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# The genus *Cheilanthes* in Namaqualand

Ronell R. Klopper

Namaqualand forms part of the Succulent Karoo Biome and covers an area of approximately 55 000 km<sup>2</sup> along the western coast of South Africa. It stretches from the Orange River in the north, southwards to the Olifants River and from the sea as far inland as Vredendal, the foot of the Bokkeveld Mountains, just east of Springbok and the Goodhouse area (see map).

Namaqualand harbours a unique plant life ( $\pm 3\ 500$  plant species) made up of masses of annuals that appear after good rains, as well as geophytes, dwarf shrubs and succulents. It is an arid area that receives on average 100–200 mm (depending on locality) of rain in winter. Not surprisingly, most people are very surprised to find out that there are ferns in Namaqualand. Of course this area is not as rich in diversity as the more humid eastern escarpment for instance. However, the ferns that do occur in the harsh and unpredictable Namaqualand are often endemic or near endemic to this region—you will not be able to see them anywhere else. Most species survive the hot dry summers of this winter-rainfall region by allowing the fronds to die off completely and with new fronds only

appearing during the brief winter rains. A few species are poikilohydrous, with fronds shrivelling up during the long, dry months and turning green again once the first rains arrive.

The genus *Cheilanthes* (lip ferns) has the best representation in Namaqualand with 11 taxa in the area. Some are fairly widespread, like *C. multifida* subsp. *multifida*, while most are confined to the region and perhaps also adjacent parts of the fynbos, Karoo or southern Namibia, like *C. rawsonii* and *C. namaquensis*. The few other ferns that occur in the region are widespread species like, *Ophioglossum polyphyllum*, *Asplenium cordatum* (= *Ceterach cordatum*) and *Mohria caffrorum*.

In the following species treatments distinguishing characters, distribution and habitat are mentioned for each species. Areas where these ferns can be easily seen by the keen fernatic in Namaqualand (and further south) are mentioned. Although not strictly found in Namaqualand or only reaching the margins of that region, *C. depauperata* are also included here.

**Identification key to the lip ferns of Namaqualand**  
(adapted from Burrows 1990)

- 1a. Fronds pilose, tomentose, or thinly pubescent ..... 2
- 1b. Fronds glabrous, subglabrous or sticky ..... 3
- 2a. Fronds thickly pilose or tomentose on one or both sides ..... 4
- 2b. Fronds thinly pubescent ..... *C. contracta*
- 3a. Fronds viscid or sticky ..... *C. depauperata*
- 3b. Fronds glabrous to subglabrous, not sticky ..... 6
- 4a. Lamina pilose or tomentose on both surfaces ..... *C. contracta*
- 4b. Lamina glabrous above, pilose or tomentose below ..... 5
- 5a. Lamina 2-pinnate to 4-pinnatifid, glabrous above, with long, reddish hairs below ..... *C. induta*
- 5a. Lamina 2-pinnatifid to 2-pinnate, subglabrous above, with a short, dense tomentum below ..... *C. rawsonii*
- 6a. Lamina triangular, deltate or pentagonal ..... 7
- 6b. Lamina lanceolate to broadly ovate ..... 9
- 7a. Venation obscure above ..... 8
- 7b. Venation apparent above ..... *C. capensis*
- 8a. Rachis winged ..... *C. deltoidea*
- 8b. Rachis not winged ..... *C. multifida* var. *multifida*
- 9a. Rhizome very thick, densely clothed in golden-brown scales; rachis winged throughout ..... *C. robusta*
- 9b. None of the above characters ..... 10
- 10a. Sori continuous ..... 11
- 10b. Sori discrete, discontinuous ..... 12
- 11a. Fronds pinnate to 2-pinnatifid; lamina linear-lanceolate to oblong-elliptic; stipe glabrous except for a few scales basally ..... *C. hastata*
- 11b. Fronds 2- to 3-pinnatifid; lamina deltoid; stipe thinly to densely set with scales or hairs ..... *C. namaquensis*
- 12a. Normal fronds less than 100 mm tall, held horizontal to the ground, pinnate to 3-pinnatifid, basal pinnae not strongly basiscopically developed ..... *C. kunzei*
- 12b. Normal fronds more than 100 mm tall, held ± vertical to the ground, 3- to 5-pinnatifid, basal pinnae strongly basiscopically developed ..... *C. multifida* var. *multifida*

### ***Cheilanthes capensis***

This commonly found and widespread fern is distinguished by its erect to subarching, ovate to triangular fronds, with pronounced venation, serrate-crenate margins and discrete sori with lacerate indusia.

*Cheilanthes capensis* occurs from southern Namibia, through the Northern and Western Cape, then sporadically through the Eastern Cape, with a slight disjunction to Lesotho, the southeastern Free State and KwaZulu-Natal. It is very common and easily seen in the Western Cape and is the second most abundant member of the genus in this province, next to *C. hastata*. It grows around boulder bases or on open ground among grasses and shrubs.

### ***Cheilanthes contracta***

This fern is characterised by its short, pale stipe hairs, and short, twisted hairs that form a thick tomentum on the underside of the lamina. *Cheilanthes contracta* might be confused with the superficially similar *C. induta*, but the latter has a broader lamina with a proportionately longer stipe and shorter lamina.

*Cheilanthes contracta* essentially occurs in the winter rainfall region, from Namaqualand to Port Elizabeth, although a few records from the Northern Cape and Mpumalanga are known. It is fairly common in the Cederberg and grows in rocky areas in fynbos, or karroid, succulent scrub.

### ***Cheilanthes deltoidea***

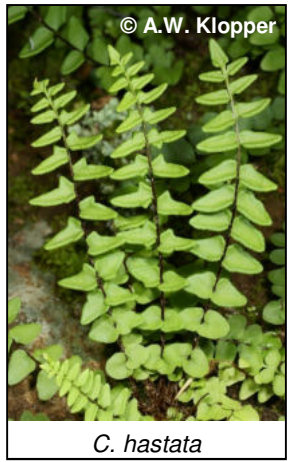
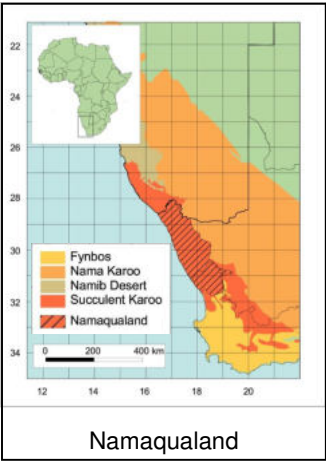
This small fern is distinguished by its triangular fronds, narrowly winged rachis and continuous indusium. It is easily confused with the very similar *C. namaquensis*, but the latter has a partially winged rachis and more broadly triangular fronds.

*Cheilanthes deltoidea* occurs from southern Namibia southwards through the Northern Cape to the Western Cape. It can easily be seen on the Anenous Pass and around Springbok. It grows in rock crevices, beneath boulders and among stones on rocky hillsides in sheltered situations.

### ***Cheilanthes depauperata***

This distinctive species is unlikely to be confused with any other fern. It is characterised by its stiffly erect fronds that are very narrow with highly reduced pinnae and pinnules. The fronds are typically sticky when pressed onto paper.

*Cheilanthes depauperata* is restricted to the hot and arid inland regions of the Western Cape, on the fringes of the Great Karoo in the rain-shadow of the southern mountain ranges. A population of this rare fern can easily be seen near the lookout point on the Gannaga Pass in the Tankwa Karoo National Park. It grows in localized patches in low, karroid, succulent scrub, usually in rock crevices or in the lee of boulders, mostly in full sun.





### Glossary

*basiscopically developed*: with enlarged or more divided segments towards the base

*elliptic*: tapering equally to each end

*lanceolate*: a lamina shape widest below the middle, tapering to the apex, with a length to width ratio of 3:1 or more

*oblong*: longer than wide

*ovate*: a lamina shape which is widest at or below the middle, tapering to the apex with a length to width ratio of 2:1 or 1:1

*pilose*: hairy with rather long, simple hairs

*pubescent*: covered with short soft hairs

*tomentose*: densely covered with short, soft, felted hairs

### *Cheilanthes hastata*

This species is readily distinguished by its narrow, glabrous, normally pinnate or 2-pinnatifid fronds with continuous subtire indusium.

*Cheilanthes hastata* is strictly a fern of the winter-rainfall region and has its centre of distribution in the Western Cape, but extends into the Northern Cape and extreme south of Namibia. It is very common and easily seen in many areas of the Western Cape and is the most common member of the genus in this province. It usually grows around boulder bases, in rock crevices, under bushes on fynbos-covered hillsides or on earth banks.

### *Cheilanthes induta*

This reasonably distinct species is characterized by the long, reddish hairs on the stipe, rachis and the underside of the frond, as well as the unusual wavy stipe. It could possibly be confused with *C. multifida*, however, the latter is completely glabrous. *Cheilanthes induta* might also be confused with the superficially similar *C. contracta*, but the former has a broader lamina with a proportionately longer stipe and shorter lamina.

*Cheilanthes induta* is restricted to the Western, Northern and Eastern Cape provinces and can be seen fairly easily in the Ceres, Citrusdal and

Worcester areas. It grows at boulder bases on rocky hillsides or cliff faces and is largely restricted to the cooler mountain ranges inland from the sea where rainfall is lower and more erratic, and seasonal temperatures and humidity extremely variable.

### *Cheilanthes kunzei*

This fairly rare fern is characterised by its small size, irregularly discontinuous indusium and its habit of bearing its thin and fragile fronds almost flat on the soil surface.

*Cheilanthes kunzei* is endemic to the Northern Cape and southern Namibia. It is easily seen around Springbok and grows on moist soil surfaces, usually with mosses or liverworts, around the bases of large granite boulders or in shaded rock crevices and recesses.

### *C. multifida* subsp. *multifida*

This fern is easily distinguished from others in Namaqualand by its deltate, 3- to 5-pinnatifid fronds with strongly basiscopically developed basal pinnae, discrete sori, unwinged rachis and glabrous stipe.

*Cheilanthes multifida* subsp. *multifida* occurs rather widespread from the Western and Northern Cape through the Eastern Cape, North West and Namibia, to Angola. It can fairly easily be seen in the Cederberg. It grows around boulder bases and in rock crevices in mountain fynbos, and in grassland or arid, succulent scrub in mountainous regions.

### *Cheilanthes namaquensis*

This rare fern can be easily confused with the similar *C. deltoidea*, but is distinguished by its partially winged rachis and less broadly triangular frond. Its darker, blackish brown stipe (not reddish brown) and thicker-textured frond separate it from the superficially similar *C. hastata*.

*Cheilanthes namaquensis* is restricted to the dry, semi-desert areas in the winter-rainfall region of southern Namibia, and the Northern and Western Cape in South Africa. It can easily be seen around Worcester and grows in rock crevices and around boulder bases in succulent scrub, rarely in fynbos.

### *Cheilanthes rawsonii*

This is one of the most distinctive *Cheilanthes* species. It is characterised by its long, slender small 2-pinnatifid fronds and its exindusiate, discrete sori.

*Cheilanthes rawsonii* is endemic to southern Namibia and far Northern Cape and is very common in the Richtersveld. It is a rare fern with a limited distribution and grows on rocky hillsides, usually on granite, around boulder bases and in rock crevices. Throughout the dry period pinnae remain dried and inrolled to withstand the very high temperatures and extreme drought. Pinnae unroll and turn green, and new fronds appear, during the short and sporadic winter rains.

***Cheilanthes robusta***

This unusual species should not be confused with any other fern. It is characterised by its unmistakable small, compacted, carrot-like fronds and its habit of growing in colonies in open areas.

*Cheilanthes robusta* occurs in the Western Cape, but has its centre of distribution in the Northern Cape and southern Namibia. It can easily be seen around Springbok and Bulletrap. It commonly grows on level ground, usually in full sun, in semi-arid, succulent scrub.

**Literature**

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