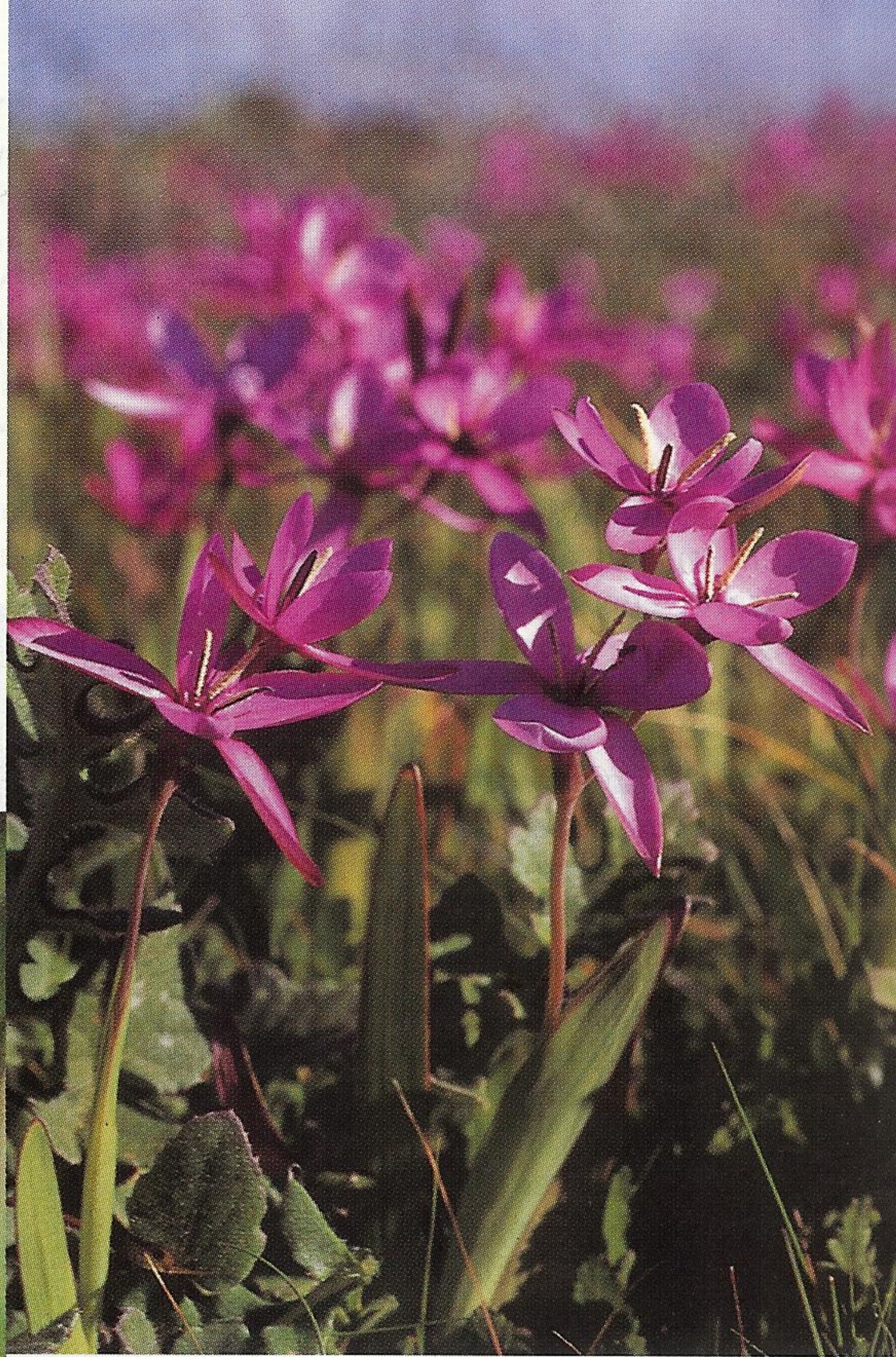


# HESPERANTHA

## THE EVENING FLOWER

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The genus *Hesperantha*, a member of the important southern African plant family Iridaceae, contains some sixty-five species. Despite this large number, the genus shows remarkably limited variability in its floral structure. The small plants, seldom more than 15 to 20 cm tall, and often less, have radially symmetric flowers, usually with a floral tube about as long as the petals, filaments inserted just below the mouth of the tube, and a style that divides at the mouth of the tube into three long stigmatic branches that spread over the tepals. The latter feature is the character that defines the genus.

*Hesperantha* means 'evening flower', the name based on the fact that those species first discovered had white flowers that opened in the later afternoon and lasted into the night, producing strong sweet fragrance, often with spicy overtones of cinnamon or cloves.

Left. The high Drakensberg species, *Hesperantha scopulosa*, the cliff hesperantha, has pink flowers with a long floral tube. Open during the day, they are pollinated by a long-proboscid fly, the only insect able to forage on nectar in the lower half of the tube.

Above. The lovely pink flowers of *Hesperantha pauciflora* (pink hesperantha) open in the late morning and close at about four o'clock. They are scentless and offer no nectar but ample pollen to visiting bees. Photos: J.C. Manning.

For the same reason, hesperanthas in the Western and Northern Cape are often known as aandblommetjies (evening flowers), a common name quite indiscriminately applied to species of several genera that have flowers which open at night.

Another, perhaps more appropriate name for hesperanthas is bontrokkie (which translates as striped skirt). This charming name alludes to the red or brown colour on the outside of the outer tepals, which contrasts sharply with the white inner surfaces.

### The first species discovered

The first species of *Hesperantha* known and grown in Europe were collected in the south-western Cape in the 18th century when travellers and plant collectors sent bulbous plants back to Europe from the vicinity of Cape Town, Stellenbosch and Paarl. All the species of *Hesperantha* there do, indeed, have white flowers that open in the later afternoon or evening, including the type species, *H. falcata* (common hesperantha), and several others such as *H. radiata* (greyhound hesperantha) and *H. pilosa* (velvet hesperantha). In cultivation the unassuming flowers of hesperanthas were notable mainly for their clockwork flowering late in the day and the production of distinctive floral odours. *Hesperantha spicata* was even known as the cinnamon-scented evening flower in 19th century parlance, or in Afrikaans, kaneeltjie.

The name *Hesperantha* is not as appropriate as early botanists supposed. Botanical exploration to the north and east of Cape Town yielded new hesperanthas with different flower colours. In the Roggeveld near Sutherland and in the western Karoo, *H. humilis* and *H. pauciflora* (pink hesperantha) have pink flowers, as does the rare Cederberg endemic, *H. elsiae*. In the southern Cape, *H. fibrosa* often has mauve flowers while some populations of *H. falcata* there have bright yellow flowers. The strikingly lovely *H. vaginata* (harlequin hesperantha) from Nieuwoudtville and the Bokkeveld plateau has yellow flowers often marked with contrasting chocolate brown. These hesperanthas with coloured flowers have two other features in common, their flowers are always open during the day and closed at night and they lack floral scent.



The specialized flowers of *Hesperantha radiata* have an unusual curved floral tube. They also open close to sunset when the tepals re-curve, giving the flowers a streamlined appearance, hence the common name greyhound hesperantha. Photo: J.C. Manning.

### The range of the genus

The genus extends from the southern African winter-rainfall zone through eastern South Africa, Swaziland and Zimbabwe as far north as Ethiopia. Across this huge stretch of Africa hesperanthas usually have mauve or pink flowers and one even has red flowers. Although white-flowered species also occur in eastern southern Africa they are the exception. There too, the flowers of species with coloured tepals open during the day while the few that have white tepals follow the south-western Cape

pattern of flowering in the late afternoon and evening. The flower colour and timing of opening and closing has an important biological function. The biological role of flowers is usually to attract insect visitors that inadvertently transfer the pollen from anthers of one flower to the stigmas of another, performing what plants themselves cannot do, cross pollination. Differently coloured flowers often attract different pollinators and as a rule white flowers that open late in the day or at night are pollinated by night-flying moths. These insects



Most striking of all hesperanthas, the harlequin hesperantha, *Hesperantha vaginata*, is a narrow endemic of the Calvinia district in the Northern Cape. Unusual for the genus, it is pollinated by monkey beetles. Photo: J.C. Manning.



Extending from Namaqualand to the Eastern Cape the ballerina hesperantha, *Hesperantha bachmannii*, has white flowers that open in the mid-afternoon. Both bees and moths are attracted to the sweetly scented flowers. Photo: J.C. Manning.

visit flowers to feed on nectar which, in *Hesperantha*, is produced at the base of the floral tube.

Colour is not visible at night but pale colours are more easily seen under conditions of low light intensity and thus moth-pollinated flowers are very often white or cream. To enable night flying insects to find their flowers, moth-pollinated plants often produce strong floral odours with spicy undertones of clove or cinnamon. And to ensure that the resource offered to a pollinator is preserved for the appropriate insect, moth-pollinated flowers often close during the day. The general assumption then, though one not firmly established by biologists, is that white- (or pale yellow) flowered hesperanthas are primarily adapted for pollination by moths.

Interestingly, species of *Hesperantha* that have brightly coloured flowers rarely produce floral odours. Colour alone seems to

fulfil the role of pollinator attraction in these species, although many other day-flowering plants have flowers with strong odours (just think of freesias and many gladioli). These daytime pollinators are usually female bees that visit hesperantha flowers to collect pollen (used to provision their nests), rather than nectar. Pollen is usually prominently displayed on large anthers held above the outspread tepals. Some bee-pollinated hesperanthas do not even offer nectar as a reward to visitors, instead relying solely on an offering of pollen. When a bee visits a flower to collect pollen it invariably becomes covered in pollen, some of which gets transferred to stigmas as it flies from flower to flower. An interesting exception to this pattern is *H. erecta* of the Western Cape's west coast. Although it has white flowers, they open in the afternoon and then produce an unusual, orchid-like scent reminiscent of the

genus *Pterygodium*. We wonder if this species is using this unusual scent to attract the specialized bees that usually visit *Pterygodium*, a novel form of pollination by deception.

Long-tongued flies and butterflies are avid nectar feeders and are important pollinators of southern African plants. To attract these pollinators, ample nectar must be provided, preferably at a site inaccessible to shorter-tongued insects like bees. *Hesperantha latifolia* from Namaqualand has evolved bright purple flowers with a tube over 20 mm long. Nectar, held at the bottom of the tube cannot be reached by bees. It is pollinated exclusively by a tangle-veined fly, *Prosoeca peringueyi*, an important pollinator of magenta and purple flowered plants in Namaqualand and the north-western Cape. The long-tubed pink flowers of the Drakensberg hesperanthas, *H. grandiflora* and *H. scopulosa* are



The bright red flowers of *Hesperantha coccinea* are a beautiful sight along streams in the mountains of Mpumalanga and KwaZulu-Natal. The red colour and a fairly long floral tube, adaptations to particular pollinators, were part of the reason the species was once placed in another genus, *Schizostylis*. Photo: J.C. Manning.

likewise pollinated by another tangle-veined fly, *P. ganglbaueri*. This fly, which occurs in the mountains of the southern African summer-rainfall zone, has a proboscis usually over 30 mm long and has no trouble reaching nectar in floral tubes of these hesperanthas as well as flowers of long-tubed gladioli, some orchid species, and even pelargoniums. Long-proboscid flies may also pollinate the flowers of the long-tubed red hesperantha, *H. coccinea* (long known as *Schizostylis coccinea*), together with the large butterfly, *Aeroptes*, an

important pollinator of bright red-flowered plants in southern Africa.

An even more unusual pollination strategy is employed by the yellow and chocolate-coloured flowers of *Hesperantha vaginata*, a species restricted to the Calvinia District of the Northern Cape. These flowers offer no nectar and bloom at a time of year when the veld is full of flowering plants. They have shifted from the bee pollination system that is common in day-flowering hesperanthas to monkey beetle pollination. On warm afternoons the flowers of *H. vaginata* are

frequently the temporary home of a species of large monkey beetle. Monkey beetles in general use the surfaces of large, brightly coloured flowers as sites for assembly and mating and are now understood to be important pollinators of many plants in the southern African winter-rainfall zone.

Pollination of hesperanthas in southern Africa is still poorly understood, but the general pattern shows that physiologically, quite simple shifts in flower colouration in combination with the timing of flower opening, are directly related to the attraction of pollinators and thus an important element in the evolutionary radiation and success of this fairly widespread African genus. The biology of *Hesperantha* highlights an important aspect of floral ecology. Such simple changes in morphology as a shift in the colour, the timing of opening and closing of a flower, the presence of nectar, and the length of the floral tube often have profound implications. They signal changes in the pollination system that have important consequences in the biology of species, the role they play in the ecosystem, and in the ultimate evolution and speciation of plants. ♀



Flowers of the Bokkeveld hesperantha *Hesperantha cucullata* photographed soon after opening in the late afternoon.

Photo: J.C. Manning.