

Short communication

# *Psednotrichia perennis* (Asteraceae, Senecioneae): A new species from the Huila plateau, Angola

N.G. Bergh<sup>a,\*</sup>, B. Nordenstam<sup>b</sup>

<sup>a</sup> The Compton Herbarium, Kirstenbosch Research Centre, South African National Biodiversity Institute, Private Bag X7, Newlands 7735, Cape Town, South Africa

<sup>b</sup> Department of Phanerogamic Botany, Swedish Museum of Natural History, Box 50007, S-10405 Stockholm, Sweden

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## Abstract

The genus *Psednotrichia* (Asteraceae–Senecioneae) is endemic to Angola and currently consists of two annual species, *P. xyridopsis* (O. Hoffm.) Anderb. & P. O. Karis, and *P. newtonii* (O. Hoffm.) Anderb. & P. O. Karis. A perennial member of the genus was collected on a recent field trip to Angola, and is here described as *P. perennis* N. G. Bergh & B. Nord., sp. nov. A key to the three species is provided.

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## 1. Introduction

Of the approximately 370 species of Asteraceae recorded for Angola (Figueiredo and Smith, 2008), a small but significant portion — viz. about 64 species (or 17 %) — belong to the tribe Senecioneae. Most of these are in the genus *Senecio* L., with the remaining genera represented by just a few species each. *Psednotrichia* Hiern. is one of these small genera and until now consisted of only two species, both of which are annual and endemic to Angola. They were first described (Hoffmann, 1896) as members of the genus *Oligothenix* DC. but were later distinguished as a separate genus, *Xyridopsis* B. Nord. (Nordenstam, 1978). This left *Oligothenix* as a monotypic genus confined to the Cape Province of South Africa. Apart from in its geographical distribution *Psednotrichia* differs from *Oligothenix* in habit, leaf-shape and floral characters, such as the discoid capitula and style branches with penicillate apices.

Although both *Xyridopsis* species were sunk into *Emilia* by Jeffrey (1986), this was later reversed by Anderberg and Karis (1995). In the same publication, Anderberg and Karis examined the floral anatomy of the little-known species *Psednotrichia tenella* Hiern., described in 1898 (Hiern, 1898) from fragmentary

material collected by F. M. Welwitsch near Humpata in Angola in 1860, and assigned by previous authors to the tribe Astereae. They showed that this species is misplaced in the Astereae, being in fact conspecific with the type of *Xyridopsis*, i.e. *X. welwitschii* B. Nord. The name *Psednotrichia* has priority over *Xyridopsis*, and the two *Xyridopsis* species were accordingly transferred to *Psednotrichia* (Anderberg and Karis, 1995). Since *xyridopsis* is the oldest available species epithet, *X. welwitschii* was renamed *P. xyridopsis* (O. Hoffm.) Anderb. & P.O. Karis while *X. newtonii* became *P. newtonii* (O. Hoffm.) Anderb. & P.O. Karis.

The affinities of *Psednotrichia* need further inquiry. Although Jeffrey (1986, 1992) included the genus in *Emilia*, its separation from *Emilia* was upheld by Bremer (1994, as *Xyridopsis*) and (as *Psednotrichia*) by Anderberg and Karis (1995) and Nordenstam (2007). Jeffrey's (1986) inclusion of *Xyridopsis* in *Emilia* was based on his hypothesis that all African taxa with “emilioid” characters (ecalyculate involucre and a unique base chromosome number of  $n=5$ ) were best placed in one genus, despite the fact that the chromosome number of *Xyridopsis/Psednotrichia* has never been investigated. Anderberg and Karis (1995) justified the separation of *Xyridopsis* from *Emilia* on the grounds that the former shares characters such as mucilaginous cypselae hairs, scapose peduncles, ecalyculate involucre and resiniferous corolla with other genera in the Senecioneae. In addition, these authors

\* Corresponding author.

E-mail address: [N.Bergh@sanbi.org.za](mailto:N.Bergh@sanbi.org.za) (N.G. Bergh).

considered that *Emilia* is large and heterogeneous, and anticipated future splitting of the genus. The circumscription of *Emilia*, *Senecio* and other genera awaits further analysis.

Due to political conflict, botanical research has been all but suspended in Angola for several decades. With the resumption of peace and the rebuilding of the country, there is scope for continuance of the botanical tradition in the flora of Angola. The following new species was collected during a botanical excursion to southern Angola at the start of 2009, in the high-altitude grassland of the Huila plateau (Fig. 1). Despite its anomalous perennial life-history it is evidently a species of *Psednotrichia* on account of the linear leaves, ecalyculate, discoid capitulum with partially connate involucre (Figs. 1 and 2) and the characteristic features of the florets (truncate style branches with a central penicillate tuft, the swollen stamen filament collar, mucilaginous cypsela hairs and flexuous, barbellate pappus bristles; Fig. 2). The new species may be closest to *P. xyridopsis* as they both have contracted stems resulting in basal, sub-rosulate leaves, while in *P. newtonii* the leaves are distributed along a more elongate stem. The perennial habit is an important addition to the morphological range in the genus.

## 2. Materials and methods

### 2.1. Species sampling and description

Plant, habitat and location details were recorded and plants were photographed in situ. Vouchers were deposited at the

Compton Herbarium, Cape Town (NBG), Pretoria Herbarium (PRE), Swedish Museum of Natural History, Stockholm (S) and at Lubango Herbarium in Angola (LUBA). Morphological characters were examined under stereo- and dissection microscopes and camera lucida attachments were used to create detailed drawings.

## 3. Species description

### 3.1. *Psednotrichia perennis* N. G. Bergh & B. Nord., sp. nov.

#### 3.1.1. Type

Angola, Huila Plateau, vicinity of Lubango; grassland above Estação Zootechnica, north-west of the town of Humpata, ~2120 m, 16 January 2009, N. G. Bergh 1944 (NBG, holo.; PRE, LUBA, S, iso.).

Herba perennis caule abbreviati, praeter axillas foliorum glabra. Folia alterna congesta subrosulata integra erecta vel suberecta lineari-filiformia subteretia leviter canaliculata margine revoluta subcarnosa 30–120 mm longa et 0.7–1.5 mm lata, basi semiamplexicaulia, axillis sericeo-lanatis. Pedunculi terminali graciles scaposi monocephali usque 350 mm longi. Capitula discoidea flaviflora. Involucrum campanulatum ecalyculatum, bracteis uniseriatis basi connatis. Flosculi hermaphroditi, corolla superne campanulata quinquelobata, lobis paullum inaequalibus ovatis canali mediano resinifero instructis. Antherae ecaudatae; collum filamenti basi dilatatum. Styli rami intus areis stigmaticis discretis, apice truncati pilis

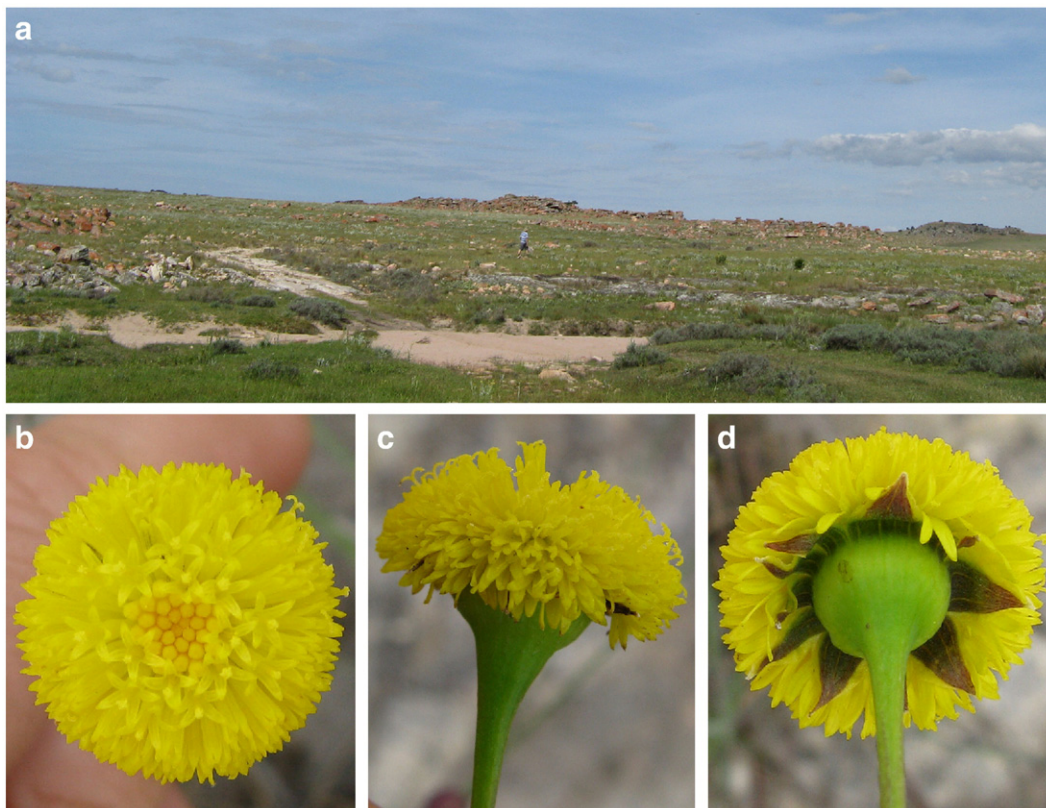


Fig. 1. (a) Afromontane grassland habitat above Estação Zootechnica, Humpata, on the Huila Plateau in Angola; (b–d) capitulum of *P. perennis* viewed from (b) above; (c) side view; (d) below. Capitulum diameter: 10 mm.

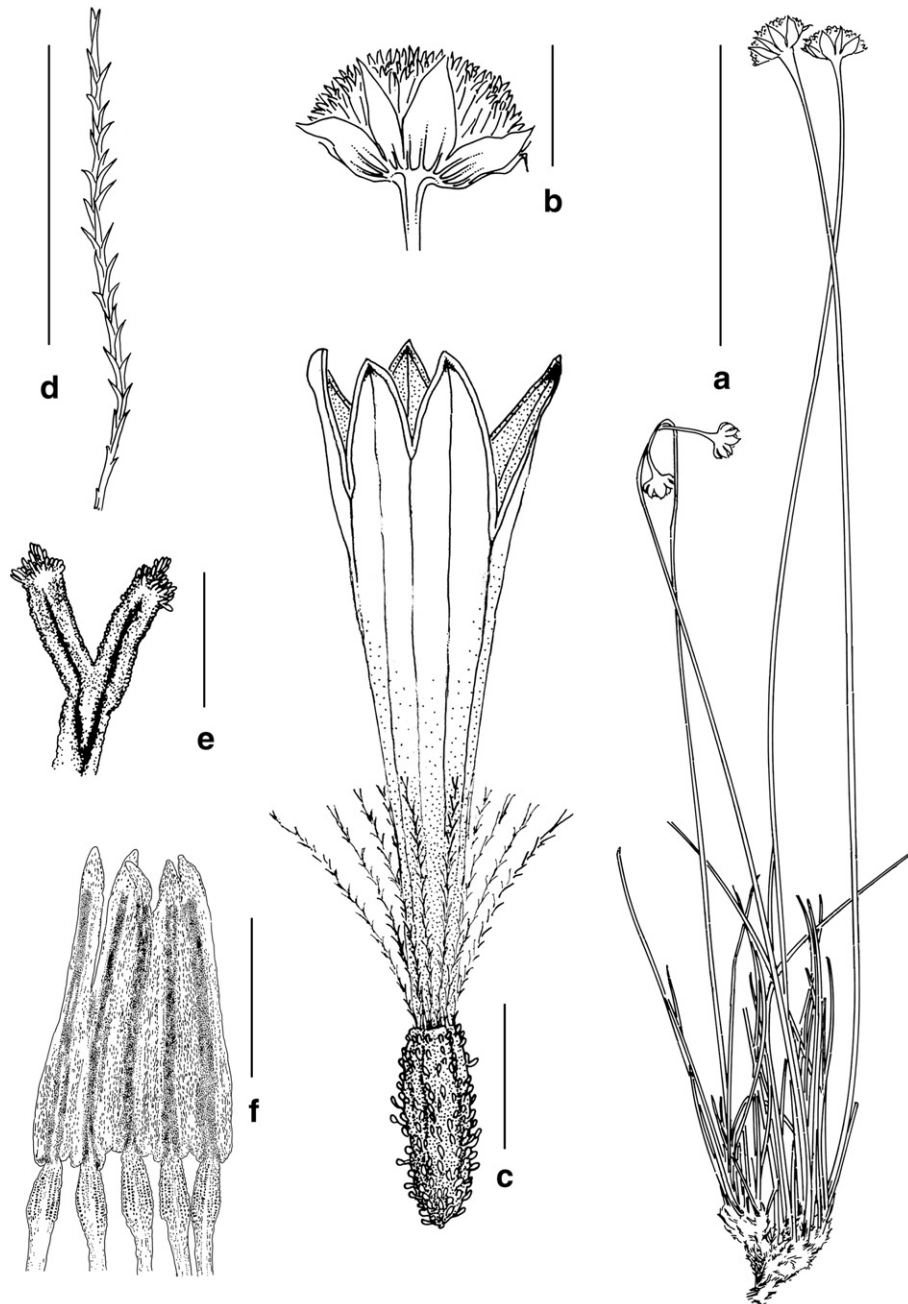


Fig. 2. *Psednotrichia perennis*. (a) habit, showing basal, subterete leaves, conspicuously tomentose leaf bases, and discoid heads on elongate scapose peduncles; (b) capitulum; (c) floret; (d) pappus bristle; (e) stigmatic branches showing vascular traces; (f) anthers showing filament collars. All drawings by N. Bergh except (a) and (b), by G. A. Verboom. Scale bars: (a): 60 mm; (b): 6 mm; (c) & (d): 1 mm; (e): 0.5 mm and (f): 0.8 mm. Drawn from the holotype: dried material [(a) and (b)] or boiled, rehydrated parts [(c)–(f)].

brevibus penicillum centrale cingentibus vestito. Cypselae obovatae breviter villosae madefactae mucilaginae. Pappi setae paucae uniseriatae flexuosae barbellatae caducae.

Perennial rhizomatous herb, 200–350 mm high, with fibrous roots, stem contracted and sparsely-branched, forming woolly crowns obscured by leaf bases. *Leaves* alternate, basally congested, erect, narrowly linear-filiform, finely canaliculate with revolute margins, glabrous and somewhat fleshy, 30–120 × 0.7–1.5 mm, obtuse, base broadened and stem-clasping, glabrous with copious silky-white hairs in axils.

*Peduncles* scapose, one — several from the crown, erect, slender, 150–350 mm long (0.7–1.5 mm in diam.), striate, glabrous, unbranched, green, somewhat inflated below the involucre. *Capitula* homogamous, discoid; *receptacle* convex, glabrous, minutely alveolate. *Involucre* cup-shaped–campanulate, 10–13 mm wide, glabrous, basally bright green, ecalyculate; *involucral bracts* 8–12, uniseriate, connate basally (to 1/3 or less), free lobes ovate–lanceolate, individual bracts 4.5–7.0 mm long, dark red-brown with light-brown veins and pale scarious margins, acute or somewhat acuminate with or



without a small tuft of white hairs, of varying width: narrow bracts 1–2 mm wide with 2–4 veins, broader bracts 2–3 mm wide with 5–10 veins. *Disc florets* perfect, corolla 3.7–4.5 mm long, limb narrowly campanulate, widening gradually towards the lobes, lobes deltoid–ovate with subcucullate papillate apices, somewhat unequal, 0.8–1.3 × 0.4–0.5 mm, midlined with a resin duct. *Anthers* 1.5–1.8 mm long, sagittate; endothelial tissue radial; filaments with distinctly balusterform collar below anther. *Style* bifurcate, branches 0.5–0.8 mm long, truncate, shortly penicillate with hairs extended into a small central tuft; stigmatic areas separated. *Cypselas* oblong–obovoid, ±1.5–2.0 mm long, terete or slightly triquetrous, ±5-veined, shortly villous with clavate, myxogenic twin hairs. *Pappus bristles* few, 1.5–2 mm long, caducous, flexuous and slender, distinctly barbellate, white.

### 3.1.2. Flowering time

Observed in flower in January.

### 3.1.3. Distribution, ecology and conservation status

The new species is so far known only from a restricted area of grassland on sandstone-derived quartzitic sand, near the edge of a dry rivulet on the high-altitude plateau of Huila Province, Angola (Figs. 1a and 3). This type of habitat is very restricted in Angola, being confined to the Huila plateau and a small patch north-east of Lobito. Nevertheless, the afro-temperate plateaus with altitudes above 2000 m are among the most species-rich areas in Southern Angola. The species may be classified as

Vulnerable according to IUCN criteria but has not been formally assessed.

### 3.1.4. Diagnosis and relationships

*Psednotrichia newtonii* (O. Hoffm.) Anderb. & P. O. Karis, is annual and poorly known, but has a different habit with more leafy and branching stems, and is recorded as growing on the margins of the Pallanca River, in the vicinity of Lubango. *P. perennis* is more similar to *P. xyridopsis* in leaf arrangement and floral details such as the slight asymmetry of the florets, median resin duct in the corolla lobes, the style branch morphology with a small central tuft to the penicillate apex, the much swollen filament collars and the short, rounded–clavate duplex cypselar hairs which become mucilaginous when soaked. In addition, *P. xyridopsis* and the new taxon may be sympatric, both being known only from the Huila plateau near the town of Humpata, although no individuals of *P. xyridopsis* were observed at the time of collection of *P. perennis*.

A possibility we considered is that the new taxon is conspecific with *P. xyridopsis*, which would require that the interpretation that the latter is an annual is incorrect. This would be possible especially if all material happened to have been collected off very young plants. It is not always possible to distinguish the annual life-history from herbarium specimens, but several collections of *P. xyridopsis* are annotated as ‘annual’ by the collectors who saw the live plants in the field (e.g. B. Fritzsche 137). The new species also differs from *P. xyridopsis* (Fig. 4) in several other features: it has a generally

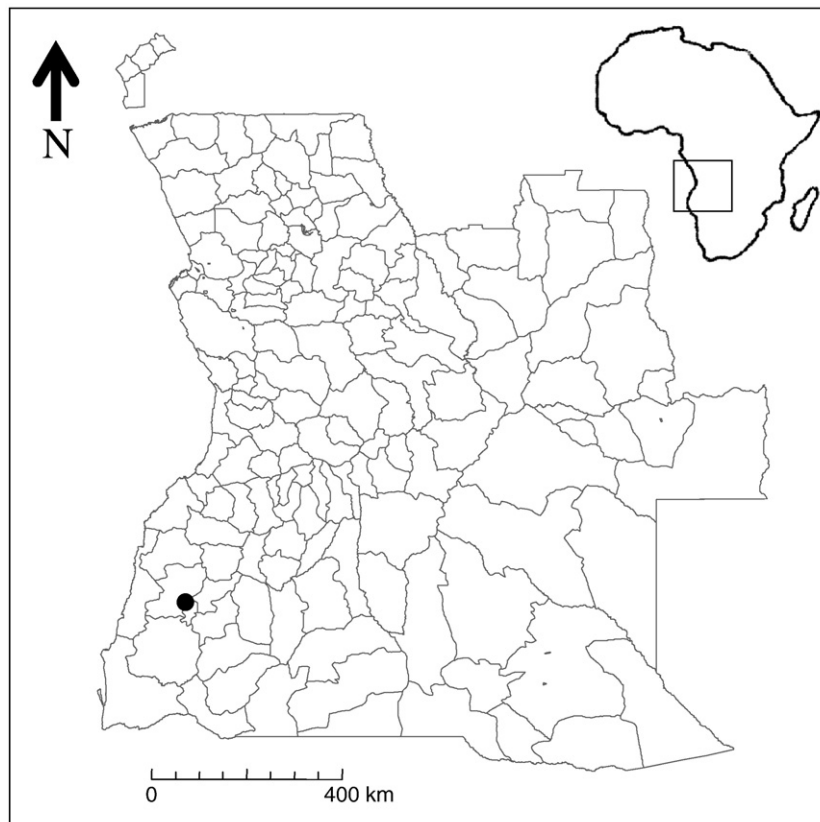


Fig. 3. Map of Angola and its provinces with the known distribution of *Psednotrichia perennis* indicated by a black filled circle.



Fig. 4. Scan of isotype of *Psednotrichia xyridopsis* (F. R. Welwitsch 3992) courtesy of the National Botanic Garden of Belgium (BR).

larger and more robust habit with relatively longer and stouter peduncles as well as larger capitula, and copious silky wool between the leaf bases. We compared several specimens of *P. xyridopsis* (F. M. J. Welwitsch 3992; B. Fritzsche 137; L. E. Kers s.n.) with the new taxon to confirm that the former does indeed appear to be annual and differs from the latter in several characters. *P. xyridopsis* is a shorter, more gracile plant with a thinner base and slender annual roots, and the tomentum between the leaf bases is lax and sparse or absent. The coarser habit of the perennial taxon is also manifest in the length and thickness of the leaves ( $30\text{--}120 \times 0.7\text{--}1.5$  mm, as compared to  $20\text{--}40 \times 0.5\text{--}0.7$  mm in *P. xyridopsis*) and peduncles ( $150\text{--}$

$350 \times 0.7\text{--}1.0$  mm, as compared to  $100\text{--}200 \times 0.5\text{--}0.7$  mm in *P. xyridopsis*). Capitula are larger in the perennial taxon ( $10\text{--}13$  mm as opposed to  $7\text{--}10$  mm diam. in *P. xyridopsis*) with generally larger involucral bracts ( $4.5\text{--}7.0 \times 1.0\text{--}3.0$  mm as compared with *P. xyridopsis* where they are  $4.0\text{--}5.0 \times 1.0\text{--}2.0$  mm). The peduncles are also less distinctly swollen below the capitulum in *P. xyridopsis*, and the pappus bristles somewhat shorter, only  $0.5\text{--}1.0$  mm as opposed to  $1.5\text{--}2.0$  mm in length in the perennial species.

All three species occur in and around the Huilla plateau in Angola and thus share a fairly narrow distribution range. There appears to be some separation of flowering time between

*P. xyridopsis* (recorded in flower in April and May) and the new perennial taxon, which was observed flowering in January. *Psednotrichia newtonii* is recorded flowering in March.

#### 3.1.5. Further collections

ANGOLA.—Huila Plateau, northwest of Lubango, grassland on plateau near Humpata (14° 54' 39.2" S, 13 ° 17' 08.3" E), ± 2120 m, 11 January 2009, N. G. Bergh 1892 (NBG, LUBA); Lubango area, near Humpata, Estação Zootechnica Reserve on the high ridges above the reservoirs, 2220 m, 17 January 2009, A. D. Harrower 4011 (NBG, LUBA).

#### 4. Key to the species of *Psednotrichia*

- 1a. Leaves distributed along the stem.....*P. newtonii*.
- 1b. Leaves congested basally on abbreviated stem.....2.
- 2a. Annual; leaf-axils glabrous or laxly and sparsely tomentose, leaves 20–40×0.5–0.7 mm, peduncles 100–200×0.5–0.7 mm, capitula 7–10 mm diam., involucre bracts 4.0–5.0×1–2 mm..... *P. xyridopsis*.
- 2b. Perennial; leaf-axils densely silky-woolly, leaves 30–120×0.7–1.5 mm, peduncles 150–350×0.7–1.5 mm, capitula 10–13 mm diam., involucre bracts 4.5–7.0×1–3 mm.....*P. perennis*.

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#### References

- Anderberg, A.A., Karis, P.O., 1995. *Psednotrichia*, a genus of the tribe Senecioneae hitherto misplaced in the Astereae (Asteraceae). *Nordic Journal of Botany* 15, 375–379.
- Bremer, K., 1994. Asteraceae. Cladistics and classification. Timber Press, Portland.
- Figueiredo, E., Smith, G.F., 2008. Plants of Angola / Plantas de Angola. *Strelitzia* 22. South African National Biodiversity Institute, Pretoria.
- Hiern, W.P., 1898. Two new genera of Compositae. *Journal of Botany* 36, 289–291.
- Hoffmann, O., 1896. Compostas da Africa Portuguesa, II. *Boletim da Sociedade Broteriana* 13, 11–35.
- Jeffrey, C., 1986. The Senecioneae in East Tropical Africa. *Notes on Compositae* : IV. *Kew Bulletin* 41, 873–943.
- Jeffrey, C., 1992. The tribe Senecioneae (Compositae) in the Mascarene Islands with an annotated world check-list of the genera of the tribe. *Notes on Compositae* : VI. *Kew Bulletin* 47, 49–109.
- Nordenstam, B., 1978. Taxonomic studies in the tribe Senecioneae (Compositae). *Opera Botanica* 44, 1–84.
- Nordenstam, B., 2007. Tribe Senecioneae. In: Kadereit, J.W., Jeffrey, C. (Eds.), *The Families and Genera of Vascular Plants* (Kubitski, K., ed.): Flowering Plants, Eudicots, Asterales, vol. VIII. Springer, Berlin, pp. 208–241.