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INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY EDUCATIONAL RESEARCH
ISSN:2277-7881; IMPACT FACTOR :8.017(2023); IC VALUE:5.16; ISI VALUE:2.286
Peer Reviewed and Refereed Journal: VOLUME:12, ISSUE:5(3), May: 2023
Online Copy of Article Publication Available (2023 Issues)
Scopus Review ID: A2B96D3ACF3FEA2A
Article Received: 2nd May 2023
Publication Date:1st June 2023
Publisher: Sucharitha Publication, India
Digital Certificate of Publication: www.ijmer.in/pdf/e-CertificateofPublication-IJMER.pdf

DOI: http://ijmer.in.doi./2023/12.05.58
www.ijmer.in

NUTRITIVE CONTENTS OF SOME MEDICINAL TREE SPECIES GROWING IN NAGAUR DISTRICT OF RAJASTHAN

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ABSTRACT

Evaluation of nutritive contents i.e. Dry Matter, Crude Protein, Crude Fibre, Crude Fat, Nitrogen Free Extract, Total Carbohydrate, Total Ash and Organic Matter from various parts of selected medicinal tree species growing in Nagaur district of Rajasthan *like A*cacia *tortilis*, *Prosopis cineraria*, *Salvadora persica* and *Tecomella undulata* was carried out. It was concluded that the medicinal tree species growing in semi-arid areas of Nagaur district of Rajasthan have sufficient amount of nutritive contents

Keywords: Nutritive contents, *A*cacia *tortilis*, *Prosopis cineraria*, *Salvadora persica* a, *Tecomella undulate,* Naguar

Introduction

Plants have great importance due to their nutritive value and continue to be a major source of medicines as they have been found throughout human history. About 30 to 40% of today's conventional drugs used in the medicinal & curative properties of various plants are employed in herbal supplements botanicals, nutraceuticals and drug [3]. To achieve nutrition and income security for the people, particularly in arid region, suitable species from forests are of vital importance that are endowed with a number of plant species of food value which yield edible leaves, fruits, seeds, roots, rhizomes etc.

Arid and semi-arid zone vegetation comprises a wide range of edible fruit-bearing and food-producing species: *Salvadora oleoides, Balanites aegyptiaca, Cordia dichotoma, Ziziphus mauritiana, Acacia tortilis, Prosopis cineraria,Capparis decidua,* etc. There are around 30 plant species in arid zone known for their edible use and of these around 20 plant species are known for their edible fruits either raw or use as vegetable. Many of the above play a multiple role in dry zone agro forestry systems, providing soil cover, wind protection, fuel wood and fodder as well as food. The fruits from arid zone are nutritionally far more superior to the commercially available fruits viz. apple, banana, grapes etc. They are rich in carbohydrates and proteins which are present in negligible amounts in commercial fruits. Also, they have higher mineral contents. *Prosopis cineraria* fruit is very rich in vitamin C and Calcium and phosphorus contents [12].

The animals and human being are fully depended on these plant species for food, fodder, fibre and fuel. The present investigation describes the evaluation of nutritive contents from stem, leaves and fruits of selected plant species. The plants growing in Western Rajasthan besides their medicinal importance may contain sufficient amount of nutrients to be considered as livestock feed. A number of plants have been anlysed for their nutritive values by many researchers. [1-14]. The present investigation describes the evaluation of nutritive contents from stem, leaves and fruits of selected plant species.

Materials and Methods

The stems, leaves and fruits of all the three selected plant species taken for present investigation, were collected from Alaye, Khinvsar and Merta area of Nagaur district. Plant parts *of Acacia tortilis, Prosopis cineraria, Salvadora persica* and *Tecomella undulata* were collected in polythene bags. The samples were dried, powdered and then used for their nutritional value such as crude protein, crude fibre, crude fat (ether extract), total ash, nitrogen free extract, total carbohydrate and organic matter procedure given by some workers.[3,11]

Analytical Procedure

Plant parts were separately dried at 100°C for 15 minutes so as to inactivate the enzymes followed by 60°C till a constant weight was achieved. These dried samples were powdered using 20 mesh screen in Willey Mill and then subjected to chemical analysis.[1] for their estimation of nutritive contents i.e. dry matter, crude protein, crude fat, total ash, NFE, organic matter, total carbohydrates as per the procedure given by some workers [4,10].

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Results and Discussion

Concentration of the nutritive contents in the various parts (stems, leaves and fruits) of all the plant species i.e. *Acacia tortilis, Prosopis cineraria, Salvadora persica* and *Tecomella undulata* collected from three different sites i.e. Alaye, Khinvsar and Merta area of Nagaur district are presented in Table 1 to 8.and depicted in figure 1 to 8. In the present study dry matter, crude protein, crude fat (ether extract), total carbohydrate, crude fibre, nitrogen free extract, total ash and organic matter were quantitatively assessed on percentage dry matter basis.

Dry matter percentage was found maximum (49.54%) in the fruits of *Acacia tortilis* collected from Merta area and minimum (20.00%) in the leaves of *Salvadora persica* collected from same area (Table-1, Figure-1).

The maximum amount of crude protein content (33.83%) was estimated in the fruits of *Acacia tortilis* collected from Alaye area, while minimum (3.32%) in the fruits of *Prosopis cineraria* collected from the Merta area (Table-2, Figure-2). Ganguly *et al.* (1974) reported that *Prosopis cineraria* contain 13.9% protein and Singh (1995) while analysing leaves of *Prosopis cineraria* reported 13.9% value of protein which is higher than the present findings.

Maximum (37.37%) crude fibre (CF) content was found in stems *of Acacia tortilis* collected from Alaye area and minimum (6.32%) in fruits of the *Salvadora persica* collected from Merta area (Table-3,Figure-3). Ganguly *et al.* (1974) reported 20.3% crude fibre in *Prosopis cineraria.*

Crude fat (ether extract) concentration was found maximum (3.84%) in fruits *of Salvadora persica* collected from Alaye area, while minimum (0.60%) in stems *of Prosopis cineraria* collected from Merta area and in the leaves of *Salvadora persica* collected from Khinvsar area (Table-4 ,Fig.4).

Maximum (32.56%) total ash was found in the leaves of *Salvadora persica* collected from Alaye area, followed by leaves collected from same plant of Khinvsar area and Merta area while minimum (4.24%) in fruits of *Prosopis cineraria* collected from Merta area (Table-5,Fig.5).

The amount of nitrogen free extract (NFE) was observed maximum (81.37%) in fruits of *Prosopis cineraria* collected from Alaye area while minimum (42.00%) in the stems of *Salvadora persica* collected from the Merta area (Table-6,Figure.6).

The amount of organic matter was found maximum (95.49%) in the fruits of *Prosopis cineraria* collected from Alaye area, while minimum (66.48%) in the leaves *of. Salvadora persicq* collected from Merta area (Table-7,Fig.7). Khatri, Sarika (2007) has observed the amount of organic matter was found to be maximum (97.15%) in the fruits *of Suaeda fruticosa* collected from Charwas area, while minimum (80.15%) in the roots *of Salsola baryosma* collected from the Rampura area. Singh, Anshu (2008) found maximum amount of organic matter (96.75%) in the fruits of *Phyllanthus niruri* collected from Gudha area, while minimum (75.52%) in the roots *of Achyranthes aspera* collected from Mandawa area of Jhunjhunu district.

Maximum (82.43%) total carbohydrate contents was found in the fruits *of Prosopis cineraria* collected from Alaye area while minimum (43.10%) in the stems of *Salvadora persica* collected from Merta area (Table-7,Figure-7). Khatri, Sarika (2007) has observed maximum (84.18%) total carbohydrate contents was found in the shoots *of Tephrosia purpuria* collected from Charwas area and minimum (69.14%) in the roots of *Aerva persica* collected from same area. Singh, Anshu (2008) has recently observed maximum (84.52%) total carbohydrate contents was found in the fruits of *Phyllanthus niruri* collected from Dundlod area and minimum (68.97%) in the roots of *Achyranthes aspera* collected from same area of Jhunjhunu district.

Conclusion

The foregoing studies thus indicate that the medicinal tree species growing in semi-arid areas of Nagaur district have sufficient amount of nutritive contents. It further suggests that the concentration of various contents also depend on the geographical and environmental conditions of different localities from where plants were collected in the present investigation. Hence, these plant species can be a good source of feed and fodder for the livestock of this region.

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Table.1 Percentage of dry matter of various parts of selected plant species

Plants	stems			leaves			fruits		
	I	II	III	I	II	III	I	II	III
Acacia tortilis,	30.66	32.16	36.72	24.14	30.34	29.72	40.14	42.18	49.54
Prosopis cineraria,	31.72	35.50	37.63	28.10	27.28	29.25	41.12	43.32	40.00
Salvadora persica	34.45	38.81	36.61	26.25	30.10	20.00	40.56	43.31	47.44
Tecomella undulata	32.68	36.60	37.72	31.10	30.50	34.00	44.48	42.28	48.24

I-Alaye area II-Khinvsar area III-Merta area

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DOI: http://ijmer.in.doi./2023/12.05.58
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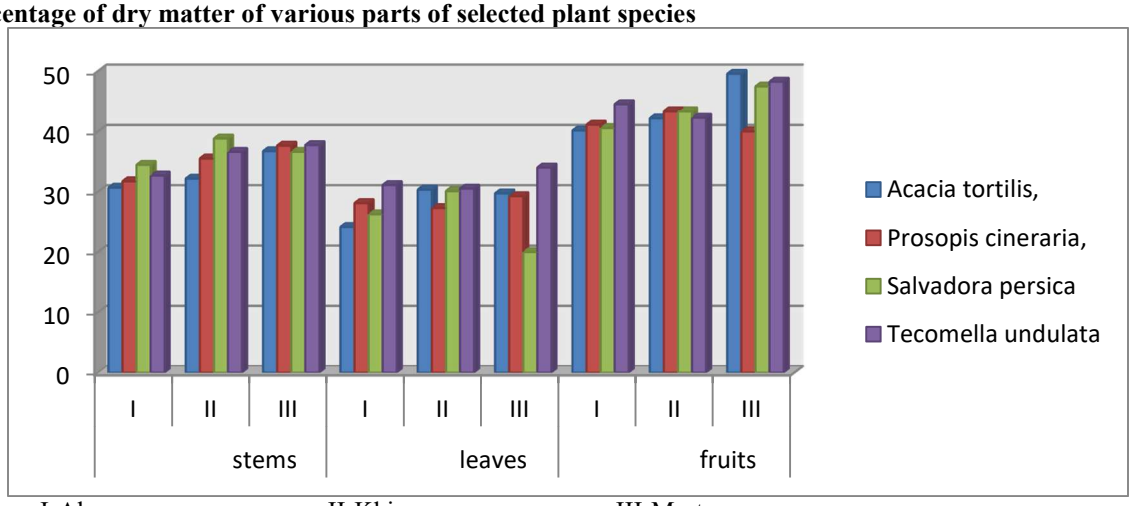
Figure.1 Percentage of dry matter of various parts of selected plant species



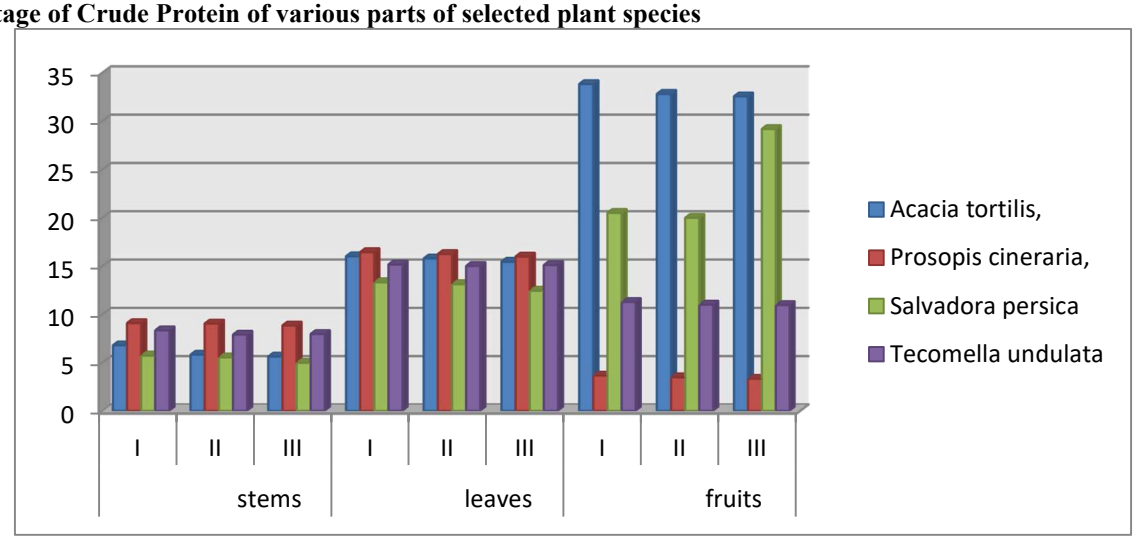
I-Alaye area II-Khinvsar area III-Merta area

Table.2 Percentage of Crude Protein of various parts of selected plant species

Plants	stems			leaves			fruits		
	I	II	III	I	II	III	I	II	III
Acacia tortilis,	6.78	5.82	5.62	16.00	15.78	15.44	33.83	32.81	32.56
Prosopis cineraria,	9.09	9.04	8.84	16.43	16.24	15.98	3.65	3.48	3.32
Salvadora persica	5.73	5.54	4.98	13.32	13.12	12.44	20.50	19.98	29.18
Tecomella undulata	8.34	7.89	7.96	15.15	15.00	15.10	11.27	11.00	10.96

I-Alaye area II-Khinvsar area III-Merta area

Fig.**2 Percentage of Crude Protein of various parts of selected plant species**



I-Alaye area II-Khinvsar area III-Merta area

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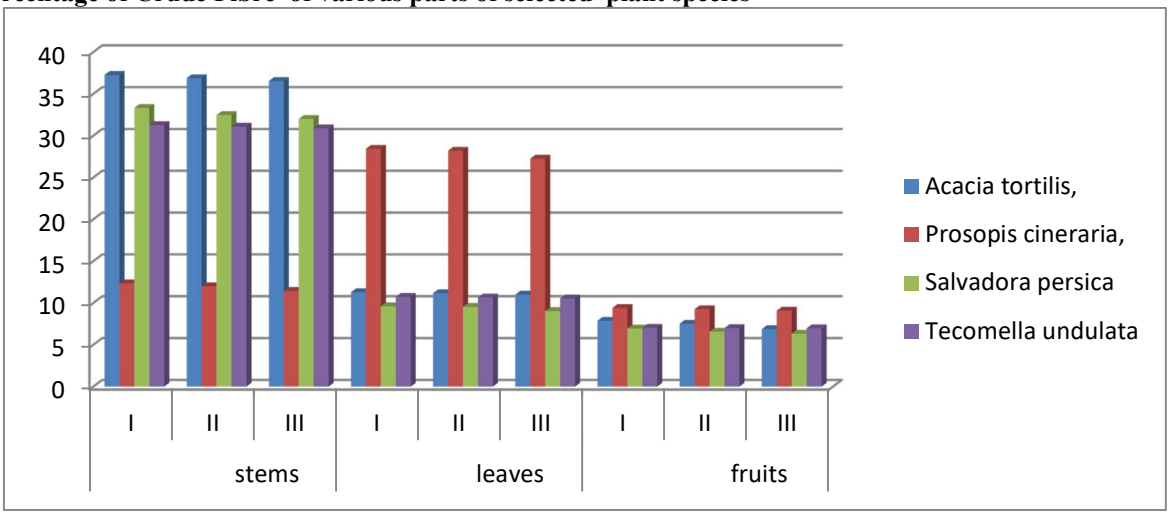
Table.3 Percentage of Crude Fibre of various parts of selected plant species

Plants	stems			leaves			fruits		
	I	II	III	I	II	III	I	II	III
Acacia tortilis,	37.37	36.88	36.54	11.29	11.18	11.00	7.88	7.52	6.88
Prosopis cineraria,	12.35	12.00	11.44	28.44	28.21	27.26	9.41	9.26	9.08
Salvadora persica	33.33	32.48	32.00	9.61	9.54	9.04	6.95	6.57	6.32
Tecomella undulata	31.28	31.09	30.90	10.74	10.66	10.55	7.03	7.00	6.98

I-Alaye area II-Khinvsar area III-Merta area

Figure 3. Percentage of Crude Fibre of various parts of selected plant species



I-Alaye area II-Khinvsar area III-Merta area

Table.4 Percentage of Crude Fat of various parts of selected plant species

Plants	stems			leaves			fruits		
	I	II	III	I	II	III	I	II	III
Acacia tortilis,	1.33	1.21	1.00	3.20	3.27	3.00	3.75	3.64	3.42
Prosopis cineraria,	0.93	0.85	0.60	2.64	2.62	2.54	1.06	1.02	0.98
Salvadora persica	1.17	1.05	1.10	0.61	0.60	0.55	3.84	3.58	3.24
Tecomella undulata	1.01	1.00	0.98	2.83	2.75	2.48	3.65	3.58	3.40

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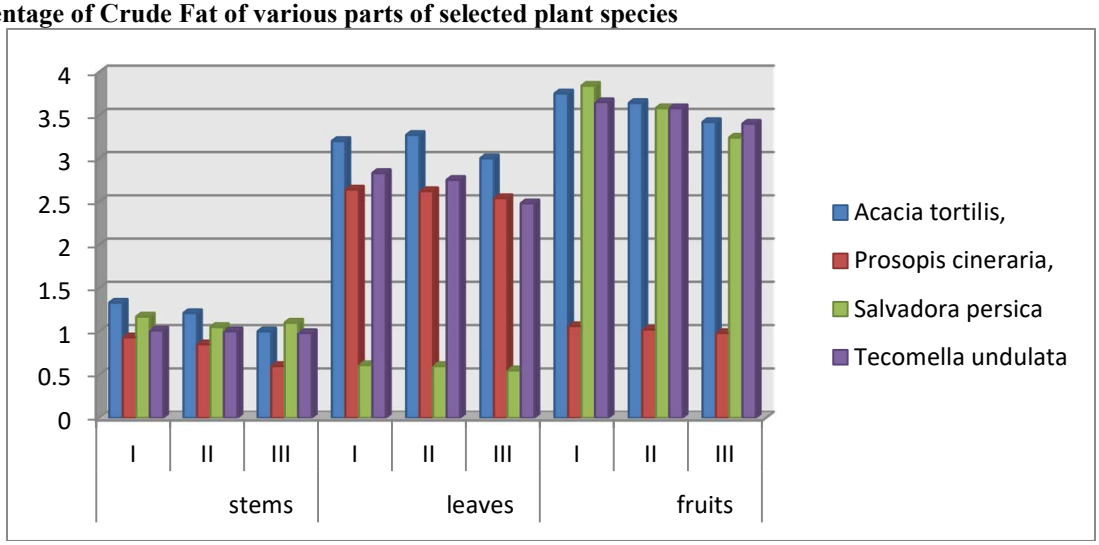
Figure 4. Percentage of Crude Fat of various parts of selected plant species



I-Alaye area II-Khinvsar area III-Merta area

Table.5 Percentage of Total Ash of various parts of selected plant species

Plants	stems			leaves			fruits		
	I	II	III	I	II	III	I	II	III
Acacia tortilis,	8.65	8.24	8.54	9.38	9.48	8.92	5.73	5.79	5.45
Prosopis cineraria,	6.39	5.94	5.98	6.40	6.21	6.00	4.51	4.48	4.24
Salvadora persica	15.60	15.34	15.00	32.56	32.00	31.76	21.40	21.00	20.44
Tecomella undulata	6.81	6.78	6.29	11.92	11.84	11.69	8.22	7.82	7.56

I-Alaye area II-Khinvsar area III-Merta area

Figure.5 Percentage of Total Ash of various parts of selected plant species

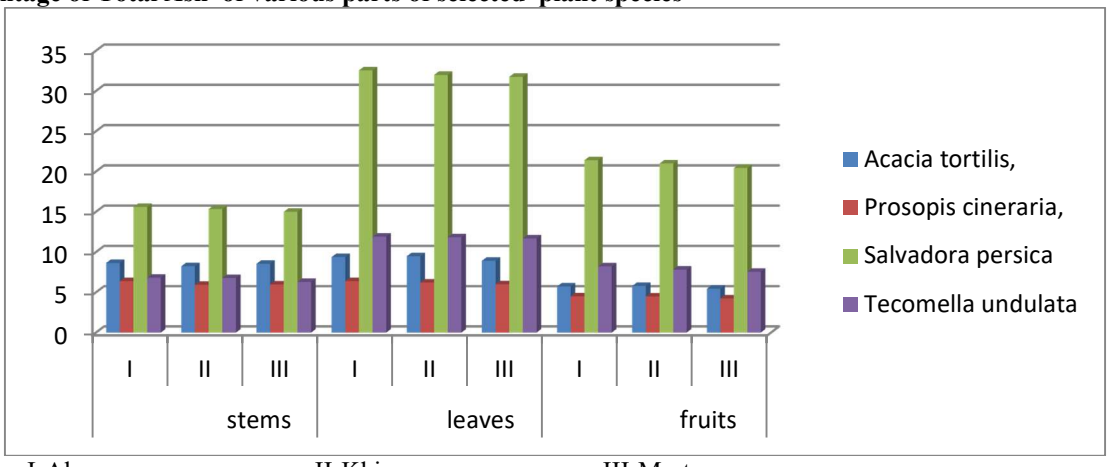


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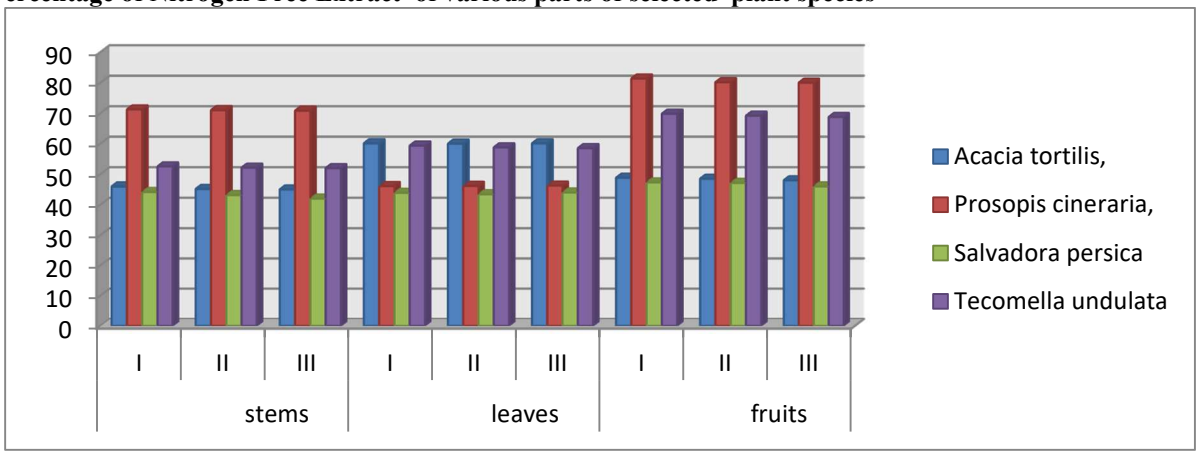
Table.6 Percentage of Nitrogen Free Extract of various parts of selected plant species

Plants	stems			leaves			fruits		
	I	II	III	I	II	III	I	II	III
Acacia tortilis,	45.97	45.16	45.00	60.13	60.00	60.10	48.81	48.51	48.00
Prosopis cineraria,	71.24	71.00	70.84	46.09	46.18	46.24	81.37	80.14	80.00
Salvadora persica	44.17	43.14	42.00	43.90	43.44	44.00	47.31	47.14	46.00
Tecomella undulata	52.54	52.14	51.98	59.36	58.80	58.54	69.83	69.17	68.75

I-Alaye area II-Khinvsar area III-Merta area

Figure.6 **Percentage of Nitrogen Free Extract of various parts of selected plant species**



I-Alaye area II-Khinvsar area III-Merta area

Table.7 Percentage of Organic Matter of various parts of selected plant species

Plants	stems			leaves			fruits		
	I	II	III	I	II	III	I	II	III
Acacia tortilis,	91.35	91.18	90.86	90.62	90.00	89.90	94.27	94.11	93.78
Prosopis cineraria,	93.61	92.59	92.31	93.60	93.44	92.98	95.49	95.00	94.64
Salvadora persica	84.40	84.14	84.00	67.44	66.56	66.48	78.60	78.54	78.00
Tecomella undulata	93.19	93.00	92.95	88.08	88.00	87.75	91.78	90.86	90.51

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Figure.7 Percentage of Organic Matter of various parts of selected plant species

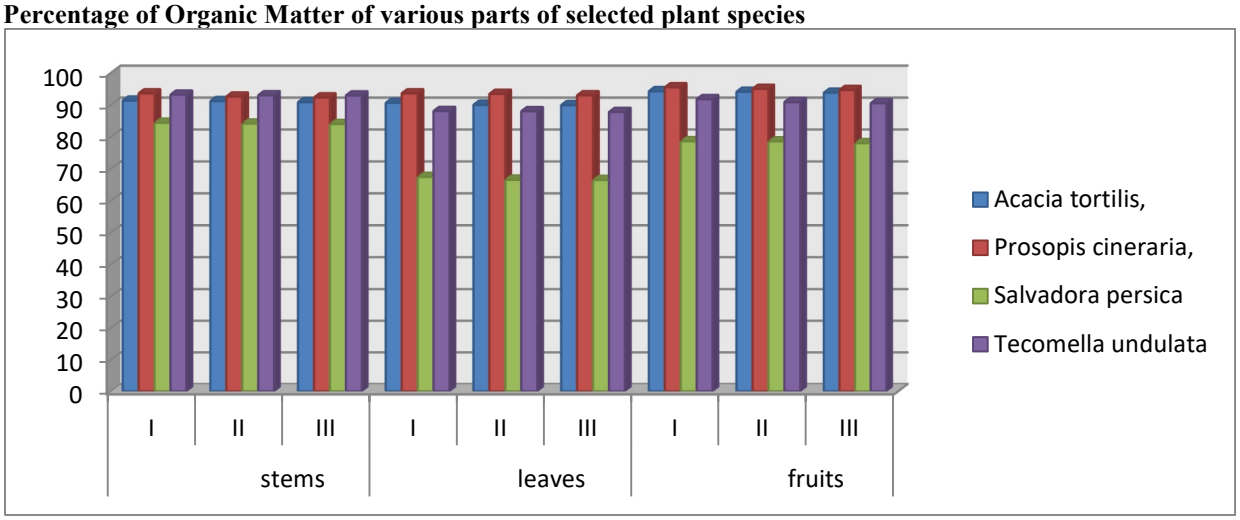

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Table.8 Percentage of Total Carbohydrate of various parts of selected plant species

Plants	stems			leaves			fruits		
	I	II	III	I	II	III	I	II	III
Acacia tortilis,	47.30	46.37	46.00	63.33	63.27	63.10	52.56	52.15	51.42
Prosopis cineraria,	72.17	78.15	71.44	48.73	48.80	48.78	82.43	81.16	80.98
Salvadora persica	45.34	44.19	43.10	44.51	44.04	44.55	51.15	50.72	49.24
Tecomella undulata	53.57	53.14	52.96	62.19	61.55	61.02	73.48	72.75	72.15

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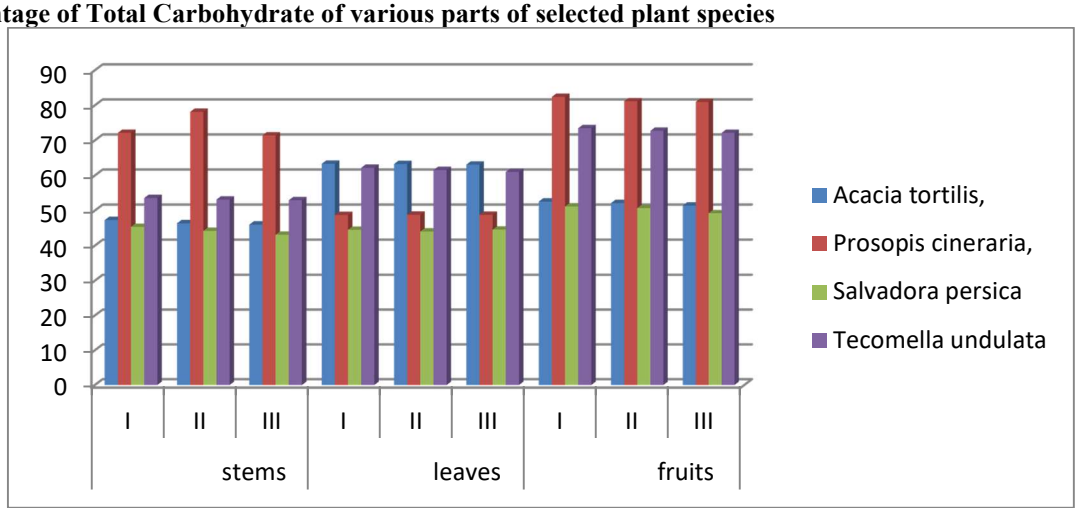
Figure.8 Percentage of Total Carbohydrate of various parts of selected plant species



I-Alaye area II-Khinvsar area III-Merta area