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Review of Costa Rican *Venadicodia*, with descriptions of two new species and localities for *V. ruthea* (Lepidoptera: Limacodidae)

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Abstract: We provide descriptions of the males and females of four species of the Latin American genus *Venadicodia* that occur in Costa Rica. Two species, *V. poguei* and *V. caneti*, are new, while three species are known exclusively from Costa Rica at this time. *V. ruthea*, described without a type locality and previously of unknown distribution, is found to occur in Costa Rica. We give the first descriptions of the genitalia and the smooth larva of *Venadicodia*, which places this genus in the *Prolimacodes* complex. Larvae of *V. caneti* are found on the hostplant *Ocotea veraguensis* (Lauraceae) and are parasitized by *Austrophorocera* sp. (Tachinidae).

Key words: Limacodidae, Venadicodia, larva, food plant.

The poorly known neotropical genus *Venadicodia* was described by Dyar (1920). Dyar (1935) wrote brief redescriptions of the genus and its three species. Schaus (1940) described a fourth species, *Venadicodia cetiona*. *Venadicodia* belongs in the *Prolimacodes* complex (Epstein, in press), a group known to have cryptic late-instar larvae with a smooth dorsum that is laterally convex or triangulate. In addition to *Prolimacodes*, other genera in the complex known to have similar larvae include *Semyra* (Epstein, in press). Adult characteristics shared between *Venadicodia* and *Prolimacodes* include filiform male antennae and a horizontally curved aedeagus, both putative synapomorphies. The South American genus *Claphidia*, which presently has one species (Epstein and Becker, 1994), is another closely related genus. It also has filiform antennae and a dark patch of scales with a white medial spot on the forewing, though it shares genitalic similarities with *Semyra*. Another lineage of Neotropical limacodids with similar larvae in late instars is the *Perola* complex, whose only obvious difference is an anterior and posterior appendage on the dorsum.

SPECIMENS STUDIED

Specimens examined in this study are from the following collections: Instituto Nacional de Biodiversidad (INBio); Natural History Museum of Los Angeles Co. (LACM); National Museum of Natural History, Smithsonian Institution (USNM); Carnegie Museum of Natural History (CMNH).

Paratypes or additional voucher material not found in the USNM and INBio collections will be deposited at each institution following the completion of the Handbook of Costa Rican Limacodidae. Additional types will be deposited in their original collections (e. g., LACM, CMNH). INBio bar codes (CB: INBIOCRI) indicated under "material examined" are for data base purposes only and do not indicate the

collection of deposition. Geographic coordinates (Lambert system) are indicated by LN or LS numbers associated with the bar codes.

Venadicodia Dyar, 1920

Type-species: *Lithacodes albipunctata* Schaus, 1920, Proc. U. S. natn. Mus. 57: 149.
Diagnosis.—Antennae filiform. Forewing often with dark patch of scales at base to end of discal cell, with a white spot on distal margin; R3 and R4 stalked off of R2 or R5 (proximal to R2). Hindwing has Sc+R1 separate from discal cell with R1 visible as in *Prolimacodes*. *Claphidia* with R3 and R4 stalked off of R2 more apically. Distal portion of aedeagus laterally sinuate. Valva with costa and cucullus weakly sclerotized, covered with dense setae; cucullus round; sacculus a narrow sclerotized band compared to *Claphidia*, pointed at distal end, though broadly joined with cucullus. Tibial spur formula 0-2-4.

Venadicodia poguei sp. n.

(Figs. 1, 2, 3, 10, 16, 18, 19, 20)

Adult male (Fig. 19). Forewing length 13 mm. Veins R3 and R4 stalked off of R5 (Fig. 18). Ground color of wings and body dark brown. Forewings brown with a dark patch neither circular nor contrasting as in *V. caneti*, covering the discal cell and reaching to the 1A+2A vein. Small patch of white scales found on CuP vein at exterior margin of the dark patch. Second small patch of white scales found between M1 and M2 veins in postmedial area. Exterior part of medial area, just as postmedial and marginal areas, are streaked with light and dark brown. Hindwings dark brown. Labial palps long, at least 3X the length of the eyes and pointing upwards. Reduced proboscis. Ventral part of body brown with cream colored scales intermingled.
Adult female (Fig. 20). Forewing length 13.5 mm. Similar to male in both coloration and patterns.

Macho adulto (Fig. 19). Longitud de las alas anteriores 13 mm. Venas R3 y R4 ramificándose de R5 (Fig. 18). Color base de las alas y el cuerpo, pardo oscuro. Alas anteriores pardas con una parche oscuro, ni tan circular ni tan contrastante como en *V. caneti*, cubriendo la celda discal y alcanzando la vena 1A+2A. Un pequeño parche de escamas blancas se encuentra sobre la vena CuP en el margen exterior del parche oscuro. Un segundo parche de escamas blancas se encuentra sobre el área postmedia entre las venas M1 y M2. La parte exterior del área media, así como el área postmedia y marginal son veteados de pardo claro y oscuro. Alas posteriores pardo oscuras. Palpos labiales largos, al menos tres veces el largo del ojo y dirigidos hacia arriba. Probóscide reducida. Parte ventral del cuerpo parda con escamas crema entremezcladas.
Hembra adulta (Fig. 20). Longitud de las alas anteriores 13.5 mm. Similar al macho en patrones y coloración.

Male genitalia (Figs. 1, 2, 3). Uncus claw proximate to apex. Gnathos simple, gradually downcurved to apex. Valva with costa and sacculus a narrow sclerotized band at the end of the valva. Transtilla forked (gnathos fits between). Juxta sclerotized below. Aedeagus curved transversely from right to left, reaching left valva; two processes at apex long and recurved to right. Female genitalia (Fig. 10). Bursa copulatrix: antrum long and sclerotized, curved at right angle in basal third, from left to right, distal portion of ductus short and membranous, rounded above near distal end of the antrum, and narrower at connection with corpus bursae; corpus bursae sclerotized at base and rugose; signum round and small. Ductus seminalis connects with rounded portion of ductus bursae beyond the antrum. Ostium bursae smooth texture, concave and contiguous with curved anteroventral lobes; lobe posterior to ostium bursae large but weakly sclerotized. Papillae anales diskhaped. Pair of sclerotized lobes on anteroventral part of eighth segment hollow, smooth and medially curved. Lateral lobes absent. Anterior apophyses extremely short, supplanted by sclerotized lobes.

Genitales del macho (Figs. 1, 2, 3). Uncus con una espina próxima al ápice. Gnathos simple, curvándose gradualmente hacia el ápice. Valva con una banda angosta esclerotizada en la costa y el sacculus hasta el extremo de la valva. Transtilla ahorquillada (con el gnathos en medio). Juxta esclerotizada por debajo. Aedeagus curvado transversalmente de derecha a izquierda, alcanzando la valva izquierda; con dos procesos largos en el ápice recurvados hacia la derecha.

Genitales de la hembra (Fig. 10). Bursa copulatrix: antrum largo y esclerotizado, curvado en ángulo recto en el tercio basal, de izquierda a derecha, porción distal del ductus corto y membranoso, redondeado por encima cerca del extremo distal del antrum, y extrechándose en la conexión con el corpus bursae; corpus bursae rugoso y esclerotizado en la base; signum redondo y pequeño. Ductus seminalis conectado a la porción redondeada del ductus bursae más allá del antrum. Ostium bursae con textura lisa, cóncavo y contiguo al lóbulo curvado anteroventral; lóbulo posterior al ostium grande y poco esclerotizado. Papillae anales en forma de disco. En la parte anteroventral del octavo segmento hay un par de lóbulos esclerotizados, huecos, lisos y un poco curvados. Lóbulos laterales ausentes. Apophysis anterior extremádamente corto, suplantado por los lóbulos esclerotizados.

Remarks: Known only from Costa Rica. The distinctive corpus bursae suggests a close relationship with *V. caneti*. The second author has dedicated the species name to Michael G. Pogue, who encouraged him to work on moths.

Comentarios: Conocida solo para Costa Rica. El distintivo corpus bursae sugiere una cercana relación con *V. caneti*. El segundo autor dedica el nombre de esta especie a Michael G. Pogue, quien lo animó a trabajar con polillas.

Distribution: Know only from Costa Rica.

Material examined (2 specimens, 1♂, 1™)

Holotype ♂, **Costa Rica:** PUNTARENAS: Prov. Puntarenas: Las Cruces Field sta. OTS, 4 mi. S. San Vito, 26-27 June 1972, C. L. Hogue & J. Dockweiler (LACM)(LS 304500 - 577500)(CB: INBIOCRI001120407).

Paratype. **Costa Rica:** LIMÓN: Rio Sardinas, 10m, R. N. F. S. Barra del Colorado, Prov. Limón, 1 ™, 21 a 24 abr 1993. F. Araya, (INBio)(LN 291500 - 564700)(CB: INBIOCRI001299106).

***Venadicodia caneti* sp. n.**

(Figs. 4, 5, 11, 16, 21, 22, 27, 28)

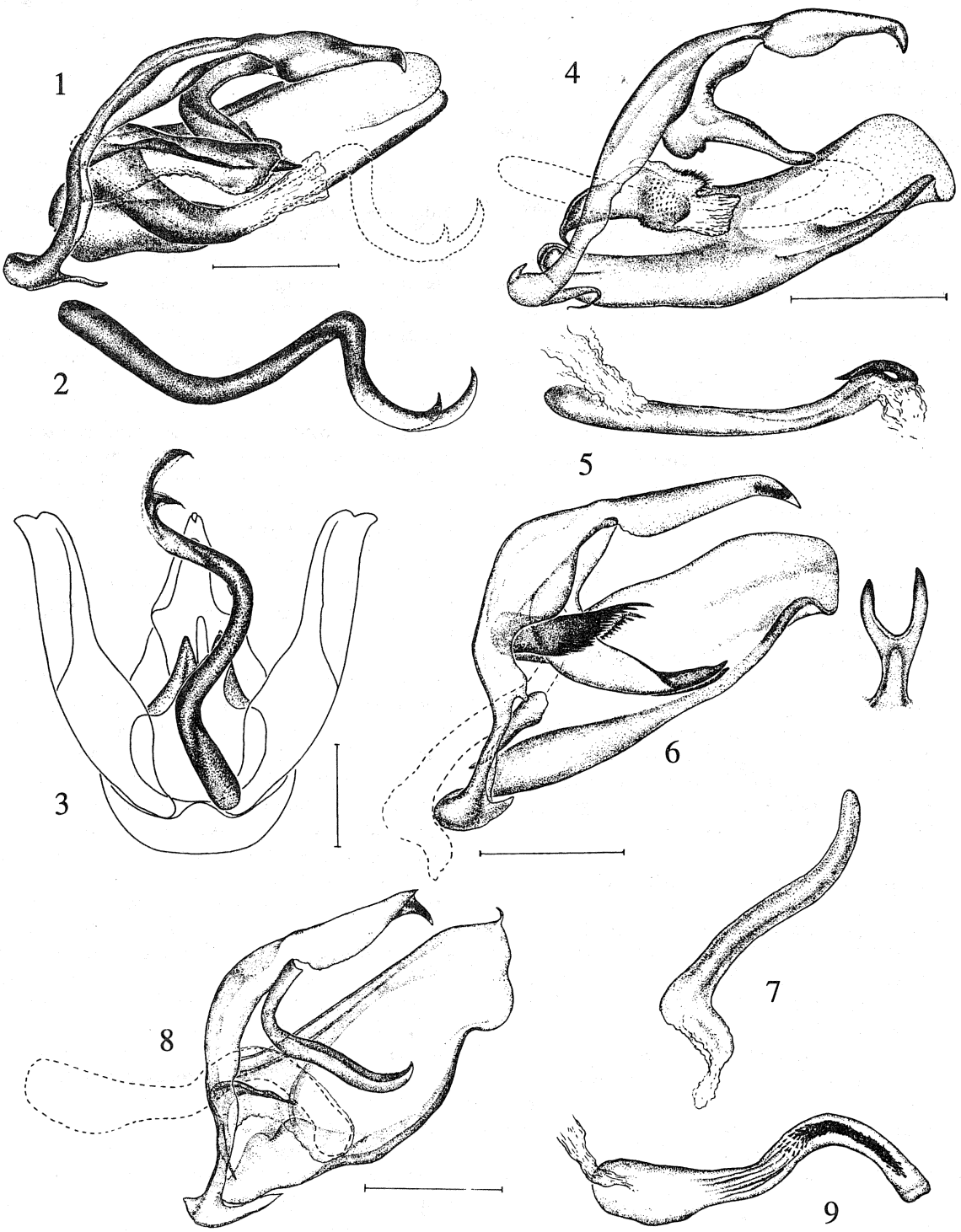
Adult male (Fig. 21). Forewing length 11 mm. R veins as in *V. poguei* (Fig. 16). Ground color of wings and body dark brown. Forewings brown with almost circular dark patch beginning on postbasal area, covering the greater part of the discal cell, reaching CuP vein, but not extending to costal and anal margins. Small patch of white scales found on CuP vein, in medial area and between the juncture of the M1 and M2. Exterior part of the medial area, just at the postmedial and marginal area, is streaked with light and dark brown, with small spots on veins of the marginal area, highly accentuated on apex. Hindwings dark brown. Labial palps long, at least 3X the length of the eyes and pointing upwards. Reduced proboscis. Ventral part of body dark brown with cream colored scales intermingled.

Adult female (Fig. 22). Forewing length 11-12 mm. Similar to the male in both coloration and patterns.

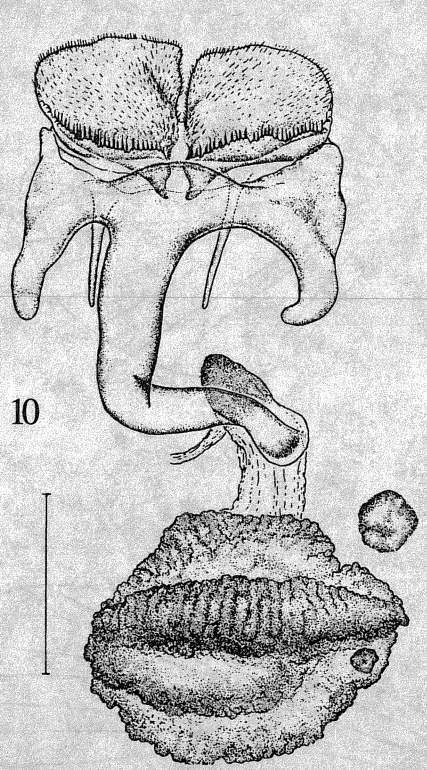
Macho adulto (Fig. 21). Longitud de las alas anteriores 11 mm. Venas R como en *V. poguei* (Fig. 16). Color base de las alas y el cuerpo, pardo oscuro. Alas anteriores pardas con un parche oscuro casi circular comenzando en el área postbasal, cubriendo en gran parte la celda discal, alcanzando la vena CuP, pero no extendiéndose hasta los márgenes costal y anal. Sobre la vena CuP en el área media y entre la conjunción de las venas M1 y M2 hay un pequeño parche de escamas blancas. La parte exterior del área media, así como el área postmedia y marginal, es veteada de pardo claro y oscuro, con pequeñas manchas sobre las venas del área marginal, acentuándose sobre el ápice. Alas posteriores pardo oscuras. Palpos labiales largos, al menos tres veces el largo del ojo y dirigidos hacia arriba. Probóscide reducida. Parte ventral del cuerpo pardo oscura con escamas crema entremezcladas.

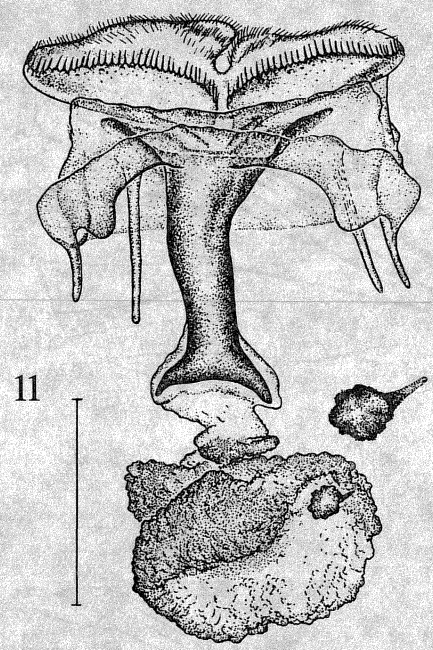
Hembra adulta (Fig. 22). Longitud de las alas anteriores 11-12 mm. Similar al macho en patrones y coloración.

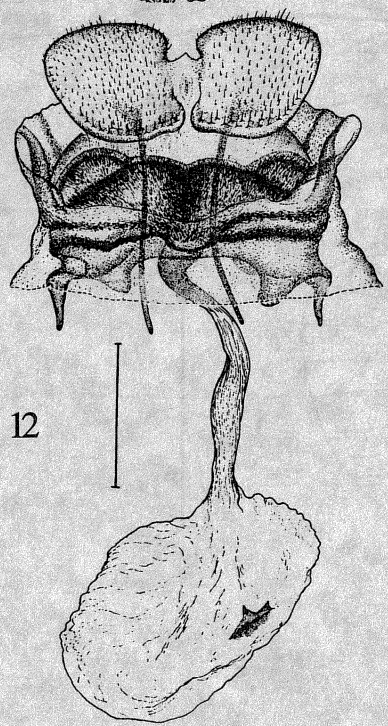
Male genitalia (Figs. 4, 5). Uncus with claw at tip, downcurved and short below. Gnathos short, not reaching midpoint of uncus, arm projecting at an oblique angle downward, basal portion capitate below, distal fourth directed more horizontal than

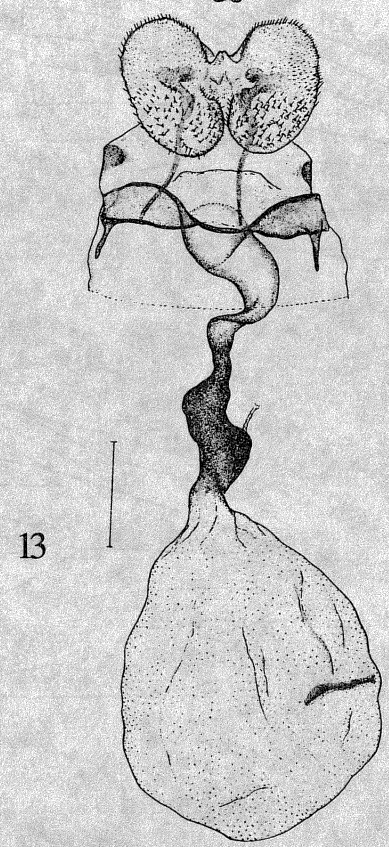


Figures 1-9. Male genitalia (lateral views with left valva removed). 1-3, *Venadicodia poguei*, new species: 1, lateral view of genitalia; 2, aedeagus; 3, ventral view (holotype, CB: INBIOCRI001120407); 4-5, *Venadicodia caneti*, new species: 4, lateral view; 5, aedeagus (paratype, CB: INBIOCRI001120409); 6-7, *Venadicodia ruthaea*: 6, lateral view (detail of ventral view of gnathos); 7, aedeagus (CB: INBIOCRI001652700); 8-9. *Venadicodia denderia*: 8, lateral view; 9, aedeagus (CB: INBIOCRI001120399). (scale=1 mm).

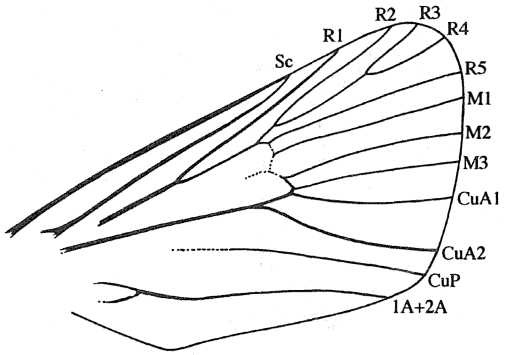








Figures 10-13. Female genitalia (ventral view). 10, *Venadicodia poguei*, new species (detail of signum)(paratype, CB: INBIOCRI001299106); 11,*Venadicodia caneti*, new species (detail of signum)(paratype, CB: INBIOCRI001120810); 12, *Venadicodia ruthaea*: (CB: INBIOCRI000678438); 13,*Venadicodia denderia*: (CB: INBIOCRI001120398). (scale=1 mm).



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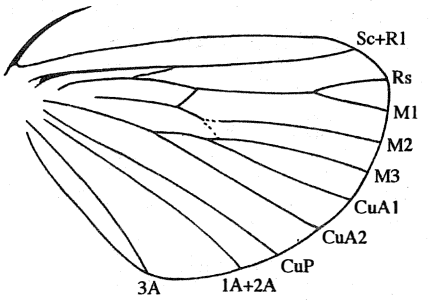

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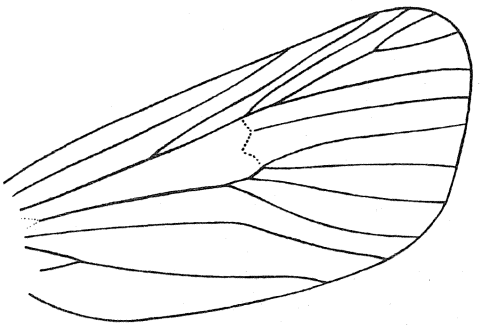

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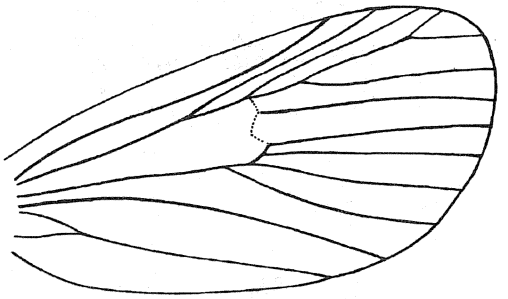

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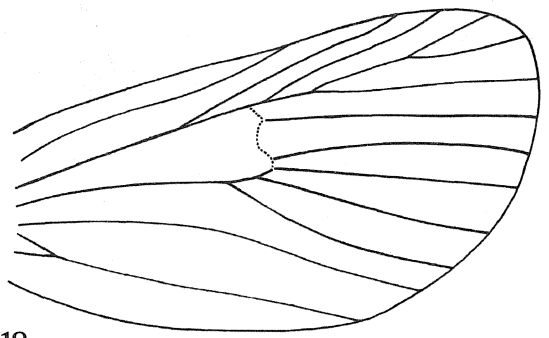

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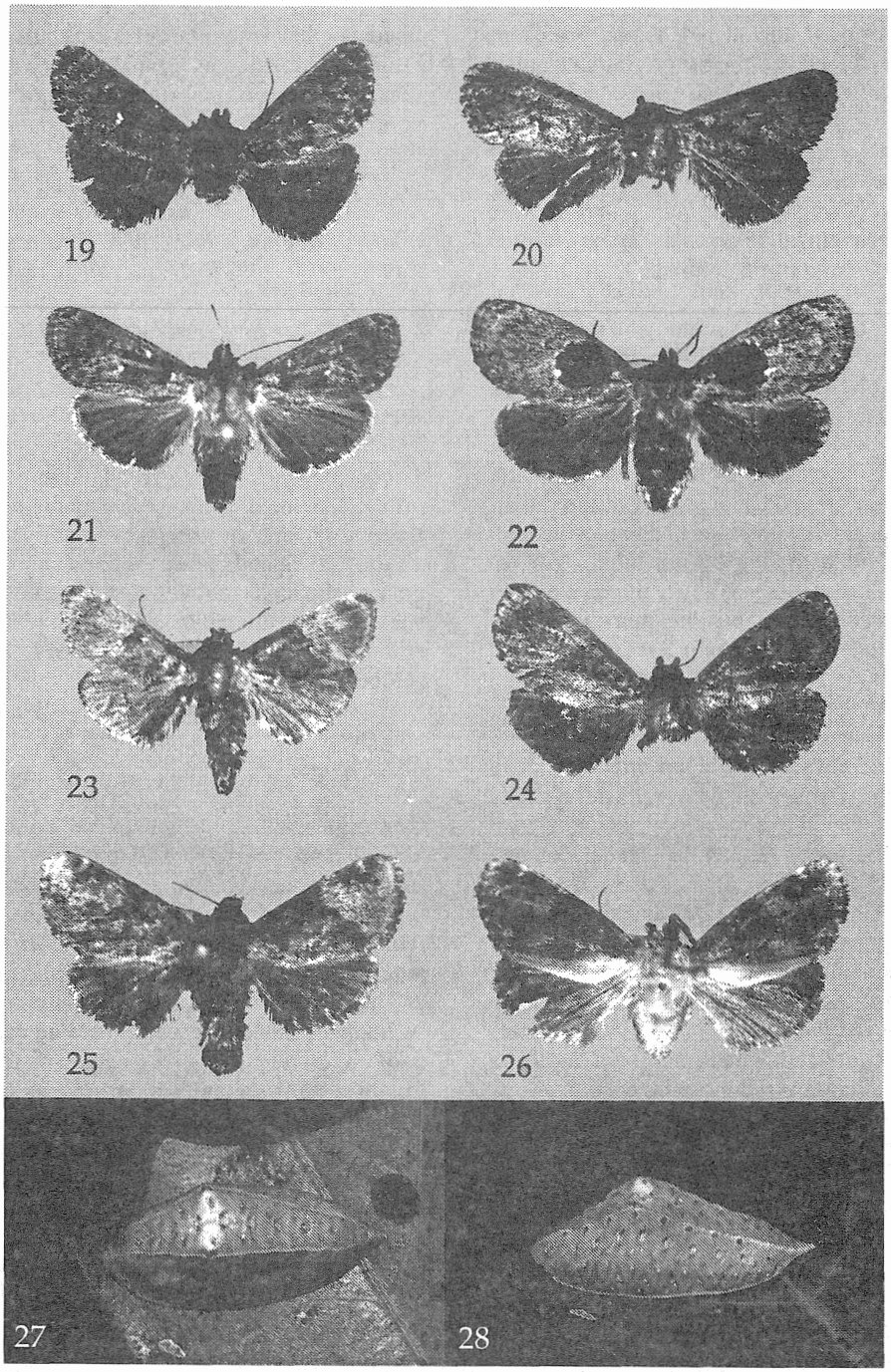
Figures 14-17. Wings venation of Costa Rican *Venadicodia*. 14-15, *Venadicodia denderia*; 14, forewing; 15, hingwing; 16, forewing of *Venadicodia caneti*, new species; 17, forewing of *Venadicodia ruthaea*; 18, forewing of *Venadicodia poguei*, new species. (scale=5 mm).



Figures 19-28. 19-20, *Venadicodia poguei* new species: 19, male (type, CB: INBIOCRI001120407); 20, female (paratype, CB: INBIOCRI001299106); 21-22, *Venadicodia caneti*, new species: 21, male (type, CB: INBIOCRI001147146); 22, female (paratype, CB: INBIOCRI001121281); 23-24, *Venadicodia ruthaea*: 23, male (CB: INBIOCRI001120408); 24, female (CB: INBIOCRI000678438); 25-26, *Venadicodia denderia*: 25, male (CB: INBIOCRI001121082); 26, female (CB: INBIOCRI001354390). 27-28, Larva of *Venadicodia caneti* new species (Janzen Voucher Specimen: 93.SRNP.2868 (CB: INBIOCRI001147149).

basal portion of the arm. Valva: sacculus sclerotized to apex, forming short rounded apical spine; costa with sclerotized band not reaching apex of valva. No transtillar lobes present. Juxta plate sclerotized, spinulose in distal portion near anellus; anellus covered with short setae above. Aedeagus relatively straight, curved to right, with single lateroventral process at apex directed anteriorly, dorsum of tip serrated.

Female genitalia (Fig. 11). Bursa copulatrix: antrum of ductus bursae long and straight sclerotized tube, somewhat bifurcate at base and distal end, unsclerotized portion of ductus bursae much shorter; corpus bursae highly rugose internally, with both basal and distal end collapsed inwardly, base of corpus bursae with a little sclerotization around the insertion of the ductus bursae (appear to be sclerotized spinules inside); signum round with single long spine. Ductus seminalis connects to ventral part of the membranous ductus bursae near its base, proximate to antrum. Ostium Bursae round and continuous with antrum. Papillae anales diskshaped. Lateral lobes of eighth segment absent. Anterior apophyses well developed, dorsally directed; short round lobes on anteroventral margin, ventral to anterior apophyses.

Genitales del macho (Fig. 4, 5). Uncus con una espina en el ápice, curvada hacia abajo y corta por debajo. Gnathos corto, no alcanzando el punto medio del uncus, brazo proyectándose en ángulo oblicuo hacia abajo, porción basal capitada por debajo, cuarto distal dirigido más horizontálmente que la porción basal del brazo. Valva con el sacculus esclerotizado en el ápice, formando una espina apical corta y redondeada; costa con una banda esclerotizada que no alcanza el ápice de la valva. Transtilla sin lóbulos presentes. Juxta con la lámina esclerotizada y espinulosa en la porción distal cerca del anellus; anellus cubierto con setas cortas por encima. Aedeagus relativamente recto, curvado hacia la derecha, con un solo proceso lateroventral en el ápice dirigido anteriormente, dorso de la punta serrado.

Genitales de la hembra (Fig. 11). Bursa copulatrix: el antrum del ductus bursae es un tubo largo, recto y esclerotizado, algo bifurcado en la base y el extremo distal, porción sin esclerotizar del ductus bursae mucho más corta; corpus bursae internamente muy rugoso, con la base y el extremo distal colapsada internamente, base del corpus bursae con una esclerotización pequeña alrededor de la inserción del ductus bursae (parece estar esclerotizado con espínulas adentro); signum redondo con una sola espina larga. Ductus seminalis conectado a la parte ventral membranosa del ductus bursae cerca de la base, próximo al antrum. Ostium bursae redondo y continuo al antrum. Papillae anales en forma de disco. Lóbulos laterales del octavo segmento ausentes. Apophysis anteriores bien desarrollados, dirigidos dorsalmente; lóbulos cortos y redondos en el margen anteroventral, ventral al apophysis anterior.

Remarks: The other *Venadicodia* known to occur in Mexico, *V. albipunctata*, is distinguished from *V. caneti* in its smaller size (forewing 8 mm), lighter brown coloring, including the dark patch on the forewing, the presence of multiple spinules on the vesica, and the uncus claw anterior to the apex on the male genitalia. Only one Costa Rican specimen of *V. caneti* is known to have been collected at lights (remainder reared from larvae, see below). The first author has dedicated the species name to Rubén Canet Moya, both teacher and friend, who introduced him to the world of Lepidoptera.

Comentarios: La otra especie conocida de *Venadicodia* ocurre en México, *V. albipunctata*, se distingue de *V. caneti* por su pequeño tamaño (alas anteriores 8 mm), coloración pardo clara incluyendo el parche oscuro sobre las alas anteriores y la presencia de múltiples espínulas en la vesica y la espina anterior al ápice del uncus en los genitales del macho. Sólo un espécimen de *V. caneti* se conoce recolectado de trampa de luz (el resto son criados a partir de la larva, ver abajo). El primer autor dedica el nombre de esta especie a Rubén Canet Moya, maestro y amigo, quien lo introdujo dentro del mundo de los lepidópteros.

Biological notes: Natural history of *Venadiodia caneti* (D. H. Janzen, personal communication)

The dry forests of Sector Santa Rosa of the Guanacaste Conservation Area (GCA) in northwestern Costa Rica (200-300 m elevation) is the only place where *Venadicodia caneti* larvae have been found. In a massive survey (1978-1994) of Santa Rosa caterpillars, 394 limacodid caterpillars, representing at least 30 species and eating 82 species of hosts, were found through haphazard search (D. H. Janzen Caterpillar

Rearing Database, see INBio World Wide Web site after 1 January 1996). Of these, 15 (3.8%) larvae were *V. caneti* and all of these were feeding on *Ocotea veraguensis*. It is clear that *V. caneti* is monophagous on *O. veraguensis* in this forest. However, it is impossible to know if the only Lauraceae that it uses in nature is *O. veraguensis*. This is because this understory shrub-treelet is the only native species of Lauraceae in this dry forest.

In the GCA dry forest, *V. caneti* shares *O. veraguensis* with at least *Adhemarius gannascus* and *Adhemarius ypsilon* (Spingidae), *Paectes lunodes* and *Gonodonta bidens* (Noctuidae), *Copaxa moinieri* (Saturniidae), *Euglyphis* n. sp. (Lasiocampidae), *Parasa viridogrisea*, *Natada fusca* and *Prolimacodes undifera* (Limacodidae), *Carathis byblis* (Arctiidae), *Epimecis conjugaria* (Geometridae), *Stericta albifasciata* (Pyralidae), *Archaeoprepona demophoon*, *Memphis morvus*, and *Memphis chaeronea* (Nymphalidae), and *Ridens phila* (Hesperiidae).

The caterpillar of *V. caneti* is hard and smooth, lacking spines of any kind (Figs. 27, 28). The general color is green and yellow to turquoise, turning blue-white as a prepupa. The cocoon is a hard polished gray-brown fat ovoid, stuck to branches or leaves. The adults eclose in the late afternoon (as is the case with many species of dry forest Limacodidae).

The caterpillars feed on leaves of all ages, though they are most frequently encountered eating mature leaves (new expanding leaves are relatively rare on the evergreen *O. veraguensis*). They may be found at any location in the tree crown, though they seem to be quite rare in large crowns and are more common on bushy saplings that are 1-2 m in height. They may be found on plants growing from deep full shade to plants in full sunlight. They feed singly (not in groups such as is the case with *Acharia* spp.) and always appear to occur at very low density in the forest.

All *V. caneti* caterpillars have been located between the last week of June and the last week of August. In four cases, the adult eclosed 21-32 days after the prepupa spun the cocoon. The eclosion dates suggest two generations per year in the Sector Santa Rosa dry forest. When caterpillars are found in late June to late August, they are penultimate to ultimate instar larvae, suggesting that they derive from eggs laid at the beginning of the rainy season in mid-May (such larvae could certainly not be a second generation following eggs laid in mid-May). The eclosion dates in September-October (there are no records of prepupae becoming dormant in cocoons made by June-August larvae) suggest that a second generation occurs in September-December. It is very likely that the prepupae from this second generation pass the December-May dry season in a state of dormancy, and eclose in response to the cool weather in mid-May (and see Janzen 1993).

Of the above-mentioned 15 caterpillars of *Venadicodia canetii*, five were parasitized by *Austrophorocera*, a medium-sized tachinid fly whose adults eclose from puparia in the cocoon of the host (one per cocoon). No other parasites have been reared from this caterpillar.

Distribution: Known from S. Mexico and N. Costa Rica.

Material examined (11 specimens, 3¢, 8™)

Holotype ¢, **Costa Rica:** GUANACASTE: Santa Rosa National Park, Guanacaste Prov., D. H. Janzen Voucher Specimen 93.SRNP.5049 (INBio)(CB: INBIOCRI001147146).

Paratypes. **México**: CHIAPAS: Yaxoquintela, 560m, 16-58N, 91-47W, 1¢, 3 November 1978, John E. Rawlins Voucher Specimen 1978-#123 (CMNH); YUCATAN: Chichen Itza, 1™, 2. I. 1954, E. C. Welling (CMNH); **Costa Rica:** GUANACASTE: Santa Rosa National Park, Guanacaste Prov., 1 ™, 19-22 Aug 1981 D. H. Janzen & W. Hallwachs, (INBio)(LN 313000 - 359800)(CB: INBIOCR001120810); D. H. Janzen Voucher Specimens: A.C.G, P. N. Guanacaste, Estación Santa Rosa, (INBio)(LN 313000 - 359800), 1¢, 93.SRNP.5691 (CB: INBIOCRI001147666), 6™, 90.SRNP.1862 (CB: INBIOCRI001121281), 93.SRNP.3058 (CB: INBIOCRI001147148), 93.SRNP.2868 (CB: INBIOCRI001147149), 81.SRNP.800 (CB: INBIOCRI001147150), 81.SRNP.921 (CB: INBIOCRI001147151), 81.SRNP.1113 (CB: INBIOCRI001147152).

Venadicodia ruthaea Dyar, 1927

(Figs. 6, 7, 12, 17, 23, 24)

Adult male (Fig. 23). Forewing length 10.5-12 mm. R veins as in *V. poguei* (Fig. 17). Ground color of wings and body brown. Forewings brown

with a darker part extending from basal area to medial area on the costal margin, descending transversally almost to the tornus and the anal margin, as in *V. denderia*. Small patch of white scales found between CuP and CuA2 veins in medial area and between the juncture of the M1 and M2. Marginal, postmedial and part of medial area light brown with the medial part of the postmedial area, just as the apex, slightly darker. Hindwings dark brown. Labial palps at least 3X the length of the eyes and pointing upwards. Reduced proboscis. Ventral part of body light brown.
Adult female (Fig. 24). Forewing length 12-13 mm. Similar to the male in both coloration and patterns.

Macho adulto (Fig. 23). Longitud de las alas anteriores 10.5-12 mm. Venas R como en *V. poguei* (Fig. 17). Color base de las alas y el cuerpo, pardo. Alas anteriores pardas con una parte más oscura extendiéndose desde el área basal hasta el área media sobre el margen costal, descendiendo transversalmente casi hasta el tornus y el margen anal, como en *V. denderia*. Entre las venas CuP y CuA2 en el área media y entre la conjunción de las venas M1 y M2 hay un pequeño parche de escamas blancas. Area marginal, postmedia y parte del área media, pardo claro, con la parte media del área postmedia así como el ápice ligeramente más oscuro. Alas posteriores pardo oscuro. Palpos labiales al menos tres veces el largo del ojo y dirigidos hacia arriba. Probóscide reducida. Parte ventral del cuerpo pardo claro.
Hembra adulta (Fig. 24). Longitud de las alas anteriores 12-13 mm. Similar al macho en patrones y coloración.

Male genitalia (Figs. 6, 7). Uncus claw at end of apex, apex narrow. Gnathos distally forked beyond midpoint. Valva: sclerotized band of sacculus reaching near apex; costa without sclerotized band in distal third. Transtilla paired sclerotized and spinose processes, projecting to posterior, curved slightly lateral and back inward at apex. Juxta a simple plate. Aedeagus short, curved to right; vesica without cornuti. Saccus directed both posterior and anterior.
Female genitalia (Fig. 12). Bursa copulatrix: ductus bursae all membranous, without sclerotized antrum; corpus bursae without sclerotized spinules at base, though juncture with ductus bursae similar to *V. caneti*; signum with two distinct spines inside. Ductus seminalis attaches near ostium bursae. Ostium bursae small and round, surrounded by large sclerotized region reaching the middle of the lateral margin of the papillae anales, covered with spinules; antrum unsclerotized and narrow. Papillae anales diskshaped; anteroventral portion of eighth segment with paired lobes curved medially. Seventh segment covering eighth segment both above and below, heavily sclerotized on dorsum, folded to form dorsal and ventral surfaces of equal length (the ventral surface more sclerotized) with mediam depression above similar to but more developed then medial depression on eighth segment. Anterior apophyses short and triangulate, but longer than in *V. poguei*.

Genitales del macho (Figs. 6, 7). Uncus con una espina en el extremo del ápice; ápice angosto. Gnathos distálmente ahorquillado más allá del punto medio. Valva con una banda esclerotizada en el sacculus llegando casi al ápice; costa sin la banda esclerotizada en el tercio distal. Transtilla con un par de procesos esclerotizados y espinosos, proyectándose posteriormente, un poco curvados laterálmente, regresando hacia el interior del ápice. La juxta es una lámina simple. Aedeagus corto, curvado hacia la derecha; vesica sin cornuti. Saccus dirigido hacia atrás y hacia adelante.
Genitales de la hembra (Fig. 12). Bursa copulatrix: ductus bursae membranoso, antrum no esclerotizado; corpus bursae sin espínulas esclerotizadas en la base, unión con el ductus bursae similar a *V. caneti*; signum con dos espinas internas distintivas. Ductus seminalis conectado cerca del ostium bursae. Ostium bursae pequeño y redondo, rodeado por una gran región esclerotizada que alcanza la mitad del margen lateral de las papilas anales, cubierto con espínulas; antrum angosto y no esclerotizado. Papillae anales en forma de disco. Porción anteroventral del octavo segmento con un par de lóbulos curvados en su parte media. Séptimo segmento cubriendo el octavo segmento por arriba y abajo, fuertemente esclerotizado en el dorso, plegado para formar la superficie dorsal y ventral de igual longitud (la superficie ventral es más esclerotizada) con la depresión media similar por encima pero más desarrollada que la depresión media sobre en el octavo segmento. Apophysis anterior corto y triangulado, pero más largo que en *V. poguei*.

Remarks: The original description of *V. ruthaea* does not have any locality information. Because Schaus collected numerous Lepidoptera in Costa Rica, including Limacodidae, it is probable that the type was colected in Costa Rica. Female previously unknown (Dyar, 1935).

Comentarios: La descripción original de *V. ruthaea* no tiene ninguna información de localidad. Porque Schaus recolectó numerosos Lepidoptera en Costa Rica, incluyendo Limacodidae, es probable que el tipo fue colectado en Costa Rica. Hembra previamente desconocida (Dyar 1935).

Distribution: Known only from Costa Rica.

Material examined (11 specimens, 3♂, 8™)

Holotype ♂, Type No. 40702, Collection Wm Schaus (no locality)(USNM).

Costa Rica: GUANACASTE: 1 ♂, Est. Pitilla, 9 km sur Santa Cecilia, Prov. Guanacaste, 700 m. 19 May -3 Jun 1993, C. Moraga, (INBio)(LS 330200 - 380200)(CB: INBIOI001341812); PUNTARENAS: 2 ♂, Est. Sirena, P. N. Corcovado, Prov. Puntarenas, 0 - 100 m m. Ago 1991, J. C. Saborío, (INBio)(LS 270500 - 508300)(CB: INBIOCRI00421926); 23 March 1984, DH Janzen & W Hallwachs (INBio)(CB: INBIOCRI001120408); 1™, Bosque Esquinas, Pen. Osa., Prov. Punta. 200 m. Jun 1994, J. F. Quesada, (INBio)(LS 302400 - 545250)(CB: INBIOCRI002003608) ; LIMON: 2 ♂, 1 ™, Sector Cocori, 30 km al N. de Cariari, Prov. Limón, 100m. Nov 1993, Dic 1993, Ene 1991, E. Rojas (INBio)(LS 286000 - 567500)(CB: INBIOCRI001652700, INBIOCRI001646844, INBIOCRI000678438).

***Venadicodia denderia* (Dyar, 1912)**

(Figs. 8, 9, 13, 14, 15, 25, 26)

Adult male (Fig. 25). Forewing length 10-12 mm. Veins R3 and R4 stalked off of R2 (Figs. 14-15). Ground color of wings and body brown with cream colored scales intermingled. Forewings brown with darker region extending from the basal area to the medial area on the costal margin, descending transversally to the tornus. This dark region also has a light zone on submedial area that reaches from anal margin to discal cell and white scales with violet sparkles are intermingled. A small patch of black, white and light brown scales is found on CuA2 vein in submedial area. Less than the distal half of the wings are light brown with a small patch of dark brown scales on the subapex, followed by a slender white band with violet sparkles that stretches to the border of the costal margin. Hindwings dark brown. Labial palps long, at least 3X the length of the eyes and pointing upwards.

Adult female (Fig. 26). Forewing length 13.5-15 mm. Similar to the male in both coloration and patterns.

Macho adulto (Fig. 25). Longitud de las alas anteriores 10-12 mm. Venas R3 y R4 ramificándose de R2 (Figs. 14-15). Color base de las alas y el cuerpo, pardo con escamas crema entremezcladas. Alas anteriores pardas con una región más oscura extendiéndose desde el área basal hasta el área media sobre el margen costal, descendiendo transversalmente hasta el tornus. Esta región oscura tiene a su vez una zona más clara sobre el área submedia desde el margen anal, alcanzando en parte la celda discal. Además hay escamas blancas con destellos violeta entremezcladas y un pequeño parche de escamas negras, blancas y pardo claro sobre la vena CuA2 en el área submedia. Menos de la mitad distal de las alas son pardo claro con un pequeño parche de escamas pardo oscuras en el subápice, seguidas por una banda delgada blanca con destellos violeta que llega hasta el borde del margen costal. Alas posteriores pardo oscuras. Palpos labiales largos, al menos tres veces el largo del ojo y dirigidos hacia arriba.

Hembra adulta (Fig. 26). Longitud de las alas anteriores 13.5-15 mm. Similar al macho en patrones y coloración.

Male genitalia (Figs. 8, 9). Uncus claw anterior to apex. Gnathos keel shaped and sinuate, upcurved in apical fourth and concave above with short setae near apex. Valva with spine directed inward from apex of costa, above the cucullus, sclerotized band of sacculus not reaching the end of the valva. Transtilla with two, smooth round lobes; membranous portion forming a cap above aedeagus. Aedeagus curved in distal third, vesica with cornuti.

Female genitalia (Fig. 13). Bursa copulatrix: antrum sclerotized, wide and sinuate at base, curved to right and constricted and once-coiled to the left; distal membranous portion about equal

length to antrum; signum a narrow linear band less than a fourth width of corpus bursae. Ductus seminalis attaches midway to membranous portion of ductus bursae. Ostium Bursae wide and round, continuous with antrum. Papillae anales diskshaped; dorsal half covered with small and dense setae and ventral half with larger setae farther apart. Anteroventral third of eighth segment a smooth sclerotized band, from portion contiguous with anterior apophyses to the sclerotized antrum of ductus. Anteroventral lobes absent. Lateral lobes just posterior to band near anterior apophyses. Posterior of dorsum of seventh segment with concave sclerotic oval. Anterior apophyses relatively long and narrow, extending only just beyond posterior apophyses

Genitales del macho (Figs. 8, 9). Uncus con una espina en la parte anterior del dorso del ápice. Gnathos en forma de quilla, curvado hacia arriba en el cuarto apical y cóncavo por encima. Valva con una espina en el ápice de la costa, dirigida hacia adentro, sacculus con una banda esclerotizada que no alcanza el final de la valva. Transtilla con dos lóbulos redondos lisos, porción membranosa formando un gorro por encima del aedeagus. Aedeagus curvado en el tercio distal, vesica con cornuti.

Genitales de la hembra (Fig. 13). Bursa copulatrix: antrum esclerotizado, ancho y sinuado en la base, curvado hacia la derecha, comprimido y torcido hacia la izquierda; porción distal membranosa aproximádamente del largo del antrum; el signum es una banda linear angosta, menor a un quarto del ancho del corpus bursae. Ductus seminalis conectado a la parte media de la porción membranosa del ductus bursae. Ostium bursae ancho y redondeado. Papillae anales en forma de disco; mitad dorsal cubierta densamente con setas pequeñas y la ventral con setas más separadas. Apophysis anterior relativamente largo y angosto, extendendiéndose solo justo más allá del apophysis posterior.

Remarks: Shares features that are found only in *V. cetiona* from Guianas, although some may be plesiomorphic, including: violet scales on the forewings, uncus claw anterior to apex, and vesica with cornuti. Other features found in *V. denderia* may be plesiomorphic relative to other members of *Venadicodia*, including a tranverse signum and absence of anteroventral lobes in the females, and the stalking of R3 and R4 from R2. Female previously unknown (Dyar, 1935).

Comentarios: Comparte características que son encontradas solo en *V. cetiona* de Guayanas, aunque algunas pueden ser plesiomórficas, incluyendo: escamas violetas en las alas anteriores, espina del uncus anterior al ápice y vesica con cornuti. Otras características encontradas en *V. denderia* pueden ser plesiomórficas relacionadas a otros miembros de *Venadicodia*, incluyendo un signum transversal y la ausencia de lóbulos anteroventrales en las hembras, y la ramificación de R3 y R4 de R2. Hembra préviamente desconocida (Dyar, 1935).

Distribution: Known only from Costa Rica.

Material examined (15 specimens, 13♂, 2♀)

Holotype ♂, Type No. 14091 U.S.N.M.; Sixola River, Costa Rica; March 14, 1909, Colection Wm Schaus (USMN) (BC: INBIOCRI001120908). **Costa Rica:** ALAJUELA: Finca San Gabriel. Alaj., Prov., 650m, (16 km ENE Queb. Grande), 2 ♂, DH Janzen & W. Hallwachs, 9 Mar 1984 (INBio)(LN 318800 - 383500)(CB: INBIOCRI001121082, INBIOCRI001120399); LIMÓN: Limon Prov., Hacienda Tapezco, 29 air km W Tortuguero, el. 40 m, lat. 10 30' N, long. 83 47' W, 1 ♀,19 March 1978, JP Donahue, D. Panny, D. Moeller, C. Lewis (LACM)(CB: INBIOCRI0011 21083), 1 ♂, C. Lewis, (LACM)(CB: INBIOCRI001147381), 1 ♂, 13-31 Aug. 1979, JP & KE Donahue, CC Hair, NK Moore, MA Hopkins (LACM)(CB: INBIOCRI001147380); HEREDIA: La Selva Biol. Sta., Puerto Viejo de Sarapiqui, Pr. Heredia, 40m, 1 ♂, Feb 1986 M. M., Chavarria, A. Chacon (INBio)(CB: INBIOCRI001121084); PUNTARENAS: Rancho Quemado, Peninsula de Osa, 200m, Prov. Punt., 1 ♂, F. Quesada, Oct 1991 (INBio)(LS 292500 - 511000)(CB: INBIOCRI000507226); Puntarenas, Bosque Esquinas, 1 ♂, mayo 1994, Marianella Segura (INBio)(CB: INBIOCRI001121287); Est. Q. Bonita, Prov. Punta, 50m, 1 ♀, Jul 1993, R. Guzmán, (INBio)(LN 469850 - 469850)(CB: INBIOCRI001128483); CARTAGO: Tuis CR, 1 ♂, June, Schaus and Barnes coll (USMN)(CB: INBIOCRI001120909); Turrialba, 2 ♂, 2 - 5 XI 1967, 22 - 28. II. 65, E. L. Todd, SS & WD Duckworth (USMN)(CB: INBIOCRI001121081, INBIOCRI001121285); Grano de Oro, Chirripó, Turrialba, Prov. Carta, 1120 m, 1 ♂, Jul 1993. P.

Campos (INBio)(LN 200250 - 595900)(CB: INBIOCRI001153256); GUANACASTE: Estacion Pitilla, 700 m, 9 km S. Santa Cecilia, Alajuela Prov. 1 ¢, 18 May 1988, Janzen & Hallwachs (INBio)(CB: INBIOCRI001118865).

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