Nordic Journal of Botany 000: 001–005, 2014
doi: 10.1111/njb.00724

Subject Editor: Alexander Sennikov. Editor-in-Chief: Torbjörn Tyler. Accepted 28 November 2014

Habenaria parviflora (Orchidaceae), extension of its austral distributional limit and new synonymy

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An extension of the austral distributional limit of *Habenaria parviflora* Lindl. and a new record for the orchid flora of Buenos Aires province is reported on the basis of specimens collected from the northwestern hills of the Tandilia System. *Habenaria uruguayensis* Garay is found to be a synonym of *H. parviflora* based on studies of original material, protologues and previous bibliography. A lectotype is designated for *H. parviflora* .

Habenaria Willd. is a cosmopolitan genus of Orchidaceae comprised of ca 835 species (WCSP 2014) having a tropical and subtropical distribution with some species reaching temperate regions (Cribb 2001). Most of its species are perennial geophytes with a cycle of growth and reproduction linked to a humid season followed by a dry season when individuals persist as sub-terranean 'root-tubers' (sensu Stern 1997) (Batista et al. 2013). In America this genus stands for a significant fraction of all grassland dwelling orchid species (Batista et al. 2013). The number of *Habenaria* species reported from Argentina ranges from 16 (Batista et al. 2011a) to 20 (Schinini et al. 2008) without any national endemism.

Habenaria parviflora Lindl. has a large distribution throughout South America having been found in Argentina, Brazil, Colombia, Ecuador, Guyana, Paraguay, Uruguay and Venezuela (Batista et al. 2011b). In Argentina it has been found in the provinces of Catamarca, Córdoba, Corrientes, Entre Ríos, Jujuy, Misiones, Salta and Tucumán (Novara and Chemisquy 2008, Schinini et al. 2008).

In this contribution, based on material collected from the northwestern hills of the Tandilia System (Cingolani 2010) in Buenos Aires province, *Habenaria parviflora* is reported as new to this populated district. Accordingly, the southern distributional limit of the species is expanded to 37°S. In adition, the study of vouchers held at national herbaria and original material available in digital repositories, the revision of previous bibliography and analysis of protologues paved the way for the proposal of a new synonymy for this species and its lectotypification. Below, a new taxonomic treatment is proposed and an emended description of the species is presented.

Habenaria parviflora Lindley (1835, p. 314)

Type: Brazil. "Hab. in Brazilia, frequens". Bahia, "prope Bahiam": "Bahia, in paludosis", s.d., P. Salzmann s.n. (lectotype designated here: K-293883 [image] mounted with Gardner 5885 and Regnell 680; isolectotypes K-293350 [image] mounted with Gardner 5885, G-169017 [image], G-169018 [image], P-408625 [image], P-408626 [image], fragment at SI; (additional isolectotypes K-293349, MPU-11331, MPU-11332, MPU-11333, MPU-11334, MPU-11632 not seen). Other syntypes: Rio de Janeiro, "in monte Corcovado ad Rio de Janeiro": C. F. P. Martius s.n. (G not seen); 1815, MAP Wied-Neuwied s.n. (M-153341 [image]).

Taxonomic synonym: *Habenaria uruguayensis* Garay (1976, p. 118) syn. nov.

Based on the same type: *Habenaria montevidensis* Lindley (1835, p. 314) nom. illeg., non Sprengel (1826, p. 692).

Type: Uruguay. Montevideo, "Hab. In Montevideo.": "found this one plant only in the hill of Montevideo", s.d., J. Tweedie s.n. (lectotype K-463562 [image] designated by Garay (1976, p. 118), fragment at SI). Other syntype: "Ex pascuis sterilibus quo sunt circa Montevideo", 1767, P. Commerson s.n. (P-408975 [image]).

Description

Terrestrial herb, 15–130 cm high including inflorescence (Fig. 1A). Root-tuber ellipsoid, 1–2 cm long., terminal or not; roots numerous, 1–2 mm wide, fascicled, undivided,

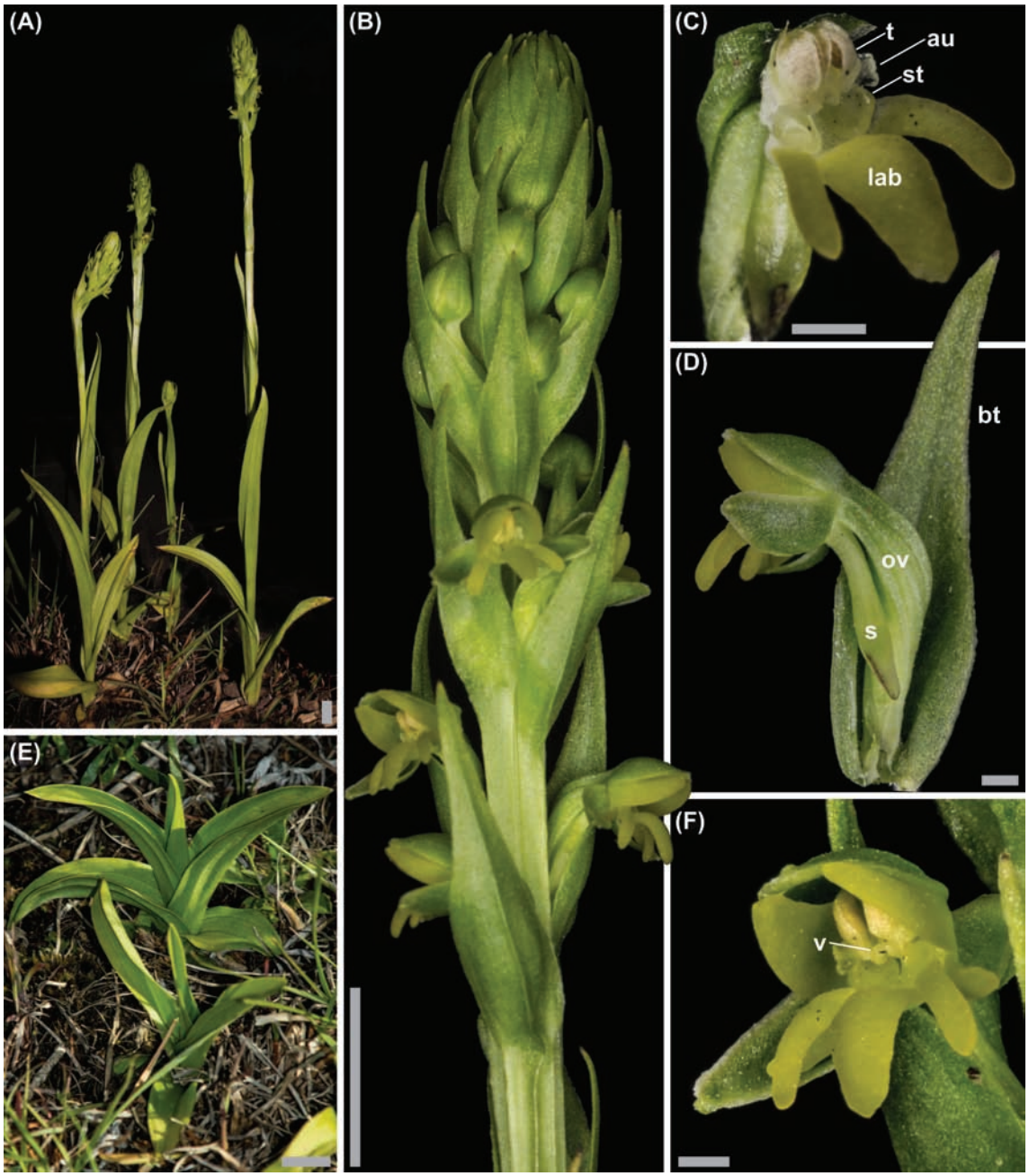

Figure 1. *Habenaria parviflora.* (A) view of whole plant, (B) inflorescence, (C) flower with column and labellum exposed, (D) flower with bract in lateral view, (E) vegetative features, (F) flower in frontal view. au = auricle, bt = bract, s = spur, lab = tripartite labellum, ov = ovary, st = stigma, t = theca, v = viscidium. Scales: (A), (B), (E) = 1 cm, (C), (D), (F) = 1 mm. From Sanguinetti 104 (SI).

conical at apex (Fig. 2A). Leaves 4–10, lanceolate to linear, 3–16 × 1–2 cm, canaliculate, acute to acuminate; lowermost leaves distichous, inclined, recurved, amplexicaul with sheathing base; upper leaves decreasing in size and becoming alternate, appresed and straight towards the inflorescence (Fig. 1A, E). Stem erect, 1.5–5.0 mm wide, ridged (Fig. 1A, B). Inflorescence spike-like, terminal, erect, spiralled, 3–18 cm long, somewhat congested or not (Fig. 1A–B); bracts naviculate, acuminate, appressed, 15–20 × 5–7 mm, covering the ovary (Fig. 1B, D). Flowers 8–12 mm long including the ovary, yellowish-green to greenish, fragrant (Fig. 1D). Dorsal sepal herbaceous, widely ovate to ovate, obtuse, 3–5 × 3–4 mm (Fig. 2B). Lateral sepals herbaceous, obliquely lance-ovate to lanceolate, 3.5–5.0 × 2–3 mm (Fig. 2B). Petals somewhat fleshy, yellowish–green, bipartite; posterior lobe triangular-ovate, falcate, 3–4 × 2 mm, slightly incurved, contiguous with the dorsal sepal; anterior lobe narrowly oblong, (0–)1.0–2.5 × 0.5 mm, slightly recurved, inserted on the base of the posterior lobe at an acute angle, variable even within the same individual, rarely very reduced or absent (Fig. 2B). Labellum fleshy, reflexed, tripartite with lobes slightly or very recurved; central lobe narrowly elliptic, 3–5 × 1.5–2.0 mm; lateral lobes usually shorter than the latter and 0.5–1.0 mm wide; spur of the

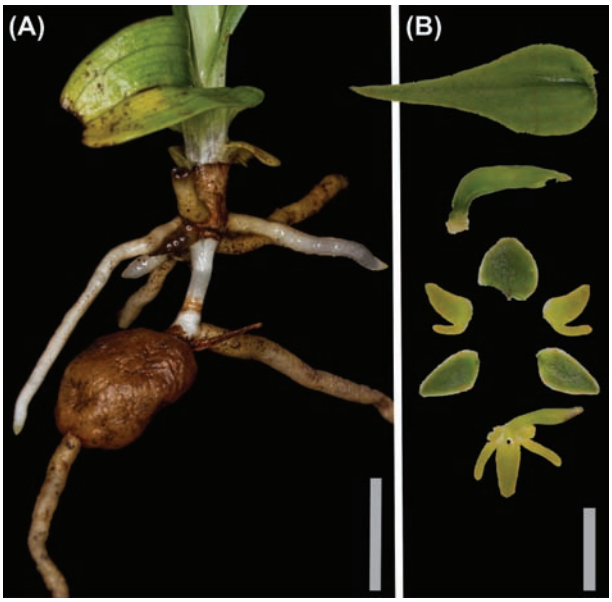

Figure 2. *Habenaria parviflora.* (A) sub-terranean characters, note the single 'root-tuber', (B) dissected flower. Scales: (A) = 1 cm, (B) = 5 mm. From Sanguinetti 104 (SI).

same length or shorter than the ovary, filiform to somewhat globose, attenuate (Fig. 2B). Ovary erect, resupinate, curved in its apical third, 5–9 × 1.5–2.0 mm, ridged (Fig. 1D). Column minute; stigmas 2, widely elliptic, 1.0 × 0.8 mm, pulvinate, slightly convex on top, projected over the labellar base guarding the entrance to the spur; auricles minuscule, hyaline, tooth-like, verrucose (Fig. 1C). Anther erect, bipartite; thecae 2, globose, 2 × 1 mm, longitudinally dehiscent; pollinia 2, 1 × 1 mm, with a short hyaline caudicle ending in an arched viscidium (Fig. 1C).

Notes

In 1835 Lindley described *Habenaria montevidensis* and *H. parviflora* based on material from Montevideo and Brazil (Bahia and Rio de Janeiro), respectively. Nonetheless, *H. montevidensis* Lindl. is a posterior homonym of *H. montevidensis* Spreng., thus being illegitimate. Cogniaux (1893) confounds these homonyms while using the name of Sprengel for the species of Lindley, in spite of the obvious differences presented in their respective protologues (Garay 1976). Ever since this confusion the name of Sprengel became widely used by the scientific community as the accepted name for the taxon described by Lindley. Meanwhile, the heterotypic synonyms *H. arechavaletae* Kraenzl. and *H. obovatipetala* Schltr. (Garay 1976, Batista et al 2011b) were the names regularly used during the period 1893–1976 to refer to the species described previously by Sprengel (1826). Finally, Garay (1976) voids the homonymy in *H. montevidensis* and ends the confusion by renaming the species of Lindley as *H. uruguayensis*.

The study of the respective protologues and the original material of *H. parviflora* and *H. uruguayensis* made it possible to establish that the differences posed for floral characters of these two entities – basically the size of the labellar appendices and the spur – are way too subtle to allow a clear separation between them. However, evident characters such as the general semblance and the size and density of the inflorescence are notably different between these two entities (Hoehne 1940, obs. pers.). This disparity among their general semblance, together with their geographic provenance might have influenced Lindley to declare them as distinct species.

The similarity between *H. parviflora* and *H. uruguayensis* – eventually "*H. montevindensis* Spreng." – is mentioned by several authors (Kraenzlin 1892, Hoehne 1940, Correa 1950, Brade 1951, Pabst 1959, Garay 1976, Izaguirre 1984, Batista et al. 2012), yet some of them also suggest these species could correspond to a single taxon (Garay 1976, Izaguirre 1984). As a matter of fact, the illustrations based on flowers from types drawn by Lindley (K-293883, K-941380) and Renz (based on G-169071) together with the illustrations of *H. uruguayensis* provided by Kraenzlin (1911, Table 3), the illustrations of *H. parviflora* provided by Barbosa Rodrigues (Sprunger et al. 1996, pp. 56, 62), Dunsterville and Garay (1976, p. 161) and Batista et al. (2008, p. 125), or the illustrations of both species provided by Herter (1939, p. 248), Hoehne (1940, Table 51, 89), Brade (1951, Estampa 2), Pabst and Dungs (1975, p. 245), Izaguirre (1984, p. 408) and Renz (unpublished from his personal herbarium) along with their descriptions, hamper a clear differentiation between them. As an example, Correa (1950) and Izaguirre (1984) mention differential characters which are not coinciding.

The difficulty in separating both entities stems from the variability presented by individuals from different and similar localities. For example, Rocha and Waechter (2006) conclude from studied specimens that *H. parviflora* is highly variable in its general semblance as in its floral parts, and even different patterns of size and shape appear in flowers from a single individual (some of those specimens erroneously identified as *H. montevidensis* Spreng.); Brade (1951) mentions that in a few square meters specimens of *H. parviflora* with diverse petals were found, some of them with well-developed anterior lobes and some others with entire petals. Furthermore, while studying Uruguayan collections, Pabst (1952) found specimens of *H. parviflora* interspersed among specimens of *H. uruguayensis* in several exsiccates – the same is mentioned by Kraenzlin (1892) – and from the cited material it can be elucidated that some vouchers of these two entities correspond to identical collection localities and dates. In accordance with all the evidence previously stated, Pabst proposes the synonymy between *H. parviflora* and *H. uruguayensis* based on the study of collections from a broad geographic range – from Montevideo to Espiritu Santo and Minas Gerais – (Pabst 1959) and concludes that the previously accepted entities belong to edaphic forms (Pabst 1957). However, Pabst makes the mistake of using the name of Sprengel, rendering the synonymy incorrect. In the present contribution the taxonomy of Pabst (1959) is restored and presented in its correct form.

Habitat and pollination biology

Habenaria parviflora is found in grasslands (Hoehne 1940, Pabst 1952, Singer 2001, Schinini 2010), in humid and sandy places (Hauman 1920, Hoehne 1940, Correa 1950, Brade 1951, Izaguirre 1984), in dry or humid rocky outcrops (Pabst 1952, 1959, pers. obs.) and even in sand dunes

close to the seashore (Pabst 1959, Rocha and Waechter 2006). The specimens collected in Buenos Aires are from the hills of Azul where they were found growing in shallow soils over rocky outcrops. As previously indicated, its general appearance can be highly variable, yet based on the study of herbarium material it can be inferred that individuals which inhabit rocky or sandy soils – potentially exposed to higher hydric deficits – reach a notably lower size with smaller inflorescences than individuals inhabiting grasslands and/or waterlogged soils.

Flowers emit a penetrating sweet smell at dusk (pers. obs.) – according to Hauman (1920), it resembles the smell of heliotrope – and they are mainly pollinated by crane flies (Diptera: Tipulidae) and pyralid moths (Lepidoptera: Pyralidae) that feed from the nectar found in the base of the spur (Singer 2001).

Conservation status

A global assessment rated *H. parviflora* in the 'Least Concern' (LC) category following IUCN criteria (Romand-Monnier 2013) due to its large extent of occurrence and a large inferred area of occupancy. Following the same criteria, at the regional scale of Buenos Aires province (307 571 km^2) this species should be listed as 'Endangered' [EN B1ab(iii)] since its inferred local extent of occurrence corresponds to the northwestern portion of the Tandilia System (EOO $<$ 5000 km^2) – a region subjected to numerous surface mining projects (Cingolani 2010), thus with a decreasing habitat quality – where a single locality is known to date. It is possible that with further prospecting efforts some other close occurrences will be found. However, the Tandilia System, as a whole, is very well-explored from a floristic point of view (Sanguinetti et al. 2014), thus it seems quite unlikely that this species might be found further southwest within this system.

Additional specimens examined

Argentina. Buenos Aires: Azul, 6 Dec 2013, A. Sanguinetti 104 (SI). Corrientes: General Paz, 21 Jan 1959, T. Myndel 5293 (LP). Ituzaingo, 29 Nov 1970, A. Krapovickas et al.16600 (BAA). La Cruz, 8 Nov 1936, A. Burkart 7846 (SI). Mburucuyá, 14 Dec 1949, T. Myndel 511 (LP). Mercedes, 14 Oct 1961, T. Myndel 6123 (LP). Monte Caseros, 1 Jan 1952, E. G. Nicora 6045 (BAA). Paso de los Libres, 13 Dec 1991, N. Bacigalupo 1477 (SI). San Martin, 11 Nov 1976, R. Guaglione et al. 42 (SI). Entre Ríos: Concordia, 22 Nov 1986, G. Rúa s.n. (BAA). Islas del Ibicuy, s.d., L. Hauman s.n. (BA). Federación, 20 Dec 1961, J. C. Gamerro 1148 (LP). Jujuy: Capital, 7 Apr 1971, M.N. Correa 4564 (SI). Manuel Belgrano, 12 Feb 2010, F.O. Zuloaga 11573 (SI). Salta. Caldera, 3 Apr 1971, F. Vervoorst et al. 4409 (SI). Tucumán. Tafí, 27 Jan 1933, A. Burkart 5278 (SI). **Brazil**. Paraná. 20 Dec 1952, Hatschbach 3038 (SI). Rio Grande do Sul. 29 Jan 1973, A. Krapovickas et al. 23024 (BAA). Sao Paulo. 11 Jul 2006, Paula-Souza et al.s.n. (SI). **Paraguay**. Cordilleras, Jul. 1902, Fiebrig 576 (SI). Guairá, Jan 1967, A. Schinini 13 (SI). Misiones, 21 Nov 1984, T. Myndel 14043 (SI). San Bernardino, 1 Feb 1915, Hassler 28 (SI). **Uruguay**. Cerro Largo, Jan 1926, W. Herter s.n. (BAF). Maldonado, 6 Jan 1912, C. Osten 5658 (SI). Montevideo, 9 Apr 1905, W. Herter 358 (SI). Salto, 25 Nov 2001, Seijo et al. 2396 (SI).

Acknowledgements – The author is grateful to the curators and personnel of the herbaria consulted for their valuable assistance. Rodrigo B. Singer contributed with valuable comments on the taxonomic proposal. Specific bibliography was consulted thanks to C. R. Buzatto and the SI library personnel. Jesica Bekenstein and Carlos Villamil helped to improve the English text. Field campaigns were possible thanks to finance provided by The Rufford Foundation and Neotropical Grassland Conservancy. Ideawild provided field and photographic equipment. The author acknowledges Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) for his doctoral scholarship.

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