



Checklist and key to the Rosaceae of Jharkhand, India

Kumar Avinash Bharati & Anand Kumar*

Central National Herbarium, Botanical Survey of India, P.O. Botanic Garden, Howrah – 711 103,
West Bengal, India.

*Corresponding author: anand_kum234@rediffmail.com

Abstract

A checklist of Rosaceae flora of Jharkhand has been prepared with the help of relevant literatures and specimens deposited in Central National Herbarium, National Botanical Research Institute and Ranchi University herbarium. All the genera, species and varieties are enumerated with identification keys, phenology and distribution at district level. Our study revealed that the family Rosaceae in Jharkhand is represented by 19 taxa under five genera. The purpose of the checklist is to document the diversity of the family Rosaceae in Jharkhand and taxonomic key will act as tool to identify the enlisted taxon.

Keywords: Checklist, Flora, Jharkhand, Rosaceae.

Introduction

Jharkhand is literally known as land of bushes situated in eastern India, encompassing an area of 79,716 sq km with geo-coordinates 22°00' N to 24°37' N latitudes and 83°15' E to 87°01' E longitudes (FSI, 2019). The state is bounded by Bihar in the north, Uttar Pradesh in the north-west, Chhattisgarh in the west, Odisha in the south as well as West Bengal in the east. About 23,611 sq. km of the state is covered by natural forest which is 29.62% of the total geographical area of the state (FSI, 2019). According to Champion & Seth (1968), Jharkhand has two major types of forests, i.e. Dry peninsular Sal forest and Northern dry mixed deciduous forest. There are three well defined seasons in Jharkhand viz. summer, rainy and winter. The summer season is in between March to June, it is hot and dry and temperature varies from 40 to 46°C. The rainy season starts from middle of June to middle of October and the annual average rainfall is about 1200 mm. The winter sets in the month of November and continues up to February.

Materials and Methods

The checklist was prepared with the help of relevant literatures like, A Forest flora of Chotanagpur (Haines, 1910), The Botany of Bihar & Orissa (Haines, 1921–1925), Flora of Bihar analysis (Singh *et al.*, 2001), Flora of Palamau (Sarma & Sarkar, 2002), Flora of Hazaribagh District (Paria and Chattopadhyay, 2000, 2005), Flora of Parasnath Wildlife Sanctuary (Ranjan, 2014) and some additions to the Botany of Bihar & Orissa (Mooney, 1941) and Supplement to the Botany of Bihar & Orissa (Mooney, 1950). The specimens deposited in Central National Herbarium (CAL), National Botanical Research Institute (LWG) and Ranchi University herbarium were also consulted. The nomenclature was updated through authentic online databases: Plants of the World Online (<http://www.plantsoftheworldonline.org/>) and International Plant Name Index (<http://www.ipni.org>). The Bentham and Hooker's system of classification was followed and key to genera and species have also been framed for easy identification of taxa.

Results and Discussion

Family Rosaceae is represented by ca. 83 genera and 3575 species at global level. It is found all over the world however many taxa are restricted to North Temperate Zone (Mabberley, 2017). There are 40 genera, 432 species, 40 subspecies, 80 varieties and one forma in India (Karthikeyan, 2000) and the present study reports five genera, 17 species, one subspecies and one variety in Jharkhand. The majority of the taxa belong to Palamau district with 10 taxa.

Key to genera

- 1a. Trees (except *Prunus pygeoides*); stipules deciduous; carpels less than 5.....2
- 1b. Shrubs or herbs; stipules usually adnate to petiole; carpels numerous..... 3
- 2a. Carpel 1; ovary superior; fruits drupe **Prunus**
- 2b. Carpels 2–5; ovary inferior; fruits pome ... **Pyrus**
- 3a. Ovary superior, ripe carpels not enclosed in the calyx-tube.....4
- 3b. Ovary inferior, ripe carpels enclosed in the calyx-tube.....**Rosa**
- 4a. Unarmed herbs, ripe carpels dry, ovule solitary **Potentilla**
- 4b. Armed shrubs, ripe carpels fleshy, ovules 2..... **Rubus**

Potentilla L.

A genus of c. 330 species nearly cosmopolitan, mainly concentrated in North temperate and arctic regions (Mabberley, 2017); 40 species in India (Gora and Panigrahi, 1995); 3 species in Jharkhand.

Key to the species

- 1a. Flowers in corymbose cyme, spreading; petals slightly exceeding the calyx 2
- 1b. Flower solitary, axillary; petals slightly smaller than calyx..... **P. supina**

- 2a. Perennials, erect; basal leaves 3-4 paired, not digitate; basal stipules lanceolate without auricles, upper stipules oblong-lanceolate.....**P. bannehalensis**
- 2b. Annuals, prostrate; basal leaves in group of 5, digitate; basal stipules membranous with lanceolate auricle, upper stipules ovate..... **P. sundaica**

1. Potentilla bannehalensis Cambess. in Jacquem., Voy. Inde 4: 52, t. 64. 1844; N.P. Singh et al., Fl. Bihar: 185. 2001. *P. leschenaultiana* Ser. var. *bannehalensis* (Cambess.) Hook.f., Fl. Brit. India 2: 350. 1878. *P. leschenaultiana* Ser. var. *biharensis* Haines, Bot. Bihar Orissa 339: 1922 (Repr. ed., 2: 354. 1961).

Fl. & Fr.: July – August.

Distrib.: Palamau.

2. Potentilla sundaica (Blume) W.Theob., Burmah 2: 490. 1883; N.P. Singh et al., Fl. Bihar: 185. 2001; T.K. Sarma & A.K. Sarkar in N.P. Singh & P.S.N. Rao, Fl. Palamau: 242. 2002. *Fragaria sundaica* Blume, Bijdr. Fl. Ned. Ind.: 1106. 1826. *Potentilla kleiniana* Wight & Arn., Prodr. Fl. Ind. Orient. 1: 300. 1834; Hook.f., Fl. Brit. India 2: 359. 1878; Haines, Bot. Bihar Orissa: 339. 1922 (Repr. ed., 2: 354. 1961).

Fl. & Fr.: April – September.

Distrib.: Palamau, Ranchi.

3. Potentilla supina L., Sp. Pl.: 497. 1753; Hook.f., Fl. Brit. India 2: 359. 1878, excl. *P. amurensis* Maxim.; Haines, Bot. Bihar Orissa: 340. 1922 (Repr. ed., 2: 354. 1961); Paria & Chattopadhyay, Fl. Hazaribagh: 275. 2000; N.P. Singh et al., Fl. Bihar: 185. 2001; T.K. Sarma & A.K. Sarkar in N.P. Singh & P.S.N. Rao, Fl. Palamau: 242. 2002.

Fl. & Fr.: December – May.

Distrib.: Hazaribagh.

Prunus L.

A genus of ca 200 species, cosmopolitan, tropical and temperate regions (Mabberley, 2017); 38 species in India (Ghora & Panigrahi, 1995); 4 species and one subspecies in Jharkhand.

Key to the species

- 1a. Leaf convolute in bud (appearing after flower); flowers in umbel; drupe glabrous.....2. **P. domestica**
- 1b. Leaf conduplicate in bud; flowers in raceme or solitary; drupe velvety or glaucous..... **2**
- 2a. Flower usually solitary; drupe velvety; stone deeply pitted and furrowed..... **3. P. persica**
- 2b. Flowers in bunch; drupe glaucous; stone smooth.. **3**
- 3a. Tree, branch with lenticels; leaf margin entire, base rounded; sepals woolly outside; style ca. 5 mm long; ovary hairy at base..... **1. P. ceylanica**
- 3b. Shrub, branch without lenticels; leaf margin crenate-serrate, base acute; sepals glabrous; style ca.1.5 mm long; ovary glabrous..... **4. P. pygeoides**

1. Prunus ceylanica (Wight) Miq., Fl. Ned. Ind. 1: 365. 1855; N.P. Singh et al., Fl. Bihar: 186. 2001. *Polydonta ceylanica* Wight, Ill. Ind. Bot. 1: 203. 1840. *Pygeum acuminatum* Colebr., Trans. Linn. Soc. London 12: 360. t. 18. 1817; Hook.f., Fl. Brit. India 2: 318. 1878; Haines, Bot. Bihar Orissa: 337. 1922 (Repr. ed., 2: 351. 1961).

Fl. & Fr.: April – October.

Distrib.: Singhbhum.

2. Prunus domestica L., Sp. Pl.: 475. 1753; N.P. Singh et al., Fl. Bihar: 186. 2001.

Key to subspecies

- 1a. Branch smooth; leaf pubescent beneath on lateral veins only, midrib glabrous; fruits sweet, oblong, erect.....2.1 subsp. **domestica**
- 1b. Branch with few thorns, villous; leaf hairy beneath on veins and midrib; fruits sour, globose, drooping.....2.2 subsp. **insititia**

2.1 subsp. **domestica**

Fl. & Fr.: February – May.

Distrib.: Palamau.

2.2 subsp. **insititia** (L.) Schneid., III. Handb. Laubholz 1: 630. 1906; N.P. Singh et al., Fl. Bihar: 186. 2001. *P. insititia* L., Cent. Pl. 1: 12. 1755. *P. communis* Huds. var. *insititia* (L.) Huds., Fl. Anglica ed. 2, 1: 212. 1778; Hook.f., Fl. Brit. India 2: 315. 1878.

Fl. & Fr.: April – September.

Distrib.: Palamau.

3. Prunus persica (L.) Batsch, Beitr. Entw. Gewächsreich: 30. 1801; Hook.f., Fl. Brit. India 2: 313. 1878; Haines, Bot. Bihar Orissa: 336. 1922 (Repr. ed., 2: 351. 1961); N.P. Singh et al., Fl. Bihar: 187. 2001; T.K. Sarma & A.K. Sarkar in N.P. Singh & P.S.N. Rao, Fl. Palamau: 243. 2002; Ranjan, Fl. Parasnath WLS: 93. 2014. *Amygdalus persica* L., Sp. Pl.: 472. 1753.

Fl. & Fr.: January – June.

Distrib.: Palamau, Ranchi.

4. Prunus pygeoides Koehne in Engler, Bot. Jahrb. Syst. 52: 297. 1915; N.P. Singh et al., Fl. Bihar: 187. 2001; Ranjan, Fl. Parasnath WLS: 93. 2014. *Pygeum andersonii* Hook.f., Fl. Brit. India 2: 320. 1878; Haines, Bot. Bihar Orissa: 337. 1922 (Repr. ed., 2: 352. 1961). *P. lucidum* T. Anderson ex Prain, Bengal Pl. 1: 464. 1903.

Fl. & Fr.: November – December.

Distrib.: Giridih.

Pyrus L.

A genus of ca. 15 species in Eurasia (especially Armenia) and Mediteranian region (Mabberley, 2017); 4 species in India (Ghora & Panigrahi, 1995); 2 species in Jharkhand.

Key to the species

- 1a. Calyx lobes persistent in fruits; leaves margin serrulate; styles 5; pome without dots..... **1. P. communis**
- 1b. Calyx lobes deciduous in fruits; leaves margin serrate; styles 3–5; pome with brown dots..... **2. P. pashia**

1. *Pyrus communis* L., Sp. Pl.: 479. 1753; Hook.f., Fl. Brit. India 2: 374. 1878; Haines, Bot. Bihar Orissa: 341. 1922 (Repr. ed., 2: 356. 1961); N.P. Singh et al., Fl. Bihar: 187. 2001; T.K. Sarma & A.K. Sarkar in N.P. Singh & P.S.N. Rao, Fl. Palamau: 244. 2002.

Fl. & Fr.: March – July.

Distrib.: Palamau, Ranchi.

2. *Pyrus pashia* Buch.-Ham. ex D. Don, Prodr. Fl. Nepal.: 236. 1825; Hook.f., Fl. Brit. India 2: 374. 1878; N.P. Singh et al., Fl. Bihar: 187. 2001.

Fl. & Fr.: November – April.

Distrib.: Palamau.

Rosa L.

About 150 species mainly in N. temperate and tropical mountains (Mabberley, 2017); 23 species in India (Ghora & Panigrahi, 1995); 5 species and one variety in Jharkhand.

Key to the species

- 1a. Stipules persistent and adnate to the petiole up to half..... 3. **R. clinophylla**
- 1b. Stipules caducous and not adnate to the petiole..... 2
- 2a. Styles not protruding from a head, closing the mouth of the floral tube.....4. **R. damascena**
- 2b. Styles protruding out.....3
- 3a. Styles free; leaflets margins serrate; flowers solitary or in fascicle.....2. **R. chinensis**
- 3b. Style united to form a column; leaflets margins entire; flowers crowded in corymbose.....4
- 4a. Stipules margin pectinate; prickles infra-stipular; styles glabrous.....5. **R. multiflora**
- 4b. Stipules margin entire; prickles scattered; styles pubescent.....1. **R. brunonii**

1. *Rosa brunonii* Lindl., Ros. Monogr.: 120. t. 14. 1820; N.P. Singh et al., Fl. Bihar: 187. 2001.

Fl. & Fr.: July – October.

Distrib.: Deoghar.

2. *Rosa chinensis* Jacq., Observ. Bot. 3: 7, t. 55. 1768; N.P. Singh et al., Fl. Bihar: 188. 2001. *R. indica sensu* Hook.f., Fl. Brit. India 2: 364. 1878. non L. (1753).

Fl. & Fr.: October – February.

Distrib.: Deoghar.

3. *Rosa clinophylla* Thory in Redouté & Thory, Roses 1: 43, t. 10. 1817; N.P. Singh et al., Fl. Bihar: 188. 2001. *R. involucrata* Roxb. ex Lindl., Ros. Monogr.: 8. 1820; Hook.f., Fl. Brit. India 2: 365. 1878, *p.p. excl. syn. R. lyelii* Lindl.; Haines, Bot. Bihar Orissa: 340. 1922 (Repr. ed., 2: 355. 1961).

Key to varieties

- 1a. Leaflets elliptic-lanceolate, tomentose-woolly beneath; hypanthia spherical..... 3.1 var. **clinophylla**
- 1b. Leaflets elliptic, glabrous on both sides except midrib; hypanthia oblong..... 3.2 var. **glabra**

3.1. var. **clinophylla**

Fl. & Fr. : February – April.

Distrib.: Chota Nagpur.

3.2 var. **glabra** (Lindl. ex Prain) Ghora & Panigrahi, J. Jap. Bot. 60: 57. 1985 & Family Rosac. India 2: 222. 1995; N.P. Singh et al., Fl. Bihar: 188. 2001. *Rosa involucrata* Roxb. var. *glabra* Lindl. ex Prain, J. Asiat. Soc. Bengal 73: 202. 1904; Hook.f., Fl. Brit. India 2: 365. 1878.

Fl. & Fr.: March – April.

Distrib.: Chota Nagpur.

4. *Rosa damascena* Mill., Gard. Dict., ed. 8. n. 15. 1768; Hook.f., Fl. Brit. India 2: 364. 1878; N.P. Singh et al., Fl. Bihar: 188. 2001.

Fl.: February – July.

Distrib.: Deoghar.

5. Rosa multiflora Thunb. in Murray, Syst. Veg. ed. 14: 474. 1784; Hook.f., Fl. Brit. India 2: 364. 1878; T.K. Sarma & A.K. Sarkar in N.P. Singh & P.S.N. Rao, Fl. Palamau: 244. 2002.

Fl.: June – July.

Distrib.: Deoghar.

Rubus L.

About 250 species, cosmopolitan, especially in Northern region (Mabberley, 2017); ca. 75 species in India (Dash *et al.*, 2016); 3 species in Jharkhand.

Key to the species

- 1a. Leaves simple..... 3. **R. rugosus**
- 1b. Leaves compound.....2
- 2a. Petals pink–red; stamens equal to the petal length; fruits black.....2. **R. niveus**
- 2b. Petals white; stamens shorter than petal length; fruits yellow.....1. **R. ellipticus**

1. Rubus ellipticus Sm. in Rees, Cycl. 30: Rubus n. 16. 1815; Hook.f., Fl. Brit. India 2: 336. 1878; Haines, Bot. Bihar Orissa: 338. 1922 (Repr. ed., 2: 353. 1961); N.P. Singh *et al.*, Fl. Bihar: 189. 2001.

Fl. & Fr.: December – March.

Distrib.: Palamau.

2. Rubus niveus Thunb., Rubo: 9. f. 3. 1813; N.P. Singh *et al.*, Fl. Bihar: 189. 2001. *R. lasiocarpus* Sm. in A. Rees, Cycl. 30: Rubus n. 6. 1815; Hook.f., Fl. Brit. India 2: 339. 1878.

Fl. & Fr.: December – February.

Distrib.: Palamau.

3. Rubus rugosus Sm. in Rees, Cycl. 30: Rubus n. 34. 1819; N.P. Singh *et al.*, Fl. Bihar: 188. 2001; T.K. Sarma & A.K. Sarkar in N.P. Singh & P.S.N. Rao, Fl. Palamau: 245. 2002. *R. moluccanus auct. non L.*, 1753: Hook.f., Fl. Brit. India 2: 330. 1878, *p.p.*; Haines, Bot. Bihar Orissa: 338. 1922 (Repr. ed., 2: 352. 1961).

Fl. & Fr.: August – October.

Distrib.: Palamau.

Cultivated species

Eriobotrya japonica Lindl.

Fragaria elatior Ehrh.

Conclusions

The data will be ready references to assess the Rosaceae diversity in the state of Jharkhand. It will facilitate strategies for management of wild plants and habitat conservation aspects in terms of plant diversity and resource management.

Acknowledgments

We are thankful to Dr. A.A. Mao, Director, Botanical Survey of India, Kolkata and Dr. V.P. Prasad, Head of Office, Central National Herbarium, Howrah for the facilities. We are also grateful to the Director, CSIR-National Botanical Research Institute, Lucknow and Head of the Department of Botany, Ranchi College, Ranchi University for permission to access the herbarium

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Access this Article in Online	
	Website: www.ijarbs.com
	Subject: Botany
Quick Response Code	
DOI: 10.22192/ijarbs.2020.07.03.011	

How to cite this article:

Kumar Avinash Bharati & Anand Kumar. (2020). Checklist and key to the Rosaceae of Jharkhand, India. *Int. J. Adv. Res. Biol. Sci.* 7(3): 94-99.
DOI: <http://dx.doi.org/10.22192/ijarbs.2020.07.03.011>