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Two new species of *Xanthomicrogaster* (Hymenoptera: Braconidae) from Argentina, with a key to species of the genus

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The genus *Xanthomicrogaster* is reported for the first time from Argentina. Two new species, *X. sayjuhu* Martínez **sp. nov.** from NE Argentina, and *X. otamendi* Martínez **sp. nov.** from the delta of the Parana River are described and illustrated. These include the first reports of the genus from temperate latitudes in South America. A key to species of *Xanthomicrogaster* is provided.

Microgastrinae is one of the most diverse subfamilies of Braconidae and is probably the most beneficial in terms of the number of parasitoid species used in biological control programs (Whitfield 1997; Quicke 2015). Currently, the subfamily includes approximately 2000 described species (Yu *et al.*, 2012), but estimates suggest that this is just a fraction of its real specific diversity, which could range between 3000–5500 (Jones *et al.* 2009), 5000–10000 (Mason 1981), to a maximum of almost 50000 species (Rodríguez *et al.* 2013). Its members are among the most difficult braconids to identify based only on morphological evidence and, in many cases, closely related species are virtually indistinguishable; therefore, biological information and/or DNA sequence data (*e.g.* DNA Barcoding) are necessary to ascertain their identity (Quicke 2015).

Xanthomicrogaster was erected by Cameron (1911) based on a few specimens from Guyana. This strictly Neotropical genus currently includes only four valid species. The type species, *X. fortipes* Cameron, is known from Guyana, Suriname and Brazil; *X. seres* Nixon is known from Mexico, whereas *X. maculatus* Pentead-Dias, Shimabukuro & van Achterberg and *X. pelides* Nixon are only known from their type localities in Brazil (Cameron 1911; Nixon 1965; Pentead-Dias *et al.* 2002; Yu *et al.* 2012).

The study of microgastrines from the entomological collection at the Museo Argentino de Ciencias Naturales revealed the presence of two undescribed species of *Xanthomicrogaster* in Argentina, reaching temperate latitudes near Buenos Aires city.

Materials and methods

All specimens examined in this work are deposited in the entomological collection at the Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, Buenos Aires, Argentina (MACN), with the exception of the holotype of *X. fortipes* Cameron, which is deposited at the Natural History Museum, London, UK (NHM).

All specimens were identified to genus level following Whitfield’s (1997) key. Images were taken and edited using a Leica® Z16 APO-A stereoscopic microscope, a Leica® DFC295/ DFC290 HD camera, and the Leica Application Suite® program at the Instituto de Biología, Universidad Nacional Autónoma de México. Morphological terminology follows Sharkey and Wharton (1997). Surface sculpture terminology follows Harris (1979).

Results

Genus *Xanthomicrogaster* Cameron

Xanthomicrogaster Cameron, 1911: 324, original description; Nixon, 1965: 264, revision and key to species; Pentead-Dias *et al.* 2002, key to species.

Type species: *Xanthomicrogaster fortipes* Cameron

Diagnosis. Following Whitfield’s (1997) key to genera of Neotropical microgastrines, *Xanthomicrogaster* can be

distinguished from the remaining microgastrine genera by the following combination of characters: second submarginal cell of fore wing small, closed apically by vein r-m; propodeum with a median longitudinal carina; epicnemial carina absent; first metasomal tergite broad, about as long as apically wide, to slightly wider, with a distinct anteromedian longitudinal furrow; hind wing with vein r-m present although spectral and difficult to observe, delimiting a cell that is higher than wide; ovipositor sheaths as long as hind tibia and covered by setae along most of their length. In addition, *Xanthomicrogaster* can be distinguished by having scrobiculate furrows delimiting the second metasomal tergite anteriorly and posteriorly.

Key to described species of *Xanthomicrogaster* (Modified from Pentead-Dias *et al.* 2002)

1. Mesosoma largely yellow (if dark spots are present, they are restricted to a single small sclerite)..... 2
- Mesosoma partly black; with distinct black markings on various sclerites, sometimes entirely black 3
2. Mesosoma entirely yellow (sometimes with darkened apicolateral corners of propodeum); second metasomal tergum poorly sculptured, almost smooth; Brazil, Guyana, Suriname *X. fortipes* Cameron
- Mesosoma yellow with a distinct dark brown to black spot covering most of scutellum; second metasomal tergum rugose; Argentina *X. otamendi* Martínez **sp. nov.**
3. Mesosoma and hind coxa completely black; Brazil *X. pelides* Nixon
- Mesosoma and hind coxa partly yellow 4
4. Hind coxa blackish ventrally; second tergite blackened; Mexico *X. seres* Nixon
- Hind coxa yellow ventrally; second metasomal tergite completely yellow 5
5. Median lobe of mesoscutum partially black, metasoma black dorsally beyond tergite II; Brazil *X. maculatus* Pentead-Dias, Shimabukuro & van Achterberg.
- Median lobe of mesoscutum and metasoma entirely yellow; Argentina *X. sayjuhu* Martínez **sp. nov.**

Xanthomicrogaster otamendi Martínez **sp. nov.** (Figs 1–6)

Body length (excluding ovipositor and sheaths) 3.1 mm (Fig. 1). Fore wing length 3.4 mm. Colour. General body colour yellow, with outer surface of scape and pedicel, flagellum, ovipositor sheaths and median area of hypopygium dark brown to black; also this species is characterized by a distinct dark brown spot covering most of the scutellar disc; wings hyaline, veins brown, pterostigma brown marginally and turning lighter towards the center. Head. Face (Fig. 2) wider than high almost smooth and shiny, only with scattered punctures at the base of each seta. Malar space slightly shorter than width of mandible base, with distinct malar suture. Vertex smooth, except for hair punctures, ocelli forming an obtuse angle, OD $0.7 \times$ POL and $0.5 \times$ OOL. First flagellomere $3 \times$ longer than apically wide and as long as second, two \times longer than 14th flagellomere. Mesosoma $1.3 \times$ longer than wide and $1.3 \times$ longer than high. Pronotum smooth, pronotal furrow shallow and smooth. Mesoscutum (Fig. 3) punctate, smooth and shiny in between punctures. Scutoscuteellar scrobe formed by 9–10 sometimes partially confluent pits. Scutellum triangular, largely smooth, except for hair punctures which are distinctly less impressed than those of the mesoscutum. Propodeum largely smooth, with a distinct median longitudinal carina. Hind tibiae on outer surface with scattered spines. Hind femur $3.8 \times$ longer than its maximum width, $0.8 \times$ the length of hind tibia and $1.6 \times$ longer than hind basitarsus. Wings (Figs 5–6). Fore wing with pterostigma 2.5 – $2.6 \times$ longer than wide. Vein R $1.4 \times$ the length of pterostigma, and $2.8 \times$ longer than r. Metasoma. Tergite I 0.8 – $0.9 \times$ as long as broad, with a distinct median furrow, coarsely sculptured, punctate to rugose areolate. Second tergite rectangular, parallel sided, rugose (Fig. 4), with anterior and posterior margins distinctly scrobiculate, third tergite largely smooth and shiny third except for some scattered shallow punctures. Remaining tergites smooth and shiny. Ovipositor sheaths about $0.7 \times$ as long as metasoma and $0.8 \times$ as long as hind tibia.

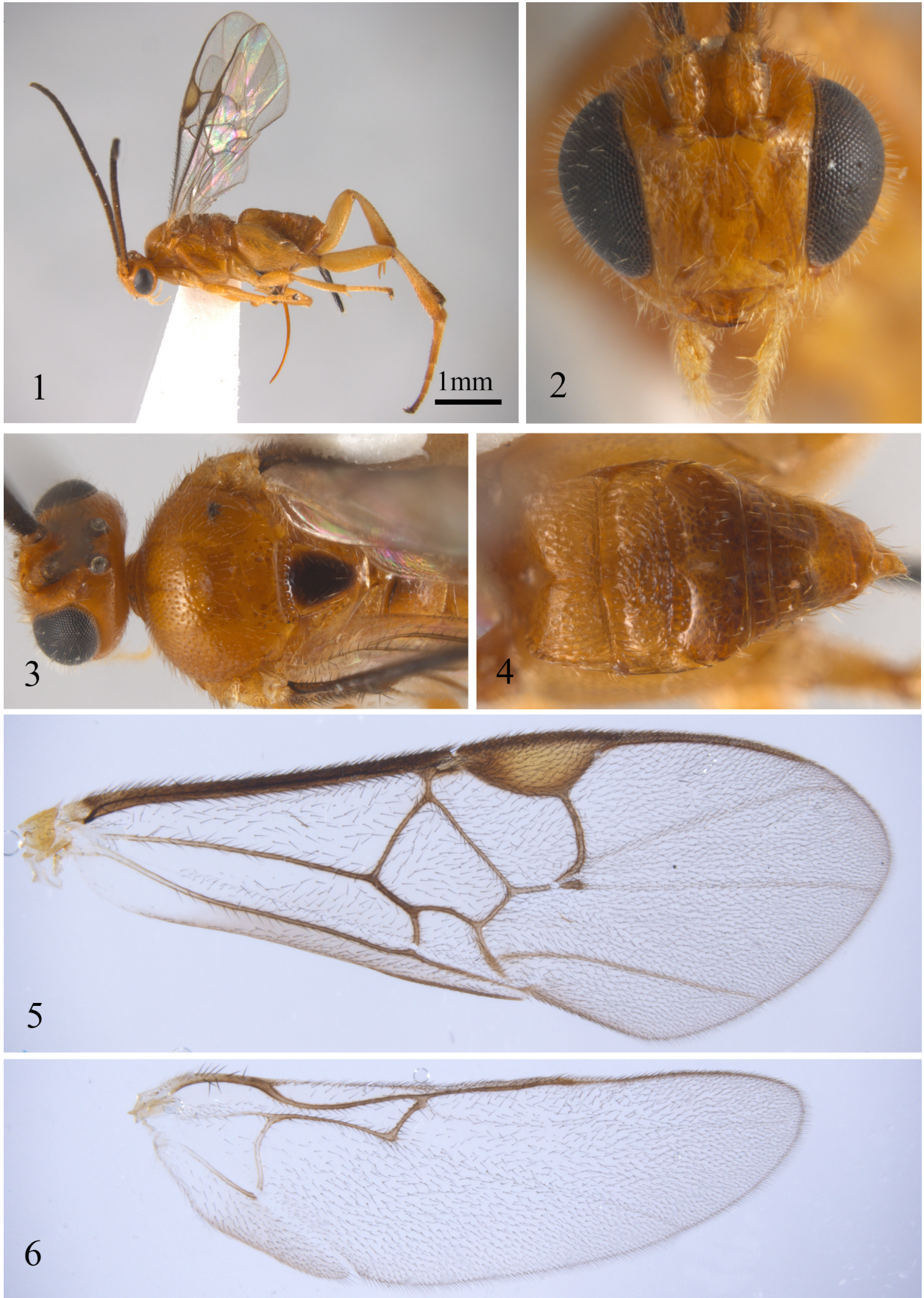
Male: Unknown.

Etymology: The species name refers to the type locality.

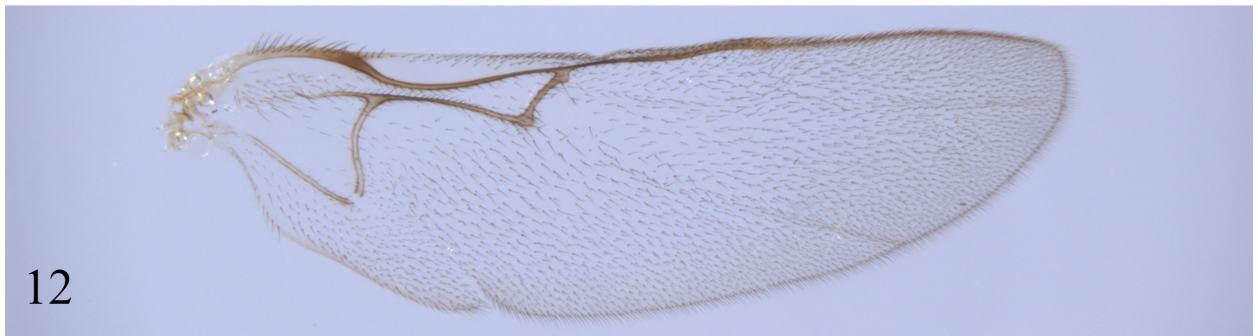
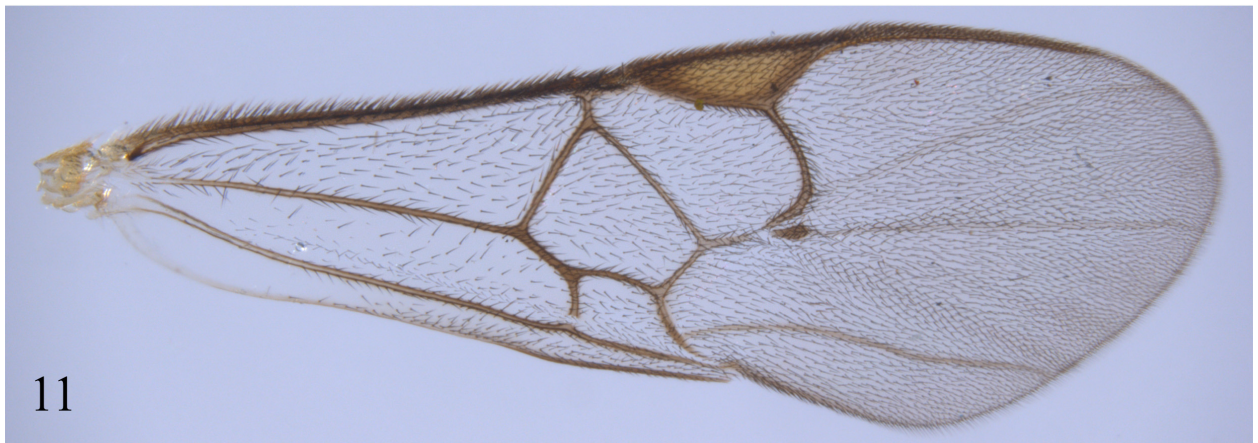
Material examined: Holotype female, Argentina, Buenos Aires province, Reserva Natural Otamendi, 16.xii.2006, Martínez col. Paratype: One female, same data as holotype.

Xanthomicrogaster sayjuhu Martínez **sp. nov.** (Figs 7–12)

Body length (excluding ovipositor and sheaths) 3.0 mm (3.0–3.1 mm) (Fig. 7). Fore wing length 3.4 mm (3.4–3.5 mm). Colour. General body yellow, with outer surface of scape and pedicel, flagellum, lateral areas of mesoscutum, lower area of mesopleuron, mesosternum, lateral areas of propodeum and ovipositor sheaths dark brown to black; hind trochantellus, apex of hind tibia and hind tarsus also darkened, brown. Wings hyaline, veins brown, pterostigma brown marginally and turning lighter towards the center. Head. Face (Fig. 8) wider than high, almost smooth and shiny, only with



FIGURES 1–6. *Xanthomicrogaster otamendi* sp. nov. 1, habitus of female in lateral view; 2, head in anterior view; 3, head and mesosoma in dorsal view; 4, metasoma in dorsal view; 5, fore wing; 6, hind wing. Figures 1–4, holotype; 5–6, paratype.



FIGURES 7–12. *Xanthomicrogaster sayjuhu* sp. nov. 7, habitus of female in lateral view; 8, head in anterior view; 9, head and mesosoma in dorsal view; 10, metasoma in dorsal view; 11, fore wing; 12, hind wing. Figures 7–10, holotype; 11–12, paratype.

scattered punctures at the base of each seta. Malar space slightly shorter than width of mandible base, with distinct malar suture. Vertex smooth, except for hair punctures, ocelli forming an obtuse angle, OD $0.5 \times$ POL and $0.5 \times$ OOL. First flagellomere $3 \times$ longer than apically wide and as long as second, about two \times longer than 14th flagellomere. Mesosoma $1.3 \times$ longer than wide and $1.3 \times$ longer than high. Pronotum smooth, pronotal furrow shallow and smooth. Mesoscutum punctuate (Fig. 9), smooth and shiny inbetween punctures. Scutoscutellar scrobe formed by 8–10 sometimes partially confluent pits. Scutellum triangular, largely smooth, except for hair punctures which are distinctly less impressed than those of the mesoscutum. Propodeum largely smooth, with a distinct median longitudinal carina. Hind tibiae on outer surface with scattered spines. Hind femur $4.1 \times$ longer than its maximum width, $0.9 \times$ the length of hind tibia and $1.7\text{--}1.8 \times$ longer than hind basitarsus. Wings (Figs. 11–12). Fore wing with pterostigma $2.6\text{--}2.8 \times$ longer than wide. Vein R $1.2 \times$ the length of pterostigma, and $2.9\text{--}3.1 \times$ longer than r. Metasoma. Tergite I $0.8 \times$ as long as broad, with a distinct median furrow, distinctly sculptured, rugose to rugose areolate. Second tergite rectangular, parallel sided, rugose (Fig. 10), with anterior and posterior margins distinctly scrobiculate, third tergite largely smooth and shiny except for some scattered shallow punctures. Remaining tergites smooth and shiny. Ovipositor sheaths about $0.6 \times$ as long as metasoma and $0.6 \times$ as long as hind tibia.

Male: Unknown

Comments: This species is morphologically similar to *X. maculatus* Pentead-Dias, Shimabukuro & van Achterberg from the states of Sao Paulo and Minas Gerais, Brazil (Pentead-Dias *et al.* 2002). Unfortunately, it was not possible to study the type material of species from Brazil, neither by loan of specimens nor photographs. The specimens from Argentina differ from those of *X. maculatus* by the complete absence of black markings on the median lobe of the mesoscutum and on the metasomal tergites. The original description of *X. maculatus* is fairly short and consists of the description of the colour pattern and some details of the sculpture of the propodeum and metasomal terga, which do not allow further comparisons. The figures in Pentead-Dias *et al.* (2002) show some variation in the colour pattern between two paratypes, but they do not match the pattern described here for *X. sayjuhu*.

Etymology: This new species is named with the guaraní words say'ju (yellow) and hû (black), in reference to the colour pattern of this species.

Material examined: Holotype female, Argentina, Misiones, Parque Nacional Iguazú, xii.2007-i.2008, Taylor col., malaise trap. Paratypes: Two females, same data as holotype.

Discussion

Prior to this contribution, *Xanthomicrogaster* was only known from strictly tropical localities in the New World. The presence of the genus in the Delta of the Parana River, reaching temperate latitudes, extends the known geographic distribution of *Xanthomicrogaster* more than a thousand kilometers to the South.

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