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Research Article

Collection and conservation of Sorghum landraces from Tamil Nadu

M Elangovan[1], K Ganesamurthy[2], S Rajaram[2] K Sankarapandian[2] and P Kiran Babu[1]
[1] Directorate of Sorghum Research (DSR), Rajendranagar, Hyderabad 500030, AP, India
[2] Tamil Nadu Agricultural University (TNAU), Coimbatore, TN, India
*Email: elangovan@sorghum.res.in

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Abstract
Landraces are the varieties nurtured and cultivated by the farmers through traditional method of selection over the decades. The "landraces" are the primitive cultivars grown by farmers and their successors since ancient times. The Directorate of Sorghum Research (DSR) has explored Tamil Nadu and collected 150 accessions during 2003-2010. DSR has collected important landraces during its exploration, among them are *Deshi, Irungu cholam, Kaka cholam, Karareddu cholam, Kari cholam, Karuncholam, Karuppu irunggu, Kolumeddu cholam, Kovilpatti cholam, Makkatai cholam, Manjal cholam, Matthappu cholam, Nathu cholam, Nattu cholam, Pei (Thalaiviracham) cholam, Periya manjal cholam, Rasa vellai cholam, Sembavala irunggu, Sencholam, Senkatan cholam, Sevappu cholam, Sivappu irunggu, Tenkasi vellai, Vailkattu cholam, Valapoo sigappu cholam, Veettu cholam, Vella cholam, Vellai cholam, and Vellai nattu cholam* are very important and traditionally grown by the farmers over the centuries. Maximum frequency of 16 *vellai cholam* and 14 each of *sencholam* and *irungu cholam* were found in the collections. The highest number of twenty-one accessions were collected from Coimbatore district followed by 19 from Karur district. Forage landraces are very common in these regions as food and fodder values of the crop are considered essential the botanical race *Bicolor* had the maximum frequency (60 acc.) followed by *durra* race (42 acc.). Tamil Nadu has both the primitive race *bicolor* and advanced race *durra*. Most of the accessions were collected during were from the rabi (post-rainy) season (79 acc.) followed by late-kharif season (42 acc.). The landraces were grown as sole crop (121 acc.) in many parts of the state and as mixed crop either with green gram, red gram, black gram, bengal gram, cowpea, lablab and Italian millet in some pockets.

Keywords
Sorghum, Landraces, Collection, Diversity, Tamil Nadu

Introduction

Plant genetic resources represent the inter- and intra-specific reservoir of potentially useful genetic material. Landraces or farmers' varieties constitute the basic material for developing any new improved variety or hybrids. Landraces are the varieties nurtured and cultivated by the farmers through traditional method of selection over the decades. An autochthonous landrace is a variety with a high capacity to tolerate biotic and abiotic stress, resulting in high yield stability and an intermediate yield level under a low input agricultural system" (Zeven, 1998). The Biodiversity Act (2002) describes "landrace" as primitive cultivar that was grown by ancient farmers and their successors.

Sorghum [*Sorghum bicolor* (L.) Moench] is a non-native species for which India is a secondary centre of diversity (Singh, 2002). The Indian Council of Agricultural Research (ICAR) promoted independently or in collaboration with USIAD programmers/projects on germplasm collection, evaluation and utilization in sorghum during 1963-1964. The first major effort on the collection of sorghum genetic diversity was made under the auspices of Rockefeller Foundation and ICAR, and a total of 16,138 collections were assembled by 1970 (Rockefeller Foundation, 1970). Sorghum is of African origin (Kimber, 2003) and Africa has the largest diversity of cultivated and wild sorghum (Doggett 1988; deWet, 1977). In the Indian Subcontinent there is evidence for early cereal cultivation discovered at an archaeological site in Western parts of Rojdi (Saurashtra) dating back to about 4500 before present (Damania, 2002) and India is considered to be secondary center of origin of sorghum (Vavilov, 1992).

Collections of diverse crops are considered vital for developing innovations in the agricultural sector. Without them it may be only a matter of decades before agricultural yields will fall and pests and diseases will take control of farmers' fields. Plant genetic resources are important to

farming communities not only for food production, but also due to their role in culture and tradition moreover their sustainable livelihood. When plant diversity is lost, the genetic base of agriculture becomes depleted as does people's knowledge and cultural identity. The loss of biodiversity in agriculture can occur where crops are no longer being cultivated or are being marginalized.

Tamil Nadu is the traditional home of the largest number of traditional sorghum varieties. The state is an important region in the country with its different kinds of ecosystem and had been a centre of activities for many historical events from the days of the early Cholas. With its largest variety of communities, farmers have played a significant role in preserving and conserving traditional plant varieties. Agriculture sector provides the major source of income to the population of the state and the major crops in this state are paddy, sorghum (cholam), cotton, groundnut, maize etc., A primary centre of genetic diversity of any cultivated species harbors many valuable genes such as resistance to diseases, insect pests, physiological stress and quality characteristics. It could provide genetic material that may prove valuable in any plant breeding programme.

The collection of cultivated types includes landraces from various environments where they are adapted and grown. These are all annual cultigens. Agro-ecological conditions and quality are the main consideration of the region to grow the particular type. Due to a wide range of climatic, edaphic and physiographic conditions the requirement of varieties is diverse. Several landraces were found resistant and used to grow under severe stress condition. Collection of such genotypes from the field together with recorded data provides the clue for further evaluation of a particular genotype. Selection of suitable variety is a tough task and once the farmer is convinced on a specific variety of assured yield, they hardly divert from their traditional variety and in this way, they preserve such genetic materials generation after generation.

A few attempts were made on the sorghum germplasm collections in this region. Deb et al (2004) documented the levels of adaptation of improved sorghum cultivars in this region. In many areas, traditional farmers have developed complex farming systems adapted to the local conditions helping them to manage harsh environments and to meet their subsistence needs without depending on external inputs or technologies of modern agriculture. Using knowledge gained through experience, and locally available resources, indigenous farmers have developed integral and diversified production polyculture systems adapted to the different ecological systems. These agro ecosystems, based on the cultivation of crops and varieties in time and space, have allowed traditional farmers to maximize harvest security under low level of technology, and with limited environmental impact (Altieri, 1999). Traditional farmers' strategies emphasize crops diversification as a way of managing risks resulting from climatic vulnerability and market fluctuations. Additionally, they make use of resources available outside their fields. Collection and characterization of sorghum germplasm is an important activity for identifying potential germplasm for utilization in the varietal improvement programme and avoids duplication. Hence in order to rescue the land race diversity from un-surveyed and surveyed areas, the exploration was undertaken during 2002 to 2010 in Tamil Nadu and a total of 150 accessions collected were characterized.

Material and Methods

Sorghum germplasm exploration was organized by the Directorate of Sorghum Research (DSR) during 2002 to 2010 to collect the sorghum landraces available in Tamil Nadu. Nineteen districts were explored for the germplasm collection and 150 accessions were collected during this decade long exploration. The germplasm collection programmes were planned to cover the unexplored area and also the areas explored in the past. The explorations were jointly undertaken along with the All-India Coordinated Sorghum Improvement Project (AICSIP),Coimbatore and Kovilpatti Tamil Nadu Agricultural University (TNAU), and also with the Regional and Agricultural Research Stations located in different districts of the state.

Results and Discussion

The state comprises a total of 31 districts and sorghum is cultivated in all districts except Chennai, Nilgiris and Kanyakumari. The maximum number of accessions was collected from Coimbatore (21) followed by Karur (19) and Thoothukudi (15). The district-wise sorghum germplasm collection is presented in Table 1. The landrace *Vellai cholam* (16) was the most popular landrace collected, followed by *Irungu*

cholam (14) and *Sencholam* (14). In Tamil Nadu, majority of the landraces belongs to *Irungu cholam*, *Senjolam* and *Vellai cholam. Periya manjal cholam, Manjal cholam, Pei cholam, Nattu cholam, Senkaton cholam,* and *Kararedду cholam, Thalaivirchchan cholam and Makkatai cholam* (Table 1).

In these collections, some of the sorghum landraces are named with the village name prefixed to the landrace (ex. *Kovilpatti cholam* and *Tenkasi vellai)*, and also named based on the grain colour (ex. *Vellai cholam (White), Manjal cholam (Yellow), Senjolam (Red), Karuncholam (Black glume)*. Some of the landraces are named based on the shape of the ear head (ex. *Matthappu cholam*,ear head like flower fireworks shape).

Some of the traditional and popular sorghum landraces used by the farmers are *Irungu cholam, Vella cholam, Sevappu cholam, Sivappu irunggu* and *Karuppu irunggu*. *Karuppu irunggu* has been identified by the farmers as the drought tolerant landrace and the only source of fodder in these dry areas. It has the grain storability capacity of up to three years. The accessions include one variety with specific sorghum flour quality used for biscuit making in the Usilampatti areas of Madurai district. The *Irungu cholam* from southern districts of Tamil Nadu yields best quality porridge and *Mathappu cholam* is for preparing a jelly like food called *kali*. The mixture of sorghum and wheat flour is used to prepare *kali* to get more strength. Majority of the collections belongs to *bicolor* race which is the most primitive race and exclusively known for its fodder value. There were five major races and two intermediate races collected. A total of 60 accessions were collected from *bicolor* race followed by 42 from *durra* race. The race *durra* was selected from early *bicolor* that had moved into India some 3,000 years ago. With Arab migration, the *durra* moved into Ethiopia around 615 A.D., and is today the dominant race in India, Ethiopia, the Nile Valley of Sudan and Egypt (Mann et. al., 1983). The accessions are only used for fodder and feed, rarely for food and seed for next season.

Maximum accessions (79 acc.) are collected during the *Rabi* (post-rainy) season followed by late-*Kharif* (42 acc.). The accessions collected during the late-*Kharif* are sown in the month of July-August and harvested during December-January. The *Rabi* crop is sown during August-September and matures in December – January. The crop takes six months to maturity and exactly harvested during the "Sankranti" festival. In the state, sorghum is being cultivated as sole crop and sometimes mixed with pulses (red gram green gram, black gram, lablab, and cowpea) and millets (Italian millet). These cereal and legume system of inter-cropping has been evolved over years to ensure balanced food nutrition and also sustaining soil fertility.

Apart from regular use as food and fodder, the landraces are known for their multiple food uses to prepare jelly like *kali* and flour mixed with water as food. Traditional uses of millets are classified into nine major food categories. Thick porridges, thin porridges, steam-cooked products, fermented breads, unfermented breads, boiled rice products, alcoholic beverages, non-alcoholic beverages and snacks (Murthy and Kumar, 1995).

The region has been found to be the richest reservoir for genetic variability in agri-horticultural crops. These crops are grown according to the suitability and adaptability under different agro-climatic situations as well as the preference and choice given by the farmers. Though the spread of research varieties implies a possible narrowing of the gene pool, the farmers of the hills are more depended on their own landraces, inherited from their previous generation. This is possibly due to the taste and food security. Local farmers, who inhabit the remote hilly areas, are more conscious about the selection of particular landrace, which is suitable for specific environment. They have acquired this technique through several decades, based on their experience. In this way, they are still holding and preserving the valuable rice germplasm. Sorghum cultivated across this diverse agro-climatic situations and landscapes by the primitive and least influenced farmers has also evolved through development of landraces and selection pressure leading to rich granary of genetic diversity. Conservation of such sorghum biodiversity is a concern of Directorate of Sorghum Research and the emphasis has been laid to collect such native sorghum diversities in order to find out the desired traits through field characterization and evaluation. The desired characteristics may be useful for the sorghum breeders who are looking for such suitable traits for incorporation in their breeding material. Majority of traditional varieties in rainfed uplands tolerate moisture stress and possess strong root system under field conditions

(Hanamaratti *et. al*., 2008). Ganesamurthy *et. al*., (2010) reported that genetic diversity is generally associated with geographical diversity but the former is not necessarily directly related with geographical distribution. Similar finding was also reported by Nadaf *et al.,* (1986) and Shanmugam and Rangasamy (1982).

Sorghum in Tamil Nadu is known for its greater genetic diversity and each agro climatic zones are endowed with regional specific varieties and land values. The following are the specific land races collected from different districts.

Coimbatore: Sorghum germplasm exploration in this district resulted in collecting 19 accessions from 6 taluks comprising fifteen villages. The major landraces cultivated in this area are *Periya manjal cholam, Manjal cholam, Kari cholam, Karareddu cholam, CS 5, Vellai cholam, Manjal cholam*, and *Vellai cholam*.

Dindigul: In this district germplasm exploration was conducted in three taluks comprising eight villages and collected 11 accessions. The major landraces cultivated in this area are *Irungu cholam, Vella cholam, Karuncholam*, and *Matthappu cholam*.

Karur: This district known for yearlong cultivation of sorghum was subjected to germplasm exploration in four talukas comprising ten villages and collected 19 accessions. The major landraces cultivated in this area are *Vellai cholam, Kovilpatti cholam, Irungu cholam, Sencholam* and *Nathu cholam.*

Thoothukudi: This district in southern Tamil Nadu is known for irungu cholam and exploration conducted in the district in five taluk as comprising nine villages resulted in the collection of 19 accessions. The major landraces cultivated in this area are *Sencholam, Karuppu irunggu, Sivappu irunggu, Karuppu irunggu, Sembavala irunggu* and *Kaka cholam.* The Directorate of Sorghum Research has the mandate to collect and conserve these local hand races and germplasms from different parts of the country. The current status of total collections made so far by the institute is 31,746 accessions. These previous materials are to be evaluated, characterized and documented for utilization in the crop improvement programme.

Conclusion

This natural genetic diversity is under threat due to the destruction of habitats, commercial agricultural practices, industrial and infrastructural activities, and large-scale adoption of improved cultivars. Sorghum germplasm collections in Tamil Nadu represents greater genetic diversity as the crops is being grown traditionally under varied agro climatic conditions in centuries. It is suggested that the unexplored areas in the region must be surveyed vigorously to collect very valuable local landraces for use in the crop improvement programme. Most of the landraces are new versions of the past collections with natural crossing and selection and utilization of the accessions over the decades by the farming community. These land races with rare and usefull alleles could serve as a potential donar for yield enhancement and also for developing varieties to withstand biotic and abiotic stresses in the semi-arid tropical regions.

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Table.1: List of sorghum accessions collected from different localities of Tamil Nadu.

Sl.No.	Accession Number	IC No	Race	Vernacular Name	Village	Taluk	District
1	EA 1	IC 345243	Bicolor	Irungu cholam	Sinkarakottai	Dindigul	Dindigul
2	EA 2	IC 345244		Vella cholam	Ottupatti	Dindigul	Dindigul
3	EA 3	IC 345245		Vella cholam	Ottupatti	Dindigul	Dindigul
4	EA 4	IC 345246	Bicolor	Karuncholam	Chittain kottai	Dindigul	Dindigul
5	EA 5	IC 345247	Bicolor		Chittain kottai	Dindigul	Dindigul
6	EA 6	IC 345248		Matthappu cholam	Palathupatti	Dindigul	Dindigul
7	EA 7	IC 345249		Vella cholam	Dharmathu patti	Dindigul	Dindigul
8	EA 8	IC 345250	Durra		Moola Chatram	Ottan chatram	Dindigul
9	EA 9	IC 345251	Bicolor	Irungu cholam	Gandhigramam	Dindigul	Dindigul
10	EA 10	IC 345252	Bicolor	Irungu cholam	Gandhigramam	Dindigul	Dindigul
11	EA 11	IC 345253	Durra	Sevappu cholam	T. Vadipatti	T. Vadipatti	Madurai
12	EG 1	IC 541308	Durra	Periya manjal cholam	Sengalipalayam	Coimbatore	Coimbatore
13	EG 2	IC 541309	Durra	Manjal cholam	Idikarai	Coimbatore	Coimbatore
14	EG 3	IC 541310	Durra	Manjal cholam	Kulathur	Avinashi	Coimbatore
15	EG 4	IC 541311	Durra	Manjal cholam	Punjai Puliyampatti	Sathiyamangalam	Erode
16	EG 5	IC 541312	Bicolor	Vellai cholam	Punjai Puliyampatti	Sathiyamangalam	Erode
17	EG 6	IC 541313	Bicolor	Vellai cholam	Notchikottai	Sathiyamangalam	Erode
18	EG 7	IC 541314	Bicolor		Velayudhampalayam	Avinashi	Coimbatore
19	EG 8	IC 541315	Bicolor		Vadugapalayam	Palladam	Coimbatore
20	EG 9	IC 541316	Durra	Periya manjal cholam	Vadugapalayam	Palladam	Coimbatore
21	EG 10	IC 541317		Kari cholam	Kottampatti	Pollachi	Coimbatore
22	EG 11	IC 541318	Durra	Karareddu cholam	Nallore kaikatti	Pollachi	Coimbatore
23	EG 12	IC 541319		Karareddu cholam	Chandaya Gowndan Palayam	Pollachi	Coimbatore
24	EG 13	IC 541320		Periya manjal cholam	Muttaiyan kinaru	Tiruppur	Coimbatore
25	EG 14	IC 541321		Periya manjal cholam	Perumanallur	Tiruppur	Coimbatore
26	EG 15	IC 541322		CS 5	Perumanallur	Tiruppur	Coimbatore
27	EG 16	IC 541323		Vellai cholam	Perumanallur	Tiruppur	Coimbatore
28	EG 17	IC 541324	Durra	Vellai cholam	Puthupalayam	Erode	Erode
29	EG 18	IC 541325		Vellai cholam	Kollampalayam	Erode	Erode
30	EG 19	IC 541326		Vellai cholam	Chinnammapuram	Erode	Erode
31	EG 20	IC 541327		Vellai nattu cholam	Salaiputhur	Erode	Erode
32	EG 21	IC 541328		Vellai cholam	Kunthanipalayam	Karur	Karur

Table.1: Contd..

Sl.No.	Accession Number	IC No	Race	Vernacular Name	Village	Taluk	District
33	EG 22	IC 541329		Vellai cholam	Muthusolipalayam	Karur	Karur
34	EG 23	IC 541330		Vellai cholam	K. Paramathi	Karur	Karur
35	EG 24	IC 541331		Kovilpatti cholam	K. Paramathi	Karur	Karur
36	EG 25	IC 541332		Irungu cholam	K. Paramathi	Karur	Karur
37	EG 26	IC 541333	Durra	Manjal cholam	Ottakalmandabam	Pollachi	Coimbatore
38	EG 27	IC 541334	Durra	Vellai cholam	Udumalaipet	Poovathur	Coimbatore
39	EG 28	IC 541335	Durra	Vellai cholam	Udumalaipet	Poovathur	Coimbatore
40	EG 29	IC 541336	Bicolor	Irungu cholam	Kattakamanmpatti	Nilakottai	Dindigul
41	EG 30	IC 541337	Bicolor	Irungu cholam	Dharmaligapuram	Periyakulam	Theni
42	EG 31	IC 541338	Durra	Vellai cholam	Nallakaruppanpatti	Periyakulam	Theni
43	EG 32	IC 541339	Bicolor		Kailasapuram	Periyakulam	Theni
44	EG 33	IC 541340	Bicolor	Irungu cholam	Muthuthevanpatti	Palanisettypatti	Theni
45	EG 34	IC 541341	Durra	Vellai cholam	Kavillakku	Theni	Theni
46	EG 35	IC 541342		Senkatan cholam	Urilampatti	Usilampatti	Madurai
47	EG 36	IC 541343	Kafir		Ilaiyarpatti	Madurai	Madurai
48	EG 37	IC 541344	Bicolor	Irungu cholam	Karaipatti	Madurai	Madurai
49	EG 38	IC 541345	Bicolor		Kalkurichy	Kariyapatti	Virudhunagar
50	EG 39	IC 541346	Guinea	(Thalaiviracham) Pei cholam	Palayampatti	Aruppukottai	Virudhunagar
51	EG 40	IC 541347	Kafir	Sencholam	Palayampatti	Aruppukottai	Virudhunagar
52	EG 41	IC 541348	Kafir Durra	Nattu cholam	Kallanayakanpatti	Aruppukottai	Virudhunagar
53	EG 42	IC 541349	caudatum	Sencholam	Kalanasakaralam	Aruppukottai	Virudhunagar
54	EG 43	IC 541350	Bicolor	Sencholam	Alagapuri	Ettaiyapuram	Thoothukudi
55	EG 44	IC 541351	Kafir	Sencholam			Thoothukudi
56	EG 45	IC 541352	Bicolor Durra	Irungu cholam	Sulakharai	Virudhunagar	Virudhunagar
57	EG 46	IC 541353	bicolor	Nattu cholam	Konalai	Manachanallur	Trichy
58	EG 47	IC 541354	Bicolor	Nattu cholam	Siruganur	Manachanallur	Trichy
59	EG 48	IC 541355	Caudatum Durra	Makkatai cholam	Siruganur	Manachanallur	Trichy
60	EG 49	IC 541356	caudatum Durra	Sencholam	Siruvachur	Perambadur	Perambalur
61	EG 50	IC 541357	bicolor		Kodaripalayam	Perambadur	Perambalur
62	EG 51	IC 541358	Bicolor	Irungu cholam	Kodaripalayam	Perambadur	Perambalur
63	E`G 52	IC 541359	Caudatum Durra	Makkatai cholam	Esanai	Perambadur	Perambalur
64	EG 53	IC 541360	caudatum	Vailkattu cholam	Rayarpalayam	Attur	Salem
65	EG 54	IC 541361	Bicolor	Vailkattu cholam	Mallur	Salem	Salem
66	EG 55	IC 541362	Bicolor	Nattu cholam	Patchal	Namakkal	Namakkal

Table.1: Contd..

Sl.No.	Accession Number	IC No	Race	Vernacular Name	Village	Taluk	District
67	EG 56	IC 541363	Bicolor	Irungu cholam	Karupipalam	Namakkal	Namakkal
68	EG 57	IC 541364	Bicolor	Irungu cholam	Kiranpur	Namakkal	Namakkal
69	EG 58	IC 541365	Bicolor	Irungu cholam	Kiranpur	Namakkal	Namakkal
70	EG 59	IC 541366	Bicolor	Irungu cholam	Manmangalam	Karur	Karur
71	EG 60	IC 568402	Durra	Periya manjal cholam	Kurumpalayam	Coimbatore	Coimbatore
72	EG 61	IC 568403	Bicolor	Periya manjal cholam	Kurumpalayam	Coimbatore	Coimbatore
73	EG 62	IC 568404	Durra		Annur	Coimbatore	Coimbatore
74	EG 63	IC 568405	Durra		Karikaranpalayam	Coimbatore	Coimbatore
75	EG 64	IC 568406	Bicolor		Karikaranpalayam	Coimbatore	Coimbatore
76	EG 65	IC 568407	Durra		Karuppan pungampalli	Sathyamangalam	Erode
77	EG 66	IC 568408	Durra	Vellai cholam	Muniyappan palayam	Bhavani	Erode
78	EG 67	IC 568409	Durra	Vellai cholam			Erode
79	EG 68	IC 568410	Durra		Pothaneri	Mettur	Salem
80	EG 69	IC 568411	Caudatum	Sencholam	Mettur	Mettur	Salem
81	EG 70	IC 568412			Thompuragam patti	Dharmapuri	Dharmapuri
82	EG 71	IC 568413	Guinea	Veettu cholam	Nariayaneri	Tiruppatur	Krishnagiri
83	EG 72	IC 568414	Guinea		Periyakali nayakkan patti	Tiruppatur	Krishnagiri
84	EG 73	IC 568415	Guinea		Kanavaimadi	Alangayam	Vellore
85	EG 74	IC 568416	Durra		Alangayam	Alangayam	Vellore
86	EG 75	IC 568417	Bicolor	Deshi	Alangayam	Alangayam	Vellore
87	EG 76	IC 568418		Nattu cholam			Vellore
88	EG 77	IC 568419	Guinea		Vaduganthangal	Katpadi	Vellore
89	EG 78	IC 568420			Pibuthipata	Katpadi	Vellore
90	EG 79	IC 568421	Guinea		Vallankottai	Vellore	Vellore
91	EG 80	IC 568422	Guinea	Kolumeddu cholam	Kankaranpattu	Vellore	Vellore
92	EG 81	IC 568423	Durra		Kalampur	Arani	Tiruvannamalai
93	EG 82	IC 568424	Guinea			Polur	Tiruvannamalai
94	EG 83	IC 568425	Durra		Sothium	Virudhachalam	Cuddalore
95	EG 84	IC 568426	Guinea		Nallore	Virudhachalam	Cuddalore
96	EG 85	IC 568427	Durra		Nallore	Virudhachalam	Cuddalore
97	EG 86	IC 568428	Durra guinea		Veppur	Tittagudi	Cuddalore
98	EG 87	IC 568429	Guinea		Veppur	Tittagudi	Cuddalore
99	EG 88	IC 568430	Durra		M.Podaiyur	Tittagudi	Cuddalore
100	EG 89	IC 568431	Durra		M.Podaiyur	Tittagudi	Cuddalore

Table.1: Contd..

Sl.No.	Accession Number	IC No	Race	Vernacular Name	Village	Taluk	District
101	EG 90	IC 568432	Durra	Valapoo sigappu cholam	Mangalam	Perambalur	Perambalur
102	EG 91	IC 568433	Durra		Devaiyur	Perambalur	Perambalur
103	EG 92	IC 568434	Kafir		Rover thanner pandhal	Veppandhattai	Perambalur
104	EG 93	IC 568435	Kafir		Rover thanner pandhal	Veppandhattai	Perambalur
105	EG 94	IC 568436	Bicolor		Rover thanner pandhal	Veppandhattai	Perambalur
106	EG 95	IC 568437	Bicolor		Rover thanner pandhal	Veppandhattai	Perambalur
107	EG 96	IC 568438			Ammapolabam	Perambalur	Perambalur
108	EG 97	IC 568439	Durra		Nakksalem	Kunnam	Perambalur
109	EG 98	IC 568440	Durra		Nakksalem	Kunnam	Perambalur
110	EG 99	IC 568441	Durra		Kannanur	Duraiyur	Karur
111	EG 100	IC 568442	Bicolor				Karur
112	EG 101	IC 568443	Durra		Valavanthi	Musiri	Karur
113	EG 102	IC 568444	Durra		Valavanthi	Musiri	Karur
114	EG 103	IC 568445	Bicolor			Karur	Karur
115	ERS 1	IC 585206	Bicolor	Karuppu irunggu	Tittankulam	Kovilpatti	Thoothukudi
116	ERS 2	IC 585207	Bicolor	Sivappu irunggu	Kumaragiri	Kovilpatti	Thoothukudi
117	ERS 3	IC 585208	Bicolor	Sivappu irunggu	Kumaragiri	Kovilpatti	Thoothukudi
118	ERS 4	IC 585209	Bicolor	Karuppu irunggu	Kumaragiri	Kovilpatti	Thoothukudi
119	ERS 5	IC 585210	Bicolor	Karuppu irunggu	Sinthalakarai	Ettaiyapuram	Thoothukudi
120	ERS 6	IC 585211	Bicolor		Puthur	Vilathikulam	Thoothukudi
121	ERS 7	IC 585212	Bicolor	Sembavala irunggu	Kalugasalapuram	Vilathikulam	Thoothukudi
122	ERS 8	IC 585213	Bicolor		Kalugasalapuram	Vilathikulam	Thoothukudi
123	ERS 9	IC 585214	Bicolor		Kalugasalapuram	Vilathikulam	Thoothukudi
124	ERS 10	IC 585215	Bicolor	Sivappu irunggu	Tittankulam	Vilathikulam	Thoothukudi
125	ERS 11	IC 585216	Bicolor		Villisery	Kayadhar	Tirunelveli
126	ERS 12	IC 585217	Bicolor		Kallurani	Kovilpatti	Tirunelveli
127	ERS 13	IC 585218	Durra	Tenkasi vellai	Viriruppu	Sankarankoil	Tirunelveli
128	ERS 14	IC 585219	Durra	Tenkasi vellai	Viriruppu	Sankarankoil	Tirunelveli
129	ERS 15	IC 585220	Durra	Rasa vellai cholam	Eechampotal puthur	Sankarankoil	Tirunelveli
130	ERS 16	IC 585221	Bicolor	Kaka cholam	Vilathikulam	Vilathikulam	Thoothukudi
131	ERS 17	IC 585222	Bicolor	Sencholam	Vilathikulam	Vilathikulam	Thoothukudi
132	ERS 18	IC 585223	Bicolor		Aryanayagipuram	Sayalkudi	Thoothukudi
133	ERS 19	IC 585224	Bicolor		Nerunchipatti	Kamudhi	Ramanathapuram
134	ERS 20	IC 585225	Bicolor		Nerunchipatti	Kamudhi	Ramanathapuram

Table.1: Contd..

Sl.No.	Accession Number	IC No	Race	Vernacular Name	Village	Taluk	District
135	ERS 21	IC 585226	Bicolor	Sencholam	Thuvaraipatti	Kamudhi	Ramanathapuram
136	ERS 22	IC 585227	Bicolor	Sencholam	Sengappadai	Kamudhi	Ramanathapuram
137	ERS 23	IC 585228	Bicolor	Sencholam	V Puthur	Kulidhalai	Karur
138	ERS 24	IC 585229	Durra	Sencholam	V Puthur	Kulidhalai	Karur
139	ERS 25	IC 585230	Durra	Nathu cholam	Ayyarmalai	Kulidhalai	Karur
140	ERS 26	IC 585231	Bicolor		Ayyarmalai	Kulidhalai	Karur
141	ERS 27	IC 585232	Bicolor		Ayyarmalai	Kulidhalai	Karur
142	ERS 28	IC 585233	Bicolor		A Othakadai	Kulidhalai	Karur
143	ERS 29	IC 585234	Bicolor		Desiamangalam	Kulidhalai	Karur
144	ERS 30	IC 585235	Bicolor		Desiamangalam	Kulidhalai	Karur
145	ERS 31	IC 585236	Durra	Vellai cholam	Manaparai	Manaparai	Trichy
146	ERS 32	IC 585237	Durra	Sencholam	Manaparai	Manaparai	Trichy
147	ERS 33	IC 585238	Bicolor		Vadugapatti	Manaparai	Trichy
148	ERS 34	IC 585239	Durra	Sencholam	Kalpanathan patti	Manaparai	Trichy
149	ERS 35	IC 585240	Bicolor	Karuncholam	Balakarumatham patti	Manaparai	Trichy
150	ERS 36	IC 585241	Bicolor	Sencholam	Sevathampatti	Dwarankuruchi	Trichy