

TWO NEW WHITE-FLOWERED SPECIES OF *PITCAIRNIA* FROM BRAZIL

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ABSTRACT. Two new white-flowered species of *Pitcairnia* (Bromeliaceae) from coastal Rio de Janeiro State, Brazil, are described.

Key words/Palabras clave: Bromeliaceae, Pitcairnioideae, *Pitcairnia*, Rio de Janeiro

RESUMO. Duas novas espécies de *Pitcairnia* (Bromeliaceae) com flores brancas, da costa do Estado do Rio de Janeiro, são descritas.

INTRODUCTION

Belonging to subfamily Pitcairnioideae, the genus *Pitcairnia* L' Héritier contains a large and diverse array of ca. 260 species (Smith & Downs 1974). Most are terrestrial, but a few are rock-dwelling, and even fewer are epiphytic. Of the two main centers of diversity for the genus, one is the Guayana shield, where most of the species of subgenus *Pepinia* occur, and the other is the Andes with extensions into Central America. Eastern Brazil is relatively poor in species diversity but contains distinct taxa, most of which have reddish corollas, with not more than ten species possessing white flowers.

Two new white-flowered species of *Pitcairnia* from coastal Rio de Janeiro State, Brazil, are described, and FIGURE 1 shows type localities.

NEW SPECIES

Pitcairnia insularis F. Tatagiba & R.J.V. Alves, sp. nov. TYPE: Brazil, Rio de Janeiro, Município de Arraial do Cabo, Ilha de Cabo Frio, Enseada da Parede, 23°0'13"S, 41°59'49"W, elev. 30 m; 11 Mar. 2002, growing in black soil in fissures of lava outcrop, fl.; R.J.V. Alves 6981, R.P. da Silva &

A.C. Ghizi de Melo (Holotype: R).

FIGURE 2.

Species nostra *Pitcairnia albiflora* Herb. valde affinis sed indumento copioso rachis inflorescentiae et basis foliorum sicut floribus congestis in apice inflorescentiarum differt unoque petalo reflexo etiam distincta.

Plants lithophytic, flowering ca. 45 cm tall, propagating by short underground basal shoots. **Leaves** suberect-arcuate, chartaceous; sheaths triangular, indistinct from blade, 5 × 1–2 cm, abaxially white-tomentose, adaxially glabrescent, margins entire; leaf-blades linear lanceolate with base narrowed into a relatively distinct pseudopetiole, widest at middle (30–60 × 0.8–1.2 cm), apex long attenuate, entire, olive-green, greenish white-tomentose abaxially, glabrous adaxially, glabrescent toward apex; scape suberect-arcuate, 13–38 cm long, 1–3 mm diam., olive-green, densely white-tomentose; basal scape bracts leaf-like, 12–25 × 0.5–0.8 cm, imbricate, apices slightly suberect-arcuate, chartaceous, bases abaxially white-tomentose when young; upper scape bracts very narrowly triangular, 3–8 × 0.5–0.7 cm, exceeding the internodes by ½, chartaceous, olive-green, abaxially white-tomentose when young, apex not or slightly attenuate, margins entire. **Inflorescence** a raceme 7–14 cm long, flowers 12–20 in number, the lowest, 2 cm apart, congested at apex, rachis olive-green, densely whitish-wooly at insertion of flowers and bracts; floral bracts nar-

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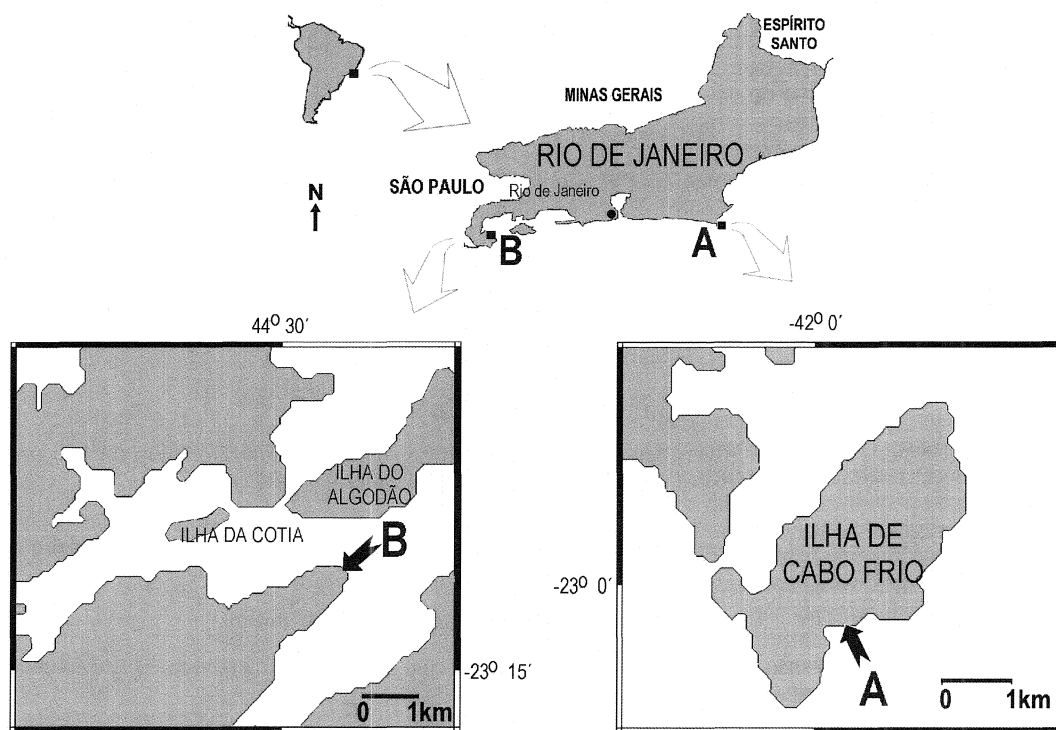


FIGURE 1. Coast of Rio de Janeiro showing type localities of two new species. A. *Pitcairnia insularis*. B. *Pitcairnia wendtia*.

rowly triangular, apex attenuate, 1–2 × 0.1–0.2 cm, reaching ½ the sepal length, papiraceous, pale magenta, abaxially white-tomentose, adaxially glabrous; pedicels spreading at 45° from the rachis, cylindric, ca. 5 mm long, 1–1.5 mm in diam., light green, sparsely tomentose, verrucose. **Flowers** 5 cm long (without the pedicel), slightly curved downwards, slightly zygomorphic, sepals triangular, slightly asymmetric, apex acute, 12 × 4 mm, free, chartaceous, glabrous (margins with occasional trichomes), light green; petals white, lanceolate, apex acute, slightly asymmetric, glabrous, 30–34 × 6–7 mm, apex of only one petal recurved. **Stamens** included, ca. 20 mm long, filaments pale yellow, free; anthers acicular, slightly sagittate at base, acute at apex, ca. 6 mm long, 0.5 mm in diam., sulfur-yellow; ovary ⅓ superior, ca. 4 mm long, ca. 4 mm diam., hypathium yellowish-green, verrucose, glabrous; stigma 3-lobed, lobe margins ciliate. **Ovules** bicaudate. **Capsules** ovoid, 2 cm long, 1 cm wide at base, apex acute, marcescent (covered by persistent dry sepals and petals), dark olive-green when dry; seeds bicaudate, appendices membranous, yellow-brown, 3-faceted, 4 mm long, ca. 0.3 mm wide, testa surface reticulate-foveate, light brown, glossy.

Paratype. BRAZIL: Rio de Janeiro, Município de Arraial do Cabo, Ilha de Cabo Frio, Enseada da Parede, 23°0'13"S, 41°59'49"W, elev. 30 m; fr; 19 Jun. 2003, fr.; R.J.V. Alves 7188, R.A. Rutter & L.S. G. Martins (R).

The *Pitcairnia albiflos* Herb. type specimen consists of the original description and plate (Herbert 1826). The new *P. insularis*, described herein, differs from *P. albiflos* mainly by the lepidote inflorescence-rachis, lepidote leaf bases; flowers congested at the inflorescence apex (leaves of *P. albiflos* are glabrous, and flowers are evenly distributed on the rachis); floral bracts exceeding 5 mm long pedicels and reaching half the length of the sepals (vs. 15–25 mm long and seldom exceeding the pedicel in *P. albiflos*); pedicels spreading at 45° from the rachis (vs. ca. 90° in *P. albiflos*); apex of only one petal curved backward (vs. all 3 curved backwards in *P. albiflos*).

Anatomically *Pitcairnia insularis* differs from *P. albiflos*, by the absence of cristiferous idioblasts with raphides in the aquiferous parenchyma and by the absence of clearly distinguishable phloem sheaths. The phloem is separated from the aquiferous channel by a double layer of chylorophyllian parenchyma.

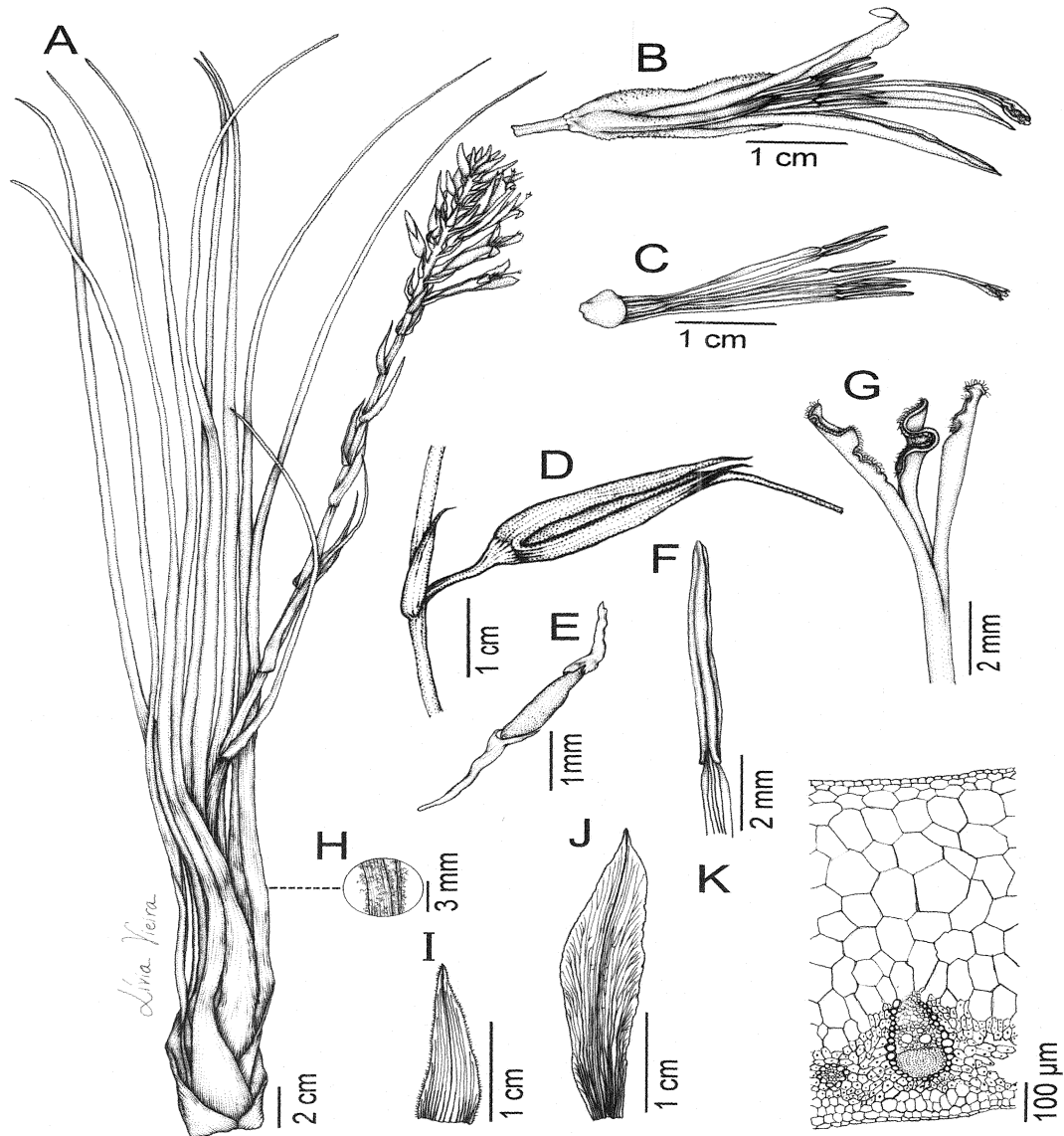


FIGURE 2. *Pitcairnia insularis* F. Tatagiba & R.J.V. Alves. **A.** Habit. **B.** Flower. **C.** Flower after removal of pedicel, calyx, and corolla. **D.** Marcescent capsule inserted on rachis. **E.** Seed. **F.** Anther. **G.** Stigma. **H.** Hairs on abaxial leaf surface. **I.** Sepal. **J.** Petal. **K.** Anatomical transversal section of leaf-blade with vascular bundle. Note hardly distinguishable phloem sheath. **A–C, F–K** drawn from R.J.V. Alves 6981 et al.; **D–E** from R.J.V. Alves 7188 et al. (R).

Pitcairnia insularis has a combination of morphological characters that clearly distinguishes it from known taxa and renders positioning within the genus difficult. This combination of characters includes its small size, only equaled by *Pitcairnia corcovadensis* Wawra, which, in other ways, is a very distinct and red-flowered species. The *P. insularis* inflorescence has white flowers congested at the apex and slightly curved down-

wards. The only known population grows on steep south-facing phonolithic outcrops, which are relatively protected from direct solar radiation. Within Rio de Janeiro State, the find extends the northernmost known limit of distribution of the genus *Pitcairnia* along the coast by ca. 100 km. This new species was discovered during an ongoing floristic survey of Cabo Frio Island initiated in 1998 by the Botanical De-

partment of the National Museum in Rio de Janeiro with support from the Brazilian Navy. This 395 m tall volcanic island dominates the north-eastern horizon of Arraial do Cabo in northern Rio de Janeiro. A peculiar species-rich forest, which combines large trees with 10 m tall columnar *Pilosocereus* cacti, covers ca. 85% of the island. Cliffs and rock outcrops account for less than 5% of the cover; vegetation degraded by goats and invasive *Casuarina* occupy 10%; and coastal strand vegetation on sand dunes occurs at one small point. *Pitcairnia insularis* is currently cultivated at Jardim Botânico do Rio de Janeiro and Jardim Botânico Neotropicum.

The name was chosen because it is the only known species of *Pitcairnia* in eastern Brazil that is endemic to an island.

Pitcairnia insularis is currently cultivated at Rio de Janeiro Botanic Gardens (JBRJ) (www.jbrj.gov.br) and Neotropicum Botanic Gardens (JBN) 1075 (<http://brunorezende.tripod.com/>).

Pitcairnia wendtia F. Tatagiba & B.R. Silva, sp. nov. TYPE: Brazil, Rio de Janeiro, Município de Paraty, Paratymirim, costões rochosos entre Paratymirim e Saco do Mamangá, 23°14'0.6"S, 44°37'6.2"W, elev. 4 m, 5 Feb. 2003, B.R. Silva 968, R.C. Forzaza, E. Borges & B. Pires (Holotype RB, isotype R). FIGURE 3.

A Pitcairnia flammea var. *pallida* L.B. Sm. differt foliis et scapis pilis maioribus dense dispositis ornatis, etiam bracteis floralibus, pedicellis, sepalis, petalis et pistillo minoribus.

Plants lithophytic, flowering ca. 120 cm tall, propagating by short stout basal shoots. Leaves suberect-arcuate, chartaceous; sheaths triangular, 5–7 × 3.5–4 cm, whitish on both surfaces, glabrous adaxially, densely tomentose abaxially, margin entire; leaf blades linear triangular, widest in mid-length, apex long attenuate, 50–90 × 2–2.5 cm, lacking spines, light green, densely white tomentose abaxially, subdensely white-tomentose adaxially; scape suberect-ascending, 70–90 cm long, 7–11 mm diam., light green, densely white lepidote; basal scape bracts leaf-like, 50–60 × 1.2–1.5 cm, suberect-arcuate, chartaceous, densely white-lepidote; upper scape bracts linearly triangular with gradually diminishing lengths (8–4 cm) and widths (9–3 mm), exceeding the internodes, lanceolate, chartaceous, light green, subdensely lepidote at base, sparsely lepidote distally, apex long attenuate, margins entire. **Inflorescence** a suberect raceme, 25–35 cm long, flowers 50–70 in number, the lower, 11 mm apart, densely flowered towards apex, rachis straight, light green, densely lepidote; floral bracts narrowly triangular, apex long attenuate, 2–4 cm long, ca. 4 mm wide, the basal

ones exceeding the sepals, distal ones reaching the upper third of the sepals, chartaceous, light green, densely white-lepidote. **Pedicels** curved upward, basally divergent by 30°, apically converging with the rachis (–10°), cylindrical, ca. 1 cm long, ca. 1 mm diam., pale yellow, subdensely lepidote. **Flowers** suberect, without pedicels, 4 cm long, calyx basally 3 mm in diameter, apices slightly curved downwards and zygomorphic with petals superposed above, apex straight during anthesis. **Sepals** narrowly triangular, apex acute, 16–19 × ca. 5 mm, free, chartaceous, basally fleshy-costate, subdensely white velutinous, pale yellow; petals white, narrowly elliptic, apex rounded, asymmetric, glabrous, 43–46 × 7–9 mm, three times the length of the sepals. **Stamens** included, ca. 4 cm long, filaments hyaline, free; anthers slightly saggitate at base, obtuse at apex, ca. 6 mm long, <0.3 mm in diam., yellow; ovary 2/3 superior, ca. 6 mm long, ca. 3 mm diam., hypathium yellowish-green, densely tomentose; stigma helicoidal, clavate, 3-lobed, lobe-margins ciliate. **Ovules** caudate, ca. 0.7 mm long.

Paratypes. BRAZIL: Rio de Janeiro, Município de Paraty, enseada de Paratymirim, afloramento rochoso entre Paratymirim e Mamangá, elev. 1–1.5 m, 16 Mar. 1986, fl., G. Martinelli 11567 & C.C. Alvim (RB, HB); BRAZIL: Rio de Janeiro, Município de Paraty, costões rochosos na beira do mar, entre Paratymirim e Mamangá, elev. 2 m, 30 May 1987, fl., G. Martinelli 12090 (RB); BRAZIL: Rio de Janeiro, Município de Paraty, Paratymirim, floresta atlântica com afloramentos rochosos na beira do mar, entre Paratymirim e Mamangá, elev. 2–100 m, 14 Jul. 1987, T. Wendt 172, G. Martinelli, A. Costa & T. Fontoura (RB).

Pitcairnia wendtia differs from *P. flammea* var. *pallida* L.B. Smith mainly by larger and more densely spaced foliar trichomes (also on scape); smaller floral bract (3.8 cm long vs. 5.9 cm); smaller pedicel (1 cm long vs. 2.6 cm); smaller sepals (1.7 cm long vs. 2.7 cm); petals smaller (4.5 cm long vs. 7.6 cm), linear to slightly curved vs. strongly curved with a rounded vs. attenuate apex; stigma more distant from the anthers (5 mm vs. 1.4 mm); smaller pistil (5 cm vs. 7.4 cm).

Anatomically *Pitcairnia wendtia* differs from *P. flammea* var. *pallida* by a distinctly sclerified phloem and the absence of bractiform cells in the spongy parenchyma. The vascular bundles of *P. wendtia* have a double phloem sheath, rare in *Pitcairnia* but common in Velloziaceae.

Pitcairnia wendtia is restricted to the vicinity of Cairucu peak, in the Municipality of Paraty,

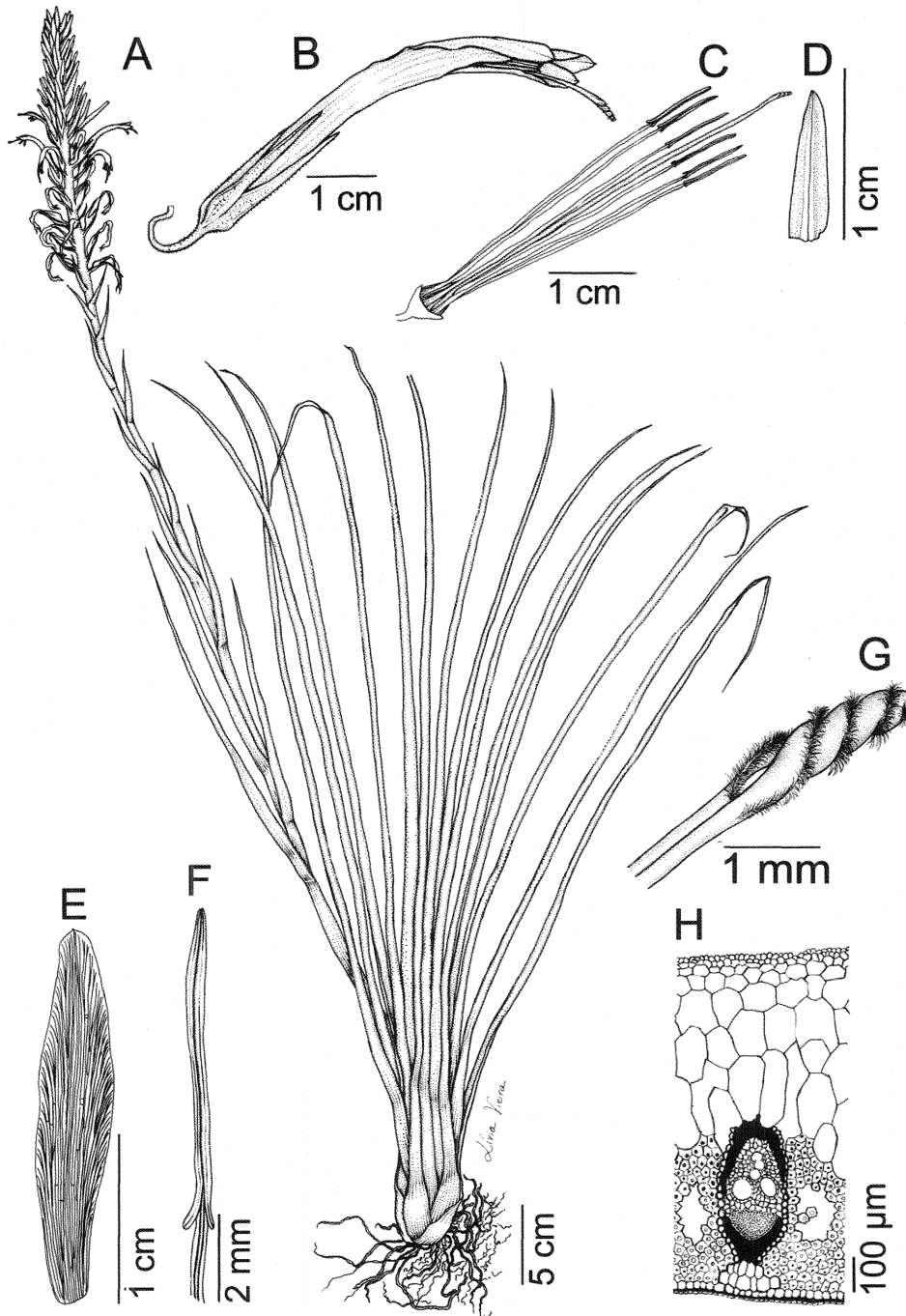


FIGURE 3. *Pitcairnia wendtii* F. Tatagiba & B.R. Silva. A. Habit. B. Flower in natural position. C. Flower after removal of pedicel, calyx, and corolla. D. Sepal. E. Petal. F. Anther. G. Stigma. H. Anatomical transversal section of leaf-blade with vascular bundle. Note double phloem sheath. All drawn from B.R. Silva 968 et al. (RB).

inside the environmental protection area of APA Cairuçú. It occurs from very near sea level to elevations of approximately 100 m, always on exposed granitic outcrops. For a brief description of associated flora, see Forzza and Silva (in press).

Pitcairnia wendtia currently is cultivated at Rio de Janeiro Botanic Gardens (JBRJ) (www.jbrj.gov.br) and Neotropicum Botanic Gardens (JBN) 968 (<http://brunorezende.tripod.com/>).

The name was chosen in honor of bromeliad researcher Tania Wendt, for her many contributions to the study of the genus.

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