BRYOMORPHE AND *DOLICHOTHRIX* (GNAPHALIEAE–RELHANIINAE): TAXONOMY AND NOMENCLATURE

INTRODUCTION

The genus name *Bryomorphe* Harv. is derived from the Greek *bryon* for moss and *morphe* for form (Harvey 1863; Jackson 1990), to describe an unusual plant with a moss-like habit in the South African Gnaphalieae. The name *Dolichothrix* Hilliard & Burtt comes from the Greek *dolicho* for long and *thrix* for hair (Jackson 1990) and refers to the long, silky twin hairs on the cypselas.

These two monotypic genera belong to the *Metalasia* group in the tribe Gnaphalieae, subtribe Relhaniinae, as described by Anderberg (1991). This group of genera is defined by small, xerophytic leaves with a tomentose adaxial surface and by white, pink or plum-red florets (as opposed to the *Relhania* group with yellow florets). Although the two genera are quite distinct and easy to identify, even in a sterile state, their nomenclature has been confused in the past. *Dolichothrix* has very small adpressed, scale-like leaves, white involucral bracts, discoid heads and long, silky, twin hairs on the cypsela, whereas *Bryomorphe* has longer ericoid leaves, chaffy involucral bracts, radiate heads, with small white ray florets, wine-red disc florets and smooth cypselas.

Bryomorphe is restricted to the Western Cape where it is found in mountainous areas from near sea level (Vogelklip, Hermanus) to altitudes of up to 2 250 m (top of Matroosberg, De Doorns). The northernmost collection is from the Cederberg and the easternmost from the Klein Swartberg. It grows in shallow soil in rock crevices in Table Mountain Sandstone and is compact and well anchored to withstand extreme weather conditions. Plants are often found on exposed rock faces that are ravaged by strong winds, cold, snow and drought. These moss-like cushion plants create within themselves a microclimate of moisture and temperature, and in the process minimize evaporation (Zalensky 1948; Bokhari & Wendelbo 1985) to ensure their survival.

Other unique characteristics of *Bryomorphe* are the presence of aerial roots and the arrangement of hairs on the abaxial leaf surface (Koekemoer 2002). *B. aretioides* is the only species in the *Metalasia* group in which aerial roots were observed. This can possibly be attributed to the cushion growth form of the plants. When the branches in an apparently single cushion are untangled, it is clear that each cushion consists of a number of individual plants. After flowering, capitula disintegrate and many seeds drop into the dense mass of branches in the cushion, where they germinate but are unable to anchor in the ground. Therefore they develop aerial roots to anchor themselves to other branches and to gain access to nutrients. In most species of the *Metalasia* group, a thin, arachnoid, hairy layer covers the abaxial leaf surface. In *Bryomorphe* these hairs are oriented toward the leaf tip, to create a striate or combed appearance.

When in full flower, *Bryomorphe* is a very attractive plant (see illustration in Paterson-Jones 1997) and it could have potential as a horticultural subject for alpine gardens.

Dolichothrix is also endemic to the inland mountains of the Western Cape with a single collection from

near Jansenville in the Eastern Cape. It grows in rock crevices on vertical rocks or on rock slabs in sandstone and quartzite, at altitudes between 1 100 and 2 300 m in slightly more arid environments than *Bryomorphe*. In the Witteberg it is quite common on rock outcrops and grows up to 0.4 m tall.

NOMENCLATURE

Turczaninow (1851) described *Helichrysum aretioides* from the specimen (*Zeyher 2908*) collected on the Cape Mountains. This Russian botanist and administrator, a civil servant in the Departments of Justice and Finances (Stafleu & Cowan 1986), collected actively in the areas where he served, and published mainly on the Russian and Chinese floras. He is relatively unknown in the history of southern African botany but was a contemporary of Cassini, De Candolle and Thunberg. He most probably received the Zeyher specimen from De Candolle, with whom he corresponded frequently (letters in G, Stafleu & Cowan 1986).

Harvey (1863) described a new genus, *Bryomorphe*, for this unusual plant but was not satisfied to have the sterile specimen of *Zeyher 2908* in TCD as a type (duplicates in K, P, PRE, S, SAM and TCD) (acronyms according to Holmgren *et al.* 1990; electronic specimen seen, denoted by e!). He selected a second specimen, *Roser 42*, on which he based his description and illustration for *B. zeyheri*. In this description Harvey cited *H. aretioides* Turcz. as a synonym, which is based on the same type collection, *Zeyher 2908*. Unfortunately Harvey (1863) also cited *Klenzea lycopodioides* Sch.Bip. as a synonym. Harvey's citation of these two earlier names makes his name illegitimate and superfluous.

Levyns (1942) therefore chose the oldest name and made the new combination, *Bryomorphe lycopodioides* (Sch.Bip.) Levyns, based on *Klenzea lycopodioides* Sch.Bip. It is very unlikely that she saw the specimen of Krauss before she made this combination because *Bryomorphe* and *Dolichothrix* are very distinct monotypic genera and can not be confused, even on very poor sterile material. The holotype of *K. lycopodioides* in the Paris Herbarium (*Krauss s.n.*, Dist. George, Roodewal) clearly represents a plant we today know as *Dolichothrix ericoides* (Lam.) Hilliard & B.L.Burtt.

Druce (1917) made the correct combination, *Bryomorphe aretioides* (Turcz.) Druce, and he should be followed.

Fairly recently, the name *Helichrysum arctioides* Turcz. has come into use and was taken up in Klopper *et al.* (2006) as a synonym of *Dolichothrix ericoides*. As far as I can establish, Turczaninow never described such a species and the name may just be the result of an orthographic error due to misreading 'are' as 'arc' in poor copies of the original text.

TAXONOMY

Bryomorphe *Harv.* in Thesaurus capensis 2: 33, t. 151 (1863); Benth.: 324 (1873); Harv.: 277 (1865); E.Phillips: 800 (1951); Herman *et al.*: 127 (2000). Type species: *Bryomorphe aretioides* (Turcz.) Druce.

Bryomorphe aretioides *(Turcz.) Druce*, Second supplement to Botanical Society & Exchange Club of the British Isles, Report for 1916, vol. 4: 611 (1917). *Helichrysum aretioides* Turcz.: 79 (1851). Type: South Africa, summits of Table and Hottentots Holland Mtns, common but rarely flowering, *Zeyher 2908* (KW, holo. e!; P!, K!, PRE!, S!, SAM!, TCD!, iso.).

B. zeyheri Harv.: 33. t. 151 (1863); Harv.: 277 (1865), nom. illegit. superfl., syn. nov. Type: South Africa, summit of Genadendal Mtn, 5000' [1 524 m], *Roser 42* (TCD, holo.!).

B. lycopodioides sensu Levyns: 283 (1942). [Levyns based this name on *Klenzea lycopodioides* Sch.Bip., which is a synonym of *Dolichothrix ericoides* (Lam.) Hilliard & B.L.Burtt.]

Small, tufted, copiously branched, moss-like shrublets, up to 70 mm high. *Main branches* woody, densely leafy throughout, up to 1.5 mm diam., compacted into rock crevices; aerial roots present. *Leaves* sessile, closely imbricate, ascending, linear; slightly incurved; abaxial surface tomentose, hairs longitudinally striate, adaxial surface woolly, margins entire. *Capitula* heterogamous, radiate, 5–6 × 3–4 mm, 12–14-flowered with 6 or 7 ray and 7–9 disc florets; one to three capitula terminal on branches, partially imbedded in uppermost leaves. *Involucral bracts* 24–31; outer bracts ovate, foliaceous in upper part and along midveins, inner bracts linear to narrowly oblong, up to 5 mm long, scarious, tips rounded with large lateral wings clasping florets. *Receptacle* rounded, less than 2 mm diam., alveolate. *Ray florets* white, female, lamina ± 2.0 × 1.5 mm, 3-lobed, tube 4.5–5.5 mm long. *Disc florets* plum-red, bisexual, 5-lobed, 3.5–4.0 mm long. *Anthers* apically acuminate, basally tailed. *Style* bifid, apices of style branches in ray florets rounded, sweeping hairs not tufted, tips of style branches in disc florets truncate, sweeping hairs tufted. *Nectaries* a small disc between style base and cypsela. *Cypsela* terete, ± 1 mm long, straw-coloured, laevigate; pappus setae free, (14–)18–22(–28), ± 4.5 mm long, barbed in lower four-fifths, densely plumose in upper fifth, occasionally interspersed with clavate cells, cell tips acuminate or rounded, often filled with a yellowish residue. *Flowering time*: mainly in Oct. to Jan., occasionally in Aug., Sept. and Feb.

Dolichothrix *Hilliard & B.L.Burtt* in Botanical Journal of the Linnean Society 82: 221 (1981); Herman et al.: 134 (2000). Type species: *Dolichothrix ericoides* (Lam.) Hilliard & Burtt.

Dolichothrix ericoides *(Lam.) Hilliard & B.L.Burtt* in Botanical Journal of the Linnean Society 82: 221 (1981). *Xeranthemum ericoides* Lam.: 240 (1789). *Helichrysum ericoides* (Lam.) Pers.: 415 (1807). *Argyrocome ericoides* (Lam.) Lam.: t. 693, f. 2 (1823). *Aphelexis ericoides* (Lam.) Sweet: 223 (1826). *Gnaphalium argyrocoma* Sch.Bip.: 169 (1845). Type: Cape of Good Hope, *Sonnerat s.n.* (P-LAM, holo.!).

Stoebe nivea Thunb.: 170 (1800); Willd.: 2408 (1803); Thunb.: 729 (1823). Type: Cape of Good Hope, *Thunberg s.n. sub THUNB-UPS 20976* (UPS, holo. !).

Klenzea lycopodioides Sch.Bip.: 973 (1843), syn. nov. *Bryomorphe lycopodioides* (Sch.Bip.) Levyns (1942), syn. nov. Type: Inter rupes

montium prope Roodewal, dist. George in Promontorio bonae spei, *Krauss s.n.,* (P, holo. !).

Woody dwarf shrubs, 0.1–0.2(–0.4) m tall, often with a stunted growth. *Main stems* usually firmly anchored in rock crevices, secondary and tertiary branches erect, often appearing one-sided on herbarium specimens; very old plants may develop a woody base with numerous buds and remains of old stems; main stems up to 8 mm diam., new growth white-woolly, greying with age; secondary stems ± 2 mm diam., branching copiously from below previous season's capitulum, woolly-hairy; branches foliaceous throughout. *Leaves* small, scale-like, tightly adpressed, not more than 2 mm long and just as wide, adaxial surface woolly-hairy; abaxial surface arachnoid, appearing shiny, very densely glandular. *Capitula* homogamous, discoid, 6–8 mm long, 1–3 terminal on branches, 24–28-flowered, spreading funnel-like from a narrow base; up to 8 mm diam. at opening. *Involucral bracts* 48–52, in several rows, white, not translucent, reflexed in upper third, tips opaque, milky-white; receptacle flat, alveolate, 1.5–1.7 mm diam. *Florets* ± 3.5 mm long, scarcely widening towards lobes, lobes pilose outside, often reddish. *Anthers*: apical appendages acuminate, basally tailed. *Style* bifid, basally swollen, branches slightly rounded. *Nectaries* absent. *Cypsela* with very dense, white, straight and stiff twin hairs; ribs 5, narrow; pappus fused in a ring at base, 18–24 setae, barbed to shortly plumose throughout, hairs fused into a flat tip with hair apices rounded and inflated. *Flowering time*: sporadic, mainly from Dec. to Mar., rarely in Aug.

The popular name for this plant, 'rock rhenoster', refers to its resemblance to *renosterbos* (*Elytropappus rhinocerotis)*. Both species have minute, adpressed, scale-like leaves covered in subsessile glands with overlying arachnoid hairs. Although leaf morphology in sterile specimens can easily lead to wrong identifications, the distinct differences in the capitula and cypsela structures can clearly identify both species.

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