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Pteridophytes of Alas Purwo National Park and Their Medicinal Potency

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Abstract—An investigation of Pteridophytes diversity at Alas Puwo National Park, Banyuwangi, East Java Province, Indonesia, was carried out in November 2015. A total 10 species of Ferns fom from 6 families had been identified based on their morphological chracteristic. The species are: *Stenochlaena palustris, Cyathea bipinnatifida, Lygodium circinatum, Drynaria quercifolia, Pteris vittata, Cyclosorus aridus, Christella dentate, Pneumatopteris costata, Sphaerostephanos invisus,* and *Amauropelta bergiana.*The medicinal potency from all speciments had been observed based on literature study. Only 5 Species has medicinal poternсy mainly for antimicrobial, wound treatment, and to treat fever..

Keywords—*Pteridophytes, Alas Purwo National Park, Species, Families, Medical potency*

INTRODUCTION

Pteridophytes are a group of vascular plant which produce spores as dispersal organ. There are about, 13,600 species of fern and fern allies distributed worldwide (Moran, 2006) and in Indonesia about 3227 species had been recorded [1] that mainly found in tropical forest.

Pteridophytes had been used for several purposes e.g. medicine [2]–[6]. Some pteridophytes had been tested their compound. *Christella dentata* indicates strong antibacteria [7]. *Pteris vittata* L. had evaluated for its antihyperglycemic activity on alloxan induced Sprague Dawley rats.[8]. More over another common Pteridophytes i.e. Drynaria quercifolia is used in India since long times .[8].

The aims of this research is to explore Ptetidophytes with medicinal potency from a Tropical forest in East Java. Alas Purwo National Park is one of the National Park located on the east tip of Java Island. It has several vegetation i.e. Mangrove, Low-land Forest, Bamboo forest, and Savanna [9]. Since Pteridophytes is less interested research object in Indonesia, still few publication about Pteridophytes diversity in this area.

METHODS

Ferns exploration and collection was carried out at on November 2015 in Tropical low land forest around Gua Bashori, Alas Purwo National Park (8°39'11.19"S, 114°22'18.69"T).

A total of 24 herbarium specimens of 10 species of had been collected from the study site. The specimens were identified morphologically and compared to several literatures [1], [10]–[14] and specimens collection at Herbarium Jemberiense.

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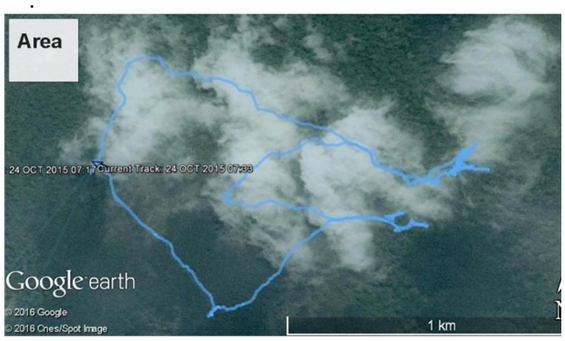

Figure 1. Sampling Location

RESULTS AND DISCUSSION

Ten species of six families Pteridophytes had beed identified based on their morphological characters. Thelypteridaceae is the most common families Pteridophes growing in research area. Total 5 species of this family from 5 different Genus.Another four Families also represented by a single genus. The lower number of species in this area compares to report by [15] indicated that climates is one of major contributor for the growth of Pteridophytes.

Tabel 1. List Species Tumuhan Paku Epifit di Gunung Raung

No	Family	Species
1	Blechnaceae	*Stenochlaena palustris* (Burm. f.) Bedd.
2	Cyatheaceae	*Cyathea bipinnatifida* (Baker) Domin
3	Lygodiaceae	*Lygodium circinatum* (Burm. f.) Sw.
4	Polypodiaceae	*Drynaria quercifolia* (L.) J. Sm.
5	Pteridaceae	*Pteris vittata* L.
6	Thelypteridaceae	*Cyclosorus aridus* (D. Don) Tagawa
7	Thelypteridaceae	*Christella dentata* (Forssk.) Brownsey & Jermy
8	Thelypteridaceae	*Pneumatopteris costata* (Brack.) Holttum
9	Thelypteridaceae	*Sphaerostephanos invisus* (G.Forst.) Holttum
10	Thelypteridaceae	*Amauropelta bergiana* (Schltdl.)

All speciment had sori as main identification character. The presence of the sori idicated that speciment were on mature spteps. Since the data collection was carrid out on dry seassons we assumend that due to low moisture stess, Pteridophytes response the environmental change by reduce their growth and prefer to reproduce by producing spores [16]. Based on Abiotic data idicated that during the data collection, the area was under dry season exposed, Temperature aroun 30,1°C, Light Intensity 597 luxmeter, and moisture 58.4% (Table 2). All speciments picture and two descriptions is provide below:

Table 2. Abiotic data of Research Area

Plot	Tempherature (°C)	Light Intensity (lux)	Air Moisture(%)
1	30,1	324	61,6
2	29,3	213	39,9
3	29,2	904	63,5
4	28,6	547	64,6
5	29,7	530	62,9
6	30,1	1019	61,1
7	31,5	674	59,5
8	32,5	565	54,4
Mean	30,1	597	58,4
Std dev	1,3	269,5	8,1

Figure 2 Photo specimen: 1)Amauropelta bergiana; 2) Christella dentate; 3) *Cyathea bipinnatifida*; 4) *Cyclosorus aridus*

Figure 3 Photo specimen: 1) Drynaria quercifolia ; 2) Lygodium circinatum; 3) *Pneumatopteris costata* ; 4) *Pteris vittata*

Figure 4 Photo specimen: 1) Sphaerostephanos invisus ; 2) Stenochlaena palustris ; 3) Tectaria aurita

Specimen Description

Tectaria aurita

Rhizome short, creeping, ascending or erect, 35 mm diam.; Stipes pale brown to castaneous, 15–35 cm in sterile and up to 60 cm in fertile fronds, densely pubescent on adaxial surface, glabrous beneath. Laminae ovate-subdeltoid or pentagonal, up to 40 by 30 cm, tripinnatifid at base; lateral pinnae 2–4 pairs, the basal pinna much the largest, stalked, asymmetrically subtriangular, acute at apex, with one or two basal basiscopic pinnules; upper pinnae shortly stalked, deeply lobed or with a free sessile basal basiscopic pinnule; apical pinna subdeltoid, cuneate and a little decurrent at base, deeply lobed to pinnatifid; herbaceous, green, glabrous on laminar surface; rachis and pinna-rachis with dense articulated hairs above, glabrous beneath; veins forming copious anastomosis with included veinlets. Sori in terminal leaf; narrowed; fully covered basal side.

Lygodium circinatum

Rhizome shortly creeping, densely covered with blackish hairs. Fronds large, climbing to several metres; stipes brownish stramineous, hairy on the lower part, narrowly winged on upper part; rachis 2–5 mm diam., glabrous, with very short wings (or ridges) or not; primary rachis-branches very short, less than 2 mm long, the apex dormant and somewhat sunken, covered with pale brownish hairs; secondary rachis-branches 2–4 cm long, sometimes branching once dichotomously; sterile leaflets with 2–7 lobes palmately divided with cuneate base, the lobes gradually narrowing towards acute apex, entire at margin, up to 20 cm long, more than 2 cm broad, sometimes fertile on the upper part; lamina softly papyraceous, glabrous except sparsely hairy main veins, sometimes warty; fertile leaflets similar in the branching system to the sterile ones, narrower or not, up to 1.6 cm broad (excluding the sporangia-bearing lobes). Sporangia-bearing lobes protruding, numerous at margin of tertiary leaflets, 2–5 mm long, about 1.2 mm broad; indusia glabrous

Medicinal Potency

All species list had been observed their medical potency. Mainly literatures comes from India. The list of medicinal potency provided in table 3.

Table 3. Medicinal Potency

No	Species	Medicinal potency
1	*S.palustris*	to treat fever [17], skin diseases, ulcers, and stomachache [6], cooling agent for burns [5]
2	*C.bipinnatifida*	-
3	*L. circinatum*	childbirth medicine, contraceptive, wounds treatment [18]
4	*D. quercifolia*	wound healing [19], to treat diarrhea, typhoid, cholera, chronic jaundice, fever, headache, skin disease, jaundice, hepatitis, Chest pain, diabetes, gonorrhea, debility, malaria, stimulate hair growth, to treat baldness [20] for controlling of cough, tuberculosis and typhoid fever[2][21]
5	*P. vittata*	antimicrobial activity, antitumor activity,platelet aggregation, antiinflammatory action, hypotensive, antiviral[8]
6	*C. aridus*	-
7	*C. dentata*	antibacterial[7]
8	*P. costata*	-
9	*S.invisus*	-
10	*bergiana*	-

CONCLUSION

Total 10 species of Ferns fom from 6 families had been identified in Alas Puwo National Park. The species are: *Stenochlaena palustris, Cyathea bipinnatifida, Lygodium circinatum, Drynaria quercifolia, Pteris vittata, Cyclosorus aridus, Christella dentate, Pneumatopteris costata, Sphaerostephanos invisus,* and *Amauropelta bergiana.* All of them only 5 Species has medicinal poternсy mainly for antimicrobial, wound treatment, and to treat fever

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