

## THE MANTIDS OF HISPANIOLA, WITH THE DESCRIPTION OF TWO NEW SPECIES (MANTODEA)

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**Abstract:** A large collection of mantids from Hispaniola was studied. Nine species were identified; *Gonatista reticulata* (Thunberg) and *Paramusonia cubensis* (Saussure) are new for the Hispaniolan fauna; *Gonatista jaiba* n. sp. and *Epaphrodita lobivertex* n. sp. are new to science. Furthermore *Epaphrodita dentifrons* Saussure is treated as a synonym of *Epaphrodita musarum* (Palisot de Beauvois). A key to males of *Gonatista* is provided.

**Key words:** Mantodea, *Gonatista jaiba* new species, *Epaphrodita lobivertex* new species, Hispaniola, Caribbean.

### Las mantis de Hispaniola, con descripción de dos nuevas especies (Mantodea)

**Resumen:** Se describen, sobre material de la República Dominicana, dos especies nuevas de mántidos (*Gonatista jaiba* n. sp. y *Epaphrodita lobivertex* n. sp.). Por otra parte, se considera a *Epaphrodita dentifrons* Saussure como sinónimo de *Epaphrodita musarum* (Palisot de Beauvois). Se incluye también una clave para los machos de *Gonatista*.

**Palabras clave:** Mantodea, *Gonatista jaiba* nueva especie, *Epaphrodita lobivertex* nueva especie, Hispaniola, Caribe.

### Introduction

Hispaniola is a subtropical Caribbean island located just south of the tropic of Cancer. It is the second largest landmass of the Greater Antilles with an area of nearly 78,000 square kilometers. Most characteristic for its great topographic variability and diversity of ecosystems, it contains the highest and most extensive mountain systems in the Caribbean. Many Hispaniolan arthropod groups, especially those of limited vagility, include a high proportion of endemic elements. Biogeographic relations of this fauna are mainly with the neighboring islands of Cuba and Puerto Rico and Central America.

Most Hispaniolan mantids were described during the XIX century by pioneer entomologists like Palisot de Beauvois, Serville and Saussure. The most recent publication on Hispaniolan mantids was a short paper by Wetherbee (1996) stating that the African species *Gongylodes gongylodes* Linnaeus, 1758 had likely been introduced to the Haitian part of Hispaniola with the slave trade. This assertion was made based on a painting published by E. L. Daubenton, although likely produced by René-Gabriel Rabié during the second half of the 18th century in Haiti. However, we do not consider this report as valid until there is confirmation by collection of specimens.

Despite their ubiquitous presence and significance as predators of many other insects, Hispaniolan mantids have never been the subject of a faunistic study and the information available on the endemic species is almost completely limited to the original descriptions. An ongoing survey of the orthopteroid fauna across the geography of the Dominican Republic, has afforded the opportunity to assemble a more or less representative sample of species.

This paper presents a taxonomic overview of the Hispaniolan mantid fauna. Nine species are reported on, of which two are new species: *Gonatista jaiba* n. sp. and *Epaphrodita lobivertex* n. sp., and two are new records for the island: *Gonatista reticulata* (Thunberg) and *Paramusonia cubensis* (Saussure). The species *Epaphrodita dentifrons* (Saussure) is synonymized with *E. musarum* (Palisot de Beauvois). Six out of the nine species reported here appear to be endemic to Hispaniola. The species *Phyllovaetes cingulata* (Drury, 1773) reported for Cuba and Haiti (Ehrmann, 2002).

### Materials and methods

A total of 182 specimens collected across the geography of Dominican Republic (Fig. 69) and the type of *G. major* were examined. Types of the two new species described here are deposited in the collection of the Academy of Natural Sciences, Philadelphia (ANSP). Other materials will be divided in approximately equal numbers between the ANSP, the National Museum of Natural History, Washington, D. C. (NMNH), and the Museo Nacional de Historia Natural, Santo Domingo, Dominican Republic (MHND). Specimens collected by M. Ivie and associates will be deposited in the Montana State University collection (MTUC). Drawings were done using a Leica MZ8 stereomicroscope and camera lucida. Anatomical terminology follows Snodgrass (1935), except for the copulatory apparatus that follows La Greca (1954). Measurements were made using a Leitz stereomicroscope.

## Taxonomic treatment

### *Gonatista* Saussure, 1869

*Gonatista* Saussure, 1869: 54.

The genus *Gonatista* is widely distributed in North America and the Caribbean area. There are four homogeneous species, *G. reticulata* (Thunberg), *G. phryganoides* (Serville), *G. grisea* and *G. major* Caudell, whose specific differences such as chromatic models and body size, as shown in literature (Caudell 1912), do not help us in their identification. On the basis of the material studied here we have verified that a valid diagnostic character is the morphology of the external copulatory apparatus; this character also permitted us to discover a new species. The ventral phallomere shows two different models: in *G. phryganoides* it is longer than wide, without a distal process and the distal margin bilobate (Fig. 10); in the other four species it is rhomboidal with a rounded distal margin (Figs. 6-9). The phalloid apophysis in *G. reticulata* and *G. major* is kidney-shaped (Figs. 11, 13, 16-18, 21-23); in the other species it is very different (Figs. 12, 14, 15, 19, 20, 24, 25). *G. grisea* is distributed in the United States.

### Key to *Gonatista* species (Males)

1. Length of the tegminae <29 mm .....  
..... *G. phryganoides* (Serville)  
– Length of the tegminae > 30mm ..... 2
2. Length of the tegminae > 40 mm ..... 3  
– Length of the tegminae < 39 mm ..... 4
3. Distal process of phalloid apophysis kidney-like (Figs. 16-18) ..... *G. major* Caudell  
– Distal process of phalloid apophysis as in the (Fig. 20) .....  
..... *G. jaiba* n. sp.
4. Tegminae with numerous black spots often confluent in larger spots ..... *G. reticulata* (Thunberg)  
– Tegminae with little black spots never confluent in larger spots ..... *G. grisea* (Fabricius)

### *Gonatista reticulata* (Thunberg, 1815)

Figs. 3, 8, 13, 21-23, 70.

*Mantis reticulata* Thunberg, 1815: 288.

*Mantis bifasciata* De Haan, 1842: 78.

*Gonatista cubensis* Saussure, 1869: 61.

MATERIAL EXAMINED. DOMINICAN REPUBLIC: **RD-154** Busú, El Curro, Sierra Martín García, Azua Prov., 18°17.819'N 70°57.287'W, 771 m, 16-17.VII.2003, 2 % (leg. D. Perez, R. Bastardo, B. Hierro); **RD-153** La Poza de Agua Nueva, El Curro, Sierra Martín García, Azua Prov., 18°18.324'N 70°57.176'W, 800 m, 15-16.VII.2003, 2 % (leg. D. Perez, R. Bastardo, B. Hierro); **RD-156** La Furnia, Barreras, Azua Prov., 18°19.289'N 70°54.755'W, 18.VII.003, 1 % (leg. D. Perez, R. Bastardo, B. Hierro); **RD-152** Barreras, Azua Prov. 18°19.527'N 70°54.411'W, 174 m, 14.VII.2003, 1 % (leg. D. Perez, R. Bastardo, B. Hierro); Prov. La Vega, ca. 5 km S. Constanza, 1250m, 31.VIII.1988, 1 % (leg. M. A. Ivie); Isla Saona, 23.VI.1992, 1 & (leg. K. Guerrero, M. Gil); La Vega, Prov. La Vega, 3.VIII.1974, 1 & (Coll. Dominguez); El Cajuil, L. M. Farfán, Prov. San Juan, R.D. 2.VIII.1987, 1 & (Coll. R. Rimoli).

REMARKS: This species, for the body size (Table I) and the shape of pronotum (Figs. 2, 4), is near to *G. grisea*, from

which it differs in the following characters: the tegminae are in proportion larger and darker; the phalloid apophysis is very different as shown in the figures 8, 9, 13, 14. For this last character it is near to *G. major* (Figs. 7, 11), from which it differs above all for the distal margin of the ventral phallomere being more rounded; for the distal process of the phalloid apophysis, smaller and with the free margin moderately sinuous; furthermore it differs also by its smaller body size (Table I).

Since the male copulatory apparatus and the female sex have not been described we think it opportune to give a brief description here.

MALE EXTERNAL GENITALIA. Ventral phallomere (Fig. 8) longer than wide, distal margin largely rounded. Left phallomere well sclerotized, dorsal lamina narrow and arcuated; distal branch of ventral lamina (Fig. 13) narrow, apical process short and sinuous; phalloid apophysis (Figs. 21-23) with a distal process kidney-shaped, with the free margin moderately sinuous.

### FEMALE

*Head*. Wider than supracoxal dilatation, ochraceous or brown with small black spots; vertex straight with a flattened tubercle near ocular suture; eyes kidney-shaped; frontal shield black, very transverse and with sinuous upper margin.

*Thorax*. Pronotum rectangular, ochraceous with numerous small black spots; lateral margins finely denticulated; prosternum black. Anterior legs robust: coxae prismatic with triangular section; 3-4 small teeth on external margin, lateral and posterior margins finely spinulated; internal apical lobes divergent, of which the external one is larger and black. Femora about 5 times as long as their maximum width; upper margin sinuous and with small ivory tubercles; external surface ochraceous with a longitudinal series of ivory tubercles. Tibiae with 6-7 ochraceous external spines with black apex, of which the first one more developed; 12 internal spines all ochre with black apex. Middle and posterior legs slender with metatarsi longer than the others. Tegminae not reaching the apex of abdomen, about 3.6 times as long as their maximum width; apex rounded; costal area sub-hyaline; discoidal area opaque with sparse dark, small spots, very numerous in the specimen from El Cajuil. Metathoracic wings hyaline; costal area narrow; discoidal and anal areas brown.

*Abdomen*. Wide; lateral margin of sternites with membranous lobes. Supraanal-plate small, triangular not reaching the apex of the sub-genital-plate.

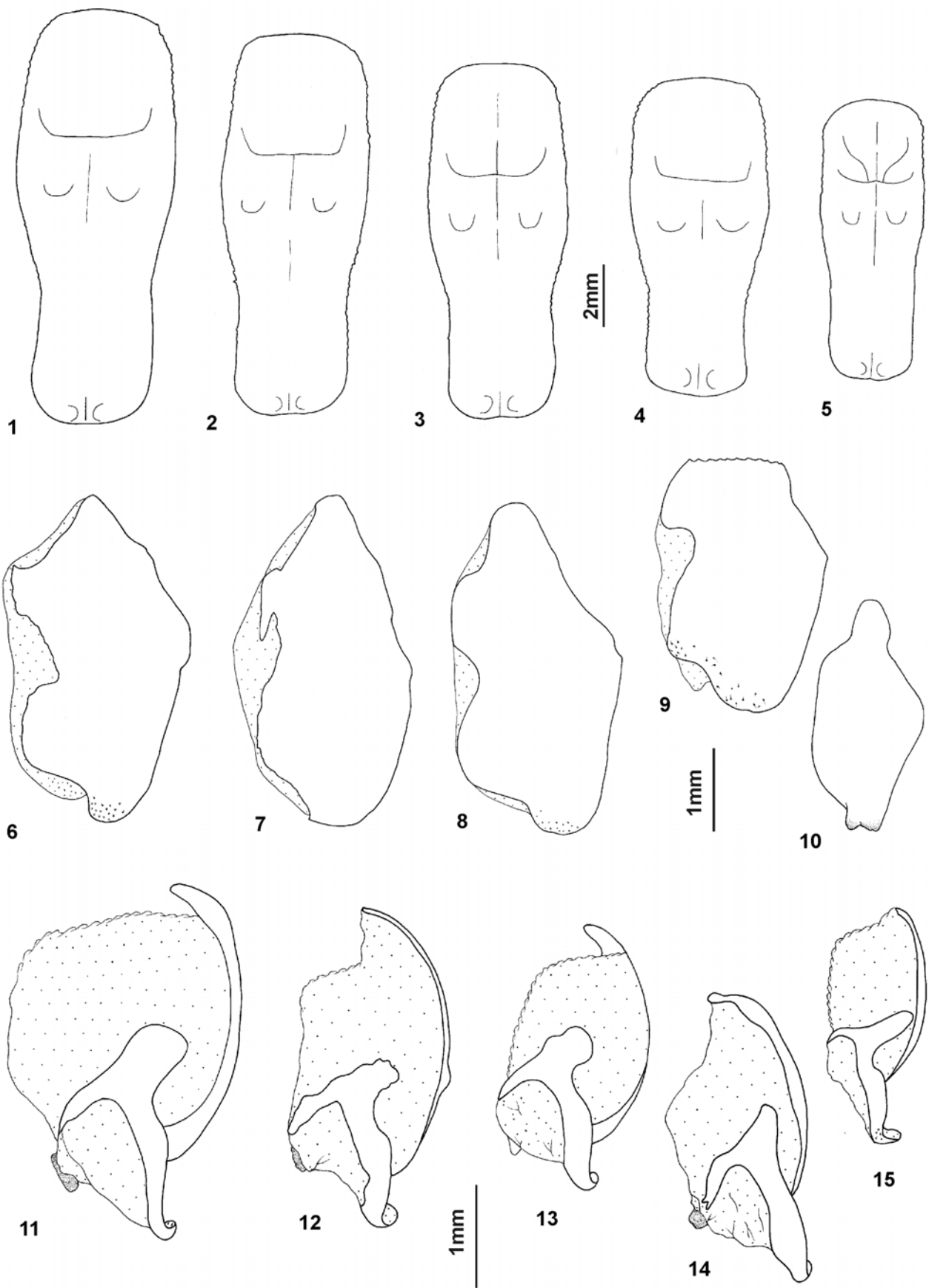
DISTRIBUTION. This species is known for Cuba, Puerto Rico, and Saint-Barthelemy. This is the first record for Hispaniola (Fig. 70).

### *Gonatista phryganoides* (Serville, 1839)

Figs. 5, 10, 15, 25, 70.

*Gonatista phryganoides* Serville, 1839: 198.

MATERIAL EXAMINED. DOMINICAN REPUBLIC: **RD-153** La Poza de Agua Nueva, El Curro, Sierra Martín García, Azua Prov., 18°18.324'N 70°57.176'W, 800 m, 15-16.VII.2003, 3% (leg. D. Perez, R. Bastardo, B. Hierro); La Estrelleta Prov., 4 km SE Rio Limpio, ca 760 km, 24-25.V.1973, 1 % (Leg. D. H. Davis).



**Figs. 1-5.** Pronotum of: 1. *G. major*; 2. *G. jaiba* n. sp.; 3. *G. reticulata*; 4. *G. grisea*; 5. *G. phryganoides*.  
**Figs. 6-10.** Ventral phallomere of: 6. *G. jaiba* n. sp.; 7. *G. major*; 8. *G. reticulata*; 9. *G. grisea*; 10. *G. phryganoides*.  
**Figs. 11-15.** Left phallomere in ventral view of: 11. *G. major*; 12. *G. jaiba* n. sp.; 13. *G. reticulata*; 14. *G. grisea*; 15. *G. phryganoides*.

Table I. Mean measurements of morphological characters of the *Gonatista* species (mm).

	head width	pronotum length	minimum pronotum width	length of metazona	tegmina length	femora length
<b>Males</b>						
<i>G. reticulata</i>	6.4	9.6	2.9	6.5	36	10.4
"	7.2	11.1	3.2	7.1	39	11.2
"	7.1	11.0	3.1	7.6	37	11.4
"	7.1	10.5	3.3	7.3	37	10.9
"	7.0	9.9	3.2	6.8	37	10.3
"	6.8	10.3	3.2	6.9	37	10.5
"	6.7	10.4	2.9	6.8	36	10.6
<i>G. phryganoides</i>	5.4	8.1	2.2	5.6	29	8.5
"	5.4	8.0	2.0	5.4	26	8.3
"	5.5	8.2	2.3	5.6	28	8.5
"	5.6	8.3	2.4	5.7	28	8.6
<i>G. major</i>	7.2	12.5	3.5	8.0	43	12.6
"	7.6	12.7	3.7	8.3	41	12.5
"	7.3	12.5	3.6	8.5	44	12.6
"	7.8	13.5	3.8	9.2	46	13.7
"	7.9	13.2	3.8	9.1	46	13.3
"	7.7	13.4	3.4	9.1	44	13.5
"	7.9	13.2	3.4	8.7	44	13.4
<i>G. jaiba</i>	7.4	11.6	3.5	8.0	41	11.7
<b>Females</b>						
<i>G. major</i>	9.7	16.5	4.8	11.4	32	16.8.
"	8.8	14.0	4.6	9.6	27	14.9
<i>G. reticulata</i>	8.3	13.5	4.0	9.3	25	13.8
"	8.5	12.7	4.0	8.6	24	13.0
"	8.2	11.6	3.7	7.8	24	11.8

This is the smaller species of the genus *Gonatista*, it is easily distinguishable from the others by its size, also for the following characters: Pronotum (Fig. 5) rectangular with supracoxal dilatation not distinct; tibiae with numerous hairs; tegminae with small dark spots that seldom converge into larger spots.

The copulatory apparatus shows a characteristic shape: ventral phallomere (Fig. 10) longer than wide, with a bilobate distal margin. Left phallomere (Figs. 15, 25) well sclerotized; dorsal lamina very narrow and long phaloid apophysis with a robust and sinuous distal process. Female unknown.

DISTRIBUTION. This species is known only from the Dominican Republic (Fig. 70).

***Gonatista major* Caudell, 1912**

Figs. 1, 7, 11, 16-18, 70.

*Gonatista major* Caudell: 1912: 161.

MATERIAL EXAMINED. HOLOTYPE ♀, Santo Domingo (NMNH).

OTHER MATERIAL EXAMINED. DOMINICAN REPUBLIC: Punta Cana Beach Resort, La Altagracia Prov., 23-27.VII.2001, 1 ♀ (Coll. D. E. Perez); Mina de oro Pueblo Viejo Prov. Sánchez Ramirez, 375-812mE 2094-033mN, 181 m, 21-26.IV.2003, 2 ♀♀ (Coll. Bastardo); 1.5 km N Boca Chica, 13-18.V.1973, 1 ♀ (leg. M. Davis); Parque Nacional del Este, Boca de Yuma entrance, 5.VIII.1999, 1 ♀ (leg. M. A. Ivie & K. A. Guerrero); Jarabacoa, Prov. La Vega, 7.IV.1984, 1 ♂; Prov. Hato Mayor, 3 km S. Sabana de La Mar, 19°01.800'N 69°29.092'W, 3. VIII.1999, 1 ♂ & (M. A. Ivie & K. A. Guerrero).

REMARKS: These specimens have been compared with the holotype and no differences have been discovered. This species is easily distinguishable by its large body size (Table I), by the shape of the pronotum (Fig. 1) and of the copulatory apparatus which is described here.

*Copulatory apparatus*. Ventral phallomere (Fig. 7) longer than wide with medial margin irregularly sinuous; distal margin rounded with a short tooth. Left phallomere (Figs. 11, 16-18) with dorsal lamina narrow; ventral lamina with a long narrow posterior branch, with a short apical process; phaloid apophysis with a distal process kidney-shaped with the free margin not sinuous.

DISTRIBUTION. This species is known only from the Dominican Republic (Fig. 70).

***Gonatista jaiba* Lombardo & Perez-Gelabert, sp.nov.**

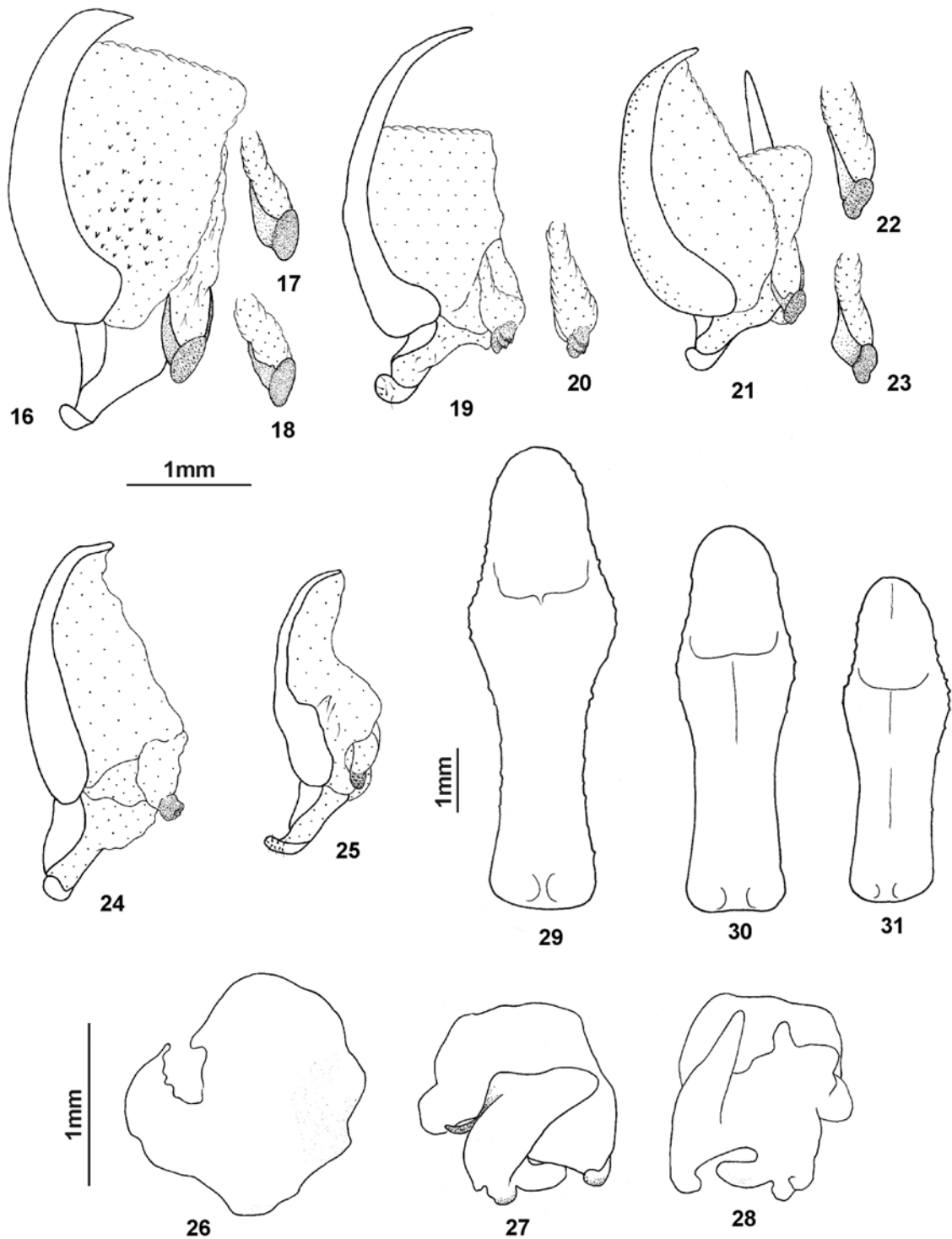
Figs. 2, 6, 12, 19, 20, 70, 74.

MATERIAL EXAMINED. HOLOTYPE ♀ DOMINICAN REPUBLIC: Oviedo, Pedernales Prov. 12.X.1998 (leg. D. E. Perez), Deposited at ANSP.

DESCRIPTION:

*Head*. Wider than long; eyes kidney-shaped; vertex straight with a flattened tubercle near ocular suture; ocelli big; frontal shield very transverse, pentagonal in shape.

*Thorax*. Pronotum rectangular (Fig. 2), ochre with scattered small dark points; lateral margins finely denticulated; supracoxal dilatation not distinct; metazonal disc with two large gibbositities; posterior margin with two conical tubercles. Wings well developed well beyond the apex of the abdomen: tegminae hyaline with numerous small black spots. Anterior coxae beyond posterior margin of pronotum; internal apical lobes ochre and divergent, of which the external one is larger. Anterior femora ochre, external surface with a series of 6-7 ivory tubercles; dorsal margin moderately sinuous with small granules. Anterior tibiae with the same chromatic model of femora, with 6 acuminate spines, of which the first one is very long. Middle and posterior legs slender; posterior metatarsi longer than the others together.



**Figs. 16-25.** Left phallomere in dorsal view of: **16-18.** *G. major*; **19-20.** *G. jaiba* n. sp.; **21-23.** *G. reticulata*; **24.** *G. grisea*; **25.** *G. phryganoides*. **Figs. 26-28.** Copulatory apparatus of *Paramusonia cubensis*: **26.** ventral phallomere; **27-28.** left phallomere in ventral and dorsal view. **Figs. 29-31.** Male pronotum of *Callimantis antillarum*.

*Abdomen.* Brown, with the first six urosternites leaf-like; external margin irregularly denticulated. Cerci beyond the subgenital plate; supragenital plate triangular with rounded apex.

*Copulatory apparatus.* Ventral phallomere (Fig. 6) longer than wide without distal process. Left phallomere well sclerotized (Figs. 12, 19), phalloid apophysis (Fig. 20) with a robust distal process with two transversal ridges.

This species (Fig. 70) is similar to *G. reticulata* from which it differs only by the different shape of the copulatory apparatus (Figs. 6, 8, 12, 13, 19-23).

**ETYMOLOGY.** The species epithet is in reference to the crab-like appearance of these mantids. Jaiba is the popular name for the native fresh-water crabs of Hispaniola. Substantive in apposition.

***Paramusonia cubensis* (Saussure, 1869)**

Figs. 26-28.

*Mantis cubensis* Saussure, 1869: 70.

MATERIAL EXAMINED. DOMINICAN REPUBLIC: **RD-069** Km 54 Rd. Azua Barahona Prov., 70 m, 18°21.871'N 71°09.080'W, 24.XI.2002, 2 % (leg. D. Perez, B. Hierro, H. Andújar); Punta Cana Beach Resort, La Altagracia Prov., 20-30.VII.2000, 1 % (leg. R. H. Bastardo); **RD-64** Parque del Mirador del Norte, Santo Domingo Prov., 96 m, 18°31.387'N 69°55.497'W, 21.XI.2002, 1 % (leg. D. Perez, R. Bastardo, B. Hierro).

REMARKS: These specimens correspond well to the original description of the species. We take this opportunity to describe the male external genitalia because this structure is a valid diagnostic indicator.

*Copulatory apparatus.* Ventral phallomere (Fig. 26) more or less rounded, without a distal process; right margin with a deep incisure. Left phallomere (Figs. 27, 28) sacciform with an acuminate phalloid apophysis.

DISTRIBUTION: This species is distributed in Cuba, Colombia and Venezuela. This is the first report from Hispaniola.

***Callimantis antillarum* (Saussure, 1859)**

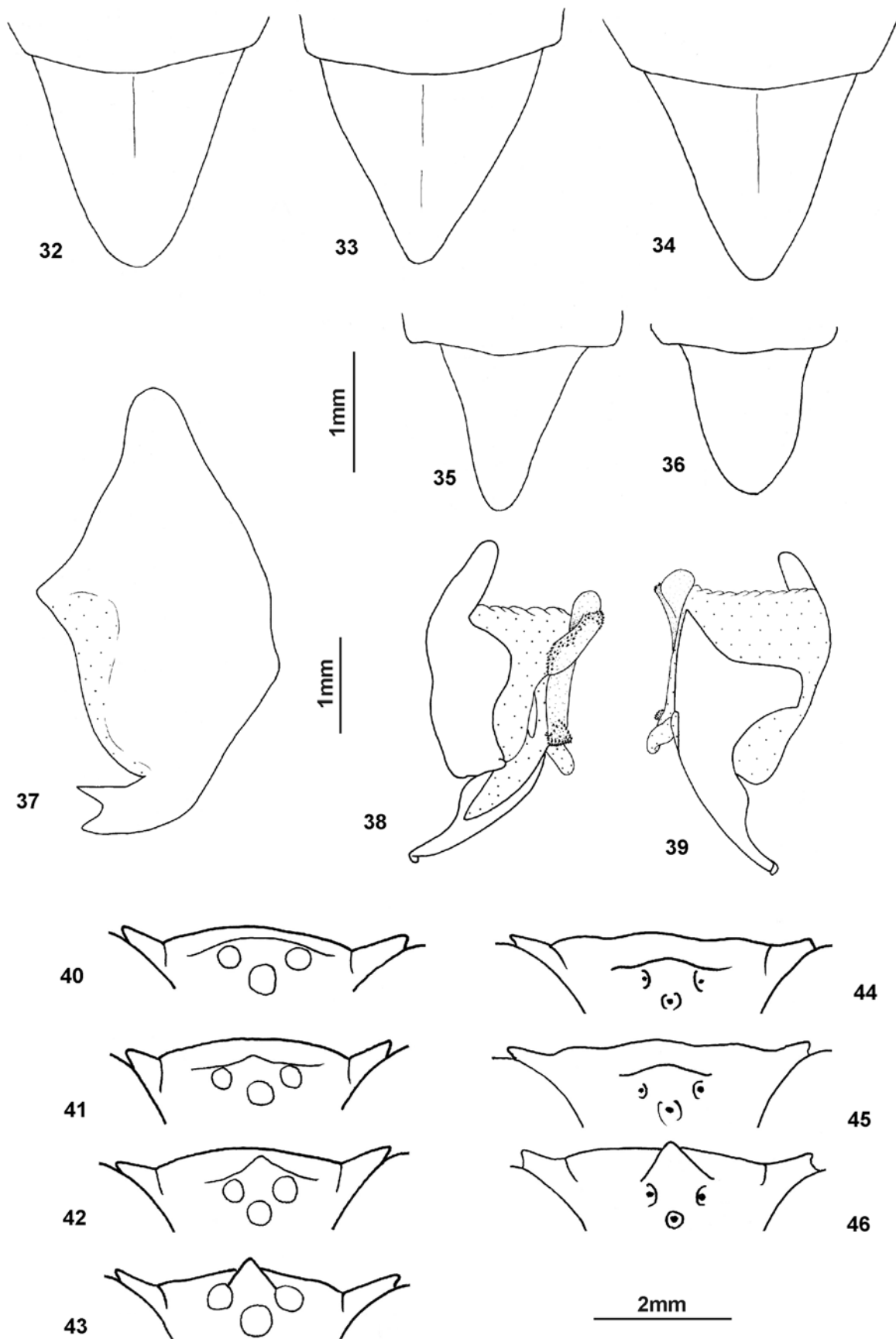
Figs. 29-36.

*Mantis antillarum* Saussure, 1859: 60.

MATERIAL EXAMINED. DOMINICAN REPUBLIC: **RD-056** Pueblo Nuevo, Bani, Peravia Prov. 18°17.672'N 70°19.922'W, 16.XI.2002, 1 %, 1 % juv., (leg. D. Perez, B. Hierro, R. Bastardo); **RD-066** 3 km N Padre las Casas, rd to Las Lagunas, Azua Prov., 613m, 18°44.914'N 70°55.436'W, 23.XI.2002, 1 %, 1 & (leg. D. Perez, B. Hierro, H. Andújar); **RD-85** 2 km rd Los Martínez, S. J. de Ocoa Prov., 18°27.574'N 70°28.036'W, 7.XII.2002, 1 %, 2 && (leg. D. Perez, R. Bastardo); **RD-062** 5 km W Las Américas Airport, Santo Domingo, 18°28.158'N 63°43.601'W 19.XI.2002, 1 % (leg. D. Perez, B. Hierro, R. Bastardo); **RD-055** 2 km N Bayahibe, La Altagracia Prov., 18°23.423'N 68°50.453'W, 31.VII.2002, 1 % 1 & (leg. D. Perez, B. Hierro, R. Bastardo); **RD-081** Playa Blanca, PNJ, Pedernales Prov., 17°44.895'N 71°31.166'W, 4.XII.2002, 1 & (leg. D. Perez, B. Hierro, R. Bastardo); **RD-028** 3 km S Montecristi, Montecristi Prov., 5.II.2002, % (leg. R. Bastardo, B. Hierro, D. Perez); **RD-090** 3 km E Montecristi, Montecristi Prov., 19°49.657'N 71°37.254'W, 11.XII.2002, 6 %, 2 && (leg. D. Perez, R. Bastardo); 6 km before Montecristi, Montecristi Prov., 2.X.1996, 1 % (leg. D. Perez, S. Navarro, B. Santana); **RD-088** 4 km E Montecristi, Montecristi Prov., 19°49.657'N 71°37.254'W, 11.XII.2002, 1 & (leg. D. Perez, R. Bastardo); **RD-017** Near km 8 rd Cabo Rojo Aceitillar, Pedernales Prov., dry forest 19.I.2002, 5 %, 1 &, (leg. R. Bastardo, B. Hierro, S. Navarro, D. Perez); Cabo Rojo, 24-28.8.1988, 1 % (M. A. Ivie, K. Philips, K. A. Johnson); Cabo Rojo, 19.8.1988, 3 % (leg. M. A. Ivie, K. Philips, K. A. Johnson); 35 km NNW Cabo Rojo 1370 m, El Aceitillar, Pedernales Prov., 24-26.VIII.1988, 1 % (leg. M. A. Ivie, K. Philips, K. A. Johnson); **RD-078** El Cajuil, Oviedo, Pedernales Prov., 52m, 17°48.783'N 71°21.538'W, 2.XII.2002, 2 %, 1 & (leg. D. Perez, B. Hierro, R. Bastardo); Pedernales, Oviedo, dry forest, 5-8.VI.2001, 1 %, 1 & (M. Takizawa); Pedernales, Oviedo, dry forest, 29-30.IX.1994, 2 %, 1 & (leg. D. Perez); **RD-021** Arroyazo, Reserva Científica Ebano Verde, La Vega Prov., 990 m, 19°02.27'N 70°32.64'W 26-27.I.2002, 1 % (leg. R. Bastardo, B. Hierro, D. Perez); Monseñor Nouel, La Presa de Blanco, 11-14.V.2001, 1 %, 1 & (leg. H. Takizawa); Santo Domingo, Parque Mirador del Norte, 18.VIII.2001, 1 & (leg. H. Takizawa); Santo Domingo, Parque Mirador del Norte, 27.V.2001, 1 & (leg. H. Takizawa); Santo Domingo, Parque Mirador del Norte,

26.VIII.2001, 1 & (leg. H. Takizawa); Santo Domingo, Parque Mirador del Norte, 20.V.2001, 1 % (leg. H. Takizawa); Santo Domingo, Parque Mirador del Norte, 17.VI.2001, 1 & (leg. H. Takizawa); Santo Domingo, Parque Mirador del Norte, 8.VII.2001, 1 % (leg. H. Takizawa); Santo Domingo, Parque Mirador del Norte, 2.XII.2001, 1 & (leg. H. Takizawa); Azua, El Número, 1.XI.2001, 1 % (leg. H. Takizawa); Azua, El Número, 25.I.2001, 1 %, 2 && (leg. H. Takizawa); **RD-054** 4 km on rd to honduras, nr second bridge, Peravia prov., 28.VII.2002, 18°21.326'N 70°25.909'W, 1 %, 1 & (leg. D. Perez, R. Bastardo); Peravia Prov. km 2 rd to Los Martinez, Ocoa, 29.IX.1996, 1 % (leg. D. Perez); **RD-069** Km 54 Rd. Azua Barahona Prov., 70 m, 18°21.871'N 71°09.080'W, 24.XI.2002, 2 && (leg. D. Perez, B. Hierro, H. Andújar); Jardín Botánico Nacional, Santo Domingo, 18°29.69'N 69°57.32'W, 13.IX.1999, 1 & (leg. D. Perez, R. Bastardo, M. de la Cruz); Jardín Botánico Nacional, Santo Domingo, 18°29.69'N 69°57.32'W, 20.IX.2000, 1 & (leg. D. Perez, R. Bastardo); Azua Prov., Las Yayitas, 7.XII.1994, 3 %, 2 && (leg. D. Perez, G. Dominici); Parque Nacional Jaragua, Boca de la Cañada, 18 km S. Oviedo, 22-23.IX.2000, 2 && (leg. D. Perez, R. Bastardo, B. Hierro); San Cristóbal Prov., Sabana de Hatillo, 13.XII.1994, 1 & (leg. D. Perez); Talanquera, San Pedro de Macorís Prov., 18°26.27'N 69°24.08'W, 12.IX.1999, 1 & (leg. D. Perez); Talanquera, San Pedro de Macorís Prov., 18°26.27'N 69°24.08'W, 17.XII.2000, 1 & (leg. D. Perez); 2 km rd. Los Martinez-Los Ranchos, near Ocoa, Peravia Prov., 10.XII.1994, 1 & (leg. D. Perez, G. Dominici, B. Hierro, S. Navarro); Loma Quita Espuela, San Francisco de Macorís Prov., 23.X.1998, 1 & (leg. D. Perez, S. Navarro); San Cristóbal Prov., Res. Cuevas El Pomier, 11.XI.1994, 1 % (leg. D. Perez, R. Bastardo, S. Navarro); Independencia Prov., ESE Jimaní, S. Laguna Limón 18°24'N 71°41'W, 3.VII.1992, 1 % (leg. R. O. Ivie); Independencia Prov., Pinos del Eden, 3.XII.1994, 1 % (leg. D. Perez, R. Bastardo, B. Hierro, J. Mateo); Azua Prov., hills of Monte Rio beach, 26.IX.1996, 1 & (leg. D. Perez, B. Hierro, G. Dominici); Prov. Pedernales, Parc. Nac. Sierra de Bahoruco, 45 km N El Aceitillar 1220-1450 m, 9.VIII.1999, 1 % (leg. M.V. Ivie, K. A. Guerrero); Pinar Parejo, Valle Nuevo, La Vega Prov., 10.VII.1998, 1 & (leg. S. Navarro, D. Veloz, K. Polanco); margen Rio Mulito, Prov. Pedernales, 19 km N Pedernales, 18°09.2' 71°44.8'W, 19-20.III.1998, 1 %, 3 && (leg. D. Perez, S. Navarro); Santiago prov., Diego de Ocampo, 1000-1300 m, 26.VIII.1995, 1 % (leg. D. Perez); **RD-007** Banks of Jura River, Peralta, Azua Prov., 510 m, 16.I.2002, 1 % (leg. R. Bastardo, B. Hierro, S. Navarro, D. Perez).

REMARKS: This species, among the mantids that populate Hispaniola, has the maximum plasticity, therefore its limits of variability are extremely ample, both as regards strictly morphological characters (size, length of tegminae, shape of pronotum and the supra-anal plate, etc.) and for chromatic characters. Having been able to examine a large number of co-specific specimens (the examination of the copulatory apparatus showed no differences to justify their separation) from Hispaniola, allowed us to note that it is not possible to recognize, within the species, even a purely limited geographical localization of the different phenotypes and that the various fluctuating characters have all the transition stages from one extreme to the other, without there being any correlation between them. Furthermore, the species is very common in all the Caribbean area and does not seem to be strictly linked to one environment rather than another: forests, meadows and other forms of tropical landscape are equally colonized by this species that does not seem to find any ecological barrier to its area of diffusion. In this way, in the same population notably different examples can be found with various characters.



**Figs. 32-36.** Supraanal plate of *Callimantis antillarum*: 32-34. females; 35-36. males. **Figs. 37-39.** Copulatory apparatus of *Stagnomantis domingensis*: 37. ventral phallomere; 38. 39. left phallomere in dorsal and ventral view. **Figs. 40-46.** Variability of process of the vertex of *Epaphrodita musarum*: 40-43. males; 44-46. females.

**Table II. Mean measurements of morphological characters of *Callimantis antillarum* based on some geographical distribution (mm)**

	head width	pronotum length	tegmina length	femora length	body length
Pueblo Nuevo	2.7	4.3	8.5	3.6	18.0
Santo Domingo	2.7	4.2	8.4	3.6	18.0
Montecristi	2.6	4.1	8.3	3.5	17.0
Cabo Rojo	3.0	5.1	10.1	4.5	23.8
El Aceitillar	2.8	4.7	9.8	3.9	21.0
% Parque Mirador	2.8	4.6	9.6	3.8	20.0
Oviedo	2.6	4.1	8.2	3.4	17.0
Los Martínez	3.1	5.4	10.3	4.6	25.0
"	2.8	4.6	9.7	3.9	23.0
Arroyazo	3.3	4.7	10.6	4.7	25.0
"	3.0	5.0	10.1	4.6	24.0
Pedernales	3.4	5.8	7.8	4.5	23.0
Aceitillar	3.5	5.8	4.7	4.6	24.0
Santo Domingo	3.3	5.1	7.5	3.8	22.0
&& Las Lagunas	3.8	6.7	10.6	4.5	25.7
Pueblo Nuevo	3.5	5.7	4.2	4.5	25.0
Playa Blanca	3.7	6.5	10.5	4.7	26.3
El Número	3.4	5.7	7.6	4.3	23.0

The differences in body size are marked as can be seen from the table (Table II) relative to the following extremes of body, pronotum, anterior femora and forewings length.

The pronotum (Figs. 29-31) is one of the structures that is most variable in both sexes, going from forms in which the ratio between metazona length and minimum width is just 4, to forms where this ratio is about 4.75. This measurement allows us to evaluate the slenderness of the pronotum where there are individuals with a less slender pronotum, in which the ratio is about 4, to individuals with a more slender pronotum in which the ratio is about 4.8.

The variability in the development of the wings is also conspicuous and there does not seem to be a correlation between body size and development of the wings, in fact, in some females much larger than the average the wings are notably shortened (Table II).

Also the supra-anal plate (Figs. 32-36) has a notable variability: there are examples where this structure is narrow and long, with the apex acute, in other specimens, instead, it is shorter, wider and with the apex sub-rounded.

The colour variations are, above all, in the wings: the extremity can be green or brown with all the intermediate variations; the posterior wing is hyaline with the discoidal area blackish and the base of the anal area that ranges from orange to pink to ochre; the remaining part of the anal area is blackish; finally, a black pre-apical mark of variable size is present in the discoidal area.

### *Stagmomantis domingensis* (Palisot de Beauvois, 1805)

Figs. 37-39.

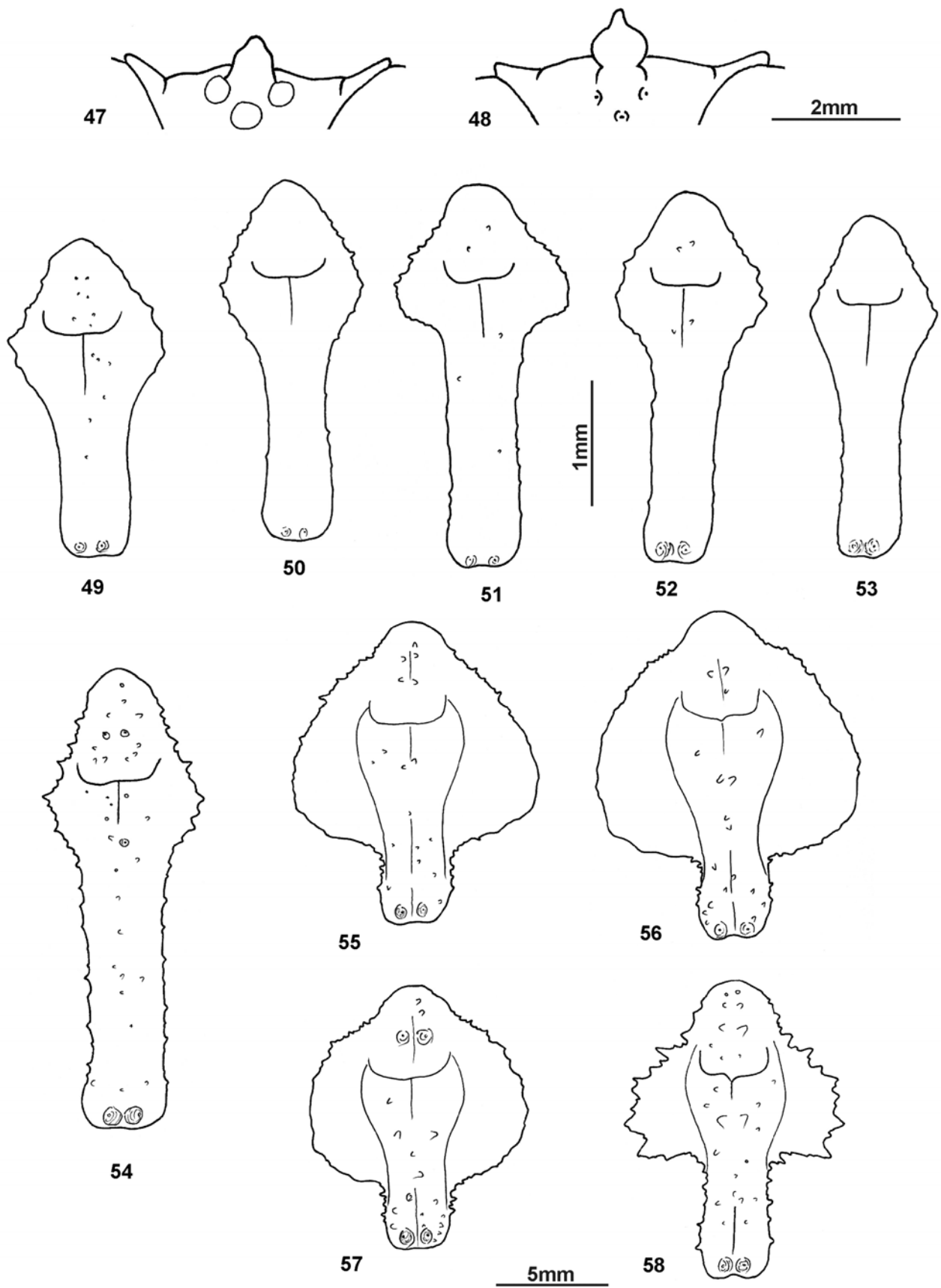
*Mantis domingensis* Palisot de Beauvois, 1805: 61-62, tav. 7.

MATERIAL EXAMINED. DOMINICAN REPUBLIC: **RD-081** Playa Blanca, PNJ, Pedernales Prov., 17°44.895'N 71°31.166'W, 4.XII.2002, 2 % (leg. D. Perez. B. Hierro, R. Bastardo); **RD-056** Pueblo Nuevo, Bani, Peravia Prov., 18°17.672'N 70°19.922'W, 16.XI.2002, 2 % 5 &&, (leg. D. Perez. B. Hierro, R. Bastardo); **RD-088** 4 km E Montecristi, Montecristi Prov., 19°49.657'N 71°37.254'W, 10.XII.2002, 3 % (leg. D. Perez., R. Bastardo); **RD-055** 2 km N Bayahibe, La Altagracia Prov., 18°23.423'N 68°50.453'W, 31.VII.2002, 2 % (leg. D. Perez, B. Hierro, R. Bastardo); **RD-090** 3 km E Montecristi, Montecristi Prov.,

19°49.657'N 71°37.254'W, 11.XII.2002, 2 % (leg. D. Perez, R. Bastardo); **RD-062** 5 km W Las Américas Airport, Santo Domingo, 18°28.158'N 63°43.601'W 19.XI.2002, 4 % (leg. D. Perez. B. Hierro, R. Bastardo); **RD-025** 10 km rd to Los Anones, Ocoa Prov., 1070m, 1-2.II.02, 1 & (leg. RB, BH, DP); Jardín Botánico Nacional, Santo Domingo, 13.IX.1999, 18°29.69'N 69°57.32'W, 1 % 1 & (leg. D. Perez, R. Bastardo, M. de la Cruz); Punta Cana Beach Resort, La Altagracia Prov. 20-30.VII.2000, 1 & (Coll. R. Bastardo); Pedernales, lado Fundacipe, Pedernales Prov., 18°01.8'N 71°44.7'W, 19-20.III.1999, 2 && (D. Perez, S. Navarro); **RD-087** Down from Palos Grandes, NE of S. J. de Ocoa, Ocoa Prov., 1440m, 18°37.283'N 70°31.481'W, 8.XII.2002, 1 & (leg. D. Perez, R. Bastardo); **RD-63** Sierra Prieta, Santo Domingo Prov., 18°38.315'N 69°58.302'W, 20.XI.2002, 1 & (leg. D. Perez. B. Hierro, R. Bastardo); **RD-57** ~2 km N Bani, Peravia Prov., dry scrub, 18°18.489'N 70°20.599'W, 16.XI.2002, 1 & (leg. D. Perez. B. Hierro, R. Bastardo); **RD-069** km 54 rd. Azua-Barahona, 70 m, 18°21.871'N 71°09.080'W, 24.XI.2002, 1 & (leg. D. Perez, B. Hierro, H. Andújar); **RD-078** El Cajuil, Oviedo, Pedernales Prov., 52m, 17°48.783'N 71°21.538'W, 2.XII.2002, 1 & (leg. D. Perez. B. Hierro, R. Bastardo); **RD-060** Monte Rio, 4 km W of beach, 70 m, 18°22.972'N 70°43.036'W, 17.XI.2002, 1 & (leg. D. Perez. B. Hierro, R. Bastardo); Margen Rio Mulito, Prov. Pedernales, 19 km N Pedernales, 18°09.2'N 71°44.8'W, 19-20.III.1999, 1 % (leg. D. Perez, S. Navarro); Las Yayitas, Azua Prov. 18°30.19'N 70°12.53'W, 17.X.1998, 1 % (leg. D. Perez. B. Hierro, R. Bastardo); Santiago Prov., Jánico, Jardín Botánico de Jánico, 400-540m, 27.VIII.1995, 1 % (leg. D. Perez. B. Hierro, S. Navarro); Prov. Pedernales P. N. Sierra de Bahoruco, 1240 m, 18°09.023'N 71°37.387'W, 22.VIII.1999, 1 % (leg. M. A. Ivie, K. A. Guerrero); Laguna de Nisibón, El Seibo Prov., 18°49.36'N 68°40.12'W, 26.IX.1999, 1 % (leg. D. Perez, R. Bastardo, L. Ramos); Parque Nacional Jaragua, Boca de la Cañada, 18 km S Oviedo, 22-23.IX.2000, 1 % (leg. D. Perez. B. Hierro, R. Bastardo); Punta Cana Beach Resort, La Altagracia Prov., 23-27.VII.2001, 2 % (Coll. D. Perez)

REMARKS: Thanks to a large series of conspecific specimens (the examination of the copulatory apparatus reveals no differences that allow us to attribute them to different species), we have been able to identify some characters with an intraspecific variability. The differences of the measurements are notable (Table III). The pronotum in both sexes is variable, the ratio between the length and minimum width in the males is 30-21 and in the females 13.7-18. This measurement allows us to evaluate the





**Figs. 47-48.** Vertex of *Epaphrodita lobivertex* n. sp.: 47. male; 48. female. **Figs. 49-54.** Male pronotum of: 49-53. *Epaphrodita musarum*; 54. *Epaphrodita lobivertex* n. sp. **Figs. 55-58.** Female pronotum of: 55-57. *Epaphrodita musarum*; 58. *Epaphrodita lobivertex* n. sp.

**Table III. Mean measurements of morphological characters of *Stagmomantis domingensis* based on some geographical distribution (mm)**

	head width	pronotum length	supracoxal dilatation width	metazona length	metazona width	femora length	tegmina length	tegmina width	body length
<b>Males</b>									
Bayahibe	4.8	19	2.2	15.0	0.9	12.0	32.0	-	52
Montecristi	4.3	15	2.2	11.5	0.8	10.0	29.0	-	46
Pueblo Nuevo	5.2	18	2.5	14.0	1.0	13.0	33.0	-	53
"	5.0	19	2.5	14.5	1.0	13.0	34.0	-	53
Playa Blanca	4.9	15	2.1	12.0	0.5	11.0	28.0	-	45
Punta Cana	4.5	17	2.3	12.9	0.5	12.0	30.0	-	48
<b>Females</b>									
Pedernales	6.2	23	3.4	18.0	1.3	15.0	24.0	6.0	54
"	5.7	20	3.1	16.0	1.1	14.0	23.5	5.1	48
Santo Domingo	6.9	25	3.5	19.0	1.4	16.5	24.0	6.0	57
Punta Cana	6.9	24	3.5	17.0	1.45	16.0	23.0	5.2	60
Los Anones	6.6	22	3.7	16.0	1.6	16.0	26.0	6.4	52
Bani	5.5	18	2.8	14.0	1.2	13.0	19.0	5.2	47

slenderness of the pronotum that gradually goes from less slender, to individuals that have a more slender one.

Also the development of the wings, above all in the females, has a certain variability and there seems to be no correlation between body size and their development: in fact, in some females that are larger than average the wings do not exceed the third urotergite, while in others, of smaller size, the apex of the tegmine extends well beyond the eighth urotergite. Also the ratio between length and width varies from 3.65 to 4.60. The stigma is always ivory in color and half moon shaped, its left margin has a brown mark sometimes faded or even absent.

The copulatory apparatus is homogeneous: ventral phallomere (Fig. 37) longer than wide with a long arcuated and bidentate distal process, left phallomere (Figs. 38-39) well sclerotized: dorsal lamina longer than wide; ventral lamina wider than dorsal lamina with a elongate distal process; phalloid apophysis well developed with two branches, of which, the anterior one is wide with minute spines, the posterior one is narrower and with numerous robust spines.

**DISTRIBUTION.** This species is widely distributed in Hispaniola.

### *Epaphrodita* Serville, 1831

*Epaphrodita* Serville, 1831: 52.

The genus *Epaphrodita* is commonly distributed in the Caribbean area; there are two species: *E. musarum* (Palisot de Beauvois, 1805) and *E. dentifrons* Saussure, 1872. They are known from only a few specimens, of which *E. dentifrons* is known only from the male. Their descriptions are very similar and do not furnish any striking features that cannot be attributed to intraspecific variability. In fact, these two species are distinguished on the basis of the absence or presence of a triangular tooth above the ocelli. The examination of a considerable number of the co-specific specimens (the external male genitalia are similar) from the same locality or adjacent areas have shown that this character is very variable in both sexes (Figs. 40-46): in fact there are specimens without a tooth (*E. musarum*), in this case there is a prominent carina, while there are other specimens with a triangular tooth of variable size (*E.*

*dentifrons*). Since Saussure described *E. dentifrons* from only one specimen, he was not able to value the intraspecific variability of this character, therefore he made the mistake of raising this single specimen to the level of species. Therefore, we believe that there are not sufficient reasons to maintain the two species separated, thus *E. dentifrons* is a junior subjective synonym of *E. musarum*. Furthermore we have a couple of specimens very different from *E. musarum* that we think belong to a new species that will be described below.

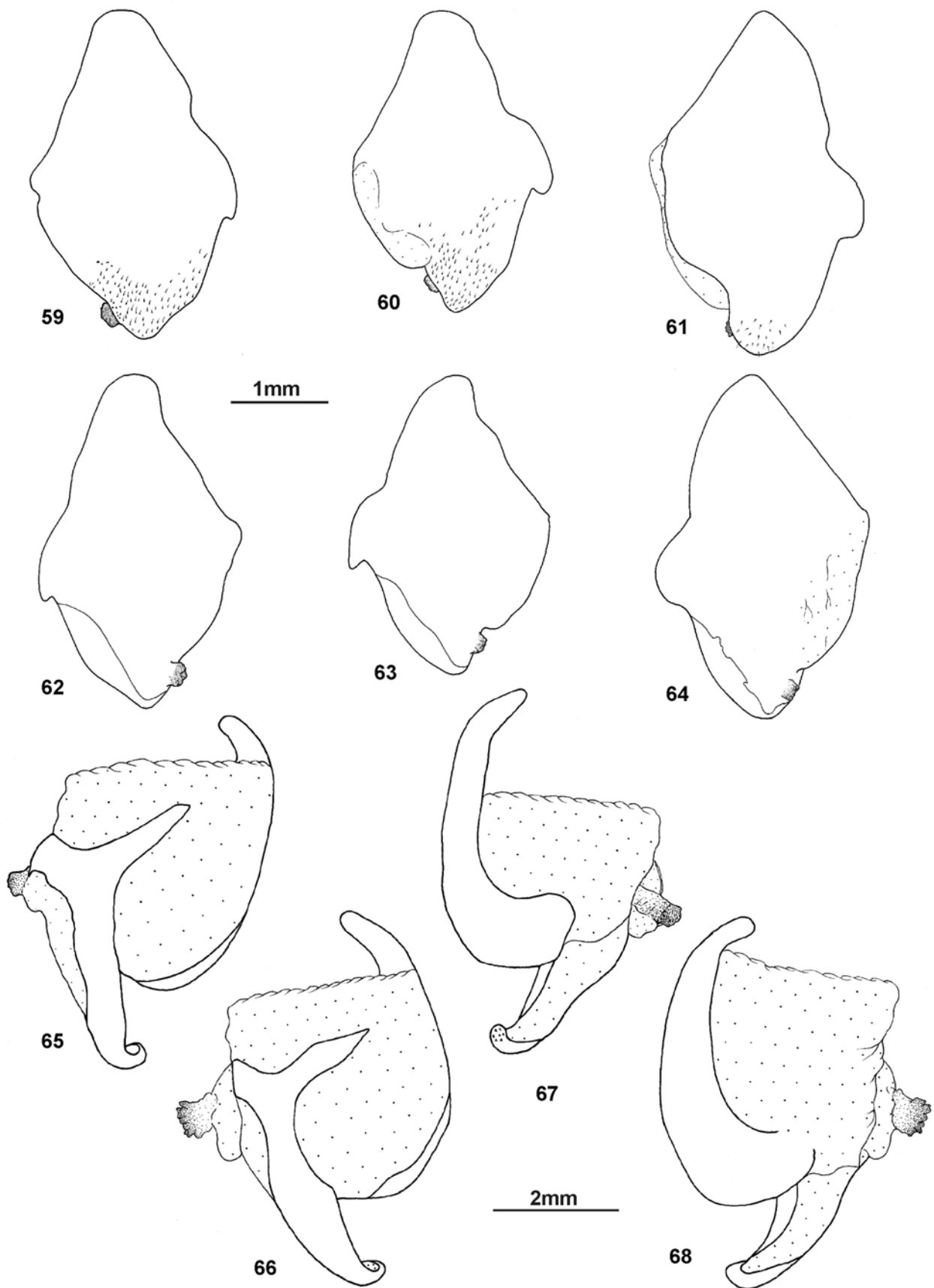
### *Epaphrodita musarum* (Palisot de Beauvois)

Figs. 40-46, 49-53, 55-57, 59, 60, 62, 63, 65, 67, 71.

*Mantis musarum* Palisot de Beauvois, 1805: 111.

*Epaphrodita dentifrons* Saussure, 1872: 281-282 (*n. syn.*).

**MATERIAL EXAMINED.** DOMINICAN REPUBLIC: **RD-034** Boca de la Cañada, 15 km S Oviedo, Pedernales Prov. 17°54.901'N 71°30.067'W, 4.VII.2002, 1 % (leg. B. Hierro, R. Bastardo, D. Perez); Punta Cana Beach Resort, La Altagracia Prov., 20-30.VII.2000, 2 %% (leg. R. Bastardo); **RD-062** 5 km W Las Américas Airport, Santo Domingo, 18°28.158'N 63°43.601'W 19.XI.2002, 1% (leg. D. Perez, B. Hierro, R. Bastardo); Prov. Hato Mayor, W. Sabana de la Mar, Par. Nac. Los Haitises, 01.07.1992, 1% (leg. R. O. Ivie); Monseñor Nouel, La Presa de Blanco, 11-14.V.2001, 1 % (leg. H. Takizawa); **RD-086** Hilltop on way to Palos Grandes, NE S. J. de Ocoa, 1437m, Ocoa Prov. 18°37.871'N 70°30.777'W, 8.XII.2002, 4 %% (leg. D. Perez, R. Bastardo); **RD-064** Parque Mirador del Norte, Santo Domingo Prov., 96m, 18°31.387'N 69°55.497'W, 21.XI.2002, 3 %% (leg. D. Perez, R. Bastardo); **RD-052** Pueblo Nuevo, Bani, Peravia Prov., 27.VII.2002, 97m, 18°17.757'N 70°19.601'W, 1 % (leg. D. Perez, R. Bastardo); Prov. La Altagracia, P. N. del Este, Boca de Yuma, 05.VIII.1999, 18°21.904'N 68°37.087'W, 1 % (leg. M. A. Ivie, K. A. Guerrero); Margen Rio Mulito, Prov. Pedernales, 19 km N Pedernales, 18°09.2'N 71°44.8'W, 19-20.III.1999, 230m, 1 % (leg. D. Perez, S. Navarro); Prov. La Vega, Constanza, 1160m, 30.VIII.1988, 1 & (leg. M. A. Ivie, T. K. Philips, K. A. Johnson); El Aceitillar, km 25 Alcoa Road, Pedernales Prov., I.XII.1994, 1 & (leg. D. Perez, B. Hierro, R. Bastardo); **RD-025** Km 10 on rd to Los Anones, Ocoa Prov., 1070m, 1-2.II.2002, 1 & (leg. R. Bastardo, B. Hierro, D. Perez); **RD-165** Rio Limpio, Elias Piña Prov., 19°14.908'N 71°32.228'W, 769m, 25.VII.2003, 1 & (leg. D. Perez, R. Bastardo, B. Hierro); **RD-095** Rodeo, 0.5 km E Presa de Blanco, Bonao, Monseñor Nouel Prov., 20.III.2003, 1 & (D. Perez, R. Bastardo, B. Hierro).



**Figs. 59-64.** Ventral phallomere of: **59, 60, 62, 63.** *Epaphrodita musarum*; **61, 64.** *Epaphrodita lobivertex* n. sp. **Figs. 65-68.** Left phallomere of: **65, 67.** *Epaphrodita musarum* in ventral and dorsal view; **66, 68.** *Epaphrodita lobivertex* n. sp. in ventral and dorsal view.

REMARKS: This species is well represented in Hispaniola's fauna and this permitted us to evaluate its intraspecific variability.

Besides the head, as we described above, also the pronotum is very variable in both sexes (Figs. 48-58): the expansion of the lateral margin of the pronotum can sharply stop immediately after the supracoxal dilatation (Figs. 51, 52) or it can continue up to about half of the metazona (Figs. 49, 50, 53). Also the ratios: metazona/prozona and length/minimum width of the metazona are variable. From these characters there are individuals with a slender pronotum or a pronotum more or less rounded. Moreover, the lateral margins of the pronotum, even if they are indistinctly denticulated, can sometimes be well denticulated in all their length.

The copulatory apparatus is homogeneous: the ventral phallomere (Figs. 59-60, 62, 63) is rhomboidal without a distal process but with a robust and very sclerotized process above the distal margin. The left phallomere (Figs. 65, 67) has a wide dorsal lamina, the phalloid apophysis is well developed with the free margin irregularly developed; ventral lamina with apical process rich in some small spines. In this case there is a prominent carina.

DISTRIBUTION. This species is known from Haiti and the Dominican Republic (Fig.71).

***Epaphrodita lobivertex* Lombardo & Perez-Gelabert, sp.nov.**

Figs. 47, 48, 54, 58, 61, 64, 66, 68, 71, 72, 73.

*E. musarum*: Westwood, 1889: 22 (female).

MATERIAL EXAMINED. HOLOTYPE ♀ DOMINICAN REPUBLIC: **RD-63** Sierra Prieta, Santo Domingo Prov., 18°38.315'N 69°58.302'W, 20.XI.2002, (leg. D. Perez. B. Hierro, R. Bastardo); "ALLOTYPE" &, Dominican Republic, 00303.

DIAGNOSIS.

Medium in size, chestnut in color, front with a robust process, supracoxal dilatation of the female, leaf-like with denticulated margins.

MALE.

*Head*. About 1.04 times as wide as pronotal supracoxal dilatation; eyes ovoid with acute apex; vertex arcuated; front wide with a smoothed robust process above ocelli (Fig. 47); occiput with two conical processes; frontal shield pentagonal, longer than high; antennae not well developed.

*Thorax*. Pronotum (Fig. 54) 4.72 times as long as its minimum width; lateral margins of prozona with very distinct robust teeth; metazona with less robust teeth; supracoxal dilatation well distinct; disc of prozone with large tubercles scattered on the median line; disc of metazone roof-like with sparse small granules; posterior margin with two robust conical tubercles. Anterior legs robust: coxae 0.8 times as long as pronotum, prismatic in shape; anterior margin with 4-5 robust teeth with acute apex, the other ones with small spines; femora wide at base more restricted in distal area, dorsal margin smooth, external surface with 7-8 small granules scattered on median line; tibiae with 14 external spines of which the first six slipped. Middle and posterior legs slender, femora with a pre-apical

lobe. Wings well developed, beyond abdomen apex; tegminae with numerous dark spots, 6.5 times as long as their width; costal area opaque, reduced to short but wide basal area; costal margin moderately sinuous; apex sub-rounded; discoidal area hyaline with a large light spot delimited by two dark bands. Metathoracic wings with costal area and apex of discoidal area similar in color at tegminae; discoidal area shiny brown; anal area with shiny brown concentric bands.

*Abdomen*. Cylindrical narrow, margins of 5<sup>th</sup> and 6<sup>th</sup> sternite with a small lobe; 6<sup>th</sup> tergite with a robust tooth on distal margin. Supranal plate elongated beyond the apex of subgenital plate.

*External male genitalia*. Ventral phallomere (Figs. 61, 64) longer than wide without distal process, distal margin rounded and with numerous short hairs, ventral surface with a robust and stocky pre-apical. Left phallomere (Figs. 66, 68) well developed and sclerotized; dorsal lamina narrow and arcuated; ventral lamina with a distal hooked process; phalloid apophysis short, very sclerotized.

*Measurements* (mm). Head width 4.5; pronotum length 10.4; metazona length 8.5; supracoxal dilatation width 4.3; metazona minimum width 2.2; femur length 9.0; femur width 2.2; tegmina length 41; tegmina width 6.4.

FEMALE

*Head*. Similar to male, with scattered dark dots some of which fuse to form a larger spot; eyes ovoid with acute apex; vertex moderately arcuated; occiput with two stocky tubercles, front wide with a very robust process (Fig. 48); frontal shield longer than high; last article of labial palpi black.

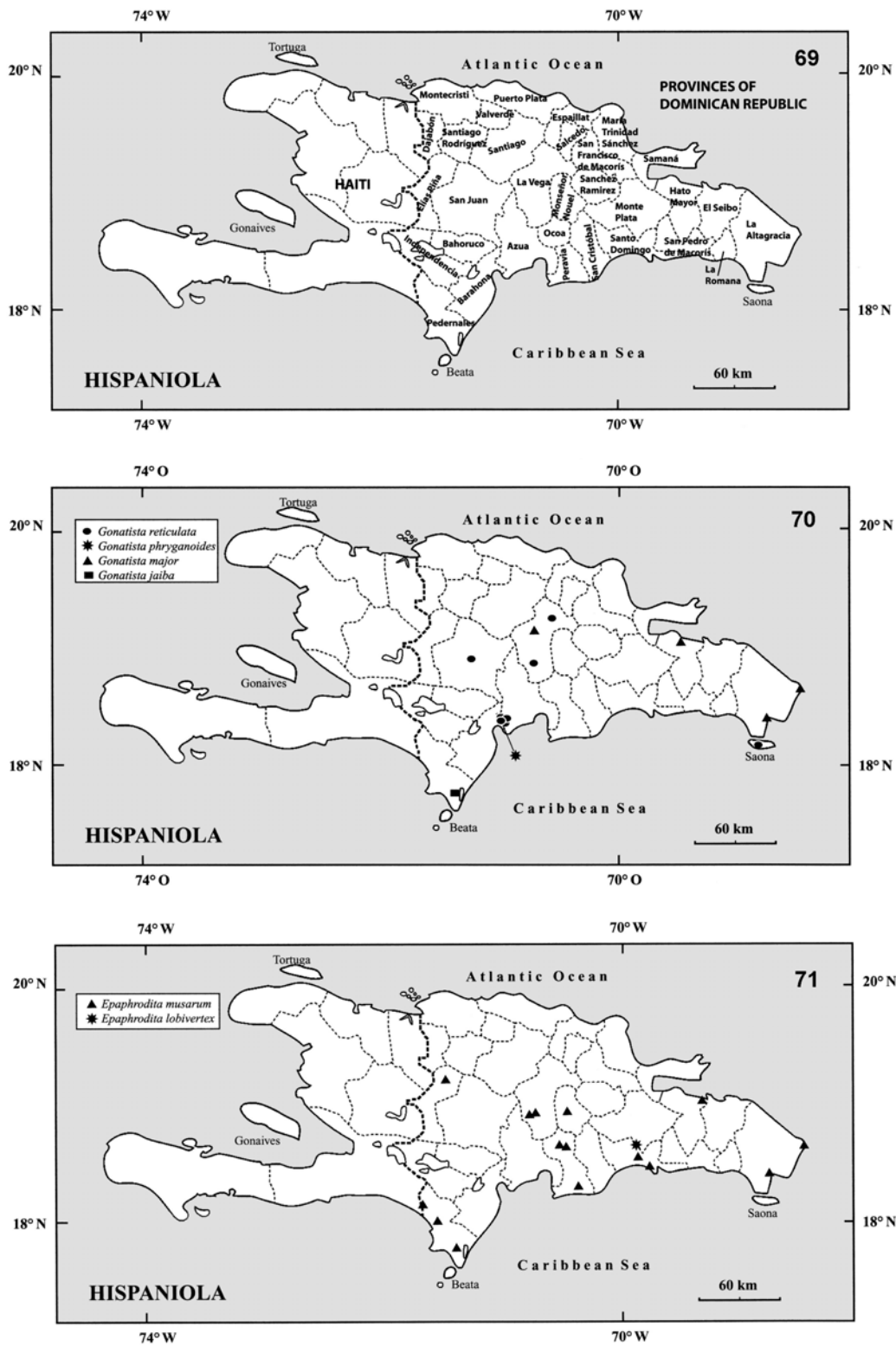
*Thorax*. Pronotum (Fig. 58) 1.7 times as long as its minimum width; supracoxal dilatation leaf-like with denticulated margins; disc of pronotum with sparse tubercles of various size; metazona with a distinct basal carina separating two robust conical tubercles. Legs similar to male but more robust. Wings reduced: tegminae opaque, 2 times as long as its maximum width; costal margin moderately sinuous; costal area brown with a wide preapical white band extending to discoidal area; discoidal area hyaline brown; stigma large ivory in color. Metathoracic wings opaque with white and grey spots; discoidal area dark; anal area with concentric dark spots.

*Abdomen*. Trapezoidal; tergites with a median longitudinal carina; lateral margins of 1<sup>st</sup>-7<sup>th</sup> sternites with leaf-like dilatation. Supranal plate elongated with a prominent longitudinal bilobate carina.

*Measurements* (mm). Head width 4.5; pronotum length 9.7; metazona length 6.5; femur length 8; tegmina length 8.6; tegmina width 4.3.

REMARKS. We assign to this species also the female specimen that Westwood (1889) determined as *E. musarum*, because by Westwood's drawing, even if approximate, the shape of the pronotum and the mesothoracic wings, shows a notable similarity with those of the female of *E. lobivertex* n. sp.

ETYMOLOGY. The term *lobivertex* is referred to the basal lobe of the vertex. Substantive in apposition.



**Fig. 69.** Map of the provinces of Hispaniola. **Fig. 70.** Distribution map for *G. reticulata* (Thunberg), *G. phryganoides* (Serville), *G. major* Caudell, *G. jaiba* n.sp. **Fig. 71.** Distribution map for *E. musarum* Palisot-de Beauvois, *E. lobivertex* n.sp.

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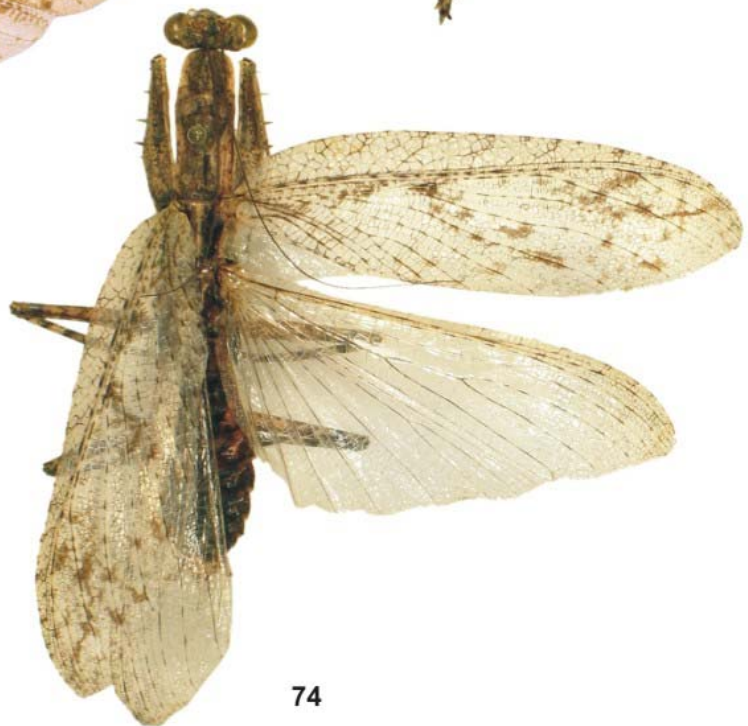
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**Figs 72-73.** *Epaphrodita lobivertex* n.sp. (female and male). **Fig. 74.** *Gonatista jaiba* n.sp. (male).

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