COLCHICACEAE

COLCHICUM ALBOFENESTRATUM, A NEW SPECIES FROM NAMAQUALAND, SOUTH AFRICA

Colchicum L. was until recently regarded as a strictly northern hemisphere genus comprising ± 90 species of acaulescent, often hysteranthous-leaved geophytes. Based on the results of the molecular studies in Colchicaceae by Vinnersten & Manning (2007), the genus was redefined by Manning *et al.* (2007) to include all the species of *Androcymbium* Willd., ± 50 of which occur in southern Africa with a further few species in the Canary Islands, North Africa and the Mediterranean. As presently circumscribed, *Colchicum* is found in Africa, Europe and Asia and encompasses ± 150 species. The enlarged genus is well defined by its mostly reduced or absent stem, a congested spike of erect, sessile or subsessile, bracteate flowers with specialized androecial nectaries situated at the base of the filaments (secondarily lost in some species), by unusual 2–4-porate pollen, and by the occurrence of idioblasts containing sulphur-mucopolysaccharides in some or all parts of the plant.

Among the southern African species of *Colchicum*, Müller-Doblies & Müller-Doblies (1984, 1990, 1998, 2002) added 23 new species and three new subspecies to the traditionally recognised *Androcymbium*. Pedrola-Monfort *et al.* (1999a, b) contributed a further two new species and one new subspecies, and Manning & Goldblatt (2001) described one more new species. During the compilation of an account of the monocotyledonous flora of the Succulent Karoo region, South Africa (Snijman *et al.* 2008) it became evident that three collections in the Compton Herbarium (NBG) represent a very distinctive species from Namaqualand that still remains unnamed. First collected in 1986 by Dr E.G.H. Oliver, a well-known Cape botanist, this new species is recognised by its crispulate leaf margins and the white and green tessellated bracts, and is described as *Colchicum albofenestratum*.

Colchicum albofenestratum *J.C.Manning & Snijman*, sp. nov.

Plantae acaulescentes, cormo (8–)10–23 mm diam. Folia 3, disticha; inferioribus 2 lanceolatis vel ovatis, 20–45 × 6–30(–45) mm, patentibus, marginibus undulatis vel crispulatis, hyalinis, cartilagineis, plerumque laevibus; supremo suberecto vel erecto, late ovato vel oblongo, acutato vel obtusato, carinato, 20–45 × 12–40 mm, nervatura viridi, intervenio albo, margine plano vel leviter undulato, laevi, carina hyalina et cartilaginea, laevi vel papillata; bracteis late ovato-oblongibus vel obovatibus, colore folium supremum simulantibus. Flores 1 vel 2, sessiles; perianthio unguiculato, ± 12 mm longo, ungue 5–6 × 1.5–2.0 mm; limbo auriculato-cucullato, 7 × 3 mm. Stamina exserta; filamentis curvis, 7 mm longis, limbum tepali ± aequantibus; antheris oblongis, 5.5–6.0 mm longis. Ovarium subglobosum, ± 4 mm longum; stylo ± 7 mm longo.

TYPE.—Western Cape: 3118 (Vanrhynsdorp): Knersvlakte, Kwaggaskop, clay flats near railway line, (–BC), 20 August 1986, *Snijman 1064* (NBG, holo.).

Acaulescent, cormous geophyte. *Corm* 40–55 mm deep, ovoid, (8–)10–23 mm diam., with crescent-shaped basal crest, tunics brown, coriaceous. *Leaves* 3, distichous, amplexicaul; lower 2 spreading or prostrate, lanceolate to ovate, 20–45 × 6–30(–45) mm, apiculate, margin closely undulate or crispulate, hyaline, cartilaginous, smooth or rarely minutely ciliate basally; uppermost suberect or erect, thin-textured, broadly ovate-oblong, 20–45 × 12–40 mm, acute or obtuse, keeled, conspicuously tessellated, white with green rectangular veining, the green coloration usually coalescing and becoming solid distally, white windows collapsing when dry and thus ± excavated, margin plane or slightly undulate, smooth, keel hyaline and cartilaginous, smooth or papillate; bracts broadly ovate-oblong to obovate, resembling upper leaf in texture and coloration but tessellated throughout, lowermost slightly smaller than uppermost leaf, 15–40 mm long. *Flowers* 1 or 2, sessile; perianth ± 12 mm long, clawed, tepal claw 5–6 × 1.5–2.0 mm, tepal limb erect, lanceolate, cucullate, basally auriculate, 7 × 3(–6) mm. *Stamens* exserted; filaments curved, shorter to ± as long as tepal limb, 4–7 mm long, apparently green; nectary globular, ± 1 mm diam., apparently darkly coloured; anthers oblong, 5.5–6.0 mm long. *Ovary* subglobose, ± 4 mm long; styloids erect, apically recurved, ± 7 mm long; stigmas apical, punctiform. *Flowering time*: mid to late July, rarely early August. Figure 6.

Distribution and ecology: *Colchicum albofenestratum* is currently known from just two localities on the Knersvlakte, a broad undulating plain in southern Namaqualand that straddles the Northern and Western Cape Provinces, South Africa. In the northeastern Knersvlakte, the species has been recorded from the lower foothills of the inland escarpment, ± 20 km SW of Loeriesfontein, Northern Cape, and in the southwest it is known from an area just north of the Soutrivier near the Farm Rooiberg, Western Cape (Figure 7). The single northeastern Knersvlakte plant examined has the tepals unusually broadened at the base, ± 5 mm wide, forming a conspicuous nectar cup. Unfortunately the apices have been eaten off and it is also not possible to determine how consistent these broad tepals are within the population. In all other respects it matches the Rooiberg plants exactly. Never abundant, *C. albofenestratum* grows in stony, loamy sand among sparse, low, succulent shrubs in a climate marked by hot, dry summers and mild, rainy winters. Like most southern African *Colchicum* species from the winter rainfall region, *C. albofenestratum* flowers in winter, usually from mid to late July into August.

Working within the concept of the genus *Androcymbium*, Müller-Doblies & Müller-Doblies (2002) recognised several floral features as putative adaptations to pollination systems. From the form and size of the tepals, the length of the anthers, and the position and colouring of the androecial nectaries, they inferred the existence of melittophilous, myophilous and mammal pollination syndromes in several southern African species. In addition, Manning *et al.* (2007) hypothesized that the coloured or contrastingly textured bracts that characterize several *Colchicum* species with geoflorous inflorescences are

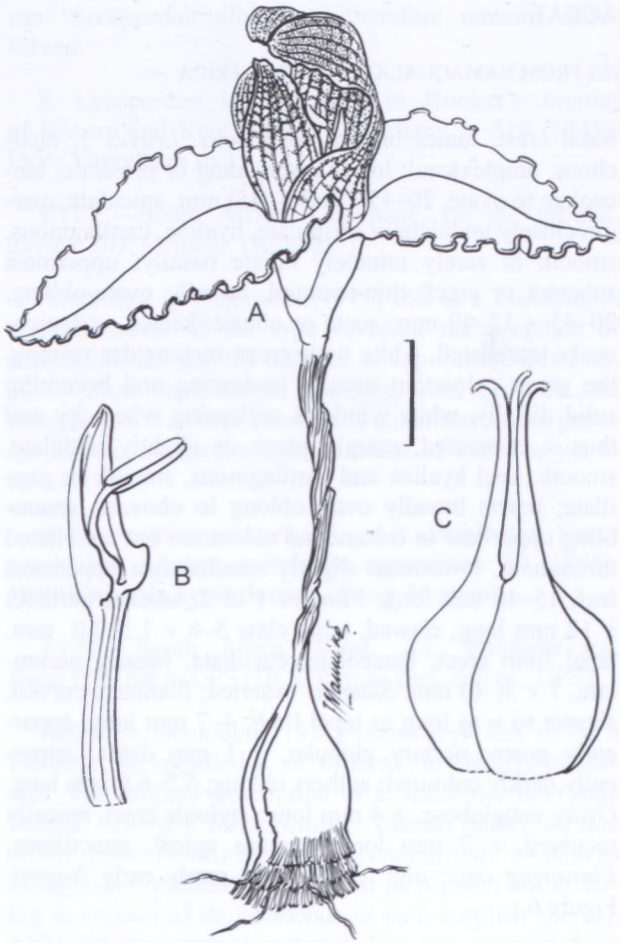

FIGURE 6.—*Colchicum albofenestratum*, *Snijman 2349* (PRE). A, plant; B, detached tepal; C, developing capsule. Scale bar: A, 10 mm; B, C, 5 mm. Artist: J.C. Manning.

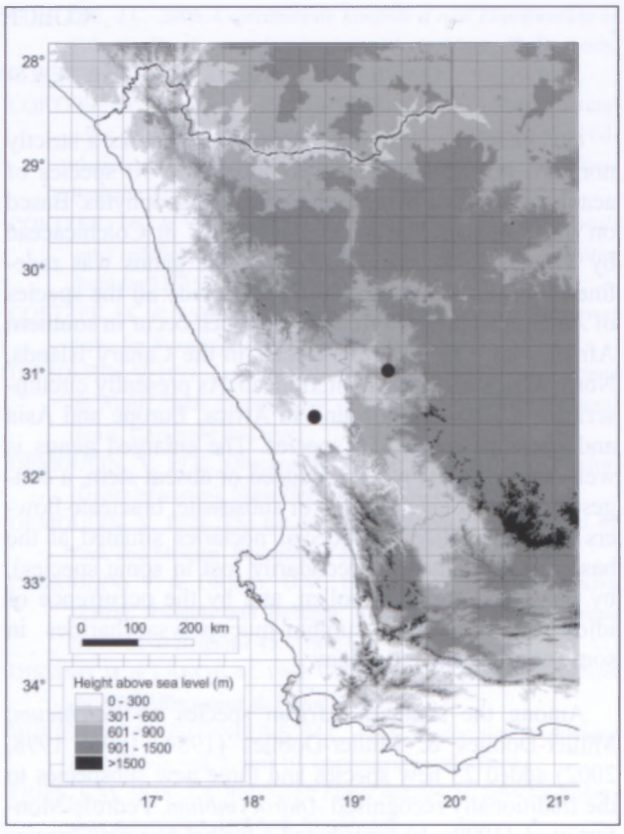

FIGURE 7.—Known distribution of *Colchicum albofenestratum*.

possible adaptations to rodent pollination. The importance of these floral traits has since been confirmed by Kleizen *et al.* (2008) who found that *Colchicum scabromarginatum* (Schltr. & K.Krause) J.C.Manning & Vinnersten appears to depend exclusively on rodents for fertilization, that *C. coloratum* J.C.Manning & Vinnersten subsp. *coloratum* attracts both rodents and birds, and that *C. hantamense* Engl. is honey-bee pollinated. Based on these findings it seems likely that *C. albofenestratum*, with its broad, thin-textured, white and green tessellated bracts and apparently dark nectar, constitutes a further member of the guild of rodent-pollinated geophytes that is now known from the Succulent Karoo.

Diagnosis and relationships: *Colchicum albofenestratum* is distinguished by its markedly heterophyllous leaves, with the lower two leaves opposite, spreading or prostate, crispulate-edged and mostly aciliate, and the upper leaf and bracts broadly ovate-oblong and attractively patterned by vertical rows of small, thin-textured, depressed, white interstices between green, longitudinal and cross-veins. The solitary or paired flowers have tepals with a limb ± 7 mm long and almost equal to the filaments in length, large anthers 5.5–6.0 mm long, and apparently dark androecial nectaries.

The tessellated bracts and uppermost leaf of *C. albofenestratum* are unique in the genus and are approached only in *C. crispum* (Schinz) J.C.Manning & Vinnersten, in which the uppermost leaf is white with green veins in the lower half and the bracts are entirely white or flushed green apically. *Colchicum crispum* is the only other species known to have crispulate leaf margins but the margins in this species are copiously and coarsely ciliate, and the filaments are much exserted from the tepal limbs.

Species relationships within *Colchicum* remain incompletely understood. The detailed infrageneric classification of *Androcymbium* proposed by Müller-Doblies & Müller-Doblies (2002), based on morphology that primarily reflects pollination syndromes, has not received support from the molecular studies by Manning *et al.* 2007, which show that section *Androcymbium* is polyphyletic and that the attractively coloured or enlarged upper leaf and bracts appear to have evolved independently in at least two clades in section *Androcymbium*. We are unable to speculate on the possible relationships of *C. albofenestratum* at present.

Other specimens seen

NORTHERN CAPE.—3019 (Loeriesfontein): Kamdaniekop, slopes SW of turnoff to Kliprand, (–CD), 12 July 1986, *Oliver 8844* (NBG).

WESTERN CAPE.—3118 (Vanrhynsdorp): Kners-vlakte, Farm Rooiberg, sand at base of dolomite outcrop, (–BC), 22 July 2005, *Snijman 2022* (NBG); 31 August 2009 (fruiting), *Snijman 2349* (PRE).

ACKNOWLEDGMENTS

The Department of Tourism, Environment and Conservation in Northern Cape, the Western Cape Nature

Conservation Board, and Mr Buys Wiese are thanked for permits and permission to collect specimens on the Knersvlakte. Colin Paterson-Jones kindly assisted in the field and Hester Steyn prepared the map.

REFERENCES

KLEIZEN, C., MIDGELEY, J. & JOHNSON, S.D. 2008. Pollination systems of *Colchicum* (Colchicaceae) in southern Africa: evidence for rodent pollination. *Annals of Botany* 102: 747–755.

MANNING, J.C. & GOLDBLATT, P. 2001. A remarkable new species of *Androcymbium* from Northern Cape, South Africa. *Bothalia* 31: 203–205.

MANNING, J.C., FOREST, F. & VINNERSTEN, A. 2007. The genus *Colchicum* L. redefined to include *Androcymbium* Willd. based on molecular evidence. *Taxon* 56: 872–882.

MÜLLER-DOBLIES, U. & MÜLLER-DOBLIES, D. 1984. Zur Kenntnis der Gattung *Androcymbium* (Colchicaceae) im südlichen Afrika: Zwei Synonyma und fünf neue Arten. *Willdenowia* 14: 179–197.

MÜLLER-DOBLIES, U. & MÜLLER-DOBLIES, D. 1990. Zur Kenntnis der Gattung *Androcymbium* (Colchicaceae) im südlichen Afrika: 2. *Androcymbium exiguum* hat doch Artwert. *Willdenowia* 19: 453–470.

MÜLLER-DOBLIES, U. & MÜLLER-DOBLIES, D. 1998. De Liliifloris notulae. 6. De decuria prima specierum novarum generis *Androcymbium* sect. Androcymbium (Colchicaceae) in Africa Australis *s.l. Feddes Repertorium* 109: 551–572.

MÜLLER-DOBLIES, U. & MÜLLER-DOBLIES, D. 2002. De Liliifloris notulae. 7. De decuria altera specierum novarum generis *Androcymbium* (Colchicaceae) in Africa Australi *s.l. Feddes Repertorium* 113: 545–599.

PEDROLA-MONFORT, J., MEMBRIVES, N., MONTSERRAT, J.M. & CAUJAPÉ-CASTELLS, J. 1999a. A new species from western South Africa: *Androcymbium huntleyi* (Colchicaceae). *Fontqueria* 53: 1,2.

PEDROLA-MONFORT, J., MEMBRIVES, N. & MONTSERRAT, J.M. 1999b. Two new *Androcymbium* (Colchicaceae) from western South Africa. *Fontqueria* 54: 7–9.

SNIJMAN, D.A., MANNING, J.C., GOLDBLATT, P., FISH, L., DUNCAN, G.D., ARCHER, C., ROUX, J.P., KURZWEIL, H., LINDER, H.P., VERBOOM, G.A., KLOPPER, R.R. & SMITH, G.F. 2008-09. *Monocotyledons, ferns and quillworts of the Namaqualand-Namib Succulent Karoo, Tanqua-southern Great Karoo and Western Mountain Karoo, southern Africa*. website: http://www.sanbi.org/frames/posafram.htm/.

VINNERSTEN, A. & MANNING, J.C. 2007. A new classification of Colchicaceae. *Taxon* 56: 171–178.

D.A. SNIJMAN* and J.C. MANNING*

* Compton Herbarium, South African National Biodiversity Institute, Private Bag X7, 7735 Cape Town.

MS. received: 2009-09-16.