



Checklist and key to the Elaeocarpaceae, Linaceae, Malpighiaceae, Zygophyllaceae, Geraniaceae, Oxalidaceae, Avertroaceae and Leeaceae of Jharkhand, India

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Abstract

Introduction: A checklist of Elaeocarpaceae, Linaceae, Malpighiaceae, Zygophyllaceae, Geraniaceae, Oxalidaceae, Avertroaceae and Leeaceae flora of Jharkhand has been prepared with the help of relevant literatures and herbarium specimens deposited in Central National Herbarium, herbarium of Ranchi University and National Botanical Research Institute (CSIR). **Methodology:** The data has been collected from relevant literatures and herbarium specimens. All the genera, species and varieties are enumerated with identification keys. The generic distributions at global, national and state level have been provided. The valid names of the species along with author(s), flowering and fruiting time and occurrence at district level are mentioned.

Results: Our study revealed that the families are represented by 17 species under 10 genera. The purpose of the checklist is to document the diversity of the Elaeocarpaceae, Linaceae, Malpighiaceae, Zygophyllaceae, Geraniaceae, Oxalidaceae, Avertroaceae and Leeaceae families in Jharkhand and provide taxonomic keys to students and botanists a means for identification.

Keywords: Angiosperm, Checklist, Biodiversity, Jharkhand.

1. Introduction

The name Jharkhand originated from the geography of the state because it is covered with forests and bushes. Total area of the state is 79,710 sq km with geo-coordinates 21° 55' to 25°

45'N, 83° 35' to 87° 55'E (https://himset.com/states/statewise-latitude-longitude.php). The state is surrounded by Bihar in north, Uttar Pradesh in north-west, Chhattishgarh in west, Odisha in south as well as in West Bengal east. About 29.61% of the

geographical area (23,605 sq km) of the state is covered by natural forest and after addition of plantation (2.8%), it increased to 32.48% which higher than the national average of 23.81% (<http://forest.jharkhand.gov.in/>). According to Champion & Seth (1968), Jharkhand has two major types of forests, i.e. Northern dry mixed deciduous forest and Northern tropical dry deciduous forest (Dry peninsular sal forest). The dry peninsular sal forest cover is more with compare to the northern dry mixed deciduous forest. In broad sense, there are 3 seasons in the state viz. summer, rainy and winter. The summer season is hot and dry occurs in between March to June, sometimes temperature rises up to 46°C at few localities. The rainy season is well marked by about 1200 m average precipitation in between middle of June to middle of October. The winter is not intense like northern states of India, however, it starts in the month of November and continues up to February.

The natural forest of Jharkhand especially Chota Nagpur Plateau region had attracted many taxonomists in the state. Anderson (1863) was the first explorer in Parashnath hills who collected plants to study the flora of Bihar. Further, based on the collection of Hooker, Edgeworth and Thomson and after few years Clarke (1884) also studied on the flora of Parasnath. Haines (1910) did extensive work in Chotanagpur plateau and published a title "A Forest Flora of Chotanagpur" with 275 species recorded from Singhbhum. However, his most remarkable work was "Botany of Bihar and Orissa" which was published in six parts including 813 species from Singhbhum (Haines, 1921–1925). Later, other botanists like Mooney (1941,1944,1950), Mukerjee (1947,1956), Bressers (1951), Sanyal (1957), Ara (1960,1966), Kanodia & Malick (1966), Panigrahi (1966), Meher–Homji (1971), Paul (1976,1978,1984,1990), Paul and Prasad (1978), Raizada (1978), Majumdar and Biswas (1979), Biswas and Maheshwari (1980), Mishra (1985), Paria and Chattopadhyay (2000, 2005), Singh et al. (2001), Sarma and Sarkar (2002) and Ranjan (2014) have significantly contributed to the flora of Bihar and Jharkhand states. The past publications revealed that the selected families of

Jharkhand was not studies so far, therefore, the present work was taken up to evaluate the diversity of the families in the state.

2. Materials and Methods

The work on the above mentioned families was started in November 2018 and completed in March, 2021. The literatures on the flora of Jharkhand like, the Botany of Bihar & Orissa (1921–1925), Flora of Bihar analysis (2001), Flora of Palamau (2002), Flora of Parasnath (2014) and some additions to the Botany of Bihar & Orissa (1941) and Supplement to the Botany of Bihar & Orissa (1950) were referred. We also examined, the specimens deposited in Central National Herbarium (CAL), herbarium of Ranchi University and National Botanical Research Institute (LWG). Distribution of species at global scale was verified through Mabberley (2008, 2017). The National level and state level distribution was verified from Endemic vascular plants of India (2009) and Flora of Bihar analysis (2001), respectively. The nomenclatures were updated through authentic online databases: Plants of the World online (<https://powo.science.kew.org/>) and International Plant Name Index (<http://www.ipni.org>). The Bentham and Hooker's system of classification was followed and a diagnostic generic and species key have also been framed for easy identification of taxa.

3. Results

A total of 17 species under 10 genera are represented by Elaeocarpaceae (1 species, 1 genus), Linaceae (1 species, 1 genus), Malpighiaceae (1 species, 1 genus), Zygophyllaceae (1 species, 1 genus), Geraniaceae (1 species, 1 genus), Oxalidaceae (6 species, 2 genera), Averrhoaceae (2 species, 2 genera) and Leeaceae (4 species, 1 genus).

Key to the family

- 1a. Tree 2
- 1b. Herb or shrub 4
- 2a. Stamens many; fruit drupe **Elaeocarpaceae**

- 2b. Stamens 5 or 10; fruit berries 3
3a. Nodes swollen; stamens 5; staminoidal tube present; stigma swollen **Leeaceae**
- 3b. Nodes not swollen; stamens 10; staminoidal tube absent; stigma capitate **Averrhoaceae**
- 4a. Stamens 5; staminodes 5 **Linaceae**
- 4b. Stamens 10; staminodes absent 5
5a. Climber **Malpighiaceae**
5b. Non- 6
6a. Fruit spinous **Zygophyllaceae**
6b. Fruit not spinous 7
7a. Inflorescence axillary **Geraniaceae**
7b. Inflorescence cymose or umbellate **Oxalidaceae**

ELAEOCARPACEAE

The family Elaeocarpaceae has about 12 genera and 550 species in tropical and warm regions of the world excluding Cont. Africa; 2 genera and 33 species in India (Murti, 1993); 1 genus and 1 species in Jharkhand.

ELAEOCARPUS Burm. ex L.

The genus *Elaeocarpus* has about 290 species in tropical and warm old world regions excluding Africa (Mabberley, 2017); 29 species in India (Murti, 1993); 1 species in Jharkhand.

Elaeocarpus robustus Roxb., Fl. Ind. ed. 1832, 2: 597. 1832; Masters in Hook.f., Fl. Brit. India

1:402.1874, p.p.; Haines, Bot. Bihar Orissa 96. 1921 (Repr. ed. 1: 100.1961). *Elaeocarpus tectorius* auct. non (Lour.) Poir., 1812: Murti in Sharma & Sanjappa, Fl. India 3: 559. 1993, p.p.; N.P. Singh *et al.*, Fl. Bihar, Analysis 83. 2001, p.p.

Fl. & Fr.: May–October. Undivided Bihar (Murti l.c.)

Cultivated species

Elaeocarpus floribundus Blume

LINACEAE

The family Linaceae has about 10 genera and 250 species, compolitan (Mabberley, 2017); 5 genera and 12 species in India (Hajra, 1993); 1 genus and 1 species in Jharkhand.

REINWARDTIA Dumort.

The genus *Reinwardtia* has about 3 species in Indian Subcontinent to China and Indo-China (POWO, 2021); 2 species in India (Hajra, 1993); 1 species in Jharkhand.

Reinwardtia indica Dumort., Comment. Bot. 19. 1822. *Linum trigynum* Roxb. ex Hardw. in Asiat. Res. 6: 357. 1799, non L., 1753, nom. illeg. *Reinwardtia trigyna* Planch. in London J. Bot. 7: 522. 1848; Hook.f., Fl. Brit. India 1: 412. 1874; Haines, Bot. Bihar Orissa 150. 1921 (Repr. ed. 1: 155. 1961); N.P. Singh *et al.*, Fl. Bihar, Analysis 84. 2001; Ranjan, Fl. Parasnath Wildlife Sanctuary 52.2014.

Fl. & Fr.: September–February. Throughout the state.

Cultivated species

Linum usitatissimum L.

MALPIGHIACEAE

The family Malpighiaceae has about 74 and 1300 species in tropical & warm regions of the world especially South America (Mabberley, 2017); 8 genera and 36 species (6 genera and 13 species cultivated) in India (Srivastava, 1997); 1 genus and 1 species in Jharkhand.

HIPTAGE Gaertn.

The genus *Hiptage* has 20–30 species in Asia to Fiji (Mabberley, 2017); 9 species in India (Srivastava, 1997); 1 species in Jharkhand.

Hiptage benghalensis (L.) Kurz in J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 43(2): 136. 1874; R.C. Srivastava in Hajra *et al.*, Fl. India 4: 14. 1997; Paria & SP. Chattop., Fl. Hazaribagh 1: 500. 2000; N.P. Singh *et al.*, Fl. Bihar, Analysis 85. 2001. *Banisteria benghalensis* L., Sp. Pl. 427. 1753. *Hiptage madablota* Gaertn., Fruct. Sem. Pl. 2: 169. t. 116. 1791; Hook.f., Fl. Brit. India 1: 418. 1874; Haines, Bot. Bihar Orissa 152. 1921 (Repr. ed. 1: 157. 1961). *Madhulata* (Hindi).
Fl. & Fr.: January–April. Throughout the state.

Cultivated species

Galphimia gracilis Bartl.

ZYGOPHYLLACEAE

The family Zygophyllaceae has about 27 genera and 300 species in tropical and warm regions of the world especially in arid areas (Mabberley, 2017); 8 genera, 18 species and 4 varieties in India (Singh & Singh, 1997); 1 genus and 1 species in Jharkhand.

TRIBULUS L.

The genus *Tribulus* has about 25 species in tropical & warm regions of the world (Mabberley, 2017); 5 species in India (Singh & Singh, 1997); 1 species in Jharkhand.

Tribulus terrestris L., Sp. Pl. 387.1753; Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1: 423. 1874; Haines, Bot. Bihar Orissa 153. 1921 (Repr. ed. 1: 159. 1961); P. Singh & V. Singh in Hajra *et al.*, Fl. India 4. 55. 1997; N.P. Singh *et al.*, Fl. Bihar, Analysis 86. 2001. *Tribulus lanuginosus* L., Sp. Pl. 387. 1753; P. Singh & V. Singh in Hajra *et al.*, Fl. India 4. 51. 1997; N.P. Singh *et al.*, Fl. Bihar, Analysis 86. 2001. *Gokhroo*, *Chotagokhru* (Hindi).

Fl. & Fr.: Throughout the year. Throughout the state.

Cultivated species

Guaiacum officinale L.

GERANIACEAE

The family Geraniaceae has about 5 genera and 800 species in temperate & few tropical regions of the world (Mabberley, 2017); 4 genera and 45 species in India (Malhotra, 1997); 1 genus and 1 species in Jharkhand.

GERANIUM Tourn. ex L.

The genus *Geranium* has about 430 species in temperate regions of the world (Mabberley, 2017); 27 species in India (Malhotra, 1997); 1 species in Jharkhand.

Geranium ocellatum Jacquem. ex Cambess. in Jacq., Voy. Inde. 4(Bot.): 33. t. 38. 1844; Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1: 433. 1874; Haines, Bot. Bihar Orissa 155. 1921 (Repr. ed. 1: 161. 1961); C.L. Malhotra in Hajra *et al.*, Fl. India 4. 75. 1997; N.P. Singh *et al.*, Fl. Bihar, Analysis 87. 2001.

Fl. & Fr.: March–April. Giridih, Hazaribagh, Palamau, Santhal Pargana.

OXALIDACEAE

The family Oxalidaceae has about 5 genera and 565 species in tropical to temperate regions of the world (Mabberley, 2017); 2 genera and 20 species in India (Manna, 1997); 2 genera and 6 species in Jharkhand.

Key to genera

1a. Leaflets pinnate; capsules dehiscing into valves without leaving a central axis

Biophytum

1b. Leaflets digitate; capsules with valves remaining attached to central axis **Oxalis**

1. BIOPHYTUM DC.

The genus *Biophytum* has 50 species in tropical regions (Mabberley, 2017); 12 species in India (Manna, 1997); 3 species in Jharkhand.

Key to species

1a. Leaflets overlapping, midrib arched; peduncles absent ***B. umbraculum***

1b. Leaflets not overlapping, midrib straight or oblique; peduncles present **2**

2a. Midrib of leaflets straight; sepals almost equal to capsules ***B. reinwardtii***

2b. Midrib of leaflets oblique; sepals much exceeding capsules ***B. sensitivum***

1. *Biophytum reinwardtii* (Zucc.) Klotzsch in Peters, Naturw. Reise Mossambique 6(Bot., 1): 85. 1861; Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1: 437. 1874; Haines, Bot. Bihar Orissa 156. 1921 (Repr. ed. 1: 162. 1961); Manna in Hajra *et al.*, Fl. India 4: 236. 1997; N.P. Singh *et al.*, Fl. Bihar, Analysis 87. 2001; T.K. Sarma & A.K. Sarkar in N.P. Singh & P.S.N. Rao, Fl. Palamau 129. 2002. *Oxalis reinwardtii* Zucc. in Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 1: 274. 1830. *Lajauri* (Santhali).

Fl. & Fr.: October–December. East Singhbhum, Koderma, Palamu, Ranchi, West Singhbhum. Leaves and roots are used for insomnia.

2. *Biophytum sensitivum* (L.) DC., Prodr.1: 690. 1824; Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1: 436. 1874; Haines, Bot. Bihar Orissa 156.1921 (Repr. ed. 1: 161. 1961); Manna in Hajra *et al.*, Fl. India 4: 238. 1997; N.P. Singh *et al.*, Fl. Bihar, Analysis 88. 2001; T.K. Sarma & A.K. Sarkar in N.P. Singh & P.S.N. Rao, Fl. Palamau 130. 2002. *Oxalis sensitiva* L., Sp. Pl. 434. 1753.

Fl. & Fr.: October–January. Throughout the state.

3. *Biophytum umbraculum* Welw., Apont. 590. 1859. *Biophytum petersianum* Klotzsch in Peters, Naturw. Reise Mossambique 6(Bot., 1): 81, t. 15. 1861; Manna in Hajra *et al.*, Fl. India 4: 235. 1997; N.P. Singh *et al.*, Fl. Bihar, Analysis 87. 2001. *Oxalis apodiscias* Turcz. in Bull. Soc. Imp. Naturalistes Moscou 36(1): 430. 1863. *Biophytum apodiscias* (Turcz.) Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1: 437. 1874; Haines, Bot. Bihar Orissa 156. 1921 (Repr. ed. 1: 161. 1961).

Fl. & Fr.: January–October. Ranchi.

2. OXALIS L.

The genus *Oxalis* has about 500 species, cosmopolitan especially in South America & Cape (Mabberley, 2017); 10 species in India (Manna, 1997); 3 species in Jharkhand.

Key to the species

1a. Plants caulescent; flowers yellow

O. corniculata

1b. Plants acaulescent; flowers violet or purple-violet **2**

2a. Stolons present; leaflets fishtail-shaped, broadly *deltoid* ***O. dehradunensis***

2b. Stolons absent; leaflets broadly obcordate ***O. debilis***

1. *Oxalis corniculata* L., Sp. Pl. 435. 1753; Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1: 436. 1874; Haines, Bot. Bihar Orissa 157. 1921 (Repr. ed. 1: 162. 1961); Manna in Hajra *et al.*, Fl. India 4: 242. 1997; Paria & S.P. Chattop., Fl. Hazaribagh 1: 545. 2000; N.P. Singh *et al.*, Fl. Bihar, Analysis 88. 2001; T.K. Sarma & A.K. Sarkar in N.P. Singh & P.S.N. Rao, Fl. Palamau 131. 2002. *Teenapatiya*, *Khatibuti*, *Amboti* (Hindi); *Tandi Chaton arak* (Santhali).

Fl. & Fr.: March–December. Throughout the state.

2. *Oxalis debilis* Kunth, Nov. Gen. Sp. 5: 236. 1822. *Oxalis corymbosa* DC., Prodr. 1: 696. 1824; Calder in Rec. Bot. Surv. India 6: 337. 1919; Hajra *et al.*, Fl. India 4: 246. 1997; N.P. Singh *et al.*, Fl. Bihar, Analysis 88. 2001.

Fl. & Fr.: September–December. Undivided Bihar (Hajra *et al.*, *l.c.*)

3. *Oxalis dehradunensis* Raizada, Suppl. Fl. Gangetic Plain 5: 37. 1976; Manna in Hajra *et al.*, Fl. India 4: 246. 1997; N.P. Singh *et al.*, Fl. Bihar, Analysis 88. 2001. *Oxalis richardiana* Babu, Herb. Fl. Dehra Dun 104. 1977; T.K. Sarma & A.K. Sarkar in N.P. Singh & P.S.N. Rao, Fl.

Palamau 131. 2002. *Oxalis intermedia* A. Rich., Hist. Phys. Cuba, Pl. Vasc. 315. 1841 (non Steud., 1841). *Oxalis latifolia* sensu Paria & S.P. Chattop., Fl. Hazaribagh 1: 546. 2000, non Kunth, 1822.

Fl. & Fr.: May–October. Hazaribagh, Palamu

AVERRHOACEAE

The family Averrhoaceae has about 16 species in Malesia, Madagascar, Myanmar and S. America (Manna, 1997); 1 genus and 2 species in India and also in Jharkhand (Manna, 1997).

AVERRHOA L.

The genus *Averrhoa* has 2–4 species in Brazil to Malaysia and cultivated in pantropical region (Mabberley, 2017); 2 species in India (Manna, 1997); 2 species in Jharkhand.

Key to species

- 1a. Panicles cauliflorous; seeds exaxillate
A. bilimbi
1b. Panicles axillary; seeds arillate
A. carambola

1. *Averrhoa bilimbi* L., Sp. Pl. 428.1753; Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1: 439. 1874; Haines, Bot. Bihar Orissa 157. 1921 (Repr. ed. 1: 163. 1961); Manna in Hajra & al, Fl. India 4: 256. 1997; N.P. Singh *et al.*, Fl. Bihar, Analysis 88. 2001.

Fl. & Fr.: March–May. Undivided Bihar (Haines, l.c. 1921).

2. *Averrhoa carambola* L., Sp. Pl. 428. 1753; Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1: 439. 1874; Haines, Bot. Bihar Orissa 157. 1921 (Repr. ed. 1: 162. 1961); Manna in Hajra *et al.*, Fl. India 4:257.1997; Paria & S.P. Chattop., Fl. Hazaribagh 1: 542. 2000; N.P. Singh *et al.*, Fl. Bihar, Analysis 89. 2001. *Kamrakh*, *Karmal* (Hindi).

Fl. & Fr.: March–August. Cultivated. Singhbhum, Hazaribagh.

LEEACEAE

The family Leeaceae has 1 genus and about 34 species in tropical and subtropical regions of S.E. Asia, Malesia, Micronesia, Melanesia, Australia and tropical Africa (Mabberley, 2017); 1 genus and 11 species in India (Naithani, 2000); 1 genus and 4 species in Jharkhand.

LEE D. van Royen ex L. (nom. cons.)

The genus *Leea* has about 34 species in tropical and subtropical regions of S.E. Asia, Malesia, Micronesia, Melanesia, Australia and tropical Africa (Mabberley, 2017); 11 species in India (Naithani, 2000); 4 species in Jharkhand.

1b. Leaves simple to 1–3-pinnate, very large, variable in shape and size ***L. macrophylla***

1b. Leaves pinnate and never simple
2

2a. Leaves 5–7-nerved at base
L. asiatica

2b. Leaves 3-nerved at base
3

3a. Leaves glabrous beneath; stipules obovate, caducous
L. indica

3b. Leaves pubescent or hirsute on the veins beneath; stipules narrow, persistent
L. compactiflora

1. *Leea asiatica* (L.) Ridsdale in Manilal, Bot. Hist. Hort. Malabaricus 189. 1980; B.D.Naithani in N.P. Singh *et al.*, Fl. India 5: 330. 2000; N.P. Singh *et al.*, Fl. Bihar, Analysis 114. 2001; T.K. Sarma & A.K. Sarkar in N.P. Singh & P.S.N. Rao, Fl. Palamau 155. 2002. *Phytolacca asiatica* L., Sp. Pl. 441. 1753. *Leea crispa* L., Mant. Pl. 124. 1767; Lawson in Hook.f., Fl. Brit. India 1: 665. 1875; Haines, Bot. Bihar Orissa 208. 1921 (Repr. ed. 1: 215. 1961). *Leea aspera* Edgew. in Trans. Linn. Soc. London 20: 36. 1846; Lawson in Hook.f., Fl. Brit. India 1:665. 1875; Haines, Bot. Bihar Orissa 208. 1921 (Repr. ed. 1:215. 1961).

Fl. & Fr.: June–December. East Singhbhum, Giridih, Hazaribagh, Palamu, Ranchi, West Singhbhum.

2. *Leea compactiflora* Kurz in J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42(2): 65. 1873; N.P. Singh *et al.*, Fl. Bihar, Analysis 114. 2001; T.K. Sarma & A.K. Sarkar in N.P. Singh & P.S.N. Rao, Fl. Palamau 156. 2002. *Leea trifoliata* M.A. Lawson in Hook.f., Fl. Brit. India 1: 666. 1875. *Leea robusta* auct. non Roxb., 1824: Lawson in Hook.f., Fl. Brit. India 1: 667. 1875, p.p.; Haines, Bot. Bihar Orissa 209. 1921 (Repr. ed. 1: 216. 1961).

Fl. & Fr.: September–November. Chota Nagpur, East Singhbhum, Santhal Pargana, West Singhbhum.

3. *Leea indica* (Burm.f.) Merr. in Philipp. J. Sci. 14: 245. 1919; N.P. Singh *et al.*, Fl. Bihar, Analysis 114. 2001. *Staphylea indica* Burm.f., Fl. Indica 75. t. 24. f. 2. 1768. *Leea sambucina* (L.) Willd., Sp. Pl., ed. 4, 1: 1177. 1798; M.A. Lawson in Hook.f., Fl. Brit. India 1: 666. 1872, p.p.; Haines, Bot. Bihar Orissa 208. 1921 (Repr. ed. 1: 216. 1961); Ranjan, Fl. Parasnath Wildlife Sanctuary 65.2014.

Fl. & Fr.: June–December. Giridih, Sahibganj, Santhal Pargana.

4. *Leea macrophylla* Roxb. ex Homem., Hort. Hafn. 1: 251. 1813; Lawson in Hook.f., Fl. Brit. India 1: 664. 1875; Haines, Bot. Bihar Orissa 207. 1921 (Repr. ed. 1: 215. 1961); N.P. Singh *et al.*, Fl. Bihar, Analysis 114. 2001.

Fl. & Fr.: September–December. Ranchi and Santhal Pargana (Haines, 1925).

4. Discussion

Eight families of angiosperm have been selected for the study because their representation is not

prominent. It will aid in the assessment of the diversity of the species and help in the biodiversity management plan. It has been observed that at global level these families are well represented by many species but in Jharkhand numbers of species are very less. The family Elaeocarpaceae has about 550 species in tropical and warm regions of the world but in Jharkhand only one species is found. The family Linaceae is cosmopolitan, it has about 250 species worldwide but represented by one species in Jharkhand. The family Malpighiaceae has about 1300 species in tropical & warm regions of the world especially South America but one species is found in Jharkhand. The family Zygophyllaceae has about 300 species in tropical and warm regions of the world especially in arid areas but this family is represented by one species in Jharkhand. The family Geraniaceae has over 800 species in temperate & few tropical regions of the world but only 1 species found here. The family Avertroaceae has about 16 species in Malesia, Madagascar, Myanmar and S. America but 2 species are in the state. The family Leeaceae has about 34 species in tropical and subtropical regions of S.E. Asia, Malesia, Micronesia, Melanesia, Australia and tropical Africa but 4 species in Jharkhand. The family Oxalidaceae has about 565 species in tropical to temperate regions of the world but 6 species in Jharkhand (Mabberley 2008, 2017).

In present study, it has been observed that Oxalidaceae has been represented by maximum number of species (6 species), it is followed by Leeaceae (4 species), Avertroaceae (2 species) and rest of the families have been represented by one species each (Fig. 1).

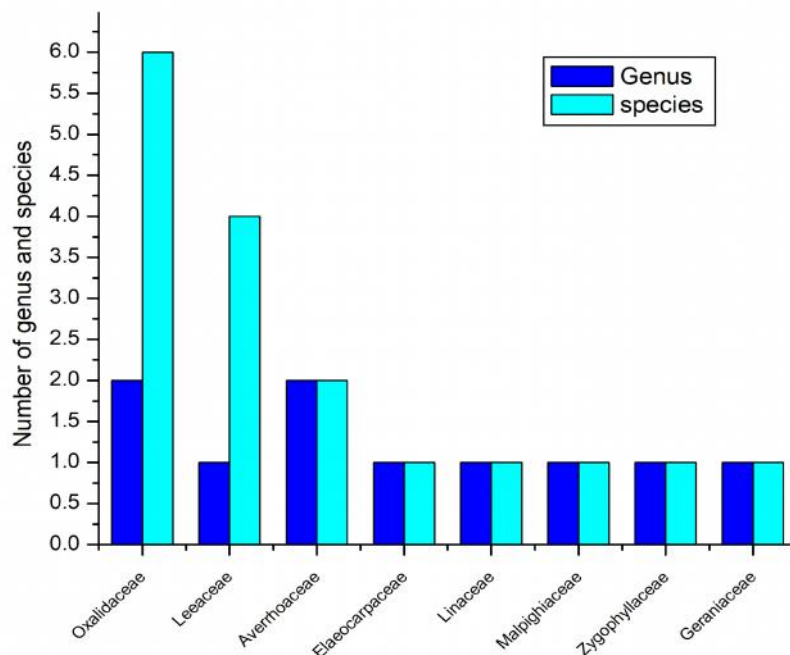


Fig. 1: Number of Genera and Species are distributed in Jharkhand

5. Conclusion

A total of 17 taxa belongs to Elaeocarpaceae, Linaceae, Malpighiaceae, Zygophyllaceae, Geraniaceae, Oxalidaceae, Averrhoaceae and Leeaceae families are documented. The distributions at global and national level of associated taxa have been provided. This data will be ready references to assess the diversity of enlisted families in the state of Jharkhand. The study will facilitate strategies for management of wild species and conservation in terms of plant diversity and resource management.

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