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# Species Richness, Distribution, and Status of Mosses in Selected Mountains in Mindanao, Philippines

**LESLEY CASAS LUBOS**
*Dawsonia@yahoo.com*
Liceo de Cagayan University, Research and Publication Office
Cagayan de Oro City, Mindanao, Philippines

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***Abstract*** **-** The paper determined the species richness, distribution, and status of mosses in selected mountains in Mindanao, Philippines. Field collections of mosses were conducted in Mt. Kalatungan, Bukidnon Province ,Mt. Matutum, South Cotabato Province , and Mt. Malambo, Davao Province at 10 meters on each side of the trails using alpha-taxonomy method. The mosses were collected, classified, and identified. Its status were also assessed. The study revealed 137 species, 87 genera and 33 families of mosses. Of the 137 species, 109 were found in Mt. Kalatungan , 59 in Mt. Matutum. and 20 in Mt. Malambo. Assessment of status of the species revealed 7 species as Philippine record, 37 new to Mindanao, 1 collected only twice, 29 widespread, 12 rare species, and all species collected were new record in terms of locality. Mt. Kalatungan had the highest species richness, followed by Mt. Matutum, and Mt. Malambo had the least number of species. Based on the findings, with the alarming rate of degradation of the mountains which is basically caused by human activities such as land clearing, slash and burn method for expanding crop plantation, urbanization, firewood consumption, over collection of moss plant materials of horticulture, landscaping

and other commercial purposes. Some species are epiphytes on tree trunks or branches of live trees while others are on rotten logs, rock surfaces, moist stones along the stream banks and some grow well on soil. Hence, the identified habitats of new records in the Philippines, new to Mindanao , new in terms of locality, widespread , and rare species of mosses should be protected through a strict implementation of the forest laws by concerned authorities.

***Keywords*** - Mosses, species richness, distribution, status, Mindanao Island, Philippines.

## INTRODUCTION

The large and diverse Philippine moss flora has a modern checklist (Tan and Iwatsuki, 1991). The history and progress of Philippine bryology were reviewed and summarized by Tan (1992) who discussed in detail the floristic composition and affinity of the archipelagic moss flora (see also Tan, 1984). In Tan's publications, Mindanao was cited as an important island, albeit with a still incompletely known flora, which may hold critically the key to a better understanding of the origin and evolution of the entire Philippine moss flora. In recent years, the Island of Mindanao has been postulated to have a different geological origin and plate tectonic history from the rest of the islands forming the Philippine archipelago (Hall, 1998). As such, this second largest southern island of the country may harbor important floristic and bryogeographical information that needs to be documented before the local forests become completely decimated. To date, Mindanao Island has a total of 187 genera and 314 species of mosses (cf. Tan and Iwatsuki 1991), 50 of which are known only from this island. The rest are found also in Luzon and the Visayas Islands. Among the 50 species of Philippine mosses known from Mindanao, 4% are widespread in the tropics, 60% are Malesian taxa, 21% have an Australasian link, 10% have a Bornean link, and only 6% have a continental Asiatic connection. Clearly, the moss flora of Mindanao has a strong southern and Australasian influence compared to other large islands in the country (Tan ,1998). The main objective of this paper is to determine the species richness, distribution, and status of mosses in selected mountains in Mindanao, Philippines.

## MATERIALS AND METHODS

### *Survey and Collection*

Survey of mosses was conducted in Mt. Kalatungan, Bukidnon Province, Mt. Matutum, Tupi, South Cotabato Province, and Mt. Malambo, Datu Salumay, Davao Province. Representative specimens of mosses were collected at 10 m on each side of the trail from base to the upper portion of the three selected areas using alpha- taxonomy method.

### *Classification and Identification*

The specimens collected were classified and identified using the taxonomic keys of Bartram (1939). Morphological characters of the leaf (leaf arrangement, midrib, base, apex, margin, cells, shape) and sporophyte (size, shape, texture of capsule and seta, number of teeth) were used to identify the species.

### *Photographs*

A camera was used for documentation. Stereomicroscope, trinocular microscope and dissecting microscope were also used to identify and classify the species of mosses.

### *Preparation of Herbarium specimens*

The collected specimens of mosses were placed in a plastic bag or ziplock, labelled with the following data: collection number, name of collector, altitude, name of the mountain, date of collection, and associated habitats. This was then air-dried and placed in a standard packets and properly labeled for herbarium vouchers.

### *Assessment of Conservation Status*

A New Annotated Checklist of Iwatsuki and Tan (1991**),** print scientific journals and on-line journals were used to determine the status of the collected specimens. Assessment of conservation status of the species, whether new record in the Philippines, new in Mindanao, new in terms of locality, rare, and widespread was made.

## RESULTS AND DISCUSSION

### Species Richness and Distribution

A total of 137 species, 87 genera and 33 families of mosses were found in the three selected mountains in Mindanao, Philippines (Figs. 1 and 2, p. 87 and Table 1 p. 76).

Mt. Kalatungan (Fig. 3 p. 87) showed the highest species composition with 109 species , followed by Mt. Matutum (Fig. 4 p. 88) with 53 species, and Mt. Malambo (Fig. 5 p. 88) with only 20 species of mosses (Table 1).

Table 1. Checklist of family, genera, and species of mosses on the selected mountains in Mindanao, Philippines

| | Family / Genera / Species | KALATUNGAN | MALAMBO | MATUTUM | STATUS |
|---|---|---|---|---|---|
| | **Fissidentaceae** | | | | |
| | *Fissidens Hedw.* | | | | |
| 1 | *Fissidens oblongifolius* Hook. f. & Wils. | / | x | x | NRL,NRM |
| 2 | *Fissidens nobilis* Griff. | / | x | / | NRL,W |
| | **Dicranaceae** | | | | |
| | *Campylopodium* ( C. Mull.) Besch. | | | | |
| 3 | *Campylopodium medium* ( Duby) Giese & Frahm | / | x | x | NRL,NRM |
| | *Campylopus* Brid. | | | | |
| 4 | *Campylopus ericoides* ( Griff.) Jaeg | x | / | / | NRL,NRM |
| 5 | *Campyopus umbellatus* ( Arnott) Par. | / | x | x | NRL,W |
| | *Dicranella* ( C. Mull.) Besch. | | | | |
| 6 | *Dicranella setifera* ( Mitt.) Jaeg | / | x | x | NRL,R,NRM |
| | *Dicranoloma* ( Ren.) Ren. | | | | |
| 7 | *Dicranoloma billarderi* cf. ( Brid. ex anon.) Par. | / | / | x | NRL |
| 8 | *Dicranoloma blumii* (Nees)Par. | / | x | x | NRL,W |
| 9 | *Dicranoloma brevisetum var. brevisetum* ( Dozyy & Molk) Par. | x | x | / | NRL |
| 10 | *Dicranoloma brevisetum var. samoanum* ( Broth.) Tan & Kop. | / | x | x | NRL,W |
| 11 | *Dicranoloma reflexum* ( C. Mull.) Ren. | / | x | x | NRL,NRM |
| | *Holomitrium* Brid. Nom. Cons | | | | |
| 12 | *Holomitrium cylindraceum* ( P. Beauv.) Wijk & Marg. | / | x | / | NRL,NRM |
| | *Leucoloma* Brid.Nom. Cons | | | | |
| 13 | *Leucoloma molle* ( C. Mull.) Mitt. | / | / | / | NRL |
| | *Trematodon* Michx. | | | | |

Table 1 continued

| | | | | | |
|---|---|---|---|---|---|
| 14 | *Trematodon longicolis* Michx. | / | x | x | NRL,NRM |
| | **Leucobryaceae** | | | | |
| | *Cladopodanthus* Dozy & Molk. | | | | |
| 15 | *Cladopodanthus speciosus* ( Dozy & Molk.) Fleisch. | / | x | x | NRL,NRM |
| | *Leucobyum* Hampe | | | | |
| 16 | *Leucobryum aduncum* Dozy & Molk. | / | x | x | NRL,NRM |
| 17 | *Leucobyum boninense* Sull. & Lesq. | / | x | x | NRP,NRL,R |
| 18 | *Leucobryum chlorophyllum* C. Mull. | / | x | x | NRL,NRM |
| 19 | *Leucobyum javense* ( Brid.) Mitt. | / | / | / | NRL |
| 20 | *Leucobyum sanctum* ( Brid.) Hampe | x | / | x | NRL |
| | *Leucophanes* Brid. | | | | |
| 21 | *Leucophanes glaucum* ( Schwaegr.) Mitt. | / | x | / | NRL |
| 22 | *Leucophanes angustifolium* Ren. & Card. | / | x | / | NRL |
| | *Octoblepharum* Hedw. | | | | |
| 23 | *Octoblepharum albidum* Hedw. | / | x | x | NRL |
| | **Calymperaceae** | | | | |
| | *Calymperes* Sw. in Web. | | | | |
| 24 | *Calymperes serratum* A. Br. ex C. Mull. | / | x | / | NRL |
| | *Exostratum* Ellis | | | | |
| 25 | *Exostratum blumei* ( Ness ex Hampe) Ellis | / | x | x | NRL |
| 26 | *Exostratum sullivantii* ( Dozy & Molk.) Ellis | / | x | x | NRL,NRM |
| | *Syrrhopodon* Schwaegr. | | | | |
| 27 | *Syrrhopodon gardneri* ( Hook.) Schwaegr. | / | x | x | NRL,NRM |
| 28 | *Syrrhopodon japonicus* ( Besch.) Broth. | / | x | x | NRL,NRM |
| | **Pottiaceae** | | | | |
| | *Barbula* Hedw. Nom. Cons | | | | |
| 29 | *Barbula obscuriretis* Dix. | / | x | x | NRL,NRM |
| | *Hyophila* | | | | |
| 30 | *Hyophila involuta* ( Hook.) Jaeg. | / | x | x | NRL,W |

Table 1 continued

| | | | | | |
|---|---|---|---|---|---|
| 31 | *Hyophila rosea* Williams | / | / | x | NRL,NRM |
| | *Pseudosymblepharis* Broth. | | | | |
| 32 | *Pseudosymblepharis angustata* ( Mitt.) Hilp. | x | x | / | NRL,R,NRM |
| | *Weissia* Hedw. | | | | |
| 33 | *Weissia controversa* Hedw. | / | x | x | NRL,R |
| | **Funariaceae** | | | | |
| | *Funaria* Hedw. | | | | |
| 34 | *Funaria hygrometrica var. calvescens* (Schwaegr.) Mont. | / | x | x | NRL,W |
| | **Splachnaceae** | | | | |
| | *Tayloria* Hook. | | | | |
| 35 | *Tayloria indica* Mitt. | / | x | x | NRL |
| | **Bryaceae** | | | | |
| | *Brachymenium* Schwaegr. | | | | |
| 36 | *Brachymenium nepalense* Hook. | / | x | / | NRL,W |
| | *Bryum* Hedw. | | | | |
| 37 | *Bryum apiculatum* Schwaegr. | / | x | x | NRL |
| 38 | *Bryum sahyadrense* Card. & Dix. | / | x | x | NRL |
| | *Rhodobryum* Hampe. | | | | |
| 39 | *Rhodobryum aubertii* ( Schwaegr) Thir. | x | / | x | NRL |
| 40 | *Rhodobryum giganteum* ( Schwaegr.) Par. | / | x | x | NRL |
| | **Mniaceae** | | | | |
| | *Orthomnion* Wills. | | | | |
| 41 | *Orthomnion elimbatum* ( Nog.) T. Kop. | / | x | x | NRL,R,NRM |
| | *Plagiomnium* Kop. | | | | |
| 42 | *Plagiomnium integrum* ( Bosch. & Lac.) T.Kop. | / | x | x | NRL,NRM |
| | **Rhizogoniaceae** | | | | |
| | *Hymenodon* Hook.F. & Wils. | | | | |
| 43 | *Hymenodon angustifolius* Lac. | x | x | / | NRL |
| | *Pyrrhobryum* Mitt. | | | | |

Table 1 continued

| | | | | | |
|---|---|---|---|---|---|
| 44 | *Pyrrhobryum latifolium* ( Bosch. & Lac.) T. Mitt. | / | x | x | NRL |
| 45 | *Pyrrhobryum spiniforme* ( Hedw.) Mitt. | / | x | / | NRL,W |
| | *Rhizogonium* Brid. | | | | |
| 46 | *Rhizogonium graeffeenum* ( C. Mull.) Jaeg. | x | / | x | NRL |
| | **Hypnodendraceae** | | | | |
| | *Hypnodendron* ( C. Mull.) Lindb. Ex Mitt. | | | | |
| 47 | *Hypnodendron auricomum* Broth. & Geh. | / | x | x | NRP,NRL,R |
| 48 | *Hypnodendron dendroides* ( Brid.) Touw | / | x | / | NRL,W |
| 49 | *Hypnodendron diversifolium* Broth. & Geh. | / | x | x | NRL |
| 50 | *Hypnodendron reinwardtii ssp.caducifolium* ( Herz.) Touw | x | / | x | NRL,W |
| 51 | *Hypnodendron subspinervium* ( C. Mull.) Jaeg. *ssp arborescens* ( Mitt.) Touw | / | x | / | NRL |
| | **Bartramiaceae** | | | | |
| | *Philonitis* Brid. | | | | |
| 52 | *Philonitis calomicra* Broth. | x | x | / | NRL |
| 53 | *Philonitis mollis* ( Dozy & Molk.) Mitt. | / | x | x | NRL,NRM |
| 54 | *Philonitis runcinata* C. Mull. Ex aongstr | x | x | / | NRL |
| 55 | *Philonitis thwaitesii* Mitt. | x | x | / | NRL,NRM |
| | **Spiridentaceae** | | | | |
| | *Spiridens* Nees | | | | |
| 56 | *Spiridens reinwardtii* Nees | / | x | x | NRL,W |
| | **Erpodiaceae** | | | | |
| 57 | *Erpodium biseriatum* (Aust.) Aust. | / | x | x | NRL, R,2 C |
| | **Orthotrichaceae** | | | | |
| | *Macromitrium* Brid. | | | | |
| 58 | *Macromitrium blumei* Nees ex Schwaegr. | / | x | x | NRL |
| 59 | *Macromitrium longicaule* C. Mull. | / | x | / | NRL |
| 60 | *Macromitrium salakanum* C. Mull. | / | x | / | NRL |
| 61 | *Macromitrium ochraceum* ( Dozy & Molk.) C. Mull. | / | x | x | NRL |

Table 1 continued

| | | | | | |
|---|---|---|---|---|---|
| | *Racopilum* P. Beauv. | | | | |
| 62 | *Racopilum johannis-winkleri* Broth. | / | x | / | NRL |
| 63 | *Racopilum spectabile* Reinw. & Hornsch. | / | / | / | NRL,W |
| | **Cyrtopodaceae** | | | | |
| | *Bescherellia* Duby | | | | |
| 64 | *Bescherellia philippinensis* ( C.Mull.) Fleisch. | / | x | / | NRL,R |
| | **Pronodontaceae** | | | | |
| | *Neolindbergia* Fleish. | | | | |
| 65 | *Neolindbergia cladomniodes* Akiyama | x | x | / | NRP,NRL,R |
| | **Pterobryaceae** | | | | |
| | *Calyptothecium* Mitt. | | | | |
| 66 | *Calyptothecium recurvulum* ( Broth ex C. Mull.) Broth. | x | x | / | NRL |
| | *Garovaglia* Endi. | | | | |
| 67 | *Garovaglia bauerlenii* ( Geh.) Par. | / | x | x | NRP,NRL,R |
| 68 | *Garovaglia elegans* ( Dozy & Molk.) Hampe ex Bosch & Lac. | / | / | / | NRL,W |
| 69 | *Garovaglia luzonensis var. zwickeyi* ( Bartr.) During | / | x | x | NRL |
| | *Pterobryopsis* Fleisch. | | | | |
| 70 | *Pterobryopsis gedehensis* Fleisch. | / | x | / | NRL |
| | *Symphysodon* | | | | |
| 71 | *Symphysodon neckeroides var. neckeroides* Dozy & Molk | / | x | x | NRL |
| | *Symphysodontella* Fleisch. | | | | |
| 72 | *Symphysodontella attenuatula* Fleisch. | / | x | / | NRL |
| 73 | *Symphysodontella subulata* Broth. | / | x | x | NRL |
| 74 | *Symphysodontella parvifolia* Bart. | / | x | / | NRP,NRL,R |
| | *Trachyloma* Brid. | | | | |
| 75 | *Trachyloma indicum* Mitt. | / | x | x | NRL,W |
| | **Meteoriaceae** | | | | |
| | *Aerobryidium* Fleisch. | | | | |
| 76 | *Aerobryidium crispifolium* ( Broth.& Geh.) Fleisch. ex Broth. | / | x | x | NRL,NRM |

Table 1 continued

| | | | | | |
|---|---|---|---|---|---|
| 77 | *Aerobryidium filamentosum* ( Hook.) Fleisch. | / | x | x | NRL |
| | *Aerobryopsis* Fleisch. | | | | |
| 78 | *Aerobryopsis wallichi* ( Brid.) Fleisch. | x | x | / | NRL,W |
| | *Aerobryum* Dozy & Molk. | | | | |
| 79 | *Aerobryum speciosum* (Dozy & Molk.) Dozy & Molk. | / | x | x | NRL |
| | *Barbella* Fleisch. Ex. Broth. | | | | |
| 80 | *Barbella cubensis* ( Mitt.) Broth. | / | x | x | NRL |
| | *Floribundaria* Fleisch. | | | | |
| 81 | *Floribundaria floribunda* ( Dozy & Molk.) Fleisch. | / | x | / | NRL,W |
| | *Meteoriopsis* Fleisch. Ex Broth | | | | |
| 82 | *Meteoriopsis squarrosa* ( Hook.) Fleisch. | / | x | x | NRL |
| | *Meteonium* ( Brid.) Dozy & Broth. | | | | |
| 83 | *Meteonium subpolytrichum*( Brid.) Dozy & Broth. | / | x | x | NRL,NRM |
| | *Papillaria* ( C. Mull.) C. Mull. | | | | |
| 84 | *Papillaria fuscencens* ( Hook) Jaeg. | / | x | x | NRL |
| 85 | *Papillaria leuconeura* ( C. Mull.) Jaeg. | / | x | x | NRL,NRM |
| | **Phyllogoniaceae** | | | | |
| | *Cryptogonium* ( C. Mull.) Mull. On F. Mull. | | | | |
| 86 | *Cryptogonium phylogonioides* ( Sull.) Isov. | / | x | x | NRL |
| | **Neckeraceae** | | | | |
| | *Himantocladium* ( Mitt.) Fleisch. | | | | |
| 87 | *Himantocladium cyclophyllum* ( C. Mull.) Fleisch. | / | x | x | NRL,W |
| 88 | *Himantocladium plumula* ( Ness.) Fleisch. | x | x | / | NRL |
| | *Homaliodendron* Fleisch. | | | | |
| 89 | *Homaliodendron flabellatum* ( Sm.) Fleisch. | / | x | / | NRL,W |
| | *Neckera* Hedw. Nom. Cons. | | | | |
| 90 | *Neckera warburgii* Broth. | / | x | x | NRL |
| | *Neckeropsis* Reichardt | | | | |
| 91 | *Neckeropsis lepineana* ( Mont.) Fleisch. | / | x | / | NRL,W |

Table 1 continued

| | | | | | |
|---|---|---|---|---|---|
| | *Pinnatella* Felisch. | | | | |
| 92 | *Pinnatella mariei* ( Besch.) Broth. | / | x | x | NRL |
| 93 | *Pinnatella alopecuroides* ( Hook.) Fleisch. | / | x | x | NRL |
| | **Lembophyllaceae** | | | | |
| | *Neobarbella* Nog. | | | | |
| 94 | *Neobarbella comes* ( Griff.) Nog. | / | x | x | NRL,NRM |
| | **Hookeriaceae** | | | | |
| | *Calliscostella* (C. Mull.) Mitt.,nom.cons | | | | |
| 95 | *Calliscostella papillata* ( Mont.) Mitt. | x | x | / | NRL,W |
| | *Calyptrochaeta* Desv. | | | | |
| 96 | *Calyptrochaeta parviretis* cf. ( Fleisch.) Iwats., Tan & Touw | x | x | / | NRL |
| 97 | *Calyptrochaeta remotifolia* ( C. Mull.) Iwats., Tan & Touw | / | x | x | NRL |
| | *Chaetomitriopsis* Fleisch. | | | | |
| 98 | *Chaetomitriopsis glaucocarpa* ( Reinw.) Fleisch. | / | x | x | NRL |
| | *Chaetomitrium* Dozy & Molk | | | | |
| 99 | *Chaetomitrium warburgii* Broth in Warb | / | x | x | NRL |
| | *Cyclodictyon* Mitt. | | | | |
| 100 | *Cyclodictyon blumeanum* ( C. Mull.) O. Kuntze | x | x | / | NRL,W |
| | *Distichophyllum* Dozy & Molk. | | | | |
| 101 | *Distichophyllum tortile* Dozy & Molk.ex. Bosch & Lac. | / | x | x | NRL,NRM |
| | **Leucomiaceae** | | | | |
| | *Leucomium* Mitt. | | | | |
| 102 | *Leucomium strumosum* ( Horsch.) Mitt. | / | x | x | NRL |
| | **Hypopterygiaceae** | | | | |
| | *Lopidium* Hook. F. & Wils. | | | | |
| 103 | *Lopidium struthiopteris* ( Brid.) Fleisch. | / | x | / | NRL |
| | **Thuidiaceae** | | | | |
| | *Pelekium* | | | | |

Table 1 continued

| | | | | | |
|---|---|---|---|---|---|
| 104 | *Pelekium* velatum Mitt. | / | x | x | NRL,W |
| | *Thuidium* Schimp in B.S.G. | | | | |
| 105 | *Thuidium cymbifolium* ( Dozy & Molk.) Dozy & Molk. | / | x | x | NRL,W |
| 106 | *Thiudium glaucinum* ( Mitt.) Bosch. & Lac. | x | x | / | NRL |
| | **Brachytheciaceae** | | | | |
| | *Eurrhynchium* Schimp. In B.S.G. | | | | |
| 107 | *Eurrhynchium vagans* ( Jaeg.) Bartr. | / | x | / | NRL,NRM |
| | *Palamocladium* C. Mull. | | | | |
| 108 | *Palamocladium nilgheriense* ( Mont.) C. Mull. | / | x | x | NRL |
| | *Homalothecium* Schimp. | | | | |
| 109 | *Homalothecium appressifolium* ( Williams) Broth. | / | x | / | NRL,NRM |
| | *Rhynchostegium* B.S.G. | | | | |
| 110 | *Rhynchostegium celebicum* ( Lac.) Jaeg. | / | x | / | NRL |
| | **Entodontaceae** | | | | |
| | *Entodon* C. Mull. | | | | |
| 111 | *Entodon plicatus* C. Mull. | / | x | x | NRL |
| | *Erythrodontium* Hampe | | | | |
| 112 | *Erythrodontium julaceum* C. Mull. | / | x | x | NRL,W |
| | **Sematophyllaceae** | | | | |
| | *Acroporium* Mitt. | | | | |
| 113 | *Acroporium ramicola* ( Hampe) Broth. | / | x | / | NRP,NRL |
| 114 | *Acroporium stramineum* ( Reinw. & Horsch.) Fleisch. | x | / | x | NRL |
| 115 | *Acroporium strepsiphyllum* ( Mont.) B.C. Tan | x | / | x | NRL |
| | *Meiotheciella* B.C. Tan, ( Mont) B.C.Tan | | | | |
| 116 | *Meiotheciella papillosa* ( Broth in ther) B.C. Tan, Schof & Ramsay, comb.nov. | / | x | x | NRP,NRL,R |
| | *Meiothecium* Mitt. | | | | |
| 117 | *Meiothecium microcarpum* ( Hook.) Mitt. | / | x | x | NRL |
| | Radulina Buck & Tan | | | | |
| 118 | *Radulina hamata* ( Dozy & Molk) Buck & Tan | x | / | x | NRL,W |

Table 1 continued

| | | | | | |
|---|---|---|---|---|---|
| | *Rhaphidostichum* Fleisch. | | | | |
| 119 | *Rhaphidostichum piliferum* ( Broth.) Broth. | x | / | x | NRL,NRM |
| | *Sematophyllum* Mitt. | | | | |
| 120 | *Sematophyllum subpinnatum* ( Hook.) Mitt. | / | x | x | NRL |
| | *Trichosteleum* | | | | |
| 121 | *Trichosteleum ruficaule* ( Thwaits & Mitt.) Tan | / | x | / | NRL |
| | Trimegistia ( C. Mull.) C. Mull. | | | | |
| 122 | *Trimegistia calderensis* ( Sull.) Broth. | x | x | / | NRL |
| | **Hypnaceae** | | | | |
| | *Ectropothecium* Mitt. | | | | |
| 123 | *Ectropothecium dealbatum* ( Reinw. & Hornsch.) Jaeg. | / | x | x | NRL,W |
| 124 | *Ectropothecium falciforme* ( Dozy & Molk.) Jaeg. | x | / | x | NRL |
| 125 | *Ectropothecium ferrugineum* ( C. Mull.) Jaeg. | x | x | / | NRL |
| 126 | *Ectropothecium ichnotocladum* ( C. Mull.) Jaeg. | / | x | / | NRL |
| 127 | *Ectropothecium monumentorum* cf. ( Duby) cf.Jaeg. | / | x | x | NRL,W |
| 128 | *Ectropothecium penzigianum* Fleisch. | / | x | x | NRL,NRM |
| 129 | *Ectropothecium striatulum* Dix. Ex Bartr. | / | x | x | NRL,NRM |
| | *Ctenidium* ( Schimp.) Mitt. | | | | |
| 130 | *Ctenidium luzonense*cf. Broth. | / | x | x | NRL |
| | *Vasicularia* ( C. Mull.)C. Mull. | | | | |
| 131 | *Vasicularia reticulata* ( Dozy & Molk.) Broth. | x | x | / | NRL,W |
| | **Buxbaumiaceae** | | | | |
| | *Diphyscium* Mohr. | | | | |
| 132 | *Diphyscium involutum* Mitt. | / | x | x | NRL,NRM |
| | **Polytrichaceae** | | | | |
| | *Dawsonia* R. Br. | | | | |
| 133 | *Dawsonia longifolia* ( Brush & Schimp Zant var. superba ( Grev.) Zant | / | x | x | NRL, R |
| | *Pogonatum* P. Beauv. | | | | |

Table 1 continued

| | | | | | |
|---|---|---|---|---|---|
| 134 | *Pogonatum camusii* ( Ther) Touw. | / | / | x | NRL |
| 135 | *Pogonatum cirratum ssp.cirratum* ( Sw.) Brid. | / | / | x | NRL,NRM |
| 136 | *Pogonatum microphyllum* ( Dozy & Molk.) Dozy & Molk. | / | x | / | NRL,NRM |
| 137 | *Pogonatum neesii* ( C. Mull.) Dozy. | x | x | / | NRL,W |
| | TOTAL | 109 | 20 | 53 | |

Legend: x - absent
/ - present
NRP - New record in the Philippines
NRM - New record in Mindanao
NRL - New Record in terms of Locality
R - Rare
2 C - 2nd collection in the Philippines
W- Widespread

Table 2. Number of family, genera, and species of mosses in the three selected mountains in Mindanao, Philippines

| MOUNTAIN | FAMILY | GENERA | SPECIES |
|---|---|---|---|
| Kalatungan | 32 | 76 | 109 |
| Matutum | 24 | 44 | 53 |
| Malambo | 12 | 17 | 20 |

This study confirmed the report and observation of Tan (1992,1994,1998) and Tan, Lubos, and Schwarz (2000) that mosses grow best in moist forest with high altitude. Mt. Kalatungan has the highest altitude compared to Mt. Matutum and Mt. Malambo.

***Assessment***

The three mountains revealed that there are 7 new records of mosses in the Philippines, 37 new to Mindanao, 137 new records in terms of locality, 12 rare species, 1 collected twice, and 29 widespread species (Table 3).

Table 3. Status of mosses in three selected mountains in Mindanao, Philippines.

| **Status** | **Kalatungan** | **Matutum** | **Malambo** |
|---|---|---|---|
| 1. New Record in the Philippines (NRP) ( reported by Tan, Lubos, and Schwarz,2000) | **6** | **1** | **0** |
| 2. New record in Mindanao (NRM) | **33** | **8** | **0** |
| 3. New record in terms of locality (NRL) | **109** | **53** | **20** |
| 4. Rare (R) | **11** | **3** | **0** |
| 5. 2nd collection (2C) | **1** | **0** | **0** |
| 7. Widespread (W) | **21** | **13** | **4** |


Fig. 1. Philippine Map

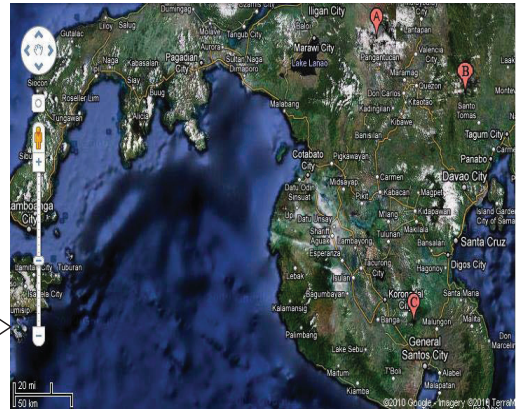


Fig. 2. Mindanao Map

Fig. 3. Mt. Kalatungan, Bukidnon Province with highest elevation of 2,824 masl

Fig. 4. Mt. Matutum, South Cotabato Province with highest elevation of 2,286 masl.

Fig. 5. Mt. Malambo, Salumay, Davao Province with highest elevation of 1,278 masl.

## CONCLUSION

The study found that there are new records of mosses found in Mindanao, particularly in Mt. Kalatungan in Bukidnon, Mt. Matutum in South Cotabato and Mt. Malambo in Salumay, Davao Province.

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