



Research Paper

Taxonomical and floristic study of ground flora in urban area of Jabalpur and its surroundings Madhya Pradesh India

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Abstract: The present paper on Taxonomical and floristic study of ground flora found in urban area of Jabalpur and its surroundings (M.P.), India. Jabalpur is one of the districts in Madhya Pradesh as known City of Ponds with luxurious aesthetic and rich floristic biodiversity of plants. Due to recent drastic changes in urbanization and industrialization have affected the flora of Jabalpur district. It has some hilly tracks covered with luxuriant vegetation along with the forest area is represented by mixed deciduous forest. Taxonomical investigation were undertaken to explore the floristic data of herbaceous plants belongs to several families. The updated data based on DELTA (description language for taxonomy) software with new advancement. A number of plant species also have significant medicinal value.

Keywords: Jabalpur district, Flora, Herbaceous plants, Electronic herbarium.

INTRODUCTION:

Jabalpur is one of the districts of Madhya Pradesh state in central part of India with

rich floristic biodiversity. However, recent urbanization and industrialization has affected the flora of Jabalpur and its surroundings a lot. The district lies between latitudes $23^{\circ} 10'$ North and $79^{\circ} 59'$ East longitude. Climate of the region has fallows as hot season March to Middle June, monsoon/ rainy seasons mid June to September and winter/ cold season October to mid March. The city of Jabalpur is located at an altitude 411 meters and area of the district is 10, 160 sq. km. Jabalpur is prominent place for the “Marble Rock” city of India. A city, which has no parallel in the country. The “Flora of Jabalpur” studied earlier by Oommachan and Shrivastava (1996). After, publication of Flora of Jabalpur several research works have been done, Saini and Charmkar (2014), Verma et al. (2013) etc. So, the main focused of the study to check the floristic biodiversity and taxonomic point of view, because it very necessary to explore existing floristic structure of Jabalpur region update and revise the earlier data. This work has been done by using DELTA (Descriptive

MATERIAL AND METHODS:

Field visits were undertaken to different localities of Jabalpur city throughout the year (various seasons) and collected the digital photographs in natural habitat and plant specimens for observation, identification and data preparation in the laboratory during the study period.

The plant species were identified with help of different floras viz., Flora of Jabalpur (Oommachan and Shrivastava, 1996); Flora of Bhopal (Oommachan, 1977); Flora of Madhya Pradesh (1993; 1997; 2001); Flora of Upper Gangetic plain' (Duthie: 1903-29) and Kirtikar and Basu (1975).

The digital electronic herbarium was constructed and the whole data of plant specimens were feeded in the DELTA software and digital images were attached to the respective plant descriptions in the database. The traditional herbarium method also adopted from Santapau (1961), Jain and Rao (1976) and the prepared herbarium specimens was confirmed at S.F.R.I., Jabalpur (M. P.). Various experts were also consulted for identification, their systematic position and nomenclature of the species, genera and families and other literatures.

RESULTS AND DISCUSSION:

According, floristic study of flora of Jabalpur reported 933 species, 585 genera and 139 families. The distribution of families, genera and species with respect to dicots and monocots. A total 585 genus from which 470 belonging to dicots and 115 belonging to monocots. They have recorded 139 families out of which 113 belonging to dicot and 26 belonging to monocots. Out of 933 species, 745 species are belonging to Dicots and 188 species belonging to Monocots. The ten dominant families in order of their species content were made for the flora of Jabalpur. The families which are given viz., Leguminosae (I), Gramineae (II), Asteraceae (III) , Euphorbiaceae (IV) , Acanthaceae (V), Scrophulariaceae (VI), Malvaceae (VII), Labiatae (VIII), Convolvulaceae (IX) and Verbenaceae (X) respectively (Oommachan and Shrivastava, 1996). Table, the data revealed and enumerates the herbaceous plants which are arrange in botanical name, family and habit respectively. During study period collected 217 herbaceous plant species collected which are belonging to 50 different families in study sites and surroundings in this region.

Table. A number of herbaceous plants collected during survey period from (2011-2013) selected study sites of Jabalpur region.

S. NO.	BOTANICAL NAME	FAMILY	HABIT
1.	<i>Andrographis paniculata</i> (Burm.f.) Wall ex. Ness.	Acanthaceae	Herb
2.	<i>Asteracantha longifolia</i> (Linn.) Nees.	Acanthaceae	Herb
3.	<i>Barleria cristata</i> L.	Acanthaceae	Herb
4.	<i>Blepharis maderaspatensis</i> (L.) Hey.	Acanthaceae	Herb
5.	<i>Justicia procumbens</i> L.	Acanthaceae	Herb
6.	<i>Ruellia tuberosa</i> L.	Acanthaceae	Herb
7.	<i>Achyranthes aspera</i> L.	Amaranthaceae	Herb
8.	<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	Amaranthaceae	Herb

9.	<i>Alternanthera pungens</i> Kunth.	Amaranthaceae	Herb
10.	<i>Alternanthera sessilis</i> (L.) R. Br. ex. DC.	Amaranthaceae	Herb
11.	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Herb
12.	<i>Amaranthus viridis</i> L.	Amaranthaceae	Herb
13.	<i>Celosia argentea</i> L.	Amaranthaceae	Herb
14.	<i>Gomphrena celosioides</i> Mart. Bietr.	Amaranthaceae	Herb
15.	<i>Gomphrena globosa</i> L.	Amaranthaceae	Herb
16.	<i>Crinum delixum</i> Ker. Gawl.	Amaryllidaceae	Herb
17.	<i>Centella asiatica</i> L.	Apiaceae	Herb
18.	<i>Coriandrum sativum</i> L.	Apiaceae	Herb
19.	<i>Trigonella foenum-graecum</i> L.	Apiaceae	Herb
20.	<i>Catharanthus roseus</i> (L.) G. Don.	Apocynaceae	Herb
21.	<i>Rauwolfia serpentina</i> (L.) Benth. Ex.. Kurz.	Apocynaceae	Herb
22.	<i>Colocasia esculenta</i> (L.) Schot.	Aracaceae	Herb
23.	<i>Amorphophallus campanulatus</i> (Roxb.) Bl. ex. Decme.	Araceae	Herb
24.	<i>Asclepias curassavica</i> L.	Asclepiadaceae	Herb
25.	<i>Acanthospermum hispidum</i> DC.	Asteraceae	Herb
26.	<i>Ageratum conyzoides</i> L.	Asteraceae	Herb
27.	<i>Bidens pilosa</i> L.	Asteraceae	Herb
28.	<i>Blumea lacera</i> (Burm.f.) DC.	Asteraceae	Herb
29.	<i>Blumea laciniata</i> (Roxb.) DC.	Asteraceae	Herb
30.	<i>Blumea oxyodonta</i> DC.	Asteraceae	Herb
31.	<i>Caesulia axillaris</i> Roxb.	Asteraceae	Herb
32.	<i>Calendula officinalis</i> Linn.	Asteraceae	Herb
33.	<i>Calyptocarpus vialis</i> Less.	Asteraceae	Herb
34.	<i>Dahlia variabilis</i> Desf.	Asteraceae	Herb
35.	<i>Echinops echinatus</i> Roxb.	Asteraceae	Herb
36.	<i>Eclipta prostrata</i> L.	Asteraceae	Herb
37.	<i>Helianthus annuus</i> L.	Asteraceae	Herb
38.	<i>Lagascea mollis</i> Cav.	Asteraceae	Herb
39.	<i>Parthenium hysterophorus</i> L.	Asteraceae	Herb
40.	<i>Solidago petiolaris</i> Ait.	Asteraceae	Herb
41.	<i>Sonchos asper</i> (L.) Hill.	Asteraceae	Herb
42.	<i>Sphaeranthus indicus</i> L.	Asteraceae	Herb
43.	<i>Tagetes erecta</i> L.	Asteraceae	Herb
44.	<i>Tridax procumbens</i> L.	Asteraceae	Herb
45.	<i>Vernonia cinerea</i> (L.) Less.	Asteraceae	Herb
46.	<i>Wedelia wallichii</i> (Less.) Linn.	Asteraceae	Herb
47.	<i>Xanthium strumarium</i> L.	Asteraceae	Herb
48.	<i>Impatiens balsamina</i> L.	Balsaminaceae	Herb
49.	<i>Brassica campestris</i> L.	Barassicaceae	Herb
50.	<i>Brassica nigra</i> Koch.	Barassicaceae	Herb
51.	<i>Brassica oleracea</i> L.	Barassicaceae	Herb

52.	<i>Helioropium indicum</i> L.	Boraginaceae	Herb
53.	<i>Heliotropium ovalifolium</i> Forsk.	Boraginaceae	Herb
54.	<i>Raphanus sativus</i> L.	Brassicaceae	Herb
55.	<i>Cassia tora</i> L.	Caesalpiniaceae	Herb
56.	<i>Canna indica</i> L.	Cannaceae	Herb
57.	<i>Cleome gynandra</i> L.	Capparidaceae	Herb
58.	<i>Cleome viscosa</i> L.	Capparidaceae	Herb
59.	<i>Spergula arvensis</i> L.	Caryophyllaceae	Herb
60.	<i>Stellaria medica</i> (L.)	Caryophyllaceae	Herb
61.	<i>Chenopodium album</i> L.	Chenopodiaceae	Herb
62.	<i>Commelina attenuate</i> Koen. ex. Vahl.	Commelinaceae	Herb
63.	<i>Commelina benghalensis</i> L.	Commelinaceae	Herb
64.	<i>Commelina erecta</i> L.	Commelinaceae	Herb
65.	<i>Convolvulus alsinoides</i> L.	Convolvulaceae	Herb
66.	<i>Evolvulus alsinoides</i> L.	Convolvulaceae	Herb
67.	<i>Kalanchoe pinnata</i> Lamk.	Crassulaceae	Herb
68.	<i>Cyperus digitatus</i> Roxb.	Cyperaceae	Herb
69.	<i>Cyperus compressus</i> L.	Cyperaceae	Herb
70.	<i>Cyperus difformis</i> L.	Cyperaceae	Herb
71.	<i>Cyperus esculentus</i> Linn.	Cyperaceae	Herb
72.	<i>Cyperus iria</i> L.	Cyperaceae	Herb
73.	<i>Cyperus niveus</i> Retz. Obs.	Cyperaceae	Herb
74.	<i>Cyperus rotundus</i> L.	Cyperaceae	Herb
75.	<i>Cyperus triceps</i> Endl. Cat.	Cyperaceae	Herb
76.	<i>Acalypha ciliata</i> Porsskal.	Euphorbiaceae	Herb
77.	<i>Acalypha indica</i> L.	Euphorbiaceae	Herb
78.	<i>Chroxophora parvifolia</i> Klotz. ex. Schwfth.	Euphorbiaceae	Herb
79.	<i>Chroxophora prostrata</i> Dalz.	Euphorbiaceae	Herb
80.	<i>Euphorbia milii</i> Des.	Euphorbiaceae	Herb
81.	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Herb
82.	<i>Euphorbia prostrata</i> L.	Euphorbiaceae	Herb
83.	<i>Phyllanthus amarus</i> Schum.	Euphorbiaceae	Herb
84.	<i>Hyptis suaveolens</i> (L.) Point. Ann.	Lamiaceae	Herb
85.	<i>Leonotis nepetifolia</i> (L.) R. Br.	Lamiaceae	Herb
86.	<i>Leucas aspera</i> (Willd.) Link. Enum.	Lamiaceae	Herb
87.	<i>Leucas diffusa</i> Benth.	Lamiaceae	Herb
88.	<i>Ocimum basilicum</i> L.	Lamiaceae	Herb
89.	<i>Ocimum cannum</i> Sims.	Lamiaceae	Herb
90.	<i>Ocimum grassiticimum</i> Linn.	Lamiaceae	Herb
91.	<i>Ocimum sanctum</i> L. Mant.	Lamiaceae	Herb
92.	<i>Plectranthus mollis</i> Ait.	Lamiaceae	Herb
93.	<i>Salvia coccinea</i> Jues. ex. Murr.	Lamiaceae	Herb
94.	<i>Salvia plebeia</i> R. Br.	Lamiaceae	Herb
95.	<i>Allium cepa</i> L.	Liliaceae	Herb

96.	<i>Allium sativum</i> L.	Liliaceae	Herb
97.	<i>Aloe barbadensis</i> Mill.	Liliaceae	Herb
98.	<i>Asparagus racemosus</i> Willd.	Liliaceae	Herb
99.	<i>Linum usitatissimum</i> L.	Linaceae	Herb
100.	<i>Abelmoschos ficulensis</i> (Linn.) Wt. et. Arn.	Malvaceae	Herb
101.	<i>Abelmoschus esculentus</i> (L.) Moench.	Malvaceae	Herb
102.	<i>Abelmoschus manihot</i> (L.) Medik.	Malvaceae	Herb
103.	<i>Abelmoschus moschatus</i> Medik.	Malvaceae	Herb
104.	<i>Abutilon indicum</i> (Linn.) Sweet.	Malvaceae	Herb
105.	<i>Malvastrum coromandelianum</i> L.	Malvaceae	Herb
106.	<i>Sida acuta</i> Burm.	Malvaceae	Herb
107.	<i>Sida cordata</i> (Burm. f.) Borss.	Malvaceae	Herb
108.	<i>Sida cordifolia</i> L.	Malvaceae	Herb
109.	<i>Sida rhombifolia</i> L.	Malvaceae	Herb
110.	<i>Tirumifetta rhomboidea</i> Jacq.	Malvaceae	Herb
111.	<i>Triumifetta pilose</i> Roth.	Malvaceae	Herb
112.	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Herb
113.	<i>Mirabilis jalapa</i> L.	Nyctaginaceae	Herb
114.	<i>Oxalis corniculata</i> L.	Oxalidaceae	Herb
115.	<i>Oxalis corymbosa</i> DC.	Oxalidaceae	Herb
116.	<i>Argemone mexicana</i> L.	Papaveraceae	Herb
117.	<i>Alysicarpus longifolius</i> (Rottl ex. Spreng.) Wt. & Arn.	Papilionaceae	Herb
118.	<i>Alysicarpus monilifer</i> (L.) DC.	Papilionaceae	Herb
119.	<i>Alysicarpus vaginalis</i> (L.) DC.	Papilionaceae	Herb
120.	<i>Cajanus cajan</i> (L.) Mill.	Papilionaceae	Herb
121.	<i>Cicer arietinum</i> L.	Papilionaceae	Herb
122.	<i>Crotalaria hirsuta</i> Willd.	Papilionaceae	Herb
123.	<i>Desmodium dichotomum</i> (Willd.) DC.	Papilionaceae	Herb
124.	<i>Desmodium gangeticum</i> (L.) DC.	Papilionaceae	Herb
125.	<i>Desmodium triflorum</i> (L.) DC.	Papilionaceae	Herb
126.	<i>Indigofera cassioides</i> Rottler ex. DC.	Papilionaceae	Herb
127.	<i>Indigofera cordifolia</i> Heyne ex. Roth.	Papilionaceae	Herb
128.	<i>Indigofera hirsute</i> L.	Papilionaceae	Herb
129.	<i>Indigofera tinctoria</i> L.	Papilionaceae	Herb
130.	<i>Indigofera trifoliata</i> L.	Papilionaceae	Herb
131.	<i>Melilotus alba</i> Medik. ex. Desr.	Papilionaceae	Herb
132.	<i>Melilotus indica</i> L.	Papilionaceae	Herb
133.	<i>Tephrosia purpurea</i> (L.) Pers.	Papilionaceae	Herb
134.	<i>Tephrosia stigosa</i> (Dalz.)	Papilionaceae	Herb
135.	<i>Tephrosia villosa</i> (L.) Per.	Papilionaceae	Herb
136.	<i>Vicia hirsuta</i> L.	Papilionaceae	Herb
137.	<i>Vicia sativa</i> L.	Papilionaceae	Herb
138.	<i>Vicoa indica</i> (L.) DC.	Papilionaceae	Herb

139.	<i>Sesamum indicum</i> L.	Pedaliaceae	Herb
140.	<i>Alloteropsis ciminina</i> (L.) Stapf.	Poaceae	Herb
141.	<i>Apluda mutica</i> L.	Poaceae	Herb
142.	<i>Aristida satacea</i> Retz. Obs.	Poaceae	Herb
143.	<i>Avena fatua</i> L.	Poaceae	Herb
144.	<i>Bothriochloa pertusa</i> (L.) A. Camus.	Poaceae	Herb
145.	<i>Brachiaria ramosa</i> (L.) Stapf.	Poaceae	Herb
146.	<i>Brachiaria reptans</i> (L.) Gard. & C.E. Hubb.	Poaceae	Herb
147.	<i>Chloris barbata</i> L.	Poaceae	Herb
148.	<i>Cynodon dactylon</i> (L.) Rers.	Poaceae	Herb
149.	<i>Dactyloctenium aegyptium</i> (L.) Willd. Beauv.	Poaceae	Herb
150.	<i>Dicanthium annulatum</i> (Forssk.) Stapf.	Poaceae	Herb
151.	<i>Digitaria adscendens</i> (H.B. & K.) Henr.	Poaceae	Herb
152.	<i>Digitaria granularis</i> (Trin.) Henr.	Poaceae	Herb
153.	<i>Echinochloa colonum</i> (Linn.) Link.	Poaceae	Herb
154.	<i>Elusine indica</i> (Linn.) Gaertn.	Poaceae	Herb
155.	<i>Eragrostis cilianensis</i> (All.)	Poaceae	Herb
156.	<i>Eragrostis diarrhena</i> (Schult.) Stend.	Poaceae	Herb
157.	<i>Eragrostis pilosa</i> (L.) P. Beauv.	Poaceae	Herb
158.	<i>Eragrostis uniolooides</i> (Retz.) Ness. Ex. Stend.	Poaceae	Herb
159.	<i>Eragrostis viscosa</i> (Retz.) Trin.	Poaceae	Herb
160.	<i>Heteropogon contortus</i> (L.) Beauv. Ex. R. & S.	Poaceae	Herb
161.	<i>Poa annua</i> L.	Poaceae	Herb
162.	<i>Saccharum spontaneum</i> Linn.	Poaceae	Herb
163.	<i>Setaria glauca</i> (L.) P. Beauv.	Poaceae	Herb
164.	<i>Setaria tomentosa</i> (Roxb.) Kunth.	Poaceae	Herb
165.	<i>Sporobolus glaucifolius</i> Hochst ex. Steud.	Poaceae	Herb
166.	<i>Phlox divaricate</i> L.	Polemoniaceae	Herb
167.	<i>Polygonum barbatum</i> L.	Polygonaceae	Herb
168.	<i>Polygonum glabrum</i> Willd.	Polygonaceae	Herb
169.	<i>Polygonum persicaria</i> L.	Polygonaceae	Herb
170.	<i>Portulaca grandiflora</i> Hook.	Portulacaceae	Herb
171.	<i>Portulaca oleracea</i> L.	Portulacaceae	Herb
172.	<i>Anagallis arvensis</i> L.	Primulaceae	Herb
173.	<i>Grevillea robusta</i> Cunn. in R. Br.	Proteaceae	Herb
174.	<i>Delphinium ajacis</i> L.	Ranunculaceae	Herb
175.	<i>Nigella sativa</i> L.	Ranunculaceae	Herb
176.	<i>Ranunculus sceleratus</i> L.	Ranunculaceae	Herb
177.	<i>Rosa indica</i> L.	Rosaceae	Herb
178.	<i>Borreria articularis</i> (Linn. f.)	Rubiaceae	Herb
179.	<i>Hamelia patens</i> Jacq.	Rubiaceae	Herb
180.	<i>Nelumbo nucifera</i> Gaertner.	Rubiaceae	Herb
181.	<i>Oldenlandia corymbosa</i> L.	Rubiaceae	Herb

182.	<i>Spermacoce hispida</i> L.	Rubiaceae	Herb
183.	<i>Cardiospermum helicacabum</i> L.	Sapindaceae	Herb
184.	<i>Bacopa monnieri</i> (L.) Pannel. Proc.	Scrophulariaceae	Herb
185.	<i>Russellia coccinea</i> Wetts in Engl. & Prantl.	Scrophulariaceae	Herb
186.	<i>Scoparia dulcis</i> L.	Scrophulariaceae	Herb
187.	<i>Verbascum chinense</i> (L.)	Scrophulariaceae	Herb
188.	<i>Capsicum annum</i> L.	Solanaceae	Herb
189.	<i>Datura innoxia</i> Mill.	Solanaceae	Herb
190.	<i>Datura metel</i> L.	Solanaceae	Herb
191.	<i>Datura stramonium</i> L.	Solanaceae	Herb
192.	<i>Lycopersicon esculentum</i> Mill.	Solanaceae	Herb
193.	<i>Nicotiana plumbaginifolia</i> Elench.	Solanaceae	Herb
194.	<i>Nicotiana tabacum</i> L.	Solanaceae	Herb
195.	<i>Petunia alpicala</i> L.	Solanaceae	Herb
196.	<i>Physalis minima</i> L.	Solanaceae	Herb
197.	<i>Solanum anguivi</i> Lamk. Tabl.	Solanaceae	Herb
198.	<i>Solanum melongena</i> L.	Solanaceae	Herb
199.	<i>Solanum nigrum</i> L.	Solanaceae	Herb
200.	<i>Solanum surattense</i> Burm. f.	Solanaceae	Herb
201.	<i>Solanum torvum</i> Sw.	Solanaceae	Herb
202.	<i>Solanum tuberosum</i> L.	Solanaceae	Herb
203.	<i>Spigelia anthelmia</i> L.	Spigeliaceae	Herb
204.	<i>Helicteres isora</i> L.	Sterculiaceae	Herb
205.	<i>Spilanthes paniculata</i> Wall. ex DC	Sterculiaceae	Herb
206.	<i>Waltheria indica</i> L.	Sterculiaceae	Herb
207.	<i>Corchorus aestuans</i> L.	Tiliaceae	Herb
208.	<i>Corchorus capsulairs</i> L.	Tiliaceae	Herb
209.	<i>Corchorus tricularis</i> L. Mant.	Tiliaceae	Herb
210.	<i>Turnaria ulmifolia</i> L.	Turneraceae	Herb
211.	<i>Lantana camara</i> L.	Verbenaceae	Herb
212.	<i>Verbena bipinnatifida</i> Schan.	Verbenaceae	Herb
213.	<i>Verbena officinalis</i> L.	Verbenaceae	Herb
214.	<i>Cissus quadrangularis</i> L. Mantiss.	Vitidaceae	Herb
215.	<i>Costrus speciosa</i> (Koenig) Sm. Trans.	Zingiberaceae	Herb
216.	<i>Curcuma amada</i> Roxb.	Zingiberaceae	Herb
217.	<i>Tribulus terrestris</i> L.	Zygophyllaceae	Herb

Similarly, during present studies were reported and listed families which are found in entire of this Jabalpur city and its surroundings, the families names viz., Acanthaceae, Amaranthaceae, Apiaceae, Apocynaceae, Aracaceae, Araceae, Asclepiadaceae, Asteraceae, Balsaminaceae,

Barassicaceae, Caesalpiniaceae, Cannaceae, Capparidaceae, Caryophyllaceae, Caryophyllaceae, Chenopodiaceae, Commelinaceae, Convolvulaceae, Crassulaceae, Cyperaceae, Euphorbiaceae, Lamiaceae, Liliaceae, Linaceae, Malvaceae, Nyctaginaceae, Oxalidaceae, Papaveraceae,

Papilionaceae, Pedaliaceae, Poaceae, Polemoniaceae, Polygonaceae, Portulacaceae, Primulaceae, Proteaceae, Ranunculaceae, Rosaceae, Rubiaceae, Sapindaceae, Scrophulariaceae, Solanaceae, Spigeliaceae, Sterculiaceae, Tiliaceae, Turneraceae, Verbenaceae, Vitidaceae, Zingiberaceae and Zygophyllaceae listed in above table 1.

Consequently, the ten dominant families recorded during study period. These families names viz., Poaceae (25), Asteraceae (23), Papilionaceae (21), Solanaceae (15), Malvaceae (12), Lamiaceae (11), Amaranthaceae (09), Euphorbiaceae (08), Cyperaceae (08) and Acanthaceae (06) respectively.

During study period prepared electronic herbarium with the help of DELTA software (description language for taxonomy). The digital electronic herbarium software prepared 190 morphological characters (Roots, Stems, Leafs, Flowers, Fruits and Seeds) added in software with digital photographs. The electronic herbarium are very ecofriendly, non destructive environment and useful for the young researchers and future.

Conclusion: The present study of this region very rich and luxurious diversity with high medicinal value area needs to be determined in order to develop plans for their protection. Improve awareness of conservation and sustainable use.

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