

## Review of the genera *Stenopyrgota* Malloch and *Tropidothrinax* Enderlein (Diptera, Pyrgotidae)

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**ABSTRACT.** Review of the genera *Stenopyrgota* Malloch and *Tropidothrinax* Enderlein (Diptera, Pyrgotidae). The Neotropical genera *Stenopyrgota* Malloch, 1929 and *Tropidothrinax* Enderlein, 1942 are reviewed. The genus *Stenopyrgota* is composed by the species *S. mexicana* Malloch, 1929 and *S. crassitibia* Aczél, 1956. The monotypic genus *Tropidothrinax* is composed by the species *T. boliviensis* Enderlein, 1942. The species of *Stenopyrgota* and *Tropidothrinax* are redescribed and illustrations of the main taxonomic characters are given. Illustrations of the type material of the species covered by this paper are presented for the first time.

**KEYWORDS.** Insecta; Pyrgotinae; Pyrgotini; redescription; Tephritoidea.

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Pyrgotidae is a small family of Tephritoidea flies with worldwide distribution (Kim & Han 2009). The family is composed by ca. 365 species in about 55 genera (Korneyev 2012). According to Mello & Lamas (in press), the Neotropical fauna of Pyrgotidae is represented by 58 species distributed in the following genera: *Carrerapyrgota* Aczél (four species), *Descoleia* Aczél (one species), *Idiopyrgota* Aczél (one species), *Leptopyrgota* Hendel (33 species), *Lopadops* Enderlein (one species), *Neopyrgota* Hendel (six species), *Pyrgota* Wiedemann (three species), *Pyrgotosoma* Malloch (one species), *Stenopyrgota* Malloch (two species), *Stirothrinax* Enderlein (two species), *Teretrura* Bigot (three species) and *Tropidothrinax* Enderlein (one species).

The genus *Stenopyrgota* was erected by Malloch (1929) to allocate his new species *S. mexicana*, based on a female specimen from Chihuahua, Mexico. Aczél (1956b) described the second species of the genus, *S. crassitibia* based on two female specimens from Tucumán, Argentina. Recently, Henandez-Ortiz (2010) reported the occurrence of three unnamed species from Costa Rica and Mexico. Male specimens of *Stenopyrgota* are still undiscovered.

The monotypic genus *Tropidothrinax* was described by Enderlein (1942) to include the new species *T. boliviensis*, based on a female specimen from Sara, Bolivia. Until now, the holotype is the only known specimen of this taxon.

The limits of the genera *Stenopyrgota* and *Tropidothrinax* are revised and better supported. The types of the species of *Stenopyrgota* and *Tropidothrinax* are also revised, in an attempt to provide better descriptions and illustrations of those taxa. Redescriptions of the species *S. crassitibia*, *S. mexicana* and *T. boliviensis* are presented with illustra-

tions of the main taxonomic characters. Illustrations of the type material of the species covered by this paper are presented for the first time.

### MATERIAL AND METHODS

The material examined belongs to the following collections: *Instituto y Fundación Miguel Lillo* (IFML), Tucumán, Argentina; *Museum für Naturkunde Berlin* (ZMHB), Berlin, Germany and National Museum of Natural History (USNM), Washington D.C., USA.

Stack photographs were processed using the free software Combine ZM (Hadley 2007). The morphological terminology follows Korneyev (2006), except that for the antennal segments, which follows Stuckenberg (1999) and for the thoracic stripes, which follows Stoltzfus (1988). The ratios used in the redescrptions are: eye ratio (shortest eye diameter/longest eye diameter); genal-eye ratio (genal height/longest eye diameter); postpedicel-pedicel ratio (length of postpedicel/length of pedicel); wing-thorax ratio (wing length/thorax length);  $R_{4+5}$  ratio (length of section between basal node and r-m/length of section between r-m and wing apex); M ratio (length of section between bm-cu and r-m/length of section between r-m and dm-cu). Except for the first ratio (postpedicel-pedicel ratio), the remaining ones follow Kim & Han (2000).

The type material labels are quoted in double quotation marks, each line in the text of each label is separated by a vertical line. In case of handwriting on printed labels, the handwritten text is reproduced in italics; entirely handwritten or entirely printed labels are reproduced in regular font. Abbreviated information is completed within square brackets; gender symbol are informed within brackets.

## TAXONOMY

*Stenopyrgota* Malloch, 1929

*Stenopyrgota* Malloch, 1929: 259. Type species: *Stenopyrgota mexicana* Malloch, 1929 by original designation. Hendl 1934: 144 (key); Enderlein 1942: 104 (key); Aczél 1956a: 168–169, 171, 173 (taxonomic notes), 181 (checklist); 1956b: 14, 16 (key), 25 (taxonomic notes), 26 (description of *S. crassitibia*); Steyskal 1967: 4 (catalogue); 1978: 149 (key); 1987: 814 (key); Hernández-Ortiz 2010: 958 (key), 960 (distribution); Mello *et al.* 2010: 62 (taxonomic notes).

**Diagnosis.** *Stenopyrgota* is differentiated from other pyrgotids by the following combination of characters: body setae absent or diminute; eye rounded; antennal groove without longitudinal median carina; gena without subocular spot; postscutellum slightly developed; wing covered with spots; C unbroken on Sc;  $R_{2+3}$  without apical spur vein;  $R_{4+5}$  bare; alula reduced; upper and lower calypteres bare; hind tibia thinner on basal third, without dorsal concavity; oviscape elongated and cylindrical, without apical hook.

**Redescription.** Head: frons reddish yellow on anterior half, yellow to yellowish brown on posterior half; eye rounded in profile; head setae absent; pedicel covered with setulae; postpedicel and arista bare; antennal groove yellow, deeply concave, without longitudinal median carina; orbital sclerite yellowish; subocular spot absent; occiput yellowish to dark brown, covered by sparsely setulae; median occipital sclerite yellowish brown, covered by sparsely setulae, without spot; palpus yellowish brown, covered by setulae; labelum dark brown covered by yellowish setulae.

**Thorax:** scutum yellowish brown; submesal stripe, anterior and posterior dorsocentral stripes discretely brownish; thoracic setae absent; pleura yellowish brown to brown; postscutellum slightly developed. Wing: brown with dispersal hyaline spots; veins brownish;  $R_{2+3}$  without apical spur vein;  $R_{4+5}$  bare; C unbroken on Sc, ending on M; cells bm and cup longer; alula reduced; upper and lower calypteres bare. Legs: yellowish brown; setae absent, covered by hairs; hind tibia thinner on basal third, without dorsal concavity.

**Abdomen:** oviscape elongated and cylindrical, without apical hook.

Male unknown.

*Stenopyrgota crassitibia* Aczél, 1956

(Figs. 1–8)

*Stenopyrgota crassitibia* Aczél, 1956: 26. Type locality: Argentina, Tucumán, Cerro de San Javier. Aczél 1956a: 167–169, 171 (taxonomic notes), 181 (checklist); 1956b: 26 (original description); Steyskal 1967: 4 (catalogue); Hernández-Ortiz 2010: 960 (distribution).

**Type material examined.** Holotype female with labels (Fig. 1): (1) handwritten on white paper: “Tucumán | Cerro de San | Javier – Tafi | Viejo coll. R. Golbach”; (2) printed with handwritten inscriptions on white paper: “*Stenopyrgota* (female symbol) | *crassitibia n. sp.* | Dr. M. Aczél Det.”; (3) Printed on red paper: “HOLOTIPO”; (4) printed on white paper: “Pyrgotidae”. Preservation: pinned; left wing and right hind leg mounted on slide. Missing parts: none. Type depository: IFML. Paratype female with labels: (1)

handwritten on white paper: “Tucumán | C. de S. Javier [Cerro de San Javier] | 18-XII-46 [18/xii/1946] | Coll: R. Golbach”; (2) printed with handwritten inscriptions on white paper: “*Stenopyrgota* (female symbol) | *crassitibia n. sp.* | Dr. M. Aczél Det. 1.”; (3) Printed with handwritten inscriptions on white paper: “INST. M. LILLO [Instituto Miguel Lillo] | preparación | N° 202 M. Ala”. Preservation: pinned. Missing parts: none. Type depository: IFML.

**Remarks on the type material.** Although the third label of the paratype indicates that the wing (“Ala”) was mounted on slide, this is not the case for this specimen, but only for the holotype. The paratype has all the structures. Concerning the date of holotype collecting, this information was not included in any label of the specimen. According to Aczél (1956b: 29), both specimens of the type series were collected at the same date and locality.

**Diagnosis.** *Stenopyrgota crassitibia* is differentiated from their congener by frons trapezoidal; r-m placed slightly before middle of discal cell;  $CuA_1$  not reaching wing margin.

**Redescription.** Body (Fig. 2) yellowish to dark brown; body length 12.7–14 mm (holotype 12.7 mm); wing length 7.3–7.8 mm (holotype 7.3 mm).

**Head** (Figs. 3–4): frons trapezoidal, 0.9–1.0 times wider than long; eye ratio 0.9–0.8; genal-eye ratio 0.2–0.3; postpedicel-pedicel ratio 1.2–1.5; postpedicel 1.3 times as long as wide; arista yellow; face yellowish brown; parafacial yellowish, 0.3–0.4 times as wide as postpedicel; gena yellow; palpus 1.0 times as long as postpedicel.

**Thorax** (Fig. 5): postpronotal lobe, scutellum, anepisternum, katepisternum, anepimeron and proepisternum yellowish brown, with sparse hairs. Wing (Fig. 6): r-m slightly before middle of discal cell;  $CuA_1$  not reaching wing margin; wing-thorax ratio 2.5;  $R_{4+5}$  ratio 0.4; M ratio 0.8; halter whitish. Legs: fore femur 6.3–6.7 times as long as wide; hind tibia as in Fig. 7.

**Female abdomen:** dark brown, covered with setulae; syntergite 1+2 0.6 times as long as tergites 3–6; oviscape (Fig. 8) yellowish brown, yellow on apex, bare, 0.8–0.9 times as long as preabdomen.

Male unknown.

*Stenopyrgota mexicana* Malloch, 1929

(Figs. 9–15)

*Stenopyrgota mexicana* Malloch, 1929: 260. Type locality: Mexico, Chihuahua, Sierra Madre. Aczél 1956b: 29 (synonymic list); Steyskal 1967: 4 (catalogue); 1978: 155 (new occurrence); Hernández-Ortiz 2010: 960 (distribution).

**Type material examined.** Holotype female with labels (type labels in Fig. 9): (1) printed on white paper: “Sierra Madre | Chih. [Chihuahua]”; (2) “H.dRPiedras Verdes [Rio Piedras Verdes] | Abt7300ft [about 7300 feet]”; (3) handwritten on white paper: “7.16”; (4) printed on white paper: “Coll | Townsend”; (5) printed with handwritten inscriptions on red paper: “Type No. | 43279 | U.S.N.M.”; (6) printed with handwritten inscriptions on white paper: “*Stenopyrgota* | *mexicana* | Det | JR Malloch Type”. Preservation: pinned. Missing parts: femora, tibiae and tarsi of the mid legs and right hind leg. Type depository: USNM.

**Diagnosis.** This species can be differentiated from their congener by frons amphora-shaped; r-m placed slightly after the middle of discal cell;  $CuA_1$  reaching wing margin.



Figs. 1–8. *Stenopyrgota crassitibia* Aczél, female holotype. 1, holotype labels. 2, habitus, lateral. 3, head (dorsal view). 4, head (lateral view). 5, thorax (dorsal view). 6, wing. 7, right hind leg (anterior view). 8, oviscapae (lateral view). Scales: 2, 6–7: 1.0 mm; 3–4: 0.25 mm; 5 and 8: 0.5 mm.

Redescription. Body (Fig. 10) brown; body length 12 mm; wing length 8.0 mm.

Head (Figs. 11–12): frons amphora-shaped, 0.8 times wider than long; eye ratio 0.9; genal-eye ratio 0.3; postpedicel-pedicel ratio 1.0; postpedicel 1.4 times as long as wide; arista brown; face yellowish brown; parafacial yellowish brown, 0.5 times as wide as postpedicel; gena yellowish brown; palpus 2.4 times as long as postpedicel.

Thorax (Fig. 13): postpronotal lobe yellowish brown, with 4 setulae; scutellum yellowish brown, with 2 setulae; anepisternum with a longitudinal row of setulae on posterior margin; katepisternum with 2 setulae; anepimeron with 2 setulae; proepisternum yellowish brown, covered with sparsely setulae. Wing (Fig. 14): r-m slightly distal from middle of discal cell;  $CuA_1$  reaching wing margin; wing-thorax ratio 3.3;  $R_{4+5}$  ratio 0.5; M ratio 1.1; halter whitish. Legs: fore femur 7.5 times as long as wide.

Female abdomen: yellowish brown, covered with setulae; syntergite 1+2 3.9 times as long as tergites 3–6; oviscapae (Fig. 15) yellow, yellowish brown on basal third, bare, 1.0 times as long as preabdomen.

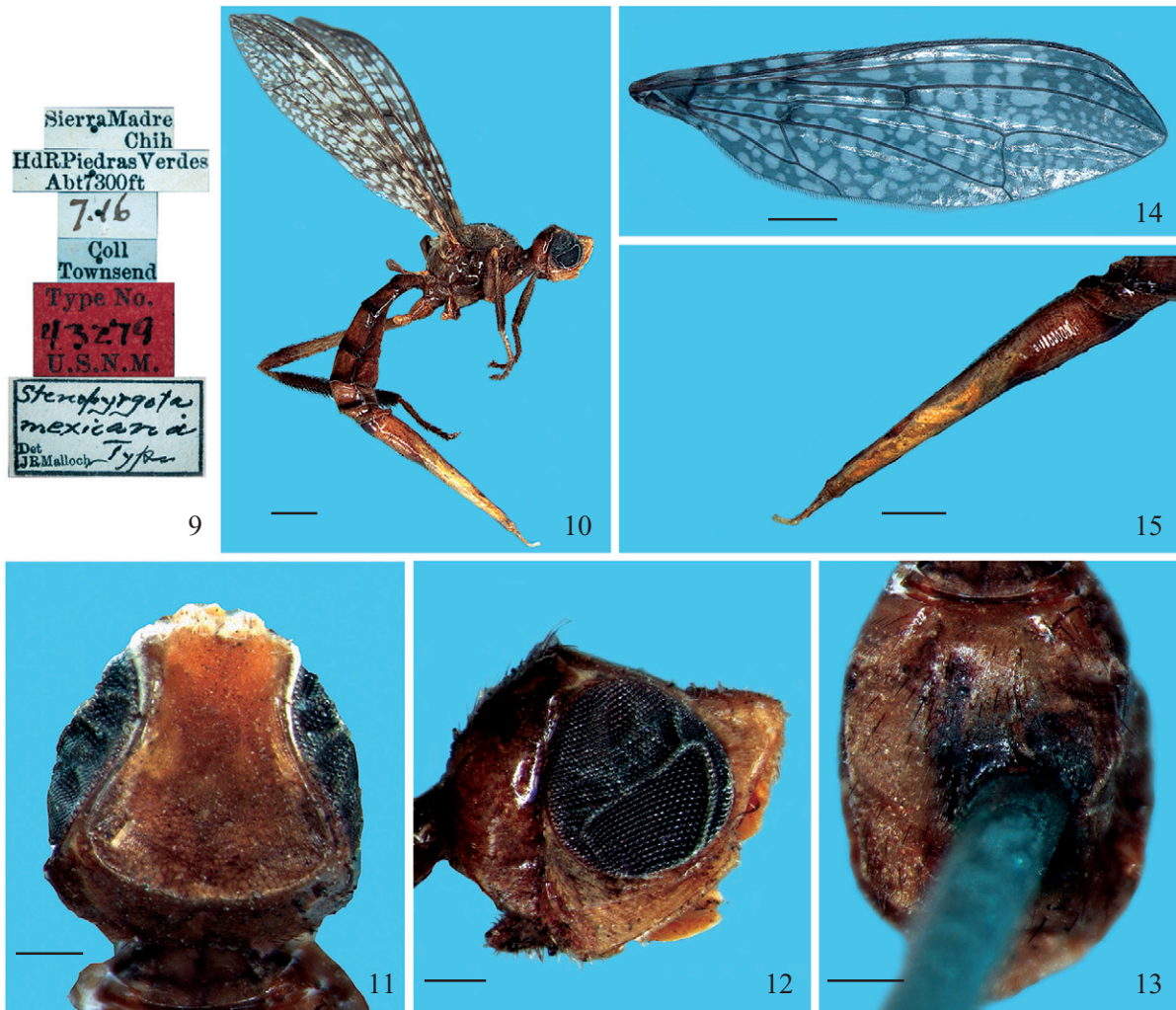
Male unknown.

### *Tropidothrinax* Enderlein, 1942

*Tropidothrinax* Enderlein, 1942: 115. Type species: *Tropidothrinax boliviensis* Enderlein, 1942 by original designation. Aczél 1956a: 168 (taxonomic notes), 182 (checklist); 1956b: 15, 17 (key); 1956c: 15 (taxonomic notes); Steyskal 1967: 5 (catalogue); Mello *et al.* 2010: 62 (taxonomic notes).

Diagnosis. *Tropidothrinax* is differentiated from other pyrgotids by the following combination of characters: ocellar seta present; antennal groove with median longitudinal carina; gena with subocular spot; 2 notopleural setae;





Figs. 9–15. *Stenopyrgota mexicana* Malloch, female holotype. 9, holotype labels. 10, habitus lateral. 11, head (dorsal view). 12, head (lateral view). 13, thorax (dorsal view). 14, wing. 15, ovipositor (lateral view). Scales: 10 and 14: 1.0 mm; 11–12: 0.25 mm; 13 and 15: 0.5 mm.

postscutellum well developed;  $R_{2+3}$  without apical spur vein;  $R_{4+5}$  bare; female mid femur with femoral organ; hind tibia without dorsal concavity; ovipositor without apical hook.

### *Tropidothrinax boliviensis* Enderlein, 1942

(Figs. 16–21)

*Tropidothrinax boliviensis* Enderlein, 1942: 116. Type locality: Sara, Bolivia. Aczél 1956c: 15 (synonymic list), 16 (taxonomic notes); Steyskal 1967: 5 (catalogue).

Type material examined. Holotype female with labels (Fig. 16): (1) printed on green paper: “O. Bolivien (west Bolivia) | Prov. Sara 600 – [Sara Province] | 700m. IX. 1906 – III. | 07 J. Steinbach S.V.”; (2) printed on red paper: “Typus”; (3) printed with handwritten inscriptions on white paper: “*Tropidothrinax* | *boliviensis* | Type Enderl. (female symbol) | Dr. Enderlein det. 193”. Preservation: Pinned. Missing parts: none. Type depository: ZMHB.

Redescription. Body (Fig. 17): yellowish to dark brown; setae and setulae black except labellum with yellow setulae; body length, with ovipositor, 12.0 mm; wing length 9.0.

Head (Figs. 18–19): vertex with a brown spot; frons yellowish, 0.8 times wider than long; eye ratio 0.7; genal-eye ratio 0.3; postpedicel-pedicel ratio 1.2; medial vertical seta 0.3 times as long as longest diameter of the eye; lateral vertical seta 0.3 times as long as medial vertical seta; 2 ocellar setae divergent; orbital seta absent; postocellar seta divergent, with an extra seta near left one; scape yellowish brown, apical margin covered with setulae; pedicel yellowish brown, completely covered with setulae; postpedicel yellowish brown, bare, 1.4 times as long as wide; arista yellow, micropubescent; antennal groove yellowish, with median longitudinal carina; parafacial brownish, 0.8 times as wide as postpedicel; gena brown; postgena yellow; occiput yellow, reddish on lateral margins, with sparse setulae; median occipital sclerite yellow; palpus yellowish, 1.3 times as long as postpedicel, covered with setulae; labellum dark brown, covered with yellowish setulae.

Thorax (Fig. 20): scutum yellowish brown; submesal stripe reddish brown, anterior and posterior dorsocentral stripes brown; postpronotal lobe yellowish brown, with 1 seta



Figs. 16–21. *Tropidothrinax boliviensis* Enderlein, female holotype. 16, holotype labels. 17, habitus lateral. 18, head (dorsal view). 19, head (lateral view). 20, thorax (dorsal view). 21, wing. Scales: 10 and 14: 1.0 mm; 17, 20–21: 1.0 mm; 18–19: 0.5 mm.

and 13 setulae; 2 notopleural setae; 1 dorsocentral seta; 1 supra-alar seta; 2 postalar setae; 1 intra-alar seta; 1 acrostichal seta; scutellum brownish, with 3 lateral scutellar setae and sparse setulae; mediotergite brown; pleuron brown, with anterior longitudinal dark brown stripe; proepisternum brownish, with a longitudinal row of 8 setulae; anepisternum with 4 setae on posterior margin, covered by setulae; katapisternum with 5 setae and 8 setulae; anepimeron with 4 setae and 10 setulae. Wing (Fig. 21): brown with dispersed hyaline spots;  $R_{2+3}$  without apical spur vein;  $R_{4+5}$  bare, curved after dm-cu; wing-thorax ratio 3.1;  $R_{4+5}$  ratio 0.5; M ratio 1.6. Halter yellowish. Legs: yellowish brown, darker on basal third of fore femur, middle of mid and hind tibia on dorsal surface; mid femur with femoral organ on anterior surface; fore coxa with 6 apical setae and sparsely setulae on anterior surface, 3 setulae on posteroventral surface; fore trochanter with 1 apical seta on dorsal surface; fore femur 3.6 times as long as wide, with one longitudinal row of 3 apical setae on dorsal surface, with one longitudinal row of 7 setae decreasing in size from base to apex on ventral surface, with ventrolateral row of setae on apical one-third; mid coxa with 7 apical setae on anterior surface; mid trochanter with 1 apical seta on

dorsal surface; mid femur with ventrolateral row of setae on apical one-third; hind coxa with 4 apical setae on anterior surface and 12 setulae on ventral surface; hind trochanter with 1 apical seta on dorsal surface and 3 apical setulae on posterodorsal surface; hind femur with 4 setae on apical third of dorsal surface, with one longitudinal row of setae decreasing in size from base to apex on ventral surface, with ventrolateral row of setae on apical third; hind tibia without dorsal concavity.

Female abdomen: dark brown; syntergite 1+2 1.1 times as long as tergites 3–6 combined; oviscapae yellowish brown, darker on anterior margin, without apical hook, 0.8 times as long as preabdominal tergites combined, covered with sparsely setulae.

Male unknown.

## DISCUSSION

The delimitation of the genus *Stenopyrgota* is better established with inclusion of the following characters: eye rounded; gena without subocular spot; postscutellum slightly developed; C unbroken on Sc;  $R_{2+3}$  without apical spur vein;  $R_{4+5}$  bare and



oviscape without apical hook. In relation to *Tropidothrinax*, the new diagnostic features presented are: gena with subocular spot; mid femur with femoral organ on anterior surface; hind tibia without dorsal concavity; postscutellum well developed and oviscape without apical hook.

Among the Neotropical genera of Pyrgotini, *Stenopyrgota* shares with *Carrerapyrgota*, *Leptopyrgota* and *Lopadops* the absence of a longitudinal carina into the antennal groove (Mello *et al.* 2010). *Stenopyrgota* and *Leptopyrgota* share the absence of ocellar seta;  $R_{2+3}$  without apical spur vein;  $R_{4+5}$  bare; alula reduced and oviscape without apical hook. *Leptopyrgota* can be easily recognized by the presence of orbital, postocellar, media vertical and lateral vertical setae; oval eye; postscutellum well developed; wing hyaline (except in some species with an apical spot) and hind tibia with dorsal concave (Mello & Lamas unpubl. data).

Among the Neotropical Pyrgotini with median longitudinal carina into the antennal groove, *i.e.*, *Idiopyrgota*, *Neopyrgota*, *Pyrgota*, *Stirothrinax* and *Tropidothrinax* (Mello *et al.* 2010), the genera *Idiopyrgota* and *Tropidothrinax* are segregated from the others by presenting the following combination of characters: presence of ocellar seta, 2 notopleural setae, 1 intra-alar seta, 3 scutellar setae,  $R_{2+3}$  without apical spur vein, hind tibia without dorsal concavity and oviscape without apical hook. *Idiopyrgota* is recognized by: 1 orbital, 3 dorso-central, 1 supra-alar and 1 post-alar setae, acrostichal seta absent, sternites 3 and 4 with 6–9 setae in posterior margin (stronger on female), oviscape with 6 apical setulae (Aczél 1956c; Mello & Lamas 2008). Aczél (1956c) based on the morphological similarities between both genera, considered them closely related although distinct. A cladistic analysis of the Pyrgotini is urgently needed to establish the relationship among the Neotropical genera and to evaluate Aczél's hypothesis about the proximity of *Idiopyrgota* and *Tropidothrinax*.

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