

A RESUME OF BOTANICAL EXPLORATIONS AND FLORISTIC STUDIES IN  
THE CENTRAL INDIAN STATE OF MADHYA PRADESH

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*Botanical Survey of India, Howrah*WHY MADHYA PRADESH DID NOT HAVE  
A FLORA

Madhya Pradesh the largest Indian State lying in Central India was formed in 1948 from the former Central Provinces & Berar. Subsequently in 1956, Berar was transferred to Maharashtra, and Madhya Bharat (the former Central India Agency or Central India, and at one time a part of Rajputana) and Vindhya Pradesh (formerly a part of Central India known as Bundelkhand) were merged with Madhya Pradesh to form the State as we know it now. Jaspur, Surguja and Bastar, belonging to the Eastern States Agency, were also merged into Madhya Pradesh. It is evident, therefore, that till 1948 this Central Indian tract did not have a Flora covering its entire area.

BOTANICAL EXPLORATIONS & FLORISTIC  
STUDIES IN MADHYA PRADESH

Botanical activity in the two former constituents of Madhya Pradesh, namely, the erstwhile Central Provinces and Central India, can be divided into three periods. Some salient features of the three periods are mentioned here. The details of explorations etc. have been set out in tabular form in chronological sequence, in Appendix I. In order to give an idea about the state of

exploration in different parts, a supplementary list of districts/areas visited by collectors has been included in Appendix II. An exhaustive bibliography has been provided at the end.

*First Period (upto 1920) :* This was a period of brisk activity, which lasted for nearly a hundred years. The earliest record of explorations is probably that of V. Jacquemont, a French botanist, who collected in Bundelkhand region in 1830 and in and around the Malwa Plateau in 1832. In quick succession, a host of botanists, foresters, administrators, surgeons, army personnel, missionaries, engineers, etc. followed, exploring and collecting in different parts of this tract. Some of the important explorations are those of N. Vicary (1833) in Central India, Bundelkhand, Sagar & Jabalpur, M.P. Edgeworth (1838, 1848) in Malwa region and Bundelkhand, W. Griffith (c. 1839) in Malwa, Narbada valley and Jabalpur, W. Munro (c. 1839) in Chambal, R. H. Beddome (1848) and O. Kuntze (c. 1875-76) in Jabalpur, D. Brandis (1863, 1868-69) in Satpura range and northwards, G. King (c. 1867) mainly in Guna, T. C. Jerdon (1868) in Central India and Sagar, C. B. Clarke (1876 ?), J. J. Wood (1878) and the Rev.'s A. Campbell and L. Cardon (prior to 1900) in Jaspur and Surguja, J. F. Duthie (1888-89, 1891) in Bundelkhand

and parts of Western and Central Madhya Pradesh, C. Maries (1889-90) in Gwalior, Col. Wingate (1890's?) in Gwalior, Bundelkhand & Sagar, J. Marten (1894, c. 1900) in Jabalpur and Raipur, A. E. Lowrie (1896?, 1908-09) in Indore, Durg, Raipur and Khandwa, and R. Thompson (1870), R. S. Hole (1896-1902), D. O. Witt (c. 1908) & H. H. Haines (1914-20's?) in Central Provinces. In passing it may be mentioned that though J. D. Hooker never collected in Madhya Pradesh, he came right upto its north-eastern boundary in 1848, in Mirzapur, U.P. while on his way to Sikkim.

During this period, numerous publications were brought out, some as regional floras, others as forest floras and some as species lists, but each covering only a portion of this tract. Hooker's *Flora of British India*, published between 1872 and 1897, was probably the first Flora to deal with this tract. Stewart & Brandis' *Forest Flora of North-West and Central India*, published in 1874, covered a major part of the State, while Duthie's *Flora of the Upper Gangetic Plains*, published between 1903 and 1922, dealt with the part of the State lying north and west of the Vindhyan Range (cfr. small inset map). All these Floras were based on meagre collections from this tract, which is evident from the occasional citations of collectors from here. Foresters, such as Hole, Haines and Witt also brought out regional species lists or forest floras [45, 46, 34, 36, 199-200], dealing primarily with woody elements, for Central Provinces and Berar. Wood and Biscoe published species lists [202, 13] for Chota Nagpur and Indore, respectively.

**Second Period (1920-1947) :** There was a sudden lull in floristic activities in this period, probably due to the disturbed conditions prevailing in the subcontinent. However, Mooney actively botanised in Jaspur, Surguja

and Bailadila regions, between 1936 and 1946. He published vegetations accounts, species lists and a Supplementary Flora [101-104, 106] to Haines' *Botany of Bihar and Orissa*, which itself was published between 1921 and 1925 and covered the Jaspur and Surguja regions. Species lists were also provided for Gwalior by Kenoyer [79] & Pathak [135] and the Central Provinces & Berar by Sagreiya [152].

**Third Period (1948-upto the present) :** After India's Independence, there was a renewed interest in floristic studies in order to harness our natural resources. The reorganised Botanical Survey of India commenced explorations from its newly-established Western and Southern Circles from 1957 onwards mainly in Indore, Malwa and the Bhopawar regions of western Madhya Pradesh, and in Bundelkhand, Hoshangabad, Mandla, Sagar & Bastar. The Central National Herbarium parties explored Hoshangabad, Mandla and surrounding areas. The Central Circle, established in 1962, took over further explorations in Madhya Pradesh, and initial reconnaissance surveys were conducted to different parts of the State. Subsequent surveys were confined to the districts of Bilaspur, Sidhi, Ambikapur (Surguja), Bastar, Raipur, Balaghat, Rajnandgaon, Satna, Seoni and Shahdol. The survey explorations have resulted in a number of publications on vegetation and floristic accounts, species lists, including some new species and records, by Puri & Wadhwa [138, 195-197], Sebastine & Balakrishnan [168], Joseph and Vajravelu [67, 68], A. S. Rao & Sastry [148], Subramanyam & Henry [179], R. S. Rao & Narayanaswami [149], Maheshwari [92], Panigrahi *et al.* [129-132, 134, 147, 171], Arora [4] and Sen Gupta and Ram Lal [170].

S. D. N. Tiwari of the State Forest Service and Saxena *et al.* of the State Forest Research Institute, Jabalpur, with the intent of

bringing out a State Flora, have collected in many parts of the State from 1948 onwards, and have published floristic accounts, species lists and new records [182-190, 157-167]. M. B. Raizada *et al.* of the Forest Research Institute, Dehra Dun, have published a series of new records and distribution notes on many species from Madhya Pradesh [139-146, 108-110].

Studies on the flora and vegetation of mainly small and localised areas, with a bias towards ecological aspects, have been undertaken at the universities at Sagar and Ujjain, and the colleges at Khandwa, Jabalpur, Gwalior, Bhopal and Raipur, by numerous workers [122-127, 96-100, 85-91, 5-6, 93-94, 74-78, 112-120, 177, 11, 8-9, 169, 1-2, 193-194, etc.].

*Summing up* : The present study is necessarily sketchy with many gaps in our information, due to limited access to literature and the collections lying scattered in numerous Indian and foreign herbaria.

The data gathered indicates that the districts of Bhind, Damoh, Datia, Dewas, Guna, Jhabua, Mandasaur, Morena, Narsimhapur and Rajgarh are either almost unexplored or underexplored. In recent years explorations taken up by the Botanical Survey of India mainly in the eastern and south-eastern districts have resulted in the following districts being moderately to nearly well explored—Balaghat, Bilaspur, Indore, Raigarh, Raipur, Rajnandgaon, Satna, Seoni, Sidhi, Surguja (Ambikapur). The State Forest Research Institute has been engaged with the central and southern districts, while the universities and colleges mentioned earlier on have de-

voted their attention mainly to the western districts. The present study is a pointer that western and northern Madhya Pradesh have been less explored than other parts.

#### UTILITY OF EARLIER COLLECTIONS AND FUTURE COURSE OF ACTION

The collections of the past century, or more, represent elements of a flora much different from those of to-day. The changed pattern of the flora, brought about mainly by biotic factors, indicates that our Flora must be based, primarily, on our recent collections, which are to be found in the herbaria at Central National Herbarium, Calcutta, the Forest Research Institutes, Dehra Dun and Jabalpur, the Forest Ranger's School, Balaghat, the BSI Circle's at Allahabad, Pune, and Coimbatore, alongwith the herbaria of the universities, at Sagar and Ujjain, and of the colleges at Jabalpur, Bhopal, Gwalior and Raipur. Areas which have remained underexplored must be covered by making more extensive and intensive explorations. Only then could we expect to have a reasonably accurate information on distribution patterns, newer elements, rare and endangered species, and also materials for the study of variability and other taxonomic problems in taxa so essential for bringing out an up-to-date flora. Since this would involve a concerted effort spread over a number of years, the Botanical Survey of India has initiated the State Flora Analysis short-term project, on the pattern of an Annotated Check List, based on available information and collections. This would provide us with a provisional inventory of the plant resources of this large State for our immediate needs.

## APPENDIX—1

CHRONOLOGICAL SEQUENCE OF PLANT EXPLORATIONS IN MADHYA PRADESH  
(INDICATING THE HERBARIA WHERE COLLECTIONS ARE DEPOSITED AND  
REFERENCES TO RELATED FLORISTIC PUBLICATIONS)

Note : Query marks used where data not available or where it could not be verified. Standard abbreviations for herbaria, wherever available, taken from *Index Herbariorum*.

| Name of Collector                    | Herbarium where collections deposited | Year of Collection              | Area of Collection                                                                                     | References to publications (see Bibliography) |
|--------------------------------------|---------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| F I R S T P E R I O D<br>(upto 1920) |                                       |                                 |                                                                                                        |                                               |
| V. Jacquemont                        | A, B, G, P, K,<br>CAL,....            | 1830<br>1832                    | Sidhi. Rewa. Satna, Panna.<br>{ Mandsaur, Ratlam, Ujjain, Indore,<br>Khargon (W. Nimar).               | } 53, 28.                                     |
| N. Vicary                            | Wallichian Herbarium, K, CAL,..       | 1833                            | { Central India, Bundelkhand,<br>Sagar, Jabalpur.                                                      | 28, 24.                                       |
| D. Ritchie                           | E,....                                | c. 1838                         | Central India.                                                                                         |                                               |
| M. P. Edgeworth                      | K, DD,....                            | 1838; after<br>1847.<br>c. 1848 | { Bundelkhand (chiefly around<br>Banda in U. P.<br>Dhar, Malwa, Indore.                                | } 28.                                         |
| W. Griffith                          | K, BM, CAL,....                       | c. 1839                         | Malwa Plateau, Narbada valley,<br>Jabalpur.                                                            | 33.                                           |
| W. Munro                             | K, CAL.                               | c. 1839                         | Chambal (Morēna)                                                                                       | 28.                                           |
| D. F. Macleod                        | Collections passed on to Griffith     | c. 1839-40                      | Jabalpur.                                                                                              |                                               |
| M. Kittoe                            | K, CAL, .....                         | c. 1839-40                      | Collected enroute from Northern<br>Circars to Nagpur (route passed<br>through Bastar, Raipur & Durg?). |                                               |
| R. H. Beddome                        | K, BM, CAL. DD.                       | 1848                            | Jabalpur.                                                                                              |                                               |
| C. W. W. Hope                        | DD,....                               | 1860-61;<br>1886(?)             | Panna. Rewa. Baghelkhand. (ferns)                                                                      | 51.                                           |
| D. Brandis                           | K, DD, CAL,....                       | 1863; 1888-89                   | Satpura range, incl. Pachmarhi,<br>northwards to Bij (a) war;<br>(Bundelkhand, Bijoragorah).           | 178, 28.                                      |
| G. King                              | K, B, BM,<br>CAL,....                 | c. 1867                         | Bundelkhand, Malwa, Guna, Sagar.                                                                       | 81.                                           |
| T. C. Jerdon                         | K, CAL.                               | 1868                            | Central India, Sagar.                                                                                  | 28.                                           |
| R. Thompson                          | K.                                    | 1870                            | Central Provinces,                                                                                     | 178.                                          |
| J. C. Hobson                         | K.                                    | prior to<br>1874                | Asirgarh (Khandwa).                                                                                    | 24.                                           |
| O. Kuntze                            | NY, M, K,<br>CAL, .....               | c. 1875-76                      | Jabalpur.                                                                                              | 24.                                           |

| Name of Collector | Herbarium where collections deposited          | Year of Collection               | Area of Collection                                                                                      | References to publications (see Bibliography) |
|-------------------|------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| A Barclay         | CAL, .....                                     | 1876                             | Guna.                                                                                                   |                                               |
| C B. Clarke       | K, CAL, DD,...                                 | 1876 ?                           | Jaspur & Surguja ; Central India (probably Bundelkhand region).                                         | 24.                                           |
| J. J. Wood        | K, CAL (?)                                     | 1878                             | Jaspur & Surguja                                                                                        | 24, 202.                                      |
| Mrs. C. Morris    | CAL (?)                                        | 1881                             | Pachmarhi (ferns).                                                                                      |                                               |
| W. Schlich        | K, CAL.                                        | 1883                             | Central Provinces.                                                                                      |                                               |
| J. F. Duthie      | K, BM, CAL, DD, .....                          | 1888<br>1888-89<br>1891          | Bundelkhand.<br>Indore, Nimar (Khandwa), near Jabalpur, Sagar, Damoh.<br>Betul; Pachmarhi; Hoshangabad. | 24, 28.<br>24, 28.<br>30, 24, 28.             |
| C. Maries         | K, CAL, DD.                                    | 1889-90                          | Gwalior.                                                                                                | 28.                                           |
| Col. Wingate      | K, DD.                                         | 1890's ?                         | Gwalior, Bundelkhand, Sagar.                                                                            | 28.                                           |
| G. Watt           | CAL, ISIM (Industrial Section, Indian Museum). | c. 1894                          | Raipur, Bilaspur.                                                                                       |                                               |
| J. Marten         | K, DD.                                         | 1894<br>c. 1900                  | Jabalpur,<br>Raipur.                                                                                    | } 28.                                         |
| A. E. Lowrie      | K, CAL, DD.                                    | 1896 ?<br>1908-09                | Indore.<br>Raipur, Durg, Khandwa.                                                                       | } 28.                                         |
| R. S. Hole        | DD, CAL.                                       | 1896-1902 ;<br>c. 1900 ?<br>1915 | Central Provinces, Jabalpur, Seoni.<br>Bhopawar.<br>Hoshangabad.                                        | } 45-47.                                      |
| Rev. A. Campbell  | K, G, LE, CAL.                                 | prior to 1900                    | Jaspur, Surguja                                                                                         | 39.                                           |
| Rev. L. Cardon    | K, CAL (recd. in 1901).                        | prior to 1900                    | Jaspur, Surguja. (orchids).                                                                             | 39.                                           |
| Mrs. A. S. Bell   | K, CAL.                                        | 1903-06                          | Bundelkhand.                                                                                            | 28.                                           |
| A. Meebold        | CAL, DD.                                       | 1905<br>1907<br>1908<br>?        | Chhatarpur.<br>Raisen.<br>Jabalpur.<br>Bhopal.                                                          | } 19                                          |
| I. H. Burkill     | K, CAL, ISIM.                                  | 1908<br>?                        | Khandwa (Nimar).<br>Bundelkhand, Durg.                                                                  | } 19                                          |
| D. O. Witt        | DD.                                            | c. 1908<br><br>1913-16           | Central Provinces (mainly Betul & Nimar Forest Divisions).<br>Sagar, Damoh (?)                          | } 28, 199-201.                                |
| Masters           | DD.                                            | ?                                | Gwalior, Guna.                                                                                          |                                               |
| Allington         | DD.                                            | ?                                | Indore.                                                                                                 |                                               |
| W. F. Biscoe      | DD.                                            | prior to 1910                    | Indore.                                                                                                 | 13.                                           |
| C G. Rogers       | CAL, DD.                                       | 1910                             | Nimar (Khandwa),                                                                                        |                                               |

| Name of Collector | Herbarium where collections deposited          | Year of Collection                | Area of Collection                                                                                                                  | References to publications (see Bibliography) |
|-------------------|------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| H. H. Haines      | A, ABD, BRSL, K, NY, some in CAL & DD, . . . . | 1914-20's ?<br><br>early 1900's ? | Vindhyan range, from Pachmarhi through Balaghat to the mts. of Bilaspur (incl's. Satpura hills, Durg, Raipur, Bilaspur).<br>Indore. | 34-38.                                        |
| A. B. Pande       | DD.                                            | 1911                              | Indore.                                                                                                                             |                                               |
| R. R. D. Graham   | DD.                                            | 1911-14                           | Jabalpur, Pachmarhi (ferns).                                                                                                        | 32.                                           |
| P Mukherji        | CAL, DD.                                       | 1917-18                           | Indore, Gwalior.                                                                                                                    |                                               |
| C. C. Stevens     | CAL.                                           | ?                                 | Surguja.                                                                                                                            | 39.                                           |

## S E C O N D P E R I O D

(1920 — 1947)

|                |                                                  |                     |                                  |                          |
|----------------|--------------------------------------------------|---------------------|----------------------------------|--------------------------|
| L. A. Kenoyer  | ?                                                | before 1924         | Gwalior (?).                     | 79.                      |
| H. F. Mooney   | K, CAL, DD.                                      | 1936-46             | Bailadila (Bastar).              | 101, 102, 104, 105, 142. |
|                |                                                  | 1936-48             | Jaspur, Surguja.                 | 101, 103, 104, 106.      |
| H. Crookshank  | DD (?).                                          | ?                   | Bailadila (Bastar).              | 102.                     |
| C. E. Hewetson | DD (?), SFRI (State For. Res. Instt., Jabalpur). | 1940's ?            | Central Provinces; Bailadila.    | 41-44.                   |
| S. K. Pande    | LWG, K.                                          | 1930 ; 1951<br>1955 | Pachmarhi (hepatics).<br>Indore. | 121.                     |

## T H I R D P E R I O D

(1948-upto the present)

|                              |                      |                  |                                                                                                                           |                    |
|------------------------------|----------------------|------------------|---------------------------------------------------------------------------------------------------------------------------|--------------------|
| S. C. Pandeya                | Sagar Univ. (?)      | 1947-50's        | Sagar.                                                                                                                    | 122-127.           |
| S. D. N. Tiwari              | In personal custody. | 1948-onwards     | Rewa, Shahdol, Raisen, Bhopal, Indore, Mandla, Bastar, Betul, Seoni, Raipur, Hoshangabad, Jabalpur, Rajnandgaon, Raigarh. | 133, 182-190.      |
| J. P. Srivastava             | Sagar Univ.          | 1948-49          | Sagar.                                                                                                                    |                    |
| V. Narayanaswami & R. S. Rao | CAL.                 | 1949             | Jabalpur, Hoshangabad, Khandwa.                                                                                           | 149.               |
| R. Misra                     | DD, Sagar Univ. (?)  | 1950's ?<br>1954 | Sagar.<br>Amarkantak (Shahdol).                                                                                           | 96, 98-100.<br>97. |
| R. M. Singhal                | DD.                  | 1951<br>1970     | Raipur.<br>Mandla.                                                                                                        |                    |

| Name of Collector                          | Herbarium where collections deposited | Year of Collection             | Area of Collection                                                                                                  | References to publications (see Bibliography)     |
|--------------------------------------------|---------------------------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| L. C. Singhai                              | DD.                                   | 1952-54                        | Sagar.                                                                                                              | 175.                                              |
| S. Bhattacharyya                           | Sagar Univ.(?).                       | 1954                           | Sagar.                                                                                                              | 11.                                               |
| H. L. Yadav                                | LWG.                                  | 1956                           | Pachmarhi.                                                                                                          | 70.                                               |
| H. R. Bhargava                             | Sagar Univ.(?).                       | c. 1957 ?                      | Sagar.                                                                                                              | 7.                                                |
| Srivastava                                 | LWG.                                  | ?                              | Bastar.                                                                                                             | 165.                                              |
| Naidu                                      | DD (?)                                | ?                              | Khandwa, Bastar.                                                                                                    | 182-190.                                          |
| R. P. Singh                                | DD (?)                                | prior to 1964                  | Pachmarhi.                                                                                                          | 182-190.                                          |
| R. S. Thakur                               | DD (?)                                | ?                              | Pachmarhi.                                                                                                          | 182-190.                                          |
| G. S. Puri                                 | BSI, BSA, CAL.                        | 1957-59                        | Jhabua, Dhar, Khargon, Indore, Bhopal, Shivpuri.                                                                    | 138.                                              |
| J. V. Vasavada                             | BSI, CAL.                             | 1957                           | Ratlam.                                                                                                             |                                                   |
| I. P. Mall                                 | Sagar Univ. (?)                       | 1958                           | Sagar.                                                                                                              | 93, 94.                                           |
| J. K. Maheshwari                           | S. N. College, Khandwa (?), CAL.      | 1958-59<br>1960<br>1962<br>?   | Khandwa (E. Nimar), Shahdol, Balaghat, Jabalpur. Mandla, Bilaspur.                                                  | 85-91.<br>189, 190.<br>92, 189, 190.<br>189, 190. |
| K. Subramanyam                             | MH, BSA, CAL.                         | 1958-59 ; 1961<br>1959<br>1960 | Bastar.<br>Raipur.<br>Sagar.                                                                                        | 179.                                              |
| S. K. Jain                                 | BSI, BSA, CAL.                        | 1959<br><br>1961<br>1961-63    | Indore, Dhar, Khargon, Mand-<br>saur, Gwalior.<br>Mandla, Chhindwara, Balaghat.<br>Raipur, Balaghat, Seoni, Bastar. | 56-63, 65, 66.                                    |
| B. M. Wadhwa                               | BSI, BSA, CAL.                        | 1959                           | Shivpuri, Raisen, Bhopal, Rajgarh.                                                                                  | 138, 195-197.                                     |
| K. M. Balapure                             | DD, LWG.                              | 1959                           | Central Provinces, Jabalpur.                                                                                        | 5, 6.                                             |
| K. M. Sebastine<br>&<br>N. P. Balakrishnan | MH, BSA, CAL.                         | 1959-60                        | Rewa, Satna, Jabalpur.                                                                                              | 168.                                              |
| N. P. Balakrishnan                         | MH, BSA, CAL.                         | 1959-60<br>1961                | Sagar.<br>Bastar.                                                                                                   | 179.                                              |
| D. K. Tiwari                               | Sci. College, Raipur (?).             | 1960                           | Raipur.                                                                                                             | 180, 181.                                         |
| T. R. Rao                                  | Sagar Univ.(?)                        | 1960                           | Sagar.                                                                                                              | 150.                                              |
| N. P. Chowdhury                            | Sagar Univ.(?)<br>DD (?)              | 1960's ?                       | Upper Gangetic Plain (pteridophytes).                                                                               | 23.                                               |
| J. Joseph                                  | MH, BSA, CAL.                         | 1960-61<br>1961-62             | Hoshangabad,<br>Mandla.                                                                                             | 67.<br>68.                                        |
| A. S. Rao                                  | BSI, BSA, CAL.                        | 1961-63                        | Indore.                                                                                                             | 148.                                              |
| A. B. Seerwani                             | Govt. Sci. Coll., Jabalpur (?).       | prior to<br>1962               | Jabalpur.                                                                                                           | 169                                               |

| Name of Collector                                                   | Herbarium where collections deposited                 | Year of Collection                                                | Area of Collection                                                                                                                                                                                       | References to publications (see Bibliography)                           |
|---------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| G. Panigrahi                                                        | BSA, CAL, some at L.                                  | 1962<br>1962-63<br>1962 ; 1964<br><br>1965<br>1970 ; 1972<br>1972 | Gwalior, Shivpuri, Morena, Raisen, Bhopal.<br>Bastar, Raipur, Satna, Jabalpur.<br>Hoshangabad, Betul, Jabalpur, Chhindwara, Rewa, Sidhi, Satna.<br>Bilaspur, Surguja, Raigarh.<br>Bilaspur.<br>Shivpuri. | 129-132, 134, 147, 162, 171.<br>-do-<br>-do- (excl. 3).<br>-do-<br>-do- |
| K. Sankaran Unni                                                    | Sci. College, Raipur.                                 | 1963-65 ; 1971                                                    | Raipur, Durg.                                                                                                                                                                                            | 193, 194.                                                               |
| C. M. Arora                                                         | BSA, CAL.                                             | 1964                                                              | Bilaspur, Surguja, Raigarh, Indore, Dhar, Ratlam.                                                                                                                                                        | 129-132, 134, 147, 171.                                                 |
| N. K. Jain                                                          | DD.                                                   | 1964                                                              | Jabalpur.                                                                                                                                                                                                | 54, 55.                                                                 |
| H. O. Saxena                                                        | DD (?), SFRI, LWG.                                    | 1964-67<br>1964-71                                                | Amarkantak.<br>Chhindwara, Pachmarhi, Bastar.                                                                                                                                                            | 159, 162, 164.<br>157, 160-167.                                         |
| K. V. Billore                                                       | Motilal Sci. College, Bhopal, BSI.                    | 1965-66                                                           | Bhopal.                                                                                                                                                                                                  | 116.                                                                    |
| J. P. Kaushik                                                       | Govt. Sci. Coll., Gwalior.                            | c. 1965-70                                                        | Shivpuri, Gwalior, Bhind, Morena, Datia.                                                                                                                                                                 | 74-78.                                                                  |
| V. P. Singh                                                         | Vikram Univ., Ujjain.                                 | c. 1966 ?                                                         | Ujjain.                                                                                                                                                                                                  | 174.                                                                    |
| R. Bhatiya                                                          | -do-                                                  | c. 1966                                                           | Gwalior.                                                                                                                                                                                                 | 10.                                                                     |
| S. N. Khotale, P. S. Indorkar, S. G. Shukla, V. K. Singh, G. Pandey | SFRI.                                                 | c. 1965-67                                                        | Amarkantak, Pachmarhi, Jabalpur, Chhindwara, Bastar.                                                                                                                                                     | 157, 159-167.                                                           |
| M. Oomachan                                                         | Motilal Sci. Coll., Bhopal (?); Vikram Univ., Ujjain. | 1966-73                                                           | Bhopal.                                                                                                                                                                                                  | 112-115.                                                                |
| D. S. Agarkar                                                       | Govt. Sci. Coll., Gwalior.                            | 1967-69                                                           | Lower Chambal valley (Morena & Bhind).                                                                                                                                                                   | 1, 2.                                                                   |
| P. K. Deshpandey                                                    | DD.                                                   | 1968                                                              | Jagdalpur (Bastar).                                                                                                                                                                                      |                                                                         |
| G. Sen Gupta                                                        | BSA, CAL.                                             | 1968 ; 1971<br>1971<br>1972 ; 1974 ; 1976                         | Sidhi, Rewa.<br>Raigarh,<br>Ambikapur (Surguja).                                                                                                                                                         | 170.                                                                    |
| P. N. Braru                                                         | Vikram Univ., Ujjain.                                 | c. 1976 ?                                                         | Ujjain.                                                                                                                                                                                                  | 18.                                                                     |
| C. R. Das                                                           | BSA.                                                  | 1971-72                                                           | Bastar.                                                                                                                                                                                                  |                                                                         |
| D. M. Verma                                                         | BSA, CAL.                                             | 1972 ; 1976                                                       | Raipur.                                                                                                                                                                                                  |                                                                         |

| Name of Collector          | Herbarium where collections deposited | Year of Collection | Area of Collection                 | References to publications (see Bibliography) |
|----------------------------|---------------------------------------|--------------------|------------------------------------|-----------------------------------------------|
| S. K. Murti                | BSA, CAL.                             | 1973               | Bilaspur.                          | 83.                                           |
| V. J. Nair                 | BSA, CAL.                             | 1973; 1975-1976    | Balaghat.                          |                                               |
| V. M. Kohli                | CAL.                                  | 1974               | Shahdol.                           |                                               |
| R. M. Mamgain              | BSA.                                  | 1974-75            | Satna.                             |                                               |
| P. C. Pant                 | BSA, CAL.                             | 1974<br>1974; 1976 | Durg.<br>Rajnandgaon.              |                                               |
| N. C. Ratha-khrishnan      | BSA, CAL.                             | 1974; 1976         | Raigarh.                           | 117.                                          |
| R. Dwivedi                 | Motilal Sci. Coll., Bhopal.           | c. 1975 ?          | Bhopal.                            |                                               |
| L. K. Banerjee             | BSA.                                  | 1975-76            | Seoni.                             |                                               |
| R. Khare                   | Motilal Sci. Coll., Bhopal.           | c. 1976 ?          | Bhopal.                            |                                               |
| V. S. Khare & P. C. Sharma | Vikram Univ., Ujjain.                 | c. 1976 ?          | Ujjain.                            |                                               |
| A. H. Khan                 | Motilal Sci. Coll., Bhopal.           | c. 1976 ?          | Bhopal.                            | 118, 119.                                     |
| O. P. Misra                | BSA.                                  | 1976<br>1977       | Shahdol.<br>Dhar, Khargon, Ujjain. |                                               |

## APPENDIX—II

## LIST OF DISTRICTS/AREAS EXPLORED

(with collectors name and year/years of collection within brackets)

Note : Query marks are used where data not available or where it could not be verified.

Amarkantak (see Shahdol)

Ambikapur (see Surguja)

Baghelkhand—Hope (1860-61).

Bailadila (see Bastar)

Balaghat—Haines (1914-20's ?); Maheshwari (1960); S. K. Jain (1961-63); Nair (1973; 1975-76).

Bastar (incl. Bailadila)—[Kittoe (c. 1839-40) ?; Mooney (1936-46); Crookshank ( ? ); Hewetson (1940's ?); S. D. N. Tiwari (1948 onwards); Srivastava ( ? ); Naidu ( ? ); Subramanyam (1958-59; 1961); Balakrishnan (1961); S. K. Jain (1961-63); Panigrahi (1962-63); Saxena (1964-71); Khotele, Shukla, Indorkar, Singh &amp; Pandey (c. 1966-67); Deshpandey (1968); Das (1971-72).

Betul—Duthie (1891); Witt (c. 1908); S. D. N. Tiwari (1948 onwards); Panigrahi (1962; 1964).

Bhopawar—Hole (c. 1900 ?).

Bhind (incl. Chambal)—Kaushik (c. 1965-70); Agarkar (1967-69).

- Bhopal (Sehore)**—Meebold (c. 1907 ?); S. D. N. Tiwari (1948 onwards); Puri (1957-59); Wadhwa (1959); Panigrahi (1962); Billore (1965-66); Oomachan (1966-73); Dwivedi (c. 1975 ?); Khan (c. 1976 ?); R. Khare (c. 1976 ?).
- Bij (a) war** (see Chhatarpur).
- Bijoragogarh** (see Jabalpur).
- Bilaspur**—Watt (c. 1894); Haines (1914-20's?); Panigrahi (1965; 1970; 1972); Maheshwari (?); Arora (1964); Murti (1973).
- Bundelkhand**—Vicary (1833); Edgeworth (1838; after 1847); Brandis (1863); King (c. 1867); [Clarke (1876)] ?; Duthie (1888); Wingate (1890's ?); Bell (1903-06); Burkill (1908 ?).
- Central India**—Vicary (1833); Ritchie (c. 1838); Jerdon (1868); Clarke (1876 ?).
- Central Provinces**—Thompson (1870); Schlich (1863); Hole (1896-1902); Witt (c. 1908); Hewetson (1940's ?); Balapure (1959).
- Chambal** (see Bhind, Morena).
- Chhatarpur** [incl. Bij (a) war]—Brandis (1863); Meebold (1905).
- Chhindwara**—S. K. Jain (1961); Panigrahi (1962; 1964); Saxena (1964-71); Khotele, Indorkar, Shukla, Singh & Pandey (c. 1966-67).
- Damoh**—Duthie (1888-89); [Witt (1913-16)] ?
- Datia**—Kaushik (c. 1965-70).
- Dewas**—
- Dhar**—Edgeworth (c. 1848); Puri (1957-59); S. K. Jain (1959); Arora (1964); O. P. Misra (1977).
- Durg** (incl. Rajnandgaon upto 1972)—[Kittoe (c. 1839-40)] ?; Lowrie (1908-09); Burkill (1908 ?); Haines (1914-20's ?); Unni (1963-65; 1971); Pant (1974).
- Guna**—King (c. 1867); Barclay (1876); Masters ( ? ).
- Gwalior**—Maries (1889-90); Wingate (1890's ?); Masters ( ? ); Mukherji (1917-18); [Kenoyer (before 1924)] ?; S. K. Jain (1959); Panigrahi (1962); Kaushik (c. 1965-70); Bhatiya (c. 1966).
- Hoshangabad** (incl. Pachmarhi)—Brandis (1863; 1868-69); Morris (1881); Duthie (1891); Graham (1911-14); Haines (1914-20's ?); Hole (1915); S. K. Pande (1930; 1951); S. D. N. Tiwari (1948 onwards); Narayanaswami & R. S. Rao (1949); Yadav (1956); Joseph (1960-61); Panigrahi (1962; 1964); R. P. Singh (prior to 1964); Saxena (1964-71); Khotele, Indorkar, Shukla, Singh & Pandey (c. 1966-67); Thakur ( ? ).
- Indore**—Jacquemont (1832); Edgeworth (c. 1848); Duthie (1888-89); Lowrie (c. 1896 ?); Allington ( ? ); Biscoe (prior to 1910); A. B. Pande (1911); Haines (early 1900's ?); Mukherji (1917-18); S. D. N. Tiwari (1948 onwards); S. K. Pande (1955); Puri (1957-59); S. K. Jain (1959); A. S. Rao (1961-63); Arora (1964).
- Jabalpur** (incl. Bijoragogarh)—Vicary (1833); Macleod (c. 1839-40); Griffith (c. 1839); Beddome (1848); Brandis (1863; 1868-69); Kuntze (c. 1875-76); Duthie (1888-89); Marten (1894); Hole (1896-1902); Meebold (1908); Graham (1911-14); S. D. N. Tiwari (1948 onwards); Narayanaswami & R. S. Rao (1949); Sebastine & Balakrishnan (1959-60); Balapure (1959); Maheshwari (1960); Panigrahi (1962-64); Seerwani (prior to 1962); N. K. Jain (1964); Khotele, Indorkar, Shukla, Singh & Pandey (c. 1966-67).
- Jaspur** (see Raigarh).
- Jhabua**—Puri (1957-59); Arora (1964).
- Khandwa** (incl. Asirgarh) (East Nimar)—Hobson (prior to 1874); Duthie (1888-89); Burkill (1908); Witt (c. 1908); Lowrie (1908-09); Rogers (1910); Narayanaswami & R. S. Rao (1949); Naidu ( ? ); Maheshwari (1958-59).
- Khargon** (West Nimar)—Jacquemont (1832); Puri (1957-59); S. K. Jain (1959); O. P. Misra (1977).

- Malwa (Plateau)—Griffith (c. 1839); Edgeworth (c. 1848); King (c. 1867).
- Mandla—S. D. N. Tiwari (1948 onwards); S. K. Jain (1961); Joseph (1961-62); Maheshwari (1962); Singhal (1970).
- Mandsaur—Jacquemont (1832); S. K. Jain (1959).
- Morena (incl. Chambal)—Munro (c. 1839); Panigrahi (1962); Kaushik (c. 1965-70); Agarkar (1967-69).
- Narbada valley—Griffith (c. 1839).
- Narsimhapur—
- Pachmarhi (see Hoshangabad).
- Panna—Jacquemont (1830); Hope [1860-61; 1886(?)].
- Raigarh (incl. Jaspur)—Clarke (1876?); Wood (1878); Campbell (prior to 1900); Cardon (prior to 1900); Mooney (1936-48); S. D. N. Tiwari (1948 onwards); Arora (1964); Panigrahi (1965); Sen Gupta (1971); Rathakrishnan (1974; 1976).
- Raipur—[Kittoe (c. 1839-40)]?; Watt (c. 1894); Marten (c. 1900); Lowrie (1908-09); Haines (1914-20's?); S. D. N. Tiwari (1948 onwards); Singhal (1951); Subramanyam (1959); D. K. Tiwari (1960); S. K. Jain (1961-63); Panigrahi (1962-63); Unni (1963-65; 1971); Verma (1972; 1976).
- Raisen—Meebold (1907); S. D. N. Tiwari (1948 onwards); Wadhwa (1959); Panigrahi (1962).
- Rajgarh—Wadhwa (1959).
- Rajnandgaon—S. D. N. Tiwari (1948 onwards); Pant (1974; 1976).
- Ratlam—Jacquemont (1832); Vasavada (1957); Arora (1964).
- Rewa—Jacquemont (1830); Hope (1860-61; 1886(?)); S. D. N. Tiwari (1948 onwards); Sebastine & Balakrishnan (1959-60); Panigrahi (1962; 1964); Sen Gupta (1968).
- Sagar—Vicary (1833); King (c. 1867); Jerdon (1866); Duthie (1888-89); Wingate (1890's?); Witt (1913-16); Pandeya (1947-50's); J. P. Srivastava (1948-49); R. Misra (1950's); Singhai (1952-54); Bhattacharyya (1954); Bhargava (c. 1957?); Mall (1958); Balakrishnan (1959-60); Subramanyam (1960); T. R. Rao (1960).
- Satna—Jacquemont (1830); Sebastine & Balakrishnan (1959-60); Panigrahi (1962-64); Mamgain (1974-75).
- Satpura Range (hills)—Brandis (1863; 1868.69); Haines (1914-20's?).
- Seoni—Hole (1896-1902); S. D. N. Tiwari (1948 onwards); S. K. Jain (1961-63); Banerjee (1975-76).
- Shahdol (incl. Amarkantak)—S. D. N. Tiwari (1948 onwards); R. Misra (1954); Maheshwari (1960); Saxena (1964-67); Khotale, Indorkar, Shukla & Singh (c. 1966-67); Kohli (1974); O. P. Misra (1976).
- Shajapur—
- Shivpuri—Puri (1957-59); Wadhwa (1959); Panigrahi (1962; 1972); Kaushik (c. 1965-70).
- Sidhi—Jacquemont (1830); Panigrahi (1962; 1964); Sen Gupta (1968; 1971).
- Surguja (Ambikapur)—Clarke (1876?); Wood (1878); Campbell (prior to 1900); Cardon (prior to 1900); Stevens (?); Mooney (1936-48); Arora (1964); Panigrahi (1965); Sen Gupta (1972; 1974; 1976).
- Tikamgarh—
- Ujjain—Jacquemont (1832); V. P. Singh (c. 1966?); Braru (c. 1969?); V. S. Khare & P. C. Sharma (c. 1976?); O. P. Misra (1977).

Upper Gangetic Plain—Chowdhury (1960's?).

Vidisha—

Vindhyan Range—Haines (1914-20's?).

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