

# Genus Cordyline

Subjects: [Chemistry](#), [Medicinal](#)

Contributor: Romuald Tematio Fouedjou , Bienvenu Tsakem , Xavier Siwe-Noundou , Hervet P. Dongmo Fogang , Aphalaine Tiombou Donkia , Beaudelaire Kemvoufo Ponou , Madan Poka , Patrick H. Demana , Remy Bertrand Teponno , Léon Azefack Tapondjou

*Cordyline* species have a long history in traditional medicine as a basis of treatment for various ailments such as a bloody cough, dysentery, and a high fever. There are about 26 accepted species names in this genus distributed worldwide, including *C. fruticosa*, *C. australis*, *C. stricta*, *C. cannifolia*, and *C. dracaenosides*.

[Cordyline](#)[ethnopharmacology](#)[phytochemistry](#)[biological activities](#)

## 1. Introduction

Traditional medicine frequently relies on medicinal plants for the treatment of various ailments and diseases. In developing countries, traditional medicine plays a significant role in delivering primary health care. Scientists have relied on the wealth of the floral kingdom for nearly half of all new drug discoveries to date [\[1\]\[2\]](#). Even ornamental plant species can contain a vast wealth of bioactive compounds valuable to medicine [\[3\]](#). For example, drugs currently in clinical use for cancer treatment include paclitaxel, derived from *Taxus brevifolia* L., vincristine, derived from *Catharanthus roseus* (L.) G. Don., and epigallocatechin-3-gallate, a phenolic catechin from *Camellia sinensis* [\[4\]](#), all of which are better known as ornamental rather than medicinal plants.

Natural products and their derivatives are a significant source for novel drug development in modern medicine, and many of these derivatives form the active ingredient of drugs approved by the U.S. Food and Drug Administration (FDA) [\[5\]](#). Dependency on direct medicinal plant derivatives is particularly marked in developing countries, where western medicine is often absent or simply too expensive. Plants of the genus *Cordyline*, well known as ornamental plants, have long been used as a source of traditional medicines and are of great interest in primary health care. As with *Taxus brevifolia*, *Catharanthus roseus*, and *Camelia sinensis*, these plants could be highly significant for drug discovery.

According to the literature, *Cordyline* species are characterised by the presence of flavonoids and saponins, particularly spirostane, furostanes, and cholestane glycosides, with various structural skeletons [\[6\]\[7\]\[8\]](#). These compounds have been reported to show a wide range of biological activities, including anti-inflammatory, antiproliferative, antimicrobial, cytotoxic, and hypoglycaemic properties [\[7\]\[9\]\[10\]\[11\]](#). Some activities of these plants have been investigated, prompted by their anecdotal usage in traditional medicine, and various biological activities such as antidiabetic, anti-ulcer, antidiarrheal, wound healing, and anti-inflammatory properties have been reported in several scientific publications [\[7\]\[12\]\[13\]\[14\]](#).

## 2. Botany and Taxonomy

The name *Cordyline* is derived from the Greek *kordyle*, which means *club*, which refers to the plants' thick underground stems or rhizomes. Royen was the first to report the name *Cordyline* in 1740 and to propose a classification, but due to the presence of *Yucca* and *Dracaena* in his classification, Adanson gave the plant a new generic classification in 1763 <sup>[15]</sup>. The genus *Cordyline*, one of the so-called 'tree lilies', was placed in the family Laxmanniaceae according to the Angiosperm Phylogeny Group (APG) in 2003, then in the Asparagaceae family in 2009. Also called Agavaceae, this family contains 128 genera, with more than 3000 species <sup>[16]</sup>. The genus *Cordyline* contains 26 species alone, of which *C. fruticosa*, *C. australis*, *C. stricta*, *C. annifolia*, *C. rubra*, and *C. dracaenoside* appear to have been the most researched. *Cordyline australis*, commonly called the cabbage tree and known as 'ti kouka' by the Maori people, is the most widespread of this genus and occurs in open places and at forest margins on the three main islands <sup>[17]</sup>. *Cordylines* form small trees or shrubs and have leathery leaves, which are often clustered and palm-like in appearance. *Cordyline* species have creamish white roots that often form root suckers starting from their rhizomes <sup>[18][19][20]</sup>. *Cordyline* belongs to the few genera of monocots in which a cambium is present in the stem. The most well-known ornamental and medicinal plant of this genus is *Cordyline fruticosa* L. (Chev.) (**Figure 1**), with its beautiful and attractive decorative foliage.



**Figure 1.** *Cordyline fruticosa*.

Plants of the genus *Cordyline* generally reach up to 3 m high and are remarkable for their colourful foliage and varied heights, colours, and the shape of their leaves [21][22][23]. Several hybrid combinations of the *Cordyline* species have been recorded. The species is believed to have originated in Southeast Asia and Papua New Guinea. The plants of the genus *Cordyline* are not always easy to distinguish from those of the *Dracaena*. However, the petiole of the former is generally larger than that of the latter (10 to 30 cm versus 1 to 8 cm).

### **3. Traditional Uses of the Genus *Cordyline***

Several plants of the genus *Cordyline*, and particularly their leaves, are used in traditional medicines throughout the tropical and subtropical regions for the treatment of various diseases such as dysentery, skin infection, rheumatism, inflammations, and periodic fever [24][25].

*Cordyline dracaenoides* is used as a traditional medicine in the south of Brazil as an anti-inflammatory preparation for the treatment of rheumatoid and related diseases [26]. *Cordyline stricta* is an evergreen shrub native to Australia, and an extract of its leaves is used as a hemostatic in traditional Chinese medicine [9]. *Cordyline fruticosa*, commonly known as the good luck plant, is grown in tropical and subtropical regions as an ornamental plant. In Polynesia, it is used for both cultural purposes and as a food crop [27]. The plant is widely utilised in both everyday life and as a source of traditional medicine. The leaves are used for costumes, decorations, clothing, sandals, packaging, and cooking. The rhizomes can be baked into a molasses-like food product and eaten [28]. In addition, the plant is used for the treatment of various diseases. The leaves are used to treat sore throat and neck pain [29], as a hemostatic [30][31], and to induce abortion [32], and the roots are used for toothache, laryngitis, and to treat infections of the mammary glands [31][33].

In Sabah, the Kadazan-Dusun people, who are the largest ethnic group in Malaysia, use the roots of *C. terminalis* L. Kunth (also known as *C. fruticosa*) (locally called *Pipisokalaganan*) as part of their local medicine for curing cough, bloody cough, dysentery, high fever, difficulties in urinating, bloody urine, kidney diseases, headaches, inflammation in the digestive tract, scurf, and joint pain. For example, the roots are pounded into a paste and applied to the stomach to relieve stomach pain [34]. In Hawaii, local people use the purple flowers of *C. fruticosa* to treat asthma and growths in the nose [35].

## 4. Other Important Uses of Plants of the Genus *Cordyline*

Ornamental plants are characterized by attractive foliage and/or flowers that can survive and grow indoors and/or outdoors. *Cordyline fruticosa*, with its attractive red decorative foliage, is one of India's most economically important ornamental houseplants [36]. The economic value of ornamental plants of the genus *Cordyline* has risen perceptibly worldwide and is still increasing to meet the steady demand of the floriculture industry. Reports that the roots of *Cordyline australis* may contain more than 60% fructofuranan suggest that the species could become a commercial source of fructose [37]. *Cordyline australis* has been used extensively by the Maori people in Australia, both as a source of fibre and as a food, and there is strong evidence to suggest that the plant was translocated extensively in pre-European times [38].

*Cordyline fruticosa* is often used ornamentally as a low-growing border shrub [39]. *C. fruticosa* is associated with cultural, material, and religious uses among the peoples of Oceania [18][40]. There is some evidence that the early Polynesians used *Cordyline fruticosa* for its importance in costume making, for wrapping food, for religious uses, and as a food source [41]. A hedge of *C. fruticosa* around the house was believed to ward off evil spirits and bring good luck [42]. The fleshy rhizome contains up to 20% sugar, mainly fructose, and is used as a natural sweetener in New Zealand and for the production of an alcoholic beverage in Hawaii [43]. In Hawaii, the fibre from the leaves of the 'Ti' plant (a common name for any plant of the genus in Hawaii) was used for making sandals, baskets, bird snares, sieves, and thatch for roofs, rope, and cord. The leaves of the plant (known as 'rau ti' in the Cook Islands) or the tender young shoots were eaten raw or roasted in the embers of a fire. Pith (commonly called Ti) was dried in the sun and cooked to make porridge [43]. Roots of Ti were used for making sweet drinks. Sugar was extracted by cooking the roots in an earth oven called an 'umu-ti'. Large pits were used to steam the roots. Long hedges of

*Cordyline fruticosa* are planted by locals to guard the gardens against pigs. The handling of 'Ti' was often accompanied by ceremonial protocols [43].

The New Zealand cabbage tree, known as *Cordyline australis*, is internationally rated as one of their most famous indigenous plants. Its popularity is based not only on its characteristic habit, shape, and deliciously fragrant flowers but also on the relatively recent progress of coloured foliage forms [44]. Other species, also known as cabbage trees, include *C. kaspar*, *C. indivisa* (*Ti toi*), *C. banksii* (*Ti ngahere*), and *C. pumilio* (*Ti rauriki*) [45].

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