

**First West Indies records of  
*Thermonectus succinctus* (AUBÉ, 1838),  
with notes on other Cuban species  
(Coleoptera: Dytiscidae)**

Y. ALARIE, Y.S. MEGNA & A. DELER-HERNANDEZ

**Abstract**

The present work deals with the taxonomic composition, distribution and bionomics of the Aciliini genus *Thermonectus* DEJEAN, 1833 (Coleoptera: Dytiscidae) in Cuba. *Thermonectus succinctus* is recorded for the first time from the West Indies. A key to the four species of *Thermonectus* from Cuba is provided.

**Key words:** Coleoptera, Dytiscidae, Aciliini, *Thermonectus*, new distribution records, key to species, Cuba.

**Introduction**

Dytiscinae contain the largest members of the family Dytiscidae (LARSON et al. 2000, MILLER et al. 2007). This subfamily comprises seven tribes worldwide (MILLER 2000, NILSSON 2001, 2003), of which three (Cybistrini SHARP, Hydaticini SHARP and Aciliini THOMSON) are represented in Cuba by four genera (*Cybister* CURTIS, *Hydaticus* LEACH, *Megadytes* SHARP, and *Thermonectus* DEJEAN) and nine species (PECK 2005). In Cuba, Dytiscinae are generally found in lentic habitats and tend to occur in deeper and more open sites than members of other subfamilies.

Except for some relatively recent papers (SPANGLER 1973, 1981, PECK 2005), all information regarding the composition and distribution of Cuban dytiscids is from old studies dealing with species concentrated in mountainous regions (JACQUELIN DU VAL 1856–1857, CHEVROLAT 1863, GUNDLACH 1891). Lack of information on such a diverse group of beetles prompted this study, which aims at describing the *Thermonectus* fauna of Cuba. *Thermonectus* is exclusively a New World genus, which is primarily found in warm temperate to tropical regions (TRÉMOUILLES 1989, LARSON et al. 2000). *Thermonectus* is comprised of 19 species worldwide, four of which occur in Cuba. Most species of *Thermonectus* are inhabiting temporary to permanent ponds; most species fly readily and are often collected at light (LARSON et al. 2000).

**Material and Methods**

Specimens examined: Description of form and structure, taxonomic conclusions, geographical distribution and other findings reported in this paper are based on examination of adult specimens deposited in the Museo de Historia Natural “Charles Ramsden”, Facultad de Ciencias Naturales, Universidad de Oriente, Santiago de Cuba, Cuba (CZCTR). Specimens collected in the field during this study are deposited in this collection.

Collecting methods: Sampling was unstructured and qualitative, with the goal of obtaining a strict inventory of Aciliini of the region. Beetles were collected using D-net sweeps in a variety of microhabitats including macrophyte beds, rocky shores, organic-rich sediments, and open water.

Sex determination and dissection of male genitalia: Determination of the sex of individuals was made simply by reference to the shape of the protarsi, which are enlarged laterally in males. Females of several species also differ from males by the presence of scratches on elytra. A character used in diagnosis of the species studied was the form of the male genitalia. Successful examination of these structures required some dissection. Prior to dissection, dry specimens were relaxed in hot water during 10 minutes. The genitalia were then extracted by inserting a pin into the abdominal opening. The median lobe and the parameres were then disarticulated and mounted together with the specimens. If the abdomen was removed, it was also glued to the same card as the genitalia.

The nomenclature used herein is based on the classification proposed by MILLER (2001) and NILSSON (2001).

Descriptions: The characters and terms used in the morphometric analysis are defined in Table 1. Measurements are given in Table 2. Measurements to the nearest 0.05 mm were taken using a MBS-9 stereomicroscope with a caliper in one ocular. When possible, nine specimens of each sex were chosen for measurements. Only intact specimens were selected for the study. Unless otherwise stated, all measurements represent greatest distance. In order to obtain measures of shape, the ratios PL/PW and TL/EW were calculated.

Table 1: Morphometric characters of adults of Cuban Dytiscinae.

<b>V a r i a b l e s</b>	<b>D e s c r i p t i o n</b>
Head length (HL)	Measured along the midline from the anterior clypeal margin to the anterior pronotal margin
Pronotal length (PL)	Measured along the midline from the anterior margin to the posterior margin
Elytral length (EL)	Measured along the midline from the anterior margin to the apex
Elytral width (EW)	Measured at greatest transverse width across both elytra
Pronotal width (PW)	Measured at level of posterior margin
Head width (HW)	Measured near posterior margin
Distance between eyes (DBE)	Minimum distance between eyes
Total length (TL)	The sum of three measurements: HL + PL + EL

Distribution: The Cuban records are based on specimens examined and on literature data. The principal faunal studies that we have consulted are: JACQUELIN DU VAL (1856–1857), CHEVROLAT (1863), GUNDLACH (1891), SPANGLER (1973, 1981) and PECK (2005).

### Genus *Thermonectus* DEJEAN, 1833

Species of *Thermonectus* can be distinguished by the following combination of characters: moderate size; non-emarginate eyes; posteroventral margin of mesofemur with a series of stiff setae about as long as or longer than width of femur; apex of outer spines of metatibia notched; outer margin of metaventral wing arched; male mesotarsi lacking adhesive palettes.

The following key was drawn largely from YOUNG (1954), GOODHUE-MCWILLIAMS (1968), TRÉMOUILLES (1989), and LARSON et al. (2000).

#### Key to the Cuban species of *Thermonectus*

- 1 Elytra black or reddish-black, with bright yellow or yellowish spots or fascia ..... 2
- Elytra yellowish with dense speckles in the shape of small irregular spots; postmedial fascia; longitudinal black spots at lateral margin at about greatest width..... 3
- 2 Elytra black or reddish-black with irregular yellowish markings; narrow yellowish lateral margins interrupted by longitudinal lines of black spots or speckles; irregular yellowish spot near lateral margin at greatest width and preapical fascia lacking; paramere as in Fig. 5.....  
..... *basillaris basillaris*
- Elytra black with distinct yellowish markings; broad yellowish lateral margins confluent with medial extension; irregular yellowish spot near lateral margin at greatest width; yellowish preapical fascia present; paramere as in Fig. 6..... *margineguttatus*
- 3 Head yellowish, black markings not reaching anterior margin of head; pronotum yellowish with prominent black markings, wide black band at posterior margin tapering toward lateral margins (Fig. 3); elytra speckled with indistinct discontinuous postmedial fascia; male protarsal pad with the three basal adhesive setae of about same diameter; female with elytral sculptures deeply impressed; paramere as in Fig. 7..... *circumscriptus*
- Head yellowish, black markings reaching anterior margin of head; pronotum yellowish with reduced black markings, with two large subbasal biconvex lens-shaped spots, which are open or closed and usually confluent medially (Fig. 4); elytra speckled with indistinct discontinuous postmedial fascia; male protarsal pad with one of the three basal adhesive setae about twice the diameters of the other two; female lacking elytral sculptures; paramere as in Fig. 8... *succinctus*

#### *Thermonectus basillaris basillaris* (HARRIS, 1829)

(Figs. 1, 5, 9)

*Dytiscus nimbatu*s MELSHEIMER, F.V. 1806: 48 (nomen nudum).

*Dytiscus basillaris* HARRIS 1829: 1.

*Acilius incisus* AUBÉ 1838: 147; GUNDLACH 1891: 39.

*Acilius cinctatus* AUBÉ 1838: 151.

*Acilius laticintus* LECONTE 1852: 203.

*Thermonectus nimbatu*s MELSHEIMER, F.E. 1844: 26.

*Thermonectus basillaris* [sic!] (HARRIS, 1829): CROTCH 1873: 402. – SHARP 1882a: 684; 1882b: 45.

*Thermonectus basillaris* [sic!] (HARRIS, 1829): LEECH 1941: 197. – LARSON et al. 2000: 826.

*Thermonectus basillaris* (HARRIS, 1829): SPANGLER 1981: 154. – EPLER 1996: chapter 3.90. – WHITEMAN & SITES 2003: 223.

#### MATERIAL EXAMINED:

CUBA: Isla de La Juventud: Punta del Este, 21.V.2006, Y.S. Megna coll. (5 exs.); 22.V.2006, Y.S. Megna coll. (1 ex.); Pinar del Río: Guanahacabibes, 30.VII.2003, Y.S. Megna & O. Bello coll. (2 exs.); Las Tunas: Sábalo, 06.VIII.2005, Y.S. Megna coll. (8 exs.); Palancón, 09.VIII.2005, Y.S. Megna coll. (2 exs.); Aeropuerto, 25.XI.2004, Y.S. Megna coll. (4 exs.); Las 40, 27.XI.2004, Y.S. Megna coll. (3 exs.); Loma Blanca, 10.VIII.2006, Y.S. Megna coll. (1 ex.); Granma: Cauto Cristo, 13.VII.2004, Y.S. Megna & L. Chávez coll. (1 ex.); 04.VIII.2004, L. Chávez coll. (2 exs.); 09.VIII.2004, L. Chávez coll. (1 ex.); 24.VIII.2004, L. Chávez coll.

(1 ex.); 27.VIII.2004, L. Chávez coll. (1 ex.); 06.II.2005, L. Chávez coll. (2 exs.); Santiago de Cuba: Juraguá, 10.X.2003, Y.S. Megna coll. (12 exs.); 02.XII.2006, Y.S. Megna & A. Deler-Hernández coll. (8 exs.); 08.XI.2006, Y.S. Megna & A. Deler-Hernández coll. (2 exs.); La Pimienta, 15.IX.2003, A. Deler-Hernández & F. Cala-Riquelme coll. (1 ex.); La Maya, 16.III.2006, Y.S. Megna coll. (4 exs.), C.T. Ramsden coll. (3 exs.); Guantánamo: Guantánamo, 15.V.1917, C.T. Ramsden coll. (3 exs.); 18.VI.1917, C.T. Ramsden coll. (2 exs.).

**DIAGNOSIS:** *Thermonectus basillaris* is a moderately small species, which could only be confused with the slightly smaller *T. margineguttatus*. The elytral color pattern is usually black, with variable and irregular yellowish markings.

**DESCRIPTION:** Measurements and ratios aimed to characterize the body shape are shown in Table 2.

**Color.** Head black posteriorly, with a bilobed yellow frontal band between eyes; anterior portion yellow, with yellow extending posteriorly along mesal margin of the eyes to about middle and triangularly produced medially on frons. Pronotum with a black wide transverse band in the anterior and posterior margins that are not contiguous with the lateral margins, separated by a yellow space, which is small in many specimens (Fig. 1). Elytra black, with a basal yellow band not extended to the lateral margins, yellow lateral margins with black irrorations after humeral angle to apex; venter rufous to piceous; pro- and mesothoracic legs yellow, metathoracic legs reddish-black to reddish-brown with distal end of femur slightly paler.

**Sculpture and punctation.** Each elytron with three longitudinal rows of widely spaced punctures generally extending to apex; female with longitudinal striae strongly developed on lateral portions of pronotum and basal half of elytra.

**Male genitalia** (Fig. 5). Parameres evenly narrowed apically in lateral aspect; aedeagus broad, apex bluntly pointed.

**ECOLOGY:** In Cuba this species was collected in both permanent and temporary lentic habitats as well as in saline coastal lagoons. The water temperature in these sampling areas approximated 36°C.

**DISTRIBUTION:** *Thermonectus basillaris* has a broad distribution ranging from southern Ontario to the Gulf of Mexico and west to Texas (LARSON et al. 2000). In Cuba this species is recorded both in western and eastern parts of the country including Isla de la Juventud (Fig. 9).

**COMMENTS:** The taxonomy of *T. basillaris* has been in a state of chaos since the 1800's. This species is extremely variable over its wide range of distribution. As pointed out by YOUNG (1954), however, much of the variation may be due to environmental conditions.

### ***Thermonectus circumscriptus* (LATREILLE, 1809)**

(Figs. 3, 7, 11)

*Dyticus* [!] *circumscriptus* LATREILLE 1809: 366.

*Acilius circumscriptus* (LATREILLE, 1809): JACQUELIN DU VAL 1856: 12. – CHEVROLAT 1863: 202; – GUNDLACH 1891: 38.

*Acilius maculatus* AUBÉ 1838: 141.

*Hydaticus havaniensis* CASTELNAU 1835: 96.

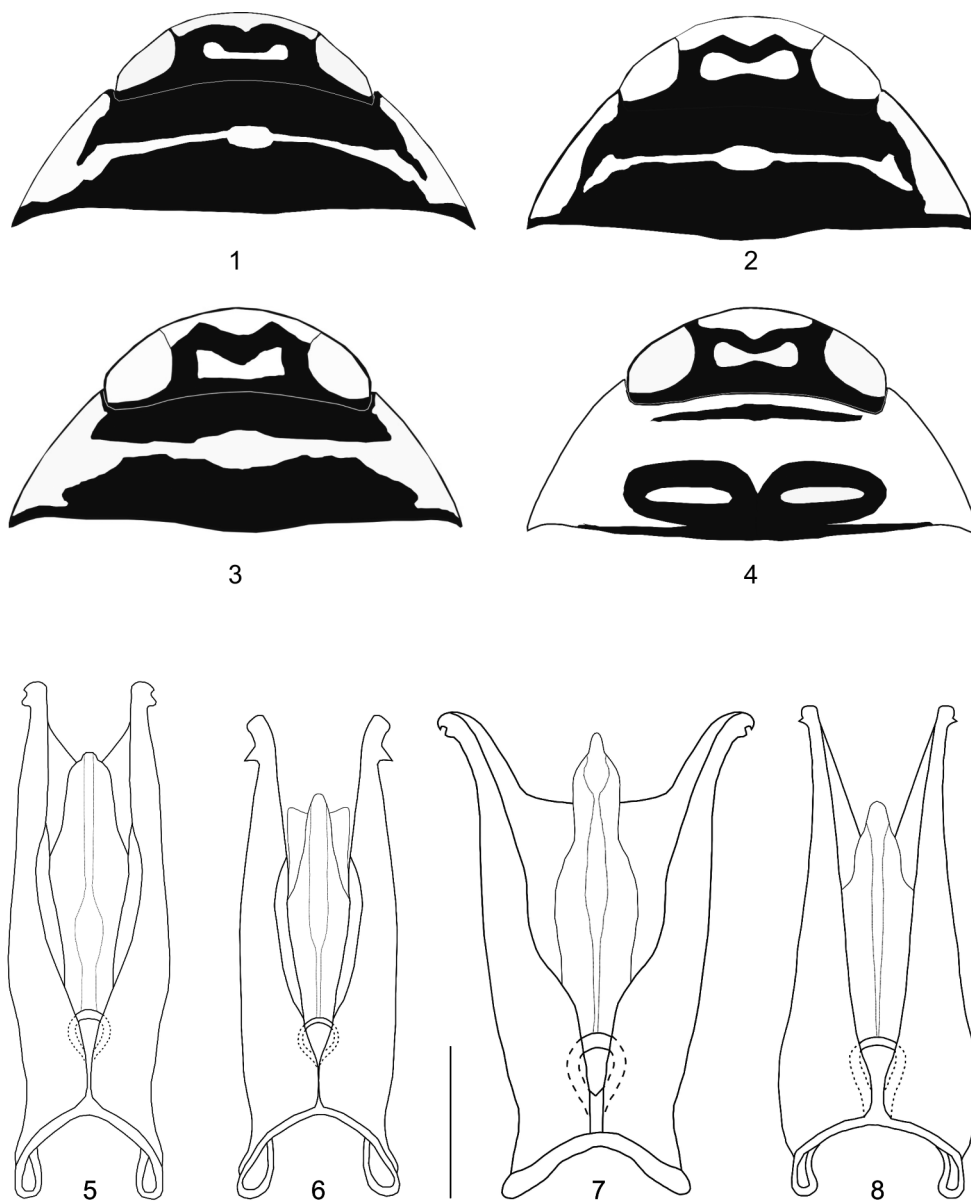
*Hydaticus insularis* CASTELNAU 1835: 96.

*Colymbetes insularis* CASTELNAU 1840: 162.

*Thermonectus circumscriptus* (LATREILLE, 1809): SHARP 1882a: 679; 1882b: 44. – LENG & MUTCHLER 1917: 196.

*Thermonectus circumscriptus* (LATREILLE, 1809): BLACKWELDER 1944: 79.

*Thermonectus circumscriptus* (LATREILLE, 1809): SPANGLER 1981: 154. – TRÉMOUILLES 1989: 101. – FERNÁNDEZ 2001: 30. – PECK 2005: 47.



Figs. 1–4: Head and pronotum of *Thermonectus* spp., 1) *T. basillaris*, 2) *T. margineguttatus*, 3) *T. circumscriptus*, 4) *T. succinctus*.

Figs. 5–8: Male genitalia of *Thermonectus* spp., dorsal view, 5) *T. basillaris*, 6) *T. margineguttatus*, 7) *T. circumscriptus*, 8) *T. succinctus*. Scale: 0.5 mm.

## MATERIAL EXAMINED:

CUBA: Isla de La Juventud: Punta del Este, 21.V.2006, Y.S. Megna coll. (3 exs.); 22.V.2006, Y.S. Megna coll. (13 exs.); Gerona, 20.V.2006, Y.S. Megna coll. (2 exs.); 28.V.2006, Y.S. Megna coll. (2 exs.); Pinar del Río: Guanahacabibes, 30.VII.2003, Y.S. Megna & O. Bello coll. (3 exs.); Las Tunas: Aeropuerto, 25.XI.2004, Y.S. Megna coll. (11 exs.); Loma Blanca, 10.VIII.2006, Y.S. Megna coll. (1 ex.); Palancón, 17.VII.2004, Y.S. Megna coll. (2 exs.); Granma: Cauto Cristo, 10.VIII.2004, L. Chávez coll. (1 ex.); 03.VIII.2004, Y.S. Megna & L. Chávez coll. (1 ex.); Holguín: Gibara, 30.VII.2002, R. Bautista coll. (1 ex.); Santiago de Cuba: Juraguá, 19.IX.2003, Y.S. Megna coll. (1 ex.); La Pimienta, 03.V.2005, A. Deler-Hernández & F. Cala-Riquelme coll. (1 ex.); La Maya, 16.III.2006, Y.S. Megna coll. (4 exs.).

DIAGNOSIS: *Thermonectus circumscriptus* is a moderately large, darkly marked species. It is characterized by its distinct black pronotal markings of wide bands at the anterior and posterior margins (Fig. 3); the elytra are dark with a vague preapical dark fascia, which varies in degree of darkness. *Thermonectus circumscriptus* is the largest species of this genus in Cuba.

DESCRIPTION: Measurements and ratios aimed to characterize the body shape are shown in Table 2.

Table 2: Descriptive statistics (mm) for Cuban species of *Thermonectus* (see Table 1).

<i>Thermonectus</i>	HL	HW	DBE	PL	PW	EL	EW	TL	TL/EW	PL/PW
<i>basillaris</i>										
♂ n=9										
Range	1.4-1.6	2.1-2.4	1.1-1.3	1.1-1.6	4.0-4.6	5.3-8.4	5.3-6.1	8.3-11.4	1.4-2.1	0.3
Mean	1.5	2.3	1.2	1.4	4.3	7.6	5.7	10.5	1.9	0.3
♀ n=9										
Range	1.2-1.4	2.0-2.6	1.1	1.1-1.3	3.1-3.7	6.4-7.4	4.3-5.1	9.0-10.0	1.8-2.2	0.3-0.4
Mean	1.3	2.2	1.1	1.2	3.5	6.8	4.7	9.3	2.0	0.3
<i>circumscriptus</i>										
♂ n=9										
Range	1.6-1.9	2.4-2.7	1.1-1.4	1.4-1.7	4.4-5.0	8.4-9.1	5.7-6.4	11.4-12.6	1.9-2.0	0.3-0.4
Mean	1.7	2.6	1.3	1.6	4.7	8.8	6.1	12.1	2.0	0.3
♀ n=9										
Range	1.7-1.9	2.3-2.9	1.0-1.7	1.3-1.7	4.1-5.1	7.7-10	5.7-7.1	10.9-13.4	1.8-2.1	0.3-0.4
Mean	1.8	2.5	1.4	1.5	4.8	9.2	6.5	12.5	1.9	0.3
<i>marginatatus</i>										
♂ n=4										
Range	1.4	2.0-2.1	1.1-1.3	1.1-1.3	3.4-4.0	6.9-7.3	4.9-5.1	9.4-10.0	1.9-2.0	0.3
Mean	1.4	2.01	1.2	1.2	3.8	7.1	5.0	9.7	1.9	0.3
♀ n=2										
Range	1.4	2.1-2.7	1.3	1.3	3.9-4.0	7.1-7.3	5.3	9.9-10.0	1.9-2.0	0.3
Mean	1.4	2.4	1.3	1.3	3.9	7.2	5.3	9.9	1.9	0.3
<i>succinctus</i>										
♂ n=9										
Range	1.6-1.7	2.3-2.6	1.3-1.4	1.4-2.0	4.3-4.9	7.9-8.9	5.6-6.4	11.0-12.4	1.9-2.0	0.3-0.4
Mean	1.7	2.5	1.4	1.6	4.6	8.3	6.1	11.6	1.9	0.4
♀ n=9										
Range	1.7-2.0	2.0-2.4	1.3-1.6	1.1-1.7	4.1-5.3	8.1-8.6	5.4-6.7	11.4-12.1	1.7-2.1	0.2-0.4
Mean	1.8	2.3	1.4	1.5	4.8	8.4	6.2	11.7	1.9	0.3

Color. Dorsal surface yellow with dense speckles in the shape of small irregular spots; head yellowish with black markings, distinct wide M-shaped spot between eyes; pronotum yellowish with a wide black band along both anterior and posterior margins, posterior band broader than

anterior one (Fig. 3); elytra yellowish with numerous coalescent black speckles and spots, and a wide postmedial fascia; venter reddish-brown to reddish black; pro- and mesothoracic legs yellowish, metathoracic legs reddish-brown, posterior half of femur yellowish-brown.

Sculpture and punctation. Each elytron with three longitudinal rows of widely spaced indistinct punctures; female generally with longitudinal short striae grouped irregularly and extended to apical third.

Male genitalia (Fig. 7). Parameres tapering sharply in apical third to distinctly hooked lobe apices; median lobe slightly constricted near base, dilated near middle of total length.

ECOLOGY: *Thermonectus circumscriptus* was collected in semi-permanent brackish or freshwaters. This species is very frequent in lagoons and backwaters with or without aquatic vegetation and seems to prefer habitats with muddy bottom, sand and small stones. It was collected at low elevation.

DISTRIBUTION: Known from the tropical coastal plain of the West Indies, Bahama Islands, Mexico and Central America (GOODHUE-MCWILLIAMS 1968). In Cuba, *T. circumscriptus* has been reported in the western and eastern portions of the country including Isla de la Juventud (Fig. 11).

***Thermonectus margineguttatus* (AUBÉ, 1838)**  
(Figs. 2, 6, 10)

*Acilius margineguttatus* AUBÉ 1838: 149. – SHARP 1878: 116. – GUNDLACH 1891: 39.

*Thermonectes margineguttatus* (AUBÉ, 1838): SHARP 1882a: 683; 1882b: 45. – LENG & MUTCHLER 1917: 196.

*Thermonectus margineguttata* (AUBÉ, 1838): BLACKWELDER 1944: 80.

*Thermonectus margineguttatus* (AUBÉ, 1838): SPANGLER 1981: 154. – TRÉMOUILLES 1989: 105. – PECK 2005: 47.

*Thermonectus margineguttatus* (AUBÉ, 1838): BENETTI et al. 2003: 41.

**MATERIAL EXAMINED:**

CUBA: Las Tunas, Aeropuerto, 25.XI.2005, Y.S. Megna coll. (1 ex.); Las 40, 27.XI.2004, Y.S. Megna coll. (2 exs.); Santiago de Cuba: La Maya, 16.III.2006, Y.S. Megna coll. (2 exs.); 17.III.2006, Y.S. Megna coll. (3 exs.); Los Reinaldos, 17.III.2006, Y.S. Megna coll. (1 ex.); San Luis, 03.IX.2006, Y.S. Megna & A. Deler-Hernández coll. (5 exs.).

DIAGNOSIS: *Thermonectus margineguttatus* is the smallest *Thermonectus* species in Cuba, which is likely to be confounded with *T. basillaris*. The dorsal color pattern of *T. margineguttatus* is generally darker than that of *T. basillaris* with irregular spots near the lateral margin at greatest width, more distinct yellowish markings, subhumeral spots, and a preapical fascia or spots.

DESCRIPTION: Measurements and ratios aimed to characterize the body shape are shown in Table 2.

Color. Head yellowish with black markings; wide black M-shaped spots between eyes; pronotum black with yellowish lateral margins; narrow irregular fascia at middle of total length (Fig. 2); elytra black with distinct yellowish markings: wide yellow lateral margin extending posteriorly, confluent with medial subbasal extension towards scutellum, interrupted at midline and anterior margins; small yellowish spot near the lateral margin at middle of total elytral length; broad yellowish convex preapical band.

Sculpture and punctation. Elytron with three longitudinal rows of widely spaced punctures; females with scratches in basal third to basal half.

Male genitalia (Fig. 6). Parameres slightly dilated near middle of total length, tapering to narrow, rounded apices with short preapical lateral spine. Median lobe acute apically, with an incomplete basal ring in ventral view.

ECOLOGY: *Thermonectus margineguttatus* was the less frequently collected species of the genus. Specimens were collected in permanent lentic habitats, generally with abundant floating and submerged vegetation. This species was also found in backwaters of small streams. It is predominantly associated with turbid waters and muddy habitats.

DISTRIBUTION: Known from the tropical coastal plain in the West Indies, Bahama Islands, Mexico and Central America. More generally distributed in the tropical lowlands of South America to Argentina (GOODHUE-MCWILLIAMS 1968). Widely distributed in Cuba (Fig. 10).

COMMENTS: The dorsal color pattern in *T. margineguttatus* varies from almost entirely black to a pattern with distinct yellowish markings over its wide range of distribution (GOODHUE-MCWILLIAMS 1968, TRÉMOUILLES 1989, BENETTI et al. 2003). The elytral markings are generally well defined among Cuban specimens.

### ***Thermonectus succinctus* (AUBÉ, 1838)**

(Figs. 4, 8, 12)

*Acilius succinctus* AUBÉ 1838: 145.

*Dytiscus succinctus* CASTELNAU 1840: 159.

*Thermonectus peninsularis* HORN 1894: 362.

*Thermonetus succincta* (AUBÉ, 1838): BLACKWELDER 1944: 80.

*Thermonectes succinctus* (AUBÉ, 1838): SHARP 1882a: 678; 1882b: 44; 1887: 758.

*Thermonectus succinctus* (AUBÉ, 1838): TRÉMOUILLES 1989: 99. – BENETTI et al. 2003: 39.

#### MATERIAL EXAMINED:

CUBA: La Habana. Santa Cruz del Norte, 12.X.2005, Y.S. Megna & A. Deler-Hernández coll. (3 exs.); Las Tunas: Aeropuerto, 25.XI.2005, Y.S. Megna coll. (1 ex.); Las 40, 27.XI.2004, Y.S. Megna coll. (2 exs.); Palancón, 09.VIII.2005, Y.S. Megna coll. (10 exs.); Granma: Cauto Cristo, 13.VII.2004, Y.S. Megna & L. Chávez coll. (1 ex.); Santiago de Cuba: Juraguá, 19.IX.2003, Y.S. Megna coll. (4 exs.); II-Frente, 27.VII.2005, Y.S. Megna coll. (2 exs.); La Maya, 16.III.2006, Y.S. Megna coll. (1 ex.); La Guadalupe, 30.XI.2005, Y.S. Megna coll. (1 ex.); La Cubana, 02.XII.2005, Y.S. Megna coll. (4 exs.).

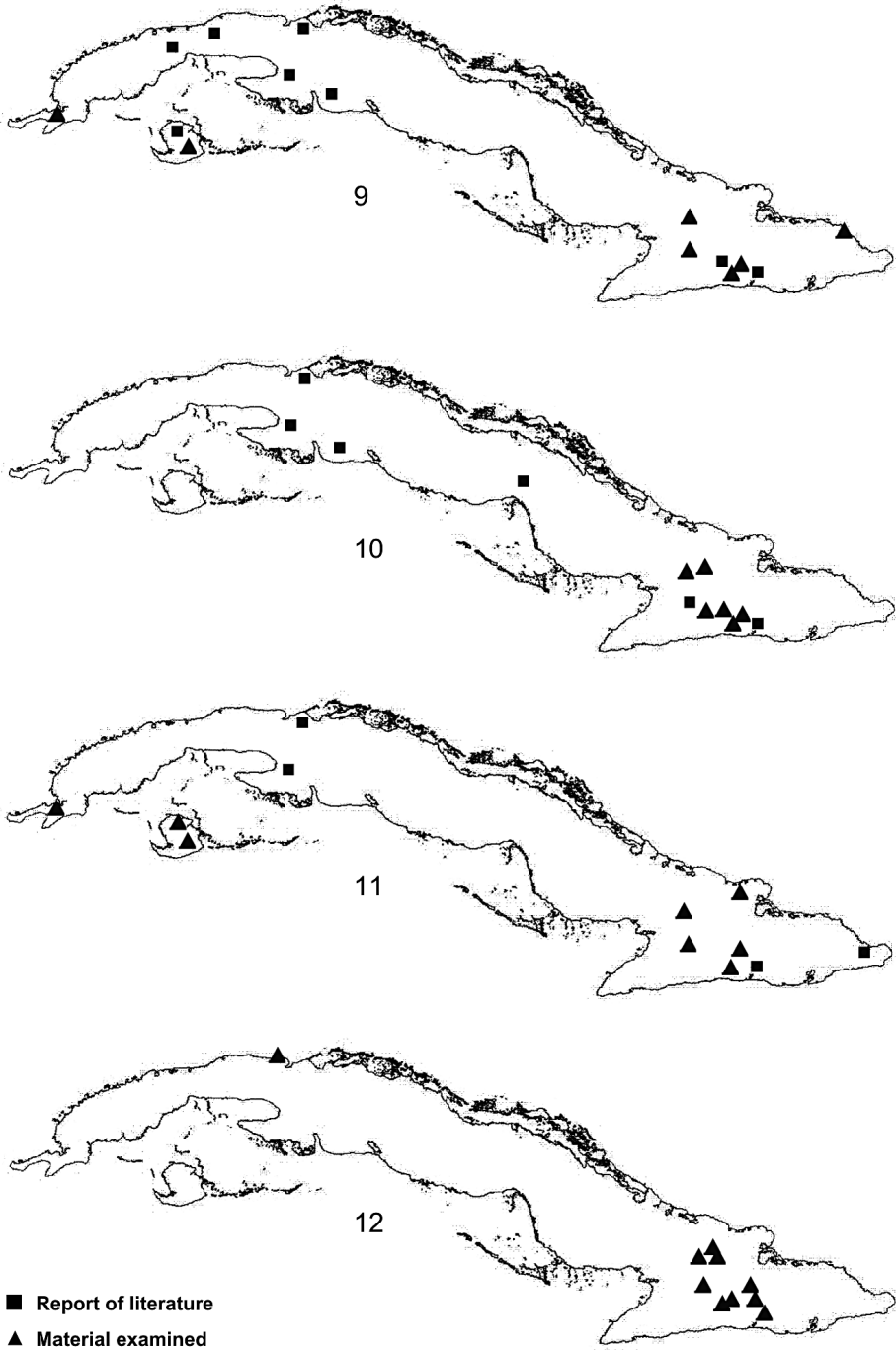
DIAGNOSIS: *Thermonectus succinctus* is slightly smaller than *T. circumscriptus*, the only other species of the *Thermonectus irroratus* species group found in Cuba; *T. succinctus* has a distinctive black pronotal marking and a distinct but discontinuous dark postmedial fascia on the elytra.

DESCRIPTION: Measurements and ratios aimed to characterize the body shape are shown in Table 2.

Color. Dorsal surface yellow with dense speckles in shape of small irregular spots; head yellowish with black markings, V-shaped black spot usually interrupted anteriorly; pronotum yellowish with dark markings, frequently with a row of small brownish maculae subapically; distinct subbasally compressed biconvex lens-shaped black spots often confluent medially; frequently with narrow brownish-yellow band at posterior margin (Fig. 4); elytra yellowish with numerous black speckles, spots, and a postmedial fascia; venter bright orange to orangish-brown; pro- and mesothoracic legs yellow; metathoracic legs orangish to orangish-brown except reddish-black tibiae.

Sculpture and punctation. Each elytron with three longitudinal rows of widely spaced indistinct punctures; female elytra smooth.





Figs. 9–12: Known distribution of *Thermonectus* species in Cuba, 9) *T. basillaris*, 10) *T. margineguttatus*, 11) *T. circumscriptus*, 12) *T. succinctus*.

Male genitalia (Fig. 8). Parameres tapering sharply posterior to greatest width, bluntly pointed apices with short lateral preapical spine; median lobe acute apically, broad basally and with an incomplete basal ring in ventral aspect.

ECOLOGY: *Thermonectus succinctus* is generally found in semi-permanent ponds with very little vegetation and clear water (GOODHUE-MCWILLIAMS 1968). In Cuba, specimens were collected both in lentic (permanent and temporary) and lotic environments with or without vegetation. Based on the number of specimens collected, this species seems to prefer semi-permanent habitats with muddy bottom.

DISTRIBUTION: Up to this study, *T. succinctus* was recorded from the tropical coastal plain of Baja California, Mexico, and Central America (GOODHUE-MCWILLIAMS 1968). *Thermonectus succinctus* was recorded from several localities of eastern parts of the country as well as north of La Havana Province (Fig. 12). These are the first reports of *T. succinctus* from the West Indies.

COMMENTS: Although the color pattern is uniform in *T. succinctus*, it varies in degree of darkness, degree of black in the biconvex lens-shaped spots of the pronotum, and in the distinctness of the postmedial fascia (GOODHUE-MCWILLIAMS 1968). TRÉMOUILLES (1989) suggested that females of *T. succinctus* have strongly impressed elytral striae. Cuban specimens all have smooth elytra in accordance with GOODHUE-MCWILLIAMS (1968).

### Acknowledgements

We thank Patricia L.M. Torres (Universidad de Buenos Aires), Hans Fery (Germany), Michel Brancucci (Naturhistorisches Museum Basel), Antonio Régil Cueto (Universidad de León), Cesar J. Benetti and Terina P. Carrión for their critical review of the manuscript and valuable comments. Financial support was provided by a Discovery grant from the Natural Sciences and Engineering Research Council of Canada (NSERC) to the first author.

### References

- AUBÉ, C. 1838: Hydrocanthares et gyrieniens. – In: Dejean, P.F.M.A. (ed.): Species général des coléoptères de la collection de M. le Comte Dejean. Vol. VI. – Paris: Méquignon Père et Fils, xvi+804 pp.
- BENETTI, C.J., RÉGIL-CUETO, J.A. & GONZALEZ, J.G. 2003: Estudio faunístico de Hydradephaga (Coleoptera: Dytiscidae, Gyrinidae, Haliplidae, Noteridae) en el Municipio de Gramado, sur de Brasil. – Boletín Sociedad Entomológica Aragones 33: 37–44.
- BLACKWELDER, R.E. 1944: Checklist of the coleopterous insects of Mexico, Central America, the West Indies and South America. – Bulletin of the U. S. National Museum 185: 72–80.
- CASTELNAU, F.L. 1834–1835: Études entomologiques, ou descriptions d'insectes nouveaux et observations sur la synonymie. Première partie. – Paris: Méquignon-Marvis Père et Fils, 159 pp. [pp. 1–94 in 1834; pp. 95–159 in 1835.]
- CASTELNAU, M. de 1840: Histoire naturelle des animaux articulés. Annelidés, crustacés, arachnides, myriapodes et insectes. Vol. 1. Histoire naturelle des insectes coléoptères. – Paris: P. Duménil, 324 pp., 19 pls.
- CHEVROLAT, L.A. 1863: Coléoptères de l'Île de Cuba. Notes, synonymies et descriptions d'espèces nouvelles. Familles des cicindélètes, carabiques, dytiscides, gyriinides et palpicornes. – Annales de la Société Entomologique de France (4) 3: 183–210.
- CROTCH, G.R. 1873: Revision of the Dytiscidae of the United States. – Transactions of the American Entomological Society 4: 383–424.

- EPLER, J.H. 1996: Identification manual for the water beetles of Florida (Coleoptera: Dryopidae, Dytiscidae, Elmidae, Gyrinidae, Haliplidae, Hydraenidae, Hydrophilidae, Noteridae, Psephenidae, Ptilodactylidae, Scirtidae). – Florida Department of Environmental Protection. Tallahassee, iv+253 unnumbered pp.
- FERNANDEZ, I. 2001: Composición taxonómica de los coleópteros de la Sierra del Rosario, Pinar del Río, Cuba. – *Poeyana* 481–483: 20–33.
- GOODHUE-MCWILLIAMS, K.L. 1968: A taxonomic revision of the North American species of the genus *Thermonectus* Dejean (Coleoptera: Dytiscidae). – Indiana University: Unpublished thesis.
- GUNDLACH, J.C. 1891: Coleoptera. Contribución a la entomología Cubana. Habana. – *Anales de la Academia de Ciencias Médicas Físicas y Naturales* (3): 33–42 [Hydrocanthara part].
- HARRIS, T.W. 1829: Corrections and additions for the “Contributions to entomology”. – *New England Farmer* 8 (1): 1–2.
- HORN, G.H. 1894: The Coleoptera of Baja California. – *Proceedings of the California Academy of Sciences* (2) 4: 302–449, pls. 7–8.
- JACQUELIN DU VAL, P.N.C. 1856–1857: Insectes. Ordre des coléoptères, Lin. – In: Sagra, R. de la (ed.). 1856–1857. *Histoire physique, politique et naturelle de l’îles de Cuba*. vol. 7. Animaux articulés, Coleoptera, pp. 1–136 published in 1856; pp. 137–328 published in 1857. – Paris (French edition, in Special Collections, MCZ Library, Harvard University; Spanish edition published in Madrid, 20 September, 1857, pp. 1–136, in a larger page size and with a different pagination from the French edition).
- LARSON, D.J., ALARIE, Y. & ROUGHLEY, R.E. 2000: Predaceous diving beetles (Coleoptera: Dytiscidae) of the Nearctic Region, with emphasis on the fauna of Canada and Alaska. – Ottawa: NRC Research Press x+971 pp.
- LATREILLE, P.A. 1809: Insectes de l’Amérique équinoxiale, recueillis pendant le voyage de MM. de Humboldt et Bonpland. – In: Humboldt, F.H.A. von (ed.): *Voyage de Humboldt et Bonpland*. 2me partie. Recueil d’observations de zoologie et d’anatomie comparée. Tom 1. – Paris, vi+412 pp., 26 pls.
- LECONTE, J.L. 1852: Descriptions of new species of Coleoptera, from California. – *Annals of the Lyceum of Natural History of New York* 5: 185–216.
- LEECH, H.B. 1941: The generic name *Thermonectus* Dej. (Coleoptera, Dytiscidae). – *The Canadian Entomologist* 73 (11): 197.
- LENG, C.W. & MUTCHLER, A.J. 1917: Supplement to preliminary list of the Coleoptera of the West Indies. – *Bulletin of the American Museum of Natural History* 37: 191–220.
- MELSHEIMER, F.E. 1844: Descriptions of the new species of Coleoptera of the United States. – Washington: Smithsonian Institution, xvi+174 pp.
- MELSHEIMER, F.V. 1806: A catalogue of insects of Pennsylvania. Part 1. – Hanover: Lepper, 64 pp.
- MILLER, K.B. 2000: Cladistic analysis of the tribe of Dytiscinae and the phylogenetic position of the genus *Notaticus* Zimmermann (Coleoptera: Dytiscidae). – *Insect Systematics & Evolution* 31: 165–177.
- MILLER, K.B. 2001: On the phylogeny of the Dytiscidae (Insecta: Coleoptera) with emphasis on the morphology of the female reproductive system. – *Insect Systematics & Evolution* 32: 45–92.
- MILLER, K.B., BERGSTEN, J. & WHITING, M.F. 2007: Phylogeny and classification of diving beetles in the tribe Cybistrini (Coleoptera, Dytiscidae, Dytiscinae). – *Zoologica Scripta* 36: 41–59.
- NILSSON, A.N. 2001: World Catalogue of Insects. Vol. 3. Dytiscidae (Coleoptera). – Stenstrup: Apollo Books, 395 pp.
- NILSSON, A.N. 2003: World catalogue of Dytiscidae – corrections and additions, 1 (Coleoptera: Dytiscidae). – *Koleopterologische Rundschau* 73: 65–74.

- NILSSON, A.N. 2004: World catalogue of Dytiscidae – corrections and additions, 2 (Coleoptera: Dytiscidae). – *Koleopterologische Rundschau* 74: 157–174.
- PECK, S.B. 2005: A checklist of the beetles of Cuba with data on distribution and bionomics (Insecta: Coleoptera). – In: *Arthropods of Florida and neighboring land areas*. – Gainesville: Florida Department of Agriculture and Consumer Services 18: 1–241.
- SHARP, D. 1878: Aquatic Coleoptera collected by M. Camille van Volxem in Brazil. – *Annales de la Société Entomologique de Belgique* 20 (1877): 116–119.
- SHARP, D. 1882a: On aquatic carnivorous Coleoptera or Dytiscidae. – *Scientific Transactions of the Royal Dublin Society* (2) 2: 179–1003, pls. 7–18.
- SHARP, D. 1882b: Dytiscidae. 3–5. – In: Godman, F.C. & Salvin, O.R.H. (eds.): *Biologia Centrali-Americana. Zoologia, Insecta. Coleoptera* 1 (2): xvi+144 pp., 4 pls.
- SHARP, D. 1887: Staphylinidae; Supplement. – In: Godman, F.C. & Salvin, O.R.H. (eds.): *Biologia Centrali-Americana. Zoologia. Insecta. Coleoptera* 1 (2) Supplement: 748–802.
- SPANGLER, P.J. 1973: Aquatic Coleoptera, collected by the biospeleological expeditions to Cuba by the Academies of Science of Cuba and Romania (Gyrinidae: Dytiscidae: Hydrophilidae: Hydraenidae: Elminthidae: Psephenidae). – *Résultats des Expéditions Biospéologiques Cubano-Roumaines à Cuba* 1: 353–358.
- SPANGLER, P.J. 1981: Supplement to the aquatic and semiaquatic Coleoptera of Cuba collected by the biospeleological expeditions to Cuba by the Academies of Science of Cuba and Romania. – *Résultats des Expéditions Biospéologiques Cubano-Roumaines à Cuba* 3: 145–171.
- TRÉMOUILLES, E. 1989: Contribución para conocimiento del género *Thermonectus* Dejean en la Argentina y áreas limítrofes (Coleoptera: Dytiscidae). – *Revista de la Sociedad Entomológica Argentina* 46 (1–4): 95–115.
- WHITEMAN, N.K. & SITES, R. 2003: Lentic beetles of the Missouri prairie region: habitat and regional associations, with keys to the Hydradephaga. – *Transactions of the American Entomological Society* 129: 185–243.
- YOUNG, F.N. 1954: The water beetles of Florida. – *University of Florida Studies. Biological Science Series* 5: 1–238.

Dr. Yves ALARIE

*Department of Biology, Laurentian University, Ramsey Lake Road, Sudbury, Ontario, Canada P3E 2C6*  
(yalarie@laurentian.ca)

Lic. Yoandri S. MEGNA

*Departamento de Biología, Museo de Historia Natural 'Charles Ramsden', Facultad de Ciencias Naturales, Universidad de Oriente, Santiago de Cuba, Cuba* (ysuarez1976@yahoo.es)

Albert DELER-HERNANDEZ

*Departamento de Conservación, Empresa Flora y Fauna (ENPFF), Oficina Territorial Santiago, Santiago de Cuba, Cuba* (adeler1982@yahoo.com)