

Contribution to the study of the genus *Stethantyx* Townes (Hymenoptera, Ichneumonidae, Tersilochinae), with the description of a new species from Brazil

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Abstract

A new species, *Stethantyx durrelli* sp. n. from Brazil, is described and illustrated. The recently described genus *Megalochus* Khalaim & Broad is synonymized with *Stethantyx*. The new species is very similar to *S. grandis* (Khalaim & Broad), **comb. n.** but differs by the first metasomal segment being trapeziform in cross-section, the presence of a distinct glymma, and the metapleuron and dorsolateral area of the propodeum being densely punctate, without coarse irregular rugae. These two species are the largest and most conspicuous representatives of the subfamily Tersilochinae. A partial key to species of *Stethantyx* is provided. Taxonomy and generic limits of *Stethantyx* are discussed.

Keywords

Neotropical region, South America, *Megalochus*, taxonomy, new species, new synonymy, key

Introduction

Stethantyx Townes is a large New World genus comprising 48 described and many undescribed species, most of which are Neotropical (Khalaim and Broad 2013; Khalaim et al. 2013, 2015; Khalaim and Ruíz-Cancino 2013; Khalaim 2016), as well as *S. nearctica* Townes which ranges from the northern US to Mexico and *S. crassa*

Horstmann known from Canada to the southern United States (Horstmann 2010). *Stethantyx* is closely related to the small Neotropical genus *Megalochus* Khalaim & Broad, with only one widely distributed species, *M. grandis* Khalaim & Broad. The genera were thought to be related based on the following synapomorphies: 1) fore wing with obtusely angled first and second abscissae of radius; 2) slender and usually long intercubitus and abscissa of cubitus between intercubitus and second recurrent vein; 3) the narrow pterostigma; and 4) dorsal end of epicnemial (prepectal) carina not joining the anterior margin of mesopleuron, continuing dorsoposterior to the subtegular ridge, or evanescent dorsally (Khalaim and Broad 2013). The *Stethantyx* genus-group was established for these two genera, comprising the largest and most conspicuous representatives of the subfamily, and recently the endemic Australian genus *Australochus* Khalaim was also included in this genus-group (Khalaim 2015).

Nothing is known about the biology and host preferences of *Megalochus* but some species of *Stethantyx* were recorded as parasitoids of the beetle families Nitidulidae and Curculionidae (Parker et al. 1950, Williams et al. 1984, Horstmann 2010). Although the genus *Stethantyx* has been extensively studied in recent years, a large number of species is still undescribed.

The aim of this work is to describe a new species of *Stethantyx* from Brazil, reconsider the classification of *Megalochus* and provide a partial key to species of *Stethantyx*. The taxonomy of the genus *Stethantyx* is also briefly discussed.

Materials and methods

Material of South American Tersilochinae from the Utah State University, Logan, Utah, USA (EMUS, Townes collection) and the Florida State Collection of Arthropods, Gainesville, Florida, U.S.A. (FSCA) was examined. In this material, a new species of *Stethantyx* was found.

Morphological terminology generally follows Townes (1969) with changes according to Khalaim (2011). Photographs were taken at the Instituto de Biología, Universidad Nacional Autónoma de México, D.F., México (UNAM) with a Leica DFC290 HD digital camera attached to a Leica Z6 APO stereoscopic microscope. Partly focused images were combined using the Leica Application Suite program.

Results and taxonomy

The genus *Megalochus* was described for a single species, *M. grandis*, occurring from Costa Rica to southern Brazil. This genus was considered to be related to the large Neotropical genus *Stethantyx*, forming with the latter and the monotypic Australian genus *Australochus* Khalaim (Khalaim 2015) a distinctive group of genera, the *Stethantyx* genus-group, and originally was distinguished from *Stethantyx* on the basis of the following features (Khalaim and Broad 2013):

	<i>Megalochus</i>	<i>Stethantyx</i>
Antenna	shortened; flagellomeres strongly transverse	not shortened; flagellomeres weakly transverse to elongate
Propodeum and metapleuron	with coarse irregular rugae	without rugae
Sub-basal cell in hind wing	unusually long and narrow	not especially narrow
First metasomal segment	round in cross-section, very slender, about 6.6 times as long as posteriorly broad	trapeziform centrally in cross-section, 3.3–5.0 times as long as posteriorly broad
Glymma	lacking	present

A new species from southern and southeast Brazil, *Stethantyx durrelli*, intermediate between the genera *Megalochus* and *Stethantyx*, was recently discovered. This species is apparently closely related to *M. grandis* as both are almost identical morphologically and in coloration, except (surprisingly!) for two important diagnostic characters of the genus *Megalochus*: in *S. durrelli*, the glymma is present (Figs 15, 16) and the propodeum and metapleuron are without rugae (Figs 10, 11). In addition, some other species of *Stethantyx* also have shortened antennae (though not as short as in *M. grandis* and *S. durrelli*) and some recently discovered species of *Stethantyx* (Khalaim et al. 2013) also have the first tergite very slender, upto 5.5 times as long as anteriorly broad in female (6.6 times in *M. grandis* and 5.4 times in *S. durrelli*). Only one of the previous five diagnostic features of *Megalochus* works well for both species: the hind wing mediella (M+Cu) is very weakly arcuate and subparallel to the submediella (1A), thus the sub-basal cell is unusually long, 5.0–6.0 times as long as broad (2.8–4.0 times in *Stethantyx*; compare Fig. 14 and Khalaim and Broad 2013: Figs 1–10). Thus, most of the diagnostic features of *Megalochus* do not distinguish the two genera with certainty and therefore this genus is synonymized here with *Stethantyx* (syn. n.). *Stethantyx durrelli* and *S. grandis* (comb. n.) can be distinguished from each other, as well as from other congeners using the key below.

Portion of the key to species of *Stethantyx*

- 1 Fore wing with first and second abscissae of radius meeting at obtuse angle (Fig. 13). *Stethantyx nearctica* species-group **2**
- Fore wing with first and second abscissae of radius meeting at right angle. *Stethantyx radiata* species-group **See key to species by Khalaim et al. 2015**
- 2 Hind wing with mediella (M+Cu) very weakly arcuate and subparallel to submediella (1A), thus the sub-basal cell is unusually long, 5.0–6.0 times as long as broad (Fig. 14). Large species with body length 10.5 to 15.0 mm..... **3**
- Hind wing with mediella (M+Cu) distinctly arcuate; sub-basal cell not unusually long, 2.8–4.0 times as long as broad. Small to moderately large species with body length usually 4.0 to 10.0 mm ... **See keys to species by Khalaim and Broad 2013, Khalaim et al. 2013, Khalaim and Ruíz-Cancino 2013**

- 3 First metasomal segment round in cross-section, without glymma. Metapleuron and dorsolateral area of propodeum with coarse irregular rugae. Fore wing with intercubitus about twice as long as abscissa of cubitus between intercubitus and second recurrent vein. Hind wing with nervellus slightly inclivous or vertical. Female with hind femur strongly clavate. Ovipositor with shallow dorsal subapical depression; sheath about 1.4 times as long as first tergite ***S. grandis* (Khalaim & Broad), comb. n.**
- First metasomal segment trapeziform in cross-section, with a deep glymma (Figs 15, 16). Metapleuron and dorsolateral area of propodeum densely punctate on finely granulate background, without coarse rugae, at most with fine wrinkles peripherally (Figs 10, 11). Fore wing with intercubitus about 5.0 times as long as abscissa of cubitus between intercubitus and second recurrent vein (Fig. 13). Hind wing with nervellus strongly inclivous (Fig. 14). Female with hind femur weakly clavate (Fig. 12). Ovipositor with a sharp dorsal subapical notch, distal margin of this notch is almost vertical (Fig. 18); sheath almost twice as long as first tergite ***S. durrelli* sp. n.**

***Stethantyx durrelli* Khalaim, sp. n.**

<http://zoobank.org/8057ADFA-7E53-465E-A982-8CA6BC87316E>

Figs 1–21

Comparative diagnosis. *Stethantyx durrelli* sp. n. is very similar to *S. grandis* but differs from it by the metapleuron and dorsolateral area of propodeum densely punctate on a finely granulate background (Figs 10, 11, 20), without coarse, irregular rugae; fore wing with intercubitus 5.0 times as long as abscissa of cubitus between intercubitus and second recurrent vein (Fig. 13) (versus 2.0 times in *S. grandis*); hind wing with nervellus strongly inclivous (Fig. 14) (slightly inclivous to vertical in *S. grandis*); hind femur of female weakly clavate (Fig. 12); first metasomal segment trapeziform in cross-section and with deep glymma (Figs 15, 16, 21); and ovipositor with a sharp dorsal subapical notch (Fig. 18). Moreover, the new species is generally paler than *S. grandis* and has a somewhat longer ovipositor. These two species are the largest known Tersilochinae with body length 10.5 to 15.0 mm (the largest specimens of *Barycnemis* and *Stethantyx* have body lengths up to 10.0 mm), and can be distinguished from their congeners using a partial key to species of *Stethantyx* above.

Description. *Female.* Body length 13.0 mm. Fore wing length about 9.2 mm.

Head rounded posterior to eyes in dorsal view (Fig. 4); temple 0.7 times as long as eye width. Mandible finely and densely punctate basally, upper tooth distinctly longer than lower. Clypeus broad, lenticular, 3.2 times as long as broad (Fig. 3), separated from face by shallow broad impression, densely and coarsely punctate in upper half, smooth and impunctate in lower half, weakly convex in lateral view. Malar space half as long as basal mandibular width. Maxillary and labial palpi short (Fig. 5). Flagellum of antenna short, distinctly narrowed towards apex, with 36 flagellomeres (Fig. 1); all



Figures 1–7. *Stethantyx durrelli* sp. n., female, holotype: **1** antenna, lateral view **2** base of antenna, lateral view **3** head, frontal view **4** head, dorsal view **5** head, ventro-postero-lateral view **6** mesoscutum, dorsolateral view **7** head and scutellum, dorsolateral view.

flagellomeres, except basal and apical ones, distinctly transverse; flagellomeres 2 to 7–9 (weak and inconspicuous on flagellomeres 8 and 9) bearing finger-shaped subapical structures on outer surface (Fig. 2). Inner eye orbits very weakly convergent ventrally (Fig. 3). Face with rather dense and long brownish setae, centrally with blunt prominence. Face and frons densely punctate (distance between punctures mostly shorter than one puncture diameter), very finely granulate to almost smooth between punctures, dull. Vertex and temple with moderately dense punctures, smooth and weakly shining between punctures. Occipital carina complete. Hypostomal carina completely absent (Fig. 5).

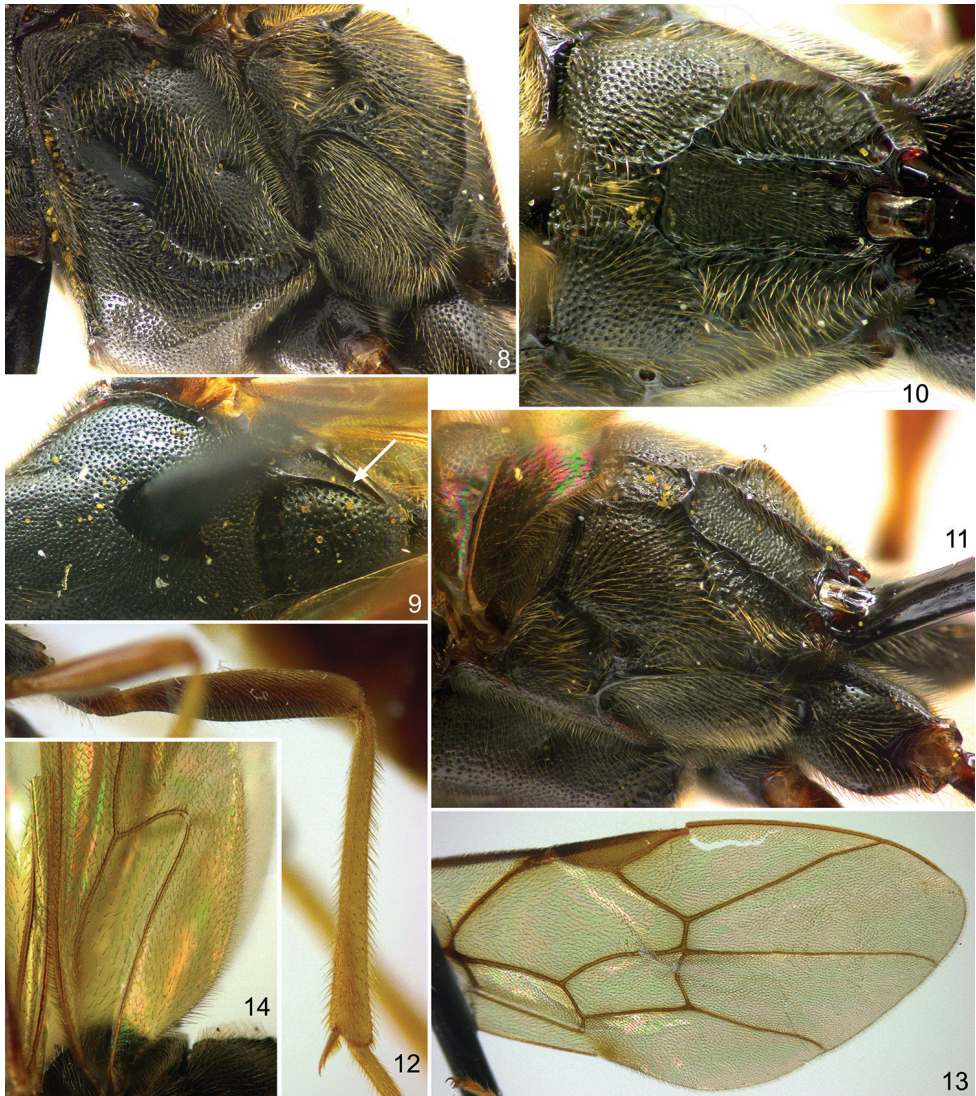
Notaulus rather long, weakly impressed, with a strong longitudinal wrinkle and sometimes with weak adjacent wrinkles (Figs 6, 7). Mesoscutum densely punctate (distance between punctures shorter than one puncture diameter), dull, finely granulate between punctures (Fig. 6). Scutellum with moderately dense punctures, dull, finely granulate between punctures, with lateral longitudinal carinae strong, developed in its anterior 0.7 (Fig. 9, arrow). Epicnemial carina not joining anterior margin of mesopleuron, evanescent above (Fig. 8). Foveate groove of mesopleuron long, moderately broad, crenulate, extending almost entire length of mesopleuron, weak anteriorly (evanescent near epicnemial carina) and very deep and sharp centrally and posteriorly (Fig. 8). Mesopleuron distinctly and densely punctate, with impunctate area above foveate groove in its anterior part, smooth between punctures centrally and finely granulate peripherally (Fig. 8). Dorsolateral area of propodeum and metapleuron very densely punctate, dull (Figs 10, 11); lower part and periphery of dorsolateral area with shallow irregular wrinkles. Basal area of propodeum slightly widened anteriorly, 1.6 times as long as anteriorly broad and 0.65 times as long as apical area; basal longitudinal carinae weak (Figs 10, 11). Propodeal spiracle separated from pleural carina by 1.0–1.5 times diameter of spiracle (Fig. 8). Apical area anteriorly widely truncate, subrectangular (apical longitudinal carinae parallel), almost twice as long as broad (Figs 10, 11), flat, very densely punctate, dull.

Fore wing (Fig. 13) with second recurrent vein (2m-cu) weakly postfurcal. First and second abscissae of radius (Rs+2r and Rs) angled about 120°. Intercubitus (2rs-m) not thickened, very long, about 5.0 times as long as abscissa of cubitus (M) between intercubitus and second recurrent vein. First abscissa of radius almost straight, 2.5 times as long as width of pterostigma. Metacarpus (R1) not reaching apex of fore wing. Hind wing with nervellus (cu1&cu-a) strongly inclivous (Fig. 14).

Hind femur slightly clavate (Fig. 12), 4.7 times as long as broad, and 0.75 times as long as tibia. Hind basitarsus half as long as tibia. Spurs of hind tibia distinctly curved at apex.

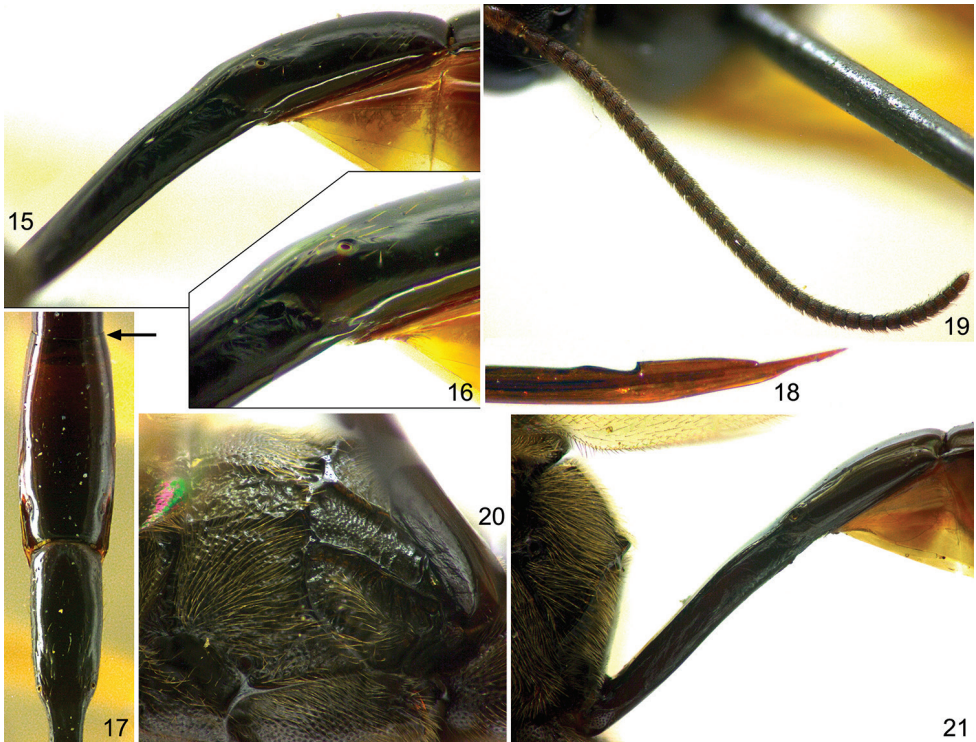
First metasomal segment very slender, 5.4 times as long as posteriorly broad, trapeziform in cross-section, arcuate in lateral view, smooth, with glymma situated somewhat behind its middle (Fig. 15). Glymma deep, joining ventral part of postpetiole by weak groove (Fig. 16). Second tergite 2.3 times as long as anteriorly broad (Fig. 17). Thyridial depression long (Fig. 17); thyridium slightly elongate, separated from anterior margin of second tergite by 3.5 times maximum diameter of thyridium. Ovipositor upcurved, with a deep dorsal subapical notch; sheath 1.9 times as long as first tergite and 1.75 times as long as hind tibia.

Head black; palpi, lower half of clypeus and mandible (except black teeth) brownish yellow. Antenna with scape and pedicel dark brown, flagellum black. Mesosoma (including tegula) black. Pterostigma pale brown. Legs brownish yellow; all coxae black; trochanters brown to brownish black; fore and mid femora brownish; hind femur brown, on lower and inner sides brownish black. Metasomal tergite 1 black, following tergites brown. Wings infumate with yellow-brown.



Figures 8–14. *Stethantyx durrelli* sp. n., female, holotype: **8** mesosoma, lateral view **9** mesoscutum and scutellum, lateral view **10** propodeum, dorsal view **11** propodeum, dorso-postero-lateral view **12** hind femur and tibia, lateral view **13** apex of fore wing **14** basal part of hind wing.

Male. Body length 10.5–13.0 mm, fore wing length 8.4–9.5 mm. Flagellum with 38 flagellomeres (Fig. 19); flagellomeres 3 to 8–10 (weak and inconspicuous on flagellomeres 9 and 10) bearing finger-shaped subapical structures on outer surface. Malar space 0.4 times as long as basal mandibular width. Propodeal spiracle separated from pleural carina by 0.5–1.0 times diameter of spiracle. Basal area of propodeum 0.7–0.8 times as long as apical area (Fig. 20). First tergite very slender and almost straight in



Figures 15–21. *Stethantyx durrelli* sp. n., female, holotype (15–18) and male, paratype (19–21): 15 first tergite, lateral view 16 glymma, lateral view 17 first and second tergites, dorsal view (the arrow points to the hind end of second tergite) 18 apex of ovipositor, lateral view 19 antenna, lateral view 20 propodeum, dorsolateral view 21 propodeum and first tergite, lateral view.

lateral view (Fig. 21); groove between glymma and ventral part of postpetiole absent or indistinct. Otherwise similar to female.

Variation. The male from São Paulo has metapleuron almost entirely covered with fine vertical wrinkles; dorsolateral area of propodeum with punctures mostly indistinct because of numerous fine wrinkles; basal area rather indistinct (basal longitudinal carinae weak); apical area hexagonal (apical longitudinal carinae ending anteriorly far from the posterior end of basal longitudinal carinae), impunctate; and nervellus less inclivous.

Type material. Holotype female (EMUS), Brazil, State of Rio de Janeiro, Teresópolis, 13.III.1966, coll. H. & M. Townes.

Paratypes. 1 male (FSCA), Brazil, State of São Paulo, Boracéia Biological Station, Sangre Grande, 18.XI.1976, coll. T. Rogers, 23KMPO93834. 1 male (EMUS), Brazil, State of Paraná, NE of Curitiba, Campina Grande do Sul, 16.II.1966, coll. H. & M. Townes.

Distribution. Southern and southeast Brazil (Rio de Janeiro, São Paulo, Paraná).

Etymology. The new species is named in honour of Gerald Durrell (1925–1995), a well-known British naturalist and author of many popular books about animals.

Discussion

Originally, Townes (1971) described *Stethantyx* with no differential diagnosis, but according to the key to world genera (Townes 1971: 34) *Stethantyx* is similar to another Neotropical genus described in the same paper, *Meggoleus* Townes, and differs from the latter by small, unspecialized propodeal spiracles (strongly enlarged in *Meggoleus*) and inclivous to weakly reclivous nervellus in the hind wing (distinctly reclivous in *Meggoleus*). Later, one more species of *Meggoleus* with enlarged propodeal spiracles was described from Central Africa (Khalaim 2007) and two species from Peru (Alvarado 2012). Besides species of *Meggoleus* with enlarged spiracles seen many undescribed Neotropical species with small to weakly enlarged propodeal spiracles and variable inclination of the nervellus have been examined. These taxa probably also belong to *Meggoleus*, although the characters suggested by Townes for separation of these two genera do not work.

Extensive study of *Stethantyx* in the past decade demonstrated a considerable morphological diversity of this genus, e.g. some species possess a right-angled radial cell, short and thick intercubitus and abscissa of cubitus between intercubitus and second recurrent vein, broad pterostigma, epicnemial (prepectal) carina with dorsal end obliterated and first metasomal segment without glymmae, and some undescribed species are not clearly distinguished from the genera *Meggoleus*, *Probles* Förster and *Tersilochus* Holmgren. Thus, most previously used diagnostic features of *Stethantyx* (Townes 1971, Khalaim and Broad 2013) do not work well for separating all *Stethantyx* species from other genera, and the limits of *Stethantyx*, as well as some other tersilochine genera, requires further investigation. Moreover, the generic status of *Stethantyx* must be confirmed by apomorphic features, while currently all diagnostic characters of this genus seem to be plesiomorphic.

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