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FLORA OF JARGA HILLS OF SOUTHERN RAJASTHAN, INDIA

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ABSTRACT

Jarga hill is confined to Udaipur and Rajsamand districts in southern Aravallis. It is a notified reserve forest in the records of forest department. Total area of Jarga Reserve forest block is 2799 ha. This forest is rich in floral diversity. As many as 424 flowering plant species, belongs to 312 genera and 99 families are confined to Jarga forest. Herb and tree species are dominant in this reserve forest. Being close to Kumbhalgarh Wildlife Sanctuary its protection and conservation is needed because it can sustain the spillover animals of the sanctuary.

Keywords: Flora, Jarga hill, Southern Rajasthan.

INTRODUCTION

Jarga Hill is confined to Udaipur and Rajsamand districts of southern Rajasthan. This hill is a notified Reserve forest and known as Jarga Reserve Forest block in records of the Forest department. Total area of Jarga reserve forest block is 2799 ha., out of which 2631.64 ha. area is managed by Sayara Range of Udaipur (North) Forest Division and rest 167.36 ha. is managed by Kumbhalgarh Range of Rajsamand Forest Division.

Guru Sikhar of Mount Abu is the highest peak (*c.* 1727 m above MSL) of Rajasthan situated in Sirohi district. After Mout Abu, Jarga peak is the second highest peak of the State having height about 1431 m. above MSL.

Eastern and western flowing rivers originate from southern Aravallis. Eastern Banas river is one of very important rivers of Rajasthan which originate from Jarga and Kumbhalgarh hills which is a tributary of eastward flowing drainage system. The runoff of Jarga hill join the eastern flowing drainage system and ultimately river Banas joins river Chambal, which joins river Yamuna and ultimately water reaches to the bay of Bangal.

Orientation of Jarga hill is North to South direction. Thus its one slope faces west and another to east direction. Two famous pilgrim centers are present on both the faces of Jarga hill. “Juna Jarga” pilgrim center is present on the eastern slope while “Naya Jarga” is present on the western slope. Micro-climate of both the pilgrim centers is cool and moist. Continuity of Jarga hill with Kumbhalgarh Wildlife Sanctuary makes this forest ecologically very important. The spillover of wild animals of Kumbhalgarh sanctuary reaches to Jarga hill and vice-versa. Leopard, Sloth Bear, Four-horned Antelope, Grey Junglefowl, Aravalli Red Spurfowl, Three-striped Palm Squirrel, Green Munia, Python etc. and important wild animals of the Jarga hill.

STUDY AREA AND STUDY PERIOD

Both the slopes of Jarga hill were studied from 2010 to 2016 to list the wild flora of this block. Many aspects of flora of Aravallis, Mount Abu and other parts of the state can be had from Awasthi (1995), Bhandari (1990), Ramdev (1969), Sharma (2002), Sharma and Tiagi (1979), Sharma and Dube (2008), Sharma and Katewa (2008), Sharma (2007 & 2016), Shetty and Singh (1987-1993), and Tiagi and Aery (2007), but no information is available for

Jarga hill. Hence present study was conducted to bridge the gap.

METHODOLOGY

Many criss-cross transactions were made to record the various plant species growing in the area. Many surveys were conducted form bottom zone to crest area and from end to end “Juna Jarga” and “Naya Jarga” sacred groves were surveyed extensively and intensively. On foot linear surveys were done along both the banks of eastern Banas river near “Naya Jarga” pilgrim site. Three main season viz., rain, winter and summer prevails in the area. Each season has its own importance. Though many “season wise surveys” were conducted but more emphasis was given on rainy season survey. This season is much suitable to study the tuberous and seasonal herbaceous species. Summer season is equally important because most of the Aravallian tree species flower and fruit between March to June, before onset of the monsoon. Various old buildings were also visited during rainy season to record the ruderal species growing on walls, parapet and roof areas. Help of local forest officers was seeked to probe the interior area. Since area is prone to Sloth Bear attack, hence few local tribles were accompanied during surveys.

The study area was visited 3-4 times during all seasons. Plants are collected by layind quadrants- 10m x 10m for trees, 5m x 5m for shrubs and 1m x 1m for herbs. The collected plant species were identified with the help of herbarium sheets and local floras with the help of botanists in the Univetrsity Department of Botany. Figs. 1-3 are among quite interesting and common herbaceous plants.

Fig. 1. White flowered *Argemone ochroleuca* is sometimes found in vicinity of *Argemone Mexicana*

Fig. 2. Fruit of *Trichosanthese bracteata*

Fig. 3. White midrib of *Hemidesmus indicus* leaf is a typical feature

RESULTS AND DISCUSSION

The findings of surveys are presented in Table 1.

Table 1. Flora of Jarga hill

S. No	Family*	Species presence in Jarga Hill**
1	Annonaceae	*Annona squamosa (S), Miliusa tomentosa (T)*
2	Menispermaceae	*Cissampelos pareira (TW), Cocculus hirsutus (SC), Tinospora cordiflolia (C)*
3	Nymphaeaceae	*Nymphaea pubescens (H)*
4	Nelumbonaceae	*Nelumbo nucifera (H)*
5	Papaveraceae	*Argemone mexicana (H), A. ochroleuca (H)*
6	Brassicaceae	*Coronopus didymus (H), Sisymbrium irio (H)*
7	Cleomaceae	*Cleome brachycarpa (H), Cleome gynadra (H), C. simplicifolia (H)*
8	Capparaceae	*Capparis grandis (T), C.sepiaria (SC), Crateva adansonii (T), Maerua arenaria (C)*
9	Flacourtiaceae	*Casearia elliptica (T), Flacourtia indica (S)*
10	Polygalaceae	*Polygala erioptera (H)*
11	Tamaricaceae	*Tamarix ericoides (S)*
12	Malvaceae	*Abutilon indicum (US), Hibiscus caesius (H), H. micranthus (S), Malvastrum coromandelianum (US), Sida acuta (US), S. cordata (H), Urena lobata (US)*
13	Bombacaceae	*Adansonia digitata (T,P), Bombax ceiba (T)*
14	Sterculiaceae	*Eriolaena hookeriana (S), E. quinquelocularis (T), Firmiana colorata (T), Helicteres isora (S), Melhania futteyporensis (S), Sterculia urens (T)*
15	Tiliaceae	*Corchorus aestuans (H), C.depressus (H), C.trilocularis (H), Grewia flavescens (S), G. tenax (S), G. tiliifolia (T), G. villosa (S), Trimumfetta pentandra (H)*
16	Malpighiaceae	*Hiptage benghalensis (C)*
17	Zygophyllaceae	*Tribulus terrestris (H)*
18	Oxalidaceae	*Biophytum sensitivum (H), Oxalis corniculata (H)*
19	Balsaminaceae	*Impatiens balsamina (H)*
20	Rutaceae	*Aegle marmelos (T), Feronia limonia (T)*
21	Simaroubaceae	*Ailanthus excelsa (T)*
22	Balanitaceae	*Balanites aegyptiaca (T)*
23	Burseraceae	*Boswellia serrata (T)*
24	Meliaceae	*Azadirachta indica (T), Melia azedaracle (T), Soymida febrifuga (T), Toona ciliata (T)*
25	Celastraceae	*Celastrus paniculata (C), Maytenus senegalensis (T)*
26	Rhamnaceae	*Ziziphus mauritiana (T), Z. nummularia (S), Z. xylopyrus (T)*
27	Vitaceae	*Ampelocissus latifolia (C), Cayratia trifolia (C)*
28	Leeaceae	*Leea edgeworthi (H)*
29	Sapindaceae	*Cardiospermum halicacabum (C), Sapindus laurifolius (T)*
30	Anacardiaceae	*Lannea coromandelica (T), Mangifera indica (T)*
31	Moringaceae	*Moringa concanensis (T), M. oleifera (T)*
33	Fabaceae	*Abrus precatorius (TW), Aerchynomene indicum (H), Alysicarpus vagiualis (H), Butea monosperma (T), Clitoria ternatea (TW), Crotalaria medicaginea (H), Dalbergia lanceolaria (T), D. latifolia (T), Desmodium gangeticum (US), D. triflorum (H), Erythrina stricta (T), Flemingia strobilifera (S), Indigofera angulosa (H), I. cordifolia (H), I. hirsute (H), I. linifolia (H), I. tinctoria (US), Mucuna pruriens (TW), Ougeinia oogeinsis (T), Pongamia pinnata (T), Pterocarpus marsupium (T), Rhynchosia minima (TW), R. rothii (TW), Tephrosia candida (US), Tephrosia purpurea (H), T. villosa (US), Zornia gibbosa (H)*
34	Caesalpiniaceae	*Bauhinia racemosa (T), B. variegata (T), Caesalpinia bonduc (SC), C. decapetala (SC), Cassia auriculata (S), C. fistula (T), C. occidentolis (US), C. pumila (H), C. tora (H), Tamarindus indica (T)*
35	Mimosaceae	*Acacia catechu (T), A. farnesiana (S), A. lencophloea (T), A. nilotica subsp. cupressiformis (T), A.nilotica subsp. indica (T), A. pennata (SC), A. senegal (T),*

S. No	Family*	Species presence in Jarga Hill**
		A. suma (T,P), Albizia lebbeck (T), A. odoratissima (T), Dichrostachys cinerea (S), Pithecellobium dulce (T), Prosopris cineraria (T), P. julifolora (T)
36	Combretaceae	*Anogeissus acuminata (T), A. latifolia (T), A. pendula (T), Terminalia bellirica (T)*
37	Myrtaceae	*Syzygium cumini (T), S. hegneanum (T)*
38	Lythraceae	*Woodfordia fruticosa (S)*
39	Cucurbitaceae	*Coccinia grandis (SC), Corallocarpus epigaeus (C), Cucumis prophetarum (C), C. setosus (C), C.melo* var. *agrestis (C), Diplocyclos palmatus (C), Luffa acutangula* var. *amara (C), Momordica balsamina (C), M. dioica (C), Trichosanthese bracteata (C), T. cucumerina (C)*
40	Cactaceae	*Opuntia dillenii (S)*
41	Aizoaceae (Ficoideae)	*Trianthema portulacastrum (H), Zaleya govindia (H)*
42	Molluginaceae	*Mollugo nudicaulis (H)*
43	Alangiaceae	*Alangium salvifolium (S)*
44	Rubiaceae	*Adina cordifolia (T), Borreria pusilla (H), Gardenia turgida (T), Hymenodictyon excelsum (T), Mitragyna parvifolia (T), Spermodictyon suaveolens (S), Xeromphis uliginosa (T)*
45	Asteraceae	*Acanthospermum hispidum (H), Anaphalis adnata (HS), Ageratum conyzoides (H), A. hourtonianum (H), Artemisia nilagirica (HS), A. parviflora (H), Blumea mollis (H), Bidens biternata (H), Blainvilea acmella (H), Centipeda minima (H), Cyathocline purpurea (H), Echinops echinatus (H), Eclipta alba (H), Flaveria trinervia (H), Glossocardia bosvallea (H), Grangea maderaspatana (H), Lagascea mollis (H), Launaea procumbens (H), Oligochoeta ramosa (H), Parthenium hysterophorus (H), Pluchea tomentosa (H), Pulicaria wightii (H), Sonchus brachyotus (H), Tridax procumtbens (H), Xanthium strumarium (H), Vernovia anthelmintica (H), V. cinerea (H)*
46	Plumbaginaceae	*Dyerophytum indicum (S), Plumbago zeylanica (S)*
47	Primulaceae	*Anagalis arvensis (H)*
48	Sapotaceae	*Madhuca indica (T), Manilkara hexandra (T)*
49	Ebenaceae	*Diosyros cordifolia (T), D. melanoxylon (T)*
50	Oleaceae	*Jasminum grandiflorum (S), Nyctanthes arbor-tristis (S), Schrebera swietenioides (T)*
51	Salvadoraceae	*Salvadora oleoides (T), S.persica (T)*
52	Apocynoaceae	*Carissa spinarum (S), Catharanthus pusillus (H), Holarrhena pubescens (S), Ichnocarpus frutescens (TW), Vallaris solanacea (TW), Wrightia arborea (T), W. tinctoria (T), Narium oleander (S)*
53	Asclepiadaceae	*Calotropis gigantea (S), C.procera (S), Ceropegia bulbosa bulbosa (TW), C. bulbosa lushii (TW), Holostemma adokodien (TW), Leptadenia pyrotechnica (S), L. retiulata (TW), Perguaria doemia (TW), Sarcostemma viminale (S), Telosma cordata (TW), Wattakaka volubilis (TW)*
54	Periplocaceae	*Cryptolepis buchanani (TW), Cryptostegia grandiflora (SC), Hemidesmus indicus (SC)*
55	Spigeliaceae	*Mitreola petiolata (H)*
56	Gentianaceae	*Canscora decussata (H), C. diffusa (H), Enicostema axillare (H)*
57	Boraginaceae	*Coldenia procumbens (H), Heliotropium indicum (H), H. marifolium (H), H. ovalifolium (H), Trichodesma indica (H)*
58	Ehretiaceae	*Cordia dichotoma (T), C. gharaf (T), Ehretia aspera (T), E.laevis (T), E.serrata (T)*
59	Convolvulaceae	*Convolvulus stocksii (H), Evolvulus alsinoides (H), E. nummularia (H), Ipomoea aquatic (H), I. nil (TW), I. obscura (TW), I. pes-tigridis (TW), Merremia aegyptia (TW), M. emarginata (H), M. quinaquefolia (H), Rivea hypocrateriformis (C)*
60	Cuscutaceae	*Cuscuta chinensis (TW), C. hyalina (TW), C. reflexa (TW)*

S. No	Family*	Species presence in Jarga Hill**
61	Solanaceae	*Datura ferox (H), D. innoxia (H), Nicotiana pulmbaginifolia (H), Physalis angulata (H), Physalis minima (H), Solanum incanum (US), S. violaceum (T), S. nigrum (H), Withania somnifera (US)*
62	Scrophulariaceae	*Bacopa monnieri (H), Craterostigma plantagineum (H), Kickxia ramosissima (H), Limnophila indica (H), Lindenbergia indica (H), Striga gesnerioides (H)*
63	Lentibulariaceae	*Utricularia exoleta (H)*
64	Gesneriaceae	*Didymocarpus pygmaea (H)*
65	Bignoniaceae	*Millingtonia hortensis (T), Oroxylum indicum (T), Stereospermum colais (T), Tecomella undulata (T)*
66	Pedaliaceae	*Sesamum indicum (H)*
67	Martyniaceae	*Martynia annua (H)*
68	Acanthaceae	*Adhatoda beddomei (S), A.zeylanica (S), Barleria acanthoides (US), B. cristata (US), B. prionitis (US), Blepharis maderaspatensis (H), Dicliptera verticillata (H), Dipterocanthus patulus (US), Elytraria acaulis (H), Eranthemum purpurascens (H), Hygrophila auriculata (H), H. serpyllum (H), Indoneesiella echioides (H), Justicia procumbens (H), Lepidagathis cristata (H), L. cuspidata (H), L.trinervis (H), Peristrophe paniculata (H), Ruellia taberosa (H), Rungia elegans (H)*
69	Verbenaceae	*Clerodendrum phlomidis (S), Gmelina arborea (T), Lantana camara (S), Phyla nodiflora (H), Vitex negundo (S)*
70	Lamiaceae	*Anisomells indica (H), Hyptis suaveolens (H), Lavandula bipinnata (H), Leonotis nepetiifolia (H), Leucas aspera (H), L. biflora (H), L.urticaefolia (H), Ocimum canum (H), Plectranthus rogusus (H)*
71	Nyctaginaceae	*Boerhavia diffusa (H), B. erecta (H), Commicarpus chinensis (H), Mirabilis jalapa (H)*
72	Amaranthaceae	*Achyranthes aspera (H), Aerva javanica (H), Alternanthera sessilis (H), Amaranthus spinosus (H), Celosia argentia (H), Digera muricata (H), Gomphrena celosioides (H), Pupalia lappacea (H)*
73	Chenopodiaceae	*Chenopodium album (H), C. murale (H)*
74	Polygonaceae	*Polygonum glabrum (H), P.plebeium effusa (H), Rumex dentatus (H)*
75	Loranthaceae	*Dendrophthoe falcata falcata (S,PS), D. falcata coccinia (S, PS)*
76	Santalaceae	*Santalum album (T, PS)*
77	Euphorbiaceae	*Acalypha ciliata (H), Bridelia retusa (T), Chrozophora rottleri (H), Croton bonplandianum (H), Euphorbia caducifolia (S), E. hirta (H), E.neriifolia (S), E. nivulia (S), Jatropha curcas (S), J.gossypifolia (S), Kirganelia reticulata (S), Mallotus philippensis (T), Phyllanthus emblica (T), P.fraternus (H), P. virgatus (H), Ricinum communis (S), Securinega leucopyrus (S), S. virosa (S)*
78	Ulmaceae	*Celtis tetrandra (T), Holoptelea integrifolia (T), Trema orientalis (T), T. politoria (T)*
79	Cannabinaceae	*Cannabis sativa (H)*
80	Moraceae	*Ficus amplissima (T), F. arnottiana (T), F. benghalensis (T), F. palmata (T), F. racemosa (T), F. religiosa (T), F. virens (T)*
81	Urticaceae	*Girardinia zeylanica (H)*
82	Salicaceae	*Salix tetrasperma (T)*
83	Ceratophyllaceae	*Ceratophyllum demersum (H)*
84	Hydrocharitaceae	*Hydrilla verticillata (H), Vallisneria spiralis (H)*
85	Zingiberaceae	*Curcuma indora (H)*
86	Musaceae	*Ensete suberbum (H)*
87	Amaryllidaceae	*Crinum defixum (H), C. latifolium (H)*
88	Agavaceae	*Agave americana (S), A. angustifolia (S), Furcraea foetida (S)*
89	Hypoxidaceae	*Curculigo orchioides (H)*
90	Dioscoreaceae	*Dioscorea bulbifera (TW)*

S. No	Family*	Species presence in Jarga Hill**
91	Liliaceae	*Aloea vera (H), Asparagus gracilis (US), A. racemosus (SC), Gloriosa superba (H), Urgenia indica (H)*
92	Commelinaceae	*Commelina forskaolii (H), C.benghalensis (H)*
93	Arecaceae	*Phoenix sylvestris (T)*
94	Pandanaceae	*Pandanus fascicularis (T)*
95	Typhaceae	*Typha angustata (H)*
96	Araceae	*Arisoema tortuosum (H), Colocasia esculenta (H), Sauromatum pedatum (H)*
97	Lemnaceae	*Lemna minor (H), Wolffia arrhiza (H)*
98	Cyperaceae	*Cyperus alopecuroides (H), C. difformis (H), C. nutans (H), Fimbristylis bisumbellata (H), F. schoenoides (H), Pycresu pumilus (H)*
99	Poaceae	*Alloteropsis cimicina (H), Apluda mutica (H), Aristida adscensionis (H), Arthroxon lancifolius (H), Chloris dolichostachga (H), C. virgata (H), Chrysopogon fulvus (H), Cymbopogon martinii (H), Cynodon dactylon (H), Dactyloctenium aegyptium (H), Dendrocalamus strictus (S), Dicanthium annulatum (H), D. pertusum (H), Echinochloa colona (H), Eragrostis tenella (H), Eremopogon foveolatus (H), Heteropogon contortus (H), Melanocenchris jacquemontii (H), Oplismenus burmannii (H), O. compositus (H), Oropetium thomoeum (H), Panicum sumatrense (H), P. psilopodium (H), Paspalidium flavidum (H), P. geminatum (H), Perotis indica (H), Phragmites australis (H), Saccharum spontaneum (H), Sehima nervosum (H), Setaria glauca (H), S.pumila (H), S. verticillata (H), Sorghum halepense (H), Sporobolus diander (H), Tetropogon tenellus (H), Themeda quadrivalvis (H), Tragus biflorus (H), Tripogon jacquemontii (H), Tripogon lisboae (H), Vetiveria zizanioides (H)*

* *From 1 to 83 are Dicot families and from 84 to 99 are Monocot families.*

** *T = Tree, S = Shrub, H = Herb, TW = Twiner, C = Climber, PS= Partial stem parasite, US = Under shrub, SC = Scandent, P = Planted*

Summary:

Major group	Family	Genera	Species
Dicot	83	254	353
Monocot	16	58	71
Total	99	312	424

S. No.	Habit	Dicot	Monocot	Total
1	Herb	147	62	209
2	Shrub/Under Shrub	60	5	65
3	Tree	97	2	99
4	Twiner/Scandent/ Climber	49	2	51
	Total	353	71	424

Jarga hill is rich in angiospermic floral diversity. As many as 424 species, belongs to 312 genera and 99 family are confined to this reserve forest. Herbs and trees are making dominant group over here. *Dalbergia sericea*, a rare species of the state, was seen in the campus of Jheelwara outpost of Kumbhalgarh Sanctuary, was not seen in this forest block. Two strains of *Prunus persica*, locally called "*Aru*" are commonly planted near wells and water chanels in this area. This species is absent in the wild. Three species of *Angoeissus* genus namely, *A. acuminata, A. latifolia* and *A. pendula* occur in this area. *A. sericea* var. *sericea* is absent in this hill, however, this species is dottedly present between Sadri and Jodhpur in arid areas. Sadri is 20 km away from northern end of Jarga hills. A dense grove of the *Tamarindus indicus* in present near "Naya Jarga Temple" on the hill slope.

Narium oleander, locally called *Kaner* is a native of Mediterranean region, which is cultivated as ornamental plant (Shetty & Singh 1991) in the state, has been naturalized in the moist and fluvial streams of Jarga hill and other surrounding areas like, Kumbhalgarh sanctuary, Deola, Phulwari-ki-nal sanctuary and Khokhariya-ki-nal. These all the localities are confined to southern Aravallis. White, pink and red flowered forms can be seen growing here and there in various streams. At the beginning of summer (March-April), when *Kaner* flowers, streams become picturesque.

Ehretia serrata is one of the rare trees of Rajasthan known from Mount Abu only (Shetty & Singh, 1991), but his species is grown near wells and water chanels in and around Jarga hill (Sharma, 2016). This tree is confined to Kailwara (Kumbhalgarh), Gogunda, Kotra and Jhadol tehsils only besides Mt. Abu. A tree of *Solanum violaceum* was also seen near “Naya Jarga” towards ridgeline of the hill. *Tecomella udulata* is a desertic species which is rare in this zone. Only few individuals are seen in well drained pockets. The trees present in this area produce yellow colored flowers during summer season. When they are in flowering stage, they become more noticeable. Red coloured forms, which are common in western Rajasthan are missing over here.

Teak (*Tectona grandis*) is absent in Jarga hills but a big patch of this species is present in Sageti Reserve Forest block of Sayara Range. Sageti block is around 10 km away from southern end of Jarga hill. Sageti block is the northern most and the western most distribution limit of teak in Rajasthan as well as in India.

Two varieties of *Dendropthoe falcata* are seen in this area, white flowered *D.falcata falcata* and red coloured *D. flacata coccinia*. Red flowered variety is more common, generally seen growing as partially stem parasite on the Salar *(Boswellia serrata)* trees. The white flowered variety is though rare but seen on many host species.

Mallotus philippensis is very common in Jarga hill, especially this species is very common around “Naya Jarga” temple.

Crinum defixum is an amphibious plant, grows in streams of the area. This species is seen here and there in eastward flowing streams and rivers. It can be seen from Jarga-Kumbhalgarh area to Baran district which is the extreme south-east part of the state. *C. defixum* is absent in westward flowing rivers like western Banas, Luni, Maghai Mansi, Wakal, Sabarmati, Jawai and Sukri. At the beginning of the monsoon, new arching leaves appear in this species, but as time passes, upper halves of leaves become decayed and de-tipped leaves are seen in the nature.

During rainy season, area becomes lush green. Tall grasses can be seen in open areas and at fringes of the forest. Perennial grasses are common in the area. A small grass *Tripogon lisboae* is seen growing in tufts on mosses, present on the big sized rocks. *Tripogon jucquemotii* grass is seen growing on walls of the buildings as ruderal flora.

Wild plantain *(Ensete superbum)* can be seen in rainy season in many localities of Udaipur and Rajsamand district. The northern as well as western most distribution limits of this species in Rajasthan are passing through Jarga and adjacent hills. Beyond Jarga hill, this species is absent from central and northern Aravallis.

During rainy season many fungi can be seen on forest floor where cool and moist conditions are present. Where clumps of *Dendrocalamus strictus* are common, and abundant fallen leaves are present on the ground in semi rotten condition, *Clavaria miniata* and *C. vermicularis* are commonly seen during rainy season. *C. miniata* has been reported from Ubheshwar hills by Sharma *et al.,* (2016). *C. miniata* and *C. vermicularis* can be seen from Kumbhalgarh Wildlife Sanctuary to Phulwari-Ki-Nal Wildlife Sanctuary in bamboo brakes. Both these fungi conspicuously grow in forest floor in Gamdi Ki Nal area of Phulwari Wildlife Sanctuary which is situated south of Jarga hill.

Traditional wells are common in Jarga-Kumbhalgarh area. Persian wheels are generally seen on every well for irrigation. Wells of area support many ruderal species on their uppermost inner surfaces. Not only flowering plants but various species of ferns are also very common in the wells. When Persian wheels are operated for irrigation, spillover water moistens the inner surface of wells, and ultimately many plant species colonize the moist surface.

Jarga hill is very important hill from Wildlife conservation point of view. It should be protected and conserved seriously as being its location very close to Kumbhalgarh sanctuary. It can support spill over wildlife of the sanctuary very well.

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