

**THE GEOGRAPHICAL INDICATIONS OF GOODS
(REGISTRATION AND PROTECTION) ACT, 1999**

(To be filled in triplicate along with the Statement of Case accompanied by five additional representation of Geographical Indication)

One representation to be fixed within the space and five others to be send separately

FORM GI-1

A	Application for the registration of a Geographical Indication in Part A of the Register Section 11 (1), Rule 23 (2) Fee: Rs. 5,000 (See entry No. 1A of the First Schedule)	
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1. Application is hereby made by the **Chairman, Ganjam Kewda Development Trust (GKDT)**, C/O Reddy House, Hillpatna, Berhampur, Ganjam, Odisha - 760005 for registration in Part A of the Register of the accompanying geographical indication **GANJAM KEWDA FLOWER** furnishing the following particulars: -

- (A) **Name of the Applicant** : The Chairman, Ganjam Kewda Development Trust (GKDT)
- (B) **Address** : C/O Reddy House, Hillpatna, Berhampur, Ganjam, Odisha - 760005
- (C) **List of association of person/ Producers / organization/ authority :**
: To be provided on request
- (D) **Type of Goods** : Kewda flowers in Class 31
- (A) **Specifications**

Pandanus fascicularis Lam., popularly called *kewda* or screwpine, is a bushy shrub, and a dominant species in the coastal vegetation of India. It grows abundantly in the coastal regions of Orissa. It belongs to the family Pandanaceae, in the order Pandanales. The plant is found growing widely, often forming thickets along roadsides, borders of agricultural fields, banks of rivers and canals, and on the seashore. The plant is a bushy shrub with many thick terrestrial stilt roots, and leaf margins with forwardly pointing spinules. It is dioeciously with distinct male and female inflorescences borne on different plants. The male spike is attractive for its characteristic aromatic odour, whereas the female spike is odourless and develops into a woody drupe. The tropical coastal climate, with sandy loamy soil having high organic carbon content and water holding capacity, is most suitable for the growth of this plant.

Flower



Pandanus fascicularis Lam. is a dioecious shrub with numerous small flowers, sometimes scandent having trunks and branches and spreading aerial roots, leaves in 4 rows or usually spirally arranged and crowded towards the top of the shoots, linear, sheathing at the base, leathery, keeled mostly spinulose on the margins and keel acuminate. The male flowers are used for extraction of the essential oil. The stem is up to 3-6 mtrs. with many thick, terete aerial and stilt root. Leaves closely spirally arranged and are caudate acuminate gloss green, margins with forward pointing spinules. Flowers are dioecious. The flowers are usually perianthless tiny, white, and fragrant with large showy bracts called spathe. The stamens are in a raceme of spikes more definitively called spadix and is known as Stemonophore. The anthers are 2 locular basifixed and are split lengthwise. They last only for

about a day, with the inflorescence decaying within three to four days. The male inflorescence is valued for its fragrance emitted by the stamens and tender white spathes covering them and valuable attar was obtained from them.

Floral formula: $P_0A_{(1-\infty)}G_0$



Kewda Plantations (*Pandanus fascicularis*)



Kewda Flower

The essential oil extracted from pandanus flowers is dominated by 2-phenylethylmethylether (β -phenyl ethyl methyl ether, 60 to 80%); minor components are the free alcohol, 2-phenylethanol (β -phenyl ethyl alcohol) and its acetic acid ester; 2-phenylethanol is also an important aroma component in rose water. Because it is well soluble in water, 2-phenylethanol can be captured in aqueous distillates quite easily. (Indian Perfumer, 36, 93, 1992) Furthermore, monoterpenes have been found to contribute to the fragrance. The most important terpene in pandanus flowers is terpinene-4-ol (up to 15%); furthermore, α -terpineol, γ -terpinene and dipentene have been reported. The ripe fruits of *P. tectorius* owe their scent to an essential oil dominated by esters: Besides geranyl acetate, a couple of hemiterpenoid esters were found: isopentenyl (3-methylbut-3-enyl) and, to a lesser degree, dimethyl allyl (3-methylbut-2-enyl) acetates and cinnamates.



Male Inflorescence

LIQUID CO₂ EXTRACTION OF *P. FASCICULARIS* LAM FLOWERS

TABLE I.
COMPOSITION OF LIQUID CO₂ FRACTIONS OF FLORAL CONCRETE OF *PANDANUS FASCICULARIS* LAM. FROM 4 g OF HEXANE EXTRACT (CONCRETE)

Fractions Composition	1	2	3	4	5	6	Wax
Yield (g)	0.61 ± 0.03	0.56 ± 0.04	0.39 ± 0.02	0.20 ± 0.03	0.17 ± 0.03	0.16 ± 0.03	1.9 ± 0.1
Monoterpene hydrocarbons	4.0	3.4	3.0	1.8	0.8	0.8	0.3
1,8-Cineole	0.5 ± 0.1	0.4 ± 0.1	0.4 ± 0.1	0.1	0.1	—	—
2-Phenyl ethyl methyl ether	69.6 ± 0.8	56.3 ± 0.5	44.8 ± 2.3	16.3 ± 0.2	1.4 ± 0.1	1.4 ± 0.1	0.6 ± 0.3
2-Phenyl ethyl alcohol	0.4 ± 0.1	0.4 ± 0.1	0.5 ± 0.1	0.4 ± 0.1	0.1	0.1	—
Terpinen-4-ol	1.4 ± 0.1	1.4 ± 0.1	1.4 ± 0.1	1.4 ± 0.1	0.2	0.2 ± 0.1	—
α-Terpineol	0.2 ± 0.1	0.2 ± 0.1	0.2	0.2	0.1 ± 0.1	0.1	—
Phenyl ethyl phenyl acetate	0.2	0.2	0.2	—	—	—	—
Palmitic acid	1.2 ± 0.6	1.0 ± 0.5	1.0 ± 0.1	2.1 ± 0.8	1.9 ± 0.4	1.5 ± 0.5	0.5 ± 0.2
Fatty acid methyl esters	0.2	1.1	1.5	1.6	1.5	1.8	0.7
9,12,15-Octadecatrienal	1.2 ± 0.1	3.4 ± 0.1	3.8 ± 0.2	4.6 ± 0.1	2.4 ± 0.1	2.7 ± 0.1	0.2 ± 0.1
9,12-Octadecadienal	2.0 ± 0.1	2.0 ± 0.1	2.2 ± 0.5	2.2 ± 0.2	1.3 ± 0.1	1.2 ± 0.1	0.4 ± 0.1
9,12-Octadecadienol	1.4 ± 0.1	1.0 ± 0.5	1.7 ± 0.7	3.2 ± 0.6	5.0 ± 0.8	5.1 ± 1.4	0.2 ± 0.1
Oleic acid	0.2 ± 0.1	0.3 ± 0.1	0.3 ± 0.2	0.3 ± 0.2	0.2 ± 0.1	0.3 ± 0.1	0.2 ± 0.1
Heicosanol	0.6 ± 0.2	0.8 ± 0.4	1.2 ± 0.1	1.4 ± 0.1	0.6 ± 0.4	0.6 ± 0.4	0.1
Hydrocarbons	13.4	21.8	35.7	55.5	78.4	80.4	95.2

The values are the average of three analyses.

COMPARISON OF RECOVERY OF FRAGRANCE COMPONENTS FROM KEWDA FLOWERS BY DIFFERENT PROCESSES

Process adopted	Gram of extract per 10 kg of flowers	2-Phenyl ethyl methyl ether	Terpinen-4-ol	α -Terpineol	Fatty acids/ alcohols/ esters/ aldehydes	Waxes/ hydrocarbons
		mg				
Hexane extraction (concrete)	31.5 \pm 1.5 (78 \pm 1.5)	7,614	185	26	6,345	8,709
Absolute by methanol	16.7 \pm 0.7 (80 \pm 1.2)	5,878	121	25	3,466	2,725
Liquid CO ₂ fraction 1	10.92 \pm 0.5 (85 \pm 1.0)	5,848	130	18.5	864	1,652
Liquid CO ₂ fraction 2	5.98 \pm 0.5 (84 \pm 1.2)	1,464	62	8.2	784	2,139
Liquid CO ₂ extract of flowers	24.0 \pm 0.60 (84 \pm 1.2)	9,918	786	141	3,588	2,026

Values in parentheses indicate amount of volatile matter.

For direct extraction of flowers with liquid CO₂, one flower weighing 75 g was taken and cut into small pieces and quickly charged into the extraction compartment of the apparatus. Extraction was carried out for 3 h in the same experimental setup to yield 0.18 \pm 0.005 g extract (0.24 \pm 0.006%, average of three experiments).

kweda flowers viz. 2-phenyl ethyl methyl ether is much better, and that of terpinen-4-ol and α -terpineol, which contribute significantly to the odor profile, has been much more efficient and is nearly three times of their content in CO₂ fractions.

(F) Name of the Geographical Indication: GANJAM KEWDA FLOWER



(G) Description of Goods:

The flower grows on a small tree or shrub which is both cultivated and grows wild in coastal areas. It can also be found in some inland districts but the flowers seem to create their most exquisite floral bouquet in certain coastal localities, the most famous being the Ganjam district of Orissa. The tree/shrub can reach a height of 18 feet. The densely branched plant is supported by aerial roots forming a thick impenetrable jungle. The long leaves possess prickly spines along the edges and mid-ribs making the plant tough to handle for those not use to their peculiar nature. The male flower "spikes"(a better technical word is inflorescence) are used for the The flowers were 25–35 cm long, 6–8 cm in diameter and, on the average, weighed about 100 g each.

Along the central stalk of spike one can find many true flowers each encased in a fragrant cream-colored spathe; a spathe being a leaflike structure enclosing a flower. A fully mature Kewda tree produces about 30-40 flower spikes each year. Kewra flowers have a sweet, perfumed odour with a pleasant quality similar to rose flowers, but kewra is more fruity.



Kewda or screw pine (*Pandanus fascicularis* Lam.) is a common species of the family Pandanaceae found growing wild in India. It grows abundantly in the coastal regions of Orissa, especially along the Ganjam coast between Rushikulya river to the north and Bahuda river to the south.

The plants are considered to be good soil binders. In the southern coastal district of Ganjam, it is an important economic plant, and its male spadices are utilized in the production of essential oil and attars through a process of distillation with water.

Fragrant Screw Pine is a small branched tree or shrub with fragrant flowers. It is a small, slender, branching tree with a flexuous trunk supported by brace roots. The flowers are stemming from a palm-like tree cultivated in India, have a delicate, floral scent and can be used to flavour foods, particularly Northern Indian sweets. With rosettes of long-pointed, stiffly leathery, spiny, bluish-green, fragrant leaves, it bears in summer very fragrant flowers. The flowers were 25–35 cm long, 6–8 cm in diameter and, on the average, weighed about 100 gm. each.



It is used as perfume, aromatic oil (kewda oil) and fragrant distillation (otto) called "keorra-ka-arak". Used plant part - male flowers. They are almost exclusively used in the form of a watery distillate called kewra water. Flowers have a sweet, perfumed odor that has a pleasant quality similar to rose flowers, but kewda is more fruity. The distillate (kewda water, pandanus flower water) is quite diluted. Most delightful, richest, and powerful of perfumes even when dried.



(H) Geographical Area of Production and Map as shown in Page No.

The Kewda flower grown region is popularly known as the Kewda Belt, and covers an area of approximately 675 km², 45 km from north to south and 15 km from east to west along the coast of the Bay of Bengal.

About 80-85% of Kewda canopy is concentrated within 10 kms radius from the sea coast. It is estimated that about 5,000 hectares of land constituting 6% of total land area in Ganjam district is covered under Kewda canopy. In the Ganjam district the two blocks i.e. Chatrapur and Rangeilunda covers 79% of the kewda plantation area and the rest by the Ganjam and Chikiti blocks. In the Ganjam district all the four blocks namely Ganjam, Chatrapur, Rangeilunda and Chikiti cover an area of 20%, 56%, 79% and 17% respectively as the kewda plantation area out of their total geographical area. Though the total geographical area of Chatrapur is highest, the kewda plantation area is more in Rangeilunda block. Though flowering of kewda takes place throughout the year, 70-80% flowers are available in rainy season (June-September); 10-15% in winter (November to January) and rest in summer i.e. during March-May. In the Ganjam district, it was estimated that 3,00,000 to 4,00,000 trees produce approximately 1,00,000,00 number of flowers per day. Now

there are 140 numbers of distillery units and each having 7-8 number of still / degs / bhatti. The total number of stills or degs is around 1200 out of which 51% is present in the Rangeilunda block .

Latitude – 19.4° to 20.7° North Latitude

Longitude – 84.5° to 85.5° East Longitude.

(I) Proof of Origin (Historical Records):

1. Pandanus odoratissimus L.f. featured prominently in religious, social and linguistic contexts since ancient times. The plant under the name of ketki has been extolled in many Sanskrit writings, Puranic and Classical. In Agni Puran, one of the 18 purans, the Agni god prescribes the various types of flowers to be used in the worship of god Vishnu. Among these the leaves and flowers of ketki also find a mention; ketki is also cited in many shloks (or stanzas) of Valmiki's Ramayana. But its association with Kamadeva (the god of Erotics) together with many images in sensual contexts comes out vividly in the Ritusamhar of Kalidas, one of the earliest and greatest poets of classical Sanskrit during the Golden Age of India. Ri-tusamhar quoted here is that edited and provided with Hindi translation by Sharma. The poet delineates with great delicacy the delights and pleasures of all the six seasons of the year. The flowering of ketki along with three other plants, represents not just the onset but the very acme and the ambience of the rainy season (Varsha Ritu). In Sarga (chapter) 2 which follows the first one on the "Hot" or the summer season (Grishm Ritu), ketki figures in four shloks or stanzas. In shlok 17, Kalidas talks of a breeze of moist air which sends shivers through the forests of ketki and Sal (*Shorea robusta* Gaertn. F); in 20, he states that ladies wear on their heads garlands woven out of ketki flowers; in 23, it is stated that with the advent of the new season the forest country is smiling with the buds of ketki; and finally in shlok 26, again it is the breeze which sweetly/deliciously troubles the inhabitants with the welcome fragrance of ketki raj (powder or pollen?). Thus from very early times, possibly two thousand years or more, the flowers of ketki or pandanus have been used in worship, as an ornament for ladies and as a source of fragrance or perfume in India. (Annexure – I, M.M. Payak, Economic Botany, Vol. 52, No. 4 (Oct. - Dec., 1998), pp. 423-425).

2. Cultivation of *P. odoratissimus* is almost limited to the Indian union state Orissa, more precisely, the Ganjam district in Southern Orissa. The flowers, which are most abundant during the monsoon season, are harvested early in the morning, as they lose their fragrance quickly after opening; thereafter, they are immediately subjected to hydrodistillation in one of the countless small distilleries found in the region (Annexure – II – Pandanus, http://www.uni-graz.at/~katzner/engl/Pand_odo.html)
3. Kewda flower and cultivation of pandanus is closely related to Kewda perfume industry which is one of the important cottage industries in coastal Ganjam district of Orissa, which has initiated about 200 years ago. It is started in the suburbs of Berhampur in the Ganjam District of Orissa by some muslims who hails from Punjab province of undivided India
4. Kewda Attar is one of the most popular perfumes in India since ancient times which is extracted from Kewda flower. About 90% of the Kewda essence is coming from Ganjam District of Orissa (Annexure – III, Rout, Naik and Rao, *Journal of Food Biotechnology*, vol. 35, 2011, pp. 500-512.)
5. It was reported that the distillation of flower started in the Ganjam district in 1924 by one Adi Mohammad who discovered kewda flower by establishing the first unit to extract the essential oil (rooh). Latter, in 1930, Mohammad Ali from Lucknow came and produced Kewda attar and water, the other products from the distillation of Kewda flower. The essential oil from flower is obtained by hydro-distillation and is known as Kewda rooh. The other products are being attar obtained by absorbing the hot vapours from the Kewda flowers in to the sandal wood oil/paraffin oil/DOP base. Only male flowers are used for distillation. The aroma is concentrated in the stamens and the spathes covering them (Annexure – IV, *Project Report on Developing in vitro Propagation Protocol for High Yielding Pandanus Fascicularis and Improving the Level for Essential Oils in Kewda, Ministry of Science & Technology, DBT Project, Regional Research Laboratory*).
6. The plant, *P. fascicularis* Lam. (synonyms: *Pandanus odoratissimus* L., *Pandanus tectorious*) belongs to the family Pandanaceae, in the order Pandanales. The plant is found growing widely, often forming thickets along roadsides, borders of

10. The commercial value of kewda absolute stems from its use as a aroma agent in soaps, cosmetics, bouquets, lotions, snuffs, hair oils, incense sticks, tobacco and betel, and as a flavouring in sweets, syrups and soft drinks (Anonymous 1986). The male flowers are kept in sachets within wardrobes and boxes to lend a lasting fragrance to the stored clothes.
11. A variety of handicrafts, such as table lamps, vanity bags, files, purses, wall hangings, pen stands, etc., are made from the processed leaves, and baskets are made from the processed roots. The plant also has some applications in Indian traditional and folk medicinal practices (**Annexure – VII**, KK Panda, AB Das and BB Panda, *Use and Variation of Pndamus Tectorius Parkinson (P.fascicularis Lam) along the Coastline of Orissa, India, Genet Resour Evol, 2009, Vol.56, pp. 629-637*).
12. From the standpoint of the environment, *P. fascicularis* is also eco-friendly. Its soil binding properties help in prevention of soil erosion from agricultural fields and stabilizes sand dunes along the seashore, reducing the impact of winds and thereby protects the coastline.
13. *P. fascicularis* is thus an important coastal bioresource, contributing significantly to the socio-economy as well as the ecology of the region. The present study was therefore undertaken to analyse the genetic diversity of the species. A survey was undertaken along the coast of Ganjam to study morphological and genetic variation of *P. fascicularis* through analyses of somatic chromosome number, nuclear DNA, randomly amplified polymorphic DNA (RAPD) and phytochemical profiling of the species, having implications in molecular phylogeny and biosystematics of the species.
14. The semi-natural *Kewda* vegetation provides flowers and performs many ecological functions. The objective of this study was to analyze the ecology of flower collection and the technical know-how used in Kewda distillation and its ecological implication. The traditional methods of flower collection, processing and extraction of essence (*Kewda attar*, *Kewda* water and *Kewda* oil) from the flower were described in detail. Three sample sites were surveyed for flower collection and annual flower production ranged from 6000 to 7000 flowers per hectare. Maximum daily flower distillation in the 10 units surveyed ranged between 6084 and 13,235

flowers while annual consumption varied from 125×10^3 to 505×10^3 flowers. The material inputs were fuel wood, base oil and a large number of other traditional materials such as copper containers, lid and *chunga*. The annual firewood consumption in the distilleries varied from 18.83 to 75.72 Mg. The annual production of *Kewda attar*, *Kewda water* and *Kewda oil* in the distilleries varied from 57 to 243 , 50 to 124 and 150 to 469 gm respectively. Other outputs were charcoal and flower waste materials, which were used locally.

(J) Method of Production:

1. The plant grows on sandy, saline, wastelands and marshy land on the bunds. The soil properties and special ecological environment contributes to the uniqueness of Kewda Rooh. The soil properties in Ganjam District, especially the Kewda Belt are as under:

pH range	:	7.5 – 8.9
Organic Carbon	:	0.63 – 1.24%
Soil Moisture	:	16.53 – 24.16%
Water holding capacity	:	23.00 – 40.00%
Soil temperature	:	18.00 - 32° C
Soil Texture	:	Silty Clay loam/Silty sandy loam

The flowers, which are most abundant during the monsoon season, are harvested early in the morning, as they lose their fragrance quickly after opening. It is plucked by pulling with a hooked stick. The mature flowers are harvested early in the morning as with the increasing intensity of sunlight the aroma fades away. The buds do not have any aroma and are thus not suitable for distillation.



Collection of Flowers manually in the early morning

And they sell these flowers to the aggregator, and aggregator supply these flowers to the distillation units on commission basis. In some cases the farmers directly sell the flowers to the distillation units. Thereafter, they are immediately subjected to hydro-distillation in one of the countless small distilleries found in the region.



(k) Uniqueness:

1. The unique characteristics of the kewda flower are its high fragrance due to high volatile oil contents, highly influenced by the sandy soil and the climatic conditions of the region.
2. Because of its high fragrance it is mainly used for flavouring purpose.
3. The special human skill and effort is required to cultivate the flower which contributes to the aura and mystique of the oil produced from the flower.
4. DNA finger print analysis of the extract confirmed that plant population from Palasa and Puri (outside the area) shows different composition where as population from Tulu, Chatrapur shows a similar concentration.
5. The somatic chromosome number in all the populations in Ganjam District is $2n=60$. The chromosome was of minute size without showing any remarkable structural variation is a unique character.
6. The average 4C DNA content is 5.09 pg (≈ 4912 Mbp) and there are no intra or inter-population differences.

(L) Inspection Body:

It is proposed by Ganjam Kewda Development Trust (GKDT) to form a core team towards ensuring standards, quality, integrity and consistency of goods. The team of members would be:

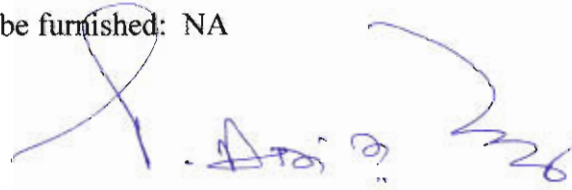
1. Technical Service Centre for Kewra, Berhampur
2. District Industrial Officer
3. Deputy Director, Horticulture & Agriculture, Government of Orissa
4. Professor, Department of Botany who is doing Research on Kewda, Berhampur University, Ganjam.
5. Council of Social Action, Berhampur
6. Access Development – Co-ordinator

Along with the Statement of Case in Class 31 in respect of **GANJAM KEWDA FLOWER** in the name of The Chairman, Ganjam Kewda Development Trust (GKDT), C/O-Reddy House, Hillpatna, Berhampur, Ganjam, Odisha - 760005 who claim to represent the interest of the producer of the said goods to which the Geographical Indication relates and which is in continuous use since in respect of the said goods.

2. The application shall include such other particulars called for in rule 32(1) in the statement of case.
3. All communication relating to this application may be sent to the following address in India:

**The Chairman,
Ganjam Kewda Development Trust (GKDT),
C/O-Reddy House, Hillpatna,
Berhampur, Ganjam (Dist),
Odisha – 760005.**

4. In the case of an application from a Convention Country the following additional particulars shall also be furnished: NA



SIGNATURE

NAME OF THE SIGNATORY: Mr. ADINARAYANA REDDY

CHAIRMAN, GANJAM KEWDA DEVELOPMENT TRUST