

## STATEMENT OF CASE

### **Description of goods:**

The botanical name of rice plant is *Oryza sativa*. *Pokkali* varieties/cultivars are world famous for their salinity tolerance. Traditional *Pokkali* cultivars and improved varieties are commonly cultivated by *Pokkali* farmers. *Pokkali*, *Cheruvirippu* and *Chettivirippu* are the ruling traditional cultivars of the tract. They have a yield potential of 1000-1500 kg/ha. Seven improved varieties has been released from Rice Research Station, Vyttila. Most of the high yielding varieties and land races are tall in stature with lodging characteristics. The height of these varieties varies from 160-200 cm, depending on season, drought and flood situation in the field. These genotypes have kneeling ability to keep panicles above flood water level. Upon lodging fresh roots will arise from the nodes to support the plants. The genotypes also show special ability for internodal elongation to overcome the effects of tidal and stagnant water.

*Pokkali* varieties have very good initial seedling vigour (attains a height of 40-45 cm within a period of one month), luxuriant growth habit, very high tillering capacity (average 12-16 tillers), long panicles (>25 cm) with large number (120-160) of medium to long bold grains. Except VTL-5 and VTL-7 all the varieties/cultivars have red kernels. VTL-6 is semi tall, non-lodging, saline tolerant and have a plant height of 115-125 cm, 10-12 productive tillers and a seed to seed maturity period of 105-110 days. It has an average grain yield of 4.0-4.5 t/ha and has tolerance to various abiotic stresses like salinity, acidity and submergence.

*Pokkali* rice is produced from *Pokkali* cultivars/varieties cultivated in the rice fields of *Pokkali* tract in Alappuzha, Ernakulam and Thrissur districts. *Pokkali* rice is medium bold in shape with very good cooking quality, special taste, average protein content of 7.5-8.5% and have intermediate (above 20 per cent) amylose content. VTL-7 exhibits an average protein content of 10.9 per cent. Rice has intermediate gelatinization temperature. Volume expansion of VTL-1, 2, 3 and 4 is more than 4.0 while that of VTL-5, VTL-6 and VTL-7 is more than 3.0. In general, *Pokkali* rice has a hulling percentage of more than 80, milling percentage of more than 75. *Pokkali* rice and the value added products made out of *Pokkali* rice have special taste and flavour and hence reputation in rice market. They are claimed to have medicinal properties also, and are used as special health care food and also as starter food after recovery from certain diseases.

### **Mode of origin/brief history:**

The extracts of Cochin State Manual authored by Shri. C. Achutha Menon, Former Secretary to Diwan, Ernakulam and published by Cochin State Government in the year 1911 contain a detailed description of system of *Pokkali* cultivation mentioning characteristics of traditional *Pokkali* cultivars and peculiar agro-climatic and soil characteristics of the tract. (Printed at Cochin Govt. Press, pp. 537)

The extract of Kerala State Gazetteer edited by Shri. Balakrishnan and published in the year 1989 also contains a detailed account of physical description of

*Pokkali* area and the main features of *Pokkali* cultivars. (Printed by Kerala Gazetteers Dept. Govt. of Kerala, pp. 779)

The above-mentioned historical documents give an account of *Pokkali* tract and the peculiar system of cultivation prevalent in the area.

#### Method of production:

##### 1. *Pokkali* fields:

*Pokkali* cultivation is a unique system of organic farming of rice prevalent in Kerala. Neither chemical fertilizer nor plant protection chemicals are applied to the crop. The daily total inflow and outflow of backwaters, the luxuriant growth of micro flora and fauna, the natural deposit of decomposed floating aquatic weed mass and the huge left over biomass of rice plant after harvest make the *Pokkali* fields nutrient rich.

##### 2. *Pokkali* cultivars:

*Pokkali* system mainly depends on traditional *Pokkali* cultivars and high yielding varieties derived from these cultivars. *ChootuPokkali*, *Chettivirippu*, *Cheruvirippu*, *Kuruva*, *Anakodan*, *Eravapandy*, *Bali*, *Orkayama*, *Orpandy* and *Pokkali* are the traditional cultivars prevalent in this tract. Improved varieties developed from Rice Research Station, Vyttila, Kerala Agricultural University are also popular. *Pokkali* varieties/cultivars are world famous for their salinity tolerance and are highly valuable as gene donors in international rice improvement programmes for salinity tolerance. They are also tolerant to soil acidity. Details of improved varieties released for the region are given below.

Name	Parentage	Method	Yield (kg/ha)	Kernal colour
VTL 1	<i>Chootu Pokkali</i>	Pure line selection	1500	Red
VTL 2	<i>Cheruvirippu</i>	Pure line selection	1800	Red
VTL 3	VTL 1 x TN 1	Hybridization	2100	Red
VTL 4	<i>Chettivirippu</i> x IR 4630-22-2-17	Hybridization	3250	Red
VTL 5	<i>Mashoori</i>	Mutation	3250	White
VTL 6	<i>Cheruvirippu</i> x IR 5 x <i>Jaya</i>	Hybridization	4500	Red
VTL 7	IR 8 x <i>Patnai</i> 23	Hybridization	4000	White

\* Improved varieties subsequently developed for cultivation in *Pokkali* tract may also be included in the varietal list for consideration as GI.

### 3. Method of cultivation:

In the *Pokkali* tract, farmers adopt a pragmatic and unique method for saline farming. The soil management and varietal selection are done meticulously to avoid crop failure due to salinity (*Ooru*). By April, the bunds are strengthened and sluices (*Thoombu*) repaired for regulating water levels. The fields are drained during low tide (*Veliyirakkam*) and the sluices closed. When the soil in the field becomes dry the fields are thrown open and mounds of 1 meter base and half meter height are formed. These mounds are called as *Vattakkannis*. The monsoon rain-washes down the dissolved salts on the mounds. The salts washed down are removed from the field by tidal action. The mounds act as elevated *in situ* nursery and protect the seedlings from flash floods. In some area instead of mounds, ridges (*Neelankkannis*) are prepared for sowing seeds. For preparation of mounds and ridges special types of *Pokkali spades* are used; while the preparation of mounds or ridges, only surface soil will be disturbed. Deep soil, if disturbed will add to salinity problem in the soil, by bringing more salts from deep layers to soil surface. The water pH ranges from 7.0 to 8.5 and the mean temperature 28 to 31°C.

A special method is adopted for sprouting seeds. The seeds are tightly packed in baskets made of plaited coconut leaves, the inside of which are lined by banana, teak, arrowroot or '*Karingotta*' leaves. These baskets are then immersed in fresh water ponds for 24 hrs, after which they are taken out and stored in shade. The radicle just sprouts out and remains quiescent under that condition for more than 30 days. The radicle inside the plaited coconut leaf baskets act as a barrier for gaseous exchange and helps the sprouting seeds to sleep till conditions become favourable for sowing. Use of *Karingotta* leaves for lining coconut baskets, gives added protection to germinating seeds in fields, against attack by fishes.

When the soil and weather conditions become favorable for sowing, the baskets containing the seeds are re-soaked for 3-6 hrs before sowing. This process is called as '*Maruneer Kodukkuka*' in nursery preparation. The mounds in the field are then raked and top leveled. The sprouted seeds are sown on the top of mounds, which act as nursery *in situ*. The sown seeds will be pasted to mounds with clay. This is to avoid removal of seeds by flooding and to reduce damage by birds.

The *Pokkali* varieties have early seedling vigor and they attain a height of 40-45 cms in 30-35 days. They are salt tolerant and show high internodal elongation. At about this stage, when field conditions become favorable the mounds are cut into pieces with 8-10 seedlings on, which are uniformly spread in the field. The clods of earth attached to the clumps give anchorage to the seedlings and help the seedlings to maintain an upright position.

Generally manuring or plant protection operations are not necessary for *Pokkali* farming systems. Fishes seen in *Pokkali* fields serve as biocontrol agents for pest and weed control. The crop matures in about 120 days. Normally *Pokkali* crop comes to harvest in the month of October. The ear head alone are harvested, leaving the straw behind. The average yield of rice with traditional rice varieties is 1500 kg/ha. Use of high yielding varieties makes the yield up to 4-4.5 t/ha. After harvest, the field is used for fish or prawn capture, which provides a substantial subsidiary income to the farmer.

In *Pokkali* cultivation where no chemical fertilizers are added, tidal ingress play an important role in maintaining the nutrient status of the soil. In addition, a plethora of microorganisms flourish in the system, which ultimately keep the soil very productive. But more significant is the annual transition from low saline to high saline phase during which, the profuse floating vegetation dies out, decomposes and add to the soil fertility. Together with decaying paddy stubbles retained in the field, the subsequent prawn filtration/farming is very much benefited by this form of organic recycling. Conversely the organic materials excreted by the fish and prawns and their remains are advantageous for plant growth. Interestingly, simultaneous culture of fish/prawn along with rice is also possible because plant protection measures are not adopted in this area.

#### 4. Paddy processing:

Paddy from *Pokkali* tract is processed adopting the traditional system of paddy processing. Paddy will be thoroughly cleaned with good quality water to remove the half filled grains, dirt and stones. Washed grains will be soaked in water overnight and in the next day morning one more washing will be made. Then the soaked paddy will be subjected to steam boiling in specially designed machines, for half an hour, using steam coming out from boiling water. Steamed paddy will then be transported to drying yards in special trolleys and will be subjected to slow drying, consecutively for two days, approximately for 6 hours/day with periodical turning for uniform drying. The paddy thus dried will be stored and will be milled, polished and packed according to demand. *Broken Pokkali* rice is also produced in the same way by providing more duration for boiling (3/4 hrs) and drying. Fresh bran collected at the time of polishing will be packed and sold as *Pokkali rice bran*. Milling of raw rice, without parboiling gives *raw Pokkali rice*. Processing of *Pokkali* rice without polishing gives *brown Pokkali rice* which is highly nutritious as it preserves the nutrients in rice bran; which are otherwise lost during polishing. *Pokkali 'Aval'* (flaked rice) is produced by pounding of roasted, soaked *Pokkali* rice.

#### Conspicuous body:

Kerala Agricultural University, Thrissur, a statutory institution established under "The Agricultural University Act 1971" and *Pokkali* Land Development Agency, N. Parvur, an autonomous paddy agency established under GO (MS) No. 382/96/AD, Thiruvananthapuram dt. 23/12/96 of Agrl. Dept. (Planning) and registered under Travancore-Cochin Charitable Societies Act 1955/12 on 19.07.2003, are working for the holistic development of the tract. *Pokkali* rice and rice products are marketed by individual *Padashekhara Samithis* working in *Pokkali* tract. *Ezhikkara Pokkali* Farmers Co-operative Self-help Group established in 2002 and working under *Palliyakkal Service Co-operative Bank*, *Ezhikkara* is making efforts in procuring, processing and marketing of *Pokkali* rice and rice products according to demand in domestic and national market.

**Inspection:**

Inspection body will be formed later which may comprise of experts of Kerala Agricultural University, officials of the State Department of Agriculture and *Pokkali* Land Development Agency.

**Mode of marketing:**

Production of rice is done by individual farmers working on Padashekhara Samithi basis. Procurement is done by two agencies: millers working in the nearby areas procure *Pokkali* rice at the time of harvest. Ezhikkara *Pokkali* Farmers Co-operative Self-help Group established in 2002 and working under Palliyakkal Service Co-operative Bank, Ezhikkara is storing, processing and marketing the *Pokkali* rice procured directly from the group members. This rice and rice products are supplied to retailers, super markets and margin free markets according to demand.

**Characteristics and Uniqueness:**

*Pokkali* cultivation is a pure organic farming of rice in tune to natural and climatic situations existing in the area and the farmers undertake the cultivation as a challenge for their survival in a highly unfavourable life situation. This organic system of rice cultivation is highly eco-friendly.

The distinctive, exclusive and rare qualities of *Pokkali* rice could be the result of several factors. The very good cooking quality, with a high percentage of protein could be attributed to the genetic parameters of *Pokkali* cultivars, the purely organic method of cultivation and the method of processing. The bold grain with its medium amylose content and distinctive organoleptic characteristics of taste, flavour etc. has increased the consumer preference for *Pokkali* rice and other value added products like *Pokkali puttupodi*, *Pokkali aval*, *Pokkali rice bran*, *Pokkali brown rice*, *Pokkali broken rice* etc. In general *Pokkali* rice is medium bold in shape with red kernel colour. The traditional cultivars show slow digestibility compared to improved cultivars and is mainly used as parboiled rice. Quality analysis in rice has proved that parboiling in rice saves many of the nutrients in rice kernel that are otherwise lost during milling. Similarly the red kernel colour of the cultivars make the *Pokkali* products more nutritious compared to white rice.

*Pokkali* rice and other *Pokkali* rice products are claimed to have medicinal properties. *Pokkali* rice is commonly used in the preparation of 'Marunnukanji' which is a traditional health care food consumed during the Malayalam month "Karkidagam" falling during peak monsoon period in Kerala. *Pokkali* rice bran is believed to be good for smoothening the problems associated with piles. *Pokkali* broken rice is also considered to be best for the preparation of starter food after recovering from certain diseases like cholera and typhoid. Rice gruel water (*Kanji vellam*) from *Pokkali* is also considered as a highly suitable drink to patients suffering from Cholera.

### **Geographical Location:**

The *Pokkali* land lie in 33 Panchayats, two municipalities and one city corporation area in Alappuzha, Ernakulam and Thrissur districts of Kerala. Original area under *Pokkali* was estimated to be 25,000 ha. But now *Pokkali* cultivation is carried out only in 8500 hectare. Of this 5500 ha is under regular *Pokkali* cultivation and the remaining area is cultivated only when the climatic conditions are favourable. Majority of the remaining *Pokkali* land has been converted to garden lands for coconut cultivation and other purposes, vast areas are left fallow or partly used for prawn farming alone.

The *Pokkali* tract which is comprised of low lying water logged areas along the saline coastal belt of Kerala is under the influence of tide, the amplitude of which may reach up to 1meter. These lands in their natural state are overgrown with mangroves.

*Pokkali* tract, comprising of parts of Thrissur, Ernakulam and Alappuzha districts, is situated between a latitude of 9°45" N and 10°15" N and a longitude of 76°10" E and 76°20" E. The Thrissur district is located at an altitude of 49.6 m above the mean sea level (MSL) and is situated at latitude of 10°32"N and 76°10"E longitude. The Ernakulam district is situated at latitude of 9°42'38" to 10°18' N and longitude of 76°12' to 76°46' E. The Alappuzha district is situated at latitude of 9°05' to 9°54' N and longitude of 76°17'30" to 76°40' E.

The map of *Pokkali* tract and the list of *Padashekhara Samithis* functioning in the tract are attached along with the application.

### **Future of *Pokkali* rice:**

*Pokkali* is the traditional system of rice cultivation, which depends on organic methods of farming. In the modern era, due to increasing awareness about health care practices and health care foods, demand for organic food is slowly increasing both in national and international market. Hence it is expected that the future of this organic rice will be more promising and rewarding. Moreover the traditional practice of taking *Marunnukanji* during the month of *Karkidakam* is now a days becoming more and more popular and people prefer to use organic rice like *Njavara* or *Pokkali* for this health care diet. It is expected that this will also add to the demand for this unique product. The value added traditional products prepared from *Pokkali* rice are also attracting more and more consumer attention in the present super markets. Registration of *Pokkali* rice and rice products as Geographical Indications will help to harvest better economic benefits from this unique system of organic rice cultivation, which is in the verge of peril.