

Mineral elements analysis using the EDX device and the similarity using the scanning electron microscope for *Juncus acutus* and *Juncus subulatus*

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HIGHLIGHTS

- Determine the similarity of the seed surface details and the stems and roots cross-section using the Scanning Electron Microscope (SEM).
- Mineral elements of the shoot of each species using the EDX device.
- Percentage the aluminum (0.24%) and silicon (0.12%) in *Juncus acutus*.

ABSTRACT

Two species of wild of *Juncus* were studied, the reasons for chosen *Juncaceae* family are ecologically important. The aim of this study was for formulating the taxonomy of wild species *Juncus acutus* L. Subsp. *acutus* and *J. subulatus* Forsk. In Libya in Jarjar-oma area at Al-Jabal Al-Akhdar. The findings indicated variations in the seed coat the decorative is one of the distinct taxonomic traits, which can be used to distinguish between the species. The periclinal wall was smooth with fine folded, the epidermal cell shape was irregular in seed of *J.acutus*. While, seed with reticulated, the anticlinal cell wall boundaries, including scars and slightly raised are channelled in seed of *J. subulatus*. Scanning electron micrographs (SEM) showing the differences between sclerenchyma cells and vascular bundles in the stems and roots between the two species. Vascular bundles in the stem of *J.acutus* are scattered, the stem is vacuoles. While, vascular bundles are only in subepidermal layer, meristematic stem where cells have no or only small vacuoles in *J.subulatus*. The rhizodermis root is relatively short, exodermis with 2-3 layers with large cells, the cortical parenchyma was thick in first species. While, the rhizodermis root is long and extensive, exodermis with 1-3 layers, the cortical parenchyma unthick in a second species. Analysis of the elements content (EDX), in the shoot of each species. Average nitrogen, potassium, magnesium and silicon are higher in *J. acutus* compared to *J.subulatus*. Sodium and chlorine content observed significant increased in *J.subulatus*. The *Juncus* selected because of their considerable salt-resistant. The EDX technology was used to find the nutritional value of *Juncus* as a fodder crop.

Keywords: *Juncaceae*; *Juncus acutus*; *Juncus subulatus*; Scanning Electron Microscopy (SEM); Anatomy; Cross-section-stems-roots; Seed coat; Mineral elements; Energy Dispersive X-Ray Analysis (EDX).

INTRODUCTION

The *Juncaceae* family is one of the families that have not been adequately studied, but has various potential. The *Juncaceae* is one of the 8 genera flowering plants with over 464 species in the Poales order (Christenhusz and Byng, 2016). The species i.e. *Juncus acutus* L. was established by Linneaus, 1753. The *Juncaceae* is of herbaceous plants monocotyledonous (Xu and Chang, 2017). The *Juncus* are typically perennials with rhizomes (Simon, 1992). *Juncaceae* differs from Poaceae and Cyperaceae in having smooth except *Luzula* with hairy in the leaves and culms, without silica encrustations (Balslev and Zuluaga, 2009). These rushes represented by a single genus with 8 or 9 species in Libya (Jafri and El-Gadi, 1980). Most species of *Juncus* grow exclusively in humid habitats (Romanowski, 2009). *Juncaceae* is ecologically important family (Chhetri, 2011). (Ferrer-Gallego, 2019), mentioned numerous recent phylogenetic analyses at the genus of *Juncus*. There is evidence of the high degree of variation among *Juncaceae* members based on epidermal cell seed characters (Abdel Khalik, 2010). Several studies have shown the use of micromorphological characters in the distinction between some *Juncaceae* taxa (Balslev and Zuluaga 2009; Verloove, 2010). Spiny rush (*Juncus acutus* subsp. *acutus*) can usually be distinguished from these by its very sharply pointed stems and leaves also some sedges (USDA NRCS, 2015). Geophytes represents about (14%) of the flora of Jarjar oma area in that includes 25 species, from these species flora *Juncus subulatus* Forsk. and *Juncus acutus* subsp. *acutus* (Abusaief, 2013). Family *Juncaceae* occurring in the Eastern Himalayan region of India (Frondoni and Iberite, 2002; Kaligarič and Škornik, 2006; Sarika, 2012). The definition of chemotaxonomy suggested the use of chemical traits to construct a systematic structure representing phylogeny (Wink, 2013). *Juncus* has used soil erosion as ground cover and is excellent as soil binders, promoting wildlife conservation by supplying forage, nesting materials, medicinal values and handicraft materials. Many methods have been used to determine the composition of the trace elements in plants such as graphite furnace atomic absorption spectrometry, spectrometry of flame atomic absorption, fluorescence X-ray, and electron microscopy scanning with a dispersive force X-ray (Helaluddin *et al.*, 2016). Making available highly nutritious amino acids sources (Zahran and El-Habib, 1979) and rich in fatty acids which can benefit livelihoods greatly (Osman *et al.*, 1975). The elements are to support photosynthesis and plant metabolism (Hodges, 2007). The species of *Juncaceae* have a high nutritional value (Costanzo, 2003), as indicated by the following: forage and seeds for domesticated animals. The objective of this study was to find out a proposed classification describing the taxonomic relationships between two species of *Juncaceae* included *Juncus acutus* L. Subsp. *acutus*. and *Juncus subulatus* Forsk. The study comprised of two parts, each of which deals with clear taxonomic evidence of the two species as follows: 1) SEM on the surface of the seeds and cross-section of stem and root. 2) Elements estimation, analysis by used EDX device.

MATERIALS AND METHODS

In this study, two species belong to family *Juncaceae* and Order of Poales. Authenticated herbarium specimens from two species *Juncus acutus* L. Subsp. *acutus* and *J. subulatus* Forsk were undertaken during the period from March to Desember in 2016, 2017 and 2018 from a salt marsh located in Jarjar oma, between latitude (32°, 47', 49.80"N) and longitude, (21°, 26' 40.60"E), distance 50 m from the sea in Al-

Jabal Al- Akhdar of Libya in Mediterranean sea. The species identified by (Jafri and El-Gadi, 1980; Boulos, 1999). In addition to, the fresh plants were gathered randomly from different area of Jarjar oma.

Sample collection

Using 10 herbarium specimens represent each species, fresh plants collected from the different locations as mentioned earlier (the fresh plants were further matched against the herbarium specimens to ensure that the identification is correct) and using the current text flora books. The whole plant, separated seeds, dried by sun, combine the ingredients and make powder. The powdered seed sample was properly mixed and carefully put on a glass cover slip air-drying as follows during electron microscopy, scanning (SEM) analysis of the cover slip itself.

Surface scans and cross-section.

The current investigation aimed to reach the classification reflecting the taxonomical relationships between two species of *Juncaceae*. Taxonomic evidences collected from different sources during this study; Scanning Electron Microscope of the seed surface characteristics and inflorescences micro-morphology and cross-section for stem and root of two species. Specific dimensions of 450 mm(W) x 640 mm(D) as it was 52% more compact, 45% brighter, and 50% more energy-efficient than the current TOKYO model, Japan, 2016. Using Energy Dispersive X-Ray Analysis (EDX) device, is an x-ray spectroscopy used to identify the chemical content of materials. In a research lab, national research centre - Cairo in Egypt.

The SEM was used to promote the analysis of micro-morphology for the seeds. The magnification power had been represented by (X) for each SEM image. The magnification power was a cross-section of stem and root between 56 to 4000 depending on the seed size variations to represent the clearest and the finest details of different surface sculptures and anatomy. To clarify the seeds most important attributes, comparative tables and accumulative figures constructed and presented. As cited by Murley (1951), descriptive terms for seed surface scanning were used and modified by Stearn (1983). All the characters studied were shown in tables, figures, plates and microphotographic images to ease the similarity or difference between the study species. The presence of elements in powder was verified via EDX.

Statistical Analysis

Use the t test with paired Wilcoxon tests to analyze the variations between the two species and the standard deviation between the replications of element analysis by an SPSS program (Page *et al.*, 2003).

RESULTS

1. *Juncus acutus* L. subsp. *acutus*

The first record in Libya is that of *Juncus acutus* L. are part of Subsp. *acutus*. In Jarjar oma area at Al-Jabal Al-Akhdar. Popular names include cultivation rush, sharp pointed rush, sharp rush, spiny rush, sharp sea rush. Synonym name was *Juncus littoralis* C. A. Mey. and *Juncus spinosus* Forssk.

Stem cross-section of *J. acutus*

Stems 2-5 mm thick, rigid, with 1-5 basal leaves, leaves 1.5-4 mm thick. terete, pungent, unseptate, brown at the sheathing base: vascular bundles distributed over most of the cross-section (Fig.1 A & B). Leaves are very similar to the stems. Auricles hyaline: stems and leaves smooth or weakly striate: Stems bear a dense cluster of flowers just below their tip. The numerous erect stems are produced off very short creeping underground stems or rhizomes. These are unbranched, rounded in cross-section or cylindrical and glabrous.

The cross-section of stem of *J. acutus* L. Subsp. *acutus*. species by scanning electron micrographs showing the parenchyma cells and vascular bundles, where the large vascular bundles of 13.41 μm , while, small vascular bundles 5.59 -7.04 μm . The stem shape is cylindrical and contains fibers. *J. acutus* stem vascular bundles include xylem is big holes and phloem is fewer holes tissues. Xylem conveys water and mineral nutrients from the roots all over the plant, while the phloem conveys carbohydrates and hormones around the plant. Culms of *J. acutus* epidermis, examined cross-section at this stage, composed of cells with thickened and dense outside walls lignified. The cortex composed 9-10 hypodermic sclerenchyma strings. The stele consist of essential parenchyma. The vascular bundles with little 5 vascular bundles and an outside one, with, big 6 vascular bundles, too. A sclerenchyma sheath consists of elements with moderate thick but depth lignification walls.

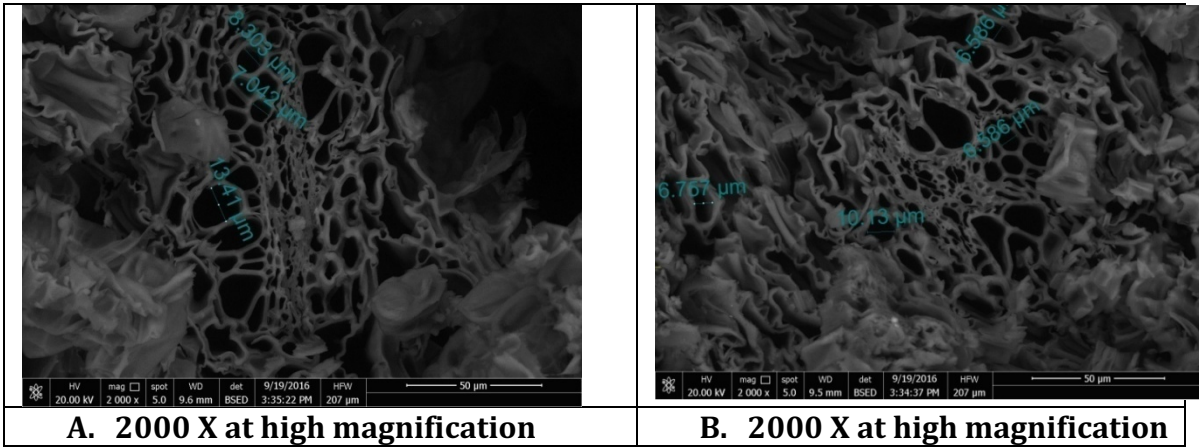


Fig. (1): SEM of the stem showing the cells of the internal cross-section of *J. acutus* L. Subsp. *acutus*.

Root cross-section scans of *J. acutus* L. Subsp. *acutus*.

The cross-section for root *J. acutus* L. Subsp. *acutus*. species by scanning electron micrographs showing the root length from 1.1-2.5 mm and width 1.176 mm (Fig.2 A & B). The sclerenchyma cells and vascular bundles where the large vascular bundles of 109.5- 143.1 μm , small 4.81- 7.35 μm (Fig. 2 C, D, E & F). The root contains casparian endodermis. The rhizodermis had relatively short and abundant absorbing hairs. The crustal parenchyma was thick with many big storages the air recesses involve an exodermis, the endodermis had big cells.

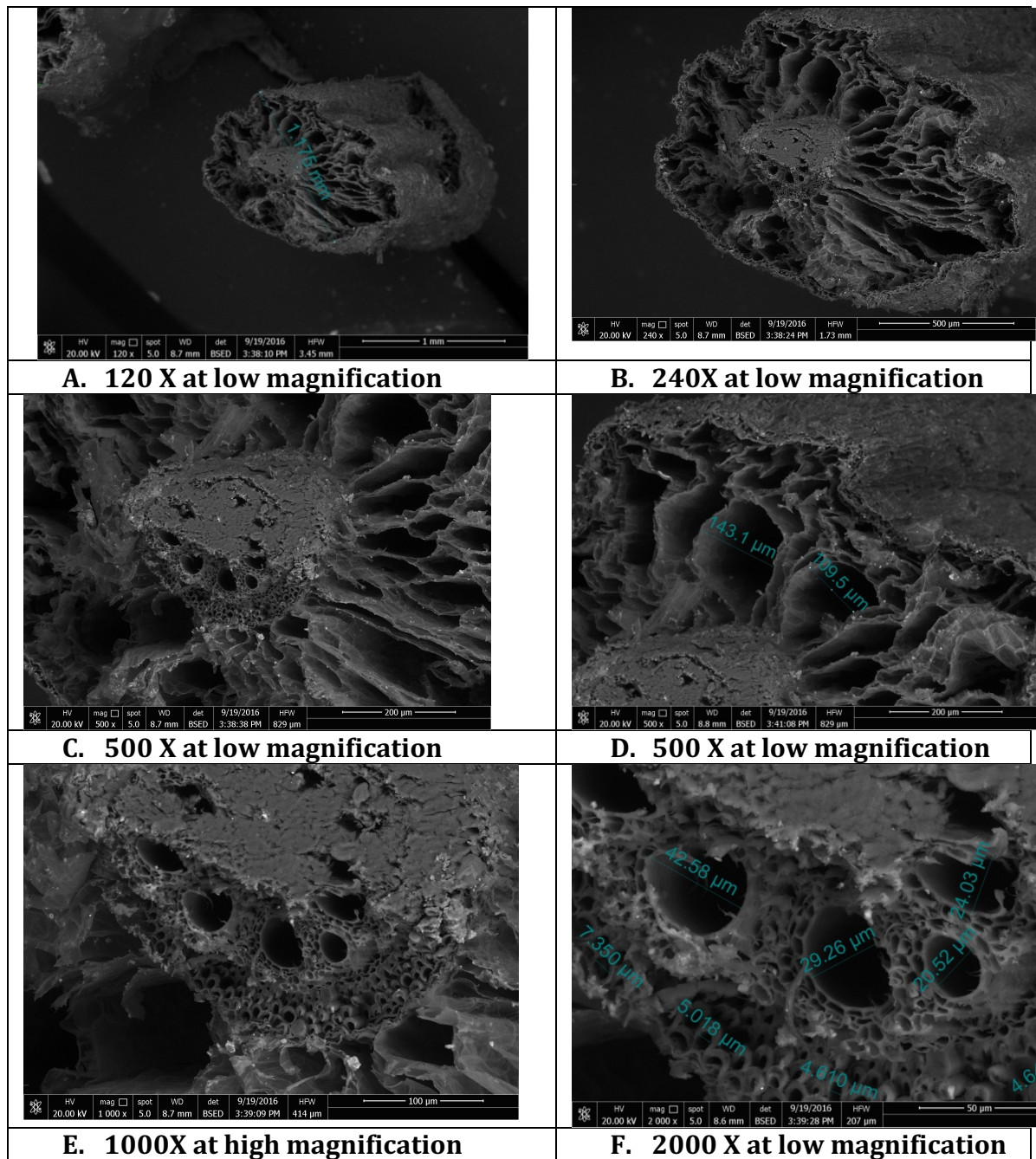


Fig. (2): SEM of the root showing the internal cross-section scan of *J. acutus* Seed surface scans *J. acutus* L. Subsp. *acutus*.

J. acutus L. Subsp. *acutus*. seeds outline seed length 1.1-2.5 mm, width 0.3-0.6 mm, the seed shape obliquely ovoid or obovoid-oblong. Glabrous surface, shiny texture, including the seed-coat, with two caudated appendages (0.2–0.3 mm). Seeds are brown, usually 80-120 seeds. By use surface scans electron microscope at surface scan of the epidermal cells of the seed, power zoom 500 and 2000 X (Fig. 7 A & C), smooth and fine folded periclinal cell wall, flattened to slightly lumpy. The border of the anticlinal wall raised, straight, fine to fine folded, epidermal shape of the cell: irregular to extend in one trend, glabrous texture of the anticlinal wall. With cells 1.689 mm length. Forme linear reticulate.

2. *Juncus subulatus* Forsk.

English name is subulate rush. Synonym name is *Juncus multifibrus* Def..

Stem internal cross-section scans of *J. subulatus*.

Stems with internodes 2-4 cm, mat-forming: stems 1.5-4 mm thick, smooth, with 2-3 basal leaves, with basal sheaths 2-3, brown below, and cauline leaves 2-4 terete: leaves to 60 cm. Unseptate untubulous, hardly pungent, sometimes exceeding the inflorescence, terete, smooth, with vascular bundles only in the subepidermal layer (Fig.3 A & B): central cavity with pith of asterisciform cells: auricles present: lowest bract 2-10 cm, shorter than the inflorescence. *J. subulatus* sclerenchyma (fibers) or phloem. The epidermis consists of cells regular dense and extensively lignified outside walls. Stomata could be seen. The cortex invlove of hypodermic sclerenchyma. No stele existent. The vascular bundles of lateral open types, with little 7 vascular bundles and an inside one, also, big 7-9 vascular bundles with 6.697-12.970 μm and a little 3.282 μm . A thick sheath sclerenchyma, consisting of components with moderately thick but extensively lignified walls.

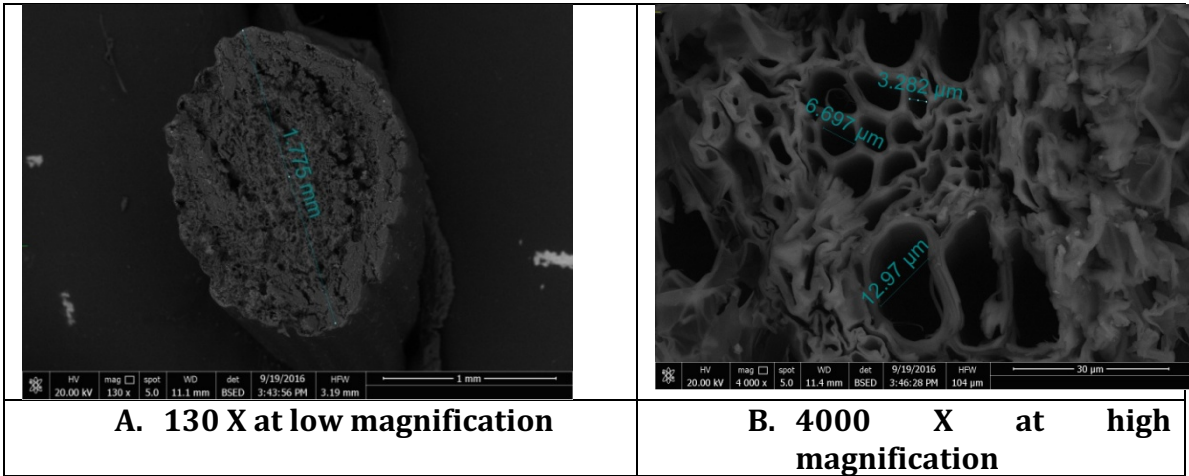


Fig. (3): SEM of the stem showing the internal cross-section scan of *J. subulatus*
Root cross-section scan of *J. subulatus*

The cross-section for root *J. subulatus* by SEM showing the root diameter 1.78 mm, sclerenchyma cells and vascular bundles, where the large vascular bundles of 30.96 μm small vascular bundles 3.799-6.191 μm (Fig.4 A, B, C & D). The root contains a casparian strip of endodermis. The rhizodermis are long and extensive, abundant absorbing hairs. The cortical parenchyma was dense, with several big recesses for storing air, involve an exodermis with 1-3 layers tenure of soft cells, the endodermis had one layer, regular. The cortical parenchyma was dense, with several big recesses for storing air.

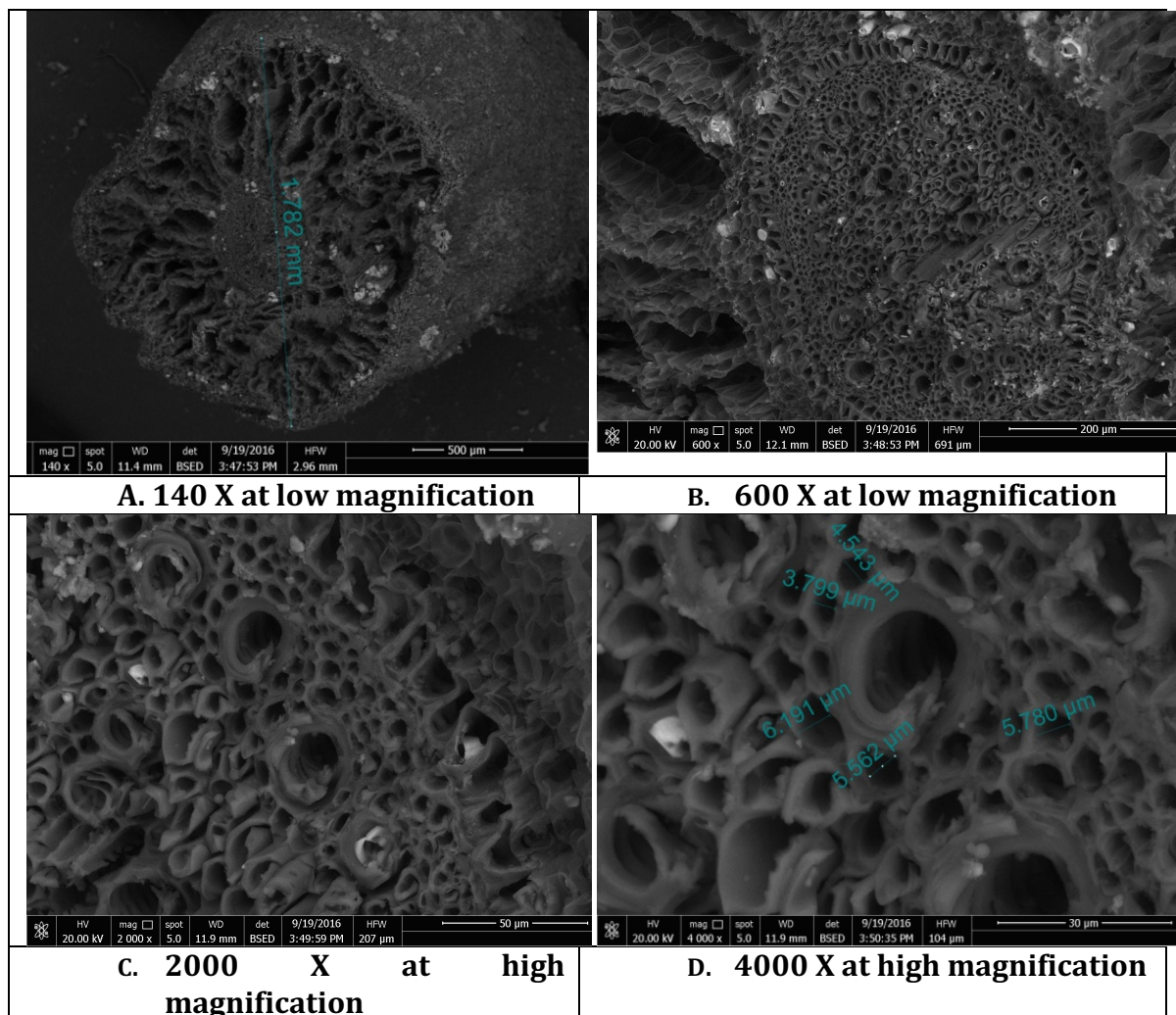


Fig. (4): SEM of the root showing the internal cross-section scan of *J. subulatus* Seed surface scan of *J. subulatus*.

Seeds length from 0.5-0.8 mm or 708.9 µm, width 0.3-0.5 mm, surface glabrous, texture shiny. Seeds pale brown; seed shape obliquely ovoid, apex appendiculate. Anticlinal cell wall boundaries little raised channeled, soft to fine folded; without appendages. Periclinal cell wall plane to little concave; reticulate. Epidermal cell shape: extend in one trend. Used surface scans electron microscope at surface scan of the epidermal cells of the seed, power zoom 1000 and 2000 X (Fig. 7 B & D). Raised and flattend anticlinal wall, toothed and raised outer perclinal wall, reticulate, sulcate and scalariform surface scan pattern and anticlinal wall texture glabrous, Sculpture in seed of secondary cell wall.

Content of the elements in *J. acutus* and *J. subulatus*.

Tab. (1) and Fig. (5 & 6) shows the content of the elements by using device Energy DispersiveX-Ray analysis (EDX) in the seed surface and cross-section of stem, inflorescences and root. contains species *J. acutus* on the elements, carbon, oxygen, potassium, nitrogen, chlorine, aluminium, magnesium and silicon. Carbon and oxygen given the highest content of the elements in both species, followed by potassium cation in *J. acutus* 1.49%. Nitrogen, the main component of the protein given the highest whtent in *J. acutus* with 1.10%. As well as, absence of sodium and sulfur in *J. acutus* species.

Contains species *J. subulatus* on the elements, carbon, oxygen, chlorine, sodium, nitrogen, potassium, silicon, magnesium and aluminium. The third element chlorine was 0.99% in *J. subulatus* followed by Na 0.77% and nitrogen 0.59%. It observed significant increase in chlorine content in *J. subulatus* species which was 0.99% compared with *J. acutus* which was 0.31%.

There is a higher percentage of aluminum and silicon in *J. acutus* were 0.24 and 0.12 %, respectively compaerd with *J. subulatus*. Aluminium has unknown role in plants whereas silicon is generally regarded as a beneficial element. Observed absence of phosphorus and sulfur in both species of *Juncus* which is a major component of grain in plants and the least content magnesium which did not exceed the average 0.05 % in *J. subulatus*. No significant differences except Na and Cl.

Tab. (1): Content the elements of EDX in the stem, inflorescences, root and seed surface, means of *J. acutus* and *J. subulatus* species $\pm$ SD Standard Deviation.

Elements	The means of the weight (%) $\pm$ SD of <i>J. acutus</i>	The means of the atomic (%) $\pm$ SD of <i>J. acutus</i>	Means % $\pm$ SD of <i>J. subulatus</i>	The means of the atomic (%) $\pm$ SD of <i>J. subulatus</i>	t test for weight	P
N	1.10 $\pm$ 0.65	1.07 $\pm$ 0.63	0.59 $\pm$ 0.26	0.57 $\pm$ 0.25	2.265	0.152
C	55.05 $\pm$ 1.38	62.56 $\pm$ 0.95	53.20 $\pm$ 1.66	60.67 $\pm$ 1.59	1.076	0.395
O ⁻²	41.55 $\pm$ 1.29	32.13 $\pm$ 5.36	44.13 $\pm$ 1.34	37.79 $\pm$ 1.32	2.088	0.172
Na ⁺	0.00	0.00	0.77 $\pm$ 0.30	0.45 $\pm$ 0.18	4.303	0.04*
K ⁺	1.49 $\pm$ 0.97	0.52 $\pm$ 0.34	0.22 $\pm$ 0.19	0.12 $\pm$ 0.01	1.917	0.195
Mg ⁺⁺	0.21 $\pm$ 0.16	0.12 $\pm$ 0.09	0.05 $\pm$ 0.07	0.03 $\pm$ 0.01	1.436	0.288
Al ⁺⁺⁺	0.24 $\pm$ 0.16	0.12 $\pm$ 0.08	0.04 $\pm$ 0.02	0.02 $\pm$ 0.01	2.341	0.144
Cl ⁻	0.43 $\pm$ 0.19	0.17 $\pm$ 0.01	0.99 $\pm$ 0.28	0.38 $\pm$ 0.11	4.014	0.04*
Si ⁻	0.12 $\pm$ 0.04	0.06 $\pm$ 0.01	0.07 $\pm$ 0.05	0.06 $\pm$ 0.01	1.05	0.404

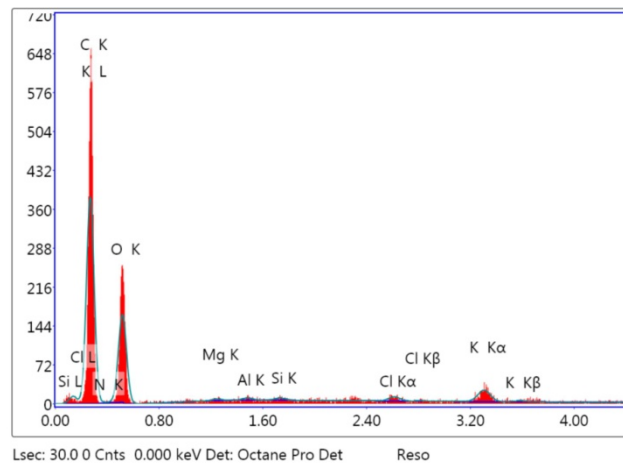


Fig. (5): Content the elements of EDX in the stem, inflorescences, root and seed surface of *J. acutus*

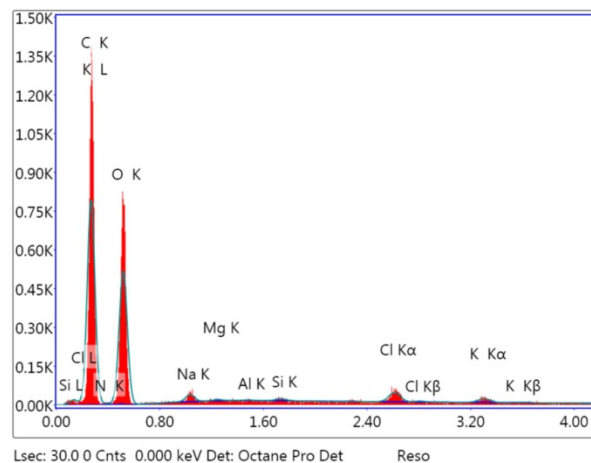


Fig. (6): Content the elements of EDX in the stem, inflorescences, root and seed surface of *J. subulatus*

Comparisons between *J. acutus* and *J. subulatus* for morphology of seed coat surface

Comparison between morphology of seed coat surface are shown in (Fig. 7 A, B, C & D) the seeds of the two species were obliquely ovoid while seed colour was brown in *J. acutus*. and pale brown in *J. subulatus*. Area of the seed, length x width (LxW) were 0.8 and 0.26 mm² in *J. acutus* and *J. subulatus*, respectively. Seed appendages were two caudated appendages in the seed -0.2- 0.3 mm only in *J. acutus*. In both species the seed coat of the periclinal cell wall is plane to little concave, but soft to fine folded in *J. acutus* and reticulate in *J. subulatus*. The epidermal cell form extended in one trend in both species, but, irregular in *J. acutus*. Anticlinal cell wall boundaries in seed surface were raised, straight, smooth with fine folded in the two species, but, slightly raised channeled in *J. subulatus*.

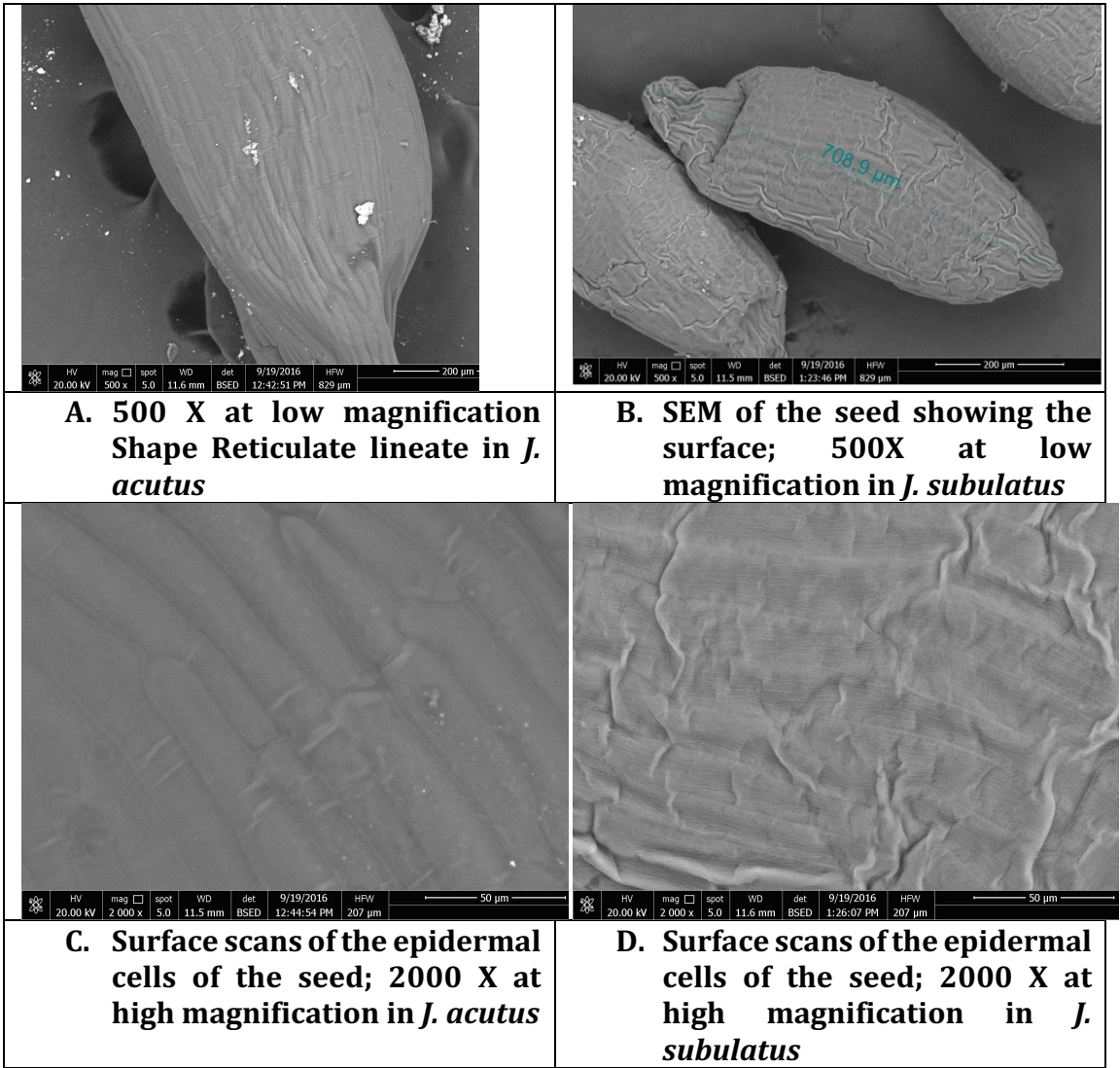


Fig. (7): Surface scans by SEM for seeds of both species

Comparisons between *J. acutus* and *J. subulatus* for stem anatomy

Comparison between cross-section of the stem should be the principles of the natural classification in (Fig. 8 A & B). Vascular bundles large 13.41 µm small 5.59-7.04 µm in stem are scattered, the stem is vacuoles in *J. acutus*. While, large vascular bundles 6.697-12.970 µm small 3.282 µm are only in subepidermal layer. The stem is meristems with no or only tiny vacuoles in *J. subulatus*.

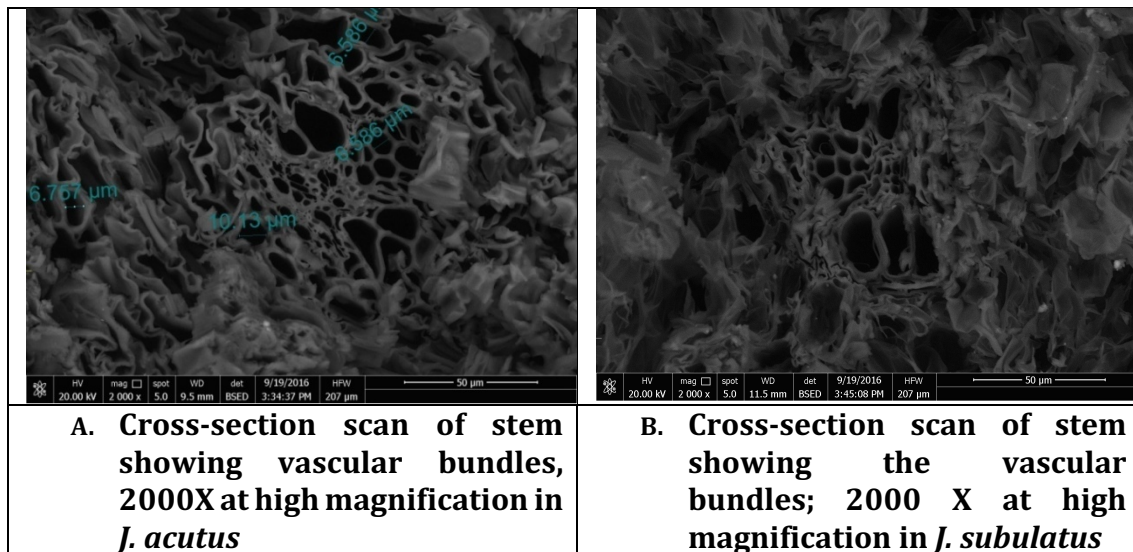


Fig. (8): Cross-section scans stem as shown by SEM

Comparisons between *J. acutus* and *J. subulatus* for root anatomy

Comparison between anatomy of roots, cross-section of root (Tab. 2 & Fig. 9 A & B), the root diameter, length 1.1-2.5 mm, width 1.176 mm, vascular bundles large 109.5-143.1 μm , small 4.81-7.35 μm , the root contains casparian endodermis, rhizodermis are relatively short, exodermis with 2-3 layers of cells with large cells in *J. acutus*. However, in *J. subulatus* the root diameter, length 1.782 mm, vascular bundles large 30.96 μm , small 3.799-6.191 μm , the root rhizodermis are long and extensive, exodermis with 1-3 layers of cells with one layer.

Tab. (2): Anatomical characters of the roots of *J. acutus* and *J. subulatus* species.

Species	<i>J. acutus</i>	<i>J. subulatus</i>
Root		
Vascular bundles (µm)	Large 109.5-143.1, small 4.81-7.35	Large 30.96, small 3.799-6.191
The root diameter (mm)	Length 1.1-2.5 width 1.176	Length 1.782
Rhizodermis	Relatively short	Long and extensive
Parenchyma	The cortical parenchyma was dense, with several big recesses for storing air	The cortical parenchyma, with many large air-storing cavities
Exodermis	2-3 layers of big cells	1-3 layers of the cells with one layer.

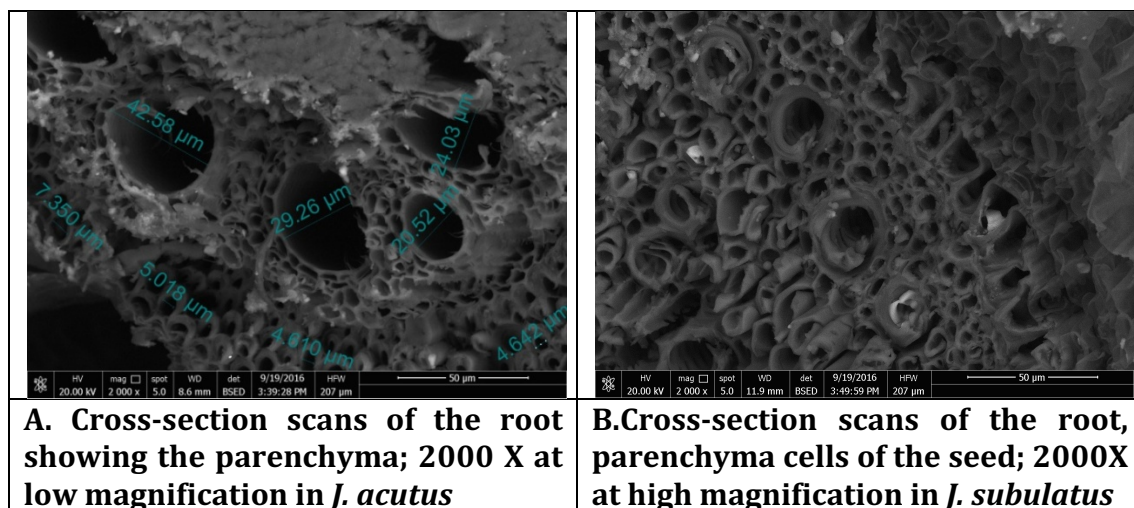


Fig. (9): Cross-section scans root as shown by SEM

DISCUSSION

A realistic way to confirm similarities between species is to use the SEM to examine the coat of the seeds and cross-section of the stems and roots in *Juncus acutus* L. Subsp. *acutus* and *J. subulatus* Forsk. The *J. acutus* L. are part of Subsp. *acutus*. It corresponds with another studies such as (Sievers, 2013; Obermeyer, 1985). Stems in *J. acutus* unbranched, rounded in cross-section or cylindrical and glabrous. Agree with Jones *et al.* (2007) that *Juncaceae* (rushes) have stems that are generally erect and cylindrical and the leaves are mostly basal. Rushes are phylogenetically similar to sedges. Phloem transfers the hormones and carbohydrates about the plant. Also, Riedell and Schumacher, (2009) stated that stem *J. acutus* L. vascular bundles include xylem big violet holes and phloem little holes can be seen purple/red. The root contains casparian endodermis. As stated above, Hassan *et al.* (2015) the role of casparian endodermis in *J. acutus* its dynamic implications in regulating root-level salt influx which is an important mechanism for halophytes. *J. subulatus* the outer apiculate to acute, the inner obtuse- mucronate, pale light brown, with membranous margins (Snogerup, 1963; Labadie, 1976; Drábková, 2013). Several studies have shown the use of micromorphological characteristics to differentiate some taxa of the *Juncaceae* family (Faltyn *et al.*, 2017; Giuliotti *et al.*, 2017). Seed surface scan of *J. subulatus* raised outer perclinal wall, reticulate, sulcate and scalariform surface

scan pattern and anticlinal wall texture glabrous, sculpture in seed of secondary cell wall. Also, Zareh *et al.* (2017) stated that the anticlinal cell wall varied between the taxa, while, Abdel Khalik, (2010) found that the outer cell wall surface showed good differences among of *Juncus* species. The *J. subulatus* Forskalina has a thick leafy stem with terete blades and creeping rhizome (Drábková and Kirschner, 2013).

In addition to the data from the macro, micro and heavy element's, the EDX matrix provides a better understanding of chemistry in the *Juncaceae*. The number and content of elements in a studied species varied among *J. acutus* and *J. subulatus*. The elemental composition in *J. acutus* include 8 elements (N, C, O⁻², K⁺, Mg⁺⁺, Al⁺⁺⁺, Cl⁻ and Si⁻), While, *J. subulatus* include 9 elements (N, C, O⁻², K⁺, Na⁺, Mg⁺⁺, Al⁺⁺⁺, Cl⁻ and Si⁻). Carbon and oxygen gave highest content of the elements in both species, the main components of the plant carbohydrates followed by potassium cation in *J. acutus* 1.49%, which is indispensable chemical element for both plant and animal life. Potassium plays a key role in protein synthesis, photosynthesis and oxidative metabolism, stomatal function, being a major enzymes revitalized (Marschner, 1995; Shabala, 2003). chlorine was the third element in *J. subulatus* 0.99%. The role of the chloride anion is essential on chemical balance with the potassium concentration that increases in the guard cells during the opening and closing of stomata. Chloride also, has role in photosynthesis, specifically in the water splitting system (Jezek and Blatt, 2017). It observed significant increase in chlorine content in *J. subulatus* which was 0.99% compared with *J. acutus* was 0.31%.

There is a higher percentage of aluminum and silicon in *J. acutus* were 0.240 and 0.120 %, respectively compared with *J. subulatus*. Where aluminum and silicon are normally in the soil minerals, but their availability for plant uptake is limited by low-level solubility, accept (Hodson and Evans, 1995) that toxicity to aluminum is a major problem in natural acid soils.

CONCLUSIONS

Comparison between *Juncus acutus* L. Subsp. *acutus* and *J. subulatus* Forsk. in anatomical stem are scattered, vacuoles in *J. acutus* While, are only in subepidermal layer. The stem is meristems whose cells have no or only small vacuoles in *J. subulatus*. Cross-section of root, contains casparian endodermis, rhizodermis are relatively short, exodermis with 2-3 layers of cells with large cells in *J. acutus*. Whereas, in *J. subulatus* the root rhizodermis are long and extensive, exodermis with 1-3 layers of cells. Where, fits *J. subulatus* the saline habitats. Two of caudate appendages in the seed -0.2- 0.3 mm only in *J. acutus*. In both species the seed coat of the periclinal cell wall is plane to little concave, Also, The outline of the epidermal cell extended in one trend. Limits to anticlinal cell wall in seed surface were raised, righteous, soft with fine folded in the two species. Potassium was highest content in *J. acutus* 1.49 %. Nitrogen, the main component of the protein, was given the highest of *J. acutus* with 1.10%. Higher the aluminum and silicon in *J. acutus* compaerd with *J. subulatus*. Taxonomic studies should conduct on other wild species of *Juncaceae* to clarify similarity taxonomic characteristics and contents of nutrients.

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