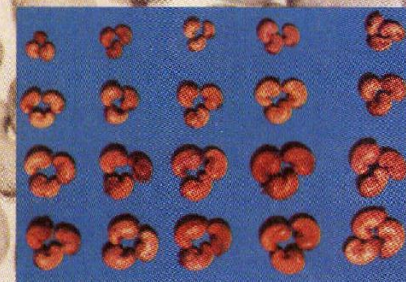


CATALOGUE OF MINIMUM DESCRIPTORS OF

# CASHEW

(*Anacardium occidentale* L.)

GERMPLASM ACCESSIONS - I



NATIONAL RESEARCH CENTRE FOR CASHEW  
(Indian Council of Agricultural Research)  
PUTTUR - 574 202, D.K., KARNATAKA, INDIA



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**Cover photographs (from left to right) :**

1. A cashew tree in Flowering
2. Cashew panicles with flowers and developing fruits
3. Variability for cashew apple shape, size and colour
4. Variability for cashew nut size

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**भारतीय कृषि अनुसंधान परिषद्**

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## FOREWORD

Tree nuts have been one of the oldest sources of food for man. Cashew leads them all in the world production and ranks third in the International trade with over 20 per cent of the tree nut market. Cashew which is indigenous to Brazil has been introduced into India by the Portuguese in 1498. Today India is the largest producer, processor, exporter and consumer of cashewnuts. It is appropriate that the research efforts on cashew initiated in 1950 gave priority for germplasm collection which was further strengthened with the inception of All India Coordinated Spices & Cashewnut Improvement Project. The National Research Centre for Cashew, which was established in 1986 was given the priority programme of establishing National Cashew Gene Bank and also a mandate to conserve the available germplasm in the country. Till 1986, cashew germplasm was collected only through the seeds but was changed to clonal material since then. Today, National Research Centre for Cashew, Puttur (Karnataka) has a collection of 320 accessions collected since 1986. Characterization of the germplasm has been taken up using the descriptors suggested by IPGRI. The first set of accessions planted in 1986 are now characterized and documented in this publication. This is the first effort made in characterization of clonal germplasm of cashew in the world and I appreciate the efforts made by my colleagues at NRCC, Puttur in bringing out this publication. I hope this will be of immense use to both the Horticulturists and Breeders who are dealing with Cashew Crop Improvement programmes in India and abroad.

*S. P. Ghosh*  
(S. P. GHOSH)

**CATALOGUE OF MINIMUM DESCRIPTORS OF CASHEW**  
**(*Anacardium occidentale* L.)**  
**GERMPLASM ACCESSIONS PLANTED AT NRCC IN 1986 - I**

**KRM Swamy, EVV Bhaskara Rao & MG Bhat**

The evaluation of germplasm is an important part of a variety development programme designed to utilize germplasm resources. As new accessions become available, it is important to identify and characterize the new materials so that researchers may incorporate lines with desirable characters into utilization programmes. The first steps of this evaluation are: (1) to compile the passport data and (2) to characterize the materials for easily recognised traits (minimum descriptors).

A large quantity of new, underscribed germplasm of cultivated cashew (*Anacardium occidentale* L.) has been collected in India (Bhaskara Rao and Swamy, 1994). The early attempts for germplasm collection were made during the early fifties with the sanctioning of Ad-hoc schemes in the then composite States of Madras, Travancore, Cochin and Bombay. The research stations started under these Ad-hoc schemes in Kerala (Kottarakkara), Karnataka (Ullal), Tamil Nadu (Vridhachalam), Andhra Pradesh (Bapatla) and Maharashtra (Vengurla) took up the programme of collection of locally

available elite plants for evaluation and further selection. These were the first attempts in collection of cashew germplasm in India. Many of the other research centres which were established subsequently have collected the seeds of germplasm from the centres, namely, Bapatla, Kottarakkara, Ullal, Vridhachalam and Vengurla. While making the initial collections of germplasm these centres have confined their survey mainly to the respective states and hence they represent the local germplasm available in the states. Since the inception of All India Coordinated Spices and Cashew Improvement Project in 1971, Central Plantation Crops Research Institute (CPCRI), Regional Station, Vittal, also took up the programme of cashew germplasm collection which mainly consisted of the seedling progenies of collections which are available at Bapatla, Vridhachalam, Vengurla, Anakkayam and a few collections made locally from Karnataka.

Subsequent to the establishment of National Research Centre for Cashew (NRCC) at Puttur (Karnataka), the germplasm collection through seeds has been discontinued and only the vegetatively propagated material is being collected and conserved in the National Cashew Gene Bank (NCGB). A coordinated approach was brought in the cashew germplasm collection by organising joint survey teams consisting of scientists of NRCC and the All India Coordinated Research Project on Cashew (AICRP on cashew) centres of the respective states. In the NCGB so far 320 clonal accessions which were

collected from 1986 to 1994 have been planted @ 6 soft wood grafts per accession by adopting a spacing of 6m x 6m and are being maintained as active collections in the field. Similarly, Regional Cashew Gene Banks (RCGB) have been established at AICRP on cashew centres such as Vengurla (bold nut collections), Bhubaneswar (cluster bearing collections), Madakkathara (dwarf types) and Chintamani (collections from maidan parts of Karnataka).

The most immediate priority is to catalogue the available germplasm and identify the duplicates. Though genetic variability is wide in cashew, the genetic base is narrow. In order to catalogue the germplasm accessions in NCGB, preliminary evaluation and characterization were done after six annual harvests. Minimum IBPGR descriptors were applied to field plantings of the cashew accessions that were planted in 1986 (56 accessions). This is the first attempt in cataloguing of cashew germplasm.

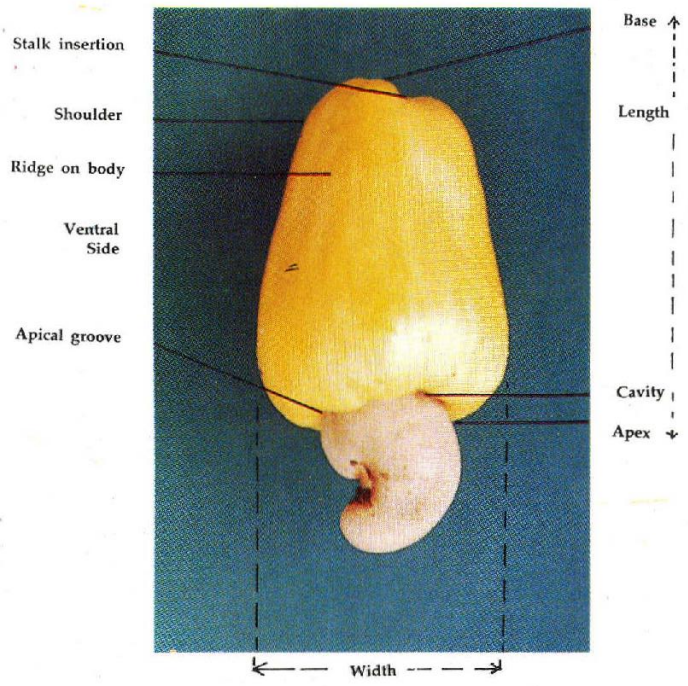
The booklet "Cashew Descriptors" was assembled and published by IBPGR (presently IPGRI) in 1986 (IBPGR, 1986). This booklet (available through IPGRI, Rome, Italy) sets forth minimum descriptors agreed upon by an expert consultation panel.

This catalogue contains characterization data expressed

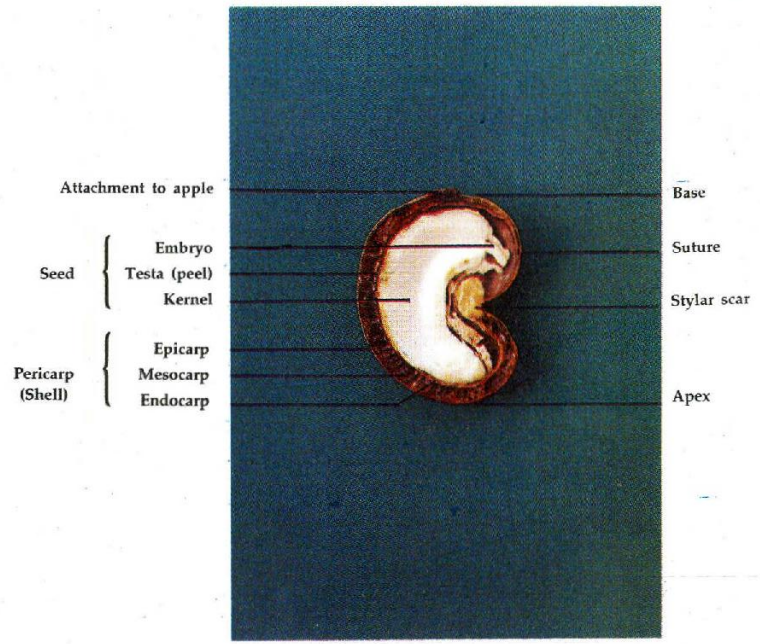
in 68 data fields (01-68). Data field 01 - is the NRCC accession number assignment, 02 - donor name, 03 - donor identification number, 04 - scientific name, 05 - type of maintenance and the rest are characterization data expressed in 63 data fields (06-68). The data fields are listed in Table 1 with corresponding numerical category (code) of the character as shown in the IBPGR "Cashew Descriptors". These fields are expressed on facing pages and the data are expressed as numerical figures which were drawn from the descriptors booklet. The data fields are numbered 01, 02 through 68. All characters were measured or observed as outlined in the descriptor list except flowering duration, flowering intensity, apple to nut ratio and culmulative yield / plant (data fields, 60, 61, 62 and 68) respectively. Colour of mature cashew apple was recorded on all accessions with the help of "The Munsell Limit Color Cascade". Different parts of cashew apple and nut are shown in Fig.1 and 2 respectively.

The data were gathered from 56 cashew accessions which were planted during 1986 in NCGB at Puttur (Lat. 1245 N ; Long. 7542 E ; elevation 90m from MSL). These accessions have been grown under rainfed conditions by adopting recommended package of practices for cashew.

Summaries of several characters measured on 56 accessions are shown in Table 2. Fifty five (98.2%) of the accessions had upright and open tree habit and one (1.8%)



Cashew apple with nut



Cashew nut

accession had spreading habit. Twelve (21.4%) of the accessions had semi-tall tree habit and 44 (78.6%) had tall (>4.0m) tree habit. Thirty four (60.7%) of the accessions had obovate (club-shaped) leaf shape, 13 (23.2%) had oval leaf shape and 9 (16.1%) had oblong leaf shape.

All the 56 accessions (100%) had cracks on trunk bark, mango-like odour of leaves, leathery leaves, acute crotch angle of main branches, acute angle of leaf petiole relative to stem, kidney-shaped nuts, absence of secondary flowering, light green colour of boot leaves, loose inflorescence, branching of inflorescence all around the main axis and loose attachment of peel to kernel.

Fifty five (98.2%) of the accessions had extensive branching, 48 (85.7%) had intermediate length of twigs (9-19cm), 50 (89.3%) had medium length of internode (1-2cm), 41 (73.2%) had easy peeling of bark from twigs, 31 (55.4%) had thin twigs (<4.5mm diameter), 30 (53.6%) had medium number of leaves per twig (9-19), 37 (66.1%) had red colour of young leaves, 51 (91.1%) had green leaves, 55 (98.2%) had wavy leaf margin, 43 (76.8%) had rounded leaf apex, 31 (55.4%) had small leaf size (<60cm<sup>2</sup>), 44 (78.6%) had reflexed leaf cross-section, 39 (69.6%) had mid season flowering (December-January), 55 (98.2%) had pyramidal shape of inflorescence and cream coloured flowers.

Twenty eight (50%) of the accessions had yellow apples and 28 (50%) had red apples, 39 (69.6%) of the accessions had conical to obovate apple shape, 6 (10.7%) had cylindrical shape, 6 (10.7%) had round shape and 5 (9.0%) had pyriform shape.

Fifty two (92.8%) of the accessions had grey coloured nut shell, 37 (66.1%) had intermediate nut weight (5.0-7.0g), 32 (57.1%) had intermediate sex ratio (0.06-0.13), 30 (53.6%) had high weight of apple (>52g), 31 (55.4%) had loose attachment of nut to apple, 33 (58.9%) had rounded flanks of nut, 32 (57.1%) had suture projection inline with apex of nut, 49 (87.5%) had intermediate shell thickness (2.5-4.0mm), 53 (94.6%) had uniform shell thickness, 38 (67.9%) had long duration of flowering (>90 days), 46 (82.1%) had medium flowering intensity (40.0-70.0%), 40 (71.4%) had medium ratio of apple to nut (6.0-12.0), 30 (53.6%) had intermediate shelling percentage, 45 (80.4%) had intermediate kernel weight (1.2-2.5g), 47 (83.9%) had shallow grooves on cotyledons and 39 (69.6%) had medium yield/plant (9-18kg/tree from 6 annual harvests).

Based on three criteria for the stratification of the accessions, namely, category of germplasm material / level of domestication, agroecological regions and characterization and evaluation data (different character states for certain strongly inherited characters of importance namely, flowering season, duration of flowering and colour of mature cashew apple), the



56 accessions were grouped into 11 distinctive clusters. Of the 11 clusters, two clusters consisted of single accessions and the largest cluster had 18 accessions (Table 3).

Table 1: Descriptors listed in this catalogue, showing data field number, descriptor name and descriptor code from IBPGR descriptor list.

Data field	Descriptor	IBPGR code
01	Accession number	1.1
02	Donor name	1.2
03	Donor identification number	1.3
04	Scientific name	1.5
05	Type of maintenance	1.11
06	Age of tree	3.4
07	Tree habit	4.1.1
08	Internode length of twig	4.1.2
09	Leaf shape	4.1.3
10	Tree height	6.1.1

Data field	Descriptor	IBPGR Code
11	Tree spread	6.1.2
12	Cracks on trunk bark	6.1.3
13	Crotch angle of main branches	6.1.5
14	Ease of peeling bark from twigs	6.1.6
15	Extension growth of twigs	6.1.7
16	Branching pattern	6.1.8
17	Twig diameter	6.1.9
18	Number of leaves per twig	6.1.10
19	Colour of young leaves	6.1.11
20	Colour of mature leaves	6.1.12
21	Odour of leaves	6.1.13
22	Leaf margin	6.1.14
23	Leaf apex shape	6.1.15
24	Leaf size	6.1.16
25	Brittleness of leaf	6.1.17
26	Angle of leaf petiole	6.1.18
27	Leaf cross - section	6.1.19

Data field	Descriptor	IBPGR Code
28	Season of flowering	4.2.1
29	Inflorescence shape	4.2.2
30	Flower colour	4.2.3
31	Mature cashew apple colour	4.2.4
32	Cashew apple shape	4.2.5
33	Colour of mature nut shell	4.2.6
34	Nut shape	4.2.7
35	Nut weight	4.2.8
36	Colour of boot leaf	6.2.1
37-1	Inflorescence size - Length	6.2.2
37-2	Inflorescence size - Width	6.2.2
38	Compactness of inflorescence	6.2.3
39	Type of inflorescence branching	6.2.4
40	Sex ratio	6.2.6
41	Secondary flowering	6.2.7
42-1	Size of cashew apple - Length	6.2.8
42-2	Size of cashew apple - Width	6.2.8
43	Weight of cashew apple	6.2.9

Data field	Descriptor	IBPGR Code
44	Shape of cashew apple base	6.2.10
45	Ridges on cashew apple	6.2.11
46	Cashew apple apex	6.2.12
47	Grooves on apex of cashew apple	6.2.13
48	Cavity at apex of cashew apple	6.2.14
49	Skin of cashew apple	6.2.17
50	Attachment of nut to cashew apple	6.2.24
51	Shape of nut base	6.2.25
52	Suture of nut	6.2.26
53	Flanks of nut	6.2.27
54	Stylar scar on nut	6.2.28
55	Shape of nut apex	6.2.29
56	Relative position of suture and apex	6.2.30
57	Shell thickness	6.2.31
58	Uniformity of shell thickness	6.2.32
59-1	Cashew nut dimension - Length	6.2.33
59-2	Cashew nut dimension - Width	6.2.33
59-3	Cashew nut dimension - Thickness	6.2.33

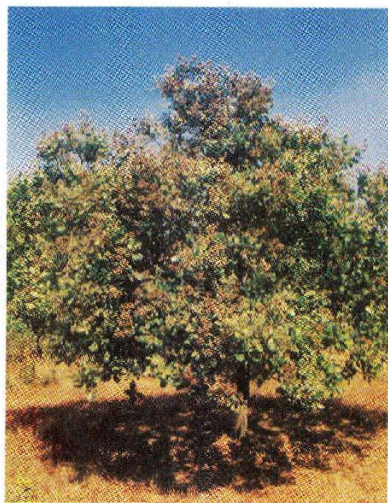
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Data field	Descriptor	IBPGR Code
60	Flowering duration	11.2.1
61	Flowering intensity	11.2.2
62	Apple to nut ratio	11.2.3
63	Shelling percentage	4.3.1
64	Kernel weight	4.3.2
65	Attachment of peel to kernel	4.3.3
66-1	Kernel dimension - Length	6.3.1
66-2	Kernel dimension - Width	6.3.1
66-3	Kernel dimension - Thickness	6.3.1
67	Cotyledonary grooves	6.3.2
68	Cumulative yield per plant	11.1

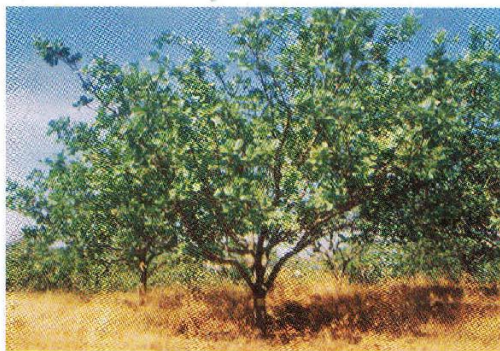
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Table 2 : Summary of the characters from 56 accessions in this descriptor catalogue.

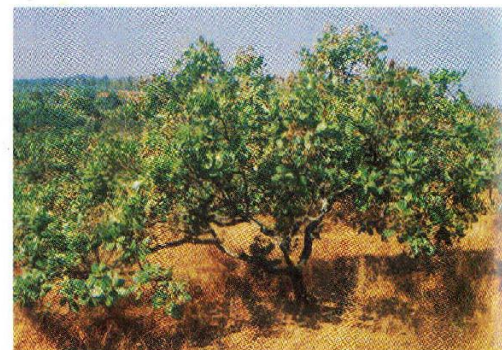
Field	Character name	Descriptor state	No. of accessions
07	Tree habit	3 Upright and compact	-
		5 Upright and open	55
		7 Spreading	1



3

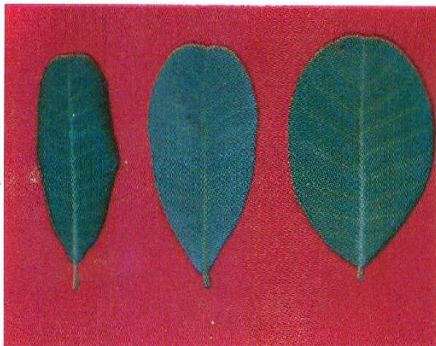


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7

08	Internode length of twig	3 Short (<1.0cm)	-
		5 Medium (1.0-2.0cm)	50
		7 Long (>2.0cm)	6

Field	Character name	Descriptor state	No. of accessions
09	Leaf shape	1 Oblong	9
		2 Obovate (club-shaped)	34
		3 Oval	13
 <p style="text-align: center;">1                      2                      3</p>			
10	Tree height	3 Dwarf (<2.5m)	-
		5 Semi-tall (2.5-4.0m)	12
		7 Tall (>4.0m)	44
11	Tree spread	3 Low (<3.0m)	-
		5 Intermediate (3.0-6.0m)	32
		7 High (>6.0m)	24

Field	Character name	Descriptor state	No. of accessions
12	Cracks on trunk bark	0 Absent (Smooth) + Present (Rough/Scaly)	- 56
13	Crotch angle of main branches	3 Acute (<90°) 5 Obtuse (>90°)	56 -
14	Ease of peeling bark from twig	3 Difficult 7 Easy	15 41
15	Extension growth of twigs	3 Short (<9.0cm) 5 Intermediate (9.0-19.0cm) 7 Long (>19.0cm)	1 48 7
16	Branching pattern	1 Extensive 2 Intensive	55 1



1



2

Field	Character name	Descriptor state	No. of accessions
17	Twig diameter	3 Thin (<4.5mm)	31
		5 Intermediate (4.5-9.0mm)	24
		7 Thick (>9.0mm)	1
18	Number of leaves/twig	3 Low (<9)	26
		5 Medium (9-19)	30
		7 High (>19)	-
19	Colour of young leaves	1 Red	37
		2 Yellow Red	17
		3 Green Yellow	2
		4 Purple	-



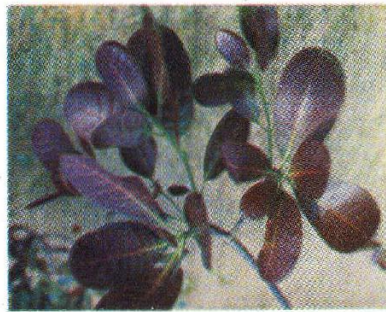
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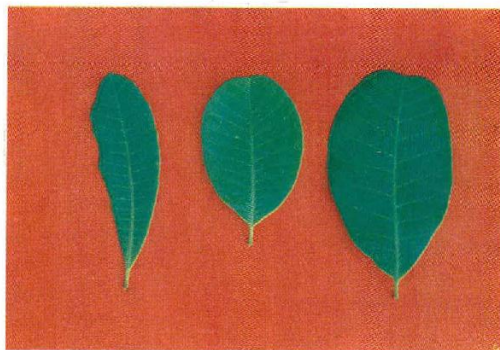


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4

Field	Character name	Descriptor state	No. of accessions
20	Colour of mature leaves	1 Light green	1
		2 Green	51
		3 Dark green	4
21	Odour of leaves	1 Mango - like	56
		2 Turpentine - like	-
22	Leaf margin	1 Smooth	55
		2 Wavy	1
23	Leaf apex shape	1 Pointed	3
		2 Rounded	43
		3 Indented (slight notch)	10

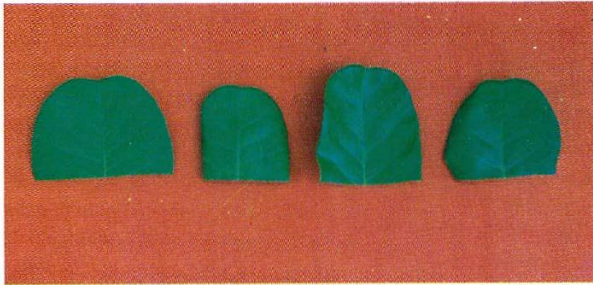


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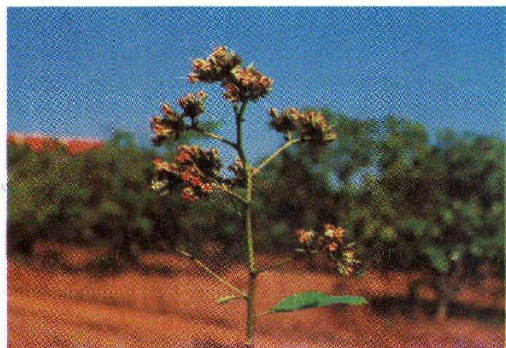
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3



Field	Character name	Descriptor state	No. of accessions
24	Leaf size (leaf area)	3 Small (<60cm <sup>2</sup> )	31
		5 Intermediate (60-120cm <sup>2</sup> )	24
		7 Large (>120cm <sup>2</sup> )	1
25	Brittleness of leaf	3 Leathery	56
		7 Brittle	-
26	Angle of leaf petiole relative to stem	3 Acute (<90 <sup>0</sup> )	56
		7 Obtuse (>90 <sup>0</sup> )	-
27	Leaf cross - section	1 Level	12
		2 Reflexed	44
		3 Incurved	-
		4 Twisted	-
			
28	Season of flowering	3 Early (Nov-Dec)	12
		5 Mid (Dec-Jan)	39
		7 Late (Jan-Feb)	5

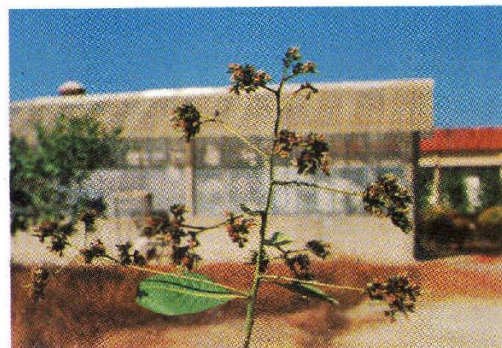
Field	Character name	Descriptor state	No. of accessions
29	Inflorescence shape	3 Narrowly pyramidal	1
		5 Pyramidal	55
		7 Broadly pyramidal	-



3



5

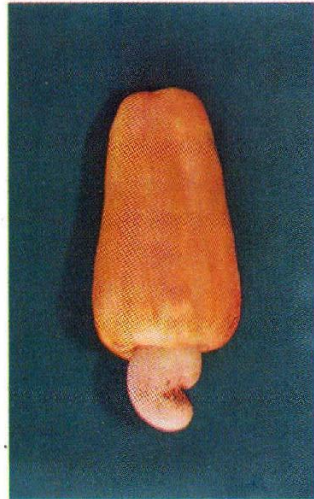


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30	Flower colour	1 White	1
		2 Cream	55
		3 Pink	-
31	Mature cashew apple colour	1 Yellow	28
		2 Red	28
		3 Yellow Red	-
		4 Red Purple	-

Field	Character name	Descriptor state	No. of accessions
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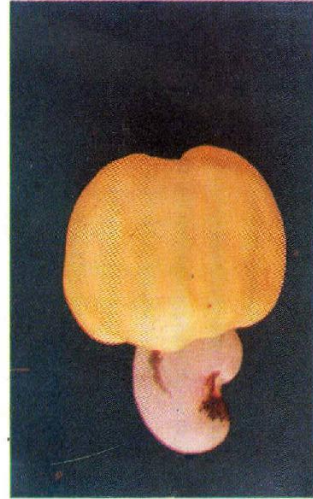
32	Cashew apple shape	1 Cylindrical	6
		2 Conical-ovate	39
		3 Round	6
		4 Pyriform	5



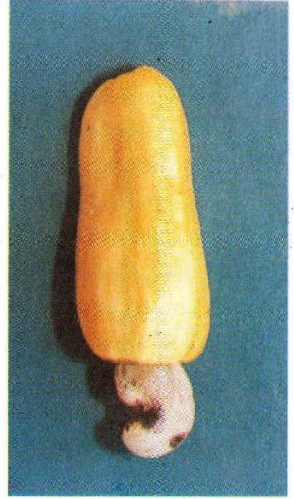
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4

33	Colour of mature nut shell	1 Buff	3
		2 Grey	52
		3 Purple	1

Field	Character name	Descriptor state	No. of accessions
34	Nut shape	1 Kidney 2 Oblong-ellipsoid	56



1

2

35	Nut weight	3 Low (<5g) 5 Intermediate (5-7g) 7 High (>7g)	18 37 1
36	Colour of boot leaf	1 Light green 2 Green	56 -

Field	Character name	Descriptor state	No. of accessions
38	Compactness of inflorescence	3 Loose 7 Compact	56 -

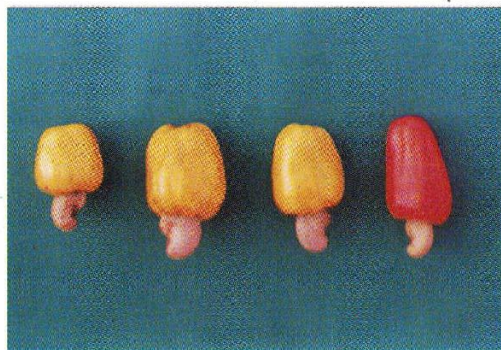


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39	Type of inflorescence branching	1 All around main axis 2 Two sided	56 -
40	Sex ratio	3 Low (<0.06) 5 Medium (0.06-0.13) 7 High (>0.13)	7 32 17
41	Secondary flowering	0 Absent + Present	56 -

Field	Character name	Descriptor state	No. of accessions
43	Weight of cashew apple	3 Low (<27g)	1
		5 Medium (27-52g)	25
		7 High (>52g)	30
44	Shape of cashew apple base	1 Angular	9
		2 Rounded	8
		3 Flattened	7
		4 Obliquely flattened	32



1

2

3

4

Field	Character name	Descriptor state	No. of accessions
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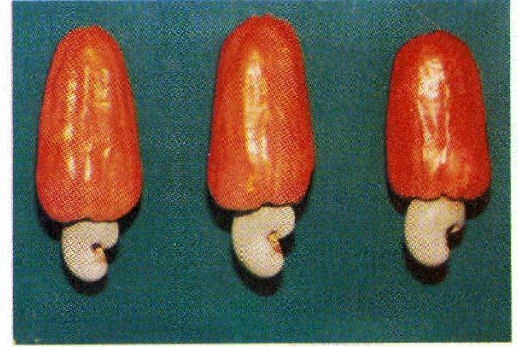
45	Ridges on cashew apple	0 Absent	-
		1 Broken	32
		2 Entire	24



0



1



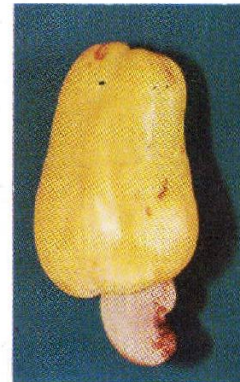
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46	Cashew apple apex
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1 Level	35
2 Oblique	21



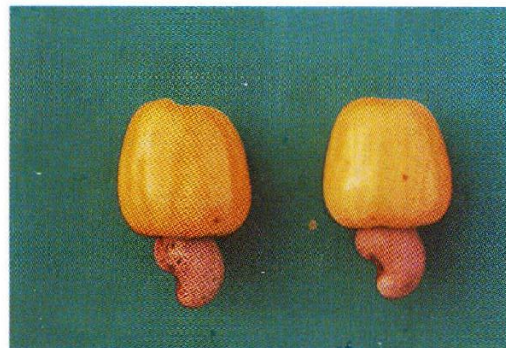
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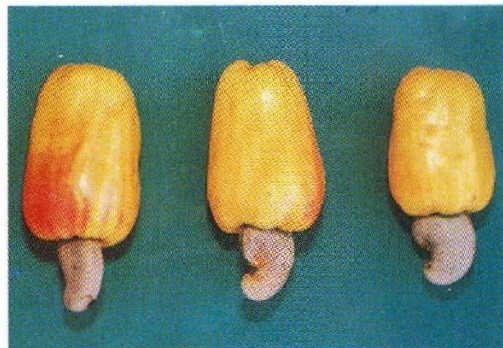
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Field	Character name	Descriptor state	No. of accessions
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47	Grooves on apex of cashew apple	0 Absent	-
		3 Shallow (Notched)	44
		7 Deep (Furrowed)	12



0

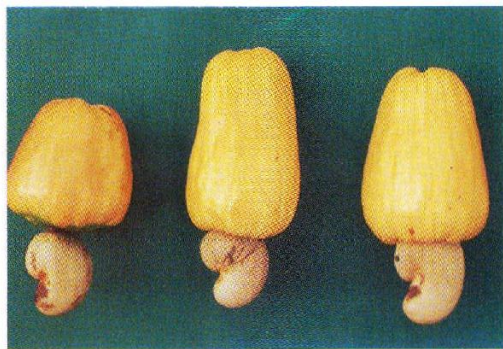


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48	Cavity at apex of cashew apple	0 Absent	6
		3 Shallow	31
		7 Deep	19



0

3

7

24



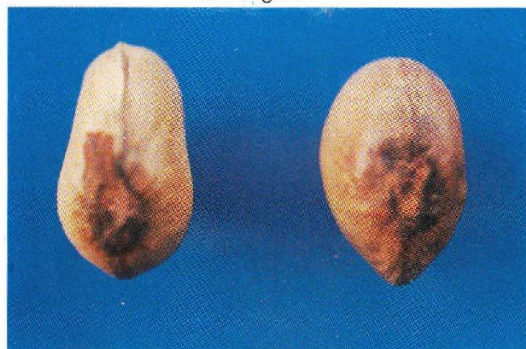
Field	Character name	Descriptor state	No. of accessions
49	Skin of cashew apple	1 Smooth and glossy	48
		2 Rough and dull	8
50	Attachment of nut to cashew apple	3 Loose	31
		5 Intermediate	6
		7 Tight	19
51	Shape of nut base	1 Round	38
		2 Flattened	14
		3 Obliquely flattened	2
		4 Angular	2



1 2 3 4

Field	Character name	Descriptor state	No. of accessions
-------	----------------	------------------	-------------------

52	Suture of nut	1 Round	39
		2 Angular	17



1

2

53	Flanks of nut	3 Flattened	22
		5 Round	33
		7 Bulging	1

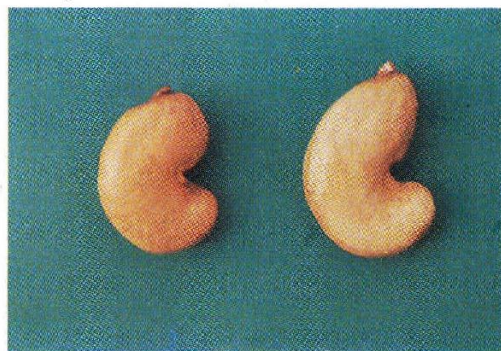


3

5

7

Field	Character name	Descriptor state	No. of accessions
54	Stylar scar on nut	3 Small (Narrow)	44
		7 Large (Wide)	12



3                      7

55	Shape of nut apex	1 Round	43
		2 Intermediate	13
		3 Pointed	-



1                      2                      3

Field	Character name	Descriptor state	No. of accessions
56	Relative position of suture and apex	1 Suture projection in front of apex	32
		2 Suture projection in line with apex	22
		3 Suture projection behind apex	2



1

2

3

57	Shell thickness	3 Thin (<2.5mm)	7
		5 Intermediate (2.5-4.0mm)	49
		7 Thick (>4.0mm)	-
58	Uniformity of shell thickness	0 Not uniform	53
		+ Unifrom	3

Field	Character name	Descriptor state	No. of accessions
60	Flowering duration	3 Short (<60days)	-
		5 Medium (60-90days)	18
		7 Long (>90days)	38
61	Flowering intensity per m <sup>2</sup> (% of flowering laterals over total number of laterals)	3 Low (<40%)	3
		5 Medium (40-70%)	46
		7 High (>70%)	7
62	Apple to nut ratio	3 Low (<6.0)	2
		5 Medium (6.0-12.0)	40
		7 High (>12.0)	14
63	Shelling percentage	3 Low (<18.0%)	2
		5 Intermediate (18.0-28.0%)	30
		7 High (>28.0%)	24
64	Kernel weight	3 Low (<1.2g)	11
		5 Intermediate (1.2-2.5g)	45
		7 High (>2.5g)	-

Field	Character name	Descriptor state	No. of accessions
65	Attachment of peel to kernel	1 Loose	56
		2 Tight	-
67	Cotyledonary grooves	3 Shallow -	47
		7 Deep	9
68	Cumulative yield per plant (6 annual har.)	3 Low (<9.0kg)	16
		5 Medium (9-18kg)	39
		7 High (>18kg)	1

Table 3: Grouping of 56 cashew accessions into clusters

Cluster number	Season of flowering	Flowering duration	Apple colour	Number of accessions	Accession number (NRC)
1.	Early	Medium	Yellow	3	1,50,56
2.	Early	Long	Yellow	7	3, 6,20,21,40, 46,47
3.	Early	Long	Red	2	38,39
4.	Mid	Medium	Yellow	7	5,7,13,17,42, 53,55
5.	Mid	Medium	Red	7	14,27,29,35,36,37,41
6.	Mid	Long	Yellow	18	2, 4, 9,10, 12, 15,16,22, 30, 31, 34, 43, 44, 45,48, 49, 52, 54
7.	Mid	Long	Red	6	8,11,25,28,32,51
8.	Late	Medium	Yellow	1	26
9.	Late	Medium	Red	2	18,33
10.	Late	Long	Yellow	2	23,24
11.	Late	Long	Red	1	19

## ACKNOWLEDGEMENT

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## CITATIONS

Bhaskara Rao, E.V.V. and Swamy, K.R.M. 1994. Genetic Resources of Cashew. In: *Advances in Horticulture Vol.9-Plantation and Spice Crops Part 1* (Eds.KL Chadha and P Rethinam). Malhotra Publishing House, New Delhi. P 79-97.

IBPGR. 1986. *Cashew Descriptors*. International Board for Plant Genetic Resources (presently, International Plant Genetic Resources Institute), Rome. 33pp.



Catalogue of  
*Anacardium occidentale* L.  
Germplasm Accessions - I

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
NRC 01	CSF Shantigodu	VTH 10/25, M 6/1	A. occidentale	1	10	5	2.9	2	3.7	5.1	+	3	7	18.5	1	5.7	14
NRC 02	CSF Shantigodu	VTH 16/26, M 16/1	A. occidentale	1	10	5	2.5	2	3.5	4.3	+	3	7	13.3	1	5.7	12
NRC 03	CSF Shantigodu	VTH 16/23, M 16/1	A. occidentale	1	10	5	1.5	2	3.5	4.4	+	3	7	10.2	1	5.3	10
NRC 04	CSF Shantigodu	VTH 23/52, M 55/4	A. occidentale	1	10	5	1.7	2	4.2	5.6	+	3	7	18.3	1	5.3	11
NRC 05	CSF Shantigodu	VTH 34/42, T.No.1	A. occidentale	1	10	5	1.4	2	4.1	5.4	+	3	7	15.3	1	5.5	13
NRC 06	CSF Shantigodu	VTH 35/9, T.No.40	A. occidentale	1	10	5	1.1	2	3.7	5.4	+	3	7	12.3	1	4.8	9
NRC 07	CSF Shantigodu	VTH 155/11, T.No.44 VTL	A. occidentale	1	10	5	1.5	3	3.9	5.6	+	3	7	14.4	1	3.9	8
NRC 08	CSF Shantigodu	VTH 155/31, T.No.44 VTL	A. occidentale	1	10	5	1.6	2	3.7	5.6	+	3	7	6.8	1	4.5	9
NRC 09	CSF Shantigodu	VTH 164/61, BLA 256-1	A. occidentale	1	10	5	1.3	1	4.1	5.9	+	3	7	17.6	1	3.9	11
NRC 10	CSF Shantigodu	VTH 164/55, BLA 256-1	A. occidentale	1	10	5	1.3	1	4.7	5.3	+	3	3	14.4	1	4.9	8
NRC 11	CSF Shantigodu	VTH 165/46, K 19-1	A. occidentale	1	10	5	1.6	3	5.5	6.0	+	3	7	16.3	1	3.8	7
NRC 12	CSF Shantigodu	VTH 165/48, K 19-1	A. occidentale	1	10	5	1.4	3	4.2	6.1	+	3	7	15.0	1	4.5	9
NRC 13	CSF Shantigodu	VTH 167/10, K 12-1	A. occidentale	1	10	5	1.5	3	4.2	5.5	+	3	3	14.0	1	4.9	11
NRC 14	CSF Shantigodu	VTH 168/9, BLA 39-4	A. occidentale	1	10	5	2.0	2	4.0	5.9	+	3	7	18.2	1	5.3	10
NRC 15	CSF Shantigodu	VTH 168/18, BLA 39-4	A. occidentale	1	10	5	1.1	3	3.3	5.0	+	3	7	19.6	1	3.8	14
NRC 16	CSF Shantigodu	VTH 168/26, BLA 39-4	A. occidentale	1	10	5	1.0	2	3.6	5.1	+	3	7	16.1	1	4.3	11
NRC 17	CSF Shantigodu	VTH 168/49, BLA 39-4	A. occidentale	1	10	5	1.4	2	3.6	6.2	+	3	7	19.3	1	4.3	11
NRC 18	CSF Shantigodu	VTH 170/13, K 28-1	A. occidentale	1	10	5	1.7	3	3.9	5.8	+	3	7	16.2	1	10.0	13
NRC 19	CSF Shantigodu	VTH 170/16, K 28-1	A. occidentale	1	10	5	1.7	3	4.5	5.7	+	3	7	12.4	1	6.0	8
NRC 20	CSF Shantigodu	VTH 172/31, BLA 273-1	A. occidentale	1	10	5	2.5	3	5.9	6.7	+	3	7	19.6	1	4.5	12
NRC 21	CSF Shantigodu	VTH 172/32, BLA 273-1	A. occidentale	1	10	5	2.0	3	7.0	7.1	+	3	7	19.6	1	6.0	14
NRC 22	CSF Shantigodu	VTH 173/28, NDR 2-1	A. occidentale	1	10	5	1.3	2	5.6	6.3	+	3	7	12.4	1	4.1	7
NRC 23	CSF Shantigodu	VTH 173/42, NDR 2-1	A. occidentale	1	10	5	2.1	2	6.3	6.5	+	3	7	18.8	1	4.3	11
NRC 24	CSF Shantigodu	VTH 173/44, NDR 2-1	A. occidentale	1	10	5	2.1	1	8.0	7.2	+	3	7	18.7	1	3.7	12
NRC 25	CSF Shantigodu	VTH 174/31, H 4-7	A. occidentale	1	10	5	1.6	2	6.1	6.8	+	3	7	15.3	1	4.0	9
NRC 26	CSF Shantigodu	VTH 174/47, H 4-7	A. occidentale	1	10	5	1.3	1	5.1	5.7	+	3	7	10.3	1	4.0	7
NRC 27	CSF Shantigodu	VTH 174/48, H 4-7	A. occidentale	1	10	5	1.1	2	6.9	6.2	+	3	7	12.5	1	3.7	6
NRC 28	CSF Shantigodu	VTH 174/49, H 4-7	A. occidentale	1	10	5	1.1	2	6.5	6.5	+	3	7	12.1	1	4.5	8

01	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37-1	37-2	38	39	40
NRC 01	1	2	1	1	2	66.8	3	1	2	3	5	2	3.2Y	2	2	1	5.6	1	15.2	18.2	3	1	0.18
NRC 02	2	2	1	1	3	49.6	3	1	2	5	5	2	3.2Y	3	2	1	6.3	1	14.2	15.4	3	1	0.13
NRC 03	1	2	1	1	2	60.1	3	1	2	3	5	2	3.2Y	2	2	1	4.8	1	16.8	14.1	3	1	0.13
NRC 04	1	2	1	1	2	59.9	3	1	2	5	5	2	3.0Y	2	2	1	5.8	1	18.2	14.2	3	1	0.07
NRC 05	1	2	1	1	2	62.2	3	1	2	5	5	2	3.0Y	2	2	1	6.4	1	17.0	15.7	3	1	0.17
NRC 06	1	2	1	2	3	50.4	3	1	2	3	5	2	3.0Y	2	2	1	5.2	1	19.0	16.1	3	1	0.07
NRC 07	1	2	1	1	2	51.0	3	1	2	5	5	2	3.2Y	2	2	1	7.5	1	15.1	15.0	3	1	0.08
NRC 08	1	2	1	1	2	46.8	3	1	2	5	5	2	5.6R	3	2	1	5.9	1	16.8	13.0	3	1	0.15
NRC 09	1	2	1	1	2	52.9	3	1	2	5	5	2	3.2Y	2	2	1	4.4	1	14.1	10.5	3	1	0.08
NRC 10	1	3	1	1	3	58.9	3	1	2	5	5	2	3.2Y	2	2	1	5.6	1	15.3	11.5	3	1	0.12
NRC 11	1	2	1	1	1	47.2	3	1	2	5	5	2	5.6R	2	1	1	5.0	1	15.6	12.9	3	1	0.12
NRC 12	1	2	1	1	2	47.7	3	1	2	5	5	2	3.2Y	2	1	1	5.0	1	15.9	15.0	3	1	0.19
NRC 13	2	2	1	1	3	64.3	3	1	2	5	5	2	3.2Y	2	2	1	4.9	1	18.9	15.5	3	1	0.15
NRC 14	2	2	1	1	2	57.7	3	1	1	5	5	2	5.6R	2	2	1	5.4	1	16.5	13.4	3	1	0.13
NRC 15	2	2	1	1	2	56.6	3	1	2	5	5	1	3.0Y	2	2	1	5.7	1	14.0	11.9	3	1	0.07
NRC 16	1	2	1	1	3	59.9	3	1	2	5	5	2	3.1Y	2	2	1	5.8	1	14.7	12.6	3	1	0.05
NRC 17	2	2	1	1	3	50.5	3	1	2	5	5	2	3.2Y	2	2	1	5.1	1	13.7	10.9	3	1	0.13
NRC 18	1	2	1	1	2	76.3	3	1	1	7	5	2	4.2R	4	2	1	8.3	1	20.9	17.7	3	1	0.04
NRC 19	1	2	1	1	1	57.4	3	1	1	7	5	2	5.6R	2	2	1	6.5	1	17.5	14.6	3	1	0.03
NRC 20	1	3	1	1	2	46.0	3	1	2	3	5	2	2.9Y	3	2	1	5.4	1	12.9	11.6	3	1	0.11
NRC 21	1	2	1	1	2	61.4	3	1	2	3	5	2	3.2Y	2	2	1	6.0	1	13.9	12.6	3	1	0.14
NRC 22	1	2	1	1	2	43.7	3	1	1	5	5	2	3.0Y	2	2	1	3.5	1	14.9	12.6	3	1	0.05
NRC 23	2	2	1	1	2	63.5	3	1	2	7	5	2	3.2Y	2	2	1	5.0	1	18.7	16.9	3	1	0.11
NRC 24	1	2	1	1	3	48.7	3	1	2	5	5	2	3.0Y	2	2	1	4.5	1	13.7	11.0	3	1	0.11
NRC 25	1	2	1	1	3	54.7	3	1	2	5	5	2	5.7R	2	2	1	5.5	1	16.7	13.8	3	1	0.14
NRC 26	1	2	1	1	2	60.7	3	1	2	7	5	2	3.0Y	2	2	1	6.4	1	19.0	21.9	3	1	0.14
NRC 27	1	2	1	1	2	74.2	3	1	1	5	5	2	5.7R	1	2	1	6.2	1	18.2	15.6	3	1	0.18
NRC 28	1	2	1	1	2	122.9	3	1	2	5	5	2	5.7R	4	2	1	6.5	1	19.7	17.1	3	1	0.09

	01	41	42-1	42-2	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59-1	59-2	59-3	60
NRC 01	0	5.7	4.2	56.7	2	2	1	7	7	1	3	2	2	5	3	1	1	3.0	0	2.9	2.3	1.5	87	
NRC 02	0	3.9	4.5	48.3	2	1	2	3	3	1	7	1	2	5	3	1	1	3.0	0	2.9	2.1	1.8	113	
NRC 03	0	3.4	2.7	20.0	3	2	1	3	3	1	3	1	2	5	3	1	1	2.2	0	2.9	2.1	1.4	121	
NRC 04	0	5.0	4.2	56.6	4	2	1	3	0	1	7	1	2	5	7	1	1	2.6	+	2.8	2.1	1.6	95	
NRC 05	0	4.6	4.3	53.3	4	2	1	7	7	1	7	1	2	5	3	2	1	3.2	0	2.9	2.2	1.6	98	
NRC 06	0	4.9	3.5	40.0	4	2	1	7	7	1	3	1	1	5	3	1	1	3.3	0	2.8	2.0	1.4	120	
NRC 07	0	5.5	4.4	71.6	3	2	1	7	7	2	7	2	1	7	3	1	1	4.0	0	2.7	2.2	2.0	90	
NRC 08	0	4.7	4.5	51.6	1	1	2	3	0	1	3	1	2	5	3	1	2	3.3	0	3.0	2.0	1.5	112	
NRC 09	0	5.6	4.1	58.3	4	2	2	3	7	1	3	1	1	3	3	1	2	2.8	0	2.8	2.0	1.6	97	
NRC 10	0	5.6	3.6	56.6	1	1	2	3	7	1	7	1	1	5	3	1	2	3.2	0	2.8	2.1	1.4	93	
NRC 11	0	5.7	3.3	50.0	4	1	2	3	3	1	3	1	1	5	3	2	1	3.0	0	2.9	2.3	1.7	128	
NRC 12	0	5.7	3.2	45.0	4	1	2	3	3	1	3	1	1	5	3	2	1	3.0	0	2.5	2.2	1.5	128	
NRC 13	0	5.5	3.0	66.6	1	2	1	3	3	1	3	1	1	3	3	1	2	3.0	+	2.8	1.9	1.3	86	
NRC 14	0	4.1	3.2	31.6	4	2	1	7	7	1	3	1	1	3	3	1	2	2.3	+	2.8	2.0	1.4	86	
NRC 15	0	5.3	4.2	53.3	4	2	2	3	7	1	3	2	1	5	3	2	2	3.1	0	2.8	2.2	1.6	103	
NRC 16	0	5.0	4.1	55.0	4	2	2	3	7	1	3	1	2	3	3	2	2	3.0	0	3.0	2.2	1.5	94	
NRC 17	0	4.7	3.7	46.6	4	1	2	7	3	2	3	1	1	3	3	2	2	3.0	0	2.8	2.0	1.3	87	
NRC 18	0	8.4	3.5	101.6	4	1	1	3	3	1	3	1	2	3	3	1	1	3.1	0	3.3	2.6	1.7	78	
NRC 19	0	6.7	3.6	65.0	4	1	1	3	7	2	5	1	1	5	3	1	1	2.8	0	3.2	2.3	1.6	91	
NRC 20	0	4.5	4.0	41.0	2	1	1	3	7	1	7	1	1	3	3	1	2	3.0	0	2.9	2.1	1.5	121	
NRC 21	0	4.6	4.0	50.0	1	1	2	3	7	2	7	2	1	5	3	1	2	3.1	0	3.0	2.2	1.7	113	
NRC 22	0	5.0	4.4	50.0	4	1	1	3	7	1	7	1	1	5	3	1	1	3.0	0	2.8	2.1	1.6	108	
NRC 23	0	5.0	3.8	50.0	4	1	1	3	7	1	3	1	1	5	3	1	1	3.0	0	2.7	2.0	1.6	94	
NRC 24	0	5.2	3.0	40.0	4	1	2	3	0	1	5	3	2	5	3	1	1	3.0	0	2.6	1.8	1.5	130	
NRC 25	0	4.9	3.8	51.6	1	1	1	3	3	1	5	2	2	5	3	1	1	3.0	0	2.7	2.3	1.6	98	
NRC 26	0	7.5	4.1	58.3	4	2	1	3	3	1	5	1	1	3	3	2	2	3.5	0	3.0	2.1	1.6	90	
NRC 27	0	7.1	4.6	86.6	2	1	2	7	7	2	3	2	2	3	3	2	2	3.1	0	3.0	2.3	1.5	90	
NRC 28	0	8.6	4.6	96.6	4	1	1	3	3	1	3	4	1	5	3	2	2	3.0	0	3.2	2.2	1.5	92	

	01	61	62	63	64	65	66-1	66-2	66-3	67	68
NRC 01	57.0	10.1	31.7	1.8	3	2.4	1.5	1.1	3	12.8	
NRC 02	56.2	7.6	26.2	1.6	3	2.5	1.4	1.2	7	10.9	
NRC 03	50.0	4.1	32.9	1.6	3	2.4	1.6	1.1	3	16.7	
NRC 04	42.8	9.7	32.2	1.9	3	2.8	2.1	1.6	3	11.5	
NRC 05	41.6	8.3	30.6	1.9	3	2.4	1.6	1.3	3	11.3	
NRC 06	54.5	7.6	28.8	1.5	3	2.3	1.4	1.0	3	13.0	
NRC 07	44.4	9.5	26.3	1.9	3	2.4	1.5	1.4	3	10.2	
NRC 08	33.3	8.7	27.1	1.1	3	2.5	1.4	1.0	3	7.3	
NRC 09	44.0	13.2	24.2	1.0	3	2.2	1.3	1.0	3	8.2	
NRC 10	55.5	11.1	25.9	1.4	3	2.4	1.4	1.1	7	9.2	
NRC 11	57.1	10.0	25.2	1.5	3	2.0	1.4	0.8	3	9.4	
NRC 12	50.0	9.0	24.0	1.3	3	2.0	1.3	0.7	3	6.8	
NRC 13	37.5	13.5	24.7	1.2	3	2.4	1.4	0.9	3	8.4	
NRC 14	62.5	5.8	33.2	1.8	3	2.5	1.6	1.1	3	11.9	
NRC 15	58.2	9.3	29.2	1.6	3	2.5	1.7	1.1	3	10.9	
NRC 16	56.2	9.4	26.2	1.5	3	2.4	1.5	1.2	3	11.7	
NRC 17	57.1	9.1	31.3	1.6	3	2.5	1.7	1.0	3	10.1	
NRC 18	53.8	12.2	26.7	2.2	3	2.7	1.6	1.2	7	7.6	
NRC 19	50.0	10.0	29.1	1.9	3	2.8	1.4	1.2	7	9.1	
NRC 20	55.5	7.5	25.8	1.4	3	2.5	1.6	1.0	3	9.6	
NRC 21	50.0	8.3	26.7	1.6	3	2.4	1.6	1.1	7	9.2	
NRC 22	55.5	9.0	27.3	1.5	3	2.3	1.4	1.2	3	8.5	
NRC 23	71.4	10.0	29.5	1.5	3	2.2	1.5	1.2	3	13.9	
NRC 24	55.5	9.8	28.9	1.3	3	2.1	1.3	1.2	3	8.7	
NRC 25	57.1	9.3	26.4	1.4	3	2.3	1.6	0.9	3	10.5	
NRC 26	63.6	9.1	26.3	1.7	3	2.5	1.5	1.3	7	9.0	
NRC 27	77.7	13.9	28.8	1.8	3	2.5	1.8	1.1	3	10.5	
NRC 28	72.7	14.8	28.3	1.8	3	2.5	1.5	1.1	3	11.0	

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
NRC 29	CSF Shantigodu	VTH 174/51, H 4-7	A. occidentale	1	10	5	1.4	3	6.1	6.0	+	3	3	17.5	1	4.1	9
NRC 30	CSF Shantigodu	VTH 174/52, H 4-7	A. occidentale	1	10	5	1.1	3	7.5	7.7	+	3	3	15.5	1	5.0	6
NRC 31	CSF Shantigodu	VTH 177/11, H 3-13	A. occidentale	1	10	5	2.0	1	5.8	6.1	+	3	7	17.4	1	4.0	8
NRC 32	CSF Shantigodu	VTH 177/18, H 3-13	A. occidentale	1	10	5	1.5	3	5.6	6.4	+	3	7	17.8	1	4.5	8
NRC 33	CSF Shantigodu	VTH 178/57, K 27-1	A. occidentale	1	10	5	1.6	1	4.6	5.3	+	3	7	14.6	1	3.5	7
NRC 34	CSF Shantigodu	VTH 178/65, K 27-1	A. occidentale	1	10	5	1.9	2	4.3	5.4	+	3	3	14.1	1	4.5	9
NRC 35	CSF Shantigodu	VTH 179/29, VEN 37-3	A. occidentale	1	10	5	1.5	2	6.2	7.4	+	3	7	15.8	1	4.4	8
NRC 36	CSF Shantigodu	VTH 179/49, VEN 37-3	A. occidentale	1	10	5	1.5	2	5.6	6.1	+	3	7	14.8	1	4.3	9
NRC 37	CSF Shantigodu	VTH 180/9, VEN 36-3	A. occidentale	1	10	5	1.9	2	4.5	5.4	+	3	7	14.7	1	4.5	9
NRC 38	CSF Shantigodu	VTH 181/30, M.Pore 38/3	A. occidentale	1	10	5	1.5	3	4.9	5.9	+	3	7	12.8	1	5.0	9
NRC 39	CSF Shantigodu	VTH 181/39, M.Pore 38/3	A. occidentale	1	10	5	2.0	1	5.6	6.7	+	3	7	18.3	1	5.0	11
NRC 40	CSF Shantigodu	VTH 183/16, My.Kot 14/1	A. occidentale	1	10	5	1.5	1	5.0	5.3	+	3	3	19.2	1	4.7	12
NRC 41	CSF Shantigodu	VTH 184/13, WBDC 6-37-3	A. occidentale	1	10	5	1.8	2	4.4	4.9	+	3	7	18.5	1	4.8	13
NRC 42	CSF Shantigodu	VTH 186/29, E 3/3	A. occidentale	1	10	5	1.6	2	4.0	5.0	+	3	3	14.5	2	4.3	10
NRC 43	CSF Shantigodu	VTH 188/37, T.No.65	A. occidentale	1	10	5	1.2	1	7.9	5.5	+	3	7	15.2	1	4.2	83
NRC 44	CSF Shantigodu	VTH 188/49, T.No.65	A. occidentale	1	10	5	1.3	2	6.9	6.2	+	3	7	14.1	1	5.3	11
NRC 45	CSF Shantigodu	VTH 189/30, T.No.223	A. occidentale	1	10	5	2.1	2	5.1	5.5	+	3	7	17.6	1	4.1	11
NRC 46	CSF Shantigodu	VTH 189/33, T.No.223	A. occidentale	1	10	5	1.8	2	5.0	5.1	+	3	3	17.8	1	4.1	11
NRC 47	CSF Shantigodu	VTH 191/17, T.No.176	A. occidentale	1	10	5	1.8	2	6.5	7.5	+	3	3	20.8	1	4.6	12
NRC 48	CSF Shantigodu	VTH 191/26, T.No.176	A. occidentale	1	10	5	1.9	2	6.6	5.5	+	3	7	19.8	1	4.1	9
NRC 49	CSF Shantigodu	VTH 191/32, T.No.176	A. occidentale	1	10	5	1.7	2	6.6	6.8	+	3	3	20.5	1	4.6	10
NRC 50	CSF Shantigodu	VTH 191/40, T.No.176	A. occidentale	1	10	5	2.1	2	5.7	6.0	+	3	3	23.0	1	4.3	11
NRC 51	CSF Shantigodu	VTH 191/41, T.No.176	A. occidentale	1	10	5	1.3	2	5.4	7.2	+	3	7	16.0	1	5.0	12
NRC 52	CSF Shantigodu	VTH 191/42, T.No.176	A. occidentale	1	10	5	1.7	2	7.1	6.6	+	3	3	12.8	1	3.5	62
NRC 53	CSF Shantigodu	VTH 192/13, T.No.251	A. occidentale	1	10	5	1.3	2	6.7	6.8	+	3	3	15.3	1	4.1	10
NRC 54	CSF Shantigodu	VTH 192/25, T.No.251	A. occidentale	1	10	5	1.6	2	7.1	6.6	+	3	7	20.0	1	4.6	13
NRC 55	CSF Shantigodu	VTH 193/26, H 1/3	A. occidentale	1	10	5	1.5	2	7.1	5.9	+	3	3	13.1	1	4.0	6
NRC 56	CSF Shantigodu	VTH 194/26, H 5/11	A. occidentale	1	10	7	1.5	2	6.1	8.4	+	3	7	13.4	1	5.6	8

01	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37-1	37-2	38	39	40
NRC 29	1	2	1	1	2	64.1	3	1	2	5	5	2	4.2R	2	2	1	4.5	1	16.9	14.0	3	1	0.03
NRC 30	1	2	1	1	2	83.1	3	1	1	5	5	2	0.5Y	2	2	1	5.2	1	16.3	13.4	3	1	0.12
NRC 31	1	2	1	1	2	81.3	3	1	1	5	5	2	3.0Y	2	2	1	7.0	1	18.3	14.4	3	1	0.12
NRC 32	1	2	1	1	2	72.6	3	1	2	5	5	2	5.6R	2	2	1	4.8	1	18.4	14.0	3	1	0.13
NRC 33	1	2	1	1	2	55.3	3	1	1	7	5	2	5.6R	2	2	1	7.0	1	18.3	16.1	3	1	0.10
NRC 34	1	2	1	1	2	66.6	3	1	1	5	5	2	2.9Y	1	2	1	4.3	1	14.1	11.3	3	1	0.08
NRC 35	1	2	1	1	2	43.4	3	1	2	5	5	2	5.7R	1	2	1	4.9	1	17.3	13.8	3	1	0.14
NRC 36	1	2	1	1	2	47.6	3	1	1	5	5	2	5.7R	2	2	1	6.0	1	17.4	14.3	3	1	0.15
NRC 37	2	2	1	1	2	102.0	3	1	2	5	5	2	5.7R	2	2	1	5.4	1	16.9	14.2	3	1	0.22
NRC 38	2	2	1	1	2	58.2	3	1	2	3	5	2	5.6R	4	2	1	3.8	1	18.0	13.7	3	1	0.06
NRC 39	1	2	1	1	2	62.0	3	1	2	3	5	2	5.7R	2	2	1	5.2	1	16.3	12.9	3	1	0.19
NRC 40	1	2	1	1	1	37.0	3	1	2	3	5	2	1.4Y	3	2	1	3.3	1	10.5	8.5	3	1	0.21
NRC 41	2	2	1	1	2	45.8	3	1	2	5	5	2	5.6R	1	2	1	2.9	1	15.8	12.9	3	1	0.16
NRC 42	1	2	1	1	2	57.0	3	1	2	5	5	2	3.0Y	2	2	1	5.9	1	17.5	15.1	3	1	0.03
NRC 43	3	2	1	1	2	70.9	3	1	2	5	5	2	3.0Y	1	2	1	6.9	1	18.5	16.9	3	1	0.09
NRC 44	3	2	1	1	2	64.8	3	1	2	5	5	2	3.0Y	1	2	1	7.1	1	17.5	14.2	3	1	0.10
NRC 45	1	2	1	1	2	53.0	3	1	2	5	5	2	3.0Y	2	2	1	3.1	1	17.1	14.1	3	1	0.03
NRC 46	2	2	1	1	3	42.8	3	1	2	3	5	2	3.0Y	3	2	1	4.0	1	19.7	15.9	3	1	0.10
NRC 47	2	2	1	1	2	82.5	3	1	1	3	5	2	3.2Y	2	2	1	4.4	1	18.4	16.4	3	1	0.16
NRC 48	2	3	1	1	2	67.0	3	1	2	5	5	2	2.9Y	2	2	1	4.4	1	15.6	13.4	3	1	0.11
NRC 49	1	2	1	1	2	85.2	3	1	2	5	5	2	3.0Y	2	2	1	5.6	1	17.5	5.1	3	1	0.09
NRC 50	2	3	1	1	2	72.2	3	1	2	3	5	2	3.0Y	2	2	1	4.8	1	16.9	14.6	3	1	0.07
NRC 51	2	2	1	1	2	66.6	3	1	2	5	5	2	2.8R	2	2	1	5.8	1	19.0	16.1	3	1	0.08
NRC 52	2	1	1	2	2	55.7	3	1	2	5	5	2	3.2Y	2	2	1	5.2	1	17.2	14.5	3	1	0.08
NRC 53	2	2	1	1	2	46.2	3	1	2	5	5	2	3.0Y	4	2	1	5.1	1	20.0	17.5	3	1	0.08
NRC 54	1	2	1	1	2	48.8	3	1	2	5	5	2	3.0Y	4	2	1	4.9	1	17.7	14.7	3	1	0.11
NRC 55	1	2	1	1	2	49.1	3	1	2	5	5	2	3.0Y	3	2	1	5.6	1	15.1	12.7	3	1	0.19
NRC 56	1	3	1	1	2	72.9	3	1	1	3	5	2	3.2Y	2	2	1	5.5	1	19.4	17.8	3	1	0.07

	01	41	42-1	42-2	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59-1	59-2	59-3	60
NRC 29	0	6.7	4.1	75.0	4	1	1	3	3	1	3	1	2	3	3	2	2	2.8	0	3.8	2.2	1.3	90	
NRC 30	0	5.5	4.2	66.0	4	1	1	3	3	1	3	2	1	3	7	1	1	2.8	0	2.9	2.0	1.5	99	
NRC 31	0	6.9	4.8	90.0	4	1	1	3	3	1	7	1	1	5	3	1	1	3.7	0	3.4	2.2	1.5	97	
NRC 32	0	5.6	3.9	85.0	1	1	1	3	3	1	3	1	2	3	3	1	1	3.0	0	3.9	2.1	1.5	102	
NRC 33	0	6.8	3.3	55.0	1	1	1	3	7	1	7	1	1	5	3	2	1	3.0	0	3.0	2.4	1.5	88	
NRC 34	0	6.5	2.7	35.0	4	1	1	3	0	1	3	4	2	3	3	1	2	2.5	0	3.0	1.8	1.2	94	
NRC 35	0	5.6	4.2	50.0	2	1	1	7	3	1	7	2	1	3	3	1	1	2.5	0	2.8	2.2	1.4	85	
NRC 36	0	5.7	4.1	70.0	1	1	1	3	3	1	7	1	1	5	3	1	1	3.0	0	3.0	2.1	1.6	82	
NRC 37	0	5.7	3.6	73.3	2	1	1	7	3	1	7	2	2	5	7	1	1	3.0	0	3.0	2.3	1.6	76	
NRC 38	0	7.3	2.8	56.6	4	2	1	3	3	2	7	1	1	5	3	1	2	2.8	0	3.7	1.8	1.3	98	
NRC 39	0	5.5	3.3	53.3	2	2	2	7	3	1	5	2	2	5	3	1	1	3.0	0	3.8	2.3	1.6	106	
NRC 40	0	3.6	3.3	36.6	3	1	1	3	3	1	3	1	1	5	3	1	1	3.0	0	2.3	1.7	1.4	95	
NRC 41	0	4.6	2.2	81.6	2	2	2	3	7	1	7	1	1	3	3	1	2	2.5	0	2.5	1.8	1.2	81	
NRC 42	0	6.5	3.7	70.0	3	2	2	3	3	1	3	1	2	5	3	1	2	3.0	0	3.0	2.2	1.6	81	
NRC 43	0	8.1	3.5	76.6	4	1	1	3	0	2	7	1	1	5	7	2	2	3.0	0	3.6	2.4	1.7	92	
NRC 44	0	7.4	3.4	63.3	4	2	1	3	0	1	3	1	1	3	7	2	3	3.0	0	3.6	2.5	1.6	95	
NRC 45	0	5.5	3.9	53.2	4	1	1	3	3	1	3	1	1	3	3	1	2	2.5	0	2.8	1.7	1.2	100	
NRC 46	0	3.8	3.7	48.3	1	1	1	3	3	2	7	1	1	5	3	1	1	2.6	0	2.7	1.9	1.4	105	
NRC 47	0	4.5	2.9	31.6	4	2	2	3	3	1	3	3	1	3	7	1	2	2.5	0	2.8	2.0	1.4	107	
NRC 48	0	4.4	3.1	38.3	4	2	2	3	3	1	5	2	1	3	7	1	1	3.0	0	2.8	1.9	1.4	94	
NRC 49	0	4.5	3.6	46.6	4	2	1	3	3	1	7	1	1	5	7	1	3	3.0	0	3.1	2.0	1.5	94	
NRC 50	0	4.5	3.4	53.3	3	2	2	3	3	1	7	1	1	5	7	1	1	3.0	0	2.9	2.0	1.4	74	
NRC 51	0	5.9	3.9	65.0	4	1	2	3	3	1	3	2	1	5	7	1	1	3.0	0	3.2	2.5	1.6	92	
NRC 52	0	4.2	3.6	50.0	4	2	2	7	7	1	3	1	1	3	3	1	1	3.0	0	3.1	2.3	1.5	92	
NRC 53	0	6.0	3.8	33.3	3	1	1	3	3	1	3	2	1	5	7	1	1	3.0	0	3.0	2.3	1.5	77	
NRC 54	0	6.8	3.0	75.0	4	2	2	7	7	1	3	1	1	3	3	1	1	3.0	0	3.1	2.2	1.3	92	
NRC 55	0	4.3	3.8	55.0	3	2	1	3	3	1	3	1	1	3	3	1	1	3.0	0	3.1	2.4	1.6	90	
NRC 56	0	4.4	3.4	43.0	4	1	1	3	3	1	3	2	1	5	7	1	1	3.5	0	3.9	2.2	1.7	88	



01	61	62	63	64	65	66-1	66-2	66-3	67	68
NRC 29	75.0	16.6	28.4	1.3	3	2.4	1.6	0.9	3	9.4
NRC 30	62.5	12.8	27.3	1.4	3	2.3	1.5	1.0	3	11.6
NRC 31	75.5	12.8	23.4	1.6	3	2.7	1.7	1.2	3	9.1
NRC 32	63.6	17.7	24.0	1.1	3	2.5	1.5	0.9	3	8.5
NRC 33	66.6	7.8	27.2	1.7	3	2.4	1.4	1.0	3	9.0
NRC 34	52.9	8.1	28.2	1.2	3	2.5	1.5	0.8	3	10.5
NRC 35	75.0	10.2	28.2	1.4	3	2.3	1.6	1.0	3	10.6
NRC 36	70.0	11.6	29.8	1.8	3	2.5	1.6	1.3	3	12.5
NRC 37	83.3	12.8	28.0	1.6	3	2.4	1.7	1.2	3	11.9
NRC 38	72.7	14.8	25.0	0.9	3	2.2	1.3	0.8	3	14.1
NRC 39	66.6	10.2	29.9	1.5	3	2.3	1.6	1.0	3	19.8
NRC 40	28.6	11.0	22.0	0.7	3	1.9	1.2	0.9	3	9.3
NRC 41	57.1	28.1	23.6	0.7	3	2.5	1.4	0.9	3	7.2
NRC 42	58.3	11.8	17.7	1.6	3	2.5	1.6	1.1	3	9.0
NRC 43	30.0	11.9	20.0	1.4	3	3.1	1.6	1.2	7	10.3
NRC 44	42.8	8.9	23.9	1.7	3	3.0	1.7	1.1	7	8.2
NRC 45	60.0	14.8	18.0	0.7	3	3.4	1.4	0.8	3	8.8
NRC 46	60.0	12.0	22.5	0.9	3	2.2	1.3	1.0	3	8.5
NRC 47	44.4	7.1	32.5	1.4	3	2.4	1.5	1.1	3	13.1
NRC 48	42.8	8.7	27.9	1.2	3	2.3	1.5	1.0	3	8.7
NRC 49	62.5	6.3	29.9	1.7	3	2.6	1.5	1.0	3	10.4
NRC 50	63.3	11.1	27.1	1.3	3	2.4	1.4	1.0	3	10.0
NRC 51	55.5	11.2	28.9	1.7	3	2.5	1.6	1.1	3	9.8
NRC 52	62.5	9.6	29.4	1.4	3	2.6	1.5	0.9	3	8.7
NRC 53	66.6	10.4	30.0	1.5	3	2.9	1.6	1.0	3	10.6
NRC 54	42.8	15.3	31.3	1.4	3	2.4	1.6	1.0	3	9.3
NRC 55	57.1	9.8	30.6	1.7	3	2.7	1.7	1.0	3	13.1
NRC 56	44.4	7.8	24.5	1.3	3	2.2	1.5	1.2	7	16.3