MATERIALS AND METHODS

A large number of woody plants (shrubs and trees) were collected between March, 2008 and July 2014 from the different places of the district Bilaspur. Most of the places visited, which are mentioned below along with their characteristics, are also presented in Figs. 3-46.

1) Ajnol: It is a village in Sri Nainadevi wild life sanctuary. Ajnol to Guru ka Lahore is 5 Km and both side view of lake as well as plains of Punjab.

2) Amarpur: 17.5 Km from Bilaspur.

3) Auhar: 16 Km from Bilaspur. It is famous for its agriculture farms (wheat, pulses).

4) Baba Balak Nath: across the Gobindsagar lake, where thousands of pilgrims follow the path through the Nainadevi wild life sanctuary. They cross the Gobind sagar by boat.

5) Baba Kali Johar: within the Nainadevi wild life sanctuary.

6) Babkhal: 63 Km from Bilaspur, Bridge under construction on river Satluj.

7) Bachhretu: It is 52 Km from Bilaspur and 34 Km from Ghumarwin, on Kot dhar. Bachhretu Fort, constructed by Raja Rattan Chand, who ruled the state from 1355 to 1406, is situated here. The site also commands a magnificent view of the sprawling Govindsagar and the surrounding hills.

8) Badan-da-ghat: 34 Km from Bilaspur. Diversions to Ladrou and Hatwar.

9) Badhaghat: 28 Km from Bilaspur.

10) Badoh: It is a village in Sri Nainadevi wild life sanctuary. It has 123.27 and 25 hectares of demarcated and undemarcated protected forests respectively. From the Badoh Ridge view of Lake, plains and forests can be seen. Badoh to Dharote via Kali Johar is 5 Km. Badoh to Kahun ka tiba via Kharkri Kala kund is 10 Km. Badoh to Bhakhra is 17 Km. Badoh to Oel is 16 Km.

11) Badol: Badol Devi temple is situated on this hill, 32 km from Bilaspur.

12) Baggi: 8 Km from Bilaspur on the way to Ghagus.

13) Bahadurpur: It is a hill station, where snowfall occurs in winter. It is the highest point in Bilaspur district and is 35 Km from Bilaspur. Bahadurpur fort was built by Raja Keshab Chand on it.

14) Baihnajattan: 23 Km from Bilaspur. Diversions to Gehrwin and Auhar occur here.
15) Balohi: 21 Km from Bilaspur on the way to Chandpur.

16) Bamta: 2 Km from Bilaspur.

17) Bandla Dhar: 1240-1375 m altitude, 14 Km from Bilaspur, famous for Paragliding.

18) Baner: 34 Km from Bilaspur famous for pine forest, on the way to Swarghat.

19) Binola: 9 Km from Bilaspur on the way to Ghagus.

20) Barmana: 550 m altitude, 20 Km from Bilaspur, famous for ACC Cement factory and as a transport area.

21) Bassi: 84 Km from Bilaspur. Bassi spring near village Bassi in pargana Kot-Kehlur of Bilaspur district is considered very sacred.

22) Beas (Vyas) Guffa: Bilaspur derives its name from Beas (Vyas) Rishi, who meditated here. Although the portion of the town was submerged into the Govindsagar, the cave is still safe. Now it is a place where people perform their religious activities.

23) Beri: 16 Km from Bilaspur, Transport area.

24) Berthin: 27 Km from Bilaspur, famous for the research centre of Agriculture University Palampur.

25) Bhajwani: It is famous for an old wooden bridge constructed during the time of Raja Anand Chand.

26) Bhakhra: It is the name of a small village in Sri Nainadevi wild life sanctuary, 91 Km from Bilaspur, located in the Himalayan foot hills, where Bhakha dam has been constructed. Bhakhra is the world's highest gravity dam and has rightly been described as a 'New Temple of Resurgent India' by Pt. Jawahar Lal Nehru, the first Prime Minister of India. The crystal clear water flowing through river outlets in the shape of a cascade soothes one’s eyes and adds to the scenic beauty of the dam. Bhakhra dam project includes the Nangal dam, Nangal hydel channel and Ganguwal and Kotia power houses. Bhakhra has 70 and 19 hectares of demarcated and undemarcated protected forests respectively.

27) Bharari: 33 Km from Bilaspur. It is a sub- tehsil HQ.

28) Bhater: It is a village in Sri Nainadevi wild life sanctuary. It has 29.21 and 53 hectares of demarcated and undemarcated protected forests respectively.

29) Bhager: 13 Km from Bilaspur, On NH-88 diversion to Jhandutta.

30) Bhrolikalan: 38 Km from Bilaspur, village in Kot dhar, diversion to Kalol and Gharan.
31) Bilaspur: Bilaspur, situated at 610 m in the lower hills, is a class IV town (10,000-19,999 population). It is a gateway to the Kullu-Manali from Punjab and Haryana. It is the headquarter of the district Bilaspur of Himachal Pradesh. Nalwari fair is famous for cattle selling-purchasing and wrestling competition, which takes place in the month of March every year. Vyas cave, Lakshmi Narayan and Dholra temples and Govind Sagar lake are other attractions.

32) Brahmpukhar: It is 16 Km from Bilaspur and diversion to Deoth, Jukhala, Namholn occurs here.

33) Chaat: 22.5 Km from Bilaspur.

34) Chalaili: 23 Km from Bilaspur.

35) Chandpur: 7 Km from Bilaspur, famous for newly constructed Kunggar-hatti bridge on Ali Khad that leads to Ghumarwin.

36) Changar: famous for all the district level offices of the Bilaspur.

37) Chanjhhia: 54 Km from Bilaspur famous for Pine forest.

38) Dadhol: 27 Km from Bilaspur on NH-88, Diversion to Dangar and Bharari.

39) Dadoh: It is a village in Sri Nainadevi wild life sanctuary. It has 90.30 and 101 hectares of demarcated and undemarcated protected forests respectively. Dadoh to Bhakra is 15 Km.

40) Damli: 22 Km from Bilaspur.

41) Dangar: 31 Km from Bilaspur, On NH-88 to Hamirpur.

42) Deoli: It is 11 Km from Bilaspur and just 1 Km from the Ghagas Bridge on the Shimla-Mandi Road. It is famous for fish breeding farm.

43) Deoth: 24 Km from Bilaspur.

44) Dhalet: It is a village in Sri Nainadevi wild life sanctuary. It has 152 and 368 hectares of demarcated and undemarcated protected forests respectively.

45) Dhararsani: 26 Km from Bilaspur.

46) Dholra: 550 m altitude, 1.5 Km from Bilaspur, famous for temple of Baba Nahar Singh.

47) Dora: It is a village in Sri Nainadevi wild life sanctuary

48) Galua: It is a village in Sri Nainadevi wild life sanctuary. It has 65.60 and 23 hectares of demarcated and undemarcated protected forests respectively. Galua to Chalela is 4 Km.
49) Garamoura: 50 Km from Bilaspur. It is a gateway to Bilaspur, on NH-21.

50) Gehriwin: It is 27 Km from Bilaspur and is famous for its pine forest and shrine of Gugga Peer. A fair is held here in honour of Gugga Peer to extoll his heroic deeds.

51) Ghagus: 545 m altitude, 12 Km from Bilaspur, NH-21 and NH-88 cross each other at this place.

52) Gharan: 55 Km from Bilaspur, a village on Kot dhar (45 km via Jhandutta).

53) Ghatewal: It is a village in Sri Nainadevi wild life sanctuary. It has 48.93 and 562 hectares of demarcated and undemarcated protected forests respectively.

54) Ghuandal: It is a village in Sri Nainadevi wild life sanctuary. It has 6 hectares of undemarcated protected forest.

55) Ghumarwin: 550 m altitude, 19 Km from Bilaspur. It is a Tehsil (HQ) and is named after 'kumhars', i.e. potters, because it was a potters centre.

56) Govind Sagar lake area: Gobind Sagar is man made lake formed in 1963 as a result of the world-famous Bhakhra dam on the river Satluj in the Bilaspur district. Bhakhra dam has rightly been described as a 'New Temple of Resurgent India' by Pt. Jawahar Lal Nehru, the first Prime Minister of India. The crystal clear water flowing through river outlets in the shape of a cascade soothes one's eyes and adds to the scenic beauty of the dam. It has an area of 170 Km² (10034 ha) and its length is 90 Km (55 miles) between Kasol and Bhakra villages. Its altitude varies from 350-500 m. It is said that 256 villages of the district were submerged into Govind Sagar, uprooting 10000 people. It is the largest man made lake of Himachal Pradesh. It is controlled by Bhakhra Beas Management Board. Temperature varies from 2-45° C. Annual rainfall is 1155 mm. It is famous for water sport and fishing. The impounding water of this lake is used for generating power. Govind Sagar is primarily a wetland, which is surrounded by dry mixed deciduous forest in the periphery. It forms a habitat for several species of fish and a winter refuge for migratory birds.

57) Gualthai: 98 Km from Bilaspur, Industrial area.

58) Guru-ka-Lahore: This is the religious place of Sikhs and Hindus. This place is also connected with Guru Gobind Singh Ji as these forested areas at that time were frequently used by the Sikhs as base from where they used to fight the Muslims regime. It is 81 Km from Bilaspur. It has 75.27 and 111.00 hectares of demarcated and undemarcated protected forests respectively. It is famous for its Gurudwara. Guru-Ka-Lahore to Bhakhra via Thana is 20 Km.
59) Gualthai to Meshiwal: 33 Km.

60) Haritlyanger: 32 Km from Bilaspur, Exit point on NH-88 to Hamirpur.

61) Harlog: 19 Km from Bilaspur.

62) Harnora: 30 Km from Bilaspur, a village near Koldam.

63) Hatwar via Ghandalwin: 46 Km from Bilaspur.

64) Hawan: 29 Km from Bilaspur, Place near Sariun Fort and Bhianu Peer Temple.

65) Jagatkhana: 44 Km from Bilaspur. The famous Jagat Khana Tank was constructed by Raja Hira Chand in 1874 A.D. Its area is about 200 m².


67) Jamthal: 32 Km from Bilaspur famous for Jalpa Devi Temple and NTPC township.

68) Jhandutta: 650 m altitude, 28 Km from Bilaspur, Tehsil (HQ).

69) Jol, 17 Km from Bilaspur.

70) Jukhala: 22 Km from Bilaspur, Valley famous for vegetables and fruits.

71) Kainchymode: 50 Km from Bilaspur, Diversions to Sri Naina Devi and Garamoura occur here.

72) Kalakund: It is a village in Sri Nainadevi wild life sanctuary

73) Kalar: 21 Km from Bilaspur. It is famous for its Mango orchards.

74) Kallri: It is a village in Sri Nainadevi wild life sanctuary. It has 92.40, 136.40 and 61 hectares of demarcated on North, demarcated on South and undemarcated protected forests respectively.

75) Kalol: 43 Km from Bilaspur. It is a village in Kotdhar.

76) Kandrour: It is situated at an altitude of 573 m above the mean sea level and is 09 Km from Bilaspur. It is famous for its ‘Kandrour Bridge’, which is highest in Asia and second highest in the World (80 m). Its span is 280 m and is constructed across the river Satluj (upper reaches of Govindsagar lake). The bridge was completed in 1964.

77) Kanfara: It is a village in Sri Nainadevi wild life sanctuary. It has 62.14 and 214 hectares of demarcated and undemarcated protected forests respectively.

78) Khal: It is a village in Sri Nainadevi wild life sanctuary. It has 81.20 and 120 hectares of demarcated and undemarcated protected forests respectively.
79) Kharkari: It is a village in Sri Nainadevi wild life sanctuary. It has 45.65 and 37.20 hectares of demarcated and undemarcated protected forests respectively.

80) Khulwin: It is a village in Sri Nainadevi wild life sanctuary. It has 106 and 9 hectares of demarcated and undemarcated protected forests respectively.

81) Kothi: 23 Km from Bilaspur. It is famous for its natural sources of water.

82) Kothipura: 10 Km from Bilaspur. It is famous transport area

83) Kot Kehlur fort: It is situated at a distance of 3 Km from Ganguwal in Punjab, but it falls in Bilaspur district. Raja Bir Chand built it as a palace-cum-fort on the advice of Goddess Naina. Now the fort is in ruins. For the local population the district is still known as Kehlur.

84) Kuthera: 31 Km from Bilaspur, Famous for Maggar bamboo.

85) Lag-Ghat: 32 Km from Bilaspur. It is a place between Rattanpur Fort (Bilaspur) and Malon Fort (Solan).

86) Lehri: It is a village in Sri Nainadevi wild life sanctuary. It has 150.80 and 315 hectares of demarcated and undemarcated protected forests respectively. Lehri to Bhakhra is10 Km and Lehri to Kala Kund is 5 Km.

87) Makri: It is a village in Sri Nainadevi wild life sanctuary. It has 86 and 157 hectares of demarcated and undemarcated protected forests respectively.

88) Malari: 32 Km from Bilaspur. Diversions to Kalol and Shahtalai occur here.

89) Maleta: It is a village in Sri Nainadevi wild life sanctuary.

90) Malokhar: 41 Km from Bilaspur. It is a transport area and there are roads leading to JP Cement Plant and Darla-Ghat (Solan).

91) Malraon: 78 Km from Bilaspur. It is a village on the west side of Kotdhar.

92) Mandyiyali: It is a village in Sri Nainadevi wild life sanctuary. It has 83.20 and 11 hectares of demarcated and undemarcated protected forests respectively.

93) Markand or Markandey: It is famous shrine situated at an altitude of 550 m and is 20 Km from Bilaspur. It is famous for Rishi Markandey temple at Makri. It is believed that a tunnel existed between Markandey and Vyas caves. The two 'Rishis' used to visit each other through this path. There is a natural water spring here and the married couples come to have a dip in the sacred water, which is believed to cure sterility and infant diseases.

94) Marottan: It is 58 Km from Bilaspur. It is a village on the east side of Kotdhar.
95) Mehran: 25 Km from Bilaspur. It is famous for Meharn (Tiun) Fort.
96) Methi: 30 Km from Bilaspur. It is a village near Rattanpur Fort.
97) Mohabali ridge (Nagani): Natural Scene of Lake and Plain of Punjab on bridle path
98) Naingujran: 23 Km from Bilaspur.
99) Nakrana Challela: It is a village in Sri Nainadevi wild life sanctuary.
100) Nale-Naun: Near Bilaspur. It is famous for Jetty motor boats, which ply to downstream places in Govindsagar.
101) Namhol: 1240 m altitude, 25 Km from Bilaspur, on NH-88, on the way to Shimla.
102) Nandvella: It is a village in Sri Nainadevi wild life sanctuary
103) Nangal to Bhakhra: 10 Km (Gwalthai to Bhakra), Metaled, owned by PWD & BBMB.
104) Nauni/Nouni: 08 Km from Bilaspur. Diversions to Brahmpukhar and Swarghat occur here.
105) Neemwali: It is a village in Sri Nainadevi wild life sanctuary. It has 52.80 hectares of demarcated protected forest.
106) Nihari: 25 Km from Bilaspur on NH-88. A horticulture nursery is situated here.
107) Palsed: It is a village in Sri Nainadevi wild life sanctuary. It has 185.60 and 470 hectares of demarcated and undemarcated protected forests respectively.
108) Panjgain via Gugga Ghat: 19 Km from Bilaspur. It is a fertile valley.
109) Panoh, 12 Km from Bilaspur, on the way to Tiundhar and Sruindhar. Diversions to Dehar, Kandraur and Ghumarwin occur here.
110) Panoul: 16 Km from Bilaspur. Diversions to Berthin and Samoh occur here.
111) Patta: 18 Km from Bilaspur.
112) Rajpura: 12 Km from Bilaspur.
113) Ree: 52 Km from Bilaspur on NH-21.
114) Rishikesh: 550 Km altitude, 23 Km from Bilaspur. It is famous for Jetty motor boats, which ply in Govindsagar.
115) Saloa: 77 Km from Bilaspur. It is a village in Sri Nainadevi wild life sanctuary. It has 84.69 and 147 hectares of demarcated and undemarcated protected forests respectively.
116) Salwar: 55 Km from Bilaspur. It is a village on Kotdhar.
117) Samletu: 35 Km from Bilaspur.

118) Samoh: 650 m altitude, 21 Km from Bilaspur. It is famous for its pine forest. Diversions to Gehrwin and Jhandutta occur here.

119) Sandu Maidan of Bilaspur.

120) Saran: It is a village in Sri Nainadevi wild life sanctuary

121) Sawana: It is a village in Sri Nainadevi wild life sanctuary. It has 52.80 hectares of demarcated protected forest.

122) Shahtalai: 47 Km from Bilaspur famous for Baba Balak Nath Temple.

123) Slapper: 570 m altitude, 23 Km from Bilaspur. It is an exit point on NH-21 on the way to Mandi. It is the culmination of an engineering feat, the Beas-Satluj link project. Here the water of Beas river has been put into Satluj river through two tunnels (of 13.16 and 12 Km long) for producing electricity. A road leads to Koldam (Harnora) from here.

124) Solag: 25 Km from Bilaspur. It is famous for 'Kalababa' shrine.

125) Sri Naina Devi Ji: It is 70 Km from Bilaspur. It is one of the five Shaktipeeths in H.P. It is situated on the top of a triangular hillock. It commands an unparalleled view of Gurudwara Anandpur Sahib and Govind sagar lake. Both Hindus and Sikhs hold the shrine in great respect Tank at Sri Naina Devi has an area is about 1200 m². It has been notified as a Naina Devi sancturay.

126) Sungal: 5 Km from Bilaspur, on NH-21.

127) Sunhani: It has its own importance in the history of Bilaspur. The ruler Bik Chand had to fly to this place in order to save himself from embracing Islam. The Sunhani has the distinction of being the capital of old Bilaspur state for 53 years. However, the ruler Dip Chand developed a strong dislike for the place and made Bilaspur as the capital.

128) Swarghat: It is situated in the Shivalik hills on the National Highway-21 at an altitude of 1200 m above the mean sea level and is 42 Km from Bilaspur. Swarghat to Bhakhra is 49 Km, While on the way to Swarghat, one cannot miss 'Malaon Forts' set atop a distant hill, which witnessed several historical battles and survived the onslaught of several rulers like the British, the Gukhas, the Sikhs and finally the hill princes. It is famous for Swarghat Tank, which was constructed by Raja Hira Chand in 1874 A.D. Its area is about 350 m² and depth 4 m. Luhnd spring at Dadrana is close to Swarghat in pargana Fatepur in

---

1 The five Shaktipeeths of Himachal Pradesh are Nainadevi in Bilaspur district, Chintpurni in Una district, Brijeshwari, Chamunda and Jwalamukhi in Kangra district.
Bilaspur district. It contains water of reputed medicinal properties. Especially it is useful for people suffering from stomach ailments and goiter. Swarghat is surrounded by pine trees and is a healthy place. The scenery of the place is quite pleasing.

129) Tepra: 2000 m altitude, 33 Km from Bilaspur. It is famous for apple orchards and its flora is almost similar to that of Shimla.

130) The Kahu ka Tibba: islands in the Gobind sagar sanctuary which are looked after for protection by WL range Nainadevi which remain surrounded by water for most of time of year. But since three four years this is connected to main land mass as early as January or February. They present a good island like location during September to January. There is wildlife also on this island like sambar and wild boars along with the red jungle fowls etc. There are a lot of scopes of developing this island as a potential tourist spot.

131) Uttapur: It is a village in Sri Nainadevi wild life sanctuary

For collecting, preserving and identifying the plants standard procedures were followed. The coloured photographs of the plants were taken in the field. Their characteristic features were also noted in the field and the collected plants were brought to the laboratory for identification. Five Herbarium mounts of plants were prepared for record and further confirmation. The terminologies followed in describing and identifying the herbs are in conformity with Harris and Harris (1994), Jain and Rao (1977), Polunin and Stainton (1984), Stainton (1988) and Womersley (1981). All the collected and identified plants are described and presented in the thesis by following the latest International Rules of Botanical Nomenclature. For each plant common and vernacular names available in the literature, etymology, citations, morphological details, flowering and fruiting periods, present places of collection, habitat, distribution in the World, India and Himachal Pradesh, economic and ethnobotanical uses, coloured photographs and notes (if any) are presented. Metric system has been adopted throughout the work. Ambasta (1986), Bennet (1987) and several other references² have been followed for correctly naming the plants. Classification given by Bentham and Hooker (1862-1883) and Hooker (1872-1897) for angiosperms with modifications according to the latest rules and knowledge have been adopted. The advantages of these systems are:

1) This system govern the placing of the herbarium mounts in the Indian herbaria.

2) Most of the Indian botanists have accepted this system of classification.

² For nomenclature of legumes in India M. Sanjappa (1992) has been followed
3) All floras till date on Himalayas, Himachal Pradesh and on parts or districts of Himachal Pradesh are based on this system.

The abbreviations used in the present thesis are in conformity with 'World List of Scientific Periodicals' and common usage in botanical taxonomy. However, in the citations the following abbreviations have been used:

ii) FBI for Flora of British India by Hooker (1872-1897).
iv) FF for Forest Flora of Punjab by Parker (1918, 1924, 1955).
ix) FS for Flora Simlensis by Collett (1902, 1921).
xii) PP for Plants of the Punjab by Bamber (1916).

In distribution within Himachal Pradesh, the following standard abbreviations have been used for different Herbaria of the country:

i) BSD for Herbarium of the Botanical Survey of India, Northern Circle, Dehradun
ii) BSIP for Herbarium of the Birbal Sahni Institute of Palaeobotany, Lucknow.
iii) CAL for Central National Herbarium, Calcutta (Kolkutta)
iv) CDRI for Herbarium of the Central Drug Research Institute, Lucknow.
v) DD for Herbarium of the Forest Research Institute, Dehradun
vi) LWG for Herbarium of the National Botanical Research Institute, Lucknow.
vii) RRL for Herbarium of the Regional Research Laboratory, Jammu

In all 303 species belonging to 221 genera and 87 families (see Table 12 in Conclusions) have been collected, identified, photographed and described alphabetically in the Results.
PLACES OF COLLECTION OF BILASPUR

View from Sariundhar, Bilaspur

View near Tepra, Bilaspur

View of ACC factory at Barmana, Bilaspur

View of Ali Khad

View of Bahadurpur Forest, Bilaspur

View of Bandladhar, Bilaspur
PLACES OF COLLECTION OF BILASPUR

View of Bhakhra dam Bilaspur

View of Chanjiar, Tiun and Delag

View of Ghumanwin from Tiundhar, Bilaspur

View of Jukhala valley, Bilaspur

View of Koldam from Chabyon, Bilaspur

View of Kotdhar and Govindsagar in district Bilaspur
PLACES OF COLLECTION OF BILASPUR

View of Kotdhar, Bilaspur

View of Panjgain, Bilaspur

View of Shahtalai, Bilaspur

View of Swarghat forest
GATEWAYS OF BILASPUR

Gateway to Bilaspur at Garamoura from Kiratpur on Chandigarh-Manali NH 21

Gateway to Bilaspur at Slapper from Mandi on Chandigarh-Manali NH 21

Gateway to Bilaspur at Haritailanger from Hamirpur at NH 88

Gateway to Bilaspur near Rajghati from Shimla-Dharamshala
RELIGIOUS PLACES OF BILASPUR

Badol Devi

Jalpa Devi, Jamthal

Baba Balak Nath temple at Shahtalai

Dhaulra temple at Dhaulra, Bilaspur

Gugga temple at Barmana, Bilaspur

Guru ka Lahore, Bilaspur
RELIGIOUS PLACES OF BILASPUR

Gurudwara Shri Kalgidhar, Bilaspur

Laxmi Narayan temple at Bilaspur

Mosque at Bilaspur

Rishi Markand temple at Markand, Bilaspur

Sri Nainadevi

Vyas Gupha at Bilaspur
BRIDES OF BILASPUR

Bridge on Gambhar khad

Bridge on Gamrola khad

Bridge on Seer khad at Mandwan

Bridge on Seer khad at Sunhani

Bridge on Seer Khad at Talwara

Bridge on Seer khad, Ghumarwin
BRIDES OF BILASPUR

Bridge on Satluj at Dehar

Bridge on Satluj at Kandour

Bridge on Satluj at Slapper

Bridge under construction on Satluj at Babkhal

Kungarhatti Bridge

Ghagus Bridge on Ali Khud