rust brown, with the antenna comprised of 43 segments (flagellum, 21, nudum, 16, apiculus, 6). Prothorax, dark brown admixed with iridescent bluish-green scales; tegulae, dark brown proximad, mixed with iridescent blue-green setae and scales distad; mesothorax, dark brown with lighter rust brown setae; metathorax, dark brown with iridescent blue-green scales and setae; abdomen blackish brown, lighter end segments, especially on A3-A7, with reddish fulvous hair tuft at end abdomen. Head below, frons dark rust brown and two fulvous scale patches ventrad; palpi, dull fulvous on proximal segment, admixed sparsely with dark brown and fulvous on second segment, and with rust, fulvous, and tawny on distal segment. Thorax, dark brown admixed sparsely with dull rust fulvous along ventral line and prothoracic legs rust fulvous with rust spines and setae on tarsus; mesothoracic and metathoracic legs, dull rust fulvous with tarsi darker reddish brown and with prominent black spines. Abdomen below, reddish fulvous and along lateral line, slightly darker end segments; hair tuft at end of abdomen fulvous admixed with tawny.

Forewing above, warm brown, with slightly darker brown along lateral margin, around anal angle and along anal margin, with darker, raised elongate pheromonal scale patch along anal margin, approximately one half distance from base; diffuse rectangular marking near end of cell. Hindwing above, bright reddish fulvous with prominent black band along the lateral margin from Rs-M_1 to anal margin; raised reddish fulvous scale patches in Cu_2-1A and 1A-2A from base of cubitus to black marginal band; single faint violet-blue spot on black band in Cu_2-1A.

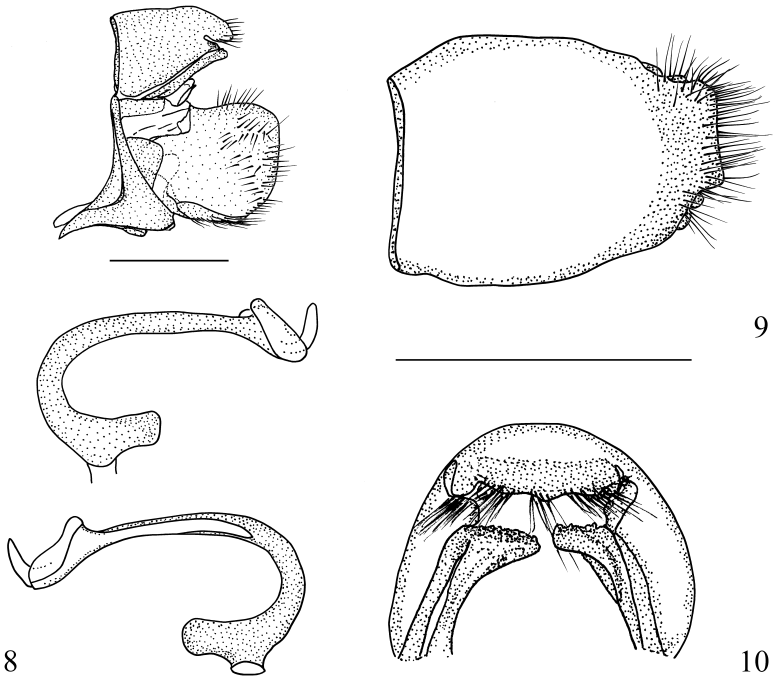
6 7

Figures 6-7, *Insigniocastnia taisae*, new species. Holotype ♂, 6, dorsal view, 7 ventral view.

Ventrad, forewing ground color dull fulvous with reddish fulvous at base and along subcosta and radius, shading to rust at apex and along anterior lateral margin to M_2-M_3, paler along anal margin; posterior lateral margin overscaled with dark brown from M_3-Cu_{1a} to anal angle and veins darkened in M_2, M_3, and Cu_{1a}; pale, bright fulvous raised scale tuft along cubitus below retinaculum and a prominent blackish-brown rectangular mark near end of forewing cell. Hindwing, ground color bright reddish fulvous with black band along lateral margin slightly reduced; iridescent blue-spot in Cu_2-1A and faint

indications of similar spots in M_3-Cu_{1a} and Cu_{1a}-Cu_{1b}. Fringes on forewing above dark brown with a few pale gray scales, nearly transparent near anal angle. Similar below. Hindwing fringes above bright reddish fulvous along costal margin to Rs-M_1, shading to black along lateral margin, anal angle, and one-third up anal margin shading the rust fulvous toward base.

Male genitalia as figured (Figs.8-10) with uncus markedly reduced, tegumen quadrate and compact, and socii and gnathos weakly developed; saccus is reduced and equal in length to the sacculus; penis lightly sclerotized, recurved and reduced in size.



Figures 8-10, *Insigniocastnia taisae*, ♂ genitalia. 8, lateral view (line = 1 mm). 9, dorsal view, uncus and tegumen. 10, posterior view uncus and tegumen (line = 0.5 mm).

Forewing length Holotype ♂= 17.5 mm; forewing lengths of remaining 14 male Paratypes ranges from 17.0 mm to 24.3 mm for an average of 20.2 mm.

Described from 15 ♂♂ specimens from lowland Ecuador; ♂ genitalia preparations (Nos. M-7914, M-7915 Jacqueline Y. Miller).

HOLOTYPE ♂: ECUADOR: ESMERALDAS: San Lorenzo, San Francisco; 150 m., ii. 2006. PARATYPES: All ECUADOR: same locality as Holotype; 3 ♂♂ iv.2005; 11 ♂♂, ii.2006.

The Holotype and 10 paratypes are deposited in the collection of the McGuire Center for Lepidoptera and Biodiversity. The remaining four specimens are deposited in the private collection of Dr. Mark J. Simon.

It is with great pleasure that I name this species *taisae* after the daughter of the collector, Ismael Aldas, who has been able to obtain an uncanny number of this species new to science.

The above description of this new species is based on the facies of the fresh holotype specimen. There is slight variation in the wing facies among the specimens within the type series, with the latter due to age and with the variability in size, perhaps related to availability of larval foodplant. According to Sr. Aldas, this species is notably a very fast flier in the canopy, usually in sunny areas. The warm dark brown ground color of the forewing in fresh specimens has two layers of scales that are apparently lost with rapid flight and age. Thus, the forewing ground color in older specimens (Figs. 6, 8) quickly becomes a lighter rust color with the wing veins, especially on the distal third of the wing, very pale. The pheromonal patch along the forewing anal margin is more evident in older specimens.

The presence of the iridescent bluish-violet markings in the black lateral marginal band of the hindwing above is very faint, usually with a single spot in Cu_2-1A. Ventrad, these iridescent blue-violet markings may range from faint, but not contiguous extradiscal spots in M_3-Cu_{1a} to 1A-2A in fresh specimens, three markings in Cu_{1a}-Cu_{1b} to 1A-2A, two markings in M_3-Cu_{1a} and usually the single spot in Cu_2-1A.

There are at least two broods a year with specimens collected in both February and April. The forewing length of the type series is quite variable ranging from 17.0-24.3 mm with the forewing length in most specimens, 20 mm.

Sr. Aldas collected representative specimens over two years in the hope that he would obtain a female. The wing maculation patterns and dissection of the genitalia in females perhaps would provide additional clues as to the generic alignment of this species. However, this has not happened, and this description is completed in the hope that someone may collect a female in the very near future.

Acknowledgements

I would like to thank Sr. Ismael Aldas and Dr. Mark J. Simon for their patience and for providing the type series of this interesting new species for description. *Castnia* (s. l.) are not that easy to obtain in good condition, and I sincerely appreciate the opportunity to have the long series on which to describe the variation. George T. Austin, Dr. Simon and my husband and colleague, Dr. Lee D. Miller, provided comments on the original manuscript. This manuscript was also forwarded to two external reviewers for additional comments, many of which were incorporated into this published version. The author would also like to acknowledge the efforts of Delano Lewis, Deborah Matthews Lott, and Dona-Marie Mintz for their efforts on the production of this publication.

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