

PTERIDOPHYTES OF INDIAN BOTANIC GARDEN, HOWRAH

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A B S T R A C T

The present paper records 35 species of pteridophytes from Indian Botanic Garden, belonging to 24 genera and 20 families. Keys for identification of all taxa (excluding ornamental) have been provided along with correct nomenclature, ecological notes and specimens collected.

INTRODUCTION

Indian Botanic Garden is situated on the west bank of the river Hooghly in Howrah district, West Bengal, near sea level (4.5 mm to 4.5 m alt.) and comprises an area of 109.29 hectares (273 acres), the approximate annual rainfall is 1536 mm and temperature ranges from 21°-31°C. The garden is divided into 25 sections or divisions and having 24 lakes. Ferns are a group of non-flowering vascular plants, reproducing by spores in sporangia which are borne in patches on edge or throughout the surface on backside of pinnae. They grow as epiphytes, terrestrial or aquatic in moist tropical and temperate climate. To ascertain the fern flora of Indian Botanic Garden a project was undertaken by the author in 2002-2003. Collection of ferns were made from the various habitats of the garden. It was found that most of the ferns are terrestrial whereas only a few are epiphytes or aquatic.

The present study revealed the occurrence of 35 species belonging to 24 genera distributed over 20 families. The ferns found in Indian Botanic Garden may be grouped under the following categories:

Epiphytes : There are only 4 epiphytic species viz., *Drynaria quercifolia* (L.) J. Sm., *Microsorium punctatum* (L.) Copel., *Pyrrosia adnascens* (Sw.) Ching, *P. lanceolata* (L.) Farwell. Important host trees are *Samanea saman* (Jacq.) Merr. (Bicentenary gate and elsewhere); *Switenia mahagoni* (L.) Jacq. (Div. 6, 21, 23, 24 and elsewhere); *Polyalthia longifolia* Thwaites (Div. 6 and elsewhere); *Mangifera indica* L. (Div. 19, and elsewhere); *Borassus flabellifer* L. (Div.1) etc. Special mention may be made about the 'Great Banyan Tree' (Div. 23), the pride of Indian Botanic Garden, which is recorded in Guinness Book of World Records has an area of 14428.44 sq. m. with 2800 prop roots is a poor host for ferns. However, a few patches of *Drynaria quercifolia* (L.) J. Sm. may be seen on it.

Climbers : Only 3 species are climbers viz., *Lygodium japonicum* (Thunb.) Sw. (Div. 6, 17 and elsewhere), *L. flexuosum* Sw. (Div. 6 and elsewhere) and *Stenochlaena palustris* (Burm.) Bedd. (Div. 8 and elsewhere).

Aquatics : The number of aquatic ferns are a few viz., *Salvinia molesta* Mich., *S. natans* (L.) All., *Azolla imbricata* (Roxb.) Nakai (found in different lakes of the garden) and *Marsilea minuta* L. (Div. 25 and marshy places along pond, ditches & lakes of Indian Botanic Garden).

Terrestrial : Rest of the ferns are terrestrials viz., *Egenolfia vivipara* (Ham. ex Hook.) C. Chr., *Pronephrium nudatum* (Roxb.) Holtt., *Tectaria polymorpha* (Wall. ex Hook.) Copel., *Phymatosorus banerjiana* (Pal & Pal) Pichi-Serm., *Adiantum capillus-veneris* L., etc.

Ferns may be seen growing here and there in Indian Botanic Garden. However their rich assemblage is found in Large Palm House (Div. 17) and Ferneries (Div. 6).

35 species available in the garden of which some are introduced and some are of great ornamental value viz., *Adiantum peruvianum* Kl., *Davallia fijiensis* Diels, *Pteris ensiformis* var. *victorie* Bak., *Selaginella willdenovii* (Desv. ex Poir.) Bak., *Tectaria subtriphylla* (Hook. & Arn.) Copel., *Nephrolepis biserrata* var. *furcans*, *Adiantum capillus-veneris* L., etc. Ornamental species are not considered in the key and description.

The ferns growing luxuriently in different areas of the garden are :

1. *Drynaria quercifolia* (L.) J. Sm. growing on *Swietenia mahagoni* (L.) Jacq., *Samanea saman* (Jacq.) Merr., (near Bicentenary gate and elsewhere), *Polyalthia longifolia* Thwait., *Borassus flabellifer* L., *Mangifera indica* L., etc. (Div. 1, 6, 17, 19, 21, 23, 24).

2. *Microsorium punctatum* (L.) Copel. sometimes grow with *Drynaria quercifolia* (L.) J. Sm. hosts plants are *Mangifera indica* L., *Samanea saman* (L.) (Jacq.) Merr. (Div. 19, Bicentenary gate & elsewhere).

3. *Pyrrosia adnascens* (Sw.) Ching on *Samanea saman* (Jacq.) Merr., *Swietenia mahagoni* (L.) Jacq. (Bicentenary gate (13), Div. 21, 23, 24).

4. *Lygodium japonicum* (Thunb.) Sw. (Div. 17, 6 and elsewhere).

5. Terrestrial ferns, *Christella dentata* (Forssk.) Brownsey, *C. dentata* (Forssk.) Brownsey & Jermy var. *himalayensis* N. Punetha & B. S. Kholia (Div. 22, 25 and elsewhere).

6. *Ampelopteris prolifera* (Retz.) Copel. (Div. 22, 25 and elsewhere).

The ferns occurring in the garden at present are given below with their correct nomenclature, description and distribution. All collections referred to are deposited in CAL. The families are arranged here according to Pichi-Sermolli's classification (1977) & Ching (1978).

Key to the families

1a. Sporangia fused together in synangial group, leaves minute scale like, sporangia borne in the axil of leaves	...	Psilotaceae
1b. Sporangia not associated in synangia, leaves megaphyllous, sporangia borne on the margin or abaxial surface of lamina or in sporocarp	...	2
2a. Terrestrial epiphytic ferns	...	3
2b. Aquatic or marshy ferns	...	15
3a. Plants climbing	...	4
3b. Plants not climbing	...	5
4a. Rhizome climbing	...	Stenochlaenaceae
4b. Rachis climbing	...	Lygodiaceae
5a. Sporangia protected by reflexed margin of lamina	...	6
5b. Sporangia not protected by reflexed margin of lamina	...	7
6a. Sporangia borne on inner surface or reflexed portion of lamina	...	Adiantaceae
6b. Sporangia borne along the margin on the surface of lamina	...	Pteridaceae
7a. Rhizome concealed by roots on nest leaves	...	Platyneriaceae
7b. Rhizome not concealed by roots	...	8
8a. Rhizome scale usually clathrate	...	9
8b. Rhizome scale non-clathrate or sometimes sub-clathrate	...	10
9a. Sori usually round, oval or linear and in some cases acrostichoid, exindusiate	...	Polypodiaceae
9b. Sori strictly linear, indusiate	...	Aspleniaceae
10a. Plants usually with distinct humus collecting fronds	...	Drynariaceae
10b. Plants having no distinct humus collecting fronds	...	11
11a. Fronds usually dimorphous	...	Bolbitidaceae
11b. Fronds monomorphous	...	12

12a. Epiphytic ferns generally	...	Nephrolepidaceae
12b. Terrestrial fern	...	13
13a. Indusium usually 'J' shaped, along with vein, crossing the vein	...	Athyriaceae
13b. Indusium usually round, reniform	...	14
14a. Unicellular hairs abundant at least on dorsal side of costae	...	Thelypteridaceae
14b. Multicellular hairs usually present at least on dorsal side of costae	...	Aspidiaceae
15a. Floating in water	...	16
15b. Plants rooting in mud, in shallow water or besides ponds and ditches	...	Marsileaceae
16a. Sporocarps in clusters, externally alike, leaves of two types, i) floating, green with midrib, ii) finely dissected, submerged root like	...	Salviniaceae
16b. Sporocarps in pairs, differ in size and shape, leaves minute, imbricate, tetragonal with an upper and under-lobe.	...	Azollaceae

PSILOTACEAE

PSILOTUM Swartz

Psilotum nudum (L.) Palisot de Beauvois, Prodr. Fam. Aetheog. 112 1805. *Lycopodium nudum*, L., Sp. Pl. 1100. 1753. *P. triquetrum* Sw., Schrad. J. Bot. 1800 (2) : 109. 1801.

Indian Botanic Garden : It is planted in fern house.

Specimen collected : IBG (Howrah), 14.8.2002, *Anjali Biswas* 68716.

POLYPODIACEAE

Key to the genera

1a. Fronds covered with stellate hairs on one or both surfaces	...	4. <i>Pyrrhosia</i>
1b. Fronds without stellate hairs on surfaces	...	2
2a. Fronds simple, rarely lobed, never pinnate, pinnae margin never cartilaginous, sori not sunken	...	3
2b. Fronds deeply pinnatifid, pinnate or otherwise lobed, pinnae margin cartilaginous, sori sunken in cavities	...	3. <i>Phymatosorus</i>

- 3a. Fronds dimorphic, sori acrostichoid, completely covering the whole undersurface of frond ... 2. *Paraleptochilus*
- 3b. Frond monomorphic, sori irregularly scattered ... 1. *Microsorium*

1. MICROSORIUM Link

Microsorium punctatum (L.) Copel. in Univ. Calif. Publ. Bot. 16 : 111. 1929. *Acrostichum pauncatum* L., Sp. Pl. ed. 2: 1524. 1763. *Pleopeltis irioides* Moore, Ind. Fil. 78, 1857; Bedd., Ferns S. Ind. t. 178. 1864.

Indian Botanic Garden : It grows luxuriently as epiphyte on large tree such as *Samanea saman* (Jacq.) Merr., *Mangifera indica* L., etc.

Specimen collected : IBG (Howrah), 2002, Anjali Biswas 68725 A, B, C.

2. PARALEPTOCHILUS Copel.

Paraleptochilus decurrens (Bl.) Copel., Gen. Fil. 198. t. 7. 1947. *Leptochilus decurrens* Bl., Enum. Pl. Jav. 206. 1828. *Gymnopteris variabilis* (Hook.) Bedd., Ferns Brit. Ind. t. 272. 1868; Bedd., Handb. 429, Fig. 258. 1883. *G. decurrens* (Bl.) Hook., Gard. Ferns t. 6. 1862; *non G. decurrens* Hook. 1857.

Indian Botanic Garden : Grows in Large Palm House.

Specimen collected : IBG (Howrah), 10.5.2002, Anjali Biswas 68727 A, B.

3. PHYMATOSORUS Pichi-Sermolli

Phymatosorus banerjjanus (Pal & Pal) Pichi.-Serm., Webbia 31 (1) : 249. 1977. *Phymatodes banerjiana* Pal & Pal, Amer. Fern. J. 103, f. 1, 2 (8): 5-7, 9. 1963.

Indian Botanic Garden : Grows in Large Palm House in shady places.

Specimen collected : IBG (Howrah), 10.5.2002, Anjali Biswas 68726 A, B.

4. PYRROSIA Mirbel

Key to the species

- 1a. Frond dimorphous, sterile frond small roundish or ovate, fertile frond ovate-lanceolate or obovate. Sori covering half or more than half of lamina ... 1. *P. adnascens*
- 1b. Frond monomorphous, frond linear to lanceolate. Sori confined to upper portion of frond ... 2. *P. lanceolata*
1. **Pyrrosia adnascens** (Sw.) Ching, Bull. Chinese Bot. Soc. 1 : 45. 1935. *Polypodium adnascens* Sw., Syn. Fil. 25, 222, t. 2. 1806. *Niphobolus adnascens* (Sw.) Bedd., Ferns S. India t. 183. 1864.

Indian Botanic Garden : It grows as epiphyte on *Switenia mahogany* (L.) Jacq.; *Mangifera indica* L.; *Samanea saman* (Jacq.) Merr., etc.

Specimen collected : IBG (Howrah), 2.9.2002, Anjali Biswas 68736.

2. ***Pyrrosia lanceolata*** (L.) Farwell, Amer. Midl. Nat. 12 : 245. 1931. *Acrostichum lanceolata* L., Sp. Pl. 1067. 1753. *Polypodium pertusum* Roxb. ex Hook., Exot. Fil. 2, t. 162. 1825; Roxb., Cal. J. Nat. Hist. 4 : 483, t. 29 (left), 1844; Morton, Contr. U.S. Nat. Herb. 38(7): 353-354. 1874. *Nipholobolus fissus* Bedd., Ferns S. Ind. t. 184, 1864, non Bl.

Indian Botanic Garden: Grows as epiphyte on large trees, like *Samanea saman* (Jacq.) Merr., *Switenia mahagoni* (L.) Jacq. etc.

Specimen collected : IBG (Howrah), 2.9.2002, Anjali Biswas 68737.

PLATYCERACEAE

PLATYCERIUM Desvaux

Platycerium wallichii Hook. Gard. Chron. 765. 1858. *Acrostichum alciorne* Wall. Cat. 19, 1828 *nom. nud.*; Bedd., Ferns S. India t. 108. 1864.

Indian Botanic Garden : Planted in pot at Fernery.

DRYNARIACEAE

DRYNARIA (Bory) J. Sm.

Drynaria quercifolia (L.) J. Sm., J. Bot. 3: 398. 1841. *Polypodium quercifolium* L., Sp. Pl. ed. 1.2: 1087. 1753.

Indian Botanic Garden : Grows as epiphyte luxuriently on different big trees such as *Polyalthia longifolia*, *Switenia mahagoni*, *Samanea saman*, *Borassus flabellifer*, *Mangifera indica*, etc. It also grows on Great Banyan Tree (*Ficus bengalensis*).

Specimen collected : IBG (Howrah), 10.5.2002, Anjali Biswas 68725 A, B, C.

LYGODIACEAE

LYGODIUM Swartz

Key to the speices

- | | | |
|---|-----|------------------------|
| 1a. Rhizomes short creeping; primary rachis branches hardly distinct or up to 3 mm long; basal pinnules largest, stalked, becoming sessile and subsessile and thereafter adnate | ... | 1. <i>L. flexuosum</i> |
| 1b. Rhizome usually long creeping; primary rachis branches distinct, 3-10 mm long; basal pinnules not largest, all pinnules similarly stalked | ... | 2. <i>L. japonicum</i> |

1. **Lygodium flexuosum** Sw. in Schrad. J. Bot. 1800 (2): 106. 1801; Bedd., Fern. S. India t. 63. 1863.
Opohioglossum japonicum L., Sp. Pl. 2: 1063. 1753.

Indian Botanic Garden : This climbing fern grows in Fernery.

2. **L. japonicum** (Thunb.) Sw., Schrad. J. Bot. 1800(2): 106. 1801; Bedd., Fern. S. India t. 64. 1863.
Opohioglossum japonicum Thunb., Fl. Jap. 328. 1784.

Indian Botanic Garden : This climbing fern grow luxuriently here and there.

Specimen collected : IBG (Howrah), 2.9.2002, Anjali Biswas 68716 A, B, C.

PTERIDACEAE

PTERIS L.

Key to the species

- | | | |
|--|-----|-------------------------|
| 1a. Frond monomorphous, basal pinnae gradually reduced, base of pinnae broadly cuneate to cordate, somewhat dilated on acroscopic side | ... | 3. <i>P. vittata</i> |
| 1b. Frond distinctly dimorphous, basal pinnae not gradually reduced, pinnae base shortly cuneate, not dialated on acroscopic side | ... | 2 |
| 2a. Upper pinnae decurrent | ... | 2. <i>P. multifida</i> |
| 2b. Upper pinnae not decurrent | ... | 1. <i>P. ensiformis</i> |

1. **Pteris ensiformis** Burm. f. in Fl. Ind. 230. 1768. *P. crenata* Sw., Schrad. J. Bot. 1800(2): 65. 1801; Bedd., Fern. S. India t. 35. 1863.

Indian Botanic Garden : It grows well in Large Palm House.

Specimen collected : IBG (Howrah), 15.07.2002, Anjali Biswas 68703 A, B.

2. **P. multifida** Poir. in Lam., Encly. 5 : 714. 1804.

Indian Botanic Garden : It grows well in Large Palm House.

Specimen collected : IBG (Howrah), 15.07.2002, Anjali Biswas 68702 A, B.

3. **P. vittata** L., Sp. Pl. 2: 1074. 1753. *P. longifolia* auct. quoad. Pl. Asiat.; Bedd., Fern. S. India t. 33. 1863; Handb. 106. t. 55. 1883.

Indian Botanic Garden : Grows here and there.

Specimen collected : IBG (Howrah), 15.07.2002, Anjali Biswas 68705.

ADIANTACEAE

ADIANTUM L.

Key to the species

- 1a. Frond simple pinnate, either imparipinnate or the rachis prolonged into a whip like elongation, rooting at apex and viviparous ... 2
- 1b. Fronds 2-3 times pinnately divided, rachis never prolonged and rooting ... 3
- 2a. Frond hairy, pinnae subsessile, trapaeziform ... 2. *A. incisum*
- 2b. Frond glabrous, pinnae lunate, subdimidiate, long petioled ... 4. *A. lunulatum*
- 3a. Rhizome erect, pinnae 5-8 pair, ultimate pinnule narrow 1-1.5 cm, sori obreniform ... 3. *A. tenerum*
- 3b. Rhizome creeping, pinnae 8-13 pairs, ultimate pinnules broad 1-2 cm, sori oblong or elongate oblong ... 1. *A. capillus-veneris*

1. **Adiantum capillus-veneris** L., Sp. Pl. 2: 1096. 1753; Bedd., Ferns S. India t. 4. 1863.

Indian Botanic Garden : Planted in pots in Fernery.

Specimen collected : IBG (Howrah), 10.05.2002, Anjali Biswas 68721.

2. **A. incisums** Forssk., Fl. Aeg. Arab. 187. 1775. *A. vestitum* Wall. Cat. n. 13. 1829. *nom. nud.* *A. caudatum sensu* Bedd., Ferns S. India t. 1863; Handb. 83, t. 44. 1883. *non* L.

Indian Botanic Garden : It grows in Indian Botanic Garden in Fernery.

Specimen collected : IBG (Howrah), 14.08.2002, Anjali Biswas 68718 A, B.

3. **A. tenerum** Sw. Nova Genera & Species Plantarum, 134. 1783-87.

Indian Botanic Garden : It is planted in Nursery in pots and grows well.

Specimen collected : IBG (Howrah), 10.05.2002, Anjali Biswas 68720 A, B.

4. **A. lunulatum** Burm. f., Fl. Ind. 235. 1768; Bedd., Ferns S. India t. 1. 1863. *A. philippines* L., Sp. Pl. 2: 1094. 1753.

Indian Botanic Garden : It grows near the office complex and other places.

Specimen collected : IBG (Howrah), 10.05.2002, Anjali Biswas 68730 A, B.

THELYPTERIDACEAE

Key to the genera

- | | | |
|--|-----|----------------------------|
| 1a. Rachis with buds in axils of pinnae | ... | 1. <i>Ampelopteris</i> |
| 1b. Rachis without buds | ... | 2 |
| 2a. Lamina simple or pinnate, generally with terminal pinna-like apex | ... | 4. <i>Pronephrium</i> |
| 2b. Lamina bipinnatifid to quadripinnatifid with pinnatifid apex | ... | 3 |
| 3a. Lamina bipinnatifid, hairs on lamina small, erect, unicellular, acicular, basal pairs of veins anastomosed | ... | 2. <i>Christella</i> |
| 3b. Lamina tripinnate to quadripinnatifid, long slender septate hair always present on lamina, venation free | ... | 3. <i>Macrothelypteris</i> |

1. AMPELOPTERIS Kunze

1. ***Ampelopteris prolifera*** (Retz.) Copel., Gen. Fil. 1947. *Hemionitis prolifera* Retz. in Obs. Bot. 6 : 26. 1791.

Indian Botanic Garden : Common fern grows luxuriently here and there.

Specimen collected : IBG (Howrah), 10.09.2002, Anjali Biswas 68732 A, B.

2. CHRISTELLA Leveille

Key to the species

- | | | |
|---|-----|---|
| 1a. Rhizome short creeping, pinnae margin cut half towards the costa, apex of lobe obtuse to round sometimes truncate, no. of veins 6-8, basal 5-6 acroscopic lobes enlarged | ... | 1. <i>C. dentata</i> |
| 1b. Rhizome long creeping, pinnae margin cut 2/3 towards the costa, lobes gradually narrowed towards apex, slightly falcate, tip subacute to acute, veins 8-10, 8-10 lower acroscopic lobes large and lobed | ... | 2. <i>C. dentata</i> var. <i>himalayensis</i> |

1. ***Christella dentata*** (Forssk.) Brownsey & Jermy in Brit. Fern. Gaz. 10 : 338. 1973. *Polypodium dentatum* Forssk., Fl Aegypt. Arab. 185. 1773.

Indian Botanic Garden : It grows luxuriently in Indian Botanic Garden.

Specimen collected : IBG (Howrah), 10.09.2002, Anjali Biswas 68733 A, B, C.

2. ***C. dentata*** (Forssk.) Brownsey & Jermy var. ***himalayensis*** N. Punetha & B. S. Kholia, J. Bombay nat. Hist. Soc. 87(2) : 264-266. 1990.

Indian Botanic Garden : Grows luxuriently in Indian Botanic Garden.

Specimen Collected : IBG (Howrah), 10.09.2002, Anjali Biswas 68735 A, B, C, E.

3. MACROTHELYPTERIS (H. Ito) Ching

Macrothelypteris torresiana (Gaud.) Ching, Acta Phytotax Sin. 8 : 310. 1963. *Polystichum torresiana* Gaud. in Frey. Voy. Bot. 333. 1824. *Nephrodium tenericaule* (Hook.) Hook., Spec. Fil. 4: 142, excl. t. 269 (1862) p.p.; Clarke, F.N.I. 528. 1880. *Lastrea flaccida sensu* Bedd., Fern. S. India t. 99. 1863.

Indian Botanic Garden : Grows in Nursery and Large Palm House.

Specimen collected : IBG (Howrah), 02.09.2002, Anjali Biswas 68709 A, B, C.

4. PRONEPHRIUM Presl

Pronephrium nudatum (Roxb.) Holtt., Blumea 20: 111. 1972. *Polypodium nudatum* Roxb., Calc. J. Nat. Hist. 4 : 491. 1844. *Goniopteris multilineata* Bedd., Ferns Brit. Ind. t. 231. 1867.

Indian Botanic Garden : Grows in Large Palm House.

Specimen collected : IBG (Howrah), 16.09.2002, Anjali Biswas 68731 A, B, C.

ASPLENIACEAE

NEOTTOPTERIS J. Sm.

Neottopteris nidus (L.) J. Sm., in Hook., Gen Fl. t. 113B. 1842. *Asplenium nidus* L., Sp. Pl. 1079. 1753.

Indian Botanic Garden : It is planted in pots in Fernery.

ATHYRIACEAE

ANISOGONIUM Presl

Anisogonium esculentum (Retz.) Presl, Tent. Pterid. 116. 1836; Bedd., Handb. 192. 1883. *Hemionitis esculentum* Retz., Obs. Bot. 6 : 38. 1791. *Callipteris esculentum* (Retz.) J. Sm., Apud. Houlst. & Moore in Gard. Mag. Bot. 3 : 265. 1851; Bedd., Ferns. S. India 54, t. 164. 1864.

Indian Botanic Garden : Grows close to ditches at palm avenue nearer to main gate.

Specimen collected : IBG (Howrah), 14.08.2002, Anjali Biswas 68729 A, B.

ASPIDIACEAE

Key to the genera

- 1a. Lamina pinnate to bipinnate, ctenitis hair usually present on upper side of rachis and costa

2. *Tectaria*

- 1b. Lamina pinnate, ctenitis hair absent on upper
side of rachis and costa

... 1. *Cyrtomium*

1. CYRTOMIUM Presl

Cyrtomium falcatum (L. f.) Presl Tent. Pterid. 86. 1836; Handb. Ferns Brit. Ind. 211. 1883; C. Chr. Amer. Fern. J. 20 : 47. 1930. *Polypodium falcatum* L.f. Suppl. Sp. Pl. 466. 1781.

Indian Botanic Garden : Fernery.

Specimen collected : IBG (Howrah), 02.09.2002, Anjali Biswas 68711 A, B.

2. TECTARIA Cavanilles

Key to the species

- 1a. Lamina bipinnatifid with 1-3 pairs of free lateral pinnae
below the pinnatifid apical part; sori large, apical on included
veinlets, indusium large, persistent

... 1. *T. coadunata*

- 1b. Lamina pinnate with 3-6 pairs of entire pinnae, terminal
pinnae as long as lateral pinnae; sori usually small, often
subconfluent, compital indusium small

... 2. *T. polymorpha*

1. **Tectaria coadunata** (J. Sm.) C. Chr. in Contr. U.S. Nat. Herb. 26: 331. 1931. *Sagenia coadunata* J. Sm. in Hook. J. Bot 4: 184. 1841; Bedd., Ferns S. Ind. 28, pl. 81. 1863.

Indian Botanic Garden : Grows in Large Palm House in damp, shady places.

Specimen collected : IBG (Howrah), 02.09.2002, Anjali Biswas 68707 A, B.

2. **T. polymorpha** (Wall. ex Hook.) Copel., Phil. J. Sci. Bot. 2 : 413. 1907. *Aspidium polymorpha* Wall. Cat. N. 382. 1828; Hook., Sp. Fil 4: 54. 1862; Bedd., Ferns S. Ind. t. 116. (non 117, 1863) 1863; Bedd., Handb. 218. 1883.

Indian Botanic Garden : It grows in Large Palm House.

Specimen collected : IBG (Howrah), 02.09.2002, Anjali Biswas 68708.

BOLBITIDACEAE

EGENOLFIA Schott.

- Egenolfia vivipara** (Ham. ex Hook.) C. Chr., Ind. Fil. Suppl. 111 : 102. 1934. *E. nudiflora* (Bory) Fee, Gen. Fil. 48, 1850-52. *Polybotrya apendiculata* var. *subintegera* Bedd., Ferns Brit. Ind. t. 111. 1865 (upper left hand fig.).

Indian Botanic Garden : Planted in Large Palm House.

Specimen collected : IBG (Howrah), 02.09.2002, Anjali Biswas 68706 A, B, C, D.

NEPHROLEPIDACEAE

NEPHROLEPIS Schott.

Key to the species

- 1a. Frond small, 30-60 cm long, linear, stipe up to 10 cm long, pinnae oblong to oblong triangular, about 2 cm long, apex obtuse, acroscopic base auricled, basioscopic rounded ... 1. *N. auriculata*
- 1b. Frond large, about 2 m, stipe up to 50 cm, pinnae lanceolate, about 20 cm, apex acuminate, base unequally cuneate ... 2. *N. biserrata*
1. ***Nephrolepis auriculata*** (L.) Trimen, J. Linn. Soc. Bot. London 24 : 152. 1887. *Polypodium auriculatum* L., Sp. Pl. 2:1088. 1753. *p. p. Nephrolepis tuberosa* (Bory ex Willd.) Presl Tent. Pterid. 79. 1836; Bedd., Ferns S. Ind. t. 92. 1865.

Indian Botanic Garden : Common fern, grows in Fernery and Large Palm House in damp, shady places.

Specimen collected : IBG (Howrah), 10.05.2002, Anjali Biswas 68724 A, B.

2. ***N. biserrata*** (Sw.) Schott, Gen. Fil. t. 3, 1834. *Aspidium biserratum* Sw., Schrad. J. 1800/2:32. 1801.

Indian Botanic Garden : It is planted at Large Palm House.

Specimen collected : IBG (Howrah), 02.09.2002, Anjali Biswas 68713 A, B, C.

STENOCHLAENACEAE

STENOCHLAENA J. Sm.

- Stenochlaena palustris*** (Burm. f.) Under., Bull. Torr. Bot. Cl. 33: 38. 1906. *Polypodium palustre* Burm. f., Fl. Ind. 234. 1768. *Stenochlaena scandens* (Sw.) J. Sm., in Hook. J. Bot. 3 : 401. 1841; Bedd., Ferns S. Ind. t. 201. 1863.

Indian Botanic Garden : It is climbing fern. Grows in Indian Botanic Garden.

Specimen collected : IBG (Howrah), 02.09.2002, Anjali Biswas 68710 A, B, C.

WATER FERN

SALVINIACEAE

SALVINIA Seguir

Key to the species

- 1a. Floating leaves boat shaped, 3.5-4.5 cm broad, hairs on papillae on upper surface of floating leaves 4, jointed at the tip ... 1. *S. molesta*

1b. Floating leaves oval oblong, 0.6-1 cm broad, hairs on papillae on upper surface of floating leaves 3-4, entirely free ... 2. *S. natans*

1. **Salvinia molesta** D. S. Mitchell, Brit. Fern Gaz. 10(5) : 251-252. 1972. *S. auriculata sensu* Ind. Auth. non Abul. 1775.

Indian Botanic Garden : It is tropical African plants and hybrid origin. It has been naturalized in Indian Botanic Garden. It floats in lakes in Indian Botanic Garden and adjoining places.

2. **S. natans** (L.) Allioni, Flora Pedemont. 2 : 289. 1785; Bak., Handb. Fern Allies 135, 1887; Prain in Bengal Plants 2 : 956. 1905; Haines, Bot. Bihar and Orissa 1217. 1924; Robert Herzog, Hedwigia 74:268. 1935. *Marsilea natans* L., Sp. Pl. ed. 2: 1099. 1763. *S. verticillata* Roxb. ex Griffith, Cal. J. Nat Hist. 4: 469. 1844; Griffith, Cal. J. Nat. Hist. 5: 254, t. 18-20. 1845.

Indian Botanic Garden : Grows in lakes.

AZOLLACEAE

AZOLLA Lamarck & Poiret

Azolla imbricata (Roxb.) Nakai, Bot. Mag. Tokyo 39: 185. 1925. *Salvinia imbricata* Roxb. ex Griffith, Cal. J. Nat. Hist. 4: 469. 1844.

Indian Botanic Garden : It grows in lakes very common in Bengal.

MARSILEACEAE

MARSILEA L.

Marsilea minuta L., Mant. 308. 1771. *M. aegyptiaca* Wall., Cat. No. 7096, 1829 (*non* Willd.) *M. dentata* Roxb., Mss. in Herb. Mus. Brit. A. Br. Mber. Akad. Berl. 729. 1871. *M. poonensis* Kolhat, Kew Bull. 2 : 293. 1957.

Indian Botanic Garden : Grows in marshy places along ponds, ditches and lakes of Indian Botanic Garden.

ACKNOWLEDGEMENTS

Grateful thanks are due to Dr. M. Sanjappa, Director, Botanical Survey of India, for encouragement. Author is also thankful to Dr. Jagdish Lal, Scientist 'D' In-charge, Cryptogamic Section for his suggestion and kindly going through the manuscript and Scientist 'SE' Indian Botanic Garden for giving permission to collect specimens. Thanks are also due to my colleagues for co-operation.

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टेरिडोफाइट्स ऑफ इंडियन बॉटेनिक गार्डन, हावड़ा

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सार संक्षेप

प्रस्तुत शोधपत्र में भारतीय वनस्पति उद्यान से 24 जेनेरा तथा 17 कुलों की 35 जातियों के अभिलेख हैं। संग्रह किए गए नमूनों के सही नामकरण, पारिस्थितिकीय टिप्पणियों के साथ टैक्सा के अभिनिर्धारण हेतु संकेत दिए गए हैं।