

FERNS AND LYCOPHYTES OF CELAQUE NATIONAL PARK, HONDURAS

K. PIĄTEK¹ (author for correspondence: piatek@interia.eu) P. NAKS¹, W. HEISE¹, M. WAYDA¹, O. REYES CALDERON² & G. SANDOVAL²

1. Institute of Botany, Jagiellonian University, Kopernika 27, 31-501 Kraków, Poland

2. Herbario Cyril Hardy Nelson-Sutherland (TEFH), Escuela de Biología, Facultad de Ciencias, Universidad Nacional Autónoma de Honduras, Tegucigalpa M.D.C., Honduras, Centro America

Key words: ferns, lycophytes, Celaque, cloud forest, Honduras, Central America, TEFH, KRA.

In this short note we present the first list of ferns and lycophytes of the Celaque National Park, Honduras. Celaque National Park is located within the Departments of Lempira, Ocotepeque and Copan. The park covers an area of about 266 km² between 1000 and 2870 m a.s.l. Topography is rugged, with over two-thirds of the land having inclination greater than 60% and soils being sandy and shallow. Eleven major rivers and a number of streams originate from Celaque. Forest formations vary with elevation: *Pinus-Quercus* forest occurs below 1800 m a.s.l., mixed broad-leaf/pine mountain forest between 1800 and 2200 m and cloud forest occurs above 2200 m a.s.l.

This compendium is based on collections made during our recent survey of the montane cloud forests of Celaque and vicinity during March and April 2008. Additionally, we have included other known collections using Tropicos database (Tropicos.org. Missouri Botanical Garden. www.tropicos.org).

Our collections are deposited in TEFH and KRA herbaria. Previous researchers' collections are deposited in MO. Nomenclature generally follows Mickel & Smith (2004), although we take the opportunity to include new combinations in *Phlegmariurus* and *Pleopeltis* that will be made by the indicated authors in the near future.

A total of 166 species in 59 genera are reported here for the park (Table 1). Twenty species are new additions to the park's flora. Collections of other collectors are listed only when a given species has not been found by us.

Celaque is the highest peak in Honduras, and biogeographically it is an isolated island with cloud forest. It is important to preserve this environment because of its fern richness (about a quarter of all known Honduran fern and lycophyte species (Nelson Sutherland et al. 1996)), its geographic isolation and potential for fern endemism (we found one undescribed species of *Grammitis*), and because of its role as a source and/or destination area for long-distance dispersal of cloud forest fern species.

This initiative is a collaborative effort of the Institute of Botany, Jagiellonian University and the Herbarium of the Universidad Nacional Autonomas de Honduras, with financial support from Jagiellonian University. This study would not have been possible without the support of several institutions and people to which we are most grateful. We thank the AFE-COHDEFOR and Area de Vida Silvestre for endorsing the project, and Cyril Hardy Nelson Sutherland for his ongoing support. We also

thank Alan R. Smith for identification of some of our collections and great improvement of our manuscript.

Table 1. Ferns and lycophytes of the Celaque National Park. Species new for the park are in boldface.

Scientific name	Collector	Coll. No.	Date	Herbarium
<i>Adiantum andicola</i> Liebm.	Naks et al.	78	01.04.08	KRA, TEFH
<i>Adiantum concinnum</i> Humb. & Bonpl. ex Willd.	Naks et al.	119	11.04.08	KRA, TEFH
<i>Adiantum jeei</i> T. Moore ex Fée	House	882	18.03.91	MO
<i>Adiantum poiretii</i> Wikstr.	Moran	5507	11.11.91	MO
<i>Adiantum tenerum</i> Sw.	Davidse	34589	23.05.91	MO
<i>Alansmia cultrata</i> (Willd.) Moguel & M. Kessler	Naks et al.	60	31.03.08	KRA, TEFH
<i>Alansmia senilis</i> (Fée) Moguel & M. Kessler	Naks et al.	55B	29.03.08	KRA, TEFH
<i>Alansmia smithii</i> (A. Rojas) Moguel & M. Kessler	Davidse	34750A	26.05.91	MO
<i>Anemia hirsuta</i> (L.) Sw.	Nelson	81	07.12.71	MO
<i>Anemia phyllitidis</i> (L.) Sw.	Naks et al.	109	01.04.08	KRA, TEFH
<i>Arachniodes denticulata</i> (Sw.) Ching	Naks et al.	52	29.03.08	KRA, TEFH
<i>Ascogrammitis anfractuosa</i> (Kunze ex Klotzsch) Sundue	Davidse	34606	23.05.91	MO
<i>Asplenium achilleifolium</i> (M. Martens & Galeotti) Liebm.	Naks et al.	155	11.04.08	KRA, TEFH

<i>Asplenium auriculatum</i> Sw.	Naks et al.	153	11.04.08	KRA, TEFH
<i>Asplenium blepharophorum</i> Bertol.	Moran	5536	13.11.91	MO
<i>Asplenium fragrans</i> Sw.	Naks et al.	68	31.03.08	KRA, TEFH
<i>Asplenium harpeodes</i> Kunze	Naks et al.	56	29.03.08	KRA, TEFH
<i>Asplenium miradorensis</i> Liebm.	Davidse	34656	24.05.91	MO
<i>Asplenium monanthes</i> L.	Davidse	34655	24.05.91	MO
<i>Asplenium monodon</i> Liebm.	Naks et al.	99	01.04.08	KRA, TEFH
<i>Asplenium polyphyllum</i> Bertol.	Naks et al.	37	26.03.08	KRA, TEFH
<i>Asplenium praemorsum</i> Sw.	Naks et al.	135	11.04.08	KRA, TEFH
<i>Asplenium serra</i> Langsd. & Fisch.	Naks et al.	67	31.03.08	KRA, TEFH
<i>Asplenium sessilifolium</i> Desv.	Moran	5551	14.11.91	MO
<i>Blechnum appendiculatum</i> Willd.	House	921	21.03.91	MO
<i>Blechnum occidentale</i> L.	Naks et al.	93	01.04.08	KRA, TEFH
<i>Blechnum polypodioides</i> Raddi	Moran	5509	11.11.91	MO
<i>Blechnum schiedeanaum</i> (Schtdl. ex C. Presl) Hieron.	Naks et al.	66	31.03.08	KRA, TEFH
<i>Blechnum stoloniferum</i> (Mett. ex E. Fourm.) C. Chr.	Moran	5579	16.11.91	MO

<i>Botrychium decompositum</i> M. Martens & Galeotti	Moran	5550	14.11.91	MO
<i>Botrychium virginianum</i> (L.) Sw.	Naks et al.	147	11.04.08	KRA, TEFH
<i>Campyloneurum amphostenon</i> (Kunze ex Klotzsch) Fée	Naks et al.	49	29.03.08	KRA, TEFH
<i>Campyloneurum angustifolium</i> (Sw.) Fée	Naks et al.	80	01.04.08	KRA, TEFH
<i>Campyloneurum tenuipes</i> Maxon	Naks et al.	116	11.04.08	KRA, TEFH
<i>Campyloneurum xalapense</i> Fée	Davidse	34674	24.05.91	MO
<i>Ceradenia jungermannioides</i> (Klotzsch) L.E. Bishop	Davidse	34813	26.05.91	MO
<i>Ceradenia margaritata</i> (A.R. Sm.) L.E. Bishop	Naks et al.	20	26.03.08	KRA, TEFH
<i>Cheilanthes complanata</i> A.R. Sm.	Naks et al.	73	01.04.08	KRA, TEFH
<i>Cheilanthes lendigera</i> (Cav.) Sw.	Davidse	34760	25.05.91	MO
<i>Cibotium regale</i> Verschaff. & Lem.	Naks et al.	110	01.04.08	KRA, TEFH
<i>Cochlidium linearifolium</i> (Desv.) Maxon ex C. Chr.	Naks et al.	134	11.04.08	KRA, TEFH
<i>Cochlidium rostratum</i> (Hook.) Maxon ex C. Chr.	Moran	5605	16.11.91	MO
<i>Ctenitis equestris</i> (Kunze) Ching	Davidse	34699	25.05.91	MO
<i>Culcita conifolia</i> (Hook.) Maxon	Naks et al.	18	26.03.08	KRA, TEFH
<i>Cyathea divergens</i> Kunze	Naks et al.	151	11.04.08	KRA, TEFH

<i>Cyathea fulva</i> (M. Martens & Galeotti) Fée	Naks et al.	42		26.03.08	KRA, TEFH
<i>Cystopteris fragilis</i> (L.) Bernh.	Naks et al.	158		11.04.08	KRA, TEFH
<i>Dennstaedtia bipinnata</i> (Cav.) Maxon	Naks et al.	144		11.04.08	KRA, TEFH
<i>Dennstaedtia dissecta</i> (Sw.) T. Moore	House	1139		15.11.91	MO
<i>Dennstaedtia globulifera</i> (Poir.) Hieron.	House	903		19.03.91	MO
<i>Dicksonia sellowiana</i> Hook.	Naks et al.	91		01.04.08	KRA, TEFH
<i>Didymoglossum reptans</i> (Sw.) C. Presl	Moran	5554		14.11.91	MO
<i>Diplazium thyooides</i> (Humb. & Bonpl. ex Willd.) Holub	Naks et al.	128		11.04.08	KRA, TEFH
<i>Diplazium cristatum</i> (Desr.) Alston	Naks et al.	139		11.04.08	KRA, TEFH
<i>Diplazium diplazioides</i> (Klotzsch & H. Karst.) Alston	Moran	5563		14.11.91	MO
<i>Diplazium donnell-smithii</i> Christ	House	926		21.03.91	MO
<i>Diplazium drepanolobium</i> A.R. Sm.	Moran	5530		13.11.91	MO
<i>Diplazium franconis</i> Liebm.	Naks et al.	146		11.04.08	KRA, TEFH
<i>Diplazium lindbergii</i> (Mett.) Christ	Naks et al.	145		11.04.08	KRA, TEFH
<i>Diplazium lonchophyllum</i> Kunze	House	920		21.03.91	MO
<i>Diplazium striatum</i> (L.) C. Presl	House	1100		13.11.91	MO

<i>Diplazium werckleanum</i> Christ	House	960	24.05.91	MO
<i>Diplopterygium bancroftii</i> (Hook.) A.R. Sm.	Naks et al.	130	11.04.08	KRA, TEFH
<i>Dryopteris nubigena</i> Maxon & C.V. Morton	Moran	5597	16.11.91	MO
<i>Dryopteris patula</i> (Sw.) Underw.	House	1118	14.11.91	MO
<i>Dryopteris wallichiana</i> (Spreng.) Hyl.	Naks et al.	16	26.03.08	KRA, TEFH
<i>Elaphoglossum andersonii</i> Mickel	Davidse	34653	24.05.91	MO
<i>Elaphoglossum ellipticifolium</i> A. Rojas	Chorley	319	19.09.91	MO
<i>Elaphoglossum erinaceum</i> (Fée) T. Moore	Naks et al.	76	01.04.08	KRA, TEFH
<i>Elaphoglossum glaucum</i> T. Moore	Naks et al.	28	26.03.08	KRA, TEFH
<i>Elaphoglossum lanceum</i> Mickel	Naks et al.	14	26.03.08	KRA, TEFH
<i>Elaphoglossum muscosum</i> (Sw.) T. Moore	Moran	5540	14.11.91	MO
<i>Elaphoglossum paleaceum</i> (Hook. & Grev.) Sledge	Naks et al.	29	26.03.08	KRA, TEFH
<i>Elaphoglossum peltatum</i> (Sw.) Urb.	Moran	5556	14.11.91	MO
<i>Elaphoglossum petiolatum</i> (Sw.) Urb.	Moran	5545	14.11.91	MO
<i>Elaphoglossum pilosius</i> Mickel	Naks et al.	19	26.03.08	KRA, TEFH
<i>Elaphoglossum sartorii</i> (Liebm.) Mickel	Naks et al.	13	26.03.08	KRA, TEFH

<i>Elaphoglossum setigerum</i> (Sodiuro) Diels	Naks et al.	71	01.04.08	KRA, TEFH
<i>Elaphoglossum squamipes</i> (Hook.) T. Moore	Naks et al.	10	26.03.08	KRA, TEFH
<i>Elaphoglossum squarrosum</i> (Klotzsch) T. Moore	Moran	5571	16.11.91	MO
<i>Equisetum myriochaetum</i> Schtdl. & Cham.	Naks et al.	97	01.04.08	KRA, TEFH
<i>Eriosorus flexuosus</i> (Kunth) Copel.	Naks et al.	15	26.03.08	KRA, TEFH
<i>Eriosorus hirtus</i> (Kunth) Copel.	Davidse	34802	26.05.91	MO
<i>Galactodenia delicatula</i> (M. Martens & Galeotti) Sundue & Labiak, in press	Davidse	34668	24.05.91	MO
<i>Hymenophyllum axillare</i> Sw.	Naks et al.	30B	26.03.08	KRA, TEFH
<i>Hymenophyllum crassipetiolatum</i> Stolze	Naks et al.	5B	23.03.08	KRA, TEFH
<i>Hymenophyllum elegans</i> Spreng.	Moran	5590	16.11.91	MO
<i>Hymenophyllum fragile</i> (Hedw.) C. V. Morton	Moran	5628	18.11.91	MO
<i>Hymenophyllum fucoides</i> (Sw.) Sw.	Naks et al.	11	26.03.08	KRA, TEFH
<i>Hymenophyllum polyanthos</i> (Sw.) Sw.	Naks et al.	69	31.03.08	KRA, TEFH
<i>Hymenophyllum pulchellum</i> Schtdl. & Cham.	Naks et al.	2	23.03.08	KRA, TEFH
<i>Hymenophyllum tegularis</i> (Desv.) Proctor & Lourteig	Naks et al.	38	26.03.08	KRA, TEFH
<i>Hymenophyllum trichophyllum</i> Kunth	Moran	5544	14.11.91	MO

<i>Hymenophyllum tunbrigense</i> (L.) Sm.	Naks et al.	23	26.03.08	KRA, TEFH
<i>Lophosoria quadripinnata</i> (J.F. Gmel.) C. Chr.	Naks et al.	84	01.04.08	KRA, TEFH
<i>Lycopodium clavatum</i> L.	Naks et al.	26	26.03.08	KRA, TEFH
<i>Macrothelypteris torresiana</i> (Gaudich.) Ching	Naks et al.	95	01.04.08	KRA, TEFH
<i>Marattia excavata</i> Underw.	Naks et al.	133	11.04.08	KRA, TEFH
<i>Marattia interposita</i> Christ	House	902	19.03.91	MO
<i>Megalastrum sparsipilosum</i> R.C. Moran & J. Prado	Moran	5527	13.11.91	MO
<i>Melpomene delata</i> (Mickel & Beitel) A.R. Sm. & R.C. Moran	Naks et al.	20B	26.03.08	KRA, TEFH
<i>Melpomene firma</i> (J. Sm.) A.R. Sm. & R.C. Moran	Davidse	34552	23.05.91	MO
<i>Melpomene moniliformis</i> (Lag. ex Sw.) A.R. Sm. & R.C. Moran	Naks et al.	4	23.03.08	KRA, TEFH
<i>Melpomene xiphopteroides</i> (Liebm.) A.R. Sm. & R.C. Moran	Moran	5634	18.11.91	MO
<i>Moranopteris basiattenuata</i> (Jenman) R. Y. Hirai & J. Prado	Naks et al.	12	26.03.08	KRA, TEFH
<i>Niphidium crassifolium</i> (L.) Lellinger	Naks et al.	96	01.04.08	KRA, TEFH
<i>Oleandra articulata</i> (Sw.) C. Presl	House	1113	14.11.91	MO
<i>Osmunda regalis</i> L.	Naks et al.	106	01.04.08	KRA, TEFH
<i>Pecluma alfredii</i> (Rosenst.) M.G. Price	Naks et al.	100	01.04.08	KRA, TEFH

<i>Phanerophlebia juglandifolia</i> (Humb. & Bonpl. ex Willd.) J. Sm.	House	961	24.05.91	MO
<i>Phlebodium inaequale</i> T. Moore	Naks et al.	81	01.04.08	KRA, TEFH
<i>Phlebodium pseudoaureum</i> (Cav.) Lellinger	Davidse	34630	24.05.91	MO
<i>Phlegmariurus acerosus</i> (Sw.) B. Øllg.	House	1021	07.07.91	MO
<i>Phlegmariurus hartwegianus</i> (Spring) B. Øllg., comb. ined.	Hawkins	60	11.11.91	MO
<i>Phlegmariurus hippurideus</i> (Christ) B. Øllg.	Naks et al.	36	26.03.08	KRA, TEFH
<i>Phlegmariurus mexicanus</i> (Herter) B. Øllg., comb. ined.	Daniel	9880	16.01.01	MO
<i>Phlegmariurus myrsinites</i> (Lam.) B. Øllg.	Davidse	34720	25.05.91	MO
<i>Phlegmariurus pringlei</i> (Underw. & F. E. Lloyd) B. Øllg., comb. ined.	Naks et al.	65	31.03.08	KRA, TEFH
<i>Phlegmariurus subulatus</i> (Desv. ex Poir.) B. Øllg.	Moran	5582	16.11.91	MO
<i>Pityrogramma calomelanos</i> (L.) Link	Naks et al.	108	01.04.08	KRA, TEFH
<i>Pityrogramma tartarea</i> (Cav.) Maxon	Naks et al.	114	01.04.08	KRA, TEFH
<i>Pleopeltis alansmithii</i> (R. C. Moran) A. R. Sm. & Tejero, comb. ined.	Naks et al.	27	26.03.08	KRA, TEFH
<i>Pleopeltis complanata</i> (Weath.) E.G.A. Hooper	House	1208	31.01.92	MO
<i>Pleopeltis crassinervata</i> (Fée) T. Moore	Moran	5517	11.11.91	MO
<i>Pleopeltis lindeniana</i> (Kunze) A. R. Sm. & Tejero, comb. ined.	Moran	5508	11.11.91	MO

<i>Pleopeltis macrocarpa</i> (Bory ex Willd.) Kaulf.	Davidse	34626	24.05.91	MO
<i>Pleopeltis mexicana</i> (Fée) Mickel & Beitel	Naks et al.	74	01.04.08	KRA, TEFH
<i>Pleopeltis plebeia</i> (Schltdl. & Cham.) A. R. Sm. & Tejero, combined.	Naks et al.	138	11.04.08	KRA, TEFH
<i>Pleopeltis polypodioides</i> (L.) E.G. Andrews & Windham	Naks et al.	136	11.04.08	KRA, TEFH
<i>Pleopeltis sanctae-rosae</i> (Maxon) A. R. Sm. & Tejero, comb. ined.	Davidse	34542	23.05.91	MO
<i>Polypodium aequale</i> Maxon	Moran	5587	16.11.91	MO
<i>Polypodium conterminans</i> Liebm.	Moran	5549	14.11.91	MO
<i>Polypodium fissidens</i> Maxon	Moran	5574	16.11.91	MO
<i>Polypodium fraternum</i> Schltdl. & Cham.	Moran	5514	11.11.91	MO
<i>Polypodium hartwegianum</i> Hook.	Naks et al.	63	31.03.08	KRA, TEFH
<i>Polypodium muenchii</i> (Christ) A. R. Sm.	Naks et al.	22	26.03.08	KRA, TEFH
<i>Polypodium plesiosorum</i> Kunze	Moran	5518	11.11.91	MO
<i>Polypodium subpetiolatum</i> Hook.	Naks et al.	77	01.04.08	KRA, TEFH
<i>Polystichum erythrorum</i> A.R. Sm.	Davidse	34776	26.05.91	MO
<i>Polystichum hartwegii</i> (Klotzsch) Hieron.	Naks et al.	53	29.03.08	KRA, TEFH
<i>Pteridium aquilinum</i> (L.) Kuhn	Naks et al.	46	29.03.08	KRA, TEFH

<i>Pteris cretica</i> L.	Moran	5529	13.11.91	MO
<i>Pteris orizabae</i> M. Martens & Galeotti	Moran	5568	14.11.91	MO
<i>Pteris paucinervata</i> Fée	Moran	5561	14.11.91	MO
<i>Pteris quadriaurita</i> Retz.	Naks et al.	92	01.04.08	KRA, TEFH
<i>Scoliosorus ensiformis</i> (Hook.) T. Moore	Naks et al.	35	26.03.08	KRA, TEFH
<i>Selaginella bernoullii</i> Hieron.	Moran	5548	14.11.91	MO
<i>Selaginella pallescens</i> (C. Presl) Spring	Naks et al.	101	01.04.08	KRA, TEFH
<i>Selaginella porphyrospora</i> A. Braun	Moran	5522	11.11.91	MO
<i>Selaginella pulcherrima</i> Liebm.	Moran	5523	11.11.91	MO
<i>Selaginella silvestris</i> Aspl.	Naks et al.	3	23.03.08	KRA, TEFH
<i>Serpocaulon triseriale</i> (Sw.) A.R. Sm.	House	1212	31.01.92	MO
<i>Stenogrammitis myosuroides</i> (Sw.) Labiak	Naks et al.	34	26.03.08	KRA, TEFH
<i>Stenogrammitis prionodes</i> (Mickel & Beitel) Labiak	Naks et al.	34B	26.03.08	KRA, TEFH
<i>Sticherus fubus</i> (Desv.) Ching	Naks et al.	113	01.04.08	KRA, TEFH
<i>Sticherus underwoodianus</i> (Maxon) Nakai	Naks et al.	43B	29.03.08	KRA, TEFH
<i>Terpsichore asplenifolia</i> (L.) A.R. Sm.	House	1093	13.11.91	MO

<i>Terpsichore semihirsuta</i> (Klotzsch) A.R. Sm.	Naks et al.	5	23.03.08	KRA, TEFH
<i>Thelypteris hispidula</i> (Decne.) C.F. Reed	Renfrow	12	01.04.89	MO
<i>Thelypteris patens</i> (Sw.) Small	Naks et al.	121	11.04.08	KRA, TEFH
<i>Thelypteris pilosula</i> (Klotzsch & H. Karst. ex Mett.) R.M. Tryon	Naks et al.	98	01.04.08	KRA, TEFH
<i>Thelypteris resinifera</i> (Desv.) Proctor	Nelson	296	07.12.71	MO
<i>Thelypteris rudis</i> (Kunze) Proctor	Naks et al.	47	29.03.08	KRA, TEFH
<i>Vandenboschia radicans</i> (Sw.) Copel.	Naks et al.	148	11.04.08	KRA, TEFH
<i>Vittaria graminifolia</i> Kaulf.	Naks et al.	54	29.03.08	KRA, TEFH
<i>Woodwardia spinulosa</i> M. Martens & Galeotti	Naks et al.	124	11.04.08	KRA, TEFH

REFERENCES

- MICKEL, J.T. & SMITH, A.R. 2004. THE PTERIDOPHYTES OF MEXICO. MEM. NEW YORK BOT. GARD. **88**: 1-1054.
- NELSON SUTHERLAND, C., GAMARRA GAMARRA, R. & FERNANDEZ CASAS, J. 1996. HONDURENSIS PLANTARUM VASCULARIUM CATALOGUS: PTERIDOPHYTA. FONTQUERIA **43**: 1-139.