

NEOBURTIA, A NEW GENUS FOR *POLYSTACHYA LONGISCAPA* (POLYSTACHYINAE, ORCHIDACEAE)

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Abstract. *Polystachya* subtribe Polystachyinae is a subject of ongoing taxonomic work. This paper describes and illustrates a new monotypic genus, *Neoburtia*, provides a key for determination of all genera of *P.* subtribe Polystachyinae, briefly discusses morphological differences between *Neoburtia* and its closest relatives, *Dendrobianthe* and *Neobenthamia*, and validates a new combination on species level. Also given are a comprehensive description and full synonymy, as well as detailed ecological, phenological and distribution data for the species of the new genus. The restricted distribution of the new genus is briefly discussed, as it is endemic to the Uluguru Range (Eastern Afrotropical biodiversity hotspot).

Key words: Africa, Eastern Afrotropical biodiversity hotspot, morphology, narrow endemic, new genus, Polystachyinae, taxonomy

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INTRODUCTION

Polystachya longiscapa Summerh. was described in 1934 by the eminent British orchidologist Victor Summerhayes (1897–1974) from a specimen collected by the young botanist Bernard Burt. He made the collection a year earlier in May 1933, in the southern part of the Uluguru Mts on the slopes of Lupanga Peak (Lukwangule Plateau) in present-day Tanzania (formerly Tanganyika) at 1500 m a.s.l. The new entity was quite large for Polystachyinae Schltr., up to 120 cm tall, growing as a lithophyte in clumps along a rocky course of rapids. The orchid was found in a remote, rarely visited and rather isolated mountain locality, confirming the presumption that many unknown taxa had yet not been discovered. Describing *Polystachya longiscapa*, Summerhayes (1934) compared the new species to *P. flexuosa* (Rolfe) Schltr. [*Dendrobianthe dendrobiiflora* (Rchb. f.) Mytnik] in the diagnosis and called the latter a ‘small edition’ of the newly described entity. Indeed it is similar to *Dendrobianthe dendrobiiflora* in some aspects (especially in habit) but it also approaches the re-

markable monotypic genus *Neobenthamia* Rolfe, collected in the same district. The problem of classifying *P. longiscapa* has been addressed by many authors, including Summerhayes (1934), Cribb (1984) and Cribb and King (2006). Cribb (1984) placed it in section *Dendrobianthe* Schltr., and Cribb and King (2006) pointed out that *Polystachya longiscapa* occupies rather an isolated position in *Polystachya* s.l. Raising section *Dendrobianthe* to generic rank, Mytnik-Ejmont (2008) decided to leave the species within the taxon, but years of detailed morphological studies and recently obtained results of molecular analyses (Russell *et al.* 2010; Mytnik-Ejmont 2011) revealed that *Dendrobianthe longiscapa* (Summerh.) Mytnik (*Polystachya longiscapa*), closely related to *Dendrobianthe* and *Neobenthamia*, occupies an isolated position within Polystachyinae and deserves generic rank.

MATERIALS AND METHODS

We based our study on an examination of 170 herbarium specimens representing *Dendrobianthe*–*Neobenthamia* complex, applying the standard procedure

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for preparing herbarium material for stereomicroscopic observations and analyzing the vegetative and generative characters of individual plants. The flowers were taken from the middle part of the inflorescence. Particular parts of the flower were boiled, dissected, measured and drawn under a stereomicroscope. The results were then analyzed and compared with the type material, diagnoses and original illustrations. The database of drawings and photographs of all studied specimens is available in the first author's archives and is available upon request.

TAXONOMIC TREATMENT

Neoburttia Mytnik, Szlachetko & Baranow,
gen. nov.

Plantae Dendrobianthe affines sunt sed a qua planta valde robusta altiore, foliis majoribus, inflorescentia scape ramosa, floribus multo majoribus pallide roseis facile, differunt.

TYPE: *Neoburttia longiscapa* (Summerh.) Mytnik, Szlach. & Baranow, *comb. nov.* (Fig. 1)

BASIONYM: *Polystachya longiscapa* Summerh., Bull. Misc. Inform. Kew **1934**: 211. 1934; TYPE (designated here): TANZANIA, Morogoro District, Uluguru Mts, Lupanga Peak, *Burt* 3496 (LECTOTYPE: K!; BR! – drawing of a flower) – *Dendrobianthe longiscapa* (Summerh.) Mytnik, *Richardiana* **8**(1): 23–27. 2008.

ETYMOLOGY. Dedicated to Bernard Burt (1902–1938), collector of the type species, who tragically died in a plane crash in Tanganyika. As the genus *Burtia* has already been described, we add the prefix 'neo-' to distinguish the two names.

An erect or rarely pendent lithophytic plant up to 120 cm high. Rhizome 0.6–0.9 cm in diameter, short and thick. Stems thickened basally and clustered, pseudobulbs 1.5–2.3 cm long, 1.5–3.0 cm in diameter, conical, covered by persistent leaf bases. Leaves 20–36 cm long, 1.5–2.6 cm wide, conduplicate, distichous, arcuate, narrowly linear-lanceolate, acute, prominently many-veined. Inflorescence up to 92 cm long, much longer than the leaves, unbranched or up to 3-branched at apex; peduncle covered by numerous imbricating, acute sheaths; branches up to 7 cm long,

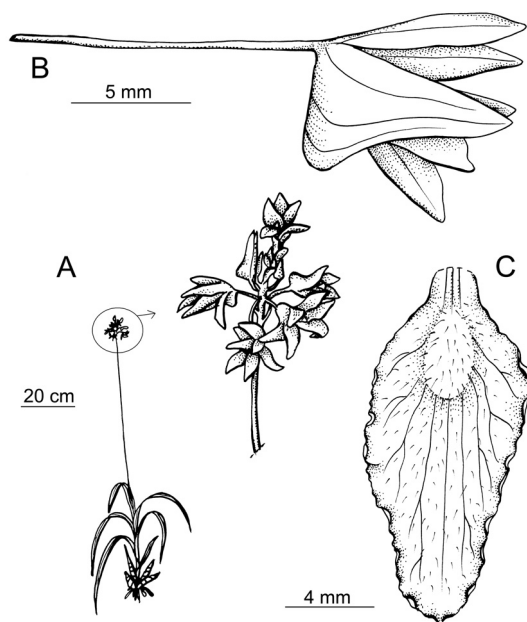


Fig. 1. *Neoburttia longiscapa* (Summerh.) Mytnik, Szlach. & Baranow. A – habit, B – flower, C – lip (drawn by J. Mytnik-Ejsmont from the lectotype).

arcuate, fleshy; rachis pubescent. Bracts 5–9 mm long, rigid, triangular, setose. Flowers pale pink to bluish pink, lip whitish to pale pink with a purple oblong fleshy dot in the basal center. Dorsal sepal 19–21 mm long, 5 mm wide, narrowly oblong-lanceolate, subacute, rounded or obtuse. Lateral sepals 18–20 mm long, 5.5–6.5 mm wide, oblique, oblong-lanceolate, rounded to obtuse. Mentum 4.8–6.5 mm high, conical. Petals 16.0–19.5 mm long, 3–4 mm wide, oblanceolate, subacute to obtuse. Lip 13–19 mm long, 9.5–10.0 mm wide, shortly clawed, entire, oblong-obovate, lowermost (due to hanging pedicels), rounded or emarginate, furfuraceous in the center, lacking any callus. Free part of gynostemium 5.0–6.5 mm high, white; column foot 4–5 mm long.

DISTRIBUTION. Tanzania, northern and western slopes of the Uluguru Mts.

HABITAT. A lithophytic or terrestrial herb growing in clumps, on rocks in cultivated fields, rocky outcrops with grasses, *Aloe* spp. and *Philippia* spp. by rivers, along the rocky course of rapids. Altitude: 700–1680 m.

REPRESENTATIVE SPECIMENS: TANZANIA: Kitundu, Apr. 1935, *Bruce 960* (BR!, K!); Lupanga Peak, along rocky course of rapids in the open in clearing below forest, alt. 1500 m, May 1933, *Burt 3496* (BR!, K!); Morogoro, Uluguru Mts, Bunduki, Sept. 1951, *Eggeling 6279* (BR!, EA, K); Gebirge, Nordwestseite, Nebelwald, alt. 1600 m, 10 Oct. 1932, *Schlieben 2783* (BR!, MA!, P!); Morningside, Aug. 1971, *Schlieben 12181* (BR!, K); steep slope between Kibungo Mission and Kihundz village, alt. 1300 m, *Thullin & Mhoro 3179* (C!); in open rocky areas and among rocks in forest, alt. 1200 m, Sept. 1932, *Wallace 178* (K!).

DISCUSSION

Our detailed morphological studies and the results of molecular studies obtained by Russell *et al.* (2010) and Mytnik-Ej-smont (2011) indicate that *Neoburttia longiscapa* occupies an isolated position within the Polystachyinae. This monotypic genus is a member of a ‘grade of species-poor lineage’ as defined by Russell *et al.* (2010), being the one of the four earliest lineages of Polystachyinae. The clade is sister to the *Neobenthamia–Dendrobianthe* clade, and our morphological studies confirm the close affinity of the three taxa. *Neo-*

burttia is a lithophytic plant much larger than *Dendrobianthe*, with leaves at least 1.5 cm wide, gathered in the lower part of the stem present at anthesis, a usually branched inflorescence up to 1 m long, pale to bluish pink flowers considerably larger than those of *Dendrobianthe*, with sepals and petals reaching 20 mm long, a prominent mentum (5.0–6.5 mm long), a glabrous lip lacking a callus, and a gynostemium 5.0–6.5 mm high. However, representatives of *Dendrobianthe* are usually epiphytes up to 55 cm high, leafless at flowering time, with leaves up to 1.5 cm wide (usually 0.4–1.0 cm) and white, pink or purple flowers with small pale purple spots on petals, a mentum 2.5–5.0 mm long, a pubescent lip furnished with a fleshy callus and a gynostemium up to 4.5 mm high. In many ways the newly proposed *Neoburttia* also brings to mind another Tanzanian narrow endemic, *Neobenthamia*, but the representatives of the latter genus are terrestrial plants lacking any pseudobulbs, with leaves arranged along the stem present at anthesis and up to 1.2 cm wide, a many-flowered racemose corymb, glabrous rachis, white flowers, a very obscure mentum (the lateral sepals just united at their base), a slightly hairy lip with

Table 1. The differences between *Neoburttia* Mytnik, Szlach. & Baranow *gen. nov.*, *Dendrobianthe* (Schltr.) Mytnik and *Neobenthamia* Rolfe.

Character / Genus	<i>Neobenthamia</i>	<i>Neoburttia</i>	<i>Dendrobianthe</i>
Life form	terrestrial	lithophyte	epiphyte
Height	90–120 cm	100–120 cm	up to 55 cm
Pseudobulbs	none	present	present
Leaves	12–24 cm long, 0.7–1.2 cm wide, present at anthesis along stem	20–36 cm long, 1.5–2.6 cm wide, present at anthesis in lower part of stem	4–30 cm long, 0.4–1.5 cm wide, absent at anthesis in lower part of stem
Flowers	white	pale pink to bluish pink	white, pink or purplish with small light purple spots on petals
Sepals	8–16 mm long	(18)19–21 mm long	6–12 mm long
Mentum	obscure	4.8–6.5 mm long	2.5–5.0(6.0) mm long
Lip colour	white with a yellow or orange-yellow central line and a row of red or magenta dots on each side of the central line	whitish to pale pink with a purple oblong fleshy dot in the basal centre	white, pale-lilac, brownish-yellow or pink with some yellow dots/lines in the lip centre
Lip callus	none	none	obscure to fleshy ridge
Column	3.2–4.5 mm high	5.0–6.5 mm high	2.5–4.5 mm high
Column foot	0.5–2.0 mm long	4–5 mm long	2.5–3.0(5.5) mm long

purple and yellow marks, and a gynostemium up to 4.5 mm high. The main differences between *Neoburttia* and the two most closely related genera, *Neobenthamia* and *Dendrobianthe*, are presented in Table 1.

The newly proposed monotypic genus is restricted in distribution to the northern and western slopes of the Uluguru Mts and is an example of a narrow endemic. The Ulugurus are part of the Eastern Afrotropical biodiversity hotspot (Mittermeier *et al.* 2004) and one of the world's most important regions for conservation (Stattersfield *et al.* 1998; Myers *et al.* 2000; Olson & Dinerstein 2002). The Eastern Arc Mts are also an interesting region, as they are recognized as one of the forest refugia in Africa that retained moist forest through the last glaciation (Diamond & Hamilton 1980; Hamilton 1982). According to Munishi *et al.* (2004), species of such a restricted distribution are very fragile in their ecosystems and can easily be driven to extinction. The habitat of *Neoburttia longiscapa* has been reduced by uncontrolled logging (Cribb & King 2006) and the species is restricted in its range to one locality. According to IUCN criteria we follow Cribb and King (2006) in maintaining that *Neoburttia longiscapa* is a vulnerable taxon (VU A1b B2b).

The new genus *Neoburttia* is placed in subtribe Polystachyinae, which includes the 9 genera keyed below.

KEY FOR DETERMINATION OF THE GENERA OF POLYSTACHYINAE SCHLTR.

1. Leaves absent at anthesis 2
- 1.* Leaves present at anthesis 3
 2. Lip furnished with a prominent cushion-like crest in the middle, deflexed just above the base, elevated keel present at the base of the lip, lip variously lobed *Epiphorella* Mytnik & Szlach.
 - 2.* Lip with a single callus, if any, not pulvinate, lip entire *Dendrobianthe* Mytnik
3. Robust plants 50–120 cm high with pseudobulbs, sepals 16–20 mm long, mentum 5.0–6.5 mm long *Neoburttia* Mytnik, Szlach. & Baranow
- 3.* Not as above 4
4. Inflorescence pendent or apically drooped, lip at lowermost position *Neobenthamia* Rolfe
 - 4.* Inflorescence erect to semi-erect, lip at uppermost position 5
 5. Spur very long and narrow, thrice the length of the dorsal sepal *Disperanthoceros* Mytnik & Szlach.
 - 5.* Spur (mentum) up to twice the length of the dorsal sepal 6
 6. Whole plant pendent or creeping, leaves fleshy, imbricate, and bilaterally flattened *Szlachetkoella* Mytnik
 - 6.* Plant neither pendent nor creeping, leaves not imbricate 7
 7. Lip with a long claw at least a third of the lip length, lip divided into three parts with the mesochile variously lobed, mentum elongate, saccate, swollen at the apex *Unguiculabia* Mytnik & Szlach.
 - 7.* Lip shortly clawed or sessile, lip usually three-lobed, then divided into the lateral and middle lobes, mentum conical-saccate, obtuse 8
 8. Leaves elliptic, ovate or obovate, lip often furnished with pseudopollen, sepals up to 8 mm long, obtuse, column short and massive, 1.0–2.5 mm high *Polystachya* Hook.
 - 8.* Leaves narrow, grass-like, lip without pseudopollen, covered with numerous clavate or capitate prominent, long hairs, sepals more than 8.5 mm long, acuminate, column slender, 2–4 mm high *Isochilostachya* Mytnik & Szlach.

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