B. TAXONOMIC ACCOUNT & ECONOMIC UTILISATION
0.1 LIST OF FAMILIES OF FERN AND FERNALLIES

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<th>Family</th>
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<td>LYCOPODIACEAE</td>
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<td>SELAGINELLACEAE</td>
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<td>3</td>
<td>HELMINTHOSTACHYACEAE</td>
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<td>4</td>
<td>OPHIOGLOSSACEAE</td>
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<td>5</td>
<td>ANGIOPTERIDACEAE</td>
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<td>6</td>
<td>DICRANOPTERIDACEAE</td>
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<td>7</td>
<td>LOXOGRAMMACEAE</td>
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<td>POLYPODIACEAE</td>
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<td>9</td>
<td>DRYNARIACEAE</td>
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<td>LYGODIACEAE</td>
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<td>CHEILANTHACEAE</td>
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<td>CRYPTOGRAMMACEAE</td>
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<td>PTERIDACEAE</td>
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<td>15</td>
<td>ADIANTACEAE</td>
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<td>HEMIONITIDACEAE</td>
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<td>VITTARIACEAE</td>
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<td>PERANEMATACEAE</td>
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<td>BOLBITIDACEAE</td>
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<td>NEPHROLEPIDACEAE</td>
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<td>DAVALLIACEAE</td>
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<td>BLECHNACEAE</td>
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<td>STENOCHLAENACEAE</td>
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<td>AZOLLACEAE</td>
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<td>34</td>
<td>SALVINIACEAE</td>
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</table>
02. KEY TO THE FAMILIES OF FERN & FERN-ALLIES

1. Aquatic or marshy plants.
2. Plants free floating.
   3. Sporocarps in branches; normal leaves above 0.8 x 0.5 cm
      SALVINIACEAE
   3'. Sporocarps in pairs; normal leaves below 1 x 0.8 mm,
      covered by simple trichomes.
      AZOLLACEAE
2'. Plants rooted in mud.
   4. Leaves distinctly 4-lobed; Sporangia in sporocarp at the base of the stipes.
      MARSILEACEAE.
   4'. Leaves not 4-lobed. Pinnately compound; Sporangia on narrow leaflets with reflexed edges.
      PARKERIACEAE.
1'. Terrestrial or epiphytic plants.
   5. Leaves microphyllous, univeined; steles without any leafgaps.
   6. Leaves eligulate, monomorphic, spiral or decussate; sporangia homosporous.
      LYCOPODIACEAE.
   6'. Leaves ligulate, polymorphic, generally arranged in 4-rows; sporangia heterosporous.
      SELAGINENNACEAE.
5'. Leaves macrophyllous, with variously branched veins; a leaf-gap usually present at the base of each leaf-trace.
   7. Sporangia borne on erect stalked spikes.
   8. Blade simple; veins anastomosing.
      OPHIOGLOSSACEAE.
   8'. Blade compound; veins free.
      HELMINHOSTACHYACEA.
   7'. Sporangia borne on abaxial surface or edges of the fronds; if on spike like outgrowths, these are stalkless and at the apex of the fronds.
   9. Sporangia wall more than one cell in thickness; annulus absent, dehiscing by a slit into 2 valves.
      ANGIOPTERIDACEAE.
9'. Sporangia wall one cell in thickness; annulus well developed, dehiscence varies.
      LYGODIACEAE.
10. Sori acrostichoid; fronds dimorphic.
11. Climbing on trees; rhizomes scandant, long creeping.
   **STENOCHLAENACEAE.**

11'. Terrestrial or lithophytic; rhizomes short creeping or erect.
   **BOLBITIDACEAE.**

10'. Sori not acrostichoid; if acrostichoid fronds not dimorphic.

12. Linear sori oblique to costa.
   13. Lamina simple, obovate to oblanceolate.
      **LOXOGRAMMACEAE.**
   13'. Lamina pinnate; if simple, hastate or sagittate.
      **HEMIONITIDACEAE.**

12'. Linear sori marginal or parallel to margin.
   14. Fronds fan shaped, deeply cleft into 2 halves, dichotomously lobed.
      **DIPTERIDACEAE.**
   14'. Fronds pinnate or pseudo dichotomously branched, repeatedly forked.
      **DICRANOPTERIDACEAE.**

15. Predominantly epiphytic, rarely terrestrial; lamina simple or rarely pinnate.
   16. Humus collecting fronds distinct, separate sterile fronds present.
      **DRYNARIACEAE.**
   16'. Humus collecting fronds mostly absent if present not separate, represented by leaf bases only.
      **POLYPODIACEAE.**

15'. Terrestrials; lamina bipinnatifid to tripinnate.
   17. Sori continuous along the edge of Leaflets.
      **THYLEPTERIDACEAE.**
   17'. Sori single at the ends of veins.
      **DENNSTAEDTIACEAE.**

18. Indusia formed by reflexed marginal flaps.

19. Marginal flaps meeting at the costa. **CRYPTOGRAMMACEAE.**
19'. Marginal flaps restricted to sub-marginal region.

20. Fronds with white powdery beneath. **CHEILANTHACEAE.**
20'. Fronds without powdery beneath.

21. Pinnules dimidiate; stipes dark and polished. **ADIANTACEAE.**
21'. Pinnules not dimidiate; stipes straw colors. **PTERIDACEAE.**
18'. Indusia not formed by reflexed margin.

22. Sori linear on both sides the costa. **BLECHNACEAE.**

22'. Sori otherwise.

23. Sori marginal, at the tip of veins. **LINDSAEACEAE.**

23'. Sori not marginal along the veins.

24. Scales clathrate; indusia single. **ASPLENIACEAE.**

24'. Scales never clathrate; indusia usually double. **ATHYRIACEAE.**

25. Sori stalked. **PERANEMATAEACEAE.**

25'. Sori not stalked.


27. Lamina simple, pinnate; indusia round to reniform. **NEHROLEPIDACEAE.**

27'. Lamina decompound; indusia half cup shaped. **DAVALLICEAE.**

26'. Stipes not articulate on rhizome.

28. Lamina covered by unicellular hairs; veins of adjacent groups unite to form an excurrent vein. **THELYPTERIDACEAE.**

28'. Lamina glabrous or with multicellular hairs; Excurrent vein absent.

29. Rachis grooved on the upper surface and open to rachilla grooves; ctenitis hairs absent. **DRYOPTERIDACEAE.**

29'. Rachis not grooved or if grooved not open to rachilla grooves; ctenitas hairs usually along the dotcell surface of rachis, rachillae and costae. **TECTARIACEAE.**
0.3 KEY TO THE GENERA & KEY TO THE SPECIES OF RESPECTIVE FAMILIES WITH BOTANICAL DESCRIPTION AND ECONOMIC UTILITY OF THE SPECIES.


Key to the Genera:

1. Stems isotomously brached, roots usually forming one basal cleft;

   Sporophylls and vegetative leaves almost alike.  1. Huperzia.

1'. Stems anisotomously branched, roots emerging at intervals;

   Sporophylls modified, peltate, sub-peltate or ephemeral. 2. Palhinhaea


Epiphytic, pendulous: roots stout, branched. Stems tufted, 15-45 cm long, ribbed, simple to once or twice dichotomously branched. Leaves spiral, patent in 3-rows, sessile or subsessile, lanceolate to oblong-lanceolate, acuminate, pointed, distinct, univened, drying pale thin, subcoriaceous. Strobili distinct, 2-3 dichotomously branched, axes again become sterile bearing trophophylls in the middle of the cones, younger sporophylls upwards. Sporangia orbicular to round, thick, dehiscing by one vertical slit; spores trilete, hyaline, minutely pitted or sparsely verrucose.
Habitat & Ecology: Found as epiphyte on tree trunks or rotten logs.

Sporulation: June - July.

Specimen examined: Duhalia Part I, PSD 0019, dt. 21.6.03.

Economic utility:

Forms of use locally:

Parts used: Whole plant

Uses: Portion of plant crushed, the paste so obtained is applied over fresh cuts and wounds for antiseptic action. Fresh poultice is given every day for quick recovery.

Established reports of utility: Spores are used as Lycopodium powder in medicine (Ghosh, et al., 2004).

* Note: Medicinal utility of the plant is reported here as new.


Terrestrial. Main stems creeping, rooting distantly, growth unlimited, 3-4mm across, leaves sparse; the fertile stems arising near the base on the long arching stems that root at the tip. Leaves spiral, sessile, entire, acuminate, veins absent, thick, not soft, green to pale green. Strobili markedly distinctly sessile, pendulous, solitary at the end of the branches; sporophylls spiral, broad ovate and suddenly narrowed-acuminate, margin thinner and long hairy; sporangia less than 1mm long, ovoid, sessile; spores smooth to alveolate.
Habitat & Ecology: Found frequently in exposed places in hills and forests.

Sporulation: July – August.

Specimen examined: Kamalpur, PSD 0071, dt. 8.2.04.

Economic utility:

Forms of use locally:

<table>
<thead>
<tr>
<th>Parts used</th>
<th>Uses</th>
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<tbody>
<tr>
<td>Whole plant</td>
<td>Plant extract is effective in skin diseases and cough</td>
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</table>

Established reports of utility: Whole plants decoctions used as lotions in Beri-beri, cough and uneasiness in the chest. Embrocation of ashes in vinegar is recommended for skin eruptions. Plants used for stuffing pillows after drying (Singh & Panigrahi, 2005).


Key to the Species:

1. Sporophylls dimorphic; spikes complanate. 3. S. tenuifolia.

1'. Sporophylls monomorphic; spikes cylindric.

2. Leaves and sporophylls entire throughout.


3'. Microspores with perispore tuberculated. 4. S. wallichii.

2'. Leaves toothed throughout or atleast on acroscopic rounded base and margin; sporophylls always toothed 2. S. involvens.


Terrestrial. Stem upto 3m long, glabrous, branches irregular, distant. Leaves dimorphic throughout, contiguous on the branches, entire. Sporophylls uniform, ovate-acuminate, entire. Strobilus upto 2cm long, both mega and microsporangia in the same strobilus.

**Habitat & Ecology:** Frequent in moist and shaded places of the area.

**Sporolution:** May - August

**Specimen examined:** Kamalpur, PSD 0087, dt. 8.2.04.

**Economic utility:**

**Forms of use locally:**

**Parts used:** Whole plant.

**Uses:** Plant paste used in cuts and wounds.

**Established reports of utility:** No other established report is found.

*Note:* Reported here as new.

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Terrestrials. Stem rigid, 5-16 cm long, branches from the middle of the erect stem, flattened, giving a foliar appearance; rhizophores and stolons arising from the base, wide creeping, light pink. Leaves compact, spirally arranged, dimorphic; lateral
leaves oblique, cordate acuminate, dentate; median leaves in two rows, compactly arranged, alternating with each other. Leaves on the erect stem deciduous leaving spiral leaf scars.

**Habitat & Ecology:** Found scattered in moist and shaded places

**Sporulation:** May - August.

**Specimen examined:** Churaibari, PSD 0116, dt. 18.12.04.

**Economic utility:**

**Forms of use locally:**

**Parts used:** Whole young sporophytic plant.

**Uses:** Plant extract is used in cuts and wounds.

**Established reports of utility:** No other established report is found.

*Note:* Reported here as new.


Terrestrials. Plants long, rooting at the base, rhizophores small in basal nodes; stems glabrous, pinnately branched; stem-leaves dimorphic; lateral leaves broad ovate, acroscopic base curved, minutely toothed on acroscopic margin, cartilaginous, obtuse, thin, not overlapping; dorsal leaves in 2 rows, alternate; branches 1.5-3.0 cm long, pinnately branched, dorsal leaves and lateral leaves similar to branches. Strobili 6.5 x 3.0 mm; sporophylls dimorphic, dorsal sterile sporophylls similar to the ventral leaves of branches, unequal sided, obtuse; ventral fertile leaves sporophylls in 3 rows, broad elliptic ovate, margin ciliated and cartilaginous. thin; spores – microspores trilete.
golden yellow, minutely densely tuberculated; megaspores trilete, pale yellow, tuberculated on dorsal side.

**Habitat & Ecology:** Found scattered in moist and shaded places.

**Sporulation:** May - July

**Specimen examined:** Duhalia, Part I, PSD 0001, dt. 21.6.03.

**Economic utility:**

**Forms of use locally:**

**Parts used:** Whole young sporophytic plant.

**Uses:** Plant extract is used in cuts and wounds.

**Established reports of utility:** No other established report is found.

**Note:** Reported here as new.

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Terrestrials. Long trailing procumbent herbs, upto 2 m long: branches pinnate, lateral branches bipinnate, tip of the branches long, stender, pinnatifid; rooting at base; leaves dimorphic; distant; lateral leaves obliquely ovate, acute, entire; median leaves ovate, acuminate, entire. Axillary leaves distant on main stem. Sporophylls uniform, ovate, acuminate, entire. Sopres oval, trilete.

**Habitat & Ecology:** Found in moist and shaded places.

**Sporulation:** May – July.

**Specimen examined:** Kamalpur. PSD 0080, dt. 8.2.04.
Economic Utility:

Forms of use locally:

Parts used: Whole young sporophytic plant.

Uses: Plant extract used in cuts and wounds.

Established reports of utility: No other established report is found.

* Note: Reported here as new.


_Helminthostachys_ Kaulf. Enum. Fil.28.1824.


Terrestrial erect herbs, upto 60cm tall. Rhizome long creeping, fleshy. glabrous ; roots fleshy, glabrous. Spike glabrous, upto 45cm long base covered with membranous sheath scales. Sterile segments; palmatifid, lobes 5-11, veins free, simple dichotomous. Fertile segment representing a terminal spike, stalk 10-18 cm long, glabrous, fleshy; spike upto 13 cm long. Sporangia borne superficially on the spike, numerous. Spores globose dark.

Habitat & Ecology: Found in moist, shaded and humus rich forest floor. Very rare.

Sporulation: May - July

Specimen examined:


Forms of use locally:
Ophioglossum reticolatum: (a) Habit (b) Pinna showing venation (c) Spike.
Parts used: Tender plant.

Uses: Tender plant edible. Plant extract used in dysentery, jaundice and sciatica.

Established reports of utility: Plant is mild asperient, intoxicant anodyne and used in sciatica. Decoction of rhizome is used in impotency. Leaves juice relieves tongue blisters. Powdered rhizome along with cow milk is used for vitality and brain tonic (Singh et al. 1989). The young fronds and fleshy rhizomes are eaten in Gorakpur, Garhal and Assam. Rhizome used in dysentery, catarrah, sciatica, malaria (Borthakur. et al., 2001).


Ophioglossum L., Sp.Pl.2; 1062. 1753.


Terrestrial. Rhizome short, cylindrical, roots fleshy, numerous. Stipe upto 10 cm long, slender. Sterile segment single on the middle of the frond, spathulate-cordate, sub-membraneous to coriaceous, veins reticulate, midrib not well differentiated. Fertile segment arising from the base of the sterile ones, erect, bearing terminal spike. 3 cm long. Peduncle 6-9 cm long, slender. Sporangia 15-40 in each row, globose.

Habitat & Ecology: Found in moist and sandy soil along with grasses.

Sporulation: April – August.

Specimen examined: Churaibari, PSD 0431, dt. 11.6.05.
Economic Utility:

Forms of use locally:

Parts used: Tender fronds.

Uses: Tender fronds edible and used in wounds.

Established reports of utility: The fresh fronds are eaten as vegetables in curries. Paste of plant is used as cooling agent in burnings and in the treatment of inflammations and wounds. Fronds are used as tonic and styptic in contusions and haemorrhages. (Borthakur et al., 2001).

5. ANGIOPTERIDACE


Terrestrial, Rhizome erect, broad, fleshy pink inside. Stipes swollen at base, adaxially flattened, abaxially rounded, whitish linear streaks all over, with small brown scales and minute hairs. Lamina long bipinnate; pinnae sub-opposite with swollen stalk, oblong–lanceolate, with a terminal pinnule; veins simple or forked twice, almost parallel, reaching up to the margin. Sori sub-marginal, ellipsoidal; sporangia up to 6 pairs in 2 rows, which is boat shaped. Spores hyaline, pale green.

Habitat & Ecology: Grows along hill slopes.

Sporulation: February- November

Specimen examined: Kamalpur, PSD 0072, dt. 8.2.04.
Economic Utility:

Forms of use locally:

Parts used: Tender shoot.

Uses: Tender shoot edible. Paste of stipe used to cure leprosy and rib’s pain.

Established reports of utility: The massive stem is cooked and eaten by tribals of Assam, an intoxicating drink called ‘ruchshi’ is made out of it. The stem is widely used as base for transportation of orchids. Base of the stipe is used in the treatment of leprosy and the roots are used as a cure for rib’s pain (Borthakur, et al., 2001).


Terrestrials. Rhizome long creeping, about 0.4cm thick, densely covered with hairs, scales absent; hairs minute, multicellular, reddish-brown. Stipes about 11-28 x 0.1-2.5cm, slender, straggling, rigid and polished; apical bud covered by brown hairs and stipule like small, 1cm long, lobed bracts. Fronds about 2m long, pinnate or dichotomously branched, lanceolate, apex acute or acuminate, deeply pinnatifid, nearly reaching up to the costa; segments narrowly linear or subulate, margin curved, deeply covered with brown hairs; rachis repeatedly forked, covered with dark brown hairs; costae and costules sparsely hairy; veins prominent, 2-forked lamina light green; texture hard. Sori small, globose, without paraphyses, in 2 rows on both sides of the costa. Spores numerous trilete, deeply grooved.
Habitat & Ecology: Forming thickets in open areas and on hill slopes.

Sporulation: June-July.

Specimen examined: Duhalia Part II, PSD 0002, dt. 22.6.03.

Economic Utility:

Forms of use locally:

Parts used: Whole plant.

Uses: Rachis used for making baskets, caps, mats. Plant paste used as anthelmintic and in wounds. Fronds used in asthma.

Established reports of utility: Rhizomes anthelmintic, fronds used in asthma and show anti microbial properties. Stipes used for preparing school pens, stalk used for making mats, chairs, seats, caps, fishingtraps, baskets. Plant is reported to have anticancer activity (Asolkar et al., 1992). Tender fronds used to remove sterility in women and in fever. (Borthakur et al., 2001).


Loxogramme (Bl.) Presl. Tent. Pterid.124. t.9. f.8.1836.


Epiphytic. Rhizomes short creeping, thick, paleaceous. Paleae upto 5 x 0.5 mm, lanceolate, entire, acuminate. brown on the rhizomes only. Fronds 25 x 3 cm wide, sessile, closely placed, simple, elliptic or lanceolate, rachis raised on upper surface, lower surface veins hidden, veinlets very few; leathery texture. Sori elongate, oblique, overlapping, small to very long. Spores pale green.
Habitat & Ecology: Scattered in moist and shaded places of the area.

Sporulation: June- July

Specimen examined: Modan Mohan, PSD 0176, dt. 12.6.05.

Economic utility:

- **Forms of use locally**: Not available.
- **Established reports of utility**: Not recorded so far.


Key to the genera:

1. Fronds covered by stellate hairs throughout.

2. Sori acrostichoid, covering the surface of the fertile lamina.  
   2'. Sori marginal, linear – confluent.

1'. Fronds glabrous or with simple gland like hairs.

3. Fronds at dimorphic.

3'. Fronds not dimorphic.

4. veins inconspicuous, sori always in more then 2 rows along rachis or costac or scattered, superficial.

4'. Venis prominient sori linear, forming coenosori in one row on each side of the rachis, oblique or Parallel.

5. Spores planoconvex; sori large, more then 3 m.m in diameters

5'. Spores oval, sori small, less then 3 mm in diameters.

7. Pyrosia

2. Drymoglossum

4. Leptochilus.

5. Microsorium.

6. Phymatosorus.


Baishya & Rao, Ferns & Fern-allies Meghalaya, 57.1982; Jamir & Rao. Ferns

Terrestrial. Rhizome creeping, dorsiventral, bearing short and stiff roots; *scales* lanceolate, terminating into hair like tip. Fronds slightly dimorphic, simple, long, stipitate; stipe upto 5 cm long in the sterile frond and upto 20 cm long in the fertile fronds, glabrous margin wavy, fertile lamina apparently smaller. Lateral veins prominent, veinlets obscure. Sporangia oval, slender, stalked accompanied with multicellular hairs. Spores oval, hyaline, light brown.

**Habitat & Ecology**: Found in moist, humus rich soil and base of tree trunk, rare.

**Sporulation**: July – October.

**Specimen examined**: R.K. Nagar, PSD 0206, dt. 5.9.05.

**Economic utility**:

- **Forms of use locally**: Not available.
- **Established reports of utility**: Not recorded so far.

*D. piloselloides* Thunb., Fl. Japan.: 331. 1784, non L.(1753); (L) C. Presl.  

Epiphytic. Rhizome long creeping, about 0.2 cm thick, wiry, clothed with scales; *scales* adpressed, diamond shaped, acuminate, some times hair like pointed; lamina dimorphic, simple; sterile lamina sessile or shortly stalked, roundish or obovate, base cuneate, margin entire; texture thick and fleshy, when young covered by stellate
Drymoglossum piloselloides; (a) Habit (b) Sterile lamina showing venation (c) Portion of fertile lamina showing sori (d) Sporangium (e) Scale.
hairs; stipe of fertile lamina scaly at base, straw coloured; fertile lamina linear to oblong, apex round, margin entire; veins indistinct, with free, forked or simple veinlets. Sori marginal, linear, continuous along the tip of lamina; sporangia oval, short stalked, with a few stellate paraphysis, dark brown. Spores oval to elliptic, light brown.

**Habitat & Ecology:** Common on tree trunks, forming large colonies.

**Sporulation:** November - March.

**Specimen examined:** Shibbari Road, Karimganj, PSD 0316. dt. 29.12.06.

**Economic Utility:**

**Forms of use locally:**

**Parts used:** Lamina.

**Uses:** The lamina of the plant is used as a paste and applied externally in the form of poultice on fractured bones after setting up the bones. Bamboo splints are usually tied around so as to prevent displacement of fractured bones.

**Established reports of utility:** The plant is used in the treatment of eczema, itch and haemorrhage. The leaves are used to treat constipation, cough, gonorrhoea, headache and small pox. (Borthakur et al., 2001).

**Note:** Additional utility is reported here.


Epiphytes. Rhizome long creeping, about 1 cm thick, solid, fleshy, covered by scales; scales lanceolate-subulate, apex acuminate, base broad. adpressed, grey-brown.
Stipes glabrous, shining, stramineous or brown. Lamina simple, deeply pinnatifid, ovate; lateral segments numerous, alternate or opposite; largest segments about 12 x 2.5 cm, lanceolate, margin entire or dentate-serrate, lowest pair deflexed; costa slightly raised; veins prominent, reticulate, forming one series of areoles with single included veinlets, marginal veins free. Sori large, round, terminal on included veinlets of the areoles. Spores oval to bean shaped, hyaline, yellow.

**Habitat & Ecology**: Found commonly on tree trunks and humus rich shady slopes.

**Sporulation**: May - December.

**Specimen examined**: Duhalia Part I, PSD 0041, dt. 25.12.03.

**Economic utility**:

**Forms of use locally**: 

**Parts used**: Rhizomes.

**Uses**: Rhizome paste used in cuts and wounds, also in urinary troubles.

**Established reports of utility**: Rhizomes of the plants is used as diuretic, pectoral astringent, used in urinary calculus and rheumatism; decoction of the whole plant is used to stop haemorrhages (*Borthakur et al.*, 2001).


Epiphytes. Rhyzome scales linear, margin sparsely toothed, dark brown. Fronds dimorphic, slender, stipitate, stipe up to 10 cm long; entire, decurrent on stipe; giving
Leptochilus axillaris; (a) Habit (b) Portion of lamina showing venation (c) Sporangium
winged appearance. Veins obscure. Fertile fronds linear upto 30x .5 cm. Sori exindusiate, sporangia oval, spores elliptic.

**Habitat & Ecology**: Found as low climbing fern, scattered.

**Sporulation**: December - February.

**Specimen examined**: Duhalia Part I, PSD 0069, dt. 25.12.03.

**Economic utility**:

- **Forms of use locally**: Not available.
- **Established reports of utility**: Not recorded so far.


**Key to the species**:

1. Lamina simple, lanceolate.

2. Lamina membranous, veins prominently raised

   5a. *M. membranaceum*

2'. Lamina criaceous or, sub-coriaceous; veins indistinct.

3. Lamina slender, stipitate; sori superficial, through the surface

   5d. *M. superficiale.*

3'. Lamina sessile; sori scattered, more or less immersed along

   the upper half of the lamina.

   5c. *M. punctatum.*

1'. Lamina pinnate or pinnatifid.

Microsorium membranacum: (a) Habit (b) Portion of lamina showing venation (c) Sporangium (d) Scale
Terrestrial. Rhizome short creeping densely covered with fibrous roots and scales. Fronds obovate-lanceolate, narrowly decurrent at the stipe, membranous. Stipe very short, up to 1 cm long. Veins prominently raised, reticulate, lateral veins parallel with veinlets. Sori globose, irregular scattered along the veinlets. Spores oval to elliptical.

**Habitat & Ecology**: Found on moist, humus rich area, very common.

**Sporulation**: July - October.

**Specimen examined**: Dullabcherra, PSD 0214, dt. 6.9.05.

**Economic Utility**:

**Forms of use locally**:

**Parts used**: Whole plant.

**Uses**: Used as ornamental.

**Established reports of utility**: Grows as an ornamental plant (*Borthakur et al.*, 2001).


Aquatic. Rhizome creeping about 0.5 cm thick, fleshy green, apex scaly; scales about 5 x 0.5 mm, lanceolate, long, acuminate, entire, pale brown. Stipes about 3 x 12 cm long, winged upwards, sparsely covered by scales. Fronds simple.
lanceolate acuminate, margin entire; terminal lobe about 20 x 2.5 cm, linear-lanceolate, acuminate apex, base long-tapering into a gradually decurrent wing upon the petiole; all lobes scaly on the midrib beneath, glabrous above; midrib raised and rounded below, flattened above; veins distinct above and below.

**Habitat & Ecology**: Found as lithophytes on big rocks or boulders near moist area.

**Sporulation**: April – September.

**Specimen examined**: Maizgram, PSD 0091, dt. 19.5.04.

**Economic utility:**

**Forms of use locally:**

**Parts used**: Whole sporophytic plant.

**Uses**: The plant is crushed along with leaves of bringal and applied locally to cuts and wounds of dogs for haemostatic and antiseptic action.

**Established reports of utility**: Not known so far.

*Note*: Medicinal utility of the plant is reported here as new.


Rhizomes short-creeping, thic, stout, paleaceous, roots very profuse hairy. Fronds 40-80 x 5-7 c.m., close, sessile, simple elliptic, narrowing gradually towards both ends, entire or repand, acuminate. Sori round to slightly elongated, minute, irregularly distributed on the veins and vein-plexus in apical half of the frond.

**Habitat & Ecology**: Widely grows in moist shaded places inside the forest, epiphytic.

**Sporulation**: April – September.

**Specimen examined**: Jhumbasti, Badarpur, PSD 02656, dt. 20.4.06.
Economic utility:

Forms of use locally:

Parts used: Whole sporophytic plant.

Uses: The plant paste applied in cuts and wounds.

Established reports of utility: Not known so far.

* Note: Medicinal utility of the plant is reported here as new.


Terrestrial. Rhizome scandent, wide creeping, clothed with lanceolate, brown, spreading scales. Stipes upto 13 cm long, slender, often sparsely covered with brown scales. Fronds lanceolate, narrowed at both ends, entire, 16-45 x 3-4.5 cm, glabrous dark green. Veins obscure. Sori large, copious, superficiale, irregularly scattered on the whole surface of lamina.

Habitat & Ecology: Found in moist and humid places.

Sporulation: December - February

Specimen examined: Durganagar T.E., PSD 0141, dt. 9.2.04.

Economic utility:

Forms of use locally:

Parts used: Rhizome.

Uses: Paste of rhizome applied on cuts and wounds.

Established reports of utility: Not known so far.

* Note: Medicinal utility of the plant is reported here as new.
Microsorium superficialis; (a) Habit (b) Portion of lamina showing venation and sori (c) Sporangium (d) Scale.


Rhizome wide creeping, about 2 cm thick, covered with ovate adpressed peltate, scaly brown scales. Stipes pale or grey brown, adaxially grooved, abaxially rounded, glabrous. Lamina pinnatifid, ovate about 55 x 45 cm, triforked at apex, base broadly cuneate, pinnae opposite or sub-opposite, basal one or two pairs sessile, others adnate. Narrow lanceolate, acuminate at the apex, margin entire, both sides glabrous, dark green, texture herbaceous. Rachis narrowly winged; costa well raised below, areoles with copious free veinlets. Sori large, median between the margin of pinna and costa, superficial, in two parallel rows on both side of the costa. Spores plano-convex.

**Habitat & Ecology:** Found as a lithophytes in shaded areas.

**Sporulation:** January - May

**Specimen examined:** Akbarpur, PSD 0101, dt. 19.5.04.

**Economic Utility:** Not available.

**Established reports of utility:** Not recorded so far.


**Key to the species:**

1. Lamina dimorphic; stipes adaxially grooved, scaly at base, glabrous above.

1’. Lamina uniform; stipes terete, clothed with stellate hairs. thick and hard

7a. *P. adnascens.*

7b. *P. heteracta*


**Habitat & Ecology**: Found abundantly on tree trunk as epiphyte in open places; also as lithophytes.

**Sporulation**: May - February

**Specimen examined**: Botoroshi, PSD 0092, dt. 19.5.04.

**Economic utility**:

**Forms of use locally**:

**Parts used**: Rhizome.

**Uses**: Cold decoction of the rhizome is mixed with little powdered seeds of *Piper nigrum* and taken orally, twice a day for curing cold and cough, for seven days by the Reang tribe. Extract of frond applied locally for curing cancerous acute skin disease. Fresh extract is applied every day till the disease is cured by the Chorei tribe.

**Established reports of utility**: Fronds of the plant are used medicinally to treat dysentery and burn injuries. *(Borthakur et al., 2001)*. *Dutta Choudhury* (1999) reported the use of the plant in cough and cold.

* Note: Additional medicinal utility of the plant is reported here.
Pyrosia adnascens; (a) Habit (b) Portion of lamina showing venation (c) Portion of lamina showing Sori (d) Sporangium (e) Scale.

Epiphytes. Rhizome wiry, creeping, densely scaly; scales ciliate towards the tip. Stipe terete, upto 15 cm long, woolly; Lamina elliptic, 10-20 x 2-6 cm, woolly, tomentose through out the surface beneath. hairs stellate, pale brown; midrib and lateral veins prominently raised, reaching the margin. Sori globose, scattered through out. Sporangia oval, shortly stalked, spores round.

**Habitat & Ecology**: Found on moist tree trunks and moss covered rocks.

**Sporulation**: July - December

**Specimen examined**: Duhalia Part I. PSD 0042. dt. 25.12.03.

**Economic utility**:

**Forms of use locally**: 

**Parts used**: Rhizome

**Uses**: Cold decoction of the rhizome is mixed with little powdered seeds of *Piper nigrum* and taken orally, twice a day for curing cold and cough, for seven days by the Reang tribe. Extract of frond applied locally for curing cancerus acute skin disease. Fresh extract is applied every day till the disease is cured by the Choroi tribe.

**Established reports of utility**: Not recorded so far.

* Note: Recorded here as new.


*Drynaria* (Bory.) J.Smith. Hook. J.Bot. 4:60.1841. *nom. cons*

**Key to the species**:
Pyrosetia heteracta: (a) Habit (b) Potion of lamina showing venation & sori (c) Sporangium (d) Scale
1. Scales with hairy margin. Leaf margin subtruncate sori on one or either side of the midrib of the leaf lobes. \textit{1.D. propinqua}.

1'. Scales with dinate margin. Leaf margin entire. Sori in many irregular rows on either side of the midrib of the leaf lobes.

2. Sterile lamina with oblong margin; fertile lamina flaccid and apical portion slightly dropping; sori in two regular rows on either side of the main lateral veins and devoid of paraphyses. \textit{2.D. quarcifelia}.

2'. Sterile lamina with wavy margin; fertile leaves stiff & erect never dropping. Sori irregularly scattered and with club-shaped \textit{3.D. sparsisora}.


\textbf{Habitat & Ecology} : Found as epiphyte on moss covered tree trunks.

\textbf{Sporulation} : May - October
Specimen examined: Mahakhal, PSD 0177, dt. 12.6.05.

Economic utility:

Forms of use locally:

Parts used: Rhizomes.

Uses: Base of the rhizomes used for decorative purposes.

Established reports of utility: Not recorded so far.

Note: Recorded here as new.


Epiphytes. Rhizome fleshy, creeping, upto 2 cm diameter, densely covered with dark roots and scales. Scales linear, terminating into hair like tip. Sterile frond over-lapping at the base of the fertile fronds, ovate, sessile, margin deeply lobed, entire and glabrous; fertile fronds pinnatifid, upto 1 m long. Slender stipitate; stipe upto 25 cm long, glabrous, pinnae linear oblong with acute apex, margin wavy, both basal margin decurrent on axis giving winged appearance. Veins reticulate, prominently raised, included veinlets absent. Sori small globose, scattered throughout the surface of the lamina. Sporangia round, slender, stalked; spores oval, hyaline, exine with minute blunt projections.

Habitat & Ecology: Found on shady and exposed tree trunks forming brakets.

Sporulation: October - June

Specimen examined: Churaibari, PSD 0291, dt 16.6.06.
Dryaria quercifolia; (a) Fertile lamina (b) Sterile lamina (c) Portion of lobe of fertile lamina showing venation & sori (d) Sporangium (e) Scale.
Economic Utility:

Forms of use locally:

Parts used: Rhizomes.

Uses: Rhizome paste used in bone fracture and skin disease.

Established reports of utilisation: Rhizomes of the plant are used as astringent; fronds is used in epithesis, hectic fever, dyspepsia and cough. The decoction of the plant is used in typhoid fever. The fluid extracted from the fronds have anti bacterial properties. The plants is used in the treatment of body ache, rheumatism, skin diseases and as tonic, expectorant and anthelmintic. Fronds anti bacterial and used to treat swellings. Rhizome is used to treat bone fracture, cough, headache and typhoid fever. The rhizome extract is mixed with honey and used to cure asthma and bronchitis. (Borthakur et al., 2001).


Epiphytes. Rhizoem long creeping, stout, flattened dorsiventrally, covered by scales; scales about 0.4-0.7 cm long, basal region shield like, tips uniseriate and bear glandular hairs, margin dentate, dark brown. Sterile leaves about 12 x 8.5 cm, adpressed to the rhizome. ovate, sessile, apex blunt or acute, margin broadly wavy, ultimate margin entire, veins prominently raised, dull brown. Fertile leaves erect, stiff. Leaf lobes alternate, lancolate, basal region faintly constricted, apex acuminate, texture leathery, margin cartilagenous and irregularly undulate, venation prominent. Sori small, in two rows one on each side of the main lateral veins of the leaf. Spores brownish, monolete.

Habitat & Ecology: Growing on shaded rock surface and tree trunks.
Drynaria sparsisora; (a) Fertile lamina (b) Sterile lamina (c) Portion of lobe of fertile lamina showing venation & sori (d) Sporangium (e) Scale
Sporulation: April - July

Specimen examined: Duhalia Part II, PSD 0351, dt. 28.5.06.

Economic utilisation: Not available.

Established reports of utility: Not recorded so far.


Phona paloi(B).

Terrestrial. Rhizome creeping, about 1.5cm thick, stout, densely scaly; scales narrow, linear, hard, subulate-setaceous, margin shortly tubercled, black. Stipes erect, grooved above, hard, polished and smooth, glabrous. Lamina about 30-50.5cm long and much wider than long, fan-like, bipartite into two equal broad-cuneate portions which are palmately and dichotomously divided; segments oblong, apex acuminate, margin entire; costae prominently raised above and below, from the summit of the stipe dichotomously repeatedly branched veins pass through the frond with 2 main costae run through each segment which are united at the apex; venation prominently raised below, reticulate; all the costae are united by transverse flexuose costules; free veinlets present in the aereoles; texture coriaceous; lamina glossy-green above, coppery-green beneath, glabrous. Sori small, round. copius. superficial, scattered in the
aerole; sporangia oval, short-stalked, light-brown. Spores oval, hyaline, pale-white, exine smooth.

**Habitat & Ecology**: Found in slopes of hilly region in shaded non-laterised sandy soil, very rare.

**Sporulation**: March - September.

**Specimen examined**: Debarma Village, Churaibari, PSD 0456, dt. 3.2.06.

**Economic utility**:

**Forms of use locally**:

**Parts used**: Leaves.

**Uses**: Leaves paste used in cuts and wounds.

**Established reports of utility**: The rhizome is used in Hepatitis (Dutta Choudhury, 1999).

**Note**: Additional utility reported here.


**Key to the species**:

1. Pinnules mostly lanceolate with cordate base in barren; fertile pinnules broadly oblate.  

3. *L. microphyllum*.

1'. Pinnules linear, oblong, margin actually serrulate.

2. Sterile lateral pinnae bipinnate, secondary pinnae pinnatifid at base.

2'. *L. japonicum*.

2' Sterile lateral pinnae unipinnate, secondary pinnae often trilobed or tripartite at base.

1'. *L. flexuosum*. 

Terrestrial climbing ferns. Rhizome creeping, short, covered by dark brown hairs. Stipes about 35 x 0.4cm, glabrous, abaxially rounded and adaxially flattened, dark brown. Fronds wide spreading, tripinnate, glabrous; primary pinnae alternate about 14 cm apart with about 2.5 mm long common stalk forked once and bearing a dormant bud on the forking axis; each forked branch bears 2–3 pinnules alternately. Sterile leaflets finely toothed; texture firm; rachis and costa densely or sparsely pubescent all over; veins distinct. 1–3 forked. free. reaching the margin; fertile leaflets little narrower than the sterile ones. Sporangia arranged adaxially on spikes of size 4 x 1 mm, protruding from the margin; sporangia large, short stalked about 5 pairs, arranged in two rows, alternate. Spores small, trilete, yellowish green.

**Habitat & Ecology**: Found in shady and open areas, often twining on bushes.

**Sporulation**: February - December

**Specimen examined**: Kamalpur, PSD 0073. dt. 8.2.04.

**Economic utilisation**:

**Forms of use locally**:

**Parts used**: whole plant.

**Uses**: Rachis of the plant is tied on hand to be secured from evil spirit. The same is tied over forehead to reduce headache by the Reang tribe.
Lygodium flexuosum: (a) Potion of lamina (b) Pinnule showing venation (c) Arrangement of sori (d) Sporangium
**Established reports of utility:** The plants are used as expectorant; rhizomes boiled mustard oil and locally applied on carbuncles and in rheumatism, sprains, scabies, ulcers, eczema and cuts. The aqueous extracts of the rhizomes is used to cure gonorrhoea. The paste of the rhizome is applied on piles and the rhizome is also tied on the waist. Rhizome is used as abortifacient and as appetizer; it is also used for treatment of abdominal pain, cholera, cuts, eczema, indigestion, jaundice, scabies and ulcers. The plant is also used in pleurisy. *(Borthakur et al., 2001).*

*Note:* Additional utility reported here.


Terrestrial. Rhizomes long creeping. Fronds 200–300 x 20–60 cm; rchis about 1.5 mm across, dorsal surface pubescent; pinnae in sterile fronds tripinnate and fertile fronds quadripinnate to further decompound; primary rachis–branches 6–8 mm long, pubescent, dormant, apex hairs long in sterile frond pinnate and in fertile frond tripinnate to further decompound, pubescent; margin in sterile frond crenate and deeply cleft to midvein in fertile; lamina pubescent; midvein and veins pubescent below; texture firm. Sporophores up to 6.5 mm long, 4–7 solitary sporangia; spores colliculate.

**Habitat & Ecology:** Found in moist open places, often twining on bushes.

**Sporulation:** July – November.

**Specimen examined:** Khasiapanji, Durganagar T.E., PSD 0516, dt. 29.11.06.

**Economic Utility:**
Lygodium japonicum: (a) Potion of lamina (b) Pinnule showing venation (c) Arrangement of sori (d) Sporangium
Forms of use locally:

**Parts used**: Rhizome.

**Uses**: Rhizome paste is taken orally mixing with water to get cured from food poisoning. Stem used as ropes for carrying fish and vegetables in village markets.

**Established reports of utility**: The plant is used as expectorant; decoction of vegetative parts and spores is used as diuretic or cathartic. Roots are used as veterinary medicine to treat animal wounds. *(Borthakur et al., 2001).*

*Note*: Additional medicinal uses reported.


Terrestrial twining fern. Rhizome long creeping about 0.6 cm thick, densely covered by hairs. Stipes about 2 mm thick, abaxially rounded, adaxially flattened, brown; rachis twining, similar to stipe. Fronds about 200–300 x 20 cm; primary branches about 5 x 1 m, up to 10 cm apart, alternate, covered by hairs, bearing a dormant apex. Secondary branches about 7x3cm, pinnate, oblong, with an apical pinna similar to lateral ones which is more or less lobed; veins distinct, branched, free, reaching the margin; texture herbaceous, pinnules glabrous, pale green. Sori finger-like about 0.5 cm long, round the margin of the pinnules except the base; sporangia short stalked, up to 6 pairs in two rows. Spores trilete, exine densely verrucate.

**Habitat & Ecology**: Found in open moist places, rare.

**Sporulation**: July - September
Specimen examined: Kalinagar T.E., PSD 0223, dt. 6.9.05.

Economic utility:

Forms of use locally:

Parts used: Whole plant.

Uses: Rachis of the plant is tied on hand to be secured from evil sprit. The same is tied over forehead to reduce headache by the Reang tribe.

Established reports of utility: Young leaves eaten; their decoction used in dysentery; poultice of leaves applied to skin diseases. Old stems are used for basket making (Borthakur, et al., 2001).

Note: Additional utility is reported.


Cheilanthes Sw. Syn. Fil.5.126.1806. nom. cons

Key to the Species:

1. Undersurface of lamina without silvery crest
   1'. Undersurface of lamina with silvery crest.

2. Stipe and rachis dark-puplish crest.
   2'. Stipe and rachis otherwise;

3. Scales on rhizome with translucent margin; indusium with flabellate margin bearing small glandular hairs.
   3'. Scales on rhizome without translucent margin; margin of indusium nearly smooth or serrate.


4. C. tenuifolia.

Terrestrials. Rhizomes short erect, about 1.5 cm thick, covered with scales; scales long lanceolate, hair pointed, acuminate apex, blackish-brown, margin translucent. Stipes cylindrical, slender, shining, reddish brown, sparsely covered with lanceolate hair-like scales. Lamina about 4.5 – 16 x 2.5-9 cm, bipinnatifid, ovate lanceolate to deltoid-lanceolate, acute apex; pinna up to 12 pairs, sub-opposite; elongate-ovate, apex blunt, deeply pinnatifid; lowest pair of pinna slightly enlarged than others; rachis similar to stipe; texture rough and coriaceous; upper surface of lamina glossy, lower surface bears scales as well as hairy and covered a white silvery crust. Veins free, forked once, reaching the margin. Sori marginal, confluent. Sporangia large, short stalked, spores globose, blackish.

**Habitat & Ecology**: Found on hill slopes, roadsides.

**Sporulation**: October - February

**Specimen examined**: Dasgram, PSD 0241, dt. 11.1.06.

**Economic Utility**:

**Forms of use locally**:

**Parts used**: Whole plant.

**Uses**: Plant paste used in cuts and wounds.

**Established reports of utility**: Young plants are used in making Tonic. Extract mixed with honey is taken after meal by person suffering from weakness due to Tuberculosis (*Borthakur et al., 2001*).

Terrestrials. Rhizomes short, semi-erect, with numerous branched roots, clothed with scales. Scales narrow, lanceolate, hair-like at apex, costaneous brown. Stipes about 14 x 0.15 cm long, slender, scaly at base, glabrous above, ebanoine-glossy, plane and margined on the upper side, dark purplish-brown. Lamina unipinnate about 48 cm long, with few basal pair of pinnae separating basal pinnules at their base, pinnatifid upwards, pinnae light brownish green, glaucous beneath, basal pinnules obliquely oblong, with lobed margin, glabrous. Sori confluent along the margin of lobes, leaving no sterile region, except the apex; indusia lacerate at margin.

**Sporulation**: July to November.

**Habitat & Ecology**: Found in open roadsides and hill slopes.

**Specimen examined**: Duhalia Part 1, PSD 0481, dt. 8.1.07.

**Economic utility**:

- **Forms of use locally**: Not available.
- **Established reports of utility in medicine**: Not known so far.


Terrestrials. Rhizome short, stout, roots tufted; scales brown, linear, hair pointed. Stipe glabrous, ebonous glossy, slender, 4–5.5 cm long with deciduous elongate scales. Fronds deltoid-lanceolate, upto 18 cm long, 2 pinate at base,
pinnatifid at apex, basioscopic pinnae of basal pairs upto 5.5 cm long, under surface
covered whitish small waxy paleae, glabrous above, texture thin, coriaceous. Sori
scariose-rounded in continuous margin. Indusia false, dark brown; sporangia large,
short stalked.Spores globose, dark brown, exine with dense reticulate, raised
thickenings.

**Habitat & Ecology**: Found along roadsides and hill slopes.

**Sporulation**: July – February.

**Specimen examined**: Latu, PSD 0247, dt. 11.1.06.

**Economic utilisation**:

*Forms of use locally:*

*Parts Used*: Root.

*Uses*: Roots of the plants are used to treat eczema and stomach-ache; fronds
are to treat periodic disorders.

*Established reports of utility*: Not known so far.

**Note**: Medicinal utility reported here as new.

4. *C.tenuifolia* (Burn.f) Sw. Syn. Fil. 129.332.1806; Bedd. Ferns South. India,
t.188.1864; Handb. Ferns Brit. India, 92.1883; Clarke, Trans. Linn. Soc. Lond.II.
Bot.1. 455.1880; Baishya & Rao, Ferns & Fern-allies. Meghalaya; Jamir & Rao
FernsNagaland, 142.1988; Manickam & Irudayaraj, Pterid. Fl. West. Ghats-S. India,

Terrestrial. Rhizome small, short, creeping or sub-erec about 1 cm thick. apex
scaly; scales lanceolate, acuminate. entire, brownish. Stipes scaly at base, glabrous
above, glossy. rounded below, above grooved, erect, dark purplish. Lamina ovate-
lanceolate, tripinnate below, bipinnate middle and unipinnate above, apex acuminate.
Rachis similar to the stipe; lamina green,glabrous; texture herbaceous; veins of the
Chelianthes tenuifolia: (a) Habit (b) Secondary pinna showing venation (c) Secondary pinna showing sori (d) Sporangium
upper surface not visible but slightly distinct below, forked once or twice, free. Sori marginal on each ultimate lobes, protected by reflexed margin of the lamina, indusia very short, undulate. Spores dark brown, tetrahedral.

**Habitat & Ecology**: Found on foot hills and in plain areas.

**Sporulation**: July - October

**Specimen examined**: Gandhai, PSD 0517, dt. 29.1.07.

**Economic Utility**:

**Forms of use locally**:

**Parts used**: Fronds.

**Uses**: Fronds crushed and made into paste and applied on abscess in the form of poultice to liberate pus. Believed to have antiseptic action. The poultice given once a day till the abscess is dried up.

**Established reports of utility**: Roots and rhizomes are used by tribals as a general tonic. The plant is used as hair tonic. *(Borthakur et al., 2001)*.

*Note*: - Recorded here for additional mode of utility.


*Sunali paloi* (B).

Terrestrials. Rhizome short, semi-erect, densely clothed with scales; scales narrow, lanceolate, acuminate, hair tipped apex. brown. Stipe stout, erect, glabrous. cylindrical, straw coloured or pale-brown. Lamina about 35 x 15 cm quadripinnate,
Onychium siliculosum: (a) Habit (b) Pinnule showing venation (c) Pinnule showing sori (d) Sporangium
ovate, apex acuminate; pinnae alternate or sub-opposite, about 8 pairs or more; margin entire; fertile segments bear terminal pinnules much longer, pod-like, apex usually trifid; veins free; rachis glabrous. Sori sub-marginal, continuous along both margins, connected with veinlets, bright golden yellow; indusia membranaceous, margin fimbricate; sporangia golden brown. Spores small, tetrahedral.

**Habitat & Ecology**: Found in dry sandy red soil in open places and forests.

**Sporulation**: January - October

**Specimen examined**: Nilmani Road, Karimganj, PSD 0298, dt. 16.6.06.

**Economic Utility:**

**Forms of use locally**:

**Parts used**: Frond.

**Uses**: Used as ornamental plant and also used in cuts & wounds.

**Established reports of utility**: Fronds are used to treat baldness and dysentery (Borthakur et al., 2001).

*Note: Additional Medicinal utility reported here.*


**Key to the species**:

1. Lamina dimorphic.

2. Basal pair of pinnae bipartite, pinnae uniform.

   3. Pinnae shortly stipitate. Linear-lanceolate, finely serrated,

   Terminal pinnae decurrent on the rachis; veins prominent

   2. *P.cretica*.

   3'. Pinnae sessile, alternate at base, margin deeply lobed, lobes

   Serrate, terminal pinna not decurrent on rachis; veins obscure

   4. *P.grevilleana*.

2'. Basal pair of pinnae not bipartite, pinnae not uniform

   3. *P.ensiformis*. 
1'. Lamina monomorphic.

4. Lamina simple pinnate.

5. Pinnae sub-entire on the upper margin and the lower
margin pinnately divided. \[7.P\text{-}semipinnata.\]

5'. Pinnae undivided on both margins. \[8.P\text{-}vittata.\]

4'. Lamina bipinnatifid or bipinnate.

6. Bassal veins anastomosing to form series costal areols. \[1.P\text{-}biaurita.\]

6'. Bassal veins not anastomosing.

7. Spinules present both on costa and costules. \[6.P\text{-}quadriaurita.\]

7'. Spinules present on costa only \[5.P\text{-}linearis.\]


Terrestrial. Rhizome short, sub-erect, densely hairy and scaly; scales dark brown, linear-lanceolate. Fronds unipinnate. 35-50 x 20 cm, basiocopic pinnae forked once downwards at base, base oblique, pinnae membraneous, glabrous, cut down nearly two-third distance to costae, margins entire. Stipe and rachis glabrous. Veins forked, one pair opposite sides uniting just above the sinus. Sori confluent or along the margin connecting all the veinlets.

**Habitat & Ecology**: Common along road sides and hill slopes in shaded area.

**Sporulation**: July - December.

**Specimen examined**: Harinagar, PSD 0215, dt. 6.9.05.
Economic utilisation:

**Forms of use locally:** Not available.

**Established reports of utility:** Rhizomes are used in treatment of wounds. (*Borthakur et al.,* 2001).


Terrestrial. Rhizomes short creeping; stipe erect 16x35 cm long, naked or with lanceolate brown scales near the base. Fronds dimorphic; sterile fronds smaller than fertile once; 20-35 cm long; fertile once more than double the length of sterile ones. Lamina sub-unipinnate, basioscopic 2-3 pairs of pinnae unequally forked to the costae on posterior base, pinnae few, sessile; fertile pinnae linear, entire. Rachis naked. veins forked ones, simple. Sori confluent along the margin except at the base and apex.

**Habitat & Ecology:** Common in dry open places along the roadsides and forests.

**Sporulation:** July - October.

**Specimen examined:** Duhalia Part II, PSD 0382, dt. 8.1.07.

**Economic utility:**

**Forms of use locally:** Not available.

**Established reports of utility:** Not known so far.

Pteris cretica; (a) Habit (b) Portion of fertile pinna showing venation & sori (c) Sporangium (d) Scale
Terrestrial. Rhizome short creeping, scaly not hairy. Scales linear-lanceolate, narrowed at apex. Stipe slender, short, 5-25 cm long, glabrous. Fronds herbaceous, glabrous membranous, simple pinnate; basioscopic one pair of pinnae lobed; lobs oval to elongate-ovate, margin sharply dentate; apical pinna linear, entire. Sterile frond 18-10 cm, fertile pinnae narrower. Veins free. Sori confluent, marginal, developing in basipetal succession.

**Habitat & Ecology**: Found in moist humus rich area and rock crevices.

**Sporulation**: June - November.

**Specimen examined**: Modan Mohan, PSD 0178, dt. 12.6.05.

**Economic utilisation**:

**Forms of use locally**:

**Parts used**: Fronds.

**Uses**: Paste of fresh fronds with water is applied locally twice a day for curing swelling of joints.

**Established reports of utility**: Decoction of fronds is used for dysentery; leaf juice is used as astringent. root juice is used for glandular swellings of neck. tender fronds edible. *(Borthakur et al., 2001)*.

Note: Additional medicinal utility of the plant is recorded here.

**4. P. grevilleana** wall. Ex Agardh. Rec Sp. Gen. Pteridis. 23.1839; Clarke. Trans. Linn. Soc. Lond II. Bot.1.466. t.56.1880; Bedd. Handb. Ferns Brit. India.112.1883: Suppl. 24.1892. Rhizome erect ca 3 cm thick, scaly at apex; scales ca 0.3 x 0.1 cm. linear lanceolate. Apex acuminate, brown. Lamina dimorphic; stipe of sterile lamina shorter than fertile ones. ca 12 x 0.3 cm. abaxcily rounded. Adaxially grooved. Scaly at base.
glabrous above, slightly winged towards the apex, straminious. Sterile lamina ca 12 x 10 cm. pedately 5-fid, apical pinna largest. ca 10 x 3 cm, sessile. ovate-lanceolate, apex obtuse rounded, alternate at base margin deeply lobed nearly to the costae, lobes ca 0.4 cm wide, overlapping, oblong, obtuse at apex margin serrated; stipe of fertile lamina similar to the sterile one but slender and longer ca 25 cm long; Fertile lamina ca 15 x 10 cm. bipinnatified with 5 pinnae, to sterile ones but lobes somewhat distant, linear-oblong falcate; venis obscure free, forked once. Sori linear along the margin except at apex and base; indusia linear; sporangia slender stalked.

**Habitat & Ecology**: Found in dry and rocky surfaces of the area.

**Sporulation**: August - December.

**Specimen examined**: Kotamoni, PSD 0117. dt. 18.12.04.

**Economic utility**:

*Forms of use locally:*

*Parts used*: Whole plant.

*Uses*: Used as an ornamental.

*Established reports of utility*: Not known so far.

5. *P. linearis* Poir in Encycl. 5.723. 1804; Manickam & Irudayaraj, Pterid Fl.West. Ghat-S.India, 80. t.56.1992. Rhizome erect upto 5 cm thick, densely clothed with scales; scales ca 8 x1 mm, linear-lanceolate, apex long acuminate, margin ciliated, pale-brown at the periphery and dark brown at the centre. Stipes ca 9 x 0.8 cm. scaly at base, glabrous above, polished, abaxially rounded, daxially grooved, chestnut brown at the base, stramineous above. Lamina ca 40-75 x 22-32 cm. ovate bipinnate, pinnea upto 10 pairs, opposite or sub-opposite shortly stalked or sessile; largest unequal, margin pinnatifid upto 2.3 mm to the costa; basal pair of pinnea bear an accessory branch on the basal basiscopic side; pinnea pale-green; costa, costules and veins raised
above and below; veins up to 20 pairs, all veins except a few pairs in distant part of the pinnae lobes forked ones, free basal basiscopic veins arising from the costa while basal acrscopic ones arisen from the axis of costa and costule, basal most pair of vainlets of adjacent lobes reaching the base of sinus independently; spinules present at the junction of costae and costule. Sori continuous all along the margin except at apex of the lobes: indusia, rigid, pale-brown. Spores yellowish-green.

**Habitat & Ecology** : Found in moist and shady places along the edge of the forests.

**Sporulation** : February –July.

**Specimen examined** : Kamalpur, PSD 0074, dt. 8.2.04.

**Economic utility** :

**Forms of use locally** :

**Parts used** : Whole plant.

**Uses** : Used as an ornamental.

**Established report of utilisation** : Not known so far.


Terrestrial. Rhizome short, sub-erect, hairs absent, densely scaly at the apical portion; scales linear, hair-pointed at apex, dark brown. Fronds bipinnatifid, upto 17-18 cm, glabrous, coriaceous; basioscopic, margin of basal pair of pinnae bipartite, rarely more pairs of pinnae divided; pinnules distinctly cut down to the costae, oblong; stipe erect, upto 40 cm long, glabrous, light purple. Spinnules present on upper surface of costae and costules. Veins forked, free, raised on the ventral side.
Pteris quadriaurita: (a) Habit (b) Pinna lobes showing venation & sori (c) Sporangium
Habitat & Ecology: Very common in moist shady places and waste areas.

Sporulation: July - December.

Specimen examined: Duhalia Part I, PSD 0043. dt. 25.12.03.

Economic utilisation:

Forms of use locally:

Parts used: Stipe

Uses: Stipe is used as straw for drinking local liquor by tribal people of the area. It is believed that drinking alcohol through this is good for health.

Established reports of utility: Not known so far.

*Note: Medicinal utility reported here as new.


Terrestrial. Rhizome short creeping, densely scaly; stipe erect upto 45 cm long, basal pairs of pinnae distant and distinct, apical lamina pinnae like with linear entire tip; pinnae sub-equal at lower margin, upper margin sub-entire, finely serrate; pinnules linear with acute apex, veins depressed. Costae and costules minutely ridged, with dense spinules, scaly at base. Sori linear, marginal; indusia reaching the sinus; tip of pinnules sterile. Spores triangular to oval, yellowish brown.

Habitat & Ecology: Found frequently on moist, humus rich soil in secondary forests.

Sporulation: February – October.

Specimen examined: Kamalpur, PSD 0084, dt. 8.2.04.

Economic utilisation:

Forms of use locally:
Parts used: Fronds.

Uses: Paste of fronds is used with water for application locally around carbuncles for bursting it and reducing pain.

Established reports of utility: Not known so far.

Note: Recorded here as new.


Terrestrial. Rhizome sub-erect, densely hairy and silky brown linear scales. Fronds imparipinnate, 20-75 x 8-15 cm, densely covered with whitish hairs; pinnae elongate linear, deltoid-cordate at base, serrulate, few pairs of basal pinnae reduced to auricle like appendages; terminal pinnae elongate-linear; veins free. Sori marginal, continuous. Spores round, bright brown.

Habitat & Ecology: Common along road cuttings and rock crevices.

Sporulation: July – February.

Specimen examined: Kayasthagram, PSD 0142, dt. 9.2.04.

Economic Utility:

Forms of use locally:

Parts used: Whole plant.

Uses: Plant paste used in pain and swelling.

Established reports of utility: Used by Kachries as tonic after boiling in water.

Roots are used demulcent (Borthakur et al., 2001).

Note: Additional utility is reported.
*Pteris vittata*; (a) Habit (b) Pinna showing venation (c) Portion of pinna enlarged showing venation & sori (d) Sporangium
15. ADIANTACEAE (Presl.) Ching. in Sunyatsenia 5:229. 1940.


**Key to the species:**

1. Lamina simple pinnate.

2. Sori transversely elongated, forming a partially interrupted or un interrupted line; pinnae glabrous. 3. *A. philippense*

2'. Sori small, not forming a continuous line; pinnae densely hairy all over. 1. *A. caudatum.*

1'. Lamina bipinnate, lanceolate, cuneate, glabrous. 2. *A. capillus-veneris.*


Terrestrial. Rhizomes short or wide creeping densely clothed with brown linear scales. Stipe dark brown, glabrous, shining, slender, wire, scaly at base. Lamina tripinate to dicompound, spreading, firm, glabrous, glaucous green; pinnules shortly stalked, obovate cuneate, superior margin 2-3 lobed and finely dentate; fertile lobes 2-notched. Sori large covered with sub-membranous reniform-lobate indusia, formed by the reflexed margin of lamina. Sporangia small globose. Spores tetrahedral, triangular, yellow.

**Habitat & Ecology**: Found along road cuttings and slopes of hills.

**Sporulation**: May - June

**Specimen examined**: Mahishasan, PSD 0115, dt. 19.5.04.
Adiantum capillus-veneris; (a) Habit (b) Pinnule enlarged showing venation & sori (c) Sporangium (d) Scale.
Economic utility:

Forms of use locally:

Parts Used: Whole plant.

Uses: Plant paste used in fever, respiratory diseases by mixing with honey. Plant is used as ornamental.

Established reports of utility: Fronds used as pectoral demulscent, expectorant, diuretic, eenagogue, and tonic, fibrifuge; whole plant is steamed for small pox cure. Fronds used in cold imposthumes of uterus, hard swelling and tumours of spleen; fronds are used in fever, sores and catarrhal infection. Fronds are used to treat bronchitis, cold, cough, fever and menstrual irregularities (Borthakur et al., 2001).


Terrestrial. Rhizome short, ascending, densely covered by stiff roots and dark brown, hair like linear scales. Stipe 5-25 cm long, densely paleate. Lamina unipinnate, upto 30 cm long, densely hispid hairy throughout, apical lamina not pinnae like, terminating into slender axis bearing proliferating, vegetative buds. Pinnae oblique-ovate, sessile. Sori reniform to slightly elongate on the apical margin of pinnae lobes; indusia cordate at base, round and entire outwards, densely hispidulous.

Habitat & Ecology: Common along road cuttings in moist areas and slopes of the hills.

Sporulation: August – December.

Specimen examined: Duhalia Part I, PSD 0070, dt. 25.12.03.
Adiantum caudatum; (a) Portion of lamina (b) Rhizome (c) Pinnule showing venation and sori (d) Sporangium (e) Scale
Economic utility:

Forms of use locally:

Parts used: Whole plant.

Uses: Used in dysentery, ulcers, burning sensation and asthma. Plant is used ornamental.

Established reports of utility: Used in skin diseases, diabetes, cough and fever (Borthakur et al., 2001).


Terrestrial. Rhizome short, ascending, densely clothed with stiff roots. Stipe and rachis purplish-black, shining, glabrous. Fronds unipinnate, 25-45 cm long, with about 15 cm long stipe, apical lamina pinnae-like; pinnae entire, upper margin lobed, thin, slender, stalked; stalks 1-2 cm long, shining, purplish-black. Sori linear, confluent or not, along the margin of pinna-lobes. Indusia coriaceous, entire, reddish brown.

Habitat & Ecology: Common in moist shady places in forests and rock crevices.

Sporulation: August – December.

Specimen examined: R.K. Nagar. PSD 0207, dt. 6.9.05.

Economic utility:

Forms of use locally:

Parts used: Whole plant.

Uses: Plant paste used in swelling and pain, Plant is used ornamental.
Adiantum philippense; (a) Habit (b) Portion showing venation & sori (c) Sporangium 
(d) Scale.
Established reports of utility: Used in fever, blood diseases, epileptic fits, rabies. Roots are used in dysentery, ulcers and muscular pains. Paste of the plant applied externally for skin disease. Fresh application is given every day till the disease is cured (Borthakur et al., 2001).


Key to the genera:

1. Lamina simple, dimorphic; lower surface covered by multicellular hairs. 1. Hemionitis.

1'. Lamina pinnate, monomorphic; lower surface covered by white, waxy, powdery substance. 2. Pityrogramma.


Terrestrial. Rhizome sub-erect, short, hard and covered by scales; scales ovate lanceolate, acuminate at apex, entire but sparsely toothed towards base, light brown. Stipes about 26cm long in fertile fronds and about 20cm long in sterile ones, shining, terete, scaly, black to dark brown. Lamina dimorphic, simple, about 11x7cm., ovate-cordate, tending to be hastate or sagittate, apex acute or rounded, margin entire; texture coriaceous; lamina pale-green, upper surface glossy and lower surface covered by multi-cellular hairs and small, soft, pale brown scales; costa raised below, grooved above; venation reticulate with small elongated areoles devoid of included veinlets; fertile lamina similar to sterile ones but slightly smaller than sterile ones. Sori
continuous along the veins; sporangia small, long stalked. Spores spherical, trilete. Exine with incomplete reticulation.

**Habitat & Ecology:** Found in shaded earth cuttings on steep slopes.

**Sporulation:** September – January.

**Specimen examined:** Kamalpur, PSD 0086, dt. 8.2.04.

**Economic utility:**

- **Forms of use locally:** Not available.

- **Established reports of utility:** The fronds are used in the treatment of aches and as vermifuge. (Borthakur et al., 2001).


Terrestrials. Rhizome scales narrow, lanceolate, slender, thin. Stipe and rachis dark purple. Fronds tufted on rhizome, up to 80 cm long, glabrous above, glaucous whitish beneath. Lamina bipinnate with deeply pinnatifid pinnae; pinnae linear-subulate, margin crenato-lobate, thin. Veins obscure. Fertile pinnae constricted narrowly; sporangia borne along the veins, scattered, sessile.

**Habitat & Ecology:** Found in dry open places along road cuttings.

**Sporulation:** October - November.

**Specimen examined:** Roynagar, Karimganj, PSD 0317, dt. 29.12.06.

**Economic Utility:**

- **Forms of use locally:**
Pityrogramma calomelanos; (a) Habit (b) Pinnule showing venation (c) Pinnule (d) Sporangium (e) Scale
Parts used: Whole plant.

Uses: Plant paste used as insecticides in poultry firms and also as ornamental.

Established reports of utility: Plant decoction is used for kidney troubles; tea prepared out of the frond is used as a cure for flu, hypertension, fever and cough. (*Borthakur et al., 2001*).

*Note: Additional utility reported here.*

17. VITTARIACEAE (Presl.) Ching in Sunyatsenia 5:232. 1940.

*Vittaria* Sm. Mem. Acad. Sci. Turin. 5:413. 1793


Epiphytic. Rhizomes creeping, about 2.5mm across, paleaceous throughout; palaee peltate, lanceolate, long acuminate, dentate. apex with gland; blackish brown. Fronds about 14-33 x 5 mm, caespitose, sub-sessile to stipes, paleaceous at base; lamina linear-lanceolate, long acuminate. base decurrent; rachis invisible, veins thin, not overlapping, ending into margin. Sori long elongate, marginal, sunk in the lamina; sporangium with thick stalk, glandular, paraphyses branched, funnel shaped; spores pale green, reniform, smooth.

Habitat & Ecology: Common on moss covered tree trunks as well on rocky surfaces.

Sporulation: February – December.

Specimen examined: Kamalpur, PSD 0089, dt. 8.2.04.

Economic utility:
Forms of use locally:

**Parts Used:** Leaves.

**Uses:** Young leaves crushed to make paste and applied over fresh cuts and wounds for blood coagulation and prevention of microbial growth. Fresh poultice is given a day till it is cured.

**Established reports of utility in medicine:** Fronds are used in treatment of rheumatism (*Borthakur et al., 2001*).

**Note:** Additional medicinal uses recorded here.

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**18. PARKERIACEAE**  Hook. Exot. Fl. 2:147. 1825.


Aquatic annuals. Rhizome with dense, fleshy roots; stipe fleshy, up to 12 cm long, glabrous, ribbed; sterile lamina unipinnate, up to 18 cm long, with deeply pinnatifid pinnae; glabrous, thin-membranous, whitish green, segments variously lobed, with narrow angular tip. Veins depressed. Fertile lamina with much branched pinnae; pinnae linear, acicular, dichotomously branched. Sori exindusiate, often protected by a continuous, reflexed margin of lamina; sporangia sessile, placed along the veins; spores tetrahedral.

**Habitat & Ecology:** Found in muddy and swampy areas or sometimes floating.
**Sporulation**: July - October.

**Specimen examined**: Sonbeel. PSD 0179, dt. 12.6.05.

**Economic utility**:

**Forms of use locally**:

**Parts used**: Whole plant

**Uses**: Plant paste used in skin diseases and edible as non-conventional food plant also as green manure in rice field.

**Established reports of utility**: Used as poultice in skin complaints and as tonic in styptic. Vegetative fronds are edible both as green salad or after cooking as pot­herb; it is sometimes susceptible to fungal attack. It is ploughed in rice field as part of the green manure in rice fields. *(Singh & Panigrahi, 2005)*.


Aquatic. Rhizome long creeping, branched, subterranean. with nodes and internodes. submerged in water or partly out of water, green or pale brown, covered by hairs all over. Hairs soft, slender, whitish. Leaves sessile, arranged at the tip of the stipe in clover leaf model, obovate or wedge-shaped. apex rounded. base cuneate, margin entire; veins distinct, above and below. branched, occasionally connected by lateral veins; texture thin. herbaceous; leaves green. glabrous. Sporocarps borne in clusters at the nodes alternately. five per cluster: sporocarps oval to bean–shaped with stalk. heterosporous with both mega and micro sporangia in the same sporocarp. Micro spores globose, mega spores ovate.
Marsilea minuta; (a) Habit (b) Leaflets showing venation (c) Sporocarp
**Habitat & Ecology**: Found common in lowlands along paddy fields as well as in shallow, stagnant water bodies.

**Sporulation**: November - February.

**Specimen examined**: Railway Karimganj, PSD 0318, dt. 29.12.06.

**Economic utility:**

**Forms of use locally:**

**Parts used**: Whole plant.

**Uses**: The plant is used as vegetable for general health. Juice obtained by crushing the plant is applied locally in cuts and wounds for antiseptic action. The same is taken orally to prevent dysentery.

**Established reports of utility**: Whole plant is used in cough, spastic condition of leg muscle, etc. and also as sedative and in insomnia; the leaves and sprouts are used as vegetables. *(Borthakur et al., 2001)*.

**Note**: Additional medicinal utility is recorded here.

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Terrestrials. Rhizome short, creeping, densely hairy. Fronds 115-180 x 45-80 cm closely originated, ovate-lanceolate, caudate, quadripinnate; stipe about 75 cm long, grooved dorsally, glabrous to very fine pubescent, brown. rachis densely hairy on both sides. upper surface haris reddish brown, while lower surface haris needle like
*Microlepia speluncae*. (a) Primary pinna (b) Rhizome pinna (c) Tertiary pinna showing venation and sori (d) Sporangium
hyaline; pinnae basal pair-the largest, widest at base, alternate. Pinnules basal basioscopic-the largest about 6-9 x 2.5-4 cm, alternate, sessile, oblong lanceolate, deltoid-lanceolate, narrowing from base. Sori near to margin, davalliloid, terminal, above sinus, indusium medium sized, pushed back, subentire, surface densely hairy; spores trilete, hyaline, minutely regularly pitted.

**Habitat & Ecology**: Frequently found in moist, shady places of the area.

**Sporulation**: October - November.

**Specimen examined**: Duhalia Part I, PSD 0056, dt. 25.12.03.

**Economic utility**:

- **Forms of use locally**:
  - **Parts used**: Fronds.
  - **Uses**: Used in cuts and wounds.

**Established reports of utility**: Fronds are used medicinally to treat fever (Borthakur, et al., 2001).

Note: Additional utility is reported here.

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**Key to the genera**:

1. Lamina simple, pinnate; sori numerous or more or less confluent, indusia marginal.  
   1. *Lindsaea*

1'. Lamina tripinnate or quadripinnatifid; sori single at the apices of lobes; indusia sub-marginal.  
   2. *Sphenomeris*


Lindsaea ensifolia; (a) Habit (b) Portion of pinna showing venation & sori (c) Sporangium (d) Scale

Terrestrials. Rhizomes short creeping, paleaceous; roots thin but firm; palae of rhizomes and stipe upto 3x0.4mm, basifixed. linear or linear-lanceolate, entire, dark-brown. Fronds about 40x150cm long, rhomboid, trilobed, pinnate with one pair of pinnae. Stipes about 20cm long, brown at base, smooth, rectangular; lamina about 20cm long; veins anastomosing, aeroles without free included veinlets. Sori marginal or anti-marginal elongated, indusium about 1mm wide, folding back on maturity. paraphyses absent. Spores trilete, pale brown or brown, postulate, plenty.

**Habitat & Ecology** : Common on roadsides in open places,

**Sporulation** : February - July.

**Specimen examinen** : Kamalpur, PSD 0074, dt. 8.2.04.

**Economic utility** :

**Forms of use locally** : Not available.

**Established reports of utilisation** : Not known so far.


Terrestrials. Rhizome short creeping to semi-erect, densely covered with palae. Palae hair-like, ferruginous. Fronds bi or tripinnate, lanceolate, upto 8-45x3-18cm., glabrous; pinnae much dissected, rather dichotomously forked into 2-4 pinnules; pinnules rhomboidal, each again forked into 2-4 lobes. Sori marginal, rather sub-marginal inside the marginal flaps, terminal on free veinlets. Indusium attached at base and sides open outwards. Spores bean-shaped with one longitudinal dark slit, light brown, hyaline.

**Habitat & Ecology:** Found in slopes of hillocks and along roadsides.

**Sporulation:** July - December.

**Specimen examined:** Duhalia Part II, PSD 0044, dt. 25.12.04.

**Economic utility:**

**Forms of use locally:**

**Parts Used:** Leaves

**Uses:** Crushed leaves applied over burns for cooling affect and also for antiseptic action.

**Established reports of utilisation:** Used internally for the treatment of chronic enteritis. *(Borthakur et al., 2001).*

**Note:** Additional medicinal utility is reported.

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**Key to the genera:**

1. Costae grooved on dorsal surface; veins reaching the margin.

2. Anastomosed basal veins more than 3 pairs; pinnae lobed one fourth to half way to costa.

   5. **Pronephrium.**

2'. Anastomosed basal veins less than 3 pairs; pinnae lobed
one third to half way to costa.  


3'. Pinnae without glands on the lower surface. 2. Christella.

1'. Costae not grooved on dorsal surface; veins not reaching the margin. 4. Macrothelypteris.


Terrestrials. Rhizomes short creeping about 1 cm thick, covered with scales all over; scales narrow, linear-lanceolate, apex acuminate, base broad, dark brown. Stipes erect, grooved adaxially, scaly at base, above glabrous or slightly pubescent. Lamina have size of about 65 x 24 cm, simple pinnate, ovate-oblong, apex acuminate; pinnae numerous, alternate or sub-opposite; basal pinnae some time small; largest pinnae have a size of about 14.5 x 2 cm, lanceolate, apex acuminate, margin cut down nearly to the costae into lobes; lobes linear, oblique, apex round, margin serrate; rachis strigose and with minute yellow glandular dots; veins 12-14 on each side of the costa, simple with few inconspicuous hairs, costules and veins bearing yellow glands; texture coriaceous; lamina green glabrous. Sori medial, one on each vein, immersed; indusia large, persistent, hairy, reniform. Sporangia stalked; stalk hairy. Spores dark, exine tuberculate.

Habitat & Ecology: Very commonly found in wet grounds in low lands.

Sporulation: August - December.

Specimen examined: Kalinagar T.E., PSD 0208, dt. 6.9.05.
Economic utility:

Forms of use locally:

Parts used: Fronds.

Uses: Fronds are edible.

Established reports of utilisation: The fresh fronds are eaten as cooked vegetables in Darjeeling. Fronds are aperient, alterative (Borthakur et al., 2001).


Key to the species:

1. Lamina oblanceolate, simple pinnate; stipes scaly at base, glabrous above, pale-brown to dark brown

2a. C. dentata.

1'. Lamina broadly ovate, deltoid or cordate; stipes hairy at apex, grey-green.

2b. C. parasitica.


Terrestrial. Rhizome short creeping. Stipe very variable in length, hairy, scaly at base; scales narrowly lanceolate. Lamina upto 90 cm long, pinnae 15-25 pairs, lower 2-4 pairs gradually reduced, upto 4-5 cm long, distant; auricled at acroscopic base, auricle lobed. Largest pinnae 8-12 x 1-2.5 cm long, often larger, acuminate, lobed. Veins 8-9 pairs, lower pair anastomosing with excurrent vein to sinus, immediate next pair to the side of sinus membrane. Both surface of costae and constulcs hairy. Sori medial. Indusia hairy.
Habitat & Ecology: Found common along shady roadside slopes and forest clearings.

Sporulation: July - December.

Specimen examined: Duhalia Part I, PSD 0002, dt. 21.6.03.

Economic utilisation:

Forms of use locally: Not available.

Established reports of utility: Not known so far.


Terrestrials. Rhizome short or long creeping. Stipe upto 40 cm long, softly hairy. Lamina upto 52 cm long or more, unipinnate; veins 8-10 pairs. lowest pair joining to form an excurrent veinlet to sinus membrane. Lower surface of pinnae covered with spreading hairs, glandular hairs usually present on veins in the lobes; upper surface of costae with thick acicular hairs. scattered on costules and veins. Sori medial, lower ones divergent, basal on veins from adjacent costules, sometimes touching; indusia hairy.

Habitat & Ecology: Found in forest floor, forest clearings etc.

Sporulation: October - December.

Specimen examined: Churaibari, PSD 0118, dt. 18.12.04.

Economic utility:

Forms of use locally: Not available.

Established reports of utility: Fronds of the plants are used in the treatment of gout and rheumatism *(Borthakur et al., 2001).*

**Key to the species:**

1. Rhizome scales linear-lanceolate; stipes 45 cm long; basal pair of pinnae shortened; Base of pinnae truncate or cuneate. **3a. C. gongylodes.**

1a. Rhizome scales ovate; stipes 70 cm long; basal pinnae not reduced; Base of the pinnae broadly cuneate. **3b. C. interruptus.**


Terrestrial. Rhizome long creeping about 0.6 cm thick, slender, covered with scales; scales narrow linear-lanceolate, light brown. Stipe about 20-40 x 0.5 cm. scaly at base, rest glabrous, adaxially grooved, pale brown. Lamina about 40 x 20 cm, simple pinnate, broadly ovate-lanceolate, terminal pinnae similar to lateral ones except for its broader base. Pinnae sessile or may be stalked, alternate or sub-opposite, lowest pair of pinnae somewhat shorter. Pinnae lobed, apex rounded or acute, margin entire; rachis glabrous or sparsely hairy on lower surface; lower surface of costae with or without hairs and covered with scales; costules and veins glabrous below with hairs like the costae, usually with round orange glands. Veins 8-10 pairs, most of the veins running up to the margins. Lamina pale green, texture chartaceous, lower surface hairy upper surface glabrous. Sori medial, globose, in a continuous row; indusia reniform, hairy; spores monolete.

**Habitat & Ecology:** Found commonly in swampy places and by the side of ponds.

**Sporulation:** April – September.

**Specimen examined:** Jhumbasti, Badarpur, PSD 0267, dt. 20.4.06.

**Economic utility:**

**Forms of use locally:** Not available.

**Established reports of utility:** Not known so far.

Terrestrials. Rhizomes long creeping, clothed with scales at the apex, scales are ovate, acuminate at the apex, margin entire. Stipes about 65 x 0.5 cm, slender, sparsely scaly and black at the base, glabrous and brown above, adaxially grooved, abaxially flattened. Lamina elliptic-lanceolate, simple pinnate with a apical pinna similar to lateral ones but the base is somewhat broad; lateral pinnae numerous, sub-opposite, sessile or very shortly stalked, basal pinnae not reduced. Rachis grooved above and below, hairy; costae slightly raised and grooved above or distinctly and flattened below; veins slightly distinct below; lower surface of costae, costules, veins and intervenal areas densely covered by long, soft acicular hairs, upper surface glabrous; lamina pale green. Sori medial on the veins in two rows, arranged in V shape. Indusia reniform, hairy; sporangial stalk bears capitate hairs. Spores monolete, pale brown, exine finely spinulose.

**Habitat & Ecology:** Found as large colonies in open, marshy places and border of paddy fields.

**Sporulation:** October – February.

**Specimen examined:** Kamalpur, PSD 0074, dt. 8.2.04.

**Economic utility:**

**Forms of use locally:**

**Established reports of utility:** Not known so far.


Terrestrial. Rhizomes short creeping, stout, densely scaly; scales about 1x0.2 cm, linear-lanceolate, apex acuminate, gland tipped, margin with long acicular hairs, pale brown. Stipes stout, adaxially grooved, abaxially rounded, scaly and dark brown at the base, pale brown above and with minute dark brown spots of persistent scale bases. Lamina ovate, about 80 x 45 cm, lanceolate, tripinnatifid; primary pinnae up to 15 pairs, subopposite or alternate, sessile or shortly stalked, apex acuminate; veins indistinct, free, forked, not reaching the margin, rachis glabrous, pale yellowish brown; lower surface of costae, costules and veins sparsely covered by long acicular, septate hairs; upper surface of costa and rachis densely covered by slender, acicular hairs; texture herbaceous lamina pale green. Sori round, on the basal acroscopic veinlets of each lobe just above the forking point; indusia inconspicuous; sporangia shortly stalked, with 2-4 capitate hair. Spores reniform, round, exine sinulose.

**Habitat & Ecology**: Found in forest clearings and along roadsides.

**Sporulation**: July – February.

**Specimen examined**: Durganagar T.E., PSD 0142, dt. 9.2.04.

**Economic utility**:

**Forms of use locally**: Not available.

**Established reports of utility**: Not known so far.
Macrothelypteris torresiana: (a) Primary pinna (b) Rhizome (c) Secondary pinna (d) Two leaves of Secondary pinna showing venation and sori (e) Sporangium (f) Scale

**Key to the species**

1. Lamina trifoliate

1'. Lamina simple pinnate.

5b. *P. triphyllum*.

5a. *P. nudatum*.


Terrestrial. Rhizomes widely creeping. Stipe up to 70 cm long, scabrous, sparsely covered with dark brown membranous scales, distant on rhizome. Lamina unipinnate, up to 155 x 65 cm, rough, coriaceous, pinnae 10-15 pairs, largest pinnae widest near the base than very gradually tapering, base broadly cuneate, acuminate, margin sharply crenate, strongly cartilaginous. Veins 16-20 pairs, free excurrent veins rare. Lower surface of pinnae postular, variously hairy; upper surface hairy on costa only. Sori small, round, medial; indusia small often rudimentary, hairy; sporangia glabrous. Spores dark, exine.

**Habitat & Ecology**: Common in moist, shady places of the area.

**Sporulation**: July - October.

**Specimen examined**: Churaibari, PSD 0119, dt. 18. 12. 04.

**Economic utility**:

**Forms of use locally**:

**Parts used**: Pinnae.
Pronephrium nudatum; (a) Habit (b) Portion of pinna showing adaxial side (c) Portion of pinna showing venation & sori (d) Sorus (e) Sporangium
**Uses**: Cold decoction of pinnae is used for acute pyorrhoea, as mouth wash. The process is repeated 2-3 times till cured. The Plant is used in the religious festival for removing evil spirit.

**Established reports of utility**: Not known so far.

**Note**: Recorded here as new medicinal plant.


Terrestrials. Rhizomes wide creeping, with distant fronds. Stipe slender, 10-45 cm long, purplish at maturity, hairy, grooved and scaly at base ; scales linear, dark brown, hairy on surface. Rachis grooved on upper surface densely hairy. Lamina 12-20 cm long, trifoliate, apical. Lamina gradually narrowed at base, rarely auricled, acuminate broad at middle, coriaceous, margin finely undulating. Costae and lateral veins densely hairy on the lower surface, glabrous in between veins ; upper surface sparsely hairy ; costae densely hairy. Veins prominently raised, reticulate, excurrent ; veinlets not free. Sori along the veinlets, exindusiate.

**Habitat & Ecology**: Found in open shaded area along the edge of the forest.

**Sporulation**: April – July.

**Specimen examined**: Duhalia Part I, PSD 0023, dt. 22.6.03.

**Economic Utility**:

**Forms of use locally**:

**Parts used**: Whole plant.
Uses: A paste obtained by crushing whole plant is applied externally as poultice over legs during nerve pain.

Established reports of utility: Not known so far.

Note: Recorded here as new medicinal plant.

23. ASPLENIACEAE Mett. ex. Frank.


Epiphytes. Rhizome short, sub-erect, massive, small, covered with numerous broad acuminate whitish brown scales. Fronds simple, lanceolate, acute at apex, gradually narrowed at base, upto 30x5 cm, glabrous, midrib prominent. Sori linear, oblique in between two veins, towards the apex of the lamina. Indusium linear, superficially attached at the base just above the veins, opening outwards, slightly curved, greenish grey when young

Habitat & Ecology: Found as a pendent epiphytes on tree trunk.

Sporulation: July - October.

Specimen examined: Churaibari, PSD 0432, dt. 11.06.05.

Economic Utility:

Forms of use locally:

Parts used: Leaves.

Uses: Extract obtained by crushing leaves applied locally to cure skin diseases.
Asplenium nidus; (a) Lamina (b) Portion of lamina showing venation & sori (c) Sporangium (d) Scale
Established reports of utility: The plant is used medicinally to cure sores and ulcers and also as depurative and sedative. (Borthakur et al., 2001).


Key to the species:

1. Veins anatomosing; stipes scaly and blackish-brown at base. 2. D. esculentum.
1'. Veins free; stipes stout, erect, sparsely scaly at base. 1. D. bontamensa


Terrestrial. Rhizome short creeping, forming sub-erect large caudex, scaly; scales linear-lanceolate, apex long acuminate, margin hooked, dark brown. Stipes 45 x 0.5 cm, scaly and blackish brown at base, glabrous and pale brown above; abaxially rounded, adaxially grooved. Lamina simple pinnate with a single apical pinna similar to lateral ones: lateral pinnae 3-7 pairs, sub-opposite or alternate, shortly stalked, lowest pair somewhat reduced. Largest pinnae about 20 x 4.5 cm, lanceolate, apex acuminate or caudate, base narrow, slightly unequal on the lower side, round, margin entire, veins distinct on both surfaces, free, forked near or at the costa; rachis glabrous, brownish; costae distinctly raised above and below, texture coriaceous. Lamina greenish, glabrous. Sori linear, confluent, irregular, starting from near the costa and extending nearly to the margin; indusia linear; spores brown, hyaline.

Habitat & Ecology: Found in moist, shady forest floor of the area.
Sporulation: July - February.

Specimen examined: Kamalpur, PSD 0075, dt. 8.2.04.

Economic utility:

Forms of use locally:

Parts used: Young fronds.

Uses: Extract obtained by crushing fronds applied locally for antiseptic action.

Established reports of utility: Not known so far.

Note: Reported as new medicinal utility.


Terrestrial. Rhizome black, semi erect. covered with much fibrous. stiff roots; scales broad lanceolate, toothed, dark brown. Stipes 60-70 cm long, sparsely covered with deciduous scales, base flat, ridged. Fronds bipinnate, upto 2 cm tall, lamina spreading. Veins forked. Sori linear, short, parallel on both side of the veins. Sporangia sori stalked. Spores oval, dark, hyaline.

Habitat & Ecology: Very commonly found in moist, open places forming thickets.

Sporulation: July - September.

Specimen examined: Thana Road, Karimganj, PSD 0319, dt. 29.12.05.
Economic Utility:

Forms of use locally:

Parts used: Circinately coiled fronds.

Uses: Fresh and young circinate fronds are edible as vegetable for maintaining general health. and sold profusely in the markets. It is considered as laxative.

Established reports of utility: Decoction prepared from rhizome and young leaves are used for haemophlysis and cough. It is used as laxative. In Assam tender fronds are sold in markets as vegetables (Borthakur et al., 2001).


Key to genera:

1. Veins usually anastomosing; areoles with included veinlets.

2. Tectaria.

1'. Veins usually free, if anastomosing, areoles without included veinlets.


Terrestrial. Rhizomes erect, short, stout. Stipes about 30-55 cm long, tufted, stramineous, dark brown. covered with scales; scales linear-lanceolate, apex
acuminate, black. Lamina bipinnate at base, pinnatifid at apex, deltoid-ovate, lateral pinnae 10-15 pairs, opposite to sub-opposite, scissile or shortly petiolate, margin of pinnae deeply lobed near to the costae; lowest basal pair of pinnae much larger; texture herbaceous, upper surface of lamina hairy; fertile lamina more contracted; rachis, costae densely short, hairy, brownish; veins free or forked, each basioscopic veinlets arising from the costa. Sori irregularly scattered throughout the segment, generally terminating on free veinlets; indusia reniform; sporangia stalked.

**Habitat & Ecology**: Commonly found in sandy, moist area along the edge of the forests.

**Sporulation**: October – November.

**Specimen examined**: Kamalpur, PSD 0411. dt. 25.12.05.

**Economic utility**:

**Forms of use locally**: Not available.

**Established reports of utility**: Not known so far.


**Key to the species**:

1. Fronds tripinnate.

1'. Fronds not tripinnate.

2. Lamina densely hairy on both surfaces.

2'. Lamina sparsely hairy on upper surface, glabrous below.

3. Costal and costular areoles with included free veinlets.

3'. Costal and costular areoles devoid of included free veinlets.


2c. *T.subconfluens.*

2d. *T.variolosa*

2b. *T.macrodonta.*


Clarke, Trans. Linn. Soc. Lond.II. Bot.1. 539.1880. N.cicutarium var.coadunate


Terrestrial. Pinnae 45x28cm wide, tripinnatifid, oblong, caudate acute; costae grooved, hairy; pinnules subopposite, stipicellulus; secondary pinnules the largest on the basal acroscopic side, sessile, ovate-oblong, deeply pinnatifid; secondary costules ctenitis-hairy on both surfaces, not grooved; lobes broad ovate, shallowly lobed to entire, aeroles along secondary costules distinct; mid-vein distant and zig-zag, basal basiscopic vein springing from secondary costules; aeroles along mid-vein in one or 2-rows in large lobes; margin ciliate or long hairy, dry pale- brown, herbaceous. Sori round,closer to mid-vein,slightly sunk; indusium large, persistent reniform, thin, subentire, sporangium stalk with glandular hairs; spores reniform, monolette, brown, perispore folded and broad.

Habitat & Ecology : Found commonly in shaded areas in forests.

Sporulation : April – July.

Specimen examined : Duhalia Part I, PSD 0003, dt. 21.6.03.

Economic utility :

Forms of use locally :

Parts used : Tender fronds.

Uses : Tender fronds are edible.

Established reports of utility : Used in medicine in acute case of diarrhea in children and other stomach troubles. Fronds are eaten as salad (Singh & Panigrahi, 2005).

Rhizome erect to sub erect short, 1 cm thick, densely scaly. Stipes tufted, abaxially rounded, adaxially grooved, scaly at base, glabrous above, brown. Lamina cordate to deltoid, bipinnate to tripininate, apex pinnatifid, lateral pinnae 2-6 pairs, opposite or sub-opposite; secondary pinnae shortly stalked or sessile; opposite or sub-opposite linier-oblong apex bluntly acuminate, base truncate; main lateral veins conspicuous, rachis similar stipe, costae and costules puberulous or shortly hairy beneath; texture thin, herbaceous, sparsely hairy or glabrous above, lamina dark-green. Sori large globose, 0.2 cm. wide arranged in two rows between the main veins; indusia reniform, brown.

**Habitat & Ecology**: Found commonly in moist, shady places of the area.

**Sporulation**: May --July .

**Specimen examined**: Churaibari, PSD 0432, dt. 11.6.05.

**Economic utility** :

**Forms of use locally** :

**Parts used**: Fronds.

**Uses**: Extract of fronds along with honey is taken in cough and cold .

**Established reports of utility**: Fronds are used medicinally to treat asthma, bronchitis and strings of honey-bee (Borthakur et al., 2001).

Terrestrials. Rhizome erect, about 1 cm thick, densely scaly; scales lanceolate. Apex acuminate, base ovate, entire, dark brown. Stipes adaxially grooved, abaxially rounded, scaly at base, glabrous above, blackish brown. Lamina broader than long, triangular, tripartite, apex acuminate or acute, lateral pinnae opposite or sub-opposite, shortly stalked; costae distinctly raised below, veins prominent, anastomosing with few free included veinlets; texture firm, pinnae glabrous above, pubescent beneath on the veins, pale green. Sori numerous, small, scattered, variable in position; indusia variable, reniform, horse-shoe shaped or peltate, persistent.

**Habitat & Ecology**: Found in shady places of dense forest.

**Sporulation**: November – February.

**Specimen examined**: Kamalpur, PSD 0076, dt. 8.2.04.

**Economic utility**:

- **Forms of use locally**: Not available.
- **Established reports of utility**: Not known so far.


Terrestrial. Rhizome short, densely covered with black slender roots; scales lanceolate, entire, black, thick. Stipes 30-40 cm long, slender, densely covered with rhizome scales and hairs. Lamina bipinnate at base, pinnatifid at apex, membranous: basal pair of pinnae shortly stalked. Rachis, costae and costules densely covered with brown septate hairs. Veins forked, free or occasionally united with acroscopic veinlets. Sori biseriate, marginal along the pinnae lobes, reniform.
Tectaria variolosa: (a) Habit (b) Lobes of pinna showing venation and sori (c) Sporangium (d) Scale
Habitat & Ecology: Found common in moist shady places in the forest.

Sporulation: April – July.

Specimen examined: Duhalia Part I, PSD 0004, dt. 21.6.03.

Economic utility:

Forms of use locally: Not available.

Established reports of utility: Not known so far.

26. PERANEMATACEAE (Presl.) Ching in Sunyatsenia 5:246.1940.

Peranema D.Don Prod. Fl. Nepal. 12.1825


Terrestrial. Rhizome massive, short, densely scaly; scales broad lanceolate, membranous, brown entire. Fronds 3-pinnate, spreading up to 165-70 cm at base; pinnules obovate. Indusium reniform, entire. Spores oval to round, dark brown, thick-walled.

Habitat & Ecology: Found in dense moist, shady places in forest.

Sporulation: April – September.

Specimen examined: Churaibari, PSD 0443, dt. 11.6.06.

Economic utility:

Forms of use locally: Not available.

Established reports of utility: Not known so far.
27. DRYOPTERIDACEAE  Herter, Rev. Sudam. Bot. 9:15.1949


Terrestrial. Rhizome sub-erect, densely scaly; scales linear lanceolate, thin membranous, entire. Fronds bipinnatifid. paleaceous. Pinnae lanceolate, sessile, cut down to rachis giving pinnatifid appearance, apex sharply serrate, thin glabrous except the costae; rachis and costae covered with light brown linear scales. Veins prominent. forked and free. Sori large, reniform-g lobose, dorsal, superficial on veins along either side of midrib. Spores oval, light brown. hyaline, exine smooth.

Habitat & Ecology: Found along fully exposed roadsides and forest clearings.

Sporulation: April – September.

Specimen examined: Railway colony. Karimganj, PSD 0292, dt. 16.6.05.

Economic utility:

Forms of use locally:

Parts used: Fronds.

Uses: Paste of fronds used in cuts and wounds.

Established reports of utility: Rhizomes are antihelmintic (Borthakur et al., 2001).

Note: Additional utility is reported here.

Key to the genera:

1. Veins anastomosing.  
   1. **Bolbitis**

1'. Veins free.  
   2. **Egenolfia**


*Acrostichum heteroclitum* Presl, Rel. Haenk.1.15. t.2.f.2. 1885. *Leptochilus heteroclitus* (Presl.) C.Chr.Ind. Fil.11.1906. **Am paloi (B).**

Terrestrial. Rhizome wiry creeping, with slender stiff roots projecting downwards; scales ovate-acuminate, attached above the base, deciduous. Fronds slender stipitate; stipes upto 25 cm long, sparsely covered by rhizome scales. Lamina variable, simple to pinnate, usually trifoliate, margin entire to undulating, glabrous, thin; terminal pinnae with apex terminating into a winged linear structure bearing proliferating vegetative buds, bend downwards giving rise to new shoots. Veins prominent, lateral veins raised, marginal veins free fertile lamina simple or pinnate, marginal smooth and shortly stalked. Sori covering the whole lower surface and brown.

**Habitat & Ecology**: Found along densely shaded forest beds at low elevation.

**Sporulation**: May – August.

**Specimen examined**: Churaibari, PSD 0434, dt. 11.6.06.

**Economic utility**:

Forms of use locally: Not available.

Established reports of utility: Not known so far.
Bolbitis heteroclita; (a) Habit (b) Portion of sterile pinna showing venation (c) Sporangium (d) Scale

**Key to the species:**

1. Lamina simple, pinnate; veins free.  
   2a. *E.appendiculate.*

1'. Lamina bipinnatifid, one pair of basal veins anasmosing.  
   2b. *E.bipinnatifida.*


Terrestrial. Rhizome short creeping about 0.75 cm thick, soft, scaly at the apex; scales ovate lanceolate, apex acuminate, margin entire. Stipes about 18x0.25 cm, adaxially grooved, abaxially rounded, sparsely scaly at base, glabrous above. dark green. Lamina simple pinnate, dimorphic, sterile lamina lanceolate, gradually narrowed to ward the apex, which often rooting by a small vegetative bud. Veins not prominent, free forked; costae slightly raised below; texture herbaceous, firm; lamina dark green; small, toothed scales scattered all over the rachis of fertile and sterile lamina; stipe of fertile lamina longer than sterile ones, margin crenate. Sori acrostichoid, covering the lower surface; sporangia blackish brown. Spores monolete, pale brown.

**Habitat & Ecology:** Found common along shaded rocks of stream banks.

**Sporulation:** October – February.

**Specimen examined:** Duhalia Part I, PSD 0045, dt. 25.12.03.

**Economic utility:**
Egenolfia appendiculata; (a) Habit (b) Sterile pinna showing venation (c) Fertile pinna showing sori (d) Sporangium (e) Scale
**Forms of use locally**: Not available.

**Established reports of utility**: Not known so far.


Terrestrial. Rhizome creeping, densely scaly; scales broad acuminate, pale brown. Fronds simple pinnate, pinna deeply pinnatifid, basal pair of pinnae large, lanceolate, membranous; segments of pinnae with serrate margin. Stipe long, erect, ridged with sparse scales, rachis with cordate-peltate scales, more or less winged upwards. Veins reticulate no free included veinlets. Fertile fornds with simple, entire, linear pinnae. Lamina dark green, dark brown glandular harris scattered all over on both surfaces of the lamina; texture herbaceous. Sori entirely covering the lower surface except the costae, sporangia slender stalked, blackish brown.

**Habitat & Ecology**: Found along moist, shady places of forests.

**Sporulation**: July – November.

**Specimen examined**: Kotamoni, PSD 0120, dt. 18.12.04.

**Economic utility**:

**Forms of use locally**: Not available.

**Established reports of utility**: Not known so far.
29. NEPHROLEPIADACEAE Ponce de Leon ex Pin-Ser.in. Webbia 29:8.1975

_Nephrolepis_ Scott. Gen. Fil.1. t.3.1834.


Terrestrial. Rhizome erect about 10 x 2.5 cm, densely covered with scales: scales linear lanceolate, acuminate, hair pointed, margin fimbriate, yellowish brown; roots bear spherical, fleshy tubers. Stipes about 14 x 0.35 cm, tough, shining, densely scaly below, glabrous or sparsely scaly above, dark olive brown when dry. Lamina about 65 x 7 cm, linear-oblong-lanceolate, gradually narrowed at both ends. simple pinnate; pinnae numerous, alternate, sessile, spreading; rachis grooved with small dark brown scales; costae and veins distinct, veins simple or forked once. free, ending in hydathodes, not reaching the margin ; texture herbaceous; lamina pale green. glabrous above and below. Sori sub-marginal, arranged in a single row, rounded: indusia reniform, dark brown towards base, pale brown towards edge. margin entire. glabrous. Spores brown, translucent.

**Habitat & Ecology :** Found in moist, exposed area along forest margins.

**Sporulation :** July – October.

**Specimen examined :** Inatpur, PSD 0083, dt. 8.2.04.

**Economic Utility :**

Forms of use locally :
**Parts used:** Fronds.

**Uses:** Frond extract applied locally in fresh cuts and wounds for antiseptic action.

**Established reports of utility:** Tubers and tender leaves are used as vegetable in Garhwal, Darjeeling and Bhutan: decoction of fronds used for cough: people of Nagaland chew the washed tubers for sinus trouble, toothache and also for diseases of liver; juice of fresh green leaves check the bleeding of cuts and coagulates blood (Borthakur et al., 2001).

**30. DAVALLIACEAE.** Mett. ex. Frank.in Leunis. 2, 3:1474.1877.

**Key to the species:**

1. Rhizome covered by both scales and hairs. 3. *Leucaestgia.*

1’. Rhizome covered by scales only.

2. Rhizome scales brown to chestnut brown, ovate-lanceolate; lamina tripinnatifid. 1. *Davallia.*

2’. Rhizomes scales white to yellow, linear lanceolate; lamina tripinnate. 2. *Humata.*


Terrestrial. Rhizome creeping about 1 cm thick, densely scaly all over, scales deltoid to ovate-lanceolate, apex long acuminate, base broad, thin transparent, brown. Stipes about 30 x 0.35 cm, firm, erect, scaly at base, glabrous above, chestnut brown.
Lamina about 50 x 25 cm. tripinnatifid, deltoid-lanceolate, apex acute or acuminate; primary pinnae numerous, alternate; veins not conspicuous, uniform, free, not reaching the margin; costae and costules slightly winged; texture sub-coriaceous; lamina dark reddish brown when dry, glabrous. Sori half cup shaped, obliquely placed as regards the central veins in the tooth, sub-marginal, brownish; indusia tubular or half cup shaped.

**Habitat & Ecology**: Found on shady moist tree trunks of forests.

**Sporulation**: November – January.

**Specimen examined**: Duhalia Part II. PSD 0046, dt. 25.12.03.

**Economic utility**:

- **Forms of use locally**: Not available.
- **Established reports of utility**: Not known so far.


Terrestrials. Rhizome wiry creeping; scales broad acuminate, brown. Stipes long, sparsely covered with broad acuminate scales. Fronds deltoid, cut down to the costae giving a pinnatifid appearance; lower pair of segments larger than the rest, glabrous. Veins forked, and free at margin. Sori marginal, elongate. Indusium suborbicular, margin entire, light brown, glabrous. Spores bean shaped, greenish-yellow, exine smooth.
Habitat & Ecology: Found in moist, shady and open tree trunks.

Sporulation: April - September.

Specimen examined: Dullabcherra, PSD 0209, dt. 5.9.05.

Economic utility:

Forms of use locally: Not available.

Established reports of utility: Not known so far.

3. Leucostegia Presl. Tent. Pterid. 94. t.4.f.1.1836.


Epiphytes as well as terrestrials. Rhizomes stout, fleshy, wide creeping, scales broad, ovate acuminate; margin hooked. Stipes erect, 10-30cm long, glabrous pale brown, shining. Fronds tripinnate, triangular in outline, glabrous; pinnae much overlapping, crowded, thin membranous, turning yellowish brown when mature, cut down to broad segments, obliquely truncate at base, rounded and crenate above. Sori large, marginal, impressed. Spores oblong to reniform, yellow, exine smooth.

Habitat & Ecology: Found in rocks of shady forest area.

Sporulation: April – September.

Specimen examined: Duhalia Part II, PSD 0005, dt. 21.6.03.

Economic utility:

Forms of use locally: Not available.
Established reports of utility: Young fronds are cooked with potato and eaten with rice in Darjeeling (Borthakur et al., 2001).


*Blechnum* L. Sp. pl. 2: 1077. 1753.


**Habitat & Ecology**: Very commonly found along moist and shady forest margins, often in patches.

**Sporulation**: April - September.

**Specimen examined**: Thana Road, Karimganj, PSD 0293, dt. 16.6.06.

**Economic Utility**:

**Forms of use locally**:

**Parts used**: Pinnae.

**Uses**: Hot decoction of the pinnae applied externally over abscess to liberate pus and also for antiseptic action.
Blechnum orientale; (a) Portion of lamina (b) Rhizome (c) Portion of pinna (d) Portion of pinna enlarged showing venation & sori (e) Scale (f) Sporangium
Established reports of utility: Fresh fronds are used as poultice for boils; rhizomes used as anthelmintic, as acure for intestinal worms, urinary troubles and as cure of delirium. (Borthakur et al., 2001).


Terrestrial. Twiners, upto 7 m long; covered with scales. scales cordate-lanceolate, attached above the base, thick, dark brown. Lamina upto 2 m tall, distant on rhizome; pinnae articulate on their axis, sterile pinnae lanceolate, acuminate at apex, cuneate at base, margin serrate-dentate, coriaceous, glabrous ; fertile pinnae linear, upto 20 x 0.4 cm. Veins simple with occasional forkings, free parallel. Sori acrostichoid. scattered throughout the surface of lamina ; sporangia slender stalked, oval; spores elliptical, light brown.

Habitat & Ecology: Very commonly found in tree trunks, covering densely.

Sporulation: April - September.

Specimen examined: Nivea, PSD 0210, dt. 5.9.05.

Economic utility:

Forms of use locally:

Parts used: Rhizomes and stipes.
Uses: The rhizomes and stipes are kept in salt water and then used as cordage in binding fish traps and as anchor ropes.

Established reports of utility: The decoction of leaves is taken in fever. Fronds are used to treat fever and skin diseases and leaves to treat throat and gastric ulcers. Tender shoot are edible. (Borthakur et al., 2001).


_A. pinnata_. R.Br. Prodr. Fl. Nov. Holl.167.1810; Dhir, Ferns N.W. Himalayas, 52.1980. Jamir & Rao, Ferns Nagaland, 405.1988; Manickam & Irudayaraj. Pterid. Fl. West. Ghats-S. India. 345. t.261.1992. _Pani pata(B)._ Aquatic. Plant about 2 x 1.5 cm with triangular stem. Stem horizontal, profusely branched. Roots 5 cm long, unbranched, densely covered by hairs. Leaves about 1x0.6 mm, sessile, alternate, dorsal lobe aerial, more or less rectangular, margin entire with membraneous border, thick, grey-green, upper surface with dense, short, blunt trichomes; veins indistinct, ventral lobes submerged, ovate, apex blunt or rounded, base cuneate, margin entire, veins distinct, copiously anastomosing ; texture thin, membraneous glabrous and brown. Megasporocarp ovoid, smaller than microsporocarp, with a single mega sporangium; microsporocarp about 1 mm in diameter, glabrous, brown, containing numerous stalked micro sporangia. Spores small, round, translucent.

Habitat & Ecology: Found common in rice fields also in stagnant ponds, ditches etc.

Sporulation: May - August.

Specimen examined: Kankalash, PSD 0268, dt. 20.4.06.

Economic utility:

Forms of use locally:
Azolla pinnata; (a) Habit (b) Microsporocrop (c) Microsporangium (d) Megasporocrop (e) Megasporangium
Parts used: Whole plant.

Uses: Used as a good food for poultry and ducks. It also used as biofertiliser in rice fields.

Established reports of utility: It used as biofertilisers in rice crops and nowadays to other crops as well (Borthakur et al., 2001).

34. SALVINIACEAE Dumor. Anal. Fam. PI. 67.1829

Salvania Seguir. Fl. Venox. 3:52. 1754.

Key to the species:

1. Hairs on papillae on upper surface of floating leaves are in regular rows. 2. S. natans.

1’. Hairs on papillae on upper surface of floating leaves are not in row but irregularly scattered. 1. S. cucullata.


Aquatic, free floating plants. Stem about 3.5 mm thick, spongy, terete, branched with nodes and internodes, hairy. Floating leaves 1.5x1cm, sessile, opposite, horizontally spreading, oblong, rounded or slightly cordate at base, margin entire, upper surface tufted hairy; lower surface thinly matted like a stem with shining pellucid brown hairs; veins anastomosing forming elongated areoles; texture soft herbaceous, pale green. Submerged leaves root like, about 5 cm long, covered by hairs, brown. Sporocarps borne in clusters on sub-merged leaves, ovoid, sessile, 2.5 mm in diameter, densely hairy, all alike but some containing microsporangia and others mega sporangia.

Habitat & Ecology: Found commonly in paddy fields, ponds etc.

Sporulation: May - December.

Specimen examined: Railway colony, Karimganj, PSD 0299, dt. 16.6.06.
Salvinia cucullata; (a) Habit (b) Floating leaf showing venation (c) Microsporangium (d) Megasporangium
Economic Utility:

Forms of use locally:

Parts used: Whole plant.

Uses: Used as good food for poultry and also used as biofertiliser.

Established reports of utility: Used as good ration for ducks and also used as biofertiliser (Borthakur et al., 2001).


Aquatic, free floating plants. Stem about 2.5 mm thick, horizontal, terete, branched with nodes and internodes. Floating leaves 1.5 x 1 cm, borne at the nodes, opposite, sessile, slightly erect, crowded oval, apex rounded, base cuneate or cordate, margin entire, intercurved so that the leaves become funnel shaped, upper surface closely papillose, under surface nearly bare; veins anastomosing to form parallel, elongated areoles; texture soft herbaceous, pale green. Submerged leaves root like. 4-8 in a cluster, arising from the nodes of stem, 5 cm long, covered by brown, septate hairs. Sporocarps quite alike in external appearance but some containing microsporangia and others mega sporangia; sporocarps ovoid or globose, covered by multi cellular hairs. Found common in ponds, fields and stagnant water bodies.

Habitat & Ecology: Found in paddy fields and ponds etc.

Sporulation: May - December.

Specimen examined: Jhumbasti, Badarpur. PSD 0277, dt. 21.4.06.

Economic Utility:

Forms of use locally:

Parts used: Whole plant.

Uses: Used as good food for ducks and also used as biofertiliser.

Established reports of utility: Used as good ration for poultry and also used as biofertiliser (Borthakur et al., 2001).
Salvinia natans; (a) Habit (b) Floating leaf showing venation (c) Microsporangium
(d) Megasporangium
PHOTOGRAPHS
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