

**SYMPETRUM CHACONI SPEC. NOV. FROM AUYAN-TEPUI,
VENEZUELA, WITH NOTES ON A PANTEPUYAN FORM OF
TRAMEA BINOTATA (RAMBUR)
(ANISOPTERA: LIBELLULIDAE)**

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S. chaconi sp.n. is described and illustrated on the basis of 1 ♂ and 1 ♀ (holotype ♂: Venezuela, Bolívar, Auyán-Tepui, 1730 m. 1/7-II-1994; deposited at MIZA, Maracay). The new sp. resembles *S. roraimae* De Marmels, 1988, but differs from it in shape of superior caudal appendages and vulvar lamina. — A Pantepuyan form of *Tramea binotata* (Ramb., 1842) with exceptionally large hindwing basal spot is also brought on record. The known Venezuelan distribution of both spp. is mapped.

INTRODUCTION

The table-top and other mountains scattered through southeastern and southern Venezuela and the adjoining regions of Brazil and the Guyanas are known as the "Guayana-Highlands", or "Pantepui" (MAYR & PHELPS, 1967). Numerous expeditions have been carried out in the past ten years in order to explore biodiversity of some of these isolated ridges. Not surprisingly, many new odonate species were discovered, several of which have already been named (DE MARMELS, 1988, 1989, 1992a, 1992b). An additional new *Sympetrum* Newman, 1832, the second member of this genus from Pantepui, is described in the present paper.

An interesting colour form of *Tramea binotata* (Rambur, 1842) has been collected so far on three distant tepuis. Albeit differences in structural characters have not been detected, it seems probable that this morph is a true Pantepuyan subspecies of the nominate form, which is widespread across the tropical lowland up to middle heights in the Andes.

All specimens referred to in the text, including types, are deposited at the "Museo del Instituto

de Zoología Agrícola" (MIZA). Facultad de Agronomía, Universidad Central de Venezuela, Maracay.

SYMPETRUM CHACONI SPEC. NOV.

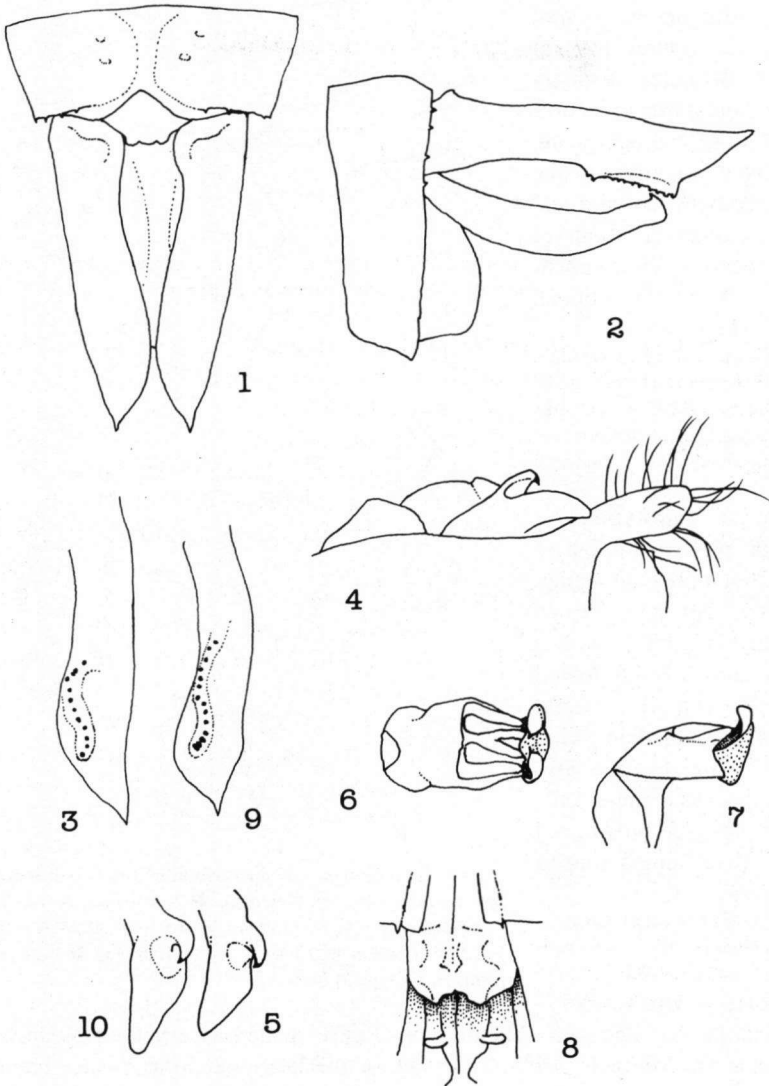
Figures 1-8; Map 1

Material. — **Holotype** ♂, **allotype** ♀: VENEZUELA: Bolívar, Auyán-Tepui, 05°53'N, 62°29'W, 1730 m, 1/7-II-1994. Expedition "Fundación Terramar", Caracas (A. Chacón & J. Clavijo) leg. Both specimens deposited at MIZA.

Etymology. — The new species is named after Mr. Anibal Chacón, my invaluable companion on many collecting trips, and technical assistant at the Section of Entomology of the MIZA. He is the collector of this and many other fine Venezuelan dragonflies.

MALE (holotype). — Colour pattern of living, mature male (from colour transparencies): labium creamy; compound eyes brown above, pale olivaceous below; face and frons on top, pale olivaceous; a black basal line in front of vertex, this line not descending laterally along eye suture; labrum yellowish. — Mesepisternum pale olivaceous with broad brown black band along humeral suture. Mesepimeron and metepimeron brown black in ventral half along sutures; each with a pale band, which is narrow and white at its ventral end, becoming broader, less sharply defined and bluish towards antealar ridges. Notal sclerites pale olivaceous, but axillar plates bright red. Legs pale ferruginous, tip of tibiae and tarsi black. Wings hyaline, venation brown basally, black distally; pterostigma pale red brown. Small brown black basal mark in forewing (FW) restricted to extreme base of subcostal space; costal and median spaces amber to halfway between base and first antenodal cross-vein (Ax). Basal spot in hindwing (HW) brown black, almost reaching to second Ax in costal and subcostal spaces; median and cubital spaces predominantly amber with dark colour restricted to extreme base. — Abdomen chiefly chestnut dorsally, each tergite darkening distally; segment 2 yellowish-olivaceous; segments 8 and 9 brown black along median carina. Ventral portion of tergites 3-9 opaque yellow with broad black distal end. Caudal appendages pale brown.

Structural features. — Vertex with two very low tubercles on top. — Prothoracic hind lobe narrowed at base and slightly bilobed, free margin beset with long hairs. FW with 10(9.5) Ax and 9 postnodal cross-veins (Px); HW with 6 Ax and 9 Px: triangle in FW crossed, in HW free; subtriangle of FW three-celled; Rspl enclosing one row of 7(8) cells in FW, 8 in HW, 2-3 cross-veins distally of pterostigma in costal space. Anal loop with an extra cell at anal angle of triangle, and one at heel. A duplicated cell (left HW) and an extra cell (right HW) also between Aspl and proximal vein of anal loop at level of heel; loop enclosing 23(20) cells. Three rows of cells between anal loop and hind border of wing at level of arculus. — Abdominal segment 4 with a well-defined accessory transverse keel. Secondary genitalia as illustrated (Figs 4-7). Superior caudal appendages straight in dorsal view, little converging towards tip; tips themselves



Figs 1-10. (Figs 1-7): *Sympetrum chaconi* sp.n., male (holotype): (1) caudal appendages, dorsal view; — (2) same, left lateral view; — (3) left superior appendage, ventral view; — (4) secondary genitalia, right lateral view; — (5) right hamule, ventral view; — (6) penis, ventral view; — (7) same, right lateral view. — (Fig. 8): *S. chaconi* sp.n., female (allotype): vulvar lamina, ventral view. — (Figs 9-10): *S. roraimae* De Marmels: (9) left superior caudal appendage, ventral view of a male from Mt Roraima (15-I-1991, A. Chacón leg.); — (10) right hamule, ventral view of a male paratype from Mt Kukenam.

parallel; in lateral view almost straight; in ventral view the ventral row of 11-12 denticles strongly curved outwards in its proximal third and occupying the distal two fifths of the distance between base and inferior angle (last tooth) of appendage. Inferior appendage with two distal dorsal hooks (Figs 1-3).

Measurements (in mm).

— Total length (including caudal appendages) 37.5; — abdomen (incl. app.) 23.0; — superior caudal appendages 1.9; — hindwing 27.0.

FEMALE (allotype). —

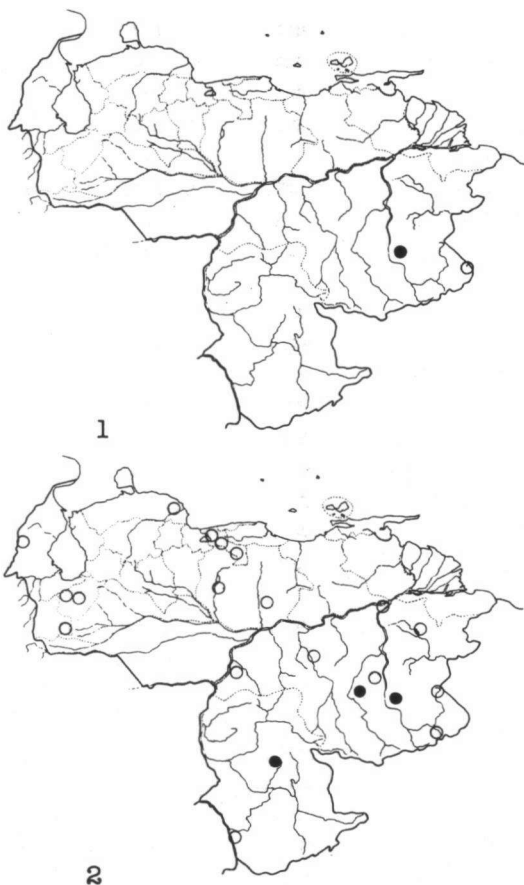
Colour pattern similar to male, but more contrasting. Tergites 3-9 pale brown dorsally in middle, with a black lateral band followed by a yellow mark at lateral carina; dorsomedian carina black. Wings hyaline with basal spots as in male; axillary plates pale brown, not red. Vulvar lamina shaped as in Figure 8.

Measurements (in mm).

— Total length 36.5; — abdomen 23.8; — hindwing 28.0.

LARVA. — Unknown.

REMARKS. — The new species is a closely related vicariant of *Sympetrum roraimae* De Marmels, 1988. The male of the latter has longer outer hamular branch (Fig. 10) and strongly convergent and down curved superior caudal appendages, with a longer and less sinuous ventral row of denticles (Fig. 9). The females of the two species differ mainly in shape of the vulvar lamina. — *S. chaconi* was taken over a swampy strip with grassy vegetation and slowly running and stagnant water, between a small river and a forest. *Erythrodiplax transversa* Borror, 1957 was very common at this spot. The latter was not found on either Mt. Roraima or Mt. Kukenam, in the range of *S. roraimae*.



Maps 1-2. Venezuela: (1) distribution of the two Pantepuyan species of *Sympetrum* Newman: ● *S. chaconi*, Auyán-Tepui (type locality); — ○ *S. roraimae*, Mt Roraima and Mt Kukenam. — (2) distribution of *Tramea binotata* (Rambur): ● Pantepuyan form; — ○ typical form.

TRAMEA BINOTATA (RAMBUR, 1842)

Figures 11-16, Map 2

T. binotata is widespread in South America and occurs in most parts of Venezuela, including the Andes and the region South of the Orinoco (Map 2). Specimens seem to vary little in general colouration and size of the hindwing basal spot. On the top of some mountains of Pantepui, however, populations exist, which have this basal spot considerably enlarged, especially so in the females (Figs 14-16).

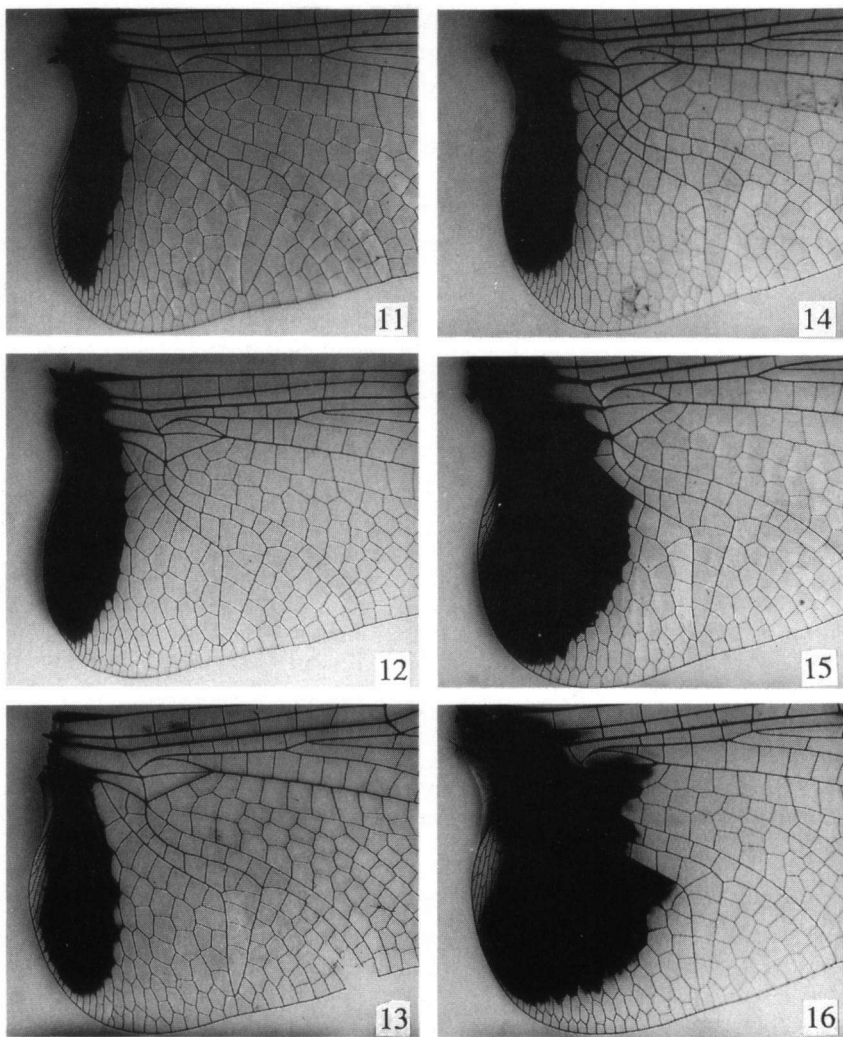
Material of the "typical" form examined (17 ♂, 5 ♀). — BOLIVIA: Buena Vista, 1 ♂, Steinbach leg. (no further data). — BRAZIL: State of Roraima, Rio Murupú, 1 ♀, 21-II-1964, J. Racenis leg. — VENEZUELA: State of Aragua, El Limón, 430 m, 2 ♂, 11-XI-1981; — Cataurito, 900 m, 1 ♂, 10-XI-1981 (ex larva), all J. De Marmels leg.; — State of Bolívar, Canaima, 450 m, 1 ♀, 20-II-1958; — Guasipati, 1 ♂, 4-VIII-1960, both J. Racenis leg.; — Rio Chiguao, 1 ♀, 7/13-IV-1983; road Santa Elena de Uairén-Icabarú, El Pilón, Peraitepui, 1000 m, 2 ♂, 20/31-I-1985, all J. De Marmels leg.; — Paso Caruachi, 105 m, 1 ♂, 14-V-1989, M.L. Gadou leg.; — El Bochínche, 200 m, 1 ♂, 15/30-V-1994, P. Bleuzen leg.; — State of Guárico, Calabozo, Laguna de Los Patos, 105 m, 1 ♂, 27-X-1982, J. Limongi & J. De Marmels leg.; — Espino, 2 ♂, 29/30-XII-1953; 1 ♀, 27-XII-1954; 1 ♂, 4-I-1955, all J. Racenis leg.; 1 ♂, 18-IV-1954, Klisans leg.; — State of Mérida, road to Jají, Las Cruces, Hacienda Las Mesas, 1650 m, 1 ♂, 15-II-1983, J. De Marmels leg.; — State of Monagas, Tonoro, 1 ♂, 13-VII-1964, J. Racenis leg.; — La Toscana, 127 m, 1 ♀, 14-X-1965, F. Fernández Y. & C.J. Rosales leg.; — State of Zulia, Kunana, 1100 m, 1 ♂, 26-XII-1950, F. Fernández Y. leg.

Additional Venezuelan records of the "typical form" (included in Map 2). — State of Amazonas: San Carlos de Rio Negro. State of Aragua: Camatagua, State of Bolívar: La Escalera (road km 88-Santa Elena de Uairén), Jabillal (Caura), Los Pijiguaos, Puerto Ordaz. State of Falcón: Yaracal. State of Mérida: Puente Chama. State of Táchira: San Antonio de Caparo.

Material of the "Pantepuyan form" examined (18 ♂, 4 ♀). — State of Amazonas: Huachamakari, 1700 m, 2 ♂, 3/5-II-1992, A. Chacón & J. Clavijo leg.; — State of Bolívar: Auyán-Tepui, Guayaraca, 1020 m, 3 ♂, 2 ♀, 16/26-IV-1956, J. Racenis leg.; Auyán-Tepui, 1600 m, 3 ♂, III-1973, Laime leg.; 1800 m, 1 ♂, 4/10-II-1988, A. Chacón leg.; 1700 m, 8 ♂, 2 ♀, 1/19-II-1994, A. Chacón, J. Clavijo & J.L. Garcia leg.; — Waikinima, 1000 m, 1 ♂, 6/13-II-1990, J. De Marmels leg.

In all of the 17 males of "typical" *T. binotata* examined, the hindwing basal spot does not, or only very slightly, surpass CuP (= cubito-anal crossing, see RIEK & KUKALOVA-PECK, 1984) distally, from where it runs backwards in a rather straight line. The same can be said of the five females studied, of which only one has the basal spot somewhat transgressing CuP distally. In all specimens the basal spot runs straight backwards to anal angle. 13 of the 17 males have only one cross-vein (cx) between the two sectors of arculus above triangle; three specimens have two cx in one wing, one in the other, and one male has two cx in both wings. This figure is, however, variable for the females.

Of the 18 Pantepuyan males only one has the basal spot ending at CuP. In the remaining specimens this spot transgresses CuP distally for a variable distance.



Figs 11-16. *Tramea binotata* Ramb., wings: (Figs 11-13): typical form: (11) right hindwing of male from Aragua (El Limón, 430 m); – (12) same of male from Mérida (road to Jaji, Hacienda Las Mesas, 1650 m); – (13) left hindwing (transposed) of female from Guárico (Espino, 100 m). – (Figs 14-16): Pantepuyan form: (14) right hindwing of male from Bolivar (Guayaraca, Auyán-Tepui, 1020 m); – (15) same of male from Auyán-Tepui, 1800 m; – (16) same of female from Auyán-Tepui, 1730 m.

From its distal extreme the basal spot runs towards proximal (anal) margin of wing diagonally, zigzagging, or in an irregular curve. Eight males have two cx between the two sectors of arculus above triangle in both hindwings, two have only one cx in each wing, and eight have two cx in one wing, one in the other. In the four Pantepuyan females the basal spot is so greatly enlarged as to render any confusion with "typical" females impossible. The presence of either one or two cx between the sectors of arculus above triangle is variable.

REMARKS. — Structural differences, either in caudal appendages, secondary genitalia or vulvar lamina, between typical and Pantepuyan specimens, have not been found. Therefore, size of the basal spot in hindwing is the only character which separates the two forms. In a few Pantepuyan males even this basal spot is not excessively enlarged. In one male from Auyán-Tepui it stops at CuP, albeit running from here towards proximal (anal) margin of wing in a strong curve. Occasional vagrants from the surrounding lowland might cause gene flow, challenging genetic stability of the Pantepuyan populations. This hypothesis gets some support from the capture on Auyán-Tepui of apparent migratory specimens of true lowland dragonflies, such as *Gynacantha nervosa* Rambur, 1842 (1500 m, 3 ♂, 3 ♀, X-1990, and 1740 m, 1 ♂, II-1994). Autochthonous populations of this aeshnid are highly unlikely to occur on any of the different terraces of the plateau. Therefore, Pantepuyan *T. binotata* probably represents a true relic subspecies which occupies the plateau of several, now isolated tepuis. That two Tepuyan subspecies might live in (geographically) close contact is demonstrated by a bird, viz. *Zonotrichia capensis* (Müller) (Aves: Emberizidae), which is known to occur as one subspecies on the slopes and a different one on top of Mt Roraima (MAYR & PHELPS, 1967).

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