



Andropogon × *guaraniticus* (Andropogoneae, Poaceae): a name for a natural hybrid from northeastern Argentina

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Abstract

A natural hybrid between *Andropogon macrothrix* and *Andropogon selloanus* from northeastern Argentina is named *Andropogon* × *guaraniticus*. A taxonomic treatment of *A.* × *guaraniticus* and an identification key including the parental species are presented.

Introduction

During field collection trips to the San Roque Department in Corrientes (Argentina), several collections of an unknown *Andropogon* Linnaeus (1753: 1045) were made. These plants grow in sandy soils on margins of the road, at an elevation of ca. 200 m. The first specimen was collected in summer, 1995 (*Quarín et al.* 41433), and two others at the same locality in 1996 (*Norrman* 227, 228). At the sites where these plants were collected, two other *Andropogon* species were found, *Andropogon macrothrix* Trinius (1832: 270) and *Andropogon selloanus* (Hackel 1889: 420) Hackel (1904: 266); the unknown specimens were considered to be putative natural hybrids between these two species. Galdeano & Norrmann (2000) have compared these putative natural hybrids to controlled hybrids (*A. macrothrix* × *A. selloanus*) and demonstrated that there are neither morphological, cytological, nor reproductive differences between them: therefore they deserve to be regarded as products of natural hybridization.

Based on morphological studies of living plants recently collected (summer 2012) and herbarium specimens, we describe and illustrate this hybrid as *Andropogon* × *guaraniticus* Nagahama & Norrmann.

Taxonomic treatment

Andropogon × *guaraniticus* Nagahama & Norrmann, *nothosp. nov.*, Figs. 1, 2

Type:—ARGENTINA. Corrientes: San Roque, Ruta 12, 30 km S de San Roque, 2 January 1996, 28°49'56"S, 58°43'45"W, 213 m, *Norrman* 227 (holotype CTES!; isotype CORD).

Andropogon × *guaraniticus* is distinguished from *A. macrothrix* by its longer hairs on the pedicel and the callus of the sessile spikelet, narrower apex of the rachis internodes, and a shorter awn. It is easily distinguished from *A. selloanus* by its long awns, which are lacking in *A. selloanus*.

Plants perennial, cespitose, culms 58.1–96.7 cm tall, nodes 5–7, glabrous. Innovations intravaginal, vernation conduplicate. Leaf sheaths generally longer than the internodes in the basal region and shorter than the internodes in the distal region, glabrous; blades 15.7–47.5 × 0.26–0.54 cm, straight, usually flat, the basal

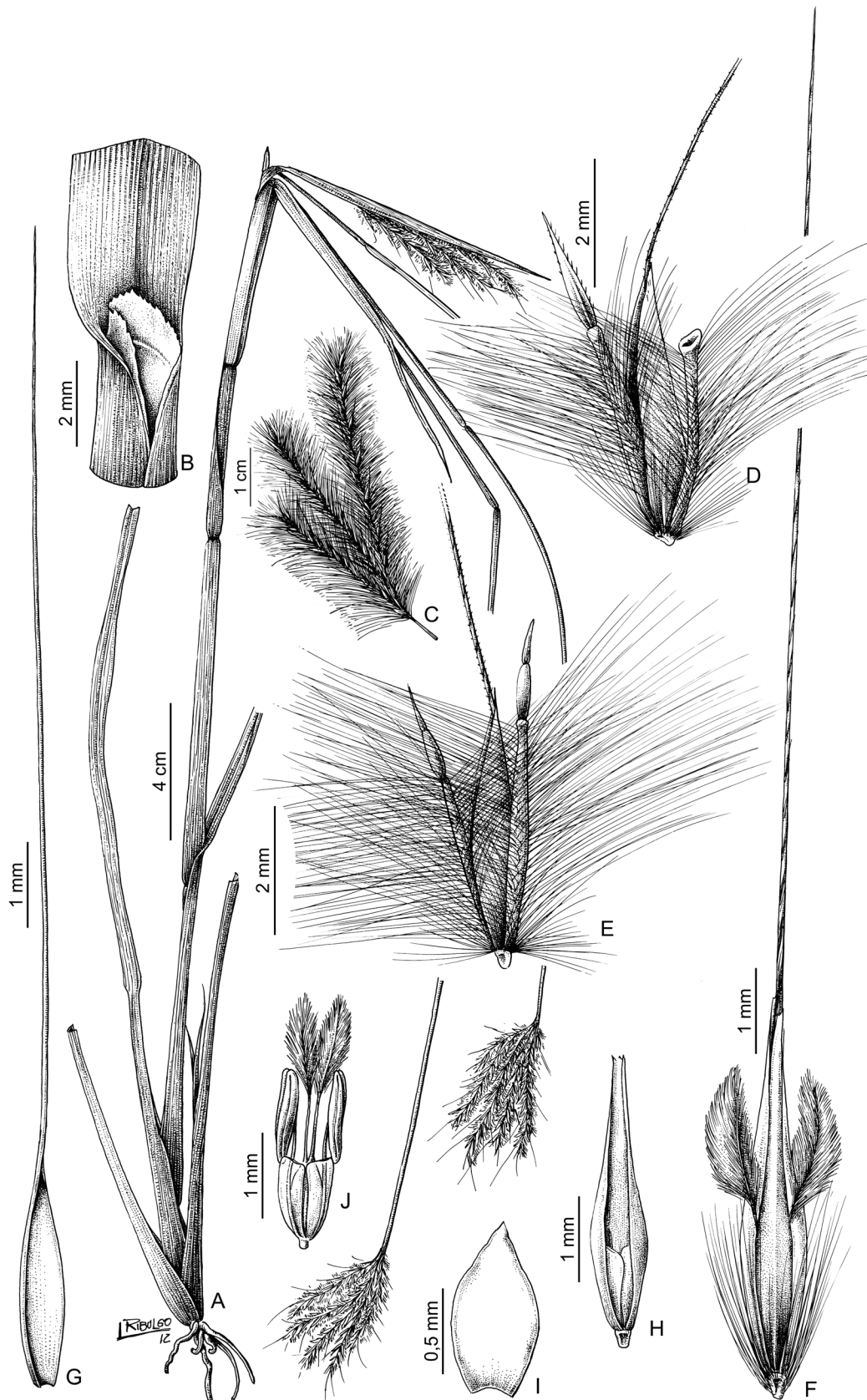


FIGURE 1. *Andropogon* × *guaraniticus*. **A.** Habit. **B.** Detail of ligule. **C.** Unit of inflorescence. **D.** Middle or proximal pair of spikelets. **E.** Distal pair of spikelets. **F–J.** Sessile spikelet. **F.** Spikelet, dorsal view. **G.** Upper lemma. **H.** Lower lemma. **I.** Upper palea. **J.** Detail of lodicules, stigma and stamens. Only two of the three stamens were drawn. **A–J.** Drawn by Laura Ribulgo from the holotype (Norrman 227).

ones with marginal trichomes 3.2–5.3 mm long, glabrous on both surfaces, margins scabrous towards the apex; apex generally subobtuse or rarely obtuse navicular; ligule 0.43–0.85 mm long, obtuse, membranous-ciliate; apex denticulate. Inflorescence scarcely branched, 28.1–75.1 cm long, composed of both terminal and axillary inflorescence units, these units 5–7.7 cm long, with 2–5 racemes, equal or subequal in length, conjugate or subdigitate, exerted or partially enclosed by the spatheole; peduncle 9.4–20.8 cm long; spatheoles 7.4–11 cm long. Pedicels and rachis internodes linear, pedicels 3.8–4.2 mm long, internodes 3.1–4.4 mm long, apex of the rachis internodes cup-shaped, 0.61–0.77 mm wide; both with hairs 7.8–11.3 mm long. Sessile spikelets (in the middle or proximal pair) perfect, 4.2–4.8 × 0.6–1 mm, awned; sessile spikelets callus pubescent, hairs 3.1–4.5 mm long. Lower glume 4–5.2 × 1–1.4 mm, slightly concave, lanceolate, chartaceous, margins glabrous, 2-nerved, scabrous on the upper portion of the keels; upper glume 3.5–4.3 × 0.9–1.3 mm, chartaceous, margins ciliate towards the apex, 3-nerved, the lateral nerves tenuous, apex acute or briefly awned. Lower lemma 2.8–3.5 × 0.5–0.8 mm, bicarinate, lanceolate, hyaline, margins glabrous at base, ciliate towards the apex, 2-nerved, acuminate; palea absent; upper lemma 2.6–2.9 × 0.5–0.8 mm, hyaline, ciliate on the margins towards the apex, 3-nerved, acute, awned, awn 11.3–15 mm long; palea 0.8–2.2 × 0.3–0.5 mm, hyaline, margins glabrous at the base, ciliate towards the apex, 0-nerved, sub-obtuse. Lodicules 2, 0.5–0.7 mm long, glabrous. Stamens 3, anthers 1–1.6 mm long, yellow. Caryopsis not seen. Distal sessile spikelets reduced 1.5–2.5 × 0.2–0.4 mm long. Pedicellate spikelets vestigial, 1.8–2.6 × 0.2–0.4 mm.

Distribution and habitat:—*Andropogon* × *guaraniticus* is known from the San Roque Department in Corrientes, Argentina. It grows mainly on the boundaries of populations of *A. selloanus* on sandy soils in open disturbed places about 200–300 m elevation, generally on road margins. *Andropogon selloanus* grows from Mexico to Argentina, usually on dry and sandy soils or on wet soils in the Pantanal, central and southern Brazil. *Andropogon macrothrix* grows in Uruguay, northeast Argentina, Paraguay, east Bolivia and south and central Brazil, on edges of streams, low swampy areas or wet soils.

Etymology:—The epithet refers to the Guarani Indians, a group of indigenous peoples of southern South America.

TABLE 1. Comparison of *Andropogon* × *guaraniticus* and the parental species. Plants were analyzed using a stereoscopic microscope and measured using digital calipers (Electronic IP65, 797B Series, Starrett®).

	<i>A. selloanus</i>	<i>A. × guaraniticus</i>	<i>A. macrothrix</i>
Ligule	truncate	obtuse	obtuse
Ligule length (mm)	0.39–0.51	0.43–0.85	0.60–0.93
Unit of inflorescence length (cm)	3.82–6.64	5.01–7.74	5.7–7.91
N° of racemes per unit of inflorescence	2–3	2–5	4–6
Spatheole length (cm)	5.63–7.34	7.41–11.02	10.49–12.34
Pedicel and rachis internode hairs length (mm)	8.24–9.80	7.81–11.34	5.84–7.27
Apex of the rachis internodes width (mm)	0.41–0.56	0.61–0.77	0.83–0.93
Sessile spikelet width (mm)	0.54–0.78	0.60–1.03	0.93–1.76
Sessile spikelet callus hairs length (mm)	7.14–8.55	3.08–4.54	1.06–2.19
Upper lemma of the sessile spikelet	usually awnless	awned	awned
Awn length (mm)	0.1–0.6(–1.66)	11.25–14.99	19.98–21.67
Pedicellate spikelet length (mm)	0.42–1.51	1.85–2.61	2.48–2.71
Pedicellate spikelet width (mm)	0.13–0.24	0.25–0.36	0.36–0.46
Habitat	open disturbed places, dry soils	open disturbed places, dry soils	low swampy areas
Geographical distribution	from Mexico to Argentina	San Roque Department, Corrientes Province, Argentina	Uruguay, Northeast Argentina, Paraguay, East Bolivia, South and Central Brazil

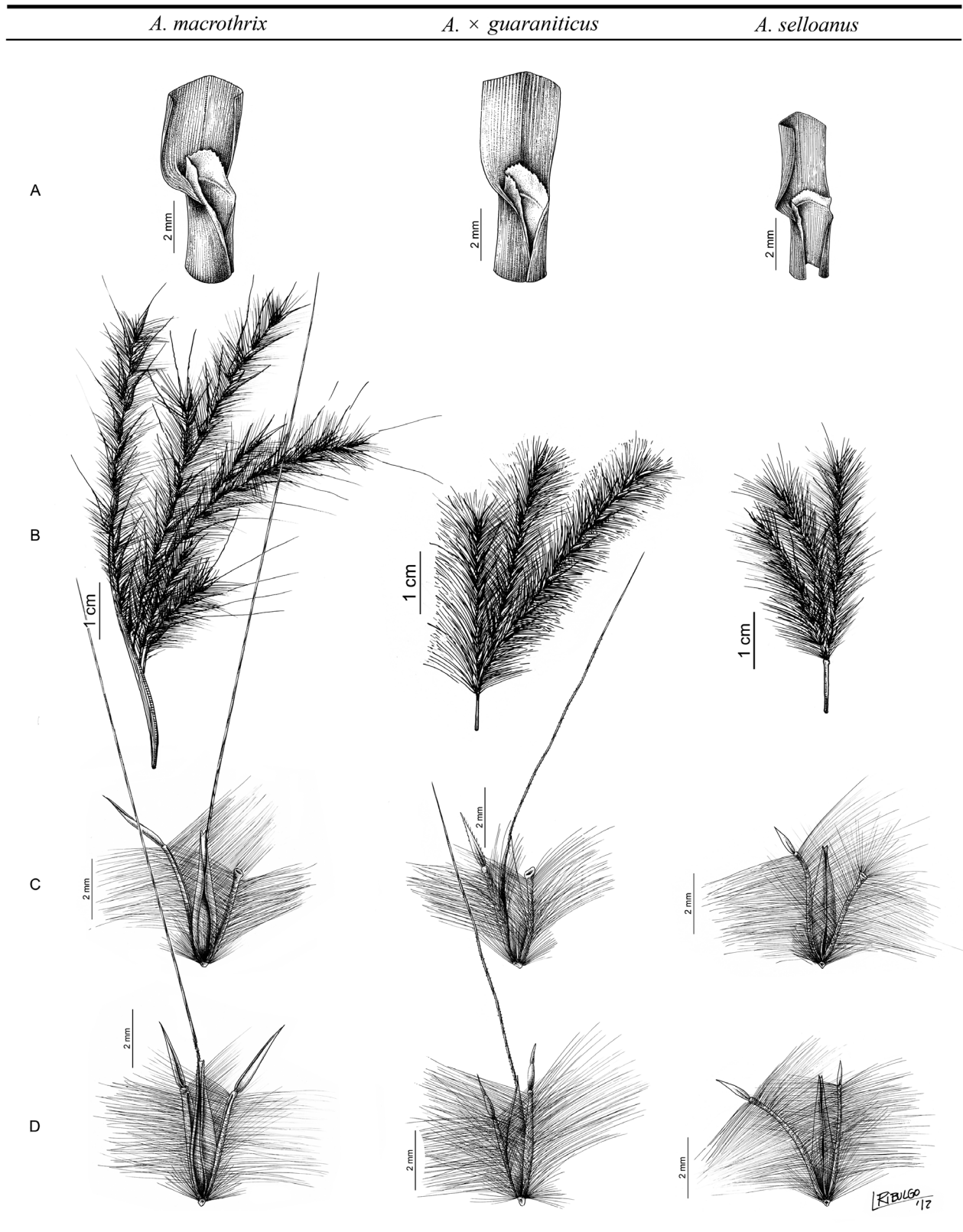


FIGURE 2. Morphological comparison between *A. macrothrix* (Norrman 93), *A. selloanus* (Norrman 99) and *A. × guaraniticus* (Norrman 227, holotype). **A.** Detail of ligule. **B.** Unit of inflorescence. **C.** Middle or proximal pair of spikelets. **D.** Distal pair of spikelets. **A–D.** Drawn by Laura Ribulgo.

Notes:—*Andropogon selloanus* was dominant at the collection site of *A. × guaraniticus*, while *A. macrothrix* grew in isolated low swampy areas on the side of the road. An on-site estimate of the relative

numbers of individuals of the two species was ca. 100:1 for *A. selloanus* and *A. macrothrix*, respectively. *Andropogon macrothrix* and *A. selloanus* are diploids ($2n = 2x = 20$, Norrmann 1985) and all hybrids obtained between them were also diploids (Galdeano & Norrmann 2000). These authors, based on the meiotic chromosome behavior and seed-set observations, confirmed the sterility of *A. × guaraniticus*. Therefore, these interspecific hybrids have been found only in the sympatric areas of the parental species, where the F1 is formed.

Key to *A. × guaraniticus* and the parental species living in northeastern Argentina

1. Ligule truncate. Apex of the rachis internodes narrower than 0.56 mm diam. Sessile spikelet with callus hairs longer than 7.14 mm, usually awnless, if awned, awn shorter than 1.66 mm. Pedicellate spikelet shorter than 1.51 mm and narrower than 0.24 mm *A. selloanus*
- Ligule obtuse. Apex of the rachis internodes wider than 0.61 mm diam. Sessile spikelet with callus hairs shorter than 4.54 mm, awned, awn longer than 11.25 mm. Pedicellate spikelet longer than 1.85 mm and wider than 0.25 mm....2
2. Pedicel hairs longer than 7.81 mm. Apex of the rachis internodes narrower than 0.77 mm. Callus hairs of sessile spikelet longer than 3.08 mm. Awn shorter than 14.99 mm. Pedicellate spikelet less than 0.36 mm diam *A. × guaraniticus*
- Pedicel hairs shorter than 7.27 mm. Apex of the rachis internodes wider than 0.83 mm. Callus hairs of sessile spikelet shorter than 2.19 mm. Awn longer than 19.98 mm. Pedicellate spikelet longer than 0.37 mm diam *A. macrothrix*

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Appendix 1. Specimens examined.

A. × guaraniticus:—ARGENTINA. Corrientes: Capital, Facultad de Ciencias Agrarias, Universidad Nacional del Nordeste, interspecific hybrid, F1, controlled crosses between *Norrmann 229* and *Norrmann 115*, 2 January 1996, cultivated accession, *Norrmann 228* (CTES); San Roque, Ruta 12, 30 km S de San Roque, *Norrmann 226* (CTES); 23 km S de San Roque, 16 March 1995, *Quarín et al. 41433* (CTES); 3 March 2012, *Nagahama 153, 154, 155* (CORD).

A. macrothrix:—ARGENTINA. Corrientes: Ituzaingó, Villa Olivarri, 24 km W de Ituzaingó, 15 December 1982, *Norrman* 78 (CTES); Ruta 12, 58 km E de Ituzaingó, 18 January 2012, *Nagahama* 178, 179, 180 (CORD); 11 km N de San Carlos, *Krapovickas* 24950 (CTES). Paso de los Libres, entrada a Estancia Meringá, 3 December 1980, *J. G. Fernández* 781 (CTES). San Martín, La Cruz, 10 November 1936, *Parodi* 12061 (BAA). San Miguel, 25 km SW de San Miguel, 18 November 1987, *Quarín et al.* 3895 (CTES). San Roque, 17 km S de San Roque, 29 January 1983, *Norrman* 81 (CTES); 23 km S de San Roque, 16 March 1995, *Quarín et al.* 4143 (CTES). Santo Tomé, 17 km S de Santo Tomé, 3 April 1982, *Norrman* 76 (CTES); Ruta 40 y arroyo Chimiray, 15 December 1982, *Norrman* 77 (CTES). **Entre Ríos**: Federación, Camping Drewans, 18 km E de Chajarí, 17 July 1983, *Norrman* 93 (CTES). **Misiones**: San Ignacio, 11 October 1975, *Zuloaga et al.* 442 (SI).

A. selloanus:—ARGENTINA. **Chaco**: Bermejo, Las Palmas, November 1917, *Jorgensen* 11940 (BAA). **Corrientes**: Capital, periferias de Corrientes, 12 March 1994, *Norrman* 229 (CTES). Ituzaingó, 5 February 1984, *Norrman* 99 (CTES); 9 km W de Ituzaingó, Ruta 12, 2 April 1982, *Norrman* 45 (CTES); 8 km W de Ituzaingó, Ruta 12, 18 January 2012, *Nagahama* 181, 182, 183 (CTES). Monte Caseros, 30 km S of Cruzú Cuatiá, Ruta 14, 26 September 1982, *Norrman* 73 (CTES). San Cosme, Laguna Totorá, 4 March 1982, *Quarín* 3692 (CTES). San Martín, 6 km SW de La Cruz, 8 February 1979, *Schinini et al.* 16842 (CTES). **Formosa**: Estero Patiño, Las Lomitas, 24 January 1928, *Parodi* 8380 (BAA). **Santa Fe**: Reconquista, 8 November 1933, *Parodi* 11172 (BAA).