

Compositions Of Leaves And Seeds Of *Aervajavanica*, (Burm.F.) Juss. Ex J.A. Schultes

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Abstract: The objectives of the research is to find out the organic compounds of the leaves and seeds of *Aervajavanica* and to find out means to know more about the shrub which is unknown by the majority of people. The sample measured in the Near infra-Red Spectrometer (NIR) to find out the percentage of organic composition of the leaves and seeds after three readings. The analysis shows that Protein in the seeds is very high than in the leaves which is equal to 74.93% of the total composition of the seeds and the acid detergent fibers is higher in the leaves than in the seeds which is equal to 72.03%.

Keywords: Leaves, organic components, seeds, and uses.

Introduction:

Plant description: The plant is herbaceous, multi-stemmed and soft-wooded and bears broad leaves; it often has an erect habit and grows to a height of about 1.6 meters. In Western Australia it tends to grow in sandy soils, especially along drainage lines. It flowers between October and January. This species is widespread in the drier parts of tropical and sub-tropical Africa and Asia. It is found in some countries in Africa such as Algeria, Egypt, Libya, Morocco, Chad, Somalia, Sudan, Kenya, Tanzania, Uganda, Cameroon, Mali, Mauritania, Niger, Nigeria, Senegal, Malawi, Mozambique and Botswana. It is also present on the Cape Verde islands and in Madagascar. Its natural range also includes Saudi Arabia, Iran, Israel and Jordan and areas further eastwards in Southern Asia and the Indian sub-continent in Afghanistan, India, Pakistan, Myanmar and Sri Lanka. (Wikipedia, 2015). *Aervajavanica* (Burm. f.) Juss. ex Schult. (*Amaranthaceae*) is a gray perennial tomentose-woolly shrub. It is native to the region from North Africa to South West Asia (Soliman, 2006). In Egypt, it grows in the Gebel Elba and surrounding mountainous region, Siwa, Farafra, Bahariya, Kharga, Dakhla, Kurkur, Uweinat, the Red Sea coastal strip and the entire Sinai (Soliman, 2006). In Saudi Arabia, it is distributed in the Western and Southern parts (Migahid 1978; Chaudhary & Akram 1987; Mandaville 1990 and Al-Hzmi & Ghandour 1992). *Aervajavanica* has erect, pale stiff branching reaching a height of 1.6 m. The pale green 20-40 mm long leaves are alternate, lanceolate, oblong ovate or sub-orbicular, subsessile or shortly petiolate and have a covering of matted hairs, upper surface with a grayish appearance. An inflorescence is usually a naked raceme of white woody, sessile dense pikes.

globular, single small black seeded. It flowers from January to May (Soliman, 2006).

Stems and Leaves: The upright (i.e. erect) stems are branched from the base of the plant and can sometimes be fairly woody in nature. These stems are rounded in cross-section (i.e. terete) with slight ridges running lengthwise (i.e. They are striated). They are densely covered in whitish or occasionally yellowish hairs (i.e. Tomentose or pannose). The simple leaves (2-7 cm long) are alternately arranged along the stems and are quite variable in shape. They can range from being long and narrow (i.e. Linear) to being almost round (i.e. sub-orbicular). Their upper surfaces are thinly covered with whitish hairs and are greenish in color, while their undersides are more densely covered in these hairs and have a whitish appearance (i.e. They are tomentose). These leaves are usually stalkless (i.e. Sessile), but they are sometimes borne on a short stalk (i.e. petiole) less than 2 cm long (University of Queensland, 2011).

Flowers and Fruit: The whitish flowers are borne in elongated clusters at the tips of the branches. These clusters (up to 10 cm long and 10 mm wide) may be dense and continuous or somewhat interrupted, especially in their lower parts. Separate male and female flowers are borne on separate plants. The male flower clusters are often more slender than the female flower clusters. Both types of flowers are stalkless and have three tiny bracts (0.75-2.25 mm long) underneath them. These bracts are narrow or egg-shaped in outline and are at least partly covered in a dense layer of white woolly hairs. They can have rounded or pointed tips and remain on the plant after the 'petals' have fallen. Both types of flowers also have five small 'petals'. These 'petals' are relatively broad, have very hairy outsides, and two of them are slightly larger than the other three. The 'petals' on the female flowers are larger than those on the male flowers (i.e. 2-3 mm long on female flowers and 1.5-2.25 mm long on male flowers). Female flowers also have a small ovary and a slender style with two very elongated stigmas at its tip, while male flowers have five delicate yellowish-coloured stamens. Flowering occurs throughout most of the year, generally after significant rainfall events. The very small (1-1.5 mm long) capsule-like fruit (i.e. utricle) are rounded in shape, but somewhat flattened (i.e. compressed). Each fruit contains a single dark brown to black coloured seed. These seeds are

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round or slightly flattened (0.9-1.25 mm), shiny in appearance, and generally smooth in texture. However, they can sometimes have a very faint surface pattern (University of Queensland, 2011).

Plant uses: This herb is deep rooted, and is used as a **soil binder** in desert reclamation. It is used for **fuel** and for **fodder** for goats. In traditional **medicine** this plant has many uses. In Sudan and Pakistan the paste and decoction of *Aervajavanica* are used traditionally for **wound healing, jaundice, diabetes** and **cough** (Nada, 2015). It is used externally to remove **swelling**, relieve **inflammation** and promote healing of **wounds and ulcers**. The flowers and roots are used to **alleviate kidney** problems and **rheumatism** and the seeds are believed to cure **headaches**. A gargle is made from the plant to treat **toothache**. The plant has naturalized in northern regions of Australia, as an alien introduction, and is cultivated and utilized by the indigenous peoples. The thick, white inflorescences have traditionally been harvested in Arabia for **stuffing cushions** and **saddle pads**. Today, the soft fibers are still used as **kapok for pillows** (Wikipedia, 2015).

Reproduction and Dispersal:

This species reproduces by seed, which are only produced on female plants. The small fruit are probably dispersed by animals and wind. They may also be spread by vehicles and in soil, as infestations often first appear along roadsides and near mine sites (University of Queensland, 2011).

Research objectives:

The objectives of the research are to:

1. Find out the organic compounds of *Aervajavanica*.
2. Encourage researchers to do further research.
3. Raise awareness among the local community to know the importance of this species.

Methodology:

Field survey: Green leaves and dried seeds were collected from the plant branches using scissors on March 2015 in the Babanosa West Kordofan State. Then the leaves were dried under shade at optimum temperature. Finally the leaves were squeezed by hands; and the seeds changed into powdered and both having the weight of 100 grams using sensitive balance.

Measurement of sample: The dried squeezed leaves of *Aervajavanica* measured to find out the composition of leaves. Near Infra – Red Spectrometer (NIR) was used. Then the amount of 100 grams put into the system in order to obtain the reading after weighting three times.

Interview: Few people who used *Aervajavanica* plant were also interviewed in order to find out some relevant information about this plant.

Results and discussion:

Measurements of leaves: The measurement of leaves explained that, the average percentage of Acid detergent fibers (ADF) in the leaves is very high than in the seeds which is equal to 72.03 % of the total composition of the leaves (Table 1 and Fig. 1).



Fig (1): The leaves of *Aervajavanica* (Source: Researcher, 2015)

Table (1): Leaves, organic compounds of *Aervajavanica*

No.	Organic compound	Value % (1)	Value % (2)	Value % (3)	Total	Average %
1	Acid detergent fibers	71.44	72.27	72.38	216.09	72.03
2	Ash	14.54	14.67	14.66	043.87	14.62
3	Fat	03.91	04.02	04.04	011.97	03.99
4	Fiber	21.88	22.38	22.51	66.77	22.25
5	Moisture	04.82	04.75	04.68	13.88	04.62
6	(NDF)	62.75	63.20	63.57	189.52	63.17
7	Protein	25.51	25.54	25.52	76.57	25.52
8	Starch	--11.27	-11.79	-11.49	-34.55	-11.51
9	Sugar	-12.07	-12.29	-12.59	-36.95	-12.31

Measurements of seeds: The second class of composition is a protein in the seeds are very higher than protein in the leaves which is equal to 74.93% of the total composition of the seeds. It is noticed that, the average of

sugar in the seeds is -5.06 % and - 12.31% of the leaves, (Table 2 and Fig. 2).



Fig (2): The seeds of *Aervajavanica* (Source: Researcher,2015)

Table (2): Seeds organic compound of *Aervajavanica*

No.	Organic compound	Value % (1)	Value % (2)	Value % (3)	Total	Average %
1	Acid detergent fibers	53.02	53.40	53.43	159.85	53.28
2	Ash	09.25	09.49	09.53	28.26	09.42
3	Fat	12.32	12.38	12.39	37.09	12.36
4	Fiber	32.25	32.47	32.61	97.33	32.44
5	Moisture	03.65	03.64	03.59	10.88	03.62
6	(NDF)	69.98	76.92	77.90	224.8	74.93
7	Protein	20.96	20.97	21.06	62.99	20.99
8	Starch	-16.85	-16.90	-17.08	-50.83	-16.94
9	Sugar	- 4.93	-05.09	-05.17	-15.19	-5.66

Conclusion: The study reveals that the leaves of *Aervajavanica* are rich in Acid detergent fibers as organic compound and the protein is very high in seeds than in the leaves. The two organic compounds are very important to the man and animal.

Recommendations: The study has come up with some recommendations, which are as follows:

1. To protect the plant from disappearance.
2. It is necessary to know the usefulness of the plant.

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