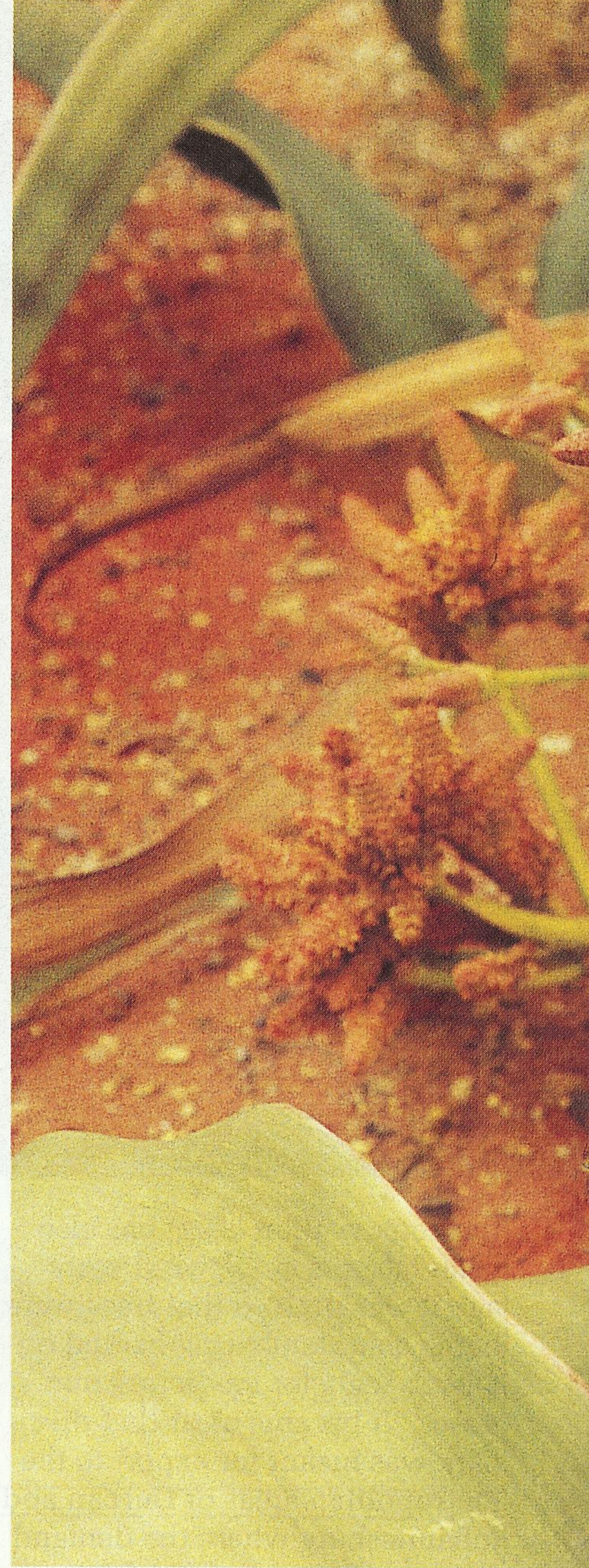


The morphology and ecology of *Welwitschia mirabilis* is unrivalled in the plant world and its discovery made headlines in the botanical literature. *Welwitschia mirabilis* was discovered in 1859 by Friedrich Welwitsch, an Austrian botanist, botanical explorer and medical doctor near Cape Negro in south-western Angola. He sent his plants to the well-known artist and traveller, J. D. Hooker, who, in 1862 (in the *Gardener's Chronicle*), named it after Welwitsch, in his honour. It belongs to the family Welwitschiaceae and is one of the most curious plants known to science. It occurs widely in the Namib desert from Mossamedes in southern Angola to the Kuiseb River in central Namibia but, with a few exceptions, *Welwitschia* plants are seldom found more than 100 to 150 km from the coast, their distribution always coinciding with the fog belt. The Namib region is subject to regular dense fog, a phenomenon associated with the cold, north-flowing Benguella current. The fog develops during the night and subsides at about 10 am. The leaves of *Welwitschia*, unlike those of most xerophytes (plants adapted to dry conditions) from arid regions, are broad, large and drooping (in older plants) and are thus ideal for trapping condensed moisture, which is directed downwards to the roots. Stomata (breathing pores) are numerous on both leaf surfaces, unlike other xerophytes, and recent research indicates that fog-water is taken up directly by these stomata (Bornman 1972). Fog contributes up to 50 mm of the annual precipitation, but in spite of this regular water supply, *Welwitschia* plants are still dependent, to some extent, on an additional source of moisture.

When I started curating the succulent collection at Kirstenbosch National Botanical Garden in 1976, I inherited a few large *Welwitschia* plants, which produced flowers annually. The oldest dates from 1949 and my interest in these remarkable

plants was renewed in 1985 when a greenhouse was erected in the Kirstenbosch nursery for the purpose of *Welwitschia* seed production. The idea of a special *Welwitschia* greenhouse came from John Winter, curator of Kirstenbosch, in response to a continual global demand for seed. Seeds collected from populations in the wild are normally heavily infested with the fungus *Aspergillus niger*. Having been made responsible for their propagation and cultivation, I developed a love for and special interest in my *Welwitschia* 'babies'. My colleague, Margaret Thomas, with Heather Paterson, collected a bag of seeds from Koigab, in Namibia, which Tommy Sardien and I sowed *in situ*. Today we have about 150 plants, the first seedlings having flowered two-and-a-half years after sowing. To date eight males have flowered, with our first female coning this year at the age of five-and-a-half years. The stigmas remained receptive for 3 months, from mid-summer through to autumn and were carefully pollinated, after ripening, with the pollen from the male flowers. The first seeds were released on 12 June 1992 and the fruits appeared uncontaminated by any fungus. The 1986 seedlings have exhibited great variation in shape and growth rate, the biggest having produced leaves that measure 20 - 30 mm in length with a stem diameter of 65 mm. Our cultivation success can be ascribed to the additional bottom heat during the winter months, the rich well-drained red 'Vanrhynsdorp' sand used and to regular watering.

Most people imagine *Welwitschia* to be a difficult plant in cultivation, almost impossible to grow and needing very special attention. This is only partly true and my experience is that *Welwitschia* can be grown with ease, even as a pot plant, which once established, will grow steadily and remain relatively disease-free. The only critical stage is the first eight months of life when the seedlings are prone to fungal attack



The first female plants to cone at Kirstenbosch. This seedling is five-and-a-half years old. Photo: E. van Jaarsveld

(soft rot). Plants can be grown quite successfully on windowsills and stoeps in cooler climates, although their growth rate is much slower than in warmer areas. Care should be taken not to under-water the plants or allow them to dry out completely. *Welwitschia* is not a succulent in the true sense of the word and cannot be treated as one would normal succulents such as *Adenium*, *Aloe* or



WELWITSCHIA MIRABILIS IN CULTIVATION AT KIRSTENBOSCH

by Ernst van Jaarsveld, Kirstenbosch Botanical Garden

Crassula. Plants are dependent on additional water from their roots, a fact that becomes plain if one studies their native habitat. The successful cultivation of any plant is, in fact, dependent on a good understanding of its habitat and growth requirements.

Viable *Welwitschia* seeds should germinate without problems. However, the species' best period is in summer and sowing should thus preferably take place

during the warmer months. Because of the rapid initial growth of the taproot, transplanting is difficult and it is better to sow directly into the container where the plants are to be kept for a few years at least. It is essential to select a suitable container, preferably oblong, with a depth of 20 cm or more. The shape is not of importance, as long as there is sufficient space for the tap root to develop and

adequate drainage. The seeds can initially be sown in small individual nursery containers, if desired, and repotted at a later stage without disturbing the tap root.

The soil should be sandy and well drained, comprising a mixture of 2 parts sand, 1 part loam and 1 part compost and including ample bone meal (a natural non-burning organic fertilizer). The ingredients should




Welwitschia mirabilis with male inflorescence. This seedling first flowered two-and-a-half years after sowing.

Photo: E. van Jaarsveld

be thoroughly mixed. It is better to use pre-sterilized soils since the seedlings are extremely prone to fungal attack during the first six months of life. The container should be filled with soil and firmed down to about 2 cm from the top, allowing watering space. The soil can then be thoroughly moistened. Sow in spring or summer, using 2–3 seeds per container (near the centre), as there is always uncertainty regarding seed viability. The

seeds are large and winged (adapted for wind dispersal) and the wing can either be torn off or left on before sowing. If more than one seed germinates in the container where the plant is to remain for a number of years, the extra seedlings can be transplanted within the first month, or left to share space with their mates. Sowing consists of placing the seed on top of the soil and just covering it with a layer of sand. The pot should be

watered well and kept in a warm, sunny situation. It is important to add a mild fungicide, such as Captan, to the irrigation during the first year. The soil must be kept moist until germination, which should take place from seven days to a few months. Seeds sown in the *Welwitschia* greenhouse on 15 August 1986 started germinating from 23 August, but the majority in September. If the root tip is bent, broken, or damaged, the seedling dies. Keep the seedlings well watered during the first season. The rate of growth is also dependent on temperature. The higher the temperatures, the more rapid the seedling growth and eventually, the flowering. Our Koigab seedlings had grown to a height of 20–30 mm three weeks after germination, with a tap root of 50–70 mm long. By February 1987, five months after sowing, the average leaf length was 80–90 mm long and 6 to 11 mm broad, and the diameter of the stem 4–6 mm. Our *Welwitschia* plants are currently watered once every two weeks and less so in winter. During the natural resting (cooler) season the watering should be reduced. In late spring, with the onset of the warm weather, watering can be increased again. It is important to place the container in a well-aerated, warm atmosphere, preferably in filtered sunlight, especially with germinating seedlings. Plants are sensitive, especially to sudden changes in light intensity. If the plant is grown in a shady situation and suddenly placed in full sun the leaves may burn or the whole plant could succumb. So always remember this when moving *Welwitschia*. 

Acknowledgement

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Reference

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Further reading

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