Comparative Morphological diversity of cultivated and wild species of Vigna Savi

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ABSTRACT

One of the challenges faced in the study of this genus is the ability to identify them when encountered in the field. This study was carried out to Compare morphological characteristics of a panel of twenty-two (22) Vigna savi of some cultivated(5) and wild(17) species obtained from the International Institute of Tropical Agriculture IITA, Ibadan Nigeria. Seeds were planted at the Department of Crop and Soil Science Research Farm, University of Port Harcourt, Nigeria using the experimental design Complete Randomized Block Design (CRBD). Physical observations were made on the seeds and the vegetative parts were observed for taxa delineation in the field. Results obtained showed the features that were of significance morphologically include the seed size, hilum position, plant height, leaf shape, leaf hairiness, twinning tendency, presence or absence of adventitious roots and the perennating stomps encountered in only one of the cultivated species of Vigna unguiculata (IT81D-975) amongst all others encountered in this study. The leaf shapes observed includes the ovate, lanceolate, cordate, elliptic, linear and deltoid. Variation in stem and petiole pigmentation at the germination phase and maturity were areas of variation indicating their phylogeny. The parameters employed in this result is to aid in providing good description for taxa separation. The relevance of these parameters in the taxonomic delimitation of species provides an easy means of identification when encountered in the field.

The variations revealed morphologically could be exploited to improve passport data available for Vigna.

Key words: Vigna, morphology, hilum, leaf shape, perennating stomp

I. INTRODUCTION

The genus *Vigna* Savi. belongs to the family Fabacee of the plant kingdom. It is a legume which produces multiple edible parts (products). The term legume is applied to all plants of the bean and pea family. The family leguminosae is the second largest family among the dicots. Recent review in the Taxon (2017) classifies it into 6-sub families as against the initial 3-sub family classification. The new subfamily classification was based on a taxonomically comprehensive phylogeny according to Taxon (2017). The new classification is said to address the long term non-monophyly of the traditionally recognized subfamily Caesalpinoideae using plastid mat K gene sequences, as well as

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including the near-complete sampling of genera (698 of the currently recognized 765 genera) and Ca. 20% (3696) of known species. The subfamilies which was previously Caesalpinoideae DC., Mimosoideae DC., and Papilionoideae is outdated and now replaced with Ceasalpinoideae, Papilionoideae, Duparaquetioideae, Cercidoideae, Detarioideae, and Dialoideae by the splitting of the Mimosoideae into four(4) subfamilies.

Studies on the distribution of the plant families reveal divers patterns, of which the legumes is said to be cosmopolitan. The family fabaceae showcases this same pattern of distribution. The ecological importance of the legume family can't be ignored because they represent an important constituent across almost all the biomes in the world. A careful observation in most extreme habitats reveals their occurrence (Schrire *et al*; 2005a, b).

Vigna species are among the well known as well as utilized legumes and they possess great potentials for exploitation. *Vigna* species like *V. unguiculata* seed have long been considered as an important product but researchers have revealed otherwise.

The genus *Vigna* have both cultivated and wild species. Research interests have been triggered from different taxonomists on majority of its species. A great deal of the challenges faced in the study of this genus is the ability to identify them when encountered in the field. Anatomical and morphological features have been employed for an in-depth study in order to address this setback in research work. It is noteworthy that the application of morphological and anatomical characteristics is not limited to the genus *Vigna* alone. These tools have been employed for proper taxa delimitation. Morphological and anatomical characteristics is not limited to the genus *Vigna* alone. They have been employed in a wide range of families for proper taxa delimitation.

According to Agbagwa and Okoli (2005) epidermal characteristics have been employed as a useful tool for comparative anatomy and taxonomic study in some members of the leguminosea, just like the studies carried out on *Abrus* (papilioinaceae) using the leaf epidermal micromorphology in parts of the tropical West Africa.

According to Agbagwa and Okoli (2005) taxonomic information is not enough to resolve controversies surrounding species identification. The need to resolve these controversies associated with variability and overlaps in the vegetative features of species for their easy identification have led to the employment of different tools to mitigate limitations posed by the limited information available. The morphological data amassed in this study on the vegetative features provides good information taxonomically for the species.

Morphology is the branch of biological studies that deals with the form and structure of a living thing without further consideration of function. Macro-morphological features are those features which could only be observed or studied without the use of visual aids while micro-morphological features require the use of visual aids as a result of their miniature size and/or ultra-structural details. Macro-morphological characters of the floral/reproductive and vegetative organs have been used in taxonomic delimitation of species (Stace, 1980; Aguoru and Okoli, 2008). Agbagwa and Okoli (2005) employed in the Systematics of *Abrus* micro-morphology.

Though the importance of macro-morphological and micro-morphological features cannot be overemphasized, it is recommended to supplement them with additional characters in order to guarantee the level of sensitivity needed to correctly identify and delineate species into particular taxa (De Langhe, 1990).

This research work focuses on elucidation of taxonomic complexities in *Vigna* species using gross morphology.

II. MATERIALS AND METHOD

The experiment was done using twenty-two accessions of eleven species of the genus *Vigna* which were obtained from the germplasm unit of the International Institute of Tropical Agriculture (IITA), Ibadan, Oyo State, Nigeria. The seeds were later planted in the Experimental / Research farm of the Faculty of Agriculture in the University of Port Harcourt, Choba, Rivers State, Nigeria.

EXPERIMENTAL DESIGN

Complete randomized block design (CRBD) with five replications was used. No treatments were allocated to the experimental units (plots).

MORPHOLOGICAL STUDIES

This was done after Radford (1986) and IPGRI (2004). Observations on vegetative characteristics of the *Vigna* species were made on the seeds and on the plants growing in the farm (Agricultural farm site of the Faculty of Agriculture in the University of Port Harcourt, Rivers State, Nigeria). Measurements on the various morphological features of interest were made.

GERMINATION STUDIES

Seeds were observed at intervals in the course of germination and measurements taken as well. No seed treatment was applied to any of the seeds. Type of germination, time of germination and characteristics of the first leaf were noted as taxonomic indices.

III. RESULTS

MORPHOLOGICAL STUDIES

Habit and vegetative morphology

Vigna species are herbs. They are annual to perennial herbs. The root system is of the tap root type with many branches. Stems are herbaceous, perennial stumps may appear slightly woody at maturity. Stems are hollow in some but all are branched. Some of the stems are hairy. The leaves are usually alternate and trifoliate. These morphological features can be observed in figures 1 to 5 and outlined in tables 1 to 3

All of these recordings were carried out in the sixth week. Most of them had high twinning tendencies

Table 1: Morphological characters observed in the leaves at week six after germination

S/NO	SPECIES	ACCESSION NO	Leaf shape	Leaf base	Leaf apex	Leaf margin	Leaf colour	Leaf texture
1	*V.adenantha*	TVNu-1853	Ovate	Acute	Acute	Slightly undulated	Intermediate green	membranous
2	*V.ambacensis*	TVNu-11	lanceolate	Acute	Acute	Acute	Dark green	membranous
3	*V.ambacensis*	TVNu-10	lanceolate	Acute	Acute	Acute	Dark green	membranous
4	*V. dekindtiana*	TVNu-1842	Cordate	Truncate	Acute	Entire	Dark green	Membranous
5	*V. gracilis*	TVNu-1805	Cordate	Rounded	acuminate	Entire	Intermediate green	Intermediate
6	*V. nigritia*	TVNu-1814	Ovate	truncate	acuminate	Entire	Dark green	Membranous
7	*V. nigritia*	TVNu-1079	Ovate	truncate	acuminate	Entire	Dark green	Membranous
8	*V. heterophylla*	TVNu-19	lanceolate	truncate	Acute	Entire	Dark green	Membranous
9	*V. oblongifolia*	TVNu-38	Linear	truncate	Acute	Entire	Dark green	Membranous
10	*V. oblongifolia*	TVNu-139	lanceolate	rounded	Acute	Entire	Dark green	Membranous
11	*V. racemosa*	TVNu-45	Ovate	rounded	acuminate	Entire	Dark green	Membranous

12	*V. racemosa*	TVNu-44	Ovate	rounded	acuminate	Entire	Dark green	Membranous
13	*V. racemosa*	TVNu-47	Ovate	truncate	acuminate	Entire	Dark green	Membranous
14	*V. reticulate*	TVNu-56	Ovate	truncate	Acute	Entire	Dark green	Membranous
15	*V. reticulate*	TVNu-54	lanceolate	rounded	Acute	Entire	Dark green	Membranous
16	*V. reticulate*	TVNu-57	Cordate	cordate	Acute	Entire	Dark green	Membranous
17	*V. unguiculata*	TVu 13094	Cordate	cordate	Acute	Entire	Dark green	Membranous
18	*V. unguiculata*	IT81D-975	Ovate	truncate	acuminate	Entire	Dark green	Membranous
19	*V. unguiculata*	TVNu-209	Ovate	truncate	acuminate	Slightly undulated	Dark green	Coriaceous
20	*V. vexillata*	TVNu-1623	Deltoid	truncate	Acute	Entire	Dark green	Membranous
21	*V. vexillata*	TVNu-1578	Elliptic	Acute	Acute	Entire	Dark green	Membranous
22	*V. vexillata*	TVNu-1592	lanceolate	Acute	Acute	Entire	Dark green	Membranous

Table 2: Morphological result showing plant description at week six

S/NO	SPECIES	ACCESSION NO	Stem colour (pigmented)	Petiole colour (pigmented)	Stem hairiness	Leaf hairiness	Adventitious roots	TWINNING TENDENCY
1	*V.adenantha*	TVNu-1853	Yes	Nil	Nil	nil	Present	Pronounced
2	*V.ambacensis*	TVNu-11	Yes	Nil	Pronounced	Pronounced	Nil	Very slight
3	*V.ambacensis*	TVNu-10	Yes	Nil	Pronounced	Pronounced	Nil	Very slight
4	*V. dekindtiana*	TVNu-1842	Nil	Nil	Nil	nil	Nil	Pronounced
5	*V. gracilis*	TVNu-1805	Nil	Nil	Nil	nil	Nil	Pronounced
6	*V. nigritia*	TVNu-1814	Nil	Nil	Nil	nil	Nil	Pronounced
7	*V. nigritia*	TVNu-1079	Nil	Nil	Nil	nil	Nil	Pronounced
8	*V. heterophylla*	TVNu-19	Yes	Nil	Pronounced	Pronounced	Nil	None
9	*V. oblongifolia*	TVNu-38	Nil	Nil	Nil	nil	Nil	Very slight

10	*V. oblongifolia*	TVNu-139	Nil	Nil	Nil	nil	Nil	Pronounced
11	*V. racemosa*	TVNu-45	Nil	Nil	Pronounced	Very slight	Present	Pronounced
12	*V. racemosa*	TVNu-44	Yes	Nil	Very slight	Very slight	Present	Pronounced
13	*V. racemosa*	TVNu-47	Yes	Nil	Nil	nil	Present	Pronounced
14	*V. reticulate*	TVNu-56	Nil	Nil	Pronounced	Very slight	Nil	Pronounced
15	*V. reticulate*	TVNu-54	Nil	Nil	Pronounced	Pronounced	Nil	None
16	*V. reticulate*	TVNu-57	Nil	Nil	Pronounced	Very slight	Nil	None
17	*V. unguiculata*	TVu 13094	Nil	Nil	Nil	nil	Nil	Pronounced
18	*V. unguiculata*	IT81D-975	Nil	Nil	Nil	nil	Nil	Pronounced
19	*V. unguiculata*	TVNu-209	Nil	Nil	Nil	nil	Nil	Pronounced
20	*V. vexillata*	TVNu-1623	Yes	Nil	Pronounced	Pronounced	Nil	Pronounced
21	*V. vexillata*	TVNu-1578	Yes	yes	Pronounced	Very slight	Nil	Very slight
22	*V. vexillata*	TVNu-1592	Yes	Nil	Very slight	Very slight	Nil	Very slight

Table 3: Measurements on the mature leaf and plant of the *Vigna* species at six weeks after germination

S/NO	SPECIES	ACCESSION NO	PLANT HEIGHT (cm)	LEAF LENGTH (cm)				LEAF WIDTH (cm)			
				1	2	3	Mean	1	2	3	mean
1	*V.adenantha*	TVNu-1853	**57**	5.6	4.8	4.7	**5.03**	4.9	5.0	3.8	**4.56**
2	*V.ambacensis*	TVNu-11	**15**	5.3	6.5	4.9	**5.67**	1.0	0.8	1.6	**1.13**
3	*V.ambacensis*	TVNu-10	**15.0**	6.1	5.4	4.7	**5.40**	1.5	1.9	1.3	**1.57**
4	*V. dekindtiana*	TVNu-1842	**30.9**	8.6	7.7	8.2	**8.17**	5.3	4.7	4.4	**0.90**
5	*V. gracilis*	TVNu-1805	**46**	3.5	3.0	2.9	**3.13**	1.8	1.7	1.6	**1.70**
6	*V. nigritia*	TVNu-1814	**21.3**	9.3	8.4	8.6	**8.77**	5.8	5.3	5.6	**5.67**
7	*V. nigritia*	TVNu-1079	**26.0**	8.2	8.5	8.0	**8.23**	5.8	5.3	5.0	**5.37**
8	*V. heterophylla*	TVNu-19	**11.3**	2.3	3.0	2.5	**2.60**	0.4	0.3	0.4	**0.37**
9	*V. oblongifolia*	TVNu-38	**67.0**	3.0	2.9	3.1	**3.00**	0.3	0.3	0.2	**0.27**

10	*V. oblongifolia*	TVNu-139	**90.0**	4.9	4.0	4.0	**4.30**	0.3	0.3	0.3	**0.30**
11	*V. racemosa*	TVNu-45	**32.0**	3.4	4.1	4.1	**3.80**	3.0	2.9	2.3	**2.73**
12	*V. racemosa*	TVNu-44	**18.0**	5.1	3.3	3.3	**3.90**	3.2	2.1	2.3	**2.53**
13	*V. racemosa*	TVNu-47	**11.1**	2.3	2.9	2.3	**2.50**	2.1	2.2	1.3	**1.87**
14	*V. reticulata*	TVNu-56	**15.0**	3.2	6.0	3.2	**4.10**	2.1	3.0	2.1	**2.40**
15	*V. reticulata*	TVNu-54	**10.0**	8.3	8.3	8.3	**8.30**	1.9	1.9	1.9	**1.90**
16	*V. reticulata*	TVNu-57	**7.0**	3.3	2.9	2.0	**2.73**	1.3	1.8	1.0	**1.37**
17	*V. unguiculata*	TVu 13094	**12.8**	4.3	5.1	5.3	**4.72**	3.1	3.3	3.2	**3.20**
18	*V. unguiculata*	IT81D-975	**18.7**	12.0	10.1	8.2	**10.1**	7.8	6.6	7.1	**7.17**
19	*V. unguiculata*	TVNu-209	**72.0**	6.3	6.9	6.3	**2.63**	3.2	4.2	3.4	**3.60**
20	*V. vexillata*	TVNu-1623	**54.0**	9.9	12.1	9.6	**10.50**	2.8	2.2	2.4	**2.47**
21	*V. vexillata*	TVNu-1578	**22.0**	5.3	4.2	4.3	**4.60**	2.0	2.1	2.3	**2.13**
22	*V. vexillata*	TVNu-1592	**16.0**	4.3	4.5	4.1	**4.30**	1.3	1.3	1.3	**1.30**

*Leaf measurements was done on the third leaf for accessions studied. There was exception to Tvnu-54 whose third leaf was just a single leaf and TVNu-56 whose fourth leaf started being a trifoliate.

Plate4.1: Plant habit of a). *Vigna adenantha* TVNu-1853b).*Vigna ambacensis* TVNu-11 c).*Vigna ambacensis* TVNu-10 d).*Vigna dekindtiana TVNu*-1842

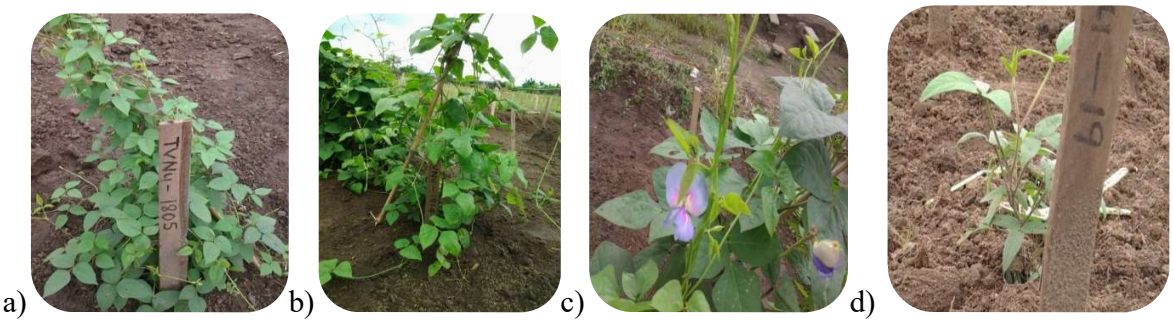


Fig 1: Plant habit of a).*Vigna gracilis* TVNu-1805 *b*).*Vigna nigritia* TVNu-1814 c). *Vigna nigritia* TVNu-1079 d).*Vigna heterophylla* TVNu-19

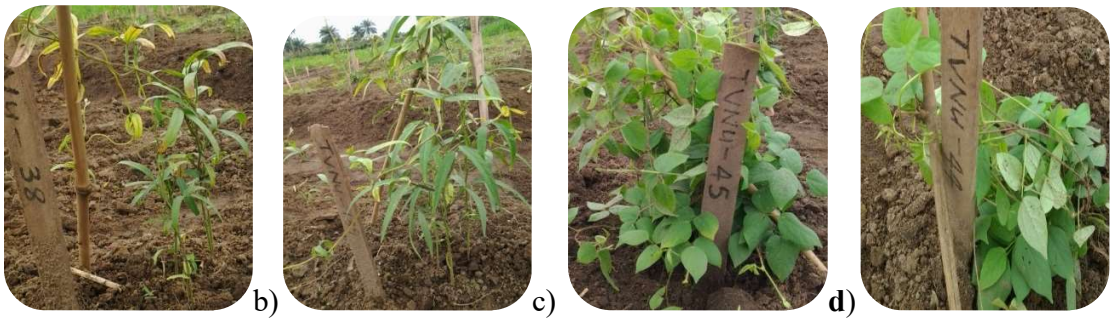


Fig 2: Plant habit of a). *Vigna oblongifolia* TVNu-38 b).*Vigna oblongifolia* TVNu-139 c). *Vigna racemosa* TVNu-45 d).*Vigna racemosa* TVNu-44

Fig 3: Plant habit of a). *Vigna racemosa* TVNu-47 b).*Vigna reticulata* TVNu-56 c). *Vigna reticulate* TVNu-54 d*) Vigna unguiculata*TVu-13094

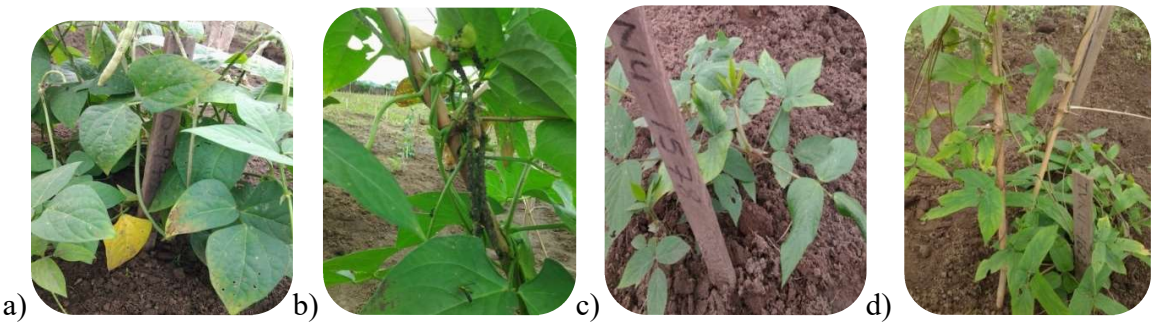


Fig 4: Plant habit of a).*Vigna unguiculata* IT81D-975 b).*Vigna unguiculata* TVNu-209 c). TVNu-1578 *Vigna vexillata* d). TVNu-1623 *Vigna vexillata*

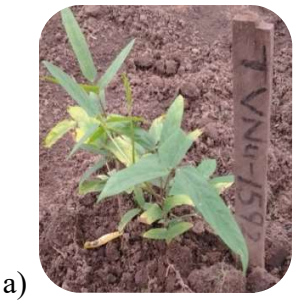


Fig 5: Plant habit of a). TVNu-1592 *Vigna vexillata*

Fruit and Seed Morphology

The different morphological types observed in the seeds of the species are shown in table 4 and in figures 6 to 11. Variations were revealed in seed colour, shape, sizes and hilum position. The seed shapes ranges from rhomboid to ovoid.

The hilum position varies from marginal to apical and near marginal to near apical.

Table 4: Morphological results on seeds characters

S/NO	SPECIES	ACCESSION NO	SEED COLOUR	SEED SHAPE	SEED SIZE (mm)	Hilum position
1	*V.adenantha*	TVNu-1853	Dark brown	Rhomboid	5x5	marginal
2	*V.ambacensis*	TVNu-11	Mottled with cream, brown and black	Ovoid	6x3	Near apical
3	*V.ambacensis*	TVNu-10	Mottled with cream, brown and black	Rhomboid	4.5x3	Near apical
4	*V. dekindtiana*	TVNu-1842	Mottled brown	Rhomboid	4.5x3	marginal
5	*V. gracilis*	TVNu-1805	Mottled with cream, black and grey	Rhomboid	3x2	Near apical
6	*V. nigritia*	TVNu-1814	Mottled brown and black	Rhomboid	3.5x2	marginal
7	*V. nigritia*	TVNu-1079	Dark brown and black	Rhomboid	3.5x2	marginal
8	*V. heterophylla*	TVNu-19	Mottled with cream, black and grey	Rhomboid	4x3	Near apical
9	*V. oblongifolia*	TVNu-38	Brown	Rhomboid	4x3	Near apical
10	*V. oblongifolia*	TVNu-139	Brown	Rhomboid	5x3	Near apical
11	*V. racemosa*	TVNu-45	Mottled brown, grey and ash	Rhomboid	3x2	Near apical
12	*V. racemosa*	TVNu-44	Mottled brown and ash	Rhomboid	4x2	Apical
13	*V. racemosa*	TVNu-47	Mottled black and grey	Rhomboid	3.5x2.5	Near apical
14	*V. reticulata*	TVNu-56	Brown	Rhomboid	3x2	Marginal
15	*V. reticulata*	TVNu-54	Mottled brown, black and grey	Rhomboid	4x3	Marginal

16	*V. reticulata*	TVNu-57	Mottled black and brown	Rhomboid	3x2	Marginal
17	*V. unguiculata*	TVu 13094	Black and brown	Rhomboid	4x3	Marginal
18	*V. unguiculata*	IT81D-975	Light brown	Rhomboid	10x7	Marginal
19	*V. unguiculata*	TVNu-209	Mottled black, brown and grey	Rhomboid	4x2.5	Marginal
20	*V. vexillata*	TVNu-1623	Black	Rhomboid	4x2.5	Marginal
21	*V. vexillata*	TVNu-1578	Mottled black and brown	Rhomboid	4x3	Marginal
22	*V. vexillata*	TVNu-1592	Black and brown	Rhomboid	4x2	Marginal

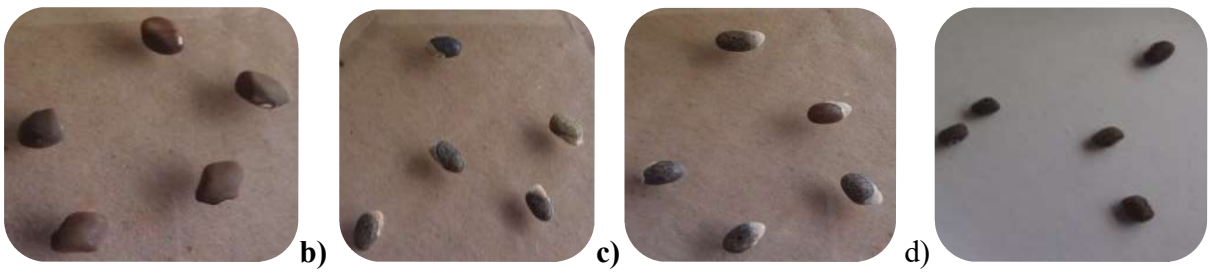


Figure 6: Seeds of a).*Vigna adenantha* TVNu-1853 b). *Vigna ambacensis* TVNu-11 c) *Vigna ambacensis* TVNu-10 d).*Vigna dekindtiana* TVNu-1842

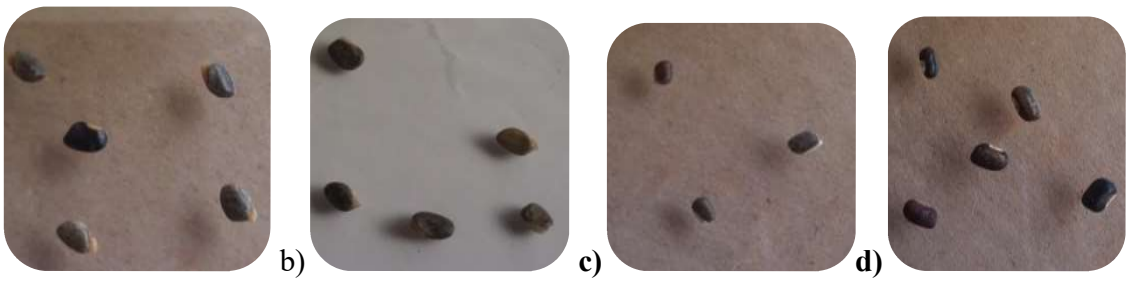


Figure 7: Seeds of a). *Vigna gracilis* TVNu-1805 b).*Vigna heterophylla* TVNu-19 c).*Vigna nigritia* TVNu-1814 d).*Vigna nigritia* TVNu-1079

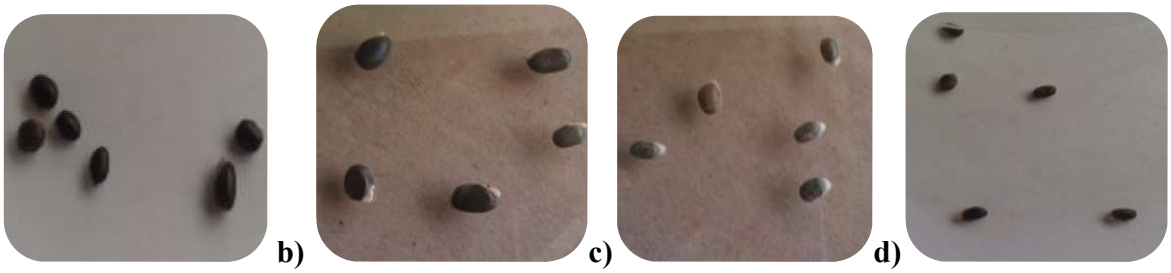


Figure 8: Seeds of a).*Vigna oblongifolia* TVNu-38 b) *Vigna oblongifolia* TVNu-139 c). *Vigna racemosa* TVNu-45 d).*Vigna racemosa* TVNu-44

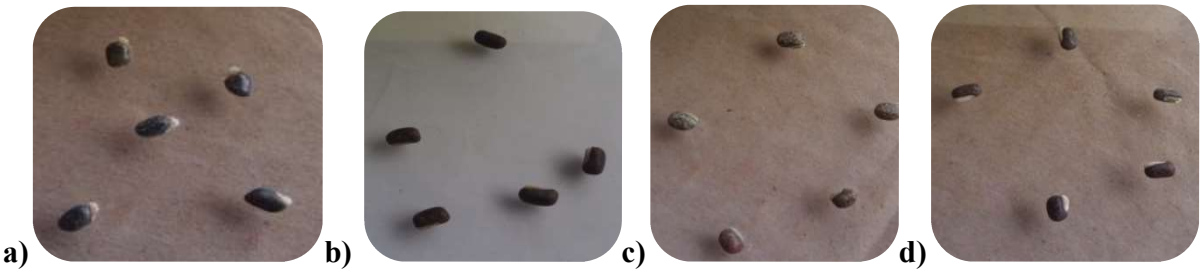


Figure 9: Seeds of a).*Vigna racemosa* TVNu-47 b).*Vigna reticulata* TVNu-56 c).*Vigna reticulata* TVNu-54 d).*Vigna reticulata* TVNu-57

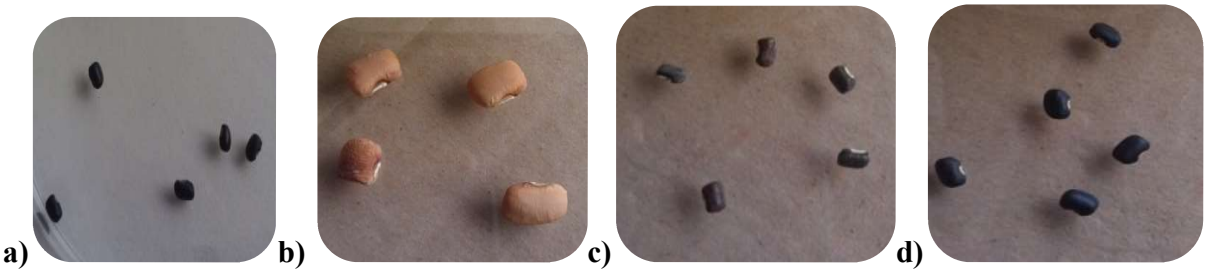
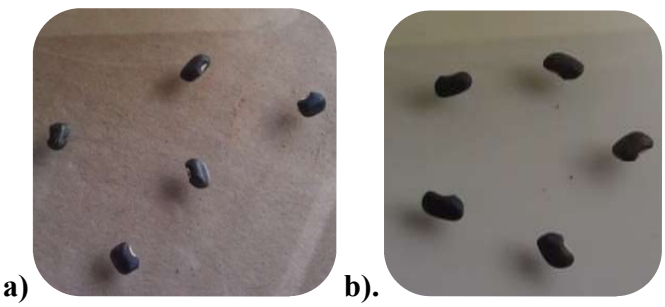


Figure 10: Seeds ofa). *Vigna unguiculata* TVu-13094 b).*Vigna unguiculata* T81D-975 c).*Vigna unguiculata* TVNu-209 d).*Vigna vexillata* TVNu-1623



Figures 11: Seeds of a).*Vigna vexillata* TVNu-1578 b). *Vigna vexillata* TVNu-1592

GERMINATION AND GROWTH STUDIES

The result for growth parameters are represented in tables 5 and 6. Great variation was observed in the time of germination, germination percentage, total number of seed that germinated as compared to the number of seeds planted, time of flowering and length of fruit pods of the individual species of *Vigna* studied. Total number of the species that podded is also recorded in table 5.

Table 5: Germination result showing growth statistics

PLANTING DATE: 28TH APRIL, 2015

S/NO	SPECIES	ACCESSION NO	NO OF SEED PLANTED	NO OF GERMINATED SEED	GERMINATION TIME	% GERMINATI	FLOWERING DATE	FLOWER COLOUR	LENGTH OF POD (cm)
1	***V.adenantha***	TVNu-1853	**5**	5	4th	100	13th, august	White with	5.5-4.5
2	***V.ambacensis***	TVNu-11	5	3	4th	60	-	-	-
3	***V.ambacensis***	TVNu-10	5	2	10th	40	-	-	-
4	***V. dekindtiana***	TVNu-1842	5	2	5th	40	-	-	-
5	***V. gracilis***	TVNu-1805	5	4	8th	80	-	-	-
6	***V. heterophylla***	TVNu-19	5	2	8th	40	-	-	-
7	***V. nigritia***	TVNu-1814	5	3	4th	60	9th, july	purple	7.8-6.0
8	***V. nigritia***	TVNu-1079	5	5	4th	100	-	-	-
9	***V. oblongifolia***	TVNu-38	5	5	4th	100	-	-	-
10	***V. oblongifolia***	TVNu-139	5	5	4th	100	-	-	-
11	***V. racemosa***	TVNu-45	5	5	5th	100	-	-	-
12	***V. racemosa***	TVNu-44	5	3	5th	60	23rdjuly	pink	-
13	***V. racemosa***	TVNu-47	5	4	4th	80	-	-	-
14	***V. reticulata***	TVNu-56	5	4	6th	80	-	-	-
15	***V. reticulata***	TVNu-54	5	3	10th	60	-	-	-
16	***V. reticulata***	TVNu-57	5	4	12th	80	-	-	-
17	***V. unguiculata***	TVu 13094	5	1	4th	20	-	-	-

18	***V. unguiculata***	IT81D-975	5	4	3	80	26 , june	yellow	10.0-8.0
19	***V. unguiculata***	TVNu-209	5	4	4th	80	30th, july	purple	7.7-7.0
20	***V. vexillate***	TVNu-1623	5	4	10th	80	30th,	purple	11.5-9.9
21	***V. vexillate***	TVNu-1578	5	4	9th	80	-	-	-
22	***V. vexillate***	TVNu-1592	5	4	5th	80	-	-	-

Table 6: Showing colour pigmentation contrast on plant during the process of growth

S/NO	SPECIES	ACCESSION NO	STEM COLOUR (PIGMENTED -RED)		PETIOLE COLOUR (PIGMENTED-RED)	
			AT GERMINATION	AT MATURITY	AT GERMINATION	AT MATURITY
1	*V.adenantha*	TVNu-1853	Nil	yes	nil	Nil
2	*V.ambacensis*	TVNu-11	Yes	yes	nil	Nil
3	*V.ambacensis*	TVNu-10	Nil	yes	nil	Nil
4	*V. dekindtiana*	TVNu-1842	Nil	nil	nil	Nil
5	*V. gracilis*	TVNu-1805	Nil	nil	nil	Nil
6	*V. nigritia*	TVNu-1814	Nil	nil	nil	Nil
7	*V. nigritia*	TVNu-1079	Nil	nil	yes	Nil
8	*V. heterophylla*	TVNu-19	Yes	yes	yes	Nil
9	*V. oblongifolia*	TVNu-38	Yes	nil	nil	Nil
10	*V. oblongifolia*	TVNu-139	Yes	nil	nil	Nil
11	*V. racemosa*	TVNu-45	Yes	nil	nil	Nil
12	*V. racemosa*	TVNu-44	Yes	yes	nil	Nil
13	*V. racemosa*	TVNu-47	Yes	yes	nil	Nil
14	*V. reticulata*	TVNu-56	Nil	nil	nil	Nil
15	*V. reticulata*	TVNu-54	Nil	nil	nil	Nil
16	*V. reticulata*	TVNu-57	Nil	nil	nil	Nil
17	*V. unguiculata*	TVu 13094	Nil	nil	nil	Nil
18	*V. unguiculata*	IT81D-975	Nil	nil	nil	Nil
19	*V. unguiculata*	TVNu-209	Nil	nil	nil	Nil
20	*V. vexillata*	TVNu-1623	Nil	yes	Nil	Nil
21	*V. vexillata*	TVNu-1578	Nil	yes	Nil	Yes

22	*V. vexillata*	TVNu-1592	yes	Nil	Nil

IV. DISCUSSION

Morphology has been greatly employed as a tool for the delineation of taxa in research works and has proven to be of great relevance. In this study the variations detected in the morphological characters of the species adds to the pool of information available for *Vigna* species to aid its identification when encountered in the laboratory. Perennating stumps of ITD81D-975, a cultivated accession of *Vigna unguiculata*, was observed to regenerate and yield fruits after the first circle of germination. No other accession of *V. unguiculata* whether wild or cultivated or any other species studied showed this characteristic. This observation has not been encountered in any of the research works so far. Thus, this is been reported for the very first time.

REFERENCE

Agbagwa, I.O. and Okoli, B.E. (2005). Fruit Epidermal Micromorphology in the Systematics of *Abrus* Adanson (Papilionaceae) in Parts of Tropical West Africa. *Asian Journal Plant Science, 4: 652-659.*

Aguoru, C. and Okoli, B.E. (2008). Systematic Description of West African species of *Momordica* L. (Cucurbitaceace). *International Journal of Tropical Agricultural & Food Systems* 2(1) 71-76

De Langhe E. A. (1990) Identification of genetic diversity in the genus Miss: A general introduction p 8-16

International Plant Genetic Resources Institute [IPGRI], (2017) Rome, Italy.

Radford, A.E. (1986). Fundamentals of Plant systematics Harper and Row, publishers N.Y. USA pp 498.

Schrire, B., Lewis, G. and Lavin, M. (2005) Biogeography of the Leguminosae. In: Lewis, G.P.,

Schrire, B.D., MacKinder, B. and Lock, M.,(2005) Eds., Legumes of the World, Kew Publishing, 21-54.

Stace, C.A. (1980). Plant Taxonomy and Biosystematics. Edward Arnorld Publishers Limited. London, pp: 81-84

Taxon (2017) International Journal of Taxonomy, phylogeny and Evolution, pp 59