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Ferns of Amsoi areas of Nagaon District, Assam , India

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Abstract

An intensive field study was done to study the ferns of Amsoi , Nagaon. The fern species found during the field study were collected ,studied and identified by studying different books and literatures. A total of 16 species under 14 genera of 12 families have been enumerated.

Keywords : Fern, Amsoi , Nagaon, Study area

Introduction

The pteridophytes formed a dominant part of earth's vegetation of the earth about 280-230 million years ago (Mehra,1967 ; Bir,1976,1978; Khare,1996). At present pteridophyte occupy a crucial and important position in the evolutionary history of the plant kingdom.Out of the different pteridophytes, the Fern have been occupying a major places . Ferns are the assemblage of vascular cryptogams that have established most successfully to life on land. Fern are the successful invader of the varied habitats. The living Fern comprises about 305 genera and 10,000 species.In India more tha n 1000 species reported (Dixit,1984). Bir (1978) give detailed account of the Indian Pteridology. B. D. Sharma (1994) studied about morphology , anatomy, and reproductive biology of pteridophyte. Some important works of Ferns from different regions of Assam and nearby areas was done by Kachroo (1953),Borthakur *et al*., Sen *et al*.(2011), Shyam *et al*.(2012).

Materials and Methods

The study area:

Amsoi is the border area of Nagaon district and Karbi Anglong of Assam,India. Amsoi is the transition zone of plain and foothill to hilly slopes of Karbi districts. Amsoi ($26^0$135 N and $92^0$43E) is 56 KM apart from Nagaon town . Amsoi area and its shady moist sandy soil , with slight acidic to alkaline nature with hilly slopes having 24hrs running water through small natural stream herbors a good number of ferns.The average temperature of the study site was 14^{0}-33^0C. Humidity ranges from 70-87%.The study site was surveyed from 2014 to 2016 once every two month in the rainy season and once in every month in the winter season. Collection of the data of the fern species were done by field visiting the areas in different seasons of the study year. The vegetative and reproductive parts of the species found in the survey area were collected and herberium were made for further study and identification following Jain and Rao (1977). The collected specimens were identified by standard herberium of the Department of Botany ,Gauhati University as well as Department of Botany , Nowgong College, Nagaon.

Observation, Description and Identification

The species observed during study in the Amsoi areas were enumerated bellow:

Adiantaceae

Adiantum philippense

Rhizome short, erect or suberect, scaly; scales 3X 0.5mm, ovate-lanceolate, acuminate at apex, entire brown with deep brown central region. Stipes 10-15 X 0.7 cm, naked and policed, scally at base, deep brown to black. Lamina 20X 5-6 cm , simple pinnate, either terminated by an apical pinna or apex of rachis prolonged bearing vegetative bud; pinnae 10-17 pairs, alternat , 3 X 1.5 cm, stalked, stalk of lower pinnae are longer than the upper ones; pinnae lanulate, lower margin straight, upper margin rounded having 4-8 broad lobes ; pinnae green , glabrous, veins distinct, dochotomously branched, free, reaching the margin. Sori continuous along the magin of the lobe, crescent shapeed, up to 2mm wide; inducia coriacious, entire, brownish; sporangia stalked.

Angiopteridacae

Angiopteris evecta

Rhizome erect, cylindrical, broad, 24 cm in diameter, fleshy, pink inside. Stipes 166x5 cm, swollen at base , adaxially flattened, abaxially rounded , whitish linear streaks allover, with small brown scales and minute hairs. Lamina 1-3 cm long, bipinnate; pinnae 6.5-100 x 25 cm, subopposite, with 3 cm long swollen stalk, oblong- lanceolate, with a terminal pinnule similar to lateral ones, pinnules 10-25 x 1-2 cm, subopposite, shortly stalked, oblong , lanceolate, acuminate, base subtruncate or cuneate, serrate, particularly towards apex; texture herbeceous, veins simple or forked twice, almost parrallel, reaching the margin. Sori submerginal, ellipsoid, sporangia upto six pairs in two rows, which is boat shaped. Spores hyaline, tetrahedral, pale green.

Blechnaceae

Blechnum orientale L.

Rhizome erect, short, creeping, scally,.Lamina dimorphic, stipe slender,sterile lamina20x 0.5 cm,glabrous,adaxially grooved, abaxialy rounded, simple pinnate; pinnae 8-15 pairs; fertile lamina more or less same size and shape . Pinnae much contracted, 25x0.5 cm. Sori densly covering the lower surface except midrib and extreme apex; sporangia large ,stalked, crowded.

Dryopteridaceae

Dryopteris sparsa

Rhizome short, densly covered by scales; stipes 12-35x0.2-0.4 cm, abaxially rounded, adaxially grooved, shinning, dark purplish at base, pale brown above. Lamina 18-48x10-30 cm ovate-lanceolate, bipinnate, opposite, petiolate. Pinnae 20x5cm, ovate-lanceolate, lowest pair of basal pinnae largest, sometimes bear accessory branch on the basal side, secondary pinnae upto 2 pairs, sub-opposite or alternate. Lamina pale green or brownish when dry, glabrous. Sori median on the veinlets, globose, usually one per lobe , inducia large, reniform, pale brown, sporangia stalked.

Equisitaceae

Equisitum ramosissmum Roxb.

Rhizome creeping, sterile and fertile branches alike, simple or irregularly branched, branches long, slender, sheath type, strobili terminal, oblong, apiculate, shortly stalked and sessile, 0.5-2.5 cm long.

Gleicheniaceae

Gleichenia J . Sm

Rhizome wide creeping , 6 cm thick , tough, covered with scales ; scales lanceolate, apex acuminate, ciliate , brown. Stipes 50-100 x .4-1 cm erect, solid scaly at base , glabrous at above. Lamina with large and spreading branches. Primary branches deeply bipinnatified ; secondary branches pinnatified near the costa; alternate ; leaflets small 1 x 0.2 cm, oblong, apex acute, each lobe seperated by a narrow sinus ; rachis , costa and costules densely clothed by pale , stellate hairs. Sori small, gobose, submarginal, yellwish-brown.

Family: Lycopodiaceae

Lycopodium clavetum Linn.

Terrestrial, branches prostrate, wide creeping ; roots clumps at definite intervals. Fertile branches short, erect-procumbent, dichotomous. Leaves crowded, spirally arranged, linear, acute, rigid, midrib obscure. Strobili upto 6 cm long, pedicellate. Strobili 2-5 on each peduncle, borne terminally. Sporophylls deltoidaristate, margin irregularly ciliated. Sporangia reniform. Spores oval, dark. The species is found in the wet slopes.

Lygodiaceae

Lygodium flexuosum (L)

Rhizome creeping, short, thick, covered by dark-brown, multicellular, unisreriate hairs. Stipes glabrous, abaxially rounded, adaxially flattened, dark brown. Fronds wide- spreading, tripinnate, glabrous, primary pinnae alternate , 15cm apart with long common stalk forked once and bearing a dormant bud on the forking axis. Each forked branch bear two to three pinnules alternately. Pinnules 6-10 x2.5 cm ,oblong, lanceolate, simple or terminal leaflet forked, basal leaflets often large , separate or lobed with 2-3 leaflets, apex acute or accumnate, base cuneate in simple pinnules, forked or lobed pinnules cordate. Sterile

leaflets finey toothed; rachis and costa densely or sparsely pubescent all over, veins distinct, 1-3 forked, free, reaching the margin; fertile leaflets a little narrower than sterile one. Sporangia arrange adaxially on spikes, protruding from the margin, sporangia large, short stalked, about 5 pairs, arranged in 2 rows, alternate.

Polypodiaceae

Drynaria quercifolia (L.)

Epiphytes,Rhizomee long creeping 2cm thick, stout, densly scaly, scales 1-1.5x 0.2 cm thick, linear-lanceolate, apex acuminate hair tipped, base broad, margin dentate-ciliate. Nest leaves 15-30x7-20 cm, sessile, crowded, ovate-cordate, dry, hard, pale-green at young, brown at maturity, glossy, margin lobate-pinnatfid, more or less half way down to the costa , lobes 4x2cm entire, glabrous, midrib and primary veins distinctly raised above and bellow, secondary and tertiary veins slightly raised above and bellow, veins interconnected. Fertile lamina 45-100x20-35 cm, grey-brown, abaxially rounded, adaxially grooved, narrowly winged on either side, glabrous; lamina ovate to oblanceolate, deeply pinnate near to the midrib, lobes upto 15 pairs, alternate, largest lobe 20-40 x 5 cm, oblanceolate, acute apex, base decurrent, margin entire, wavy. Venation distinct on both surfaces , interconnected by veinlets, pinnae pale- green, glabrous, sori 2 mm diameter, sporangia round, slender stalked.

Drymoglossum heterophylum (L.)

Epiphytes, Rhizome long creeping, wiry, 0.1cm thick, densly covered by scales; scales peltate, ovate to round, apex acuminate, centre dark brown. Stipes of fertile fronds 0.3 x 0.1 cm, about 2 cm apart, terete, articulate, covered with scales similar to rhizome. Lamina dimorphous, simple ; sterile lamina 3 x 1.5 cm , orbicular, ovate or elliptic, apex rounded, margin entire ; veins indistinct , texture thick, fleshy, more or less covered by stellate hairs at young , rarely at matured. Lamina pale or dark green; fertile lamina 3-8 x 0.5-0.8 cm , linear ,oblong, margin entire, apex rounded; asal portion is narrowed gradually, margin entire. Sori confluent along the tip of lamina, 0.2 cm wide, linear, sporangia oval, short stalked , dark brown.

Pteridaceae

Pteris ensiformis Burm.

Rhizome short , creeping, scally; scales linear-lanceolate, acuminate, entire, shinning, dark-brown. Stipes 7-30 x 0.1-0.3 cm, glabrous , slender, abaxially rounded, adaxially grooved. Fronds dimorphous. Some fronds partly fertile and partly sterile. Sterile lamina pinnate, much shorter than fertile ones. Sori confluent , marginal, developing basipitally. Spores dark –brown, tetrahedral.

Pteris vitata

Rhizome suberect, short, densely covered by scales at apex; scales ovate-lanceolate, thin, membranaceous, entire, pale-brown. Stipes 5-35 x 0.8 cm, stout, abaxially rounded, adaxially grooved, pale- brown, clothed with linear, silky , pale-brown scales. Lamina 20-90 x 10-30 cm, simple pinnate with a single , elongate, linear, terminal pinna like the lateral ones; pinnae numerous, opposite or subopposite, 1-3 cm apart, middle one largest, upper ones slightly reduced, basal ones gradually reduced. Largest pinnae 5-20 x 0.5-1 cm ; all pinnnae sessile, linear lanceolate, acuminate at apex, base broadly cuneate; margin serrate in the distal non soral part, entire in the rest; texture thin , herbaceous , both surfaces naked ; rachis naked or slightly scaly. Sori all along the margin, except at base and apex; spores round yelowish green.

Pteris cretica

Rhizome erect, 2mm thick, scally at the apex; scales 5x3 mm, ovate-lanceolate, acuminate, entire, dark brown. Stipes 10-35x 0.2-0.3cm, slender, stramineous, glabrous, glossy, abaxially rounded, adaxially grooved, pale- brown. Frond dimorphic, sterile lamina 20-38 x10-20 cm, simple pinnate, pinnae up to 7 paires, opposite or subopposite, short stalked, others sessile and simple, largest pinna 20 x 2 cm , lanceolate, acuminate, base broadly cuneate, margin sharply spinulose , serrate. Fertile lamina much longer than sterile ones ; rachis glabrous , pinnae dark green, veins parallel, simple or forked once, free. Sori linear all along the margin except at base and apex . Spores dark-brown.

Sphenomeris chinensis (L)

Rhizome short creeping, 0.5 cm thick , stout , covered with scales , scales hair like ,stiff, dark brown . Stipes 50 x 0.4 cm, scally at base , glabrous above , polished, grey-brown . Lamina 15-46 x 6- 20 cm , tripinnate , distal part bipinnatifid. Primary pinnae up to 10 pairs, ascending, subopposite or alternate , stalked , largest pinna 8-15 x 5-8 cm. Secondary pinnae about 8

paires, alternate, shortly stalked, apex acute ; tertiary pinnae about 3 pairs alternate, shortly stalked, apex rounded, basecuneate, deeply segmented into 2-4 lobes to the rachis. Lamina pale green to brownish when dry, glabrous. Sori marginal.

Selaginellaceae

Selaginella decipiens Warb

Terrestrial, stem erect, pinnately branched above, rhizophores absent. Leaves glossy green, dimorphic; lateral leaves alternate, entire. Strobilus 0.5-0.8 cm long . Sporophylls acuminate, entire. Sporangia yellowish green. Spores minute , oval to triangular, greenish.

Discussion

During the present study, the presence of 16 species under 14 genera of 12 families was recorded. From the study Amsoi represents the presence of a good number of fern genera. But the frequency of species diversity is less in comparison to number of the genus. The hilly slopes, grazing forest lands, wet and humid areas , edeges of hills , sides of the streams, road sides of the study area is rich in fern vegetation. The fern contributes a major flora of this area. The presence of wide range of fern vegetation of the study area definitely play an intengible value to increase the soil fertility. At present some of the anthropogenic activities disturbing the vegetation. Therefore, the present study give an ample scope for further study of the total flora from this area.

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