

Floristic Diversity of Raichur Fort Karnataka India

HC Shrishail¹, Siddappa Kakkalame², Madhura S³, Yogashree G D⁴

¹Assistant Professor, Department of Applied Botany, Kuvempu University, Shankaraghatta, Karnataka, India

²Assistant Professor, Department of Botany, Davanagere University, Karnataka, India

³Research Scholar, Department of Applied Botany Kuvempu University Shankaraghatta, Karnataka, India

⁴Research Scholar, Department of Applied Botany Kuvempu University Shankaraghatta, Karnataka, India

Abstract: A survey on the flora of Raichur fort was carried out from march 2019 to February 2020. Raichur fort lies between 15° 9' and 16° 34' N latitude and 77° 46' and 35"E longitude. And it is situated 398.37 MSL. In the present study, 158 plant species belonging to 39 families of Angiosperms, 04 species of Pteridophytes, 03 species of Bryophyte, 04 species of Algae were collected and recorded from the rocks and fort walls and ponds of Raichur fort. The discrepancy in the floristic diversity of fort may be due to the topography of the soil and the climatic condition of the region.

Keywords: Raichur fort, diversity, Raichur, Karnataka

1. Introduction

Raichur district is located in the north-eastern part of Karnataka state and is bounded by Yadgiri district in the north, Bijapur and Bagalkot district in the northwest, Koppal district in the west, Bellary district in the south, Mahabubnagar district of Telangana and Kurnool district of Andhra Pradesh in the east (fig 1). The district is surrounded by the Krishna River on the north and the Tungabhadra River on the south. It has seven taluks.

The major soil types are reddish, light grey, reddish brown and black soil. The black cotton soil is distinctive for its strong shrinkage and cracking when dried. The important minerals found in the district are gold, iron and building stones. The year divided broadly into four seasons. The south-west monsoon is from between October to December.

Winter period is from January to February. The hot season begins from the middle of February and extends to the end of May. December is the coldest month with mean daily maximum temperature 31.1. The period from about the middle of February to May is one of continuous rise in temperature. May is the hottest month the mean daily maximum temperature being 42.3°C. The district has dry climate. November to May is the driest part of the year, even during the south west monsoon period, the humidity is not very high.

During the South- West monsoon months, viz., June to September the district receives about 71% of the annual rainfall, September receives the highest rainfall. The annual average rainfall in district is 724.55mm. There is decrease in the rainfall from November to April.

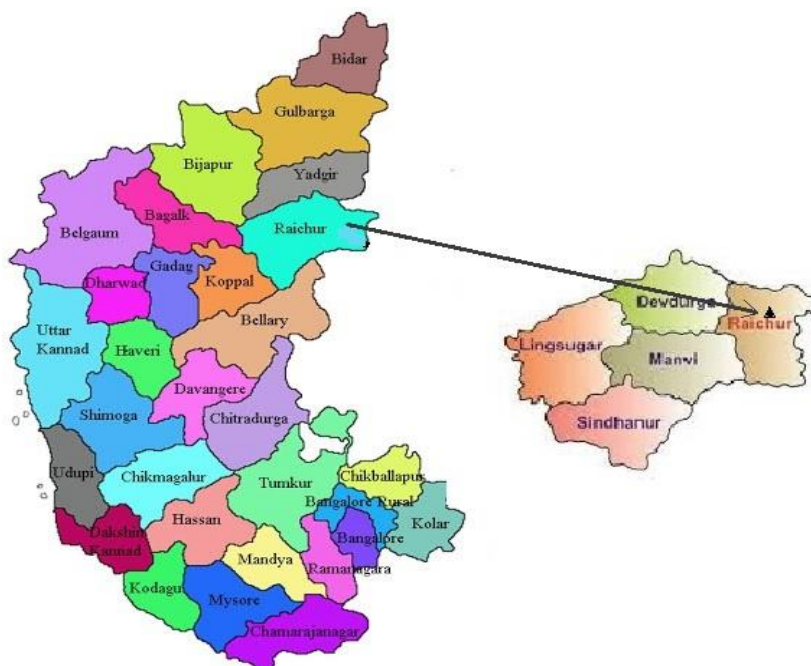


Figure 1: Raichur in Karnataka and showing the position of Raichur fort of Raichur

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2. Materials and Methods

The fort study was carried out during the period from march 2019 to Feb 2020. The soil collected from the fort was analysed using the standard methods in agricultural Research institute, kotanoor (Table 1).

Rock soil composition of Raichur fort was also analysed (Table 2). During the survey on the flora of fort, all the lower and higher plants present in and around the fort were collected seasonally. Collected lower plants were preserved in 4 % formalin. The Pteridophytes and Angiosperms were pressed using blotting paper and brought to the laboratory for the preparation of herbarium and were identified using the Flora of the presidency of Madras (Gamble, 1935), Flora of Karnataka (Saldanha, 1984), Flora of Eastern Karnataka (Singh and Roa, 1988) and Flora of Gulbarga district (Seetharam et al., 2000).

Table 1: Soil Composition of Raichur Fort of Raichur

pH	8.6
Nature of soil	Black loamy
Conductivity	0.39 M mhos
Organic carbon	0.45 kg/Acre
Nitrogen (N)	11.0 kg/Acre
Phosphorus (P)	100 kg/Acre
Potassium (K)	12 kg/Acre

Table 2: Rock Soil Composition of Raichur Fort

pH	8.4
Nature of soil	Black clay loamy
Conductivity	0.31 M mhos
Organic carbon	0.44 kg/Acre
Nitrogen (N)	9.0 kg/Acre
Phosphorus (P)	95 kg/Acre
Potassium (K)	13 kg/Acre

3. Results and Discussion

During the fort survey from march 2019 to Feb 2020, 04 species of Algae belonging to 03 genera of 01 families were collected and recorded from stones, rocks and standing water bodies of Raichur fort. Similarly, 03 species of Bryophytes belong to 01 genera of 02 families; 04 species of Pteridophytes belonging to 04 genera of 04 families were collected and recorded from the rocks and fort walls and ponds of Raichur fort. Angiosperms collected and recorded in Raichur fort are represented by 158 species belonging to 131 genera of 39 families (Table -3).

The floristic diversity of Raichur fort reveals 02% of Algae, 02% of Bryophytes, 03% of Pteridophytes, and 93% of Angiosperms. It was interesting to note that, the maximum number of Angiosperms belonging to both Monocotyledons and Dicotyledons were collected and recorded in all the seasons. The five largest families, with maximum number of species found abundantly in the fort area are Fabaceae (66%), Asteraceae (11%), Amaranthaceae (08%), Poaceae (8%), and Asclepiadaceae (07%), in which 55% were herbs, 12% were shrubs, 27% were trees and 6 % were climbers.

It is evident from the study that, Angiosperms were dominant and found through out the year. The dominant

families recorded during all the seasons are Fabaceae, Poaceae, Asteraceae, Casuarinaceae, Amaranthaceae, Asclepiadaceae, Capparidaceae and Salvadoraceae. Algae were the second dominant species recorded from the standing water bodies of Raichur fort. It was interesting to note that Pteridophytes, and Bryophytes were recorded only during the rainy and winter seasons, but two Pteridophytes were present during the summer season and lichens were absent in Raichur Fort.

Gandhe and Mungikar (2007) have mapped the vegetation of prabalgad Fort in Pune. Shrikanth et al., (2006) have documented the floristic composition of the Hampi ruins from Hospet taluk of bellary district in karnataka state. However, it is interesting to report from our study that the Herbs were dominant followed by shrubs trees and climbers. However it is interesting to note that ephemerals flora is more dominant in the month of July to September. Woody shrubs, Tree species and Fabaceae members were dominant in Raichur fort.

Table 3: List of cryptogrammic plants collected from Raichur Fort of Raichur

Name of the species	Family
I. Algae	
<i>Oscillatoria princeps</i> Vaucher ex. Gomont.	Cyanophyceae
<i>Scytonemamyochrous</i> (Dillw.) Ag. ex Born. et Flah.	Cyanophyceae
<i>Anabaena spiroiedes</i> Klebahn.	Cyanophyceae
<i>Anabaena variabilis</i> Kutz. ex. Born. et Flah.	Cyanophyceae
II. Bryophytes	
<i>Riccia dichotoma</i> L.	Ricciaceae
<i>Riccia fluitans</i> L.	Marchantiaceae
<i>Riccia discolor</i> Lehm. & Lindenb.	Ricciaceae
III. Pteridophytes	
<i>Azolla pinnata</i> L.	Azoaceae
<i>Isoetes coromandelina</i> L.	Isoetaceae.
<i>Marsilea minuta</i> L.	Marsileaceae
<i>Ophioglossum reticulatum</i> L.	Ophioglossaceae

Angiosperms (Dicotyledons)

<i>Indoneesiellaechioides</i> (L.) Sreem	Acanthaceae
<i>Andrographis paniculata</i> (Burm. f.) Wall. ex Nees.	Acanthaceae
<i>Sansevieria zeylanica</i> Roxb.	Agavaceae
<i>Alternanthera pungens</i> Humb. Bonpl. and Kunth.	Amaranthaceae
<i>Amaranthus spinosus</i> L.	Amaranthaceae
<i>Aerva lanata</i> (L.) Juss. ex Sch.	Amaranthaceae
<i>Alternanthera sesalis</i> L.	Amaranthaceae
<i>Amaranthus viridis</i> L.	Amaranthaceae
<i>Achyranthes aspera</i> L.	Amaranthaceae
<i>Pimpinella heyneana</i> (DC.) Kurz.	Apiaceae
<i>Coriandrum sativum</i> L.	Apiaceae
<i>Centella asiatica</i> (L.) Urban.	Apiaceae
<i>Mangifera indica</i> L.	Anacardiaceae
<i>Buchania lanzan</i> Spreng.	Anacardiaceae
<i>Annona reticulata</i> L.	Annonaceae
<i>Annona squamosa</i> L.	Annonaceae
<i>Catharanthus roseus</i> (L.) G. Don.	Apocynaceae
<i>Nerium indicum</i> L.	Apocynaceae
<i>Wrightia tinctoria</i> R. Br.	Apocynaceae
<i>Rauwolfia serpentina</i> (L.) Benth.	Apocynaceae
<i>Cocos nucifera</i> L.	Arecaceae
<i>Aristolochia indica</i> L.	Aristolochiaceae
<i>Calotropis gigantea</i> (L.) R. Br.	Asclepiadaceae

<i>Calotropis procera</i> R. Br.	Asclepiadaceae	<i>Cadabaindica</i> L.	Capparidaceae
<i>Gymnema sylvestre</i> (Retz.) R. Br. ex. Schult.	Asclepiadaceae	<i>Casuarina equisetifolia</i> L.	Casuarinaceae
<i>Hemidesmusindicus</i> (L.) R. Br.	Asclepiadaceae	<i>Maytenussenegalensis</i> (Lam.) Excell.	Celastraceae
<i>Tylophora indica</i> (Burm. f.) Merr.	Asclepiadaceae	<i>Commelina benghalensis</i> L.	Commelinaceae
<i>Tridax procumbens</i> L.	Asteraceae	<i>Bryophyllum, pinnatum</i> (Lam.) Oken.	Crassulaceae
<i>Lactuca sativa</i> L.	Asteraceae	<i>Trichosanthes cucumerina</i> L.	Cucurbitaceae
<i>Partheniumhysterophorus</i> L.	Asteraceae	<i>Coccinia indica</i> Wt. & Arn.	Cucurbitaceae
<i>Ageratum conyzoides</i> L.	Asteraceae	<i>Momordicacharantia</i> L.	Cucurbitaceae
<i>Tagetes erecta</i> L.	Asteraceae	<i>Cucumissativus</i> L.	Cucurbitaceae
<i>Echinopsechinatus</i> Roxb.	Asteraceae	<i>Citrullus vulgaris</i> Schrad.	Cucurbitaceae
<i>Pulicariawightiana</i> (DC.) Cl.	Asteraceae	<i>Dioscoreabulbifera</i> L.	Dioscoreaceae
<i>Tecomastans</i> L.	Bignoniaceae	<i>Croton bonplandianus</i> Bail.	Euphorbiaceae
<i>Dolichandrome falcate</i> Seem.	Bignoniaceae	<i>Tragia mucronata</i> Muell.	Euphorbiaceae
<i>Raphanussativus</i> L.	Brassicaceae	<i>Euphorbia hirta</i> L.	Euphorbiaceae
<i>Cassia occidentalis</i> L.	Fabaceae	<i>Acalypha indica</i> L.	Euphorbiaceae
<i>Cassia tora</i> L.	Fabaceae	<i>Jatropha glandulifera</i> Roxb.	Euphorbiaceae
<i>Cassia auriculata</i> L.	Fabaceae	<i>Mentha spicata</i> L.	Euphorbiaceae
<i>Cassia fistula</i> L.	Fabaceae	<i>Ocimum sanctum</i> L.	Lamiaceae
<i>Tamarindus indica</i> L.	Fabaceae	<i>Micheliachampaca</i> L.	Magnoliaceae
<i>Delonix regia</i> (L.) Gamble.	Fabaceae	<i>Sida cordifolia</i> L.	Malvaceae
<i>Peltophorum pterocarpum</i> (DC.) Baker ex K. Heyne.	Fabaceae	<i>Abutilon indicum</i> L.	Malvaceae
<i>Hardwickia binata</i> Roxb.	Fabaceae	<i>Hibiscus cannabinus</i> L.	Malvaceae
<i>Caesalpinia bonduc</i> (L.) Roxb.	Fabaceae	<i>Abelmoschusesculentus</i> L.	Malvaceae
<i>Caesalpinia coriaria</i> (Jacq.) Willd.	Fabaceae	<i>Azadirachtaindica</i> Juss.	Meliaceae
<i>Cassia absus</i> L.	Fabaceae	<i>Tinosporacordifolia</i> (Wild.) Hook. f & Thoms.	Menispermaceae
<i>Cassia sophera</i> L.	Fabaceae	<i>Ficus racemosa</i> L.	Moraceae
<i>Parkinsonia aculeata</i> L.	Fabaceae	<i>Ficus benghalensis</i> L.	Moraceae
<i>Aeschynomene indica</i> L.	Fabaceae	<i>Ficus religiosa</i> L.	Moraceae
<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae	<i>Moringaoleifera</i> Lam.	Moringaceae
<i>Canavalia ensiformis</i> (L.) DC.	Fabaceae	<i>Syzygiumcumini</i> (L.) Skeels.	Myrtaceae
<i>Clitoria ternatea</i> L.var. <i>ternatea</i>	Fabaceae	<i>Psidiumguajava</i> L.	Myrtaceae
<i>Clitoria ternatea</i> L.var. <i>pilosula</i>	Fabaceae	<i>Eucalyptus globulus</i> Labill.	Myrtaceae
<i>Crotalaria bifaria</i> L.f.	Fabaceae	<i>Boerhaviadiffusa</i> L.	Nyctaginaceae
<i>Crotalaria hebecarpa</i> (DC.) Rudd.	Fabaceae	<i>Bougainvillea glabra</i> Choisy.	Nyctaginaceae
<i>Crotalaria juncea</i> L.	Fabaceae	<i>Mirabilis jalapa</i> L.	Nyctaginaceae
<i>Dalbergia paniculata</i> Roxb.	Fabaceae	<i>Argemonemexicana</i> L.	Papaveraceae
<i>Indigofera astragalina</i> DC.	Fabaceae	<i>Passiflora edulis</i> Sims.	Passifloraceae
<i>Indigofera caerulea</i> Roxb.	Fabaceae	<i>Plumbago zeylanica</i> L.	Plumbaginaceae
<i>Indigofera cordifolia</i> Heyne ex Roth.	Fabaceae	<i>Murraya koenigii</i> (L.) Spreng.	Rutaceae
<i>Indigofera glandulosa</i> Roxb ex Willd.	Fabaceae	<i>Citrus medica</i> L.	Rutaceae
<i>Indigofera linnaei</i> Ali.	Fabaceae	<i>Aegle marmelos</i> (L.) Corr.	Rutaceae
<i>Indigofera nummularifolia</i> Liv ex Alston.	Fabaceae	<i>Canthium parviflorum</i> Lam.	Rubiaceae
<i>Pongamiapinnata</i> (L.) Pierre.	Fabaceae	<i>Ixora coccinea</i> L.	Rubiaceae
<i>Psoraleacorylifolia</i> L.	Fabaceae	<i>Cardiospermum halicacabum</i> L.	Rubiaceae
<i>Rhynchosiacapitata</i> DC.	Fabaceae	<i>Santalum album</i> L.	Santalaceae
<i>Rhynchosiarufescens</i> (Willd.) DC.	Fabaceae	<i>Withania somnifera</i> (L.) Dunal.	Solanaceae
<i>Sesbaniabispinosa</i> (Jacq.) Wt.	Fabaceae	<i>Datura metel</i> L.	Solanaceae
<i>Stylosanthesfruticosa</i> (Retz.) Alston.	Fabaceae	<i>Datura stromonium</i> L.	Solanaceae
<i>Taberneracuneifolia</i> (Roth.) Arn.	Fabaceae	<i>Lycopersicum asculantum</i> Mill.	Solanaceae
<i>Tephrosiapurpurea</i> (L.) Pers.	Fabaceae	<i>Solanumnigrum</i> L.	Solanaceae
<i>Tephrosiavillosa</i> (L.) Pers.	Fabaceae	<i>Lemnaperpussilla</i> . Torr.	Lemnaceae
<i>Zornigibosa</i> Spang.	Fabaceae	<i>Vitex negundo</i> L.	Verbenaceae
<i>Acacia eburnea</i> (L.f.) Willd.	Fabaceae	<i>Lantana camara</i> L.	Verbenaceae
<i>Acacia nilotica</i> (L.) Wild. ex Delile.	Fabaceae	<i>Tectona grandis</i> L. f.	Verbenaceae
<i>Acacia leucophloea</i> (Roxb.) Wild.	Fabaceae	<i>Clerodendrum inerme</i> (L.) Gaertner.	Verbenaceae
<i>Albizialebeck</i> (L.) Benth.	Fabaceae	<i>Jasminumofficinale</i> L.	Oleaceae
<i>Acacia farnesiana</i> (L.) Willd.	Fabaceae	<i>Nyctanthesarbo-tristis</i> L.	Oleaceae
<i>Acacia horrida</i> (L.f.) Willd.	Fabaceae	<i>Azimatetracantha</i> Lam.	Salvadoraceae
<i>Acacia planifrons</i> Wt. & Arn.	Fabaceae	<i>Tribulusterrestris</i> L.	Zygophyllaceae
<i>Acacia ceasia</i> (L.) Willd.	Fabaceae	<i>Curcuma longa</i> L.	Zinziberaceae
<i>Albiziaamara</i> (Roxb.) Boivin.	Fabaceae	Monocotyledons	
<i>Dichrostachyscinerea</i> (L.) Wt&Arn.	Fabaceae	<i>Agave americana</i> L.	Agaveaceae
<i>Mimosa hamata</i> Willd.	Fabaceae	<i>Gloriosasuperba</i> L.	Liliaceae
<i>Neptuneaoleracea</i> Lour.	Fabaceae	<i>Allium cepa</i> L.	Liliaceae
<i>Prosopis chilensis</i> L.	Fabaceae	<i>Musa paradisiaca</i> L.	Musaceae
<i>Cleome viscosa</i> L.	Capparidaceae	<i>Dactylocteniumaegypticum</i> (L.)Willd.	Poaceae
		<i>Digitariaciliaris. (Retz.) Koel.</i>	Poaceae

<i>Tricholaenateneriffae</i> Perl.	Poaceae
<i>Apludamutica</i> L.	Poaceae
<i>Aristidafuniculata</i> Trin.&Rupr.	Poaceae
<i>Tripogonpurpurascens</i> Duthie.	Poaceae

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5. Conclusion

The Raichur fort has rich vegetation of variety of plants found rare and medicinal plants in and around the fort and are listed. Thus, it felt necessary to document the variety of plants including medicinal plants and traditional knowledge which could be useful in future, for the development of traditional medicinal system in India.

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Author Profile

H.C Shrishail, Assistant Professor, Department of Botany, Kuvempu University, Shankaraghatta, Shimoga 577451.
E-mail ID: drshrishailc[at]gmail.com