Proceedings

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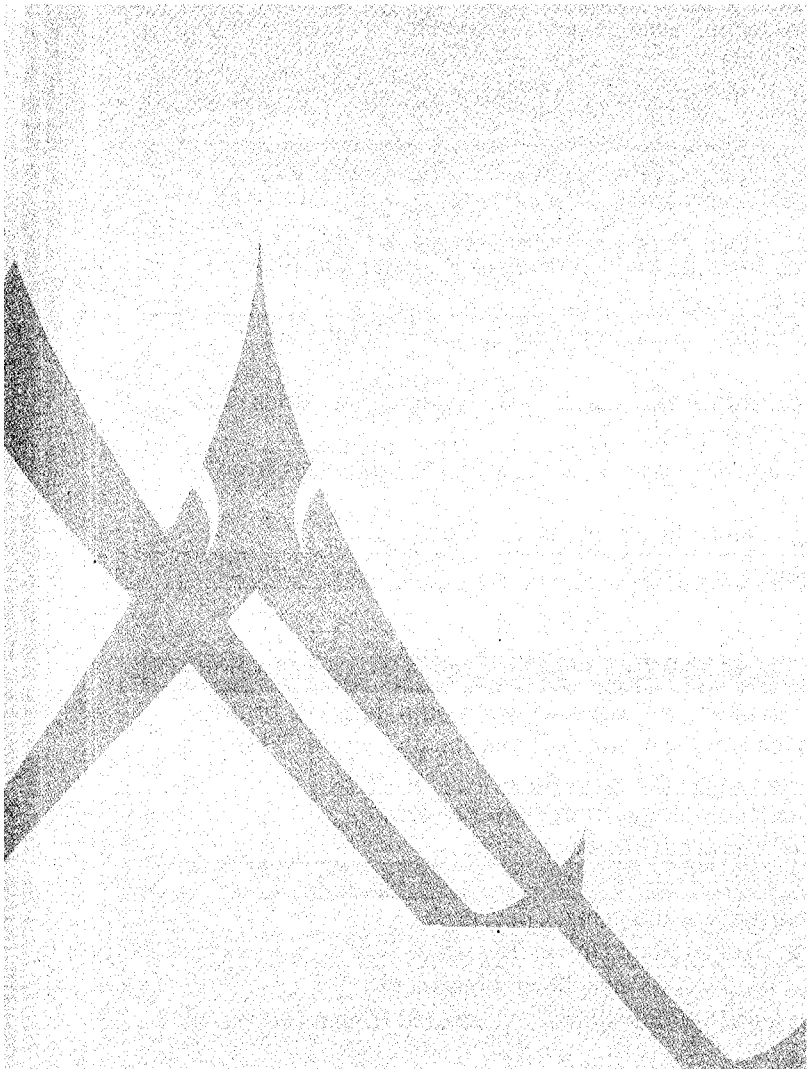

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Xylariaceous Fungi in Phu Hin Rongkra National Park, Thailand

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Abstract

Xylariaceous fungi are wood, leaf and fruit inhabitants but they are also found on litter, soil and dung, and associated with insect. One hundred and eighty specimens of the xylariaceous fungi have been found and collected from four locations (Mun Dang Waterfall, Lan Hin Tak, Lan Hin Pum and the area of Military Politics School) in Phu Hin Rongkra National Park. The Park located in Pitsanuloke, Phetchabun and Loei Provinces, Thailand. A total of 39 taxa belonging to 7 genera: *Xylaria, Hypoxylon, Biscogniauxia, Nemania, Kretzschmaria, Jumillera* and *Daldinia* have been recorded. The highest fungal species diversity was found at Mun Dang Waterfall. Twenty three species could be identified. Sixteen taxa have not been named yet, and are likely to be new. From this investigation, *Hypoxylon leptascum* and *H. thouarsianum var. macrosporum* are first recorded in Thailand. The confirmation of taxonomic study and screening of some bioactive compounds of these fungal collections will be further investigated.

Introduction

Phu Hin Rongkla National Park is one of Thailand historical areas where, there was a fighting between communists and government forces and then there was a great bloody loss. Phu Hin Rongkla covers an area of 307 km^2 (191,875 rai). It lies in Phitsanuloke, Phetchabun and Loei Provinces, and it is the 48th National Park in Thailand. The general topography of the Park is steep mountainous. The northern part of the Park borders with Laos in Chaiburi district. The southern part of the Park runs into Phetchabun Province. The highest peak in the Park is 1,800 meters above sea level. The climate of the Park is cool all year round, especially, in the cool season, temperatures decrease about 0-4 °C and all the year round, mean temperature is about 18-25 °C . The Park has mixed deciduous, dry evergreen and hill evergreen forests. Historically, the Park was the location of communist party headquarter. It was used for various activities. The headquarter area remains as it was in the old days, such as The school of Military Politics, Government Power Office, Mual-Chon Village Politics, Government Hospital. Lan Hin Tak is Broken Rock Field, Lan Hin Pum is the Field of Nodulated Stone and Mun Dang Waterfall is a large waterfall with 32 levels and a beauty to behold. It is also regarded as one of the major watershed areas left in the Phu Hin Rongkra forest. Protecting the forest, therefore, will help maintain not only the natural habitat of wild flora and fauna but also this beauteous waterfall. (The paper of Phu Hin Rongkra National Park).

The wood decay Xylariaceae are a large and distinctive family of pyrenomycete fungi (Ascomycotina) which play an important role in the natural functions of forest ecosystems. They have been representatives in most countries of the world but exhibit a strong presence in the tropics and subtropics. The number of genera is open to discussion but there are at least 40 genera (Ju & Rogers, 1996, Whalley, 1996). And

the majority of these are wood inhabitant, and also found on leaf, fruit, litter, soil and dung. The fungi are able to break down the principle components of wood (cellulose and lignin) and are generally classed as white rot fungi. Therefore they play an integral role in nutrient cycling in forests. The Xylariaceae can be broadly grouped according to their lifestyles into three groups phytopathogens, saprotrophs, and endophytes (Whalley, 1996). They also have an excellent track record for the production of secondary metabolites many of which have proved to be novel (Whalley & Edwards, 1995).

Fungal survey

The field survey for investigating the xylariaceous fungi was carried out in Phu Hin Rongkra National Park in July 2002. Fungal specimens were collected, the identified and classified according to the macroscopic and microscopic characteristics of teleomorph stage.

Results

One hundred and eighty specimens of the xylariaceous fungi were found and collected from four locations (Mun Dang Waterfall, Lan Hin Tak, Lan Hin Pum and the area of Military Politics School). The fungi were found on wood, leaf and fruit inhabitats. They have been identified as belonging to 7 genera 39 taxa. All the fungi, except species of Xylaria which occur on leaves, fruit, are found on logs, branches and twigs. The seven genera are *Xylaria, Hypoxylon, Biscogniauxia, Nemania, Kretzschmaria, Jumillera* and *Daldinia*. Twenty three species could be identified. Sixteen taxa have not been named yet, and are likely to be new (Table 1). Mun Dang Waterfall is the highest fungal diversity and Lan Hin Tak is the lowest fungal diversity. *Hypoxylon* and *Xylaria* are the dominant species. *Xylaria aristata* is found on leaves, and *Xylaria* sp. ST 2352 is found on fruit (Fagaceae).

Discussion

The distribution of species of xylariaceous genera between four locations in Phu Hin Rongkra National Park was found to show significant differences. The highest diversity and species is in the area of Mun Dang Waterfall, and with the lowest being found in Lan Hin Tak. In this survey, we have been found *H. leptascum* and *H. thouarsianum* var. *macrosporum* in the area of Mun Dang Waterfall. They are first recorded in Thailand. Normally, *H. leptascum* has been commonly found in Brazil and U.S.A., and *H. thouarsianum* var. *macrosporum* has been found in Maxico. In Thailand representatives of 20 xylariaceous genera containing a total of 126 species have been recorded by Thienhirun, (1997). The genus *Rhopalostroma* is well represented with the occurrenced of three new species (Hawksworth & Whalley, 1987; Whalley & Thienhirun, 1996), and also the genus *Entonaema* has been reported for the first time and one new species is described. (Sihanonth, Thienhirun & Whalley, 1997). The confirmation of taxonomic study and screening of some bioactive compounds of these fungal collections will be further investigated.

Acknowledgements

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Table 1 The list of Xylariaceae found in four areas of Phu Hin Rongkra National Park.

Fungal species	Lan Hin Tak	Lan Hin Pum	Mun Dang Waterfall	Military Politics School
H. fendleri	-	++	+	-
H. liehwacheense	-	+	-	+
H. monticulosum	-	-	++	-
H. moriforme	-	+	+	-
H. stygium	-	+	+++	-
H. nitens	-	-	+	-
H. purpureonitens	-	-	+	-
H. bovei var. microspora	-	-	+	-
H. lenormandii var. microspora	-	-	+	-
H. leptascum	-	-	+	-
H. thouarsianum var. macrosporum	-	-	+	-
H. sp. ST 2340	-	+	-	-
H. sp. ST 2345	-	-	+	-
X. anisopleura	-	-	+++	-
X. schweinitzii	-	-	+++	-
X. scruposa	-	-	+	-
X. obovata	-	-	++	-
X. grammica	-	-	++	-
X. fissilis	-	-	+	-
X. curta	-	-	-	++
X. aristata	+	++	-	-
X. multiplex	-	-	++	-
X. sp. ST 2352	-	-	++	-
X. sp. ST 2353	-	-	++	-
X. sp. ST 2361	-	-	++	-
X. sp. ST 2366	-	-	+	-
X. sp. ST 2367	-	-	+++	-
X. sp. ST 2369	-	-	+	-
X. sp. ST 2371	-	-	+	-
X. sp. ST 2414	-	-	+	-
B. capnodes	-	-	+++	-
B. capnodes var. microspora	-	+	+	-
B. sp. ST 2386	-	-	++	-
N. taxonomic sp. 1	-	+	+	-
N. sp. ST 2399	-	+	+++	-
N. sp. ST 2413	-	-	+	-
K. sp. ST 2398	-	-	+	-
J. sp. ST 2391	-	+	++	-
D. eschscholzii	-	-	++	-

H. = Hypoxylon X. = Xylaria B. = Biscogniauxia N. = Nemania K. = Kretzschmaria
J. = Jumillera D. = Daldinia
Fungal species density : - = none, + = low, ++ = moderate, +++ = high

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