

**A LIGHT ON DIVERSITY AND TWO NEW ADDITION IN THE GENUS *FICUS* L.
(MORACEAE) OF KALESAR NATIONAL PARK AND ADJOINING AREA,
HARYANA, INDIA**

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ABSTRACT: In the present study 11 species of Genus *Ficus* have been reported from the study area out of which 2 species (*Ficus benjamina* L. and *Ficus exasperata* Vahl) is new addition to the *Ficus* Genus of Haryana state because these 2 species have explored first time from Haryana State of India while 9 species (*Ficus auriculata* Lour., *Ficus benghalensis* L., *Ficus hispida* L. f., *Ficus microcarpa* L. f., *Ficus religiosa* L., *Ficus semicordata* Buch.-Ham. ex Sm., *Ficus palmata* Forssk., *Ficus racemosa* L. and *Ficus virens* Aiton) of Genus *Ficus* have been reported by earlier workers from different parts of Haryana State, India. Ethnobotanical data, Geocoordinates and information regarding to flowering and fruiting have been also recorded during present study.

Keywords: Kalesar National Park, Genus *Ficus*, New addition, Haryana, India.

Introduction

Actual calculation of global biodiversity has not done till now. Direct measurement of the total number of species on earth prevented due to limited sampling of the world's biodiversity while indirect measurement results are unresolved due to use of controversial approaches. Taxonomic experts gave the almost genuine measurement about the total number of species, they estimated the range between 3 and 100 million species globally (May, 2010). The total number of described species is about 1.5 million which is underestimation of real global richness, although the real range of this under estimation is unknown to the scientific world. Mora *et al.* (2011), Costello *et al.* (2012) and Roskov *et al.* (2014) have calculated the world biodiversity about 2 million species. Ehrlich & Wilson, (1991), May (1992, 2010) and Lambshead (1993) have estimated some higher extent of world total biodiversity about 100 million species. Locey & Lennon (2016) predicted the value of total global biodiversity about 1 trillion. However Kalesar National Park of Yamuna Nagar district of Haryana is very less explored for taxonomic and ethnobotanical studies. Therefore many survey of Yamuna Nagar district have been conducted for the documentation of ethnobotanical data and exploration of floristic diversity during the year 2013-2020.

MATERIALS AND METHODS

Study site: Kalesar National Park and Adjoining area was selected for taxonomic studies and exploration of floristic diversity. It is located in the foot hills of Shiwalik ranges of great Himalayas. On map it is situated between 30°18' to 30° 27' North latitude & 77°18' to 77° 35' East longitude. It is a part of Yamunanagar District of Haryana, sharing boundary with

three States i.e., Himachal Pradesh, Uttarakhand & U.P. Yamuna Nagar has an area of 1,756 square kilometres. Geologically speaking, the Shiwalik belong to the tertiary deposits of the outer Himalayas, and are chiefly composed of low sandstone and conglomerate hills, the solidified and upheaved detritus of the great range. Shiwalik system takes its name from shiwalik hills of Haridwar region between the Ganga and the Yamuna rivers. Kalesar National Park is named due to the Kalesar (shiva) temple located in protected area. The park was declared as National Park on 8th December 2003 having an area of 11570 acres. Just adjacent to the National Park is Kalesar Wildlife Sanctuary and it was notified on 13th December 1996, having an area of 13209 acres. (Fig.1).



Fig.1: Showing the map of study area

Methodology: Many field surveys were conducted in Kalesar National Park and Adjoining area in different seasons during 2013-20. Standard methods were adopted for collection of voucher specimens, preservation, and for the collection of ethnobotanical information [14]. Photographs of plants were taken in natural habitat. The ethnobotanical data (use of plant, plant parts used, local name) was collected through interviews and discussions with herbalists, farmers, spiritualist, in study area. Majority of informant's were belonged to old age group, who have a very long association with usage of plants. Specimens of all species were identified with the help of available literature [9], [10], [12], [13]. Voucher specimens were prepared and deposited in the herbarium of Botany Department, Kurukshetra University, Kurukshetra (Haryana) India. For preparing the description collected plant materials were critically examined under stereo zoom dissecting microscope to record the morphological characters as well as variations available within the species; photographs of each species and field notes were also considered for this purpose. Indented dichotomous keys were prepared for species. The keys are artificial and mostly based on morphological characters. Updatate nomenclature by

using recently accepted names after consulting various authentic works like revisions and floras. Different websites like The International Plant Names Index (IPNI), Germplasm Resources Information Network (GRIN), Plant of the world online (POWO), International Legume Database and Information Service (ILDIS), Tropicos, Encyclopedia of Life (EOL) and The Plant List were consulted to update the nomenclature. New records were recorded after comparison of present findings with the previous works in same region (Duthie, 1903-1929; Nair, 1978; Jain *et al.*, 2000).

Results & Discussion:

Ficus is a widely spread well known but problematic genus of family Moraceae due to its minute flowers present along with closed fleshy receptacle (*i.e.* scyconium). About 750 species of *Ficus* have been reported throughout the world (Corner [1, 2]; Berg [3]; Berg & Corner [4]; Ronsted *et al.* [5, 6]) and out of which 120 species belongs to India (King [7,8]). In the present study 11 species of *Ficus* have been reported from the study area out of which 2 species is new addition to the *Ficus* Genus of Haryana state because these 2 species have explored first time from Haryana State of India while 9 species of Genus *Ficus* have been reported by earlier workers from different parts of Haryana State.

Keys to Species of Genus *Ficus* L. :

Ficus Linn.

- 1a. Receptacles sessile or subsessile.
 - 2a. Leaves caudate-acuminate at apex.*F. religiosa*
 - 2b. Leaves otherwise at apex.
 - 3a. Receptacles 15-25 mm across, yellow, orange or red on ripening.
 - 4a. Plants liana, receptacle solitary.*F. benjamina*
 - 4b. Plants erect; receptacles paired.*F. benghalensis*
 - 3b. Receptacles 7-12 mm across, pink, purple, black or cream-coloured on ripening.
 - 5a. Aerial roots present, forming pillar-roots; basal nerves of leaves prominent; cystolith on both the surfaces of lamina. *F. microcarpa*
 - 5b. Aerial roots absent, if present then not forming pillar-roots; basal nerves of leaves not prominent; cystolith only on one surface of lamina.*F. virens*
- 1b. Receptacles distinctly pedunculate.
 - 6a. Leaves opposite, decussate. *F. hispida*
 - 6b. Leaves alternate, Infrequently opposite.
 - 7a. Leaves obliquely semisaggitate or cordate at base *F. semicordata*

7b. Leaves otherwise at base.

8a. Receptacles in clusters.

9a. basal nerves 5-7.

.....*F. auriculata*

9b. Basal nerves 3.

.....*F. racemosa*

8b. Receptacles solitary or paired.

10a. Leaves ovate or oblong-elliptic,
up to 10 cm broad, subcoriaceous,
scabrid above.

.....*F. exasperata*

10b. Leaves broadly ovate or orbicular,

11-19 cm broad, membranous, not scabrid.

..... *F. palmata*

***Ficus auriculata* Lour.**, Fl. Cochinch. 666, 1790; Jain, Fl. Har. 195; *F. roxburghii* Wall ex Miq., Ann. Mus. Bot. 3 : 296, 1867; Hooker, Fl. Br. Ind. V: 534; Brandis, Ind. Trees 609; Collett, Fl. Simlensis 461; Kanjilal, For. Flora 481; Duthie, Fl. Upp. Gang. Pl. 3: 159; Bamber, Pun. Plants, 17; Sabnis, Contrib. Fl. Pun. 567; Parker, For. Fl. Pun. 481.



A low-spreading tree with grey warty bark. Leaves alternate, broadly ovate or rounded, 12-35 x 10-30 cm, acute or mucronate, entire or toothed, glabrous above, pubescent beneath, base rounded-cordate. Receptacles turbinate, depressed, 8-12-ribbed, in clusters on leafless branches, purple-orange when ripe.

Frequent name: Trembal.

Flowering and Fruiting: April-August.

Occurrence and associations: Frequent in the forest.

Parul: 48, Nagli.

Ethnobotanical uses: Fruits are edible.

***Ficus benghalensis* Linn.**, Sp. Pl. 1059; Hooker, Fl. Br. Ind. V: 499; Brandis, Ind. Trees 600; Collett, Fl. Simlensis 459; Kanjilal, For. Flora 471; Duthie, Fl. Upp. Gang. Pl. 3:147; Barnber, Pun. Plants, 16; Sabnis, Contrib. Fl. Pun. 566; Maheshw., Fl. Delhi, 324; Nair, Fl. Pun. Pl. 243; Jain, Fl. Har. 195.

A large, nearly evergreen tree with greyish-white, smooth bark. Branches horizontally

spreading and throwing down at intervals a series of aerial roots. Leaves coriaceous, alternate, ovate or elliptic, obtuse, entire, glabrous above, pubescent beneath, base subcordate or rounded, petiole stout. Receptacles in axillary pairs, globose, sessile, red when ripe, nearly 1 cm in diameter, supported by 3 broad, basal bracts.



Flowering and Fruiting: June-November.

Occurrence and associations: Frequent in the area.

Parul: 247, Tajewala.

Ethnobotanical uses: Aerial roots powder is taken for enhancing sperms count in males.

Ficus benjamina Linn., Mant. Pl. 129, 1767; *Ficus benjamina* var. *comosa* (Roxb.) Kurz Forest Fl. Burma 2: 446, 1877; *Ficus benjamina* var. *comosa* King Ann. Roy. Bot. Gard. (Calcutta) 1: 44, 1888; Hooker, Fl. Brit. Ind. 5: 508. 1888.



A large avenue tree. Leaves alternate, elliptic or ovate-elliptic, 5.5-10 x 2.5-5 cm, acute or acuminate at apex, cuneate or rounded at base, entire, coriaceous, glabrous, petioles 1.5-2 cm long, stipules lanceolate, 0.8-1 cm long. Receptacles sessile, axillary, solitary or paired, thick peduncle, subglobose, yellowish orange on ripening, male and female flowers in the same receptacles. Achenes ovoid.

Frequent name: Pukar.

Flowering and Fruiting: February-October.

Occurrence and associations: Occasionally found as an escape.

Parul: 336, Yamuna Nagar.

Ethnobotanical uses: Bark decoction is used as a hepatic tonic and to treat rheumatism.

Ficus exasperata Vahl, Enum. Pl. 2: 197. 1805; Corner in Gard. Bull. Singapore 21: 74, 1965; *F. asperrima* Roxb., Fl. Ind. 3: 554.1832; King in Fl. Brit. India 5: 522. 1888.



Small trees, 5-8 m high. Leaves usually alternate, Infrequently opposite, ovate or oblong-elliptic, 12-18x7-10 cm, acute to acuminate at apex, cuneate at base, entire to sparingly dentate, subcoriaceous, scabrid above, tomentose beneath, stipulate, petioles up to 1 cm long. Receptacles axillary, solitary, pedunculate, globose, yellow on ripening, basal bracts 2-3. Male flowers sessile. Tepals 5, white, free. Stamen 1. Female flowers sessile. Gall flowers sessile to pedicellate. Achenes oblong.

Frequent name: Brahma Bargad.

Flowering and Fruiting: February-April.

Occurrence and associations: Frequent in reserve forest.

Parul: 405, Kalesar National Park.

Ficus hispida Linn. f., Suppl. Pl. 442. 1782; Hooker, Fl. Brit. Ind V: 522. 1888; Duthie, Fl. Upp. Gang. Pl. 2: 244; Brandis, Ind. Trees 606; Kanjilal, For. Flora 374; Corner in Gard. Bull. Singapore 21: 89. 1965; *F. oppositifolia* Roxb., Pl. Coromandel 2: 1.4. t. 124. 1799; *F. daemonia* Koenig ex Vahl, Enum. Pl. 2: 198. 1805.



Shrubs or trees, hispid. Leaves 7-22 x 5-10 cm, opposite, decussate, ovate or oblong-elliptic, abruptly acute at apex, rounded or truncate at base, entire, coriaceous, hispid beneath. Receptacles on leafless, hanging twigs and arising in clusters from the trunk and main branches, depressed globose, pale yellow on ripening. Male flowers are in 2 rows. Stamen 1. Female flowers sessile or pedicellate. Gall flowers sessile or pedicellate. Achenes lenticular.

Frequent name: Bhumi Goolar.

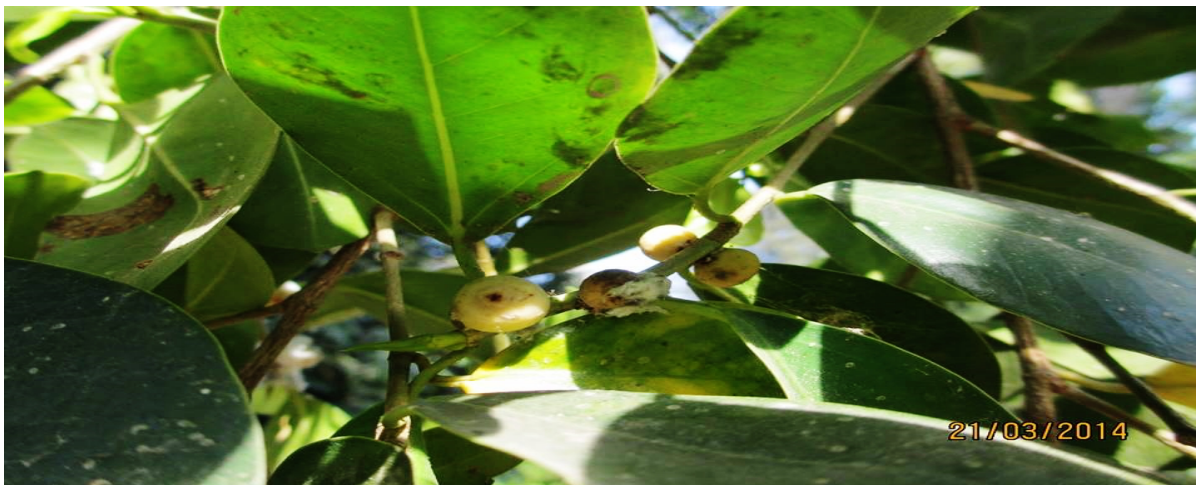
Flowering and Fruiting: January-June.

Occurrence and associations: Frequent in reserve forest.

Parul: 491, Kalesar National Park.

Ethnobotanical uses: Fruits are edible.

Ficus microcarpa Linn. f., Suppl. Pl. 442. 1782; Corner in Gard. Bull. Singapore 17: 397, 1959; Maheshw., Fl. Delhi, 325; Hooker, Fl. Brit. Ind. 5: 511, 1888; Duthie, Fl. Upp. Gang. Pl. 2: 239; Brandis, Ind. Trees 603.



An evergreen, 8-10 m high tree, with aerial roots forming prop roots. Leaves alternate, spirally arranged, elliptic-ovate or rhomboid, 4-8 x 3-5.5 cm, acute or obtuse at apex, cuneate at base, entire or undulate, glabrous or puberulous, petiolate, stipulate. Receptacles axillary, paired, sessile, globose, ca 1 cm across, pink purple, black on ripening. Male flowers numerous. Tepals 3. Stamen 1. Female flowers sessile. Gall flowers similar to female ones, pedicellate. Achenes smooth.

Flowering and Fruiting: March-October.

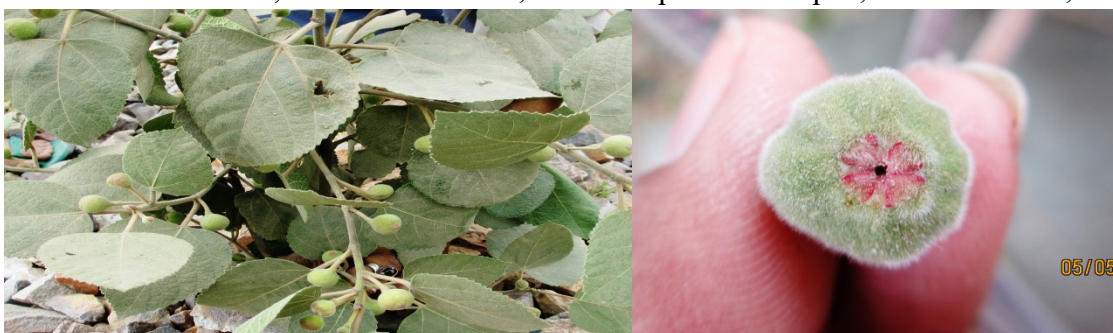
Occurrence and associations: Occasional, Planted in gardens.

Parul: 365, Khizrabad.

Ethnobotanical uses: Bark is used to treat rheumatism, mouth ulcers, skin diseases and burning sensation.

Ficus palmata Forssk., Fl. Aegypt.-Arab. 179. 1775; Hooker, Fl. Brit. Ind. V: 530; Brandis, Ind. Trees 607; Collett. Fl. Simlensis 460; Kanjilal, For. Flora 376; Duthie, Fl. Upp. Gang. Pl. 2:247; Barnber, Pun. Plants, 71; Sabnis, Contrib. Fl. Pun. 567; Maheshw., Fl. Delhi, 327; Nair, Fl. Pun. Pl. 244; Jain, Fl. Har. 195. *F. caricoides* Roxb., Fl. Ind. 3: 529. 1832; *F. virgate* Roxb., Fl. Ind. 3: 530. 1832.

Small trees, 2-3 m high, with pubescent branches. Leaves broadly ovate or orbicular, sometimes 3-5-lobed, 12-24 x 11-19 cm, acute or apiculate at apex, cordate at base,



denticulate, membranous, tomentose. Receptacles axillary, solitary, pedunculate, subglobose or pyriform, nearly 2 cm across.

Frequent name: Anjiri.

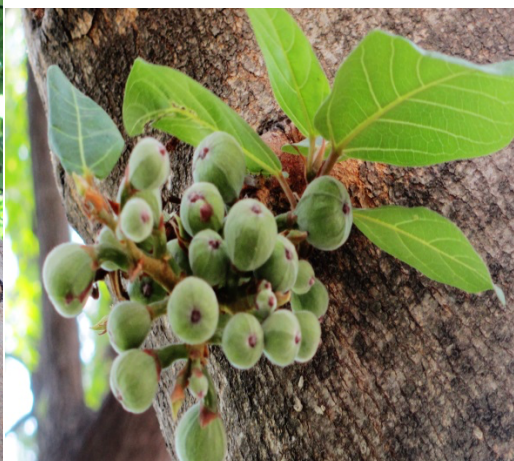
Flowering and Fruiting: June-September.

Occurrence and associations: Frequent in reserve forest.

Parul: 19, Kalesar National Park.

Ethnobotanical uses: Fruits are edible, used to treat general debility, anaemia and digestive disorders.

Ficus racemosa Linn., Sp. Pl. 1060; Corner in Gard. Bull. Straits. Settlem. 21:34, 1965; Nair, Fl. Pun. Pl. 242; Jain, Fl. Har. 195; *Ficus glomerata* Roxb., Pl. Cor. t. 123, 1798; Hooker, Fl. Br. Ind. V: 535; Brandis, Ind. Trees 609; Kanjilal, For. Flora 482; Duthie, Fl. Upp. Gang. Pl. 3: 160; Sabnis, Contrib. Fl. Pun. 567; Parker, For. Fl. Pun. 480.



A large tree with smooth, reddish-brown bark. Leaves alternate, membranous, elliptic-lanceolate or ovate-oblong, 7-12 x 2-4 cm, entire, glabrous on upper surface, subacute, base rounded or acute. Receptacles on short warty, leafless branchlets, peduncled, subglobose, 2-4 cm in diameter, downy, reddish-orange on ripening.

Frequent name: Gular

Flowering and Fruiting: May-July.

Occurrence and associations: Occasional in the area.

Parul: 339, Kalanour.

Ethnobotanical uses: Bark powder is taken with milk to treat diabetes, leprosy, small pox, leucorrhoea and fruits are eaten for balancing hormones.

***Ficus religiosa* Linn.,** Sp. Pl. 1059; Fl. Br. Ind. V: 513; Brandis, Ind. Trees 601; Collett, Fl. Sim. 459; Kanjilal, For. Flora 475; Duthie, Fl. Upp. Gang. Pl. 3: 150; Barnber, Pun. Plants, 16; Sabnis, Contrib. Fl. Pun. 566; Parker, For. Fl. Pun. 476; Maheshw., Fl. Delhi, 325; Nair, Fl. Pun. Pl. 244; Jain, Fl. Har. 195.



A large, deciduous tree, epiphytic in early life. Trunk irregularly-shaped, bark whitish bearing brown specks. Leaves 10-17 x 4-7 cm, entire, glabrous, shining, reddish when young, white-tubercled when mature, truncate-cordate, with 5-7 basal nerves, sharply acuminate, acumen nearly or more than half the length of the blade, margins of blade undulate. Receptacles in

axillary pairs, sessile, smooth, depressed-globose, 1.5 cm in diameter, dark purple on ripening.

Flowering and Fruiting: March-May.

Occurrence and associations: Frequent in the area, often self-grown.

Parul: 108, Marwa kalan.

Ethnobotanical uses: Young leaves chewed to treat scabies, heart disease, gonorrhoea and bark is used to treat asthma, epilepsy and diabetes.

***Ficus semicordata* Buch.-Ham.** ex J.E. Smith in Rees, Cyclop. 14, n. 91,1810; Jain, Fl. Har. 197; *F. cunia* Buch.-Ham. ex Roxb., Fl. Ind. 3: 561; Hooker, Fl. Br. Ind. V: 523; Brandis, Ind. Trees 606; Collett, Fl. Simlensis 460; Kanjilal, For. Flora 479; Duthie, Fl. Upp. Gang. Pl. 3:15 Bamber, Pun. Plants, 17; Sabnis, Contrib. Fl. Pun. 567; Parker, For. Fl. Pun. 476; Nair, Pun. Pl. 243.



A moderate-sized tree with dark grey bark and scabrous branches. Leaves alternate, elliptic to oblong-lanceolate, distinctly unequal-sided, acuminate, 15-22 x 5-6 cm, usually crenate-serrate, infrequently entire, scabrous or smooth on upper surface, pubescent beneath. Receptacles globose or pyriform, in pairs or clusters on leafless shoots, ribbed and brown on ripening.

Frequent name: Jarhphali.

Flowering and Fruiting: July-December.

Occurrence and associations: Occasionally occurs in the dense forest.

Parul: 402, Kalesar National Park.

Ethnobotanical uses: Bark and fruit is used to treat leprosy.

***Ficus virens* Aiton,** Hortus Kew. 3:451.1789; Corner in Gard. Bull. Singapore 17:376.1959 & 21:9.1965; Maheshw., Fl. Delhi, 327; *F. infectoria* Roxb., Fl. Ind. 3:551.1832, Hooker, Fl. Brit Ind. V: 515. 1888; Brandis, Ind. Trees 602; Kanjilal, For. Flora 372; Duthie, Fl. Upp. Gang. Pl. 2: 243.



A medium sized deciduous tree, with aerial roots from the branches. Leaves alternate, oblong-ovate, oblong-elliptic or elliptic to obovate, 6-15 x 3.5-9 cm, abruptly acuminate at apex, rounded, truncate or cuneate at base, entire, glabrous, petioles 4-6 cm long, stipules broadly ovate, ca 1 cm long. Receptacles axillary, paired, sessile or subsessile, globose, white to cream-coloured on ripening. Male flowers shortly pedicellate. Tepals 4. Stamen 1. Female flowers sessile. Gall flowers pedicellate. Achenes smooth.

Frequent name: Pilkhan.

Flowering and Fruiting: April-December.

Occurrence and associations: Frequent in the area.

Parul: 85, Marwa kalan village.

Ethnobotanical uses: Fruits are edible. Bark powder is used to treat leucorrhoea.

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