



***Nannorrhops ritchieana* (Griff.) Aitch. (Arecaceae) – a traditional multipurpose plant species of Pakistan**

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Notes on Ethnobotany

Abstract

Background: Traditional knowledge pertaining to the indigenous uses of *N. ritchieana* has been poorly documented, despite the ethnobotanical studies conducted in various parts of Pakistan. This report comprises traditional knowledge pertaining to the use of *N. ritchieana* in Tribal District Kurram, Pakistan.

Methods: Ethnobotanical information on *N. ritchieana* use was obtained by interviewing 50 Mazari product manufacturers in Tribal District Kurram at four locations; Parachinar, Sadda, Ali Zai and Bagan. For this purpose, a semi-structured questionnaire was set. Prior informed consent was obtained from every participant.

The data was quantitatively analyzed through relative frequency of citation (RFC), informant consensus factor (ICF) and cultural importance index (CI).

Results: *N. ritchieana* is widely used in Pakistan and has been recognized as a traditional multipurpose plant species with socioeconomic, cultural, medicinal, religious, and spiritual values. The leaves of this species have been used in the manufacture of a variety of household items, especially mats, trays, baskets, bread pot, grain bins, cordage, chair, hand fan, and brooms. The fruit are eaten. The leaves and fruit are used medicinally. The palm is a symbol of “fruitfulness” and of “prosperity” and is planted in graveyards and religious places. It is also used for shade and, given its charismatic crown; it is cultivated for ornamental purposes. It is also important for apiculture.

Conclusions: Documentation of traditional use and economic value of *N. ritchieana* is beneficial, not only for the indigenous people of the area but also for the country as a whole. There is a dire need to develop sustainable harvest and management of this species to preserve its use for future generations and to prevent its extinction.

Keywords: Traditional use, *Nannorrhops ritchieana*, Arecaceae, economic value, Tribal District Kurram

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**Ethnobotany Research & Applications
19:35 (2020)**

(اردو) اقتباس

پس منظر: مزی کے مقامی استعمال سے متعلق روایتی علم پاکستان کے مختلف حصوں میں ہونے والے نسلی نباتاتی مطالعات کے باوجود نامکمل دستاویز کیا گیا ہے۔ اس رپورٹ میں قبائلی ضلع کرم، پاکستان میں مزی کے استعمال سے متعلق روایتی علم شامل ہے۔

طریقہ: قبائلی ضلع کرم میں چار مقامات پر 50 مزی مواد بنانے والے افراد کے انٹرویو کے ذریعے مزی کے استعمال سے متعلق نسلی معلومات حاصل کی گئیں۔ پاراچنار، صدہ، علی زئی اور باگن۔ اس مقصد کے لئے ایک نیم ساختہ سوالنامہ مرتب کیا گیا تھا۔ پہلے سے باخبر رضامندی پر شریک سے حاصل کی گئی تھی۔

حوالہ جات کی نسبتاً تعدد (آر ایف سی)، مخبر متفقہ فیکٹر (آئی سی ایف) اور ثقافتی اہمیت انڈیکس (سی آئی) کے ذریعے اعداد و شمار کا مقداری تجزیہ کیا گیا۔

نتائج: پاکستان میں مزی کو وسیع پیمانے پر استعمال کیا جاتا ہے اور اسے روایتی کثیر مقصدی پودوں کی نسل کے طور پر تسلیم کیا گیا ہے جس میں سماجی و معاشی، ثقافتی، دواؤں، مذہبی اور روحانی اقدار ہیں۔ اس پر جاتی کے پتے متعدد گھریلو اشیاء، خاص طور پر چٹانیاں، ٹرے، ٹوکریاں، روٹی کے برتن، اناج کے ڈبے، رسی، کرسی، ہاتھ کا پنکھا اور جھاڑو تیار کرتے ہیں۔ پھل کھاتے جاتے ہیں۔ پتے اور پھل دواؤں کے استعمال میں ہیں۔ مزاری خوش قسمتی اور "خوشحالی" کی علامت ہے اور اسے قبرستانوں اور مذہبی مقامات پر لگایا گیا ہے۔ یہ سایہ اور سجاوٹی مقاصد کے لئے اگایا جاتا ہے۔ یہ شہد کی مکھیوں کی پرورش کے لئے بھی ضروری ہے۔

خلاصہ: مزی کے روایتی استعمال اور معاشی قدر کی دستاویزات نہ صرف علاقے کے مقامی لوگوں بلکہ پورے ملک کے لئے فائدہ مند ہیں۔ پائیدار فصل اور مزی کی پیداوار کو برقرار رکھنے اور آئندہ نسلوں کے لئے معدومیت کو روکنے کی اشد ضرورت ہے۔

(پشتو) لنډيز

شاليد: د مزي د داخلي كاروني په اړه دوديز پوهه د پاکستان په بيلابيلو سيمو كې د قومي نباتاتو مطالعاتو سره سره نيمگړې شوې ده. دا راپور د پاکستان د قبايلي ولسوالۍ كرم ولسوالۍ كې د مزي د كاروني په اړه دوديز پوهه لري.

ميتود: د مزي د كاروني په اړه توكميز معلومات د كرم ولسوالۍ په څلورو ځايونو كې د 50 مزي د مينځپانگې جوړونكو د مركو له لارې ترلاسه شوي. پاراچنار، سيده، علي زئي او باغان. د دې هدف لپاره يو نيم جوړ شوی پوښتنلیک ترتیب شوی و. دمخه خبر شوي رضایت د هر گبونوال څخه ترلاسه شوی و.

(، باخبره RFC د ارقامو احصایو تحلیلونه د مآخذونو د متقابل تعدد (لخوا ترسره شوي CI) او د فرهنگي اهمیت شاخص (CF) فیکتور (پایلی: مزی په پراخه کچه په پاکستان کې کارول کېږي او د یو دودیز کثیر مقصدی بوټي په توګه پیژندل شوی چې ټولنیز، اقتصادي، کلتوري، درملو، مذهبي او معنوي ارزښتونه لري. د دې نوعیت مختلف کورني توکی، په ځانګړي توګه خټکي، پټی، ټوکرۍ، د ډوډۍ څڅوړې، د غلو کانتینرونه، رسی، چوکی، د لاسي فین او د جامو تولید. میوه خوړل کېږي یا ټی او میوې د درملو په کارولو کې دي. مقبرې د تقدیر او "خوشحالی" سمبول دی او په قبرستان او مذهبي ځایونو کې ځای په ځای شوی دی. دا د سیوري او زینتي اهدافو لپاره کرل کېږي. دا د مچيو تغذیه کولو لپاره هم اړین دي.

خلاصه: د مزي دودیزه استفاده او د اقتصادي ارزښت سندونه نه یوازې د سیمې خلکو بلکې ټول هیواد ته ګټه رسوي. د دوامداره فصل او منځلو تولید ساتل او د راتلونکو نسلونو لپاره د زیانونو مخنیوي لپاره جدي اړتیا شتون لري.

Background

Nannorrhops ritchieana (Griff.) Aitch. (Mazari palm or dwarf palm) is the sole species in the genus *Nannorrhops*, Arecaceae. It is a xerophytic, sun-loving, gregarious, tufted, low-growing palm that can

form almost pure stands on sandy or stony plains or grow among other woody species on hillsides. It is an evergreen, charismatic plant with a light crown and grows to a height of 5 meter. Its leaves are grayish-green and fan-shaped with 30-120 cm long leaflets. It produces flowers and fruits from June to November (Mughal 1992). *Nannorrhops ritchieana* is restricted to Afghanistan, Iran, Pakistan, the Arabian Peninsula and northwestern India. In Pakistan, it is widely distributed in Makran, Kharan, Khuzdar, Hernai and Sibi area of Baluchistan, Kohat, Hangu, Orakzai, Waziristan and Kurram districts of Khyber Pakhtunkhwa and Jacobabad in Sindh (Mahmood *et al.* 2017, Mosti *et al.* 2005, Mughal 1992).

Tribal District Kurram is among the most remote district which was previously administrated by the Federal Government of Pakistan (erstwhile known as FATA). It lies on the Pakistan-Afghanistan border with geographic co-ordinates 33°45'0" N and 70°19' E. The district is bounded on the north and west by the Afghanistan provinces of Ningarhar and Pukthia, respectively, on the east by Orakzai and Khyber Agencies, on the southeast by Hangu district, and on the south by North Waziristan Agency. Historically, the name "Kurram" is taken from the Kurram River that flows through the valley. It is rich in natural beauty, historic places, and ethnic diversity, and its population is known for its hospitality. The people of the area believe in Jirga, among the most active social institutions in the area, which are comprised of community committees that resolve disputes and other issues. People also use collective action to support economic and social activities, for example, supporting each other on special occasions like death and marriage ceremonies, harvesting and threshing of crops, construction of Hujras (meeting places), mosques and other buildings, the cleaning of irrigation channels, protection from floods, maintaining paths, wood and grass cutting, etc. The many tribes in the region include the Sayed, Bangash, Turi, Maqbal, Hazara, Khushi, Mangel, Kharote, and Jaji. Turi and Bangash make up the majority of the population in the Tribal District Kurram. Their culture is same as in other parts of Khyber Pakhtunkhwa (Ali *et al.* 2019, Hussain *et al.* 2018a).

Generally, the people of Tribal District Kurram are mostly pastoralists and farmer (Hussain *et al.* 2018a). They are dependent on the available plant resources for medicines, fodder, shelter, timber wood, fuel wood, etc. (Ali *et al.* 2019, Hussain *et al.* 2018b).

Nannorrhops ritchieana is among the plant species with multipurpose uses and thus has a great role in the life and the economy of the rural people of the

area. Its traditional use has been poorly documented in ethnobotanical studies conducted in the area, however. The leaves have been used in the manufacture of a variety of household items, especially woven products, as well as the production of cordage, chairs, hand fans, and brooms. Leaves and fruit are used medicinally while the fruit is also eaten. Culturally, the palm is a symbol of “fruitfulness” and of “prosperity” and is planted in graveyards and religious places. Palm trees are also used for shade, with their charismatic crown lending them for ornamental purpose. Finally, it also serves for apiculture. Documentation of this indigenous species, along with its important uses is beneficial, not only for the indigenous people of the area, but also for the country as a whole. Thus, there was dire need to document its traditional use and to ensure its sustainable use in the area.

Materials and Methods

Ethnobotanical data collection

Ethnobotanical information on *N. ritchieana* use was obtained by interviewing 50 Mazari product manufacturers in Tribal District Kurram at four locations; Parachinar, Sadda, Ali Zai and Bagan. For this purpose, a semi-structured questionnaire was set. Prior informed consent was obtained from every participant.

Data analysis

The knowledge of the plant usage was quantitatively assessed using the relative frequency of citation (RFC), informants consensus factor (ICF) and cultural importance index (CI).

Relative frequency of Citation (RFC)

This index shows the local importance of each species and it is given by the frequency of citation (FC, the number of informants mentioning the use of the species) divided by the total number of informants participating in the survey (Ni), without considering the use-categories (Hussain et al. 2018b). The RFC was calculated to determine the consensus between informants on the use of the

plants in the region as it gives the local importance of a species.

$$RFC = FC / Ni$$

Where FC is the number of informants who mentioned the species, while Ni is the total number of informants participating in the study.

Informant Consensus Factor

The consistency of the use-reports within the category was evaluated numerically using the factor of informant's consensus, Fic, which gives the relationship between the number of use-reports in each category (Nur) minus number of taxa used (Nt) and the number of use reports in each category (Umair et al. 2019). Informants' Consensus Factor is calculated by following formula,

$$Fic = Nur - Nt / (Nur - 1).$$

Where Nur refers the number of use reports from informants for a particular plant-usage category and Nt refers the number of taxa or species that are used for that plant usage category for all informants.

Cultural importance index (CI)

In order to find out cultural significance of each species in every locality cultural importance index (CI) was calculated as the summation of the use report (URL) in every use category mentioned for a species in the locality divided by number of participants (NL) in that locality (Hoffman & Gallaher 2007).

$$CI = \Sigma URL / NL$$

Results and Discussion

Informant data

In current ethnobotanical study 50 Mazari product manufacturers were interviewed from Tribal District Kurram at four locations; Parachinar, Sadda, Ali Zai and Bagan Table 1.

Table 1. Informant data from four location of District Kurram

	Location							
	Parachinar		Sadda		Ali zai		Bagun	
Age Class	Male	Female	Male	Female	Male	Female	Male	Female
35-45	3	0	2	0	1	0	0	0
46-55	0	1	1	0	0	0	2	0
56-65	2	4	3	1	4	2	2	0
Above 65	3	1	7	3	3	1	3	1

Socioeconomic and cultural values

Nannorrhops ritchieana is well known for its cultural significance in the Kurram area where it has multiple uses, primarily to make woven products, cordage, thatch, brooms, and a few miscellaneous items.

Examples of household utensils are shown in Figs. 1-3.

Woven products.

Fresh palm leaflets are kept in water for one day to soften and then speared with a needle to separate the fibers. These leaflets are used to make different types of handmade materials such as baskets, trays, mats, and hats, as well as rope, hand fans, beds, and rosaries.

A large, loosely woven basket formed from rope, locally called Koraye or Trangar Fig. 1(i), is used for transporting fresh plantlets (usually onion) or vegetables to local markets. Small baskets are used to preserve food items; fruits, vegetables, eggs, etc. Fig. 3 (l) A large size tray, locally called Ghundaki / Kashari Fig. 2 (g, h), Fig. 3 (h). is used to store heavy materials, such as those that are thrown for dust or for the loading of items such as straw. Some people also sell cooked food that is kept in small baskets in the market Fig. 3 (k).

A large pot or grain bin, locally called Tarata, that is made from *N. ritchieana* leaves is used to store and keep grains safe from insects and termites Fig. 3(j) The locals make a special type pot called Pitwar / Tokrii shown in Fig. 1 (m,n,o), Fig. 2 (c & f and l) and Fig. 3(b,c). people store their breads / Naan for guests and on mirage events in fresh condition, and also have a special material known as Shhkor / chabba shown in Fig. 1 (a,b,c,g& k); Fig. 2 (b,k.) and Fig. 3 (d,i) which is used to serve naan /bread while eating.

Another pot, locally known as Sozaye Fig. 1(h); Fig 2(j) is a very common kitchen item being used in most houses to store salt because it prevents caking (i.e. it keeps moisture out for a long time); these are designed and decorated with different color fibers and plastics covers. These trays are presented as a special gift by village women to their relatives on Eid festival, and at weddings, birthdays, or to guests. Currently, this type of traditional handmade material exists in most households throughout the area. As the people of the region mostly believe in Jirga, a community committee system for resolving their social issues, long mats, locally called Andeerai / Chattai (چٹائی) Fig. 1 (l) are prepared from palm leaves; these mats are spread on the ground for people to sit on when they gather.

A large size hat Fig. 1 (j) and hand fan (Babozyei), Fig. 2 (e), that is also woven from the softened leaflets for use during the summer. In olden times, people in the area wove different type of handmade shoes called Slippery (چپلی), which were more reliable than leather or plastic shoes. (Fig. 2 (a). Nowadays such types of shoes are mostly found in museums as antiques as well as for decorative purpose in tradition loving family houses.

Cordage

The major crops cultivated on 35% of land in the Tribal District Kurram are rice, wheat and maize. During harvest seasons, palm ropes, known as Baan/ Waan (بسی) Fig. 1 (d), Fig. 2 (d), Fig. 3 (a) are used for binding crops into bundles. Palm rope is also used to tie up animal such as cows, horses and donkeys. Fig. 1 (f) : Several ropes are twisted together to form a sturdy rope, locally called Kaman, which is used to climb or step up the trunks of date palm during of fruit harvest. The rope is also used for weaving bedsteads to create a lattice that people use to sleep on.

Thatch

Most of the men of the region use both fresh and dry leaves of *N. ritchieana* to thatch roofs and to construct the rooms and outer walls of their houses and shelters, including the roofs of the Jirga Halls, i.e. the community centers as shown in Fig. 4

Brooms.

The Jirga Hall is regularly cleaned with Mazari palm brooms, locally called Jharu/Jaray Fig. 1 (e), Fig. 3 (e).

Miscellaneous items.

A tool used for hunting birds during hunting season, locally called Matoraka, are made from the leaves. The above-mentioned tools, mats, trays, baskets, bread pot, grain bins, cordage, chair, hand fan, and brooms are prepared at homes from *N. ritchieana* leaves and are sold by villagers in the market. Dried palm leaves are also used as a source of fuel wood.

Leaves were previously documented from the area as being used to make mats, fans, ropes, baskets and slippers locally known as "Saplay" (Ajaib et al. 2014). The leaves are used for making rope used for weaving bedstead (charpayee), tray (Skor), hand fan (Bozay), small prayer mat (Musalla), large prayer mat (Suff), Grain bins (Puzai) - for storage of grains, hot pot (Chabai/ Chabbi), hat (Topee), brooms (Jharu) and basket (Tokrai /Tokris) (Marwat et al. 2011).



Figure 1. Products made from *Nannorrhops ritchiana* with local names. 'a', 'b', 'c' 'g' & 'k' Shhkor / chabba (شکور), where 'g' & 'k' are decorated versions, and 'c' show initiation stage in weaving; 'd' Barn / Charpayei rope (کربان); 'e' broom Jharu / Jaray, (جارو) for sweeping; 'f' Gharwandy rope made to tie livestock (هارواندي); 'h' Sozaye (سوزی) pot for salt storage; 'i' Khatha / Laadh (لاهد) burden basket for carrying loads on horses and donkey, mostly used in mountainous area; 'j' topi /cap (خولی); 'l' Mat / Chattai, (انڊيري).



Figure 2. Products made from *Nannorrhops ritchiana* with local names. 'a' handmade shoes / Slipper (خپلی); 'b' 'k' decorated version of Shhkor / chabba (شکور); 'c' & 'f' and 'l' Pitwar / Tokrii (پیتوار) pot made to store Naan; 'd' Barn / Charpayei rope (کریبان); 'e' fan / Babozay (بابوزی); 'g' & 'h' ghundaki / kashari (کشری); 'j' Sozaye (سوزی) pot used to store salt; 'l' different handmade products in shops for selling



Figure 3. Products made from *Nannorrhops ritchiana* with local names. 'a' Barn / Charpayei rope (کربان); 'b' 'c' Pitwar / Tokrii (پیتوار) pot to store Naan; 'd'; 'l' Shhkor / chabba (شکور); 'e' broom Jharu / Jaray, (جارو) for cleaning purpose; 'f' sleeping mat; 'g' handmade hat; and 'h' ghundaki / kashari (کشری) 'i' Tarata used for keeping crops, 'k' and 'l' baskets used for selling fruits and vegetables

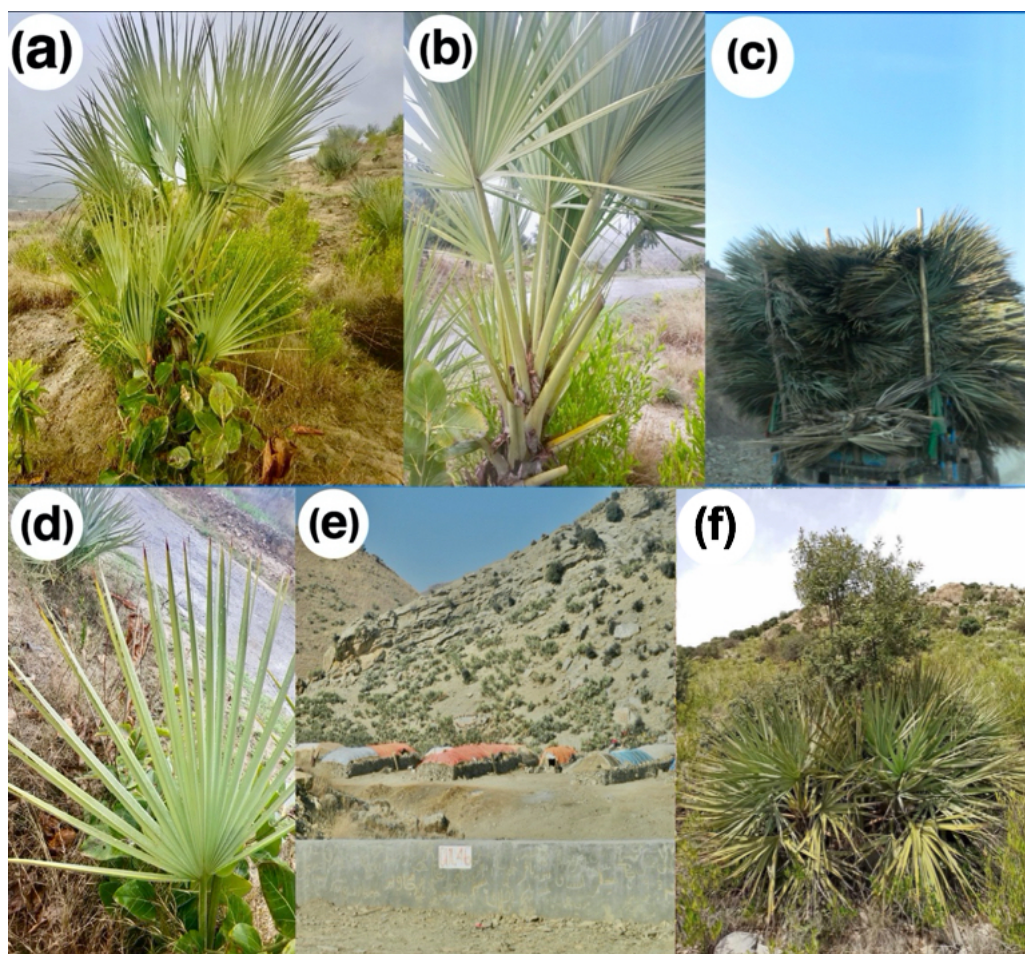


Figure 4. *Nannorrhops ritchiana*. (a) habit; (b) harvested palm; (c) palm leaves bundled and loaded for transport; (d) close-up of leaf; (e) thatched roofs. (f) in plant community

Religious and spiritual value

According to Islamic history, Prophet Muhammad (Peace Be Upon Him) prayed on a palm leaf mat. A small mat of *N. ritchieana* leaves, locally called Jainamaz/Musala Fig. 2 (i), is spread on the ground to kneel on when performing prayer. Similarly, a large mat, locally called chattai, is spread for prayer in mosques Fig. 2. (l).

Some families keep the traditional woven shoes that were worn by their elders in their homes after their elders' demise, believing that their preservation may bring prosperity to their homes. Leaves were also used in making mat for mosque in District Malakand Pakistan. The palm is considered a symbol of "fruitfulness" and of "peace" and is thus planted in graveyards and religious places.

Medicinal use

The informants also mentioned use of Mazari palm in traditional medicines. Fresh fruits are edible and are directly eaten as a purgative and a tonic. The leaves extract is used to treat diarrhea and dysentery. Literature search also indicate its

traditional medicinal use from the same and other part of Pakistan. Its fresh fruit are edible and are directly eaten as a purgative and a tonic (Hussain *et al.* 2018b) and for the treatment of alimentary tract complaints (Naseem *et al.* 2005). An extract of the leaves is prepared by maceration and used to treat diarrhea and dysentery (Marwat *et al.* 2011, Murad *et al.* 2012) whereas Panhwar & Abro (2007) specify that its young leaves are used to treat diarrhea and dysentery. Marwat *et al.* (2011) reported from Dera Ismail Khan District, Pakistan, that its tender young leaves are used as a purgative in livestock.

Due to current pandemic situations regarding COVID 19 and shortage and more expensive of facemasks in the market, the local people of district Kurram collected the fresh leaves of *Nannorrhops ritchieana*. They prepared a hand-made mask to protect themselves from Sars-CoV2 (Fig. 5). This plant has strong antiseptic properties as well. And show one main income for many low-income families in the area. Which showed that these ancient and traditional handmade materials are cheap rather than other plastic or other factories products.



Figure 5. Handmade masks made from fresh *Nannorrhops ritchiana* leaves.

Aesthetic use

The palm can be found locally growing wild in the area and it is propagated in nurseries from both seed and rhizome. The seeds remain viable for three to four year if properly stored (Mughal, 1992). Due to its charismatic and evergreen crown it is commonly planted for ornamental purpose in the area.

Quantitative analysis

The indigenous use of *N. ritchieana* was quantitatively assessed and relative frequency of citation, informant's consensus factor and cultural importance index (CI) were determined (Table 2).

The relative importance of each plant use category was calculated, and it was found that relative frequency of citation of beds (0.78), rope (0.78), mats (0.74) was highest for all the four locations. Lowest relative frequency of citation was recorded for its ornamental value (0.2).

The consistency of the use-reports within the category was evaluated through informant's consensus factor and it was highest for *N. ritchieana* use in beds (37.97) followed by rope (37.97), mats (35.97), baskets (32.97), Trays (31.97) and so on. Lowest informant's consensus factor was documented for its ornamental value (0.2). Cultural importance of *N. ritchieana* ranked as highest at Ali zai (9.36) followed by sadda (9.06), Parachinar (8.35) and Bagun (8)

Conservation status

Many people over-harvest *N. ritchieana* leaves for fuel, construction and making rope. This affects the growth and normal development of *N. ritchieana* in the area. This is raising concerns about the possible loss of the species from the area (Hussain *et al.* 2018b).

According to the FAO (1994) overexploitation and habitat loss have dramatically diminished *N. ritchieana* populations across the country. It is highly recommended that the local community should be educated and trained about pre- and post- harvest methods, as well as proper use and cultivation of

available plant resources. In-situ and ex-situ conservation methods should be encouraged to avoid further depletion of rare plants such as *N. ritchieana*. Local people can be involved in

cultivating this and other plant species more sustainably, to control overgrazing, and to apply more conservation strategies.

Table 2. Quantitative analysis of the ethnobotanical data on *N. ritchieana* from four location at district Kurram Pakistan

Uses	Location												Statistical calculation for all the four localities	
	Parachinar			Sadda			Ali Zai			Bagun				
	FC	RFC	ICF	FC	RFC	ICF	FC	RFC	ICF	FC	RFC	ICF	RFC	ICF
Baskets	10	0.7	8.9	14	0.8	12.9	6	0.5	4.83	4	0.5	2.75	0.68	32.97
Trays	9	0.6	7.89	11	0.6	9.91	9	0.8	7.89	4	0.5	2.75	0.66	31.97
Mats	8	0.6	6.88	15	0.9	13.9	9	0.8	7.89	5	0.6	3.8	0.74	35.97
Hats	5	0.4	3.8	5	0.3	3.8	4	0.4	2.75	2	0.3	0.5	0.32	14.94
Rope	10	0.7	8.9	14	0.8	12.9	7	0.6	5.86	8	1	6.88	0.78	37.97
Hand fans	4	0.3	2.75	7	0.4	5.86	8	0.7	6.88	4	0.5	2.75	0.46	21.96
Beds	10	0.7	8.9	15	0.9	13.9	7	0.6	5.86	7	0.9	5.86	0.78	37.97
Pot	5	0.4	3.8	10	0.6	8.9	6	0.5	4.83	3	0.4	1.67	0.48	22.96
Shoes	5	0.4	3.8	4	0.2	2.75	3	0.3	1.67	2	0.3	0.5	0.28	12.93
Rosaries	5	0.4	3.8	6	0.4	4.83	4	0.4	2.75	2	0.3	0.5	0.34	15.94
Thatch	3	0.2	1.67	4	0.2	2.75	2	0.2	0.5	2	0.3	0.5	0.22	9.909
Brooms	5	0.4	3.8	7	0.4	5.86	7	0.6	5.86	2	0.3	0.5	0.42	19.95
Fuel wood	6	0.4	4.83	6	0.4	4.83	6	0.5	4.83	2	0.3	0.5	0.4	18.95
Hunting tool	4	0.3	2.75	3	0.2	1.67	3	0.3	1.67	2	0.3	0.5	0.24	10.92
Religious use	4	0.3	2.75	4	0.2	2.75	3	0.3	1.67	3	0.4	1.67	0.28	12.93
Spiritual value	5	0.4	3.8	6	0.4	4.83	5	0.5	3.8	2	0.3	0.5	0.36	16.94
Diarrhea	5	0.4	3.8	4	0.2	2.75	3	0.3	1.67	2	0.3	0.5	0.28	12.93
Dysentery	3	0.2	1.67	5	0.3	3.8	4	0.4	2.75	3	0.4	1.67	0.3	13.93
Purgative	4	0.3	2.75	6	0.4	4.83	2	0.2	0.5	3	0.4	1.67	0.3	13.93
Tonic	4	0.3	2.75	4	0.2	2.75	2	0.2	0.5	2	0.3	0.5	0.24	10.92
Ornamental value	3	0.2	1.67	4	0.2	2.75	3	0.3	1.67	0	0	0	0.2	8.9

Abbreviations: FC (Frequency of Citation), RFC (Relative Frequency of Citation), ICF Informant consensus factor.

Threat to loss of traditional knowledge and economy

Traditional knowledge and its related practices play an important role in the economy of any region, such as products made from *N. ritchieana* in Tribal District Kurram. In earlier times, these palm products were found easily everywhere as they were the main source of income for many poor families in the area. However, due to the advancement of science and technology and the development of plastic factories, these ancient and traditional handmade materials are becoming very rare. Advances in technology not only affect the living standards of many poor people, but also pose an additional challenge to the Earth due to environmental degradations.

Conclusions

Nannorrhops ritchieana is an economically important plant with multipurpose use in Tribal District Kurram of Pakistan. The palm plays a vital role in the

socioeconomic conditions of poor people in the rural areas. Many of them manufacture a variety of household items, especially mats, trays, baskets, bread pots and grain bins, and cordage, chairs, hand fan, and brooms, from Mazari leaves. Its leaves are also used to construct houses, shelters and roofs. Palm parts are used as fuel wood. Due to its diverse applications and different uses special attention and support is needed to further explore its different traditional uses. Moreover, its traditional management and harvest methods should be documented.

Declarations

List of abbreviations: Not applicable.

Ethics approval and consent to participate: First author obtained permission to conduct this study from the chief persons in their respective villages. Written informed consent was obtained from all adult participants.

Consent for publication: Persons shown in pictures gave their consent for publication.

Conflict of interests: The authors declare that they have no conflict of interests.

Funding: This research work did not receive any specific grant from funding agencies or any other commercial source.

Authors' contributions: MA and KH participated in the collection of field data and identification of plant samples. MA, MU and SUK wrote the initial draft of the manuscript. All the authors including EJ and JWS contributed in writing and giving feedback on the manuscript. UA help in picture editing, RWB revised the final version of the manuscript.

Acknowledgements

The Principal Author has written this paper to acknowledge all handmade materials prepared by his mother who has recently departed from this world to heaven, on Monday 3rd June 2019. The author feels proud and honored to publish his mother's work in the prestigious journal, ERA.

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