ASPARAGACEAE

THE GENUS *PROTASPARAGUS* IN SOUTHERN AFRICA*

Historical notes

The oldest known illustration of a species of *Protasparagus* is the Plate 817 in Simon van der Stel's *'Journey to Namaqualand, 1685'*. The plant was described as 'Asparagi silvestris met bruin-roode bessen den 6de September gevonden'. It is interesting to note that the plant was recognized as an *Asparagus*, for with its pungent, hooked spines it differs markedly from the edible European species, *Asparagus officinalis* L. The branchlets, covered by overlapping cladodes and the sharp, short, hooked, axillary spines, identify it as *Protasparagus rubicundus* (Berg.) Oberm., a Cape species, still common today. Fig. 1.

FIG. 1. — *Protasparagus rubicundus* (Berg.) Oberm. tab. 817 in Van der Stel's Journey to Namaqualand 1685. (Very likely painted by Hendrik Claudius.)

In his *Species Plantarum* (1753), Linnaeus described three species from the Cape, viz *A. aethiopicus* L., *A. retrofractus* L. and *A. declinatus* [now *Myrsiphyllum declinatum* (L.) Oberm.]. He also described *A. falcatus* from India, which is found as far south as Natal. Lamarck in 1783 described *A. africanus* and *A. stipulaceus*. Linnaeus fil. and Thunberg variously placed 8 more species (collected by Thunberg at the Cape), under either *Asparagus* or *Dracaena*. In 1829 Roemer & Schultes in *Syst. Veg.* 7, dealt with 30 species. Kunth, in 1850 in *Enumeratio Plantarum* Vol. 5, divided the genus into 3 genera, viz *Asparagus* L., which bears unisexual, dioecious flowers and is endemic to Europe with few exceptions. For the species with bisexual flowers he chose the name *Asparagopsis*, which unfortunately proved to be a homonym. This was changed to *Protasparagus* in *Jl S. Afr. Bot.* 2,3: 243 (1983). The third genus, *Myrsiphyllum* Willd. (1808), was also resuscitated (cf. *Bothalia* 15: 77-88, 1984).

The genus *Protasparagus* with 67 known species in southern Africa and many more from the rest of Africa, is believed to be an old genus. Not a single hybrid was observed.

The genus is divided into two subgenera: 1, *Protasparagus* with 11 species and 2, *Africani* with 56 species.

Subgenus 1. *Protasparagus*

This subgenus is regarded as the oldest of the subgenera. It comprises shrubs usually not more than 1 metre tall, with stems and branches ending in a spine. The roots do not form tubers (an exception is *P. suaveolens* where the roots are swollen occasionally). The flowers are apical or axillary along the spineless branches but in *P. flavicaulis* no branchlets are present. Here the flowers are placed halfway on the spine (a modified branch) next to the cladode-fascicles.

Of the 11 species in this subgenus three bear nutlets, which is considered to be a more primitive character; the others, like the rest of the genus, produce berries. This subgenus is endemic to the Winter Rainfall Region with the exception of two species, which have spread further northwards, viz *P. suaveolens* (Burch.) Oberm., which reaches Zimbabwe and Malawi, and *P. flavicaulis* Oberm. which occurs in the Transvaal and neighbouring areas.

Subgenus 2. *Africani*

This subgenus, with 56 species, is more varied and has a wider distribution than subgenus *Protasparagus*. Here the spines are the modified lower part of the leaf, whereas the upper part takes the form of a soft scale, which bears the buds in its axil. The spines point downwards or outwards and are usually very sharp and hard. Some species, however, for instance the well-known cultivated *P. densiflorus* and *P. plumosus*, are almost spineless; if spines occur, they are usually confined to the basal part of the stems.

* A revision of the South African species will appear in *Flora of Southern Africa*.

The habit of members of this subgenus is more varied than of subgenus *Protasparagus* and several species have become scandent, attaining a length of 3 m or more. The subgenus has spread all over Africa to Asia and some of its species have reached Australia.

This subgenus can be divided into eight series. In series *Aethiopici* and *Racemosi* the flowers are arranged in compound, many-flowered or simple racemes. They often flower early in spring before the cladodes have matured. However, the flowering period is short. The flowers in the majority of species are arranged inside or beside a cladode-fascicle. Their strong sweet scent attracts bees and other insects.

The perianth consisting of 3 + 3 tepals, usually shows little variation. In some species however, the tepals fuse below to form a pericladium. Where the flower is attached to the pedicel a distinct disk is produced. In live flowers it is often quite clear that the attenuated lower part of the pericladium belongs to the perianth as colour differences can be observed. The upper part matches the perianth, whereas the pedicel below the disk is green.

Cladodes. The short green, usually terete 'needles' are mostly arranged in fascicles. They have been the subject of much discussion. Some researchers have regarded them as leaves, whereas others have considered them to be stems. McLean & Ivimey Cook in their textbook *The Monocotyledons* 1: 925 (1951), believe them to be flower stalks. Today it is usually accepted that the cladodes represent 'short shoots'. In *P. mucronatus* (Jessop) Oberm., *P. microraphis* (Kunth) Oberm. and *P. stellatus* (Bak.) Oberm., the cladodes develop a discoid base or foot, which fits onto raised disks produced on the receptacle. This discoid cladode-base is reminiscent of the disk found below the pericladium at the point of attachment to the pedicel.

Roots. Some common widespread species bear swollen tuberous roots (Series *Racemosi)* or form tubers on side roots (Series *Aethiopici*). These tubers contain a transparent mucilage and sustain the plants in times of drought. When dug up after a dry winter only the empty covering of the tubers is found. Notes on collections from Kenya record that the tubers are used medicinally.

Fruit. In three species of the subgenus *Protasparagus, P. recurvispinus, P. bayeri* and *P. glaucus* the tepals harden and become erect, enclosing the ovary to form a nutlet. In all the other species a berry is formed, the trilocular ovary becoming fleshy; the withered tepals may be present below or disappear. The red or black succulent berries, are consumed by birds, which distribute the seeds far and wide. It is likely that *P. racemosus* (and also *Myrsiphyllum asparagoides*) have reached Australia via India and Indonesia, as a result of bird migration.

Seeds. Usually only one, or rarely two globose black seeds develop, although each of the three locules of the ovary produces from 4–12 ovules arranged biseriately. They possess a phytomelan crust (cf. Dahlgren & Clifford, *The Monocotyledons* 230 (1982).

Horticultural and other uses

The most successful cultivated species is *P. densiflorus* (Kunth) Oberm. and its cultivar *'myersii'*. They are cultivated as perennial garden or pot plants. The cultivar *'myersii'*, a recent introduction, was developed by Mr Myers from East London. The plants become cylindrical through the suppression of side branches.

Much used by florists as a green backing for posies and other displays, is *P. plumosus* (Bak.) Oberm., because of its decorative, triangular, flattened, evergreen branch systems. *P. falcatus* (L.) Oberm. is also cultivated in Europe.

Vegetable. A common species in the southern and south-eastern Cape, *P. multiflorus* (Bak.) Oberm., has been used as a vegetable in a similar way as the European *Asparagus officinalis* L. The bushes are chopped down at the end of winter. The thick new shoots are cut off when c. 150 mm long and are prepared as food by boiling. They have a slight nutty taste, but are not considered as flavoursome as the cultivated species. *P. edulis* Oberm. from the eastern Transvaal and eastern Orange Free State is also eaten according to Mrs M. Jacobs of Harrismith.

ACKNOWLEDGEMENTS

When the revision of Protasparagus was undertaken for the *Flora of Southern Africa,* it soon became apparent that the genus had been poorly collected, probably because of a short flowering period and the presence of sharp spines.

Thanks to enthusiastic collaboration of colleagues, many new species were collected and complete material, including roots, of many inadequately known species was obtained. This helped greatly to get a better picture of this genus.

Mr M. Bruce Bayer of the Karoo Garden at Worcester became an ardent collaborator of *Protasparagus;* he discovered several new species as well as others that were poorly represented in herbaria. His hospitality and assistance is much appreciated.

Colleagues of the Botanical Research Institute in Pretoria and Stellenbosch and Mrs Pauline Bohnen of Riversdale all assisted in enriching our collection. Special thanks are due to officers of the Forestry Department at George and of the Transvaal Department of Nature Conservation, especially Mr S. P. Fourie, and to many others.

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