A NEW SPECIES OF *KEDROSTIS* FROM THE WESTERN CAPE

Kedrostis psammophila *Bruyns*, sp. nov., a ceteris speciebus capreolis destitutis, caulibus horizontalibus subterraneis repentibus, receptaculo longissimo in flore femineo cum ovario subterraneo differt. Type: South African Cape, Nortier, *Bruyns 4569* (BOL, holo.; PRE, K, M, iso.).

Plant with carrot-shaped to cylindrical tuber up to 200 × 100 mm or more, usually at least 150 mm beneath soil surface and pale grey-brown with white flesh, with several smaller subsidiary tubers produced elsewhere along stems, very strongly foetid, monoecious. *Stems* soft, creeping horizontally to 1 m or more and extensively branched beneath soil surface, cylindrical, white; portions above ground usually not more than 150 mm long, clustered, horizontally spreading, bearing leaves along whole length, grey-green, hairy. *Leaves* palmately 3- to 5-lobed often to at least halfway but sometimes ± entire, 6–20 × 10–25 mm, segments irregularly dentate, almost all of equal size, grey-green, hairy on both sides; petiole 8–15 mm long, grooved above, setose. *Tendrils* and *stipules* none. *Flowers* unisexual, male and female quite different and borne separately, inflorescences arising from underground stems. *Male flowers* on *peduncle* ± 80.0 × 1.5–2.0 mm of which usually 50 mm protruding from soil bearing 25 or more flowers, green and pilose above ground, white and glabrous below; *bracts* ± 4 mm long, often with few small teeth on margin, lanceolate, spreading; *pedicel* 12–22 mm long, slightly over 1 mm thick; *calyx* green, pilose outside, receptacle ± 4 mm long; *sepals* 1.5–2.0 × ± 1.5 mm, acute; *corolla lobes* spreading with recurved obtuse tips, 5–7 × 3 mm at base, outside green and pilose, inside green with darker longitudinal stripes, fine hairs, and yellow multicellular short clavate papillae towards edge and apex; *anthers* 3, white, erect, ± 3 mm long, very hairy inside around base, one small with 1 locule, two larger with 2 locules each. *Female flowers* on subterranean *peduncle* 0–20 × 1.0–1.5 mm, bearing 1 flower and 1–2 small bracts at apex, white, glabrous; *pedicel* curving downwards, ± 2 mm thick, white with few scattered hairs; *calyx* pale yellow, sparsely and finely pilose, smooth; *receptacle* initially horizontal then erect, cylindrical and solid, 35–70 × 2–3 mm, widening to 5–6 mm in last 5 mm, mostly subterranean; *sepals* to 2 mm long, lanceolate; *corolla lobes* 10–12 × 3–4 mm, broadest just above middle, slightly narrower at base, with rounded obtuse apex, ascending-spreading, pale greenish and smooth outside, bright yellow and papillate within; *staminodes* 0–2 per lobe (5 per flower), pilose, erect, ± 2 mm long, inserted near base of petals; *ovary* ± ovoid, horizontal, 5–7 × 4–5 mm, pale yellow, finely papillate; *style* 5–7 × 1.5–2.0 mm with broad cauliflower-like obscurely trifid apex, fused to receptacle about 4 mm below sepals. *Fruit* (only 1 seen) ± spherical, 22 mm diam., finely pubescent, green where exposed, white beneath soil. *Seeds* 8, white, flattened ovoid, 10 × 7 mm (not yet ripe). Flowering April to June. Figure 5.

Specimens examined

CAPE.—**2917** (Springbok): Wildeperdehoek Pass, (–DC), *Bruyns 5171* (BOL); 5 km S Pass, (–DC), *Bruyns 5174* (BOL). **3017** (Hondeklipbaai): Riethuis, (–AB), *Bruyns 4593* (BOL); 7 km S Taaibosduin, (–AD), *Bruyns 4592* (BOL); NE Soebatsfontein, (–BA), *Bruyns 5184* (BOL); Swartvlei, (–BD), *Bruyns 5354* (BOL); Sandkraal, (–DA), *H.-Taylor 1378* (BOL); Nariep, (–DC), no material deposited. **3018** (Kamiesberg): Stofkraal, (–CB), *Bruyns 4712* (BOL); Kliprand, (–DA), *Bruyns 5268* (BOL). **3118** (Vanrhynsdorp): Swartbooisvlei, (–AC), *Bayer 6229* (BOL); Draaihoek, (–CB), *H.-Taylor 1146* (BOL). **3218** (Clanwilliam): Nortier, (–AB), *Bayer* (BOL); *Bruyns 4569* (BOL, PRE, K, M); Grootdrif, (–AD), *Bruyns 4738* (BOL); Redelinghuys, (–BC), *Bruyns 4737* (BOL).

The Cucurbitaceae are a relatively small family in southern Africa with eight genera and 72 species (Meeuse 1962; Gibbs Russell *et al.* 1987; De Wet *et al.* 1991). The family is mainly found in those parts of the subcontinent receiving summer rainfall with only about five species (of the genera *Melothria*, *Kedrostis* and *Cucumis*) native to the western Cape. Most of them are creepers or climbers, often with a large tuberous rootstock and characteristic cucumber- or pumpkin-like fruit.

According to the key in Meeuse (1962), the present new species belongs to *Kedrostis* Medik. and is the ninth species known in southern Africa.

K. psammophila has less of a climbing or scandent habit than any other southern African species. The aerial stems are short and usually prostrate. They lack tendrils, which are found on all other southern African species of *Kedrostis*. Beneath the surface the stems spread extensively and are repeatedly branched so that the largest, central tuber can be very difficult to locate. Subsidiary tubers are sometimes found at the nodes at intervals along these underground stems and it is from these underground stems too that the inflorescences arise.

According to Meeuse (1962: 24), in *Kedrostis*, the male and female flowers are often borne on separate inflorescences with the males usually clustered and the females either clustered or solitary. This always appears to be the

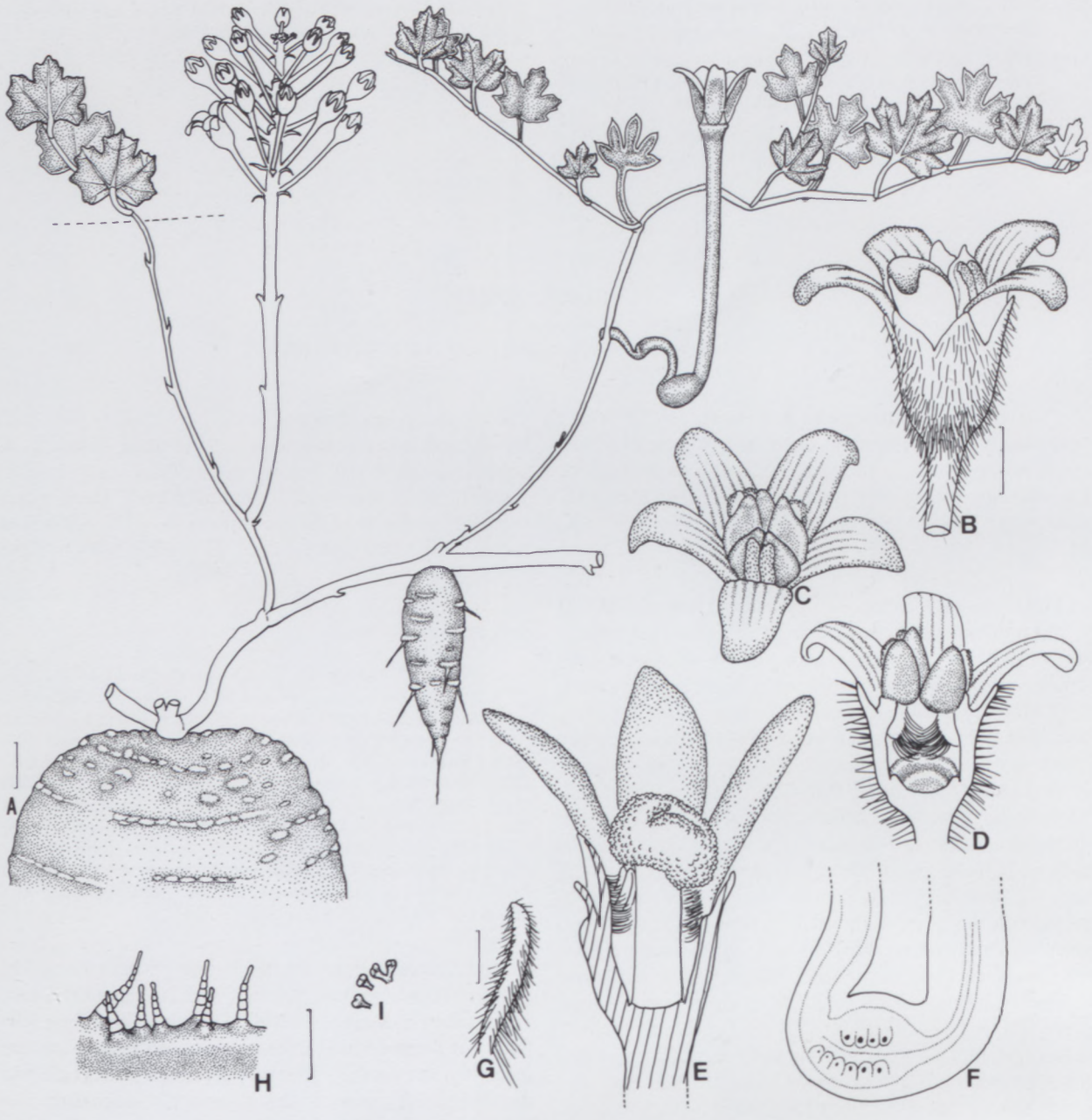

FIGURE 5.—*Kedrostis psammophila*. A, part of plant showing male inflorescence with many small flowers and female inflorescence with single flower longer and larger than male; dotted line on left indicates ground level. B, C, male flower; D, dissection of male flower; E, dissection of top of female flower; F, dissection of inflated base of female flower showing ovules; G, staminode from female flower showing hairs; H, hairs on edge of leaf; I, papillae on corolla surface. Scale bars: A, 10 mm; B–F, 3 mm (at B); G, 1 mm; H, I, 0.5 mm.

case in *K. psammophila*. He found that in general the female and male calyces and corollas are identical, but this is not true of the new species. Here the males are borne on a ± dense pedunculate inflorescence protruding from the soil and they are small and green. The bright yellow female corolla is about twice the size of the male. It has an extremely long solid receptacle with the ovary at its base close to the stem and well below the ground and the corolla situated just above the surface of the soil. This leads to the remarkable situation of the fruit developing beneath the soil and makes *K. psammophila*, along with *Cucumis humifructus* Stent, only the second known geocarpic cucurbit in southern Africa (Meeuse 1962: 62). Female flowers were found to be much rarer that male but a few were observed on the same plants as males. The plants are therefore generally assumed to be monoecious.

I have been unable to locate any herbarium records made prior to 1986 in any of the western Cape herbaria and it is remarkable that this widespread and common species has not been noticed earlier. The species was brought to my attention by M.B. Bayer, who noticed the unique flowering habit in plants growing wild near the Agricultural Research Station at Nortier. It has since turned out to be widespread in the fine reddish sand found over most of western Namaqualand from Redelinghuys in the south to around Port Nolloth (Figure 6). It occurs on this sand eastwards to the foothills of the Khamiesberge and is also found in patches of relatively soft

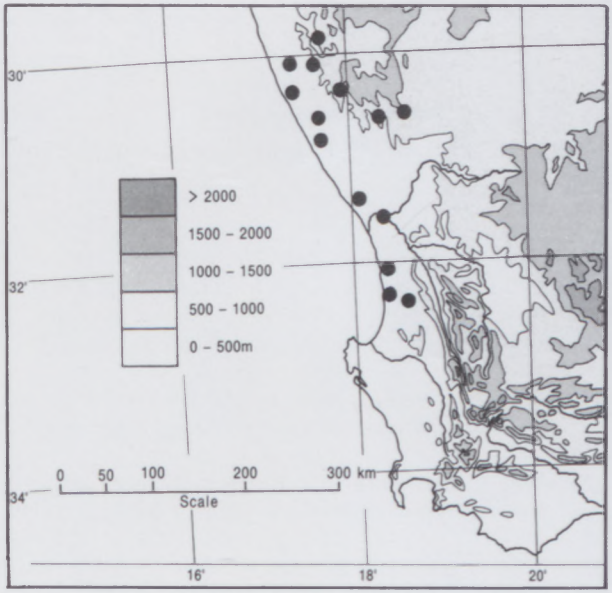

FIGURE 6.—Distribution of *Kedrostis psammophila*.

gneissic sand (much more gravelly than the coastal sands) higher up on the southern side of the Khamiesberge as far east as Kliprand.

Finding fruit of this species proved difficult and I have only seen one (*Bruyns 5174*). This had been partially exposed by erosion of the soil above it and was probably not quite fully developed. It contained eight relatively large seeds (some dissected ovaries contained up to 10 ovules) and was extremely smelly when opened. In fact, when damaged all parts of the plant give off the unpleasant foetid odour characteristic of *Kedrostis*. Meeuse mentions that *C. humifructus* is dispersed by antbears. I have, though, noticed no particular concentrations of *K. psammophila* around the groundsquirrel warrens which are common in the sandier parts of Namaqualand and its seeds may be dispersed by moles.

REFERENCES

DE WET, B.C., ARCHER, R., FISH, L., GERMISHUIZEN, G., HERMAN, P.P., JORDAAN, M., PEROLD, S.M., REID, C., VAN ROOY, J., WELMAN, W.G. & GLEN, H.F. 1991. New taxa, new records and name changes for southern African plants. *Bothalia* 21: 211.

GIBBS RUSSELL, G.E., WELMAN, W.G., RETIEF, E., IMMELMAN, K.L., GERMISHUIZEN, G., PIENAAR, B.J., VAN WYK, M. & NICHOLAS, A. 1987. List of species of southern African plants. *Memoirs of the Botanical Survey of South Africa* No. 56: 201–203.

MEEUSE, A.D.J. 1962. The Cucurbitaceae of southern Africa. *Bothalia* 8: 1–111.

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