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RESEARCH ARTICLE

SCREENING EXOTIC GROUNDNUT (*Arachis hypogaea* L.) LINES FOR INTRODUCING AS A SMALL-SEEDED VARIETY (ANKGN4/Tiny) IN SRI LANKA

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ABSTRACT

Small seeded groundnut varieties utilized for the chocolate balls and candies have huge demand by the producers. In the present study, through a screening process of exotic germplasm, a new small seeded groundnut line (SAARC NO 201) was identified as a promising variety for the industry. The SAARC NO 201 line matured within 3 months. The average yield of the line was 2.7 t ha^{-1} (±0.14) higher than that of Tissa (2.3 t ha^{-1}±0.24) and ANKG1 (2. 3 t ha^{-1}±0.13). The potential yield of the SAARC NO 201 line was 4.2 t ha^{-1}. Further, it was moderately resistant to collar rot, leaf spot, rust, and bud necrosis disease and leaf-eating caterpillars at field level. Hence, it has been released by the Department of agriculture in 2020, renaming as ANKGN4/Tiny considering its suitability for the chocolate ball industry and the greater potential for increasing productivity of groundnut in Sri Lanka.

Keywords: *Arachis hypogaea* L., Chocolate ball, Selection, Short duration, Small seeded groundnut, Value addition

INTRODUCTION

The botanical name for groundnut, *Arachis hypogaea* L., is derived from two Greek words, *Arachis* meaning a legume and *hypogaea* meaning below ground, denoting the formation of pods in the soil (Ansari *et al*., 2015). Groundnut is an important oilseed food and feed crop grown in hundreds of countries. It is valued as a rich source of energy contributed by protein (25–28%) and oil (48–50%) in seeds. Groundnut provides 564 kcal of energy from 100 g of kernels (Jambunathan, 1991). Also, the groundnut kernels contain many health-improving nutrients such as vitamins, minerals, and antioxidants and are rich in mono-unsaturated fatty acids. It contains vitamin E, antioxidants like p-coumaric acid and resveratrol, and B-complex groups of vitamin B-6, thiamin, folates, niacin and pantothenic acid. Groundnut is a dietary source of biologically active polyphenols, flavonoids, and iso-flavones (Janila *et al*., 2013). As it is highly nutritive and energetic, groundnut and products based on groundnut can be promoted as nutritional foods to combat energy, protein, and micronutrient malnutrition among people. Groundnut seeds can be consumed as raw, boiled, and roasted and it is also used in confections. Its flour is used in baked products.

Groundnut crop is mainly cultivated in dry and intermediate zones of Sri Lanka and the annual cultivation extent in 2018 was 15,752 ha with the production of 27,602 t pods. Meanwhile, Sri Lanka has imported 4300 t of groundnut valued at about Rs.784 million from other countries in 2018 (Agstat, 2019).

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Southern Bolivia and Northern Argentina are thought to be center of origin of groundnut (Gregory *et al*., 1980; Kochert *et al*., 1996). The groundnut improvement program in Sri Lanka has continued to depend on the plant introductions from international research centres. As Sri Lanka has no groundnut wild relatives, exotic parental materials were used to develop varieties by hybridization and selection (Jeewani *et al*., 2012). Seven groundnut varieties [Tissa, Walawa, Indi, Tikiri, ANKG1, ANKG2 (Lanka Jumbo) and ANKGN3] developed at Grain Legumes and Oil Crops Research and Development Centre, (GLORDC) Angunakolapelessa have been recommended for general cultivation by the Department of Agriculture (DOA) in Sri Lanka. Among them, four varieties were released as introductions through selection (Walawa, Indi, Tikiri, Lanka Jumbo), while one variety from mutation breeding (Tissa) and two varieties from hybridization and selection (ANKG1 and ANKGN3). Seed size is the most important physical quality trait that attracts consumers' immediate attention and has been under strong selection pressure since groundnut domestication (Venuprasad *et al*., 2011). Among the groundnut varieties in Sri Lanka, Tissa, Indi, Tikiri and ANKG1 varieties have medium-size seeds (35 to 70 grams per 100 seed mass) while Walawa, Lanka Jumbo and ANKGN3 were released as large-seeded or jumbo peanut (>70 grams per 100 seed mass) varieties (Jeewani *et al* ., 2020). Hence, all the varieties released so far in Sri Lanka belong to the medium and large-seeded or jumbo peanut category. Groundnuts which have a seed mass lower than 35 grams per 100 seeds are considered as small-seeded groundnut. In Sri Lanka, the majority of groundnuts are consumed as seeds with little or no value addition. Only a very few value-added products can be seen in the market. Therefore, it is very important to develop varieties that are suitable for preparing value-added products. Hence, our breeding and evaluation program focused on the development of groundnut varieties suitable for the value-added food industry.

Small-seeded groundnut varieties that can be utilized for sweets, chocolate balls and candies are limited in Sri Lanka. At present, the annual demand for the small-seeded groundnut variety suitable for the chocolate ball industry is about 2000 t. As there is a demand for small-seeded groundnut for the chocolate ball industry, the development of varieties to fulfill the needs of the local food industry and consumers is a timely requirement. Further, it will help to reduce groundnut importation and directly expands the cultivation in the country while producing a niche market for groundnut growers. Further, if there is an excess production in small-seeded groundnut, it can be easily utilized for peanut butter production and other snack production. Hence, a germplasm evaluation and selection program was initiated using the groundnut lines received from SAARC (South Asian Association for Regional Cooperation) germplasm evaluation program and from ICRISAT (International Crop Research Institute for Semi-Arid Tropics) to identify a new short duration (3 months) and small-seeded groundnut variety suitable for the chocolate ball production.

MATERIALS AND METHODS

Six Groundnut lines received from the SAARC germplasm evaluation program (SAARC No. 201 to SAARC No. 206) and 5 lines from ICRISAT, India (ICGV 3487, ICGV 4117, ICGV 4118, ICGV 3090 and ICGV 3098) were multiplied and characterized during the 2015/16 *Maha* and 2016 *Yala* seasons at the GLORDC, Angunakolapelessa, Sri Lanka. Initial line selection was carried out by evaluating the growth habit, seed size and crop duration. Six lines were selected and the yield trials were conducted at GLORDC, Angunakolapelessa, during the 2016/17 *Maha* and 2017/18 *Maha* seasons. For that, 4 m × 2.7 m plots were used with 3 replicates in Randomized Complete Block Design (RCBD) and DOA recommended spacing of 45 cm × 15 cm was provided for plants. As there were no small-seeded varieties, two medium-seeded varieties; Tissa and ANKG1 were used as check varieties. At harvesting, the outer rows and one plant at each end of each row were discarded to obtain net plot yield.

Among the six lines, three lines were identified as promising lines and evaluated in the National Coordinated Varietal Testing trial (NCVT) for yield, crop duration and hundred seed mass at different research stations under DOA in different agro-ecological regions. In 2018/19 *Maha* season, the NCVT was conducted in six research fields at GLORDC, Angunakolapelessa (DL2b), Field Crops Research and Development Institute (FCRDI), Mahailuppallama (DL1b), and four agriculture research stations at Aralaganvila (DL2a), Killinochchi (DL3), Thirunelveli (DL3) and Maduruketiya (IL1c), with Tissa and ANKG1 as check varieties. The same trial was repeated in the 2019 *Yala* season at three research stations at Angunakolapelessa, Aralaganvila and Maduruketiya. The experiments were conducted in a RCBD, with three replicates using the recommended spacing for groundnut and the plot size was 4 m × 2.7 m. The Variety Adaptability Testing trial (VAT) was carried out in the 2019/20 *Maha* season along with Tissa and ANKG1 varieties in four farmer fields at Low country dry zone areas of Madirigiriya, Sathurukondan, Saliyapura and Jadura in an RCBD with two replicates. For that, 10 m × 5 m plots were used with 2 replicates in RCBD and DOA recommended spacing of 45 cm × 15 cm was provided for plants. Data were collected on net plot yield, crop maturity duration, seed characters, and pest and disease scores under field conditions.

The selected new line, SAARC No.201 was characterized according to the groundnut descriptors developed by ICRISAT (IBPGR and ICRISAT, 1992). All the experiments were conducted by supplying DOA recommended fertilizer (Basal dressing - 35kg, 100kg, 75kg of Urea, Triple Super Phosphate and Muriate of Potash per hectare respectively and top dressing – Urea 30kg per hectare) and spacing for groundnut (45 cm × 15 cm).

SAARC No. 201 line was screened for major diseases [Leaf spot, Bud Necrosis Disease (BND), Collar rot, and Rust] and pests (Aphids, Thrips and Leaf Caterpillars) along with the check varieties (Tissa and ANKG1) under the field conditions at GLORDC, Angunakolapelessa, during 2019 *Yala* season without spraying pesticides. For that, 3 m × 2 m plots were used with 3 replicates and DOA recommended spacing of 45 cm × 15 cm was provided for plants. Hence, each plot contained four rows. Percent disease incidence data were recorded from 10 plants in the centre two rows of each plot. Disease severity indexes were recorded according to the modified ICRISAT 9 point scale and pictorial key (Subrahmanyam *et al*., 1995), where infected percentage was 1: 0% (no disease), 2: 1%-5%, 3: 6%-10%, 4: 11%-20%, 5: 21%-30%, 6: 31%-40%, 7: 41%-60%, 8: 61%-80%, 9: 81%-100%. Accordingly, resistance levels were classified as 'resistant' (disease score 1), 'moderately resistant' (disease score 2-3), 'moderately susceptible' (disease score 4-5), 'susceptible (disease score 6-7) and 'highly susceptible' (disease score 8-9).

Yield data were analyzed using SAS (SAS Institute Inc 2013) and variance component methods (Abeysiriwardena *et al*., 1991) and the treatment means were compared using Least Significant Difference (LSD) at $p = 0.05$. Further, the selected new line was handed over to Plenty Foods (Pvt) Ltd to evaluate its performance for chocolate ball product development. The new line was cultivated by Plenty Foods (Pvt) Ltd in 1 ha land at Potuvil area and submitted the evaluation report after chocolate ball product development.

RESULTS AND DISCUSSION

Among the 11 groundnut lines tested at germplasm evaluation, only six lines (SAARC No. 201, ICGV 3487, ICGV 4117, ICGV 4118, ICGV 3090 and ICGV 3098) had small seeds and matured within 3 months period. Those six lines were selected for station yield trials (Table 1).

Data on pod yield at station yield trials at GLORDC, Angunakolapelessa in 2016/17 *Maha* revealed that the SAARC No. 201, ICGV 3487 and ICGV 4118 lines were significantly higher ($p>0.05$) than the check

Table 1: Initial line selection in 2015/16 *Maha* and 2016 *Yal*a seasons at GLORDC, Angunakolapelessa.

Line	Growth habit	Seed size	Crop duration months
SAARC No. 201	erect	small	3
SAARC No. 202	decumbent3	medium	3.5
SAARC No. 203	decumbent3	medium	3.5
SAARC No. 204	decumbent2	medium	3.5
SAARC No. 205	decumbent3	medium	3.5
SAARC No. 206	decumbent2	medium	3
ICGV 3487	erect	small	3
ICGV 4117	decumbent3	small	3
ICGV 4118	erect	small	3
ICGV 3090	decumbent3	small	3
ICGV 3098	erect	small	3

varieties (Table 2). In 2017/18 *Maha* the same lines performed well when compared with other tested lines (Table2). Considering the yield and growth habits, SAARC No. 201, ICGV 3487 and ICGV 4118 lines were selected for NCVT trials.

The NCVT data were analyzed separately for each location in each season using the average ranking method (Table 3) and variance component method of analysis (Tables 4 and 5). The lines tested in two seasons of 2018/19 *Maha* and 2019 *Yala* at six different research stations revealed that the average pod yield ranged from 2.5 to 3.1 t ha^{-1} for SAARC No.201 (Table 3). Average ranking data on pod yield revealed that SAARC No.201 was superior to other tested lines and check varieties in both seasons. This may be due to the higher genetic potential of SAARC No. 201 than other tested lines.

Table 2: Average pod yield of selected groundnut lines in station yield trials during 2016/17 *Maha* and 2017/18 *Maha* at GLORDC, Angunakolapelessa.

Variety/line	Average pod yield (kg ha^{-1})	
	2016/17 *Maha*	**2017/18 *Maha***
SAAC No. 201	2704.3 a	2204.3 a
ICGV 3487	2468.3 ab	1968.5 ab
ICGV 4118	2069.7 abc	1569.8 abc
ICGV 3090	1443.8 cde	1443.2 bcd
ICGV 4117	1355.0 de	855.6 d
ICGV 3098	1299.3 e	1299.4 cd
TISSA	1799.0 cde	1798.8 abc
ANKG1	1973.3 bcd	1973.5 ab
CV%	20.06	23.1
LSD	663.9	664.1

Within each column, the means followed by the same letters are not significantly different p = 0.05.

The most adaptable lines were selected by giving adaptability rank based on the higher average pod yield, the higher number of positive deviations, lower mean deviation and non-significant variance in deviations across locations according to Abeysiriwardena *et al*., (1991). In 2018/19 *Maha*, Tissa had recorded the best adaptability rank than the other tested lines while SAARC No.201 recorded the second highest rank (Table 4).

However, Tissa was not a small-seeded variety and its 100 seed mass was 45 grams. In 2019 *Yala*, SAARC No.201 recorded the best rank (Table 5). Hence, SAARC No.201 showed higher adaptability than the other tested lines and ANKG1 variety except Tissa.

Hundred seed weight of the selected lines were tested in six locations at Thirunelveli, Angunakolapelessa, Kilinochchi, Mahailuppallama, Maduruketiya and Aralaganvila in 2018/19 *Maha* and three locations at Angunakolapelessa, Aralaganvila and Maduruketiya in 2019 *Yala* under NCVT trials confirmed that SAARC No.201 had the lowest hundred seed weight (31.9 g) than that of all the other tested varieties and lines. Further, it was observed that both SAARC

Table 3: Average pod yield (t ha^{-1}) over locations in 2018/19 *Maha* and 2019 *Yala*.

Variety / Line	2018/19 *Maha*								2019 *Yala*				
	ANK	THR	MI	MRK	KC	ARL	Average Yield	Rank	ANK	ARL	MRK	Average Yield	Rank
SAARC No. 201	1.60a	1.50 a	2.60a	3.15 ab	2.08ab	3.84a	2.52	1	2.54 a	4.17a	4.27a	3.14	1
ICGV 3487	0.93 b	0.90 b	2.68a	2.30c	2.23ab	3.13a	2.03	5	2.97a	2.59c	1.15d	2.88	5
ICGV 4118	1.52a	1.09 ab	1.76a	3.39 a	1.35 b	4.24a	2.30	2	3.04a	3.15b	2.02c	3.04	2
Tissa	1.58a	1.34 ab	2.97a	3.09 ab	2.00 ab	4.34a	2.58	2	2.84a	2.69c	3.43b	2.88	2
ANKG 1	1.28ab	1.13 ab	2.42a	2.89 b	2.60 a	3.86a	2.35	4	2.90a	3.24b	2.16c	2.77	2
CV %	14	24	34	7.4	24	25			16	6.9	16.8		
LSD (0.5)	0	0.6	1.6	0.4	0.9	1.7			0.9	0.41	1		

Rank –given by average ranking method, ANK-Angunakolapelessa, THR-Thirunelveli, MI-Mahailuppallama, MRK-Maduruketiya, KC- Kilinochchi, ARL-Aralaganvila

No.201 and ICGV 4118 belonged to the small -seeded category while others belonged to the medium-size seed category (Table 6).

Hence, SAARC No.201 and ICGV 4118 lines were selected for VAT trials at farmer fields. As ANKG1 had a lower 100 seed weight (36-39 g) than Tissa (45-46 g), the ANKG1 variety was selected as the check variety in VAT trials.

The lines tested in 2019/20 *Maha* seasons at four farmers' fields at Sathurukondan, Madirigiriya, Jadura and Saliyapura revealed that the pod yield ranged from 2.5 t ha^{-1} to 2.8 t ha^{-1} for SAARC No.201 and 1.7 to 3.1 t ha^{-1} for ANKG1 (Table 7). The average yield in SAARC No.201 at farmer fields was superior to other tested lines and check variety except in the farmer field at Sathurukondan. Considering the higher average yield, lower mean distance and variance from maximum response, SAARC No.201 line was identified as superior to ICGV 4118 and the check variety ANKG1 (Table 8).

SAARC No.201 has recorded a 2.7 t ha^{-1} average pod yield while both Tissa and ANKG1 recorded 2.3 t ha^{-1} (Table 8). Though the SAARC No.201 has small seeds, it recorded a higher average yield due to the higher number of pods per plant and it will help to make the cultivation profitable. The highest pod yield for SAARC No.201 was recorded as 4.2 t ha^{-1} at Maduruketiya and at Aralaganvila it was 4.1 t ha^{-1} (Table 3). Hundred seed mass of lines at VAT trials were depicted in table 9.

Plenty Foods (Pvt) Ltd had cultivated the SAARC No.201 line in the Potuvil area. During the cultivation season, this line was not attacked by any pests and diseases and harvested at three months aged (Table 10). After producing chocolate balls, they confirmed the fitness of SAARC No. 201 characters with the standards of chocolate ball production (personal communication). According to the evaluation report of Plenty Foods (Pvt) Ltd, SAARC No. 201 line was ideal in terms of 100 seed mass, seed size, uniformity and roasting quality (Table 10).

Table 4: Adaptability parameters derived on variance component method in NCVT during 2018/19 *Maha* season.

Variety/Line	Average yield over 6 locations t/ha	Adaptability Parameters			
		No. of + deviations out of 6 locations	Mean deviation over locations	Interaction variance	Adaptability rank
SAAC No. 201	2.52	3	0.14 [a]	0.52*	2
ICGV 3487	2.03	2	−0.29 [b]	0.24	5
ICGV 4118	2.29	1	−0.09 [ab]	0.17	4
Tissa	2.58	5	0.22 [a]	0.28	1
ANKG 1	2.35	2	0.04 [a]	0.19	3

Mean in each column followed by the same letters are not significantly different (p = 0.05), *Significant

Table 5: Adaptability parameters derived on variance component method in NCVT during 2019 *Yala* season.

Variety/Line	Average yield over 3 locations t/ha	Adaptability Parameters			
		No. of + deviations out of 3	Mean deviation over locations	Interaction variance	Adaptability rank
SAAC No. 201	3.14	2	0.78a	0.70	1
ICGV 3487	2.88	1	−0.64c	1.59*	4
ICGV 4118	3.04	0	−0.14b	0.04	3
Tissa	2.88	1	0.10b	0.25	2
ANKG 1	2.77	0	−0.11b	0.04	4

Mean in each column followed by the same letters are not significantly different (p = 0.05), *Significant

Table 6: 100 seed weight (g) of selected lines and check varieties at NCVT trials.

Line/ variety	2018/19 *Maha*							2019 *Yala*			
	THR	ANK	KC	MI	MRK	ARL	Average	ANK	ARL	MRK	Average
NO. 201	32.7	27.6	33.4	32.0	33.0	32.7	31.9±0.60	32.7	30.1	32.8	31.9±0.50
ICGV 4118	33.7	30.0	34.6	30.0	34.3	33.0	32.6±1.29	34.3	30.0	34.6	33.0±2.52
ICGV 3487	37.7	37.0	42.8	34.0	39.0	39.7	38.4±1.25	39.0	37.0	42.8	39.6±2.31
Tissa	42.2	45.0	45.1	47.3	45.3	46.0	45.1±0.63	48.2	45.0	45.3	46.2±1.00
ANKG1	34.6	40.0	45.7	37.3	36.0	38.7	38.6±1.12	33.7	39.3	34.7	35.9±1.33

ANK –Angunakolapelessa, THR-Thirunelveli, MI-Mahailuppallama, MRK-Maduruketiya, KC-Kilinochchi, ARL-Aralaganvila

The main reason for selecting small size groundnut seeds for chocolate ball production is to maximize consumer satisfaction by increasing the number of chocolate balls in a unit weight of a packet they purchase. This company is willing to utilize this candidate line for the chocolate ball production industry. The quality parameters of pods and crop maturity duration of SAARC No. 201 were compared with those of Tissa and ANKG1 varieties, and it was revealed that SAARC No. 201 is ideal for the chocolate ball production industry. Further, it is matured within 3 months that is best fitted for the seasonal cropping pattern of Sri Lanka (Table 11).

The screening results for major pest and diseases of new line confirmed that SAARC No. 201 was moderately resistant to all the

Table 7: Average Pod Yield (t ha^{-1}) of SAARC No.201 with compared to the standard variety ANKG1 at farmer fields in 2019/20 *Maha* season.

Line/ variety	Pod yield (t ha^{-1})				Average yield over locations (t ha^{-1})
	L1	L2	L3	L4	
NO.201	2.9	2.5	2.8	2.7	2.7
ICGV4118	2.3	1.7	1.9	1.8	1.9
ANKG1	3.2	2.0	2.3	1.7	2.3

L1- Sathurukondan, L2- Madirigiriya, L3- Jadura, L4- Saliyapura

Table 8: Mean and variance of the distance from the maximum response and the adaptability ranks of SAARC No.201, ICGV 4118 and ANKG1 in VAT under farmer field conditions during 2019/20 *Maha*.

Line/ variety	Distance from maximum response		Average yield t ha^{-1}	Adaptability rank
	Mean	Variance		
NO.201	0.76 b	0.11	2.74	1
ICGV4118	1.59 a	0.29	1.91	3
ANKG1	1.21 a	1.53*	2.29	2

*Significant, Mean in each column followed by the same letters are not significantly different (p = 0.05)

Table 9: Hundred seed mass (g) of selected lines and check variety in 2019/20 *Maha* season.

Line/ variety	100 seed mass (g)				Average
	L1	L2	L3	L4	
SAARC 201	32.7	30.1	32.8	30.3	31.5±0.46
ICGV 4118	36.0	37.0	32.7	38.7	36.1±1.19
ANKG1	36.1	38.7	39.3	45.0	39.8±1.37

L1- Sathurukondan, L2- Madirigiriya, L3- Jadura, L4- Saliyapura

tested diseases of Leaf spot, BND, Collar rot, and Rust. Further, it was moderately resistant to leaf-eating caterpillars. Aphids and Thrips were not recorded during the cropping season (Table 12).

Table 10: Evaluation data submitted by Plenty Foods (Pvt) Ltd.

Character	Observation
Seed germination % at the field	90
Pest and diseases	Not recorded any pest or disease problem
No. of days to harvesting	90 days
Yield	2 t/ha
100 seed weight	30 g
Seed quality–Size and uniformity	Good
Roasted quality	Good
Suitability for chocolate ball production	Fits with the standards of the products

Table 11. Seed maturity duration and quality parameters of pods.

Parameter	SAARC No. 201	ANKG1	Tissa
No. of days to mature			
Yala	89-93	96-98	94-98
Maha	86-100	88-109	87-108
Shelling %	62-68	65-70	60-65
Seed size	Small	Medium	Medium
100 seed weight (g)	30-33	38-45	40-45
Sound mature seed (%)	68-70	68-70	70-72
Seed dormancy (weeks)	No	No	No

The composition of the SAARC No. 201 line and other check varieties were tested by using the proximate analysis. The percentage moisture and carbohydrate content in medium (ANKG1 and Tissa) and small-sized groundnut seeds (SAARC No. 201) were similar (Table 13). In contrast, SAARC No. 201 had a higher protein level, compared to that in medium seeded groundnut (Table 13). Olayinka *et al* (2016) also reported that small-seeded groundnut contained higher protein than medium seeded groundnut.

Plant and pod characters of the SAARC No.201 line were recorded according to the groundnut descriptor. It has an erect growth habit and sequential branching pattern. The stem was light greenish. However, purplish stem pigmentation is also noticed in all the stages of plant development, and peg

Table 12: Screening results for major pest and diseases

Line/Variety	Field Resistance level						
	Leaf spot	BND	Collar rot	Rust	Aphids	Thrips	Leaf eating caterpillars
SAARC No. 201	MR	MR	MR	MR	NR	NR	MR
Tissa	MR	MR	MR	S	NR	NR	MR
ANKG1	MR	MS	MS	S	NR	NR	MR

S-Susceptible, MS-Moderately Susceptible, MR-Moderately Resistant, R-Resistant, NR-Not Recorded

Table 13: Proximate analysis of groundnut.

Variety/line	Moisture (%)	Fat (%)	Ash (%)	Protein (%)	CHO (%)
No. 201	7.63±0.24	41.76±0.93	2.71±0.06	27.10±0.07	20.80
ANKG1	7.03±0.42	42.21±0.04	3.99±0.04	25.66±0.82	21.11
Tissa	7.1±0.02	42.47±0.43	3.02±0.11	23.01±0.51	20.4

pigmentation was also presented. Leaflets were oblong shaped. Fifty percent flowering was observed at 25 days after planting. It contained 50-95 pods per plant. Pods had prominent beak and reticulation while the pod constriction was moderate to deep. Interestingly, 100 seed mass was 30 to 33g and belonged to the small seed category. Seeds were tan colored and no seed dormancy was recorded.

SAARC No. 201 line was identified as a superior groundnut line for the value-added food industry and nominated to the variety releasing committee of the DOA, and it was released to the farming community renaming as ANKGN4/Tiny in 2020.

CONCLUSION

A new short duration and small-seeded groundnut line (SAARC NO.201) was identified through a selection process of exotic germplasm received from the SAARC germplasm exchange program. The new line recorded the average yield of 2.7 t ha^{-1} and matured within 3 months. It is well fitted into the existing cropping pattern of Sri Lanka. This is the first small-seeded (30-33 g of 100 seed mass) variety introduced for the chocolate ball industry by DOA in Sri Lanka, Further, the new line was moderately resistant for all major diseases in groundnut at field level. The candidate variety, SAARC NO.201 has been released by the variety releasing committee in 2020 renaming it as ANKGN4/ Tiny considering its greater potential for utilizing in the chocolate ball industry in Sri Lanka.

AUTHOR CONTRIBUTION

DCJ and YPJA conceptualized and designed the study. DCJ, YPJA, GW and RWPK performed the experiments. DCJ analyzed and interpret the data. DCJ contributed in drafting the manuscript and revised the manuscript.

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