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## Study the Numerical Taxonomy of the genera *Albizia* L. , *Vigna* L. and *Vicia* L. (Leguminosae) in Iraq

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### Abstract

Emphasis was placed on studying the numerical classification of some genera of the Leguminosae family because of its great importance in the field of classification unit character is a characteristic or characteristic possessed by any object through which a particular situation can be described. Thus, the main objective of the numerical classification is clear, which is to prepare or provide an accurate classification that contains the largest amount of information. The species under study have a high medical and economic importance, as it was shown through the results of the research the extent of similarity and difference between them from the tree diagram and the selected traits, as the highest percentage of similarity between the two genus of *vigna* and *Vicia* reached 55%. And the *Vicia* of it for the genus *Albizia*.

### Introduction

Numerical classification means the numerical assessment of the overall similarity between the groups with the help of an electronic calculator, and then arranging them in the form of clusters depending on the similarity (Sneath and Sokal, 1973).

The numerical classification uses binary variables, which are defined in one of the two cases, the state of non-existence of the adjective or the state of the presence of the adjective, or it is divided into several layers with one classification weight such as (1-2-3...etc). Numerical classification methods were used in Iraq to study many From studies such as the study of (Al-Musawi, 1979) , (Al-Bermani, 1991) and (Al-Mashadani, 1992) to a number of these studies. The calculator has been widely used in the development of quantitative methods for classification, as the calculator performs the process of computational analysis and similarity And the difference between the individuals developed by the classifier using all his energy and knowledge, and thus decides which of the characteristics can be

used .It is possible to apply the computational classification to large numbers of plants and with many changes.It was suggested to use it as a routine method (Heywood, 1974), and the computational methods of the current study were used to find the relationship and documents The taxonomic ranks of the genera under study within the same family.

The plants of this species generally have medical and economic importance (Al-katib ,2000) where the importance of the genus *Albizia* is that it is a source of wood and its leaves are suitable as fodder for livestock.

Legumes (Fabaceae or Leguminosae) are flowering plants, and they are the third largest in the family, containing more than 20,000 species. Seeds contain many nutrients, the most important of which is that they are a rich source of proteins, vitamins, carbohydrates, and fiber. Therefore, it has been confirmed that it has been included in our diet by many healthy dietary guidelines (in English: Dietary Guidelines).

You should first know the difference between grains and legumes nutritionally. Legumes are rich in protein, unlike grains that are rich in carbohydrates, so grains are a source of energy, as in rice, barley and wheat.

Legumes are rich in important nutrients, such as those found in animal sources, such as protein, iron, and zinc. It also features the following: fiber. carbohydrates magnesium. potassium. B vitamins group

Other elements such as: copper, manganese, and phosphorus.

On the other hand, legumes contain some compounds called antinutrients, which interfere with digestion and absorption of other nutrients.

The herb *vigna* contains vitamin B6, which is necessary for the production of GABA growth hormones in the brain in children, which stimulates red blood cell formation. The herb combats anemia and regenerates body cells thanks to its containment of vitamin B12, which in turn improves the role of the digestive system due to the dietary fibers that are present in the mash, which also prevent the emergence of cancer cells.

There are many benefits of *vigna* bean seeds, including the following:

Reducing the formation and accumulation of cholesterol in the walls of blood vessels, which reduces the risk of heart disease and arteries, through its antioxidant properties and its ability to control fat metabolism.

Controlling blood pressure and maintaining it within its normal limits.

*vigna* beans help prevent cancer.

*vigna* bean seeds have antiviral and antibacterial properties.

Reducing the risk of chronic diseases.

Reducing the level of sugar in the blood.

*vigna* bean seeds are a light and filling meal, and therefore they can be adopted by patients who want to reduce their weight, as the fibers in them help to feel full.

Maintaining the health of the digestive system, because it contains fiber.

Protecting the liver and maintaining its functions.

Increase bone strength and prevent osteoporosis, as *vigna* bean seeds are a good and natural source of calcium.

*vigna* bean seeds are useful for pregnant women, as they are rich in folic acid and vitamin B2, both of which are important for the growth and development of the fetus, and they also contribute to the prevention of pre-eclampsia or birth defects.

The important nutrients contained in beans;

Beans *Vicia* are a source of many minerals, including copper, iron, phosphorus, potassium and magnesium. They also contain folic acid and manganese. Beans *Vicia* do not contain any saturated fat.

Beans *Vicia* contain B vitamins, vitamin K and vitamin A.

It contains a high percentage of proteins and dietary fiber.

Beans *Vicia* contain growth hormone, also known as the human growth hormone.. which helps in the occurrence of activity and muscle recovery after doing exercises or any work that causes stress.

The most amazing health benefits of *Vicia* beans:

*Vicia* help lose weight. Resists tension and stress that can affect a person from exercise or hard work, because it is rich in calories.

It is very beneficial for the heart and blood vessels as it maintains the level of cholesterol in the blood.

It resists cancer diseases, especially those that affect the mouth, because it contains chemical compounds. It maintains the level of sugar in the blood. works to reduce blood pressure in women, especially in menopause. beans help prevent harmful substances from reaching the brain that affect the secretion of serotonin, which causes happiness. works to form red blood cells and maintain strong bones. Beans support the immune system and the body's resistance against various diseases.

### **Material and Method**

traits were selected for this case, Table (1) to compare (3) genera (OUT'S) numerically, Table (2), and the traits were entered into the computer by encoding the traits with the two numbers 0 and 1 when the trait is present or not in the genus The meaning, respectively, was then entered into the prepared program, and a correlation coefficient (R) was obtained between the different units, and the

following equation was applied to obtain the similarity coefficient between the different taxonomic units.

Where (S) represents the similarity coefficient

(r) represents the correlation coefficient

The dendritic diagram Figure (1) was drawn to compare the genera numerically using the method of (Clark and Warwick, 1994). (8) traits were chosen to compare the genera using polygonal graphs. Figure (2)

**Table (1) Details of the selected traits for the genera of the Leguminosae family studied in the Numerical Classification**

Sequence	Details	Characteristics
1 2 3	tree Herb) Don't spread the ground) Herb	Natural of plant
4 5	Perennial Annial	Plant duration
6 7	(30) m (5-8) m	plant height
8 9	Dark brown, rough texture Smooth light brown	stem nature
10 11	Glabrous Hairy	Surface covering of the stem
12 13	Big 0.75 -1.5 m Small 0.5 m	Stem diameter
14 15	tall 1.75 Short 0.40 or 0.79	stem lengths
16 17	Complex pinnately Tri palmate	Type of leaf

18	2-6 pairs	Number of leaf
19	3 Leaflet	
20	Ovate -round	leaf shape
21	Cordate Blade	
22	Elliptical Blade - ovate-Elliptical Blade	
23	Acuminate Apex	Leaf Apex
24	Acute	
25	Obtuse Apex	Leaf Base
26	Acute	
27	Acuminate	
28	Glabrous	vesture
29	Hairy	
30	Glandular	
31	(10.5)cm	Leaf length
32	(3.5 ) or )6.5) cm	
33	Aromatic	The smell of the leaf
34	Non aromatic	
35	Stipule	stipule
36	Astipule	
37	Alternate	Arrangement of leaves on the stem
38	Trifoliolate	
39	(1.85) cm	petiole lengths
40	(0.30) or) 0.35) cm	
41	lateral racemose inflorescences	Inflorescence shape
42	Small flower	
43	(1.5) cm	floral cover
44	(0.9) cm	
45	Tubular	Calyx shape
46	Labiate	
47	Hairy	Vesture of plant
48	Smooth	

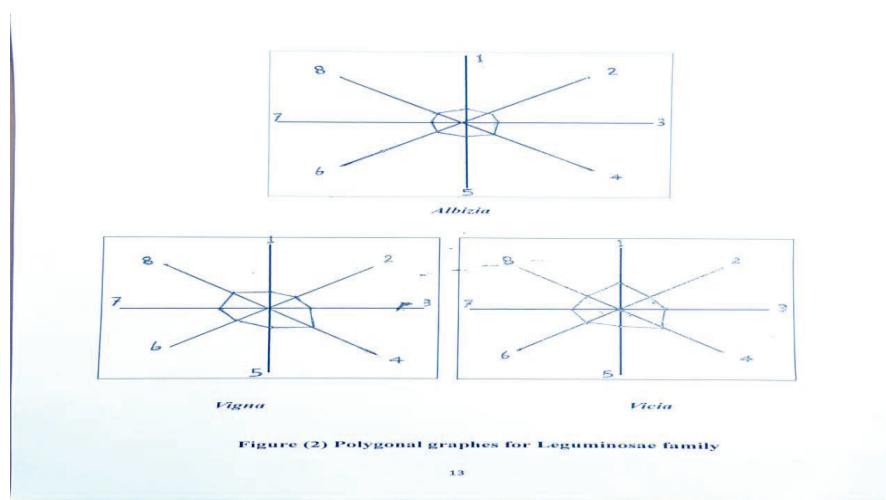
49	4	The number of sepals
50	5-4	
51	Serrate	Margin of calyx
52	Lobed	
53	Round	Petalous shape
54	Papllionaceous	
55	Yellow	Petalous colour
56	White - bright white - yellowish white	
57	White	
58	(10.5) mm	Petalous length
59	(6.45) mm or 5.0) mm	
60	4	Number of Petalous
61	5-4	
62	Yellow - light brown	Anther colour
63	Brown	
64	Oval - cylindrical	Anther shape
65	Elongated oval	
66	(1.5) mm	Anther length
67	(0.25) mm or (0.35)mm	
68	25 mm (long Filiform filament)	Filament length
69	3.5 or 8.5mm ( Short Filiform filament)	
70	Greenish yellow to yellow	Filament colour
71	Yellowish white - transparent white	
72	Globular	Ovary shape
73	Ovate – oblong ovate	
74	White - milky white	Ovary colour
75	Light green	
76	Spherical - elongated spheroid	Stigma shape
77	Ovate	
78	Auburn	Stigma colour
79	Brown	

80	Green	Style colour
81	White	
82	Yellow-light brown	Fruit colour
83	Shiny light green	
84	Straight, elongated, with waists	Fruit shape
85	Oblong ovate	
86	Oblong-ovate	Seed shape
87	Round	
88	Renal - Renal is elongated	
89	Dark brown	Seed colour
90	Bright green - Brownish black	
91	Light green - Purple	
92	A lot	Number of seed
93	few	
94	(2.5) mm	Seed dimensions
95	) more than 2.5) mm	
96	6 months	Flowering period
97	1-2 months	
98	80 %	Pollen vitality
99	95 %	
100	75 %	Germination percentage
101	95 %	
102	Asia and Africa	Habitat original
103	Indian subcontinent	
104	Western Asia and North Africa	





	Renal - Renal is elongated		
4.	Dark brown Bright green - brownish black Light green - purple	Seed colour	1 2 3
5.	Alternate Trifoliolate	Arrangement of leaves on the stem	1 2
6.	Complex pinnately Tri palmate	Type of leaf	1 2
7.	Acuminate Apex Acute	Leaf apex	1 2
8.	Acute Acuminate Apex	Leaf base	1 2



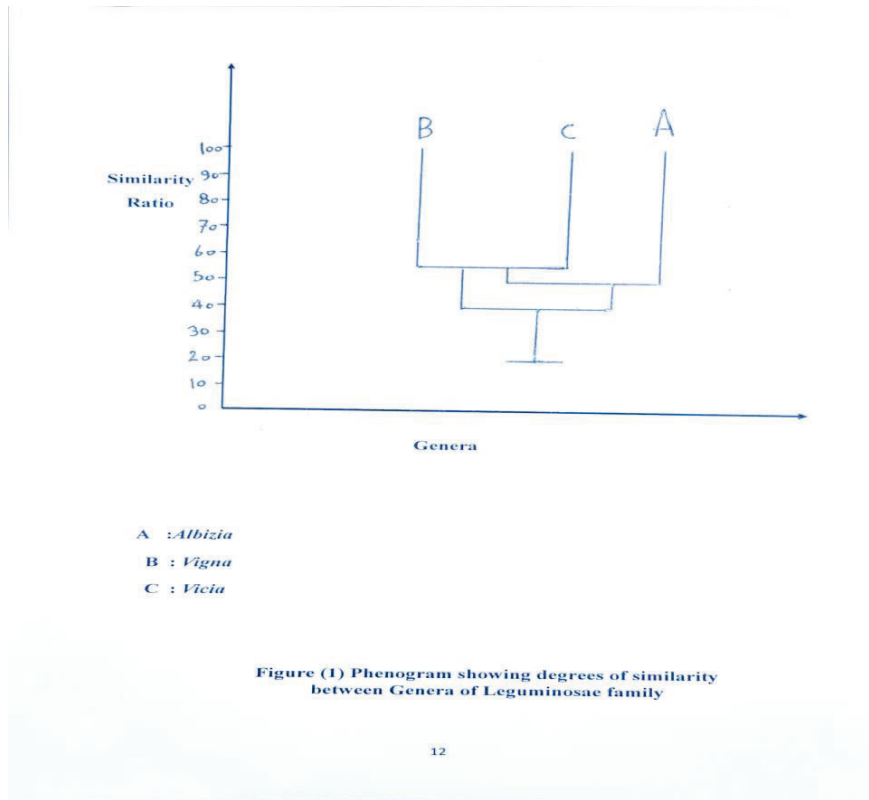


Table (4) Similarity ratios between the genera of the Leguminosae family

A	100	40	50
B	40	100	55
C	50	55	100

	A	B	C
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A : *Albizia*

B : *Vigna*

C : *Vicia*

## Results

Numerical classification methods have been used in Iraq in the study of several studies, such as the study of (AL-Bermani, 1991) and (Motar, 2000). And the genus *vicia* was 55% and this percentage is the highest percentage in which the species of the studied family met, and the reason for this is to use the largest possible number of vegetative and reproductive characteristics, regardless of their taxonomic importance. This ratio seems normal because both Genus belong to the same family, in addition to their great similarity in a number of phenotypic and reproductive characteristics, including that both Genus of herbaceous annual plants also have similarities in terms of seed numbers and plant height, as well as the economic and medical importance of seeds.

The genus *Albizia* differed in a number of characteristics, including that the height of the plant reaches 30 meters, the nature of the plant is perennial trees, the stem is brown, rough striped, the surface covering of the stem is hairy, the top of the leaf is sharp and its base is tapering, the surface covering of the leaf is hairy, the shape of the seed is round and its color is light brown.

These results are consistent with what (Townsend, 1980) mentioned in the Iraqi Botanical Encyclopedia that each of the studied species is considered an independent genera.

As for the polygonal graphs (2), the current study revealed clear boundaries between the studied races and reinforced their specificity as a stand-alone taxonomic unit, as well as showed different degrees of similarity between the races of the studied family. Appearance characteristics that distinguish this genus. The two Genus of the mash and the *Vicia* are distinguished by having close drawings, and this percentage is not the highest percentage of similarity, but the reason is due to the lack of selected characteristics for these drawings.

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