



# Giant Dwarfs: Very Large Giant Tropes, *Tropidophis melanurus* (Squamata: Tropidophiidae), and New Maximum Size Records for the Species

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Snakes of the family Tropidophiidae, sometimes-called dwarf boas, comprise two genera: *Tropidophis* and *Trachyboa* (Wilcox et al. 2002). All but five of the 33 currently recognized species of *Tropidophis* occur in the West Indies (Hedges 2002; Henderson and Powell 2009; Rodríguez Schettino et al. 2013; Díaz and Cádiz 2020; Uetz et al. 2021). However, molecular studies suggest that recognition of *Trachyboa* renders *Tropidophis* paraphyletic, given that the South American clade is sister to *Trachyboa* instead of the West Indian clade (Franco Curcio et al. 2012; Reynolds et al. 2014, 2018).

Cuba, with 17 endemic species, harbors more than 60% of all species in the West Indian clade (Hedges 2002; Henderson and Powell 2009; Rodríguez Schettino et al. 2013; Díaz and Cádiz 2020; Uetz et al. 2021). Dwarf boas are viviparous, nocturnally active constrictors that feed mostly on ectotherms such as lizards and frogs, although the larger species occasionally consume small endotherms (for reviews see Henderson and Powell 2009; Rodríguez-Cabrera et al. 2017, 2020a, 2020b, 2021). As the common name implies, these are relatively small snakes, with SVLs of 184–957 mm, although most species do not exceed 550 mm SVL (for reviews see Hedges 2002; Henderson and Powell 2009).

The Giant Trope (*Tropidophis melanurus*), which is widely distributed across the Cuban Archipelago at elevations from sea level to 1,293 m (e.g., Henderson and Powell 2009; Rodríguez Schettino et al. 2010, 2013), is by far the largest and stoutest species in the family (Schwartz and Henderson 1991; Tolson and Henderson 1993; Hedges 2002). Large sizes reported in the literature include a female with SVL =

950 mm (Grant 1957), a maximum total length of 1,057 mm in an individual of unreported sex (Schwartz and Henderson 1991), and maximum SVLs of 957 mm for females and of 770 mm for males (Hedges 2002). Earlier, however, Alayo (1951) mentioned an individual exceeding four feet (>1,220 mm) in total length from Santiago de Cuba Province. Herein we report several very large individuals of both sexes, including new size records.

Voucher specimens, when available, were deposited in the zoological collection of the Instituto de Ecología y Sistemática (CZACC), La Habana, Cuba. Other snakes could not be preserved because they escaped, died and deteriorated too much for preservation, or were part of ongoing ecological surveys. We took measurements to the nearest millimeter and body mass to the nearest gram. Not all snakes could be measured when first collected, and only the final size was recorded. In some instances, only the total length is available. Some snakes were kept in captivity after collection and were fed weekly or bimonthly, mostly on native species such as Cuban Treefrogs (*Osteopilus septentrionalis*), lizards (*Anolis* spp., *Leiocephalus cubensis*, *Pholidoscelis auberi*), Northern Mockingbird chicks (*Mimus polyglottos*), but also non-native pinky, fuzzy, and adult murid rodents (*Mus musculus* and *Rattus rattus*) and even suckling rabbits (*Oryctolagus cuniculus*). Meat slices (fish, chicken, pork, and beef) were readily accepted after some time in captivity, especially if they were first smeared with scents of natural prey, but the latter was not always necessary for the snake to accept that kind of food. Water was provided *ad libitum* in containers large enough to accommodate entire snakes. Datum for all coordinates is WGS 84.

**Table 1.** Very large Giant Tropes (*Tropidophis melanurus*): Total length (TL), snout-vent length (SVL), female (F), male (M), length in excess of the previous SVL record (LEPR). A new maximum size record is in bold type.

No.	Sex	TL	SVL	Mass	LEPR	Voucher
1	?	1,100	—	—	43	—
2	F	1,037	967	—	10	CZACC 13400
3	F	<b>1,280</b>	—	—	223	—
4	F	1,130	1,040	780	83	—
5	F	1,060	970	687	13	CZACC 13401
6	M	870	830	323	60	—
7	F	1,066	968	875	11	—

In summer 1989, R. Teruel (pers. comm., 11.IX.2021) found a large *T. melanurus* (Table 1, No. 1; 1,100 mm total length, not sexed) under a large rock in a shallow mountain stream at El Chorruto, on the road to La Gran Piedra (km 7.5), Santiago de Cuba Municipality, Santiago de Cuba Province (20.011340, -75.672270; elev. 530 m asl). It was measured and released at the site of capture. This individual exceeded by 43 mm the previous total length record for the species (i.e., 1,057 mm; Schwartz and Henderson 1991).

In the early 2000s, we found an adult female *T. melanurus* (Table 1, No. 2: 680 mm total length [tail tip missing], 634 mm SVL; CZACC 13400) at Cojímar, La Habana del Este Municipality, La Habana Province (23.152680, -82.297963; elev. 5 m asl). We kept it in captivity until 2007, when it died of unknown causes. The preserved specimen (Fig. 1) measured 1,037 mm total length, and 967 mm SVL, slightly exceeding (10 mm) the previous SVL record for females (957 mm; Hedges 2002) and almost matching the previous total length record for the species (1,057 mm; Schwartz and Henderson 1991).

In July 2007, we found an adult female (Table 1, No. 3: 1,280 mm total length) near the offices of the Empresa Nacional para la Protección de la Flora y la Fauna, Protected Area “Sabanas de Santa Clara,” Santa Clara Municipality, Villa Clara Province (22.404005, -79.916318; elev. 100 m asl). We kept it in captivity until 2009, when we transferred it to an exhibit in the Santa Clara Zoo, from which

it escaped. We were unable to record the total body mass of this individual before it escaped, but it appeared slender for a female of that length. This female is the longest individual ever reported, exceeding by 223 mm the previous total length record for the species (1,057 mm; Schwartz and Henderson 1991). Although we did not record SVL, given that tail length in other large females measured by us was about 8% of total length, we estimate a SVL of about 1,180 mm. Therefore, it almost certainly exceeded the previous SVL record for females (957 mm; Hedges 2002).

On 10 July 2008, we collected a gravid female (Table 1, No. 4: 900 mm total length, 830 mm SVL) under a pile of debris exposed to the sun on the eastern slope of Loma del Capiro, Santa Clara Municipality, Villa Clara Province (22.409663, -79.943237; elev. 140 m asl). We kept it in captivity until late 2013 when it died of unknown causes. Measurements soon after death were 1,130 mm total length, 1,040 mm SVL, 110 mm mid-body circumference, and 33 mm head length (Fig. 2). This female exceeded by 83 mm the previous SVL record for females (957 mm; Hedges 2002) and by 73 mm the previous total length record for the species (1,057 mm; Schwartz and Henderson 1991). It reached a maximum body mass (780 g) during the summer of 2012 (over a year before its death). The total increase in length during the 62-months in captivity was 230 mm (3.7 mm/month). During that time, it became very tame and, after a few weeks, it never reacted defensively (autohemorrhage, cloacal discharge, balling), even under intense handling; this caused excessive swelling of the musk glands, which periodically had to be drained manually.

On 23 June 2012, we found an adult female (Table 1, No. 5; CZACC 13401) at La Caoba, Santa Clara Municipality, Villa Clara Province (22.383062, -79.834685; elev. 100 m asl). Two large unidentified ticks were attached to a transverse scar on the back (Fig. 3). In captivity it started to refuse food in early 2014 and died of unknown causes on 21 May 2014 (ca. 2 years after collection). Measurements soon after death were 1,060 mm total length, 970 mm SVL, 100 mm mid-body circumference, 32 mm head length, and 687 g. This



**Fig. 1.** A preserved adult female Giant Trope (*Tropidophis melanurus*) (Table 1, No. 2; CZACC13400) from Cojímar, La Habana del Este Municipality, La Habana Province, Cuba. Photograph © Hansel Caballero.



**Fig. 2.** An adult female Giant Trope (*Tropidophis melanurus*) (Table 1, No. 4) from Loma del Capiro, Santa Clara Municipality, Villa Clara Province, Cuba: Dorsal view (upper left); JT holding the snake in August 2013 (upper right); area posterior to the vent swollen due to an accumulation of secretions in the musk glands (lower left); and swallowing an adult male Cuban Brown Anole (*Anolis sagrei*; ca. 60 mm SVL), notice the size of the snake's head compared with the anole (lower right). Photographs © Raimundo López-Silvero.

specimen slightly exceeded (13 mm) the previous SVL record for females (957 mm; Hedges 2002) and almost matched the previous total length record for the species (1,057 mm; Schwartz and Henderson 1991).

At 2200 h on 5 May 2014, we found an adult male (Table 1, No. 6) in a foraging position (motionless and with the anterior half of the body bent in a zigzag manner) at the base of a palm tree in the Cienfuegos Botanical Garden, Cienfuegos Municipality, Cienfuegos Province (22.125718, -80.323656; elev. 50 m asl). The snake measured 870 mm total length (tail tip missing), 830 mm SVL, 75 mm mid-body circumference, 28 mm head length, and 323 g. This individual was in a population being studied at the botanical garden (T.M. Rodríguez-Cabrera et al., unpubl. data) and was not collected. We marked it by clipping ventral scales (Brown and Parker 1976) and released it at the site of capture. This was the largest male *T. melanurus* ever reported in the wild, exceeding by 60 mm the previous SVL record for males (770 mm; Hedges 2002).

At 2130 h on 20 February 2020, we found an adult female (Table 1, No. 7: 780 mm total length and 710 mm SVL) in a foraging position at the base of a palm tree near Heriberto Duquesne, Remedios Municipality, Villa Clara Province (22.387351, -79.489016; elev. 90 m asl). We kept it in captivity and on 13 October 2021 (ca. 20 months later) it had reached 1,066 mm total length, 968 mm SVL, and 875 g, for a total increase in length of 286 mm (ca. 14 mm/month) (Fig. 4). This snake slightly exceeds by 11 mm the previous SVL record for females (957 mm; Hedges 2002) and by 9 mm the previous total length record for the species (1,057 mm; Schwartz and Henderson 1991). This also is the heaviest individual of *T. melanurus* ever reported, exceeding the body mass of female No. 4, despite its shorter length. This female remains in captivity and appears to be healthy. If it maintains its unusually high growth rate for an adult snake, it should reach 1,000 mm SVL and 1,000 g as early as next year.

Exact measurements are not available for other individuals approaching 1,000 mm SVL, but photographs with refer-



**Fig. 3.** A freshly caught adult female Giant Trope (*Tropidophis melanurus*) (Table 1, No. 5; CZACC13401) from La Caoba, Santa Clara Municipality, Villa Clara Province, Cuba, with two large ticks attached to a scar on the back (left), and being held by TMRC prior to shedding (notice the opaque coloration) in June 2013 (right). Photographs © T.M. Rodríguez-Cabrera (left) and Raimundo López-Silvero (right).

ence objects (in perspective) provide estimates of the snakes' sizes. In 1998, we collected an adult male (ca. 600 mm SVL) about 1 km north of Campo Florido, La Habana del Este Municipality, La Habana Province (23.131193, -82.119315; elev. 10 m asl). We kept it in captivity for 16 years until its death in 2014. At the time of its death, it most certainly exceeded 1,000 mm SVL. This snake is probably the largest male *T. melanurus* ever reported (Fig. 5). At about 1000 h on 12 July 2020, we photographed an adult female about 2 km south of La Movida on the path to Yagruma, Santa Clara Municipality, Villa Clara Province (22.388989, -79.888466; elev. 140 m asl). It was resting under a rock in secondary grassland. According to the reference objects in the photo, the snake most certainly exceeded 1,000 mm SVL (Fig. 6).

Giant Tropes can reach almost double the size of most other relatively large congeners. The seven West Indian species that follow in size are (in decreasing order) the Navassa Trope (*T. bucculentus*) from Navassa Island (female SVL to 596 mm, male SVL to 360 mm); the Hispaniolan Trope (*T. haetianus*), from Hispaniola and some satellite islands (female SVL to 552 mm, male SVL to 534 mm), and Schwartz and Henderson

(1991) listed a maximum total length of 712 mm; the Jamaican Eyespotted Trope (*T. stejnegeri*) from northern Jamaica (female SVL to 529 mm, male SVL to 395 mm); the Little Cayman Trope (*T. parkeri*) from Little Cayman (female SVL to 512 mm, male SVL to 422 mm); the Gracile Banded Trope (*T. wrighti*), from central-eastern Cuba (female SVL to 336 mm, male SVL to 488 mm); the Broad-banded Trope (*T. feicki*) from western Cuba (female SVL to 474 mm, male SVL to 463 mm); and the Grand Cayman Trope (*T. caymanensis*) from Grand Cayman (female SVL to 438 mm, male SVL to 470 mm) (Schwartz 1957; Hedges 2002; Henderson and Powell 2009; Rodríguez-González 2020). The largest of the South American species is *T. preciosus*, with a maximum recorded female SVL of 440 mm and 481 mm total length (Franco et al. 2012).

Although some of the snakes described above reached their maximum sizes in captivity, they were found in the wild already as large adults and were kept for only a few years, during which most increases in length were only a few centimeters. Indeed, some of the largest snakes recorded reached their large sizes in nature (Table 1: Nos. 1, 3, and 6; adult female observed at La Movida, Santa Clara Municipality, Villa Clara Province).



**Fig. 4.** An adult female Giant Trope (*Tropidophis melanurus*) (TL = 1,066 mm, SVL = 968 mm, mass = 875 g) from near Heriberto Duquesne, Remedios Municipality, Villa Clara Province, Cuba, in dorsal view (left) and held by AMRG (right) on 13 October 2021. This is the heaviest Giant Trope ever reported. Photographs © A.M. Rodríguez-González (left) and L.E. Santos (right).

Unlike other regions inhabited by snakes of the genus *Tropidophis*, the diversity in Cuba is high, with assemblages composed of as many as four sympatric species (see review in Rodríguez-Cabrera et al. 2020a). The occurrence of these assemblages appears to reflect morphological and behavioral differentiation that allows ecological segregation (Rodríguez-Cabrera et al. 2020a). Based on fossil remains of *T. melanurus* and a second smaller congener from a cave deposit in western Cuba, Syromyatnikova et al. (2021) found evidence for the occurrence of *Tropidophis* assemblages at least since the Pleistocene (2.59–0.01 MYA).

The Giant Trope seems to be the only representative of the generalist *Tropidophis* ecotype in Cuba (Rodríguez-Cabrera et al. 2016, 2020a). Apparently, *T. melanurus* occupies the niche of medium-sized, nocturnally active constrictor in Cuba. The extensive diversification of Cuban snakes in the genus *Tropidophis* has been attributed to an ecological barrier that prevented further colonization or *in situ* evolution of smaller species in the West Indian boid genus *Chilabothrus*, as happened, for instance, on the neighboring island of



**Fig. 5.** A large adult male Giant Trope (*Tropidophis melanurus*) (indicated by the arrow) from near Campo Florido, La Habana del Este Municipality, La Habana Province, Cuba, in captivity entangled in male-male combat with a smaller male in 2010 (12 years after capture). The snake under the piece of bark is an adult female. The enclosure measured 914 x 381 x 457 mm. This is probably the largest male *T. melanurus* ever reported. Photograph © J.Q. Pigott.

Hispaniola, which harbors only one species of *Tropidophis* but four species of *Chilabothrus* (Hedges 2002; Rodríguez-Cabrera et al. 2016; Landestoy et al. 2021). Greene (1980)



**Fig. 6.** An adult female Giant Trope (*Tropidophis melanurus*) from 2 km south of La Movida, Santa Clara, Villa Clara Province, Cuba. Both the plastic bottle and the forceps were 250 mm in length. Photograph © E. Morell Savall.

noted that the “species diversity and ecological roles of Caribbean *Tropidophis* are complementary to the presence of larger boas (*Epicrates*) [= *Chilabothrus*] and perhaps colubrids ....” The size and general body shape of *T. melanurus* is comparable to that of the Hispaniolan Desert Boa (*C. fordii*), a small (for the genus; SVL to 860 mm), mostly ground-dwelling species (although it will climb into shrubs) (Tolson and Henderson 1993; Landestoy et al. 2021). A similar scenario of convergence has been observed between the gracile semi-arboreal species of *Tropidophis* in Cuba and the Hispaniolan Vine Boas, *C. gracilis* and *C. ampelophis* (two strictly arboreal species), which share morphological traits largely associated with arboreality (i.e., slender and laterally compressed bodies, long and distinctive neck, large and protruding eyes) (for reviews see Hedges and Garrido 1992; Lillywhite and Henderson 1993; Tolson and Henderson 1993; Hedges 2002; Pizzatto et al. 2007; Rodríguez-Cabrera et al. 2016; Díaz and Cádiz 2020; Landestoy et al. 2021). Nonetheless, additional morphological, ecological, and behavioral studies of snakes in both genera are required before arriving at conclusions regarding ecological segregation between species.

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