



# Diversity and Distribution of Myxomycetes (Plasmodial & Cellular Slime Molds) in Selected Highlands and Islands of Luzon, Philippines

Thomas Edison E. dela Cruz

Fungal Biodiversity and Systematics Group  
Research Center for the Natural Sciences

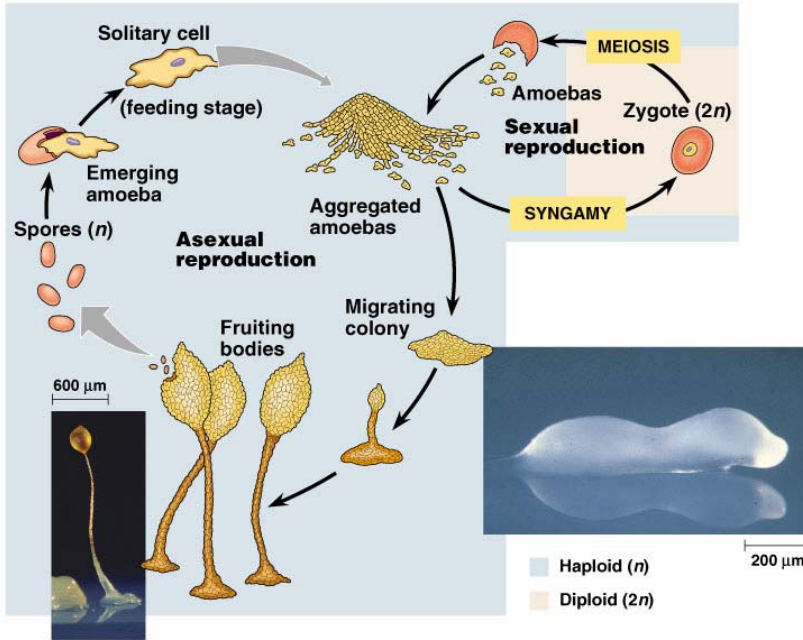
University of Santo Tomas  
España 1015 Manila, Philippines

**Email: [tedelacruz@mnl.ust.edu.ph](mailto:tedelacruz@mnl.ust.edu.ph)**

1<sup>st</sup> ASIAHORCs Symposium  
18-20 July 09, Nagoya, Japan

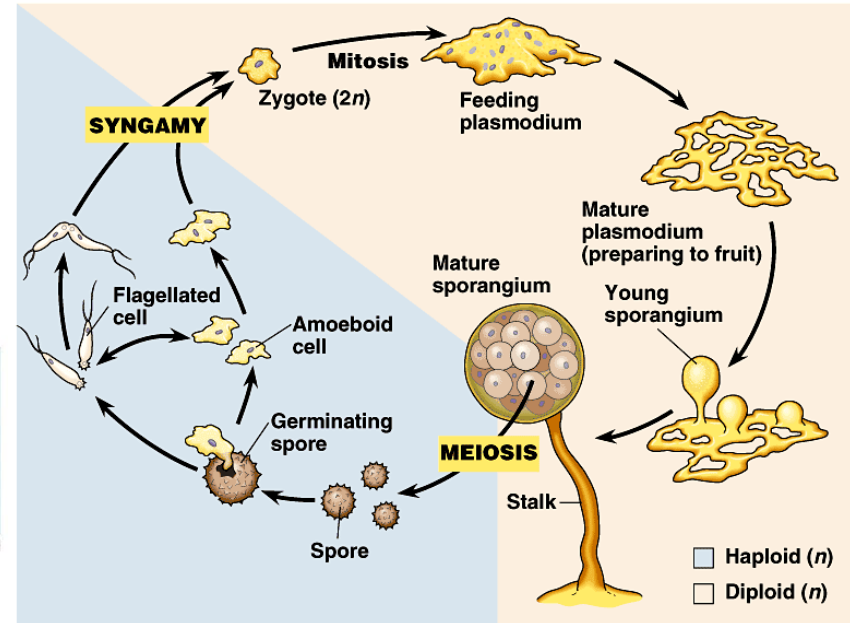
# Introduction

## Cellular Slime Molds

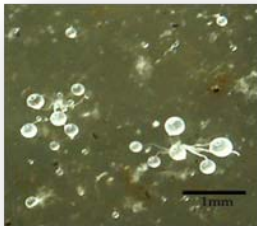


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## Plasmodial Slime Molds



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fruiting bodies

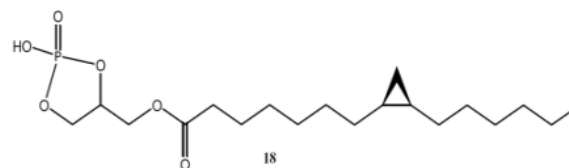


fruiting bodies

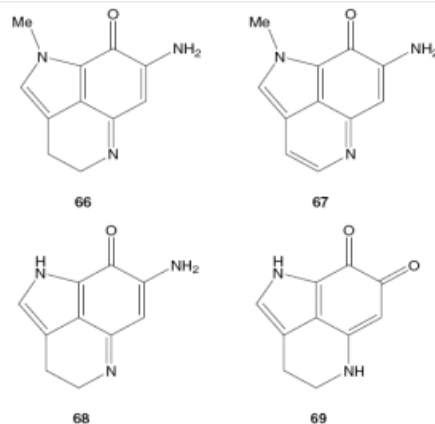


plasmodium

# Myxomycetes as Sources of Biologically Active Natural Products



Cyclic Phosphatidic Acid, an anti-cancer metabolite from *Physarum polycephalum*



Pyrroloiminoquinones from *Didymium bahiense* exhibit *in vitro* cytotoxicity against human colon tumor cell lines HCT116.

# Myxomycetes in the Philippines

## ❖ Reynolds (1981)

- annotated checklist of Philippine Myxomycetes
  - 107 species
    - 53 new records for the Philippines
    - 60% of the estimated no. of myxomycetes in the country



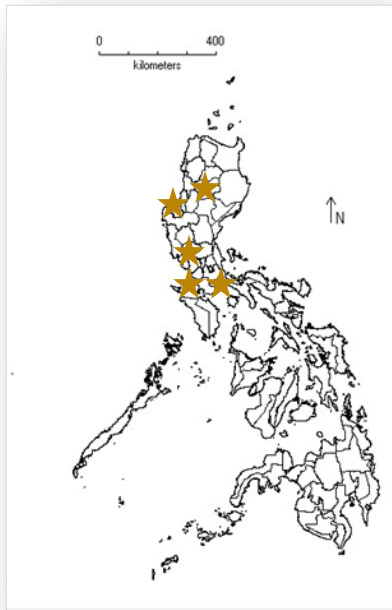
Urgent Problem:

loss of natural habitats  
(man-made activities)

## Our Objective ...

- ✓ to assess the diversity and distribution of myxomycetes found in selected highlands and islands of Luzon, Philippines

# Our Methods



## **Cavite Province (~650 masl)**

1. People's Park, Tagaytay City
2. Picnic Grove, Tagaytay City



## **Laguna Province (~1000 masl)**

1. Mt. Makiling Botanic Garden
2. UPLB – MNH



## **Benguet Province (~1500 masl)**

1. Teacher's Camp & Camp John Hay, Baguio City
2. Benguet State University, La Trinidad



## **Pangasinan Province**

1. Hundred Islands
2. Anda Island

# Our Methods

Aerial Leaf Litter

Bark

Ground Leaf Litter

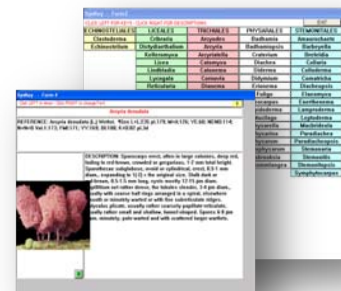
Twigs

Moist Chamber Setups (420)

5 Bark or Twig/ 10 Leaf Litter  
3 Moist Chambers per Substrate

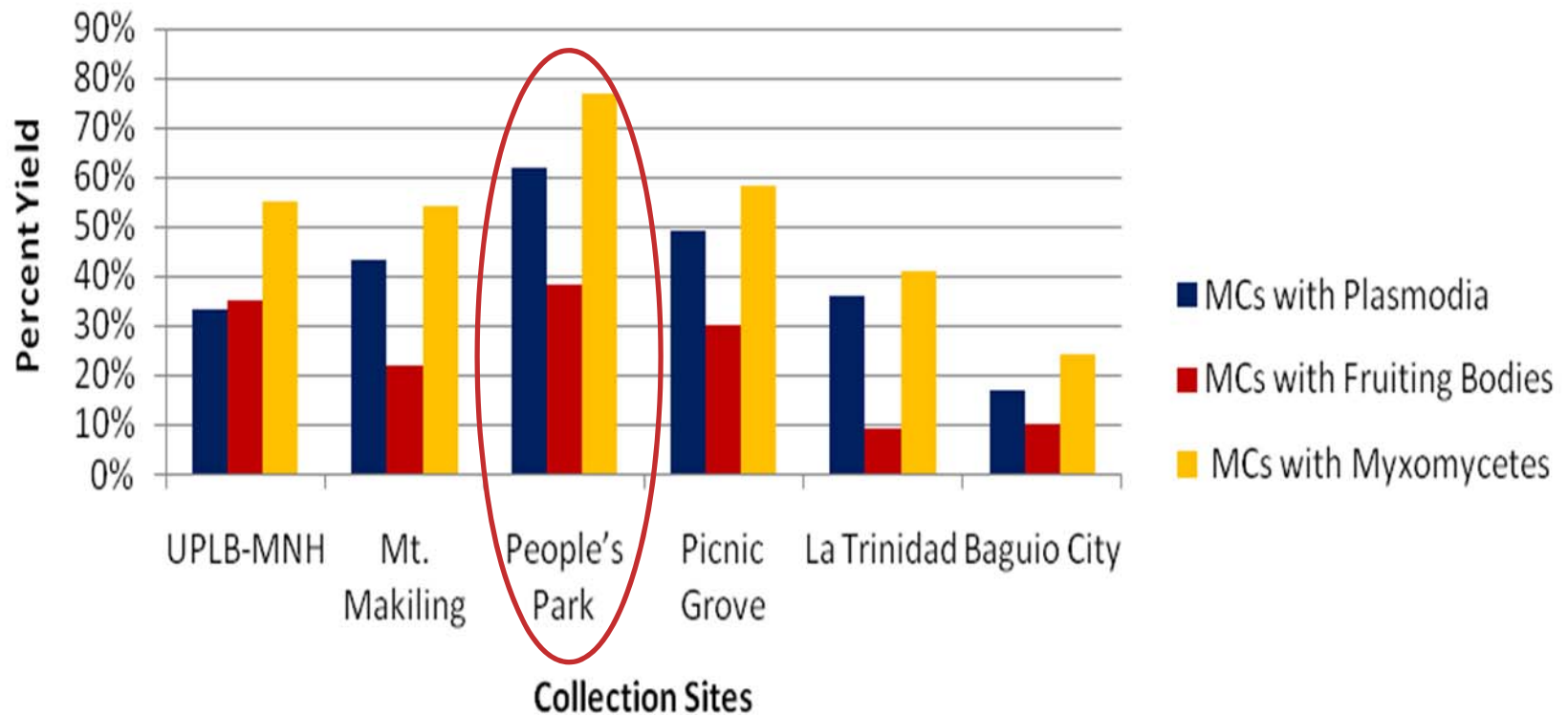
Identification

Diversity Assessment



# Our Results

Myxomycete productivity in the selected highland sites



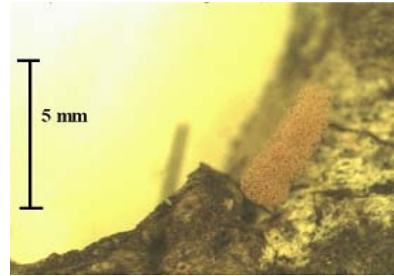


# Our Results

## Myxomycetes Collected From the Different Highland Sites



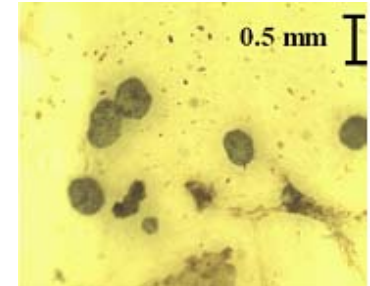
*Arcyria cinerea* var.  
*digitata*



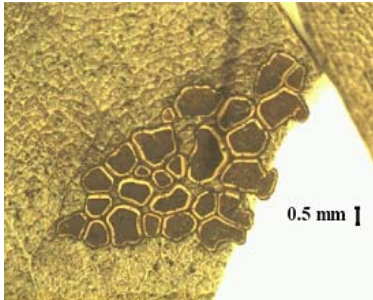
*Arcyria denudata*



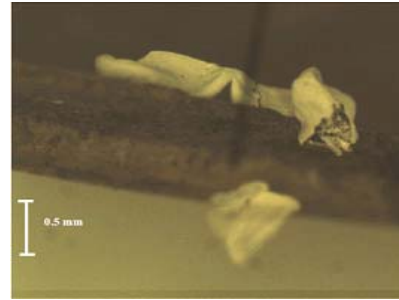
*Stemonitis fusca*



*Physarum* sp.



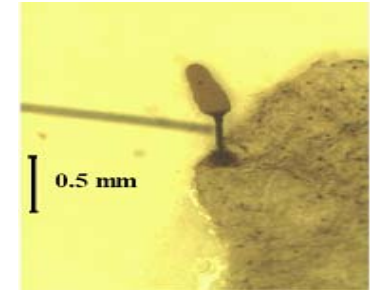
*Perichaena depressa*



*Physarum bivalve*



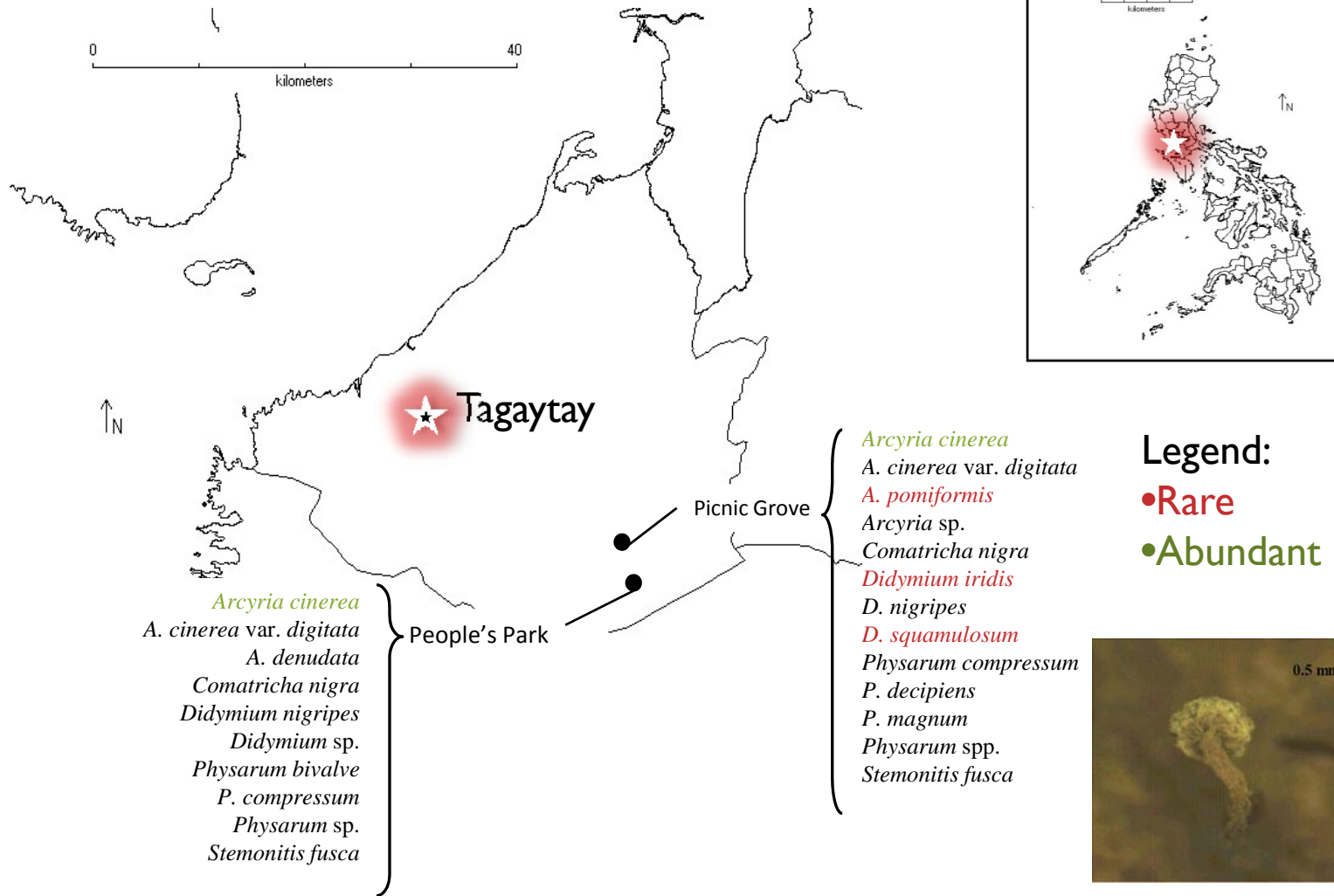
*Perichaena chryosperma*



*Arcyria cinerea*

# Our Results

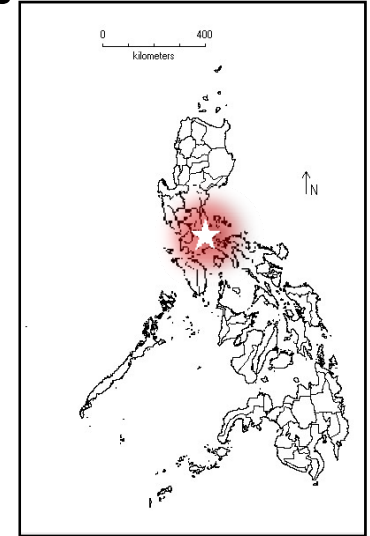
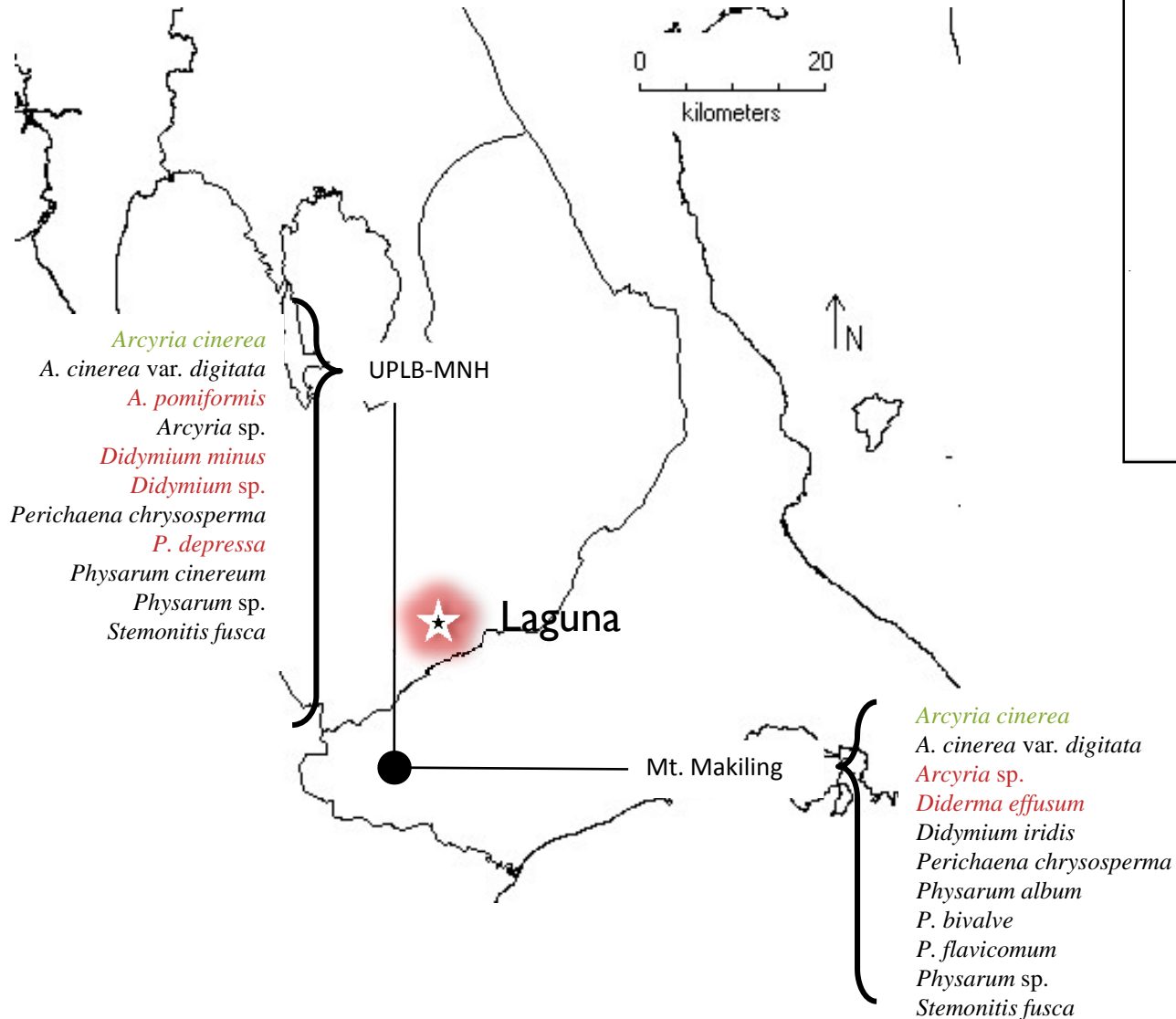
## Abundance of Myxomycetes in Different Highland Sites



*Didymium squamulosum*

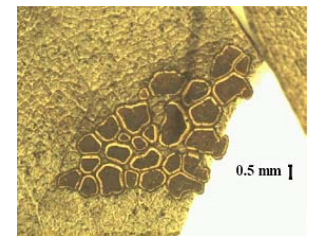
# Our Results

## Abundance of Myxomycetes in Different Highland Sites



### Legend:

- Rare
- Abundant



*Perichaena depressa*

# Our Results

## Abundance of Myxomycetes in Different Highland Sites



*Arcyria cinerea*  
*A. cinerea* var. *digitata*  
*Comatricha nigra*  
*Perichaena chrysosperma*  
*Physarum album*

La Trinidad

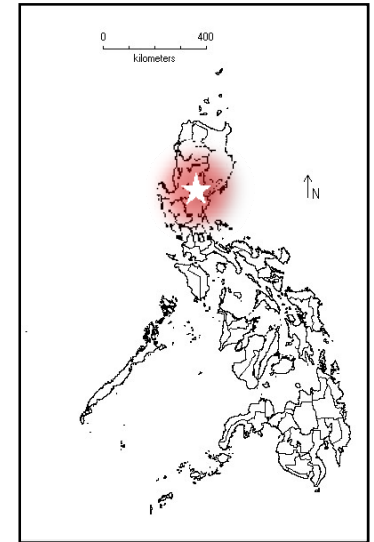


Benguet



*Arcyria cinerea*  
*A. cinerea* var. *digitata*  
*Comatricha nigra*  
*Didymium iridis*  
*Stemonitis fusca*

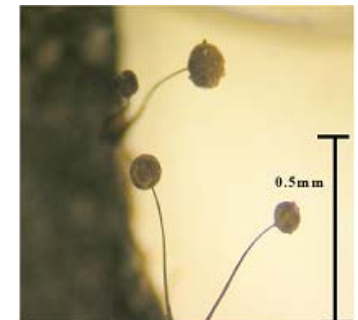
Baguio



Legend:

● Rare

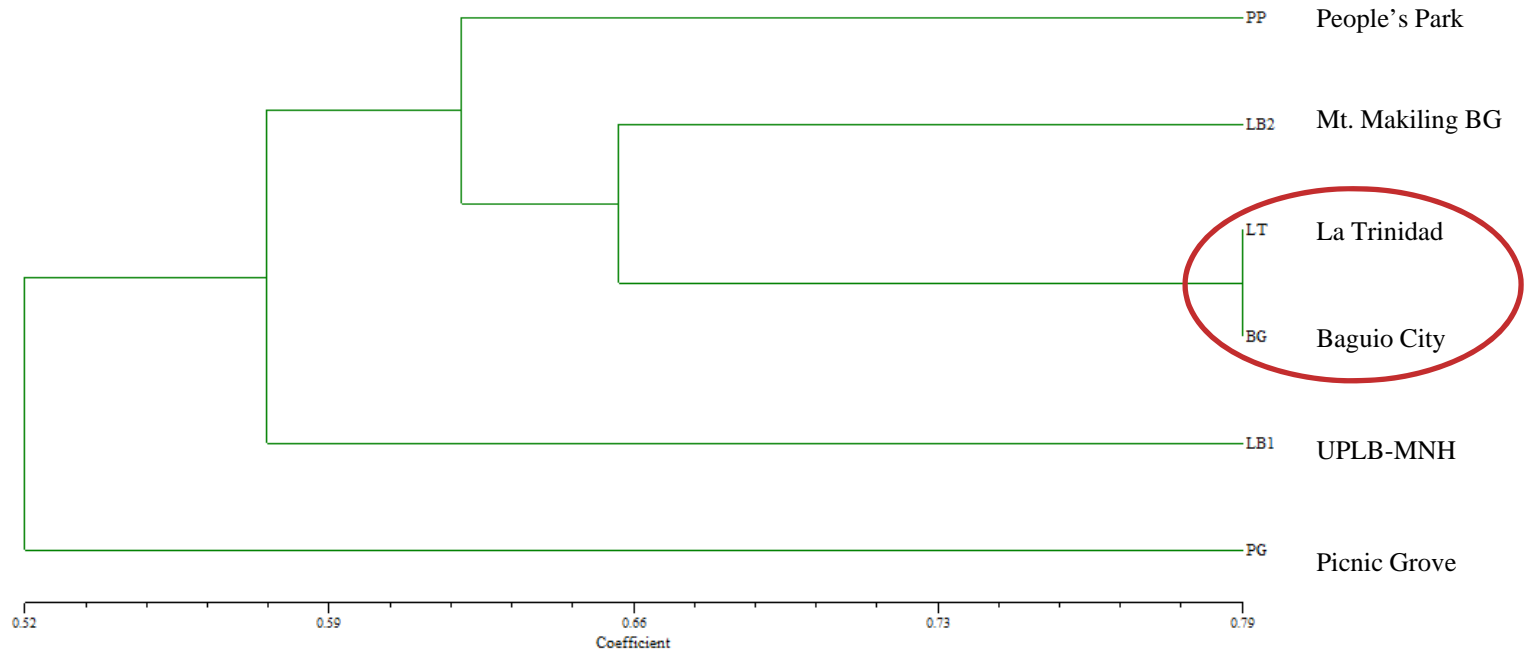
● Abundant



*Comatricha nigra*

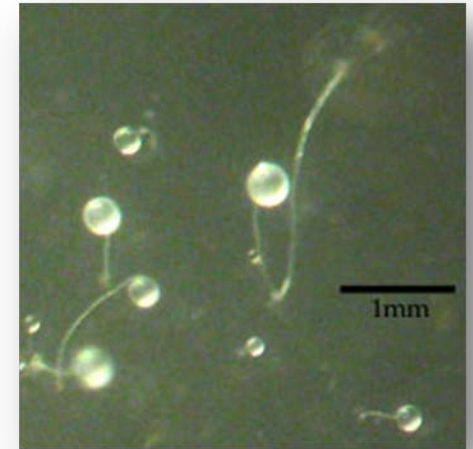
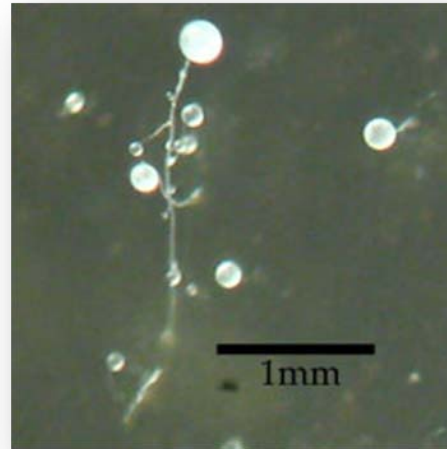
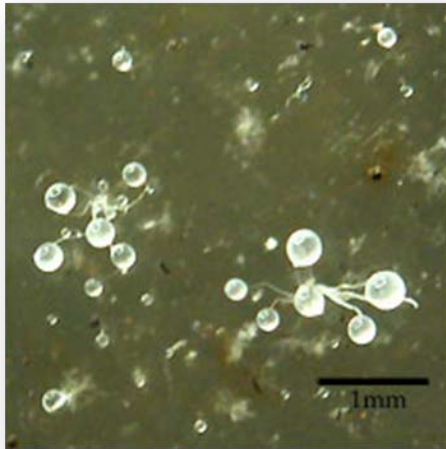
# Our Results

Cluster analysis of the different highland sampling sites in Luzon based on their simple matching coefficient (Ssm) values



# Our Results

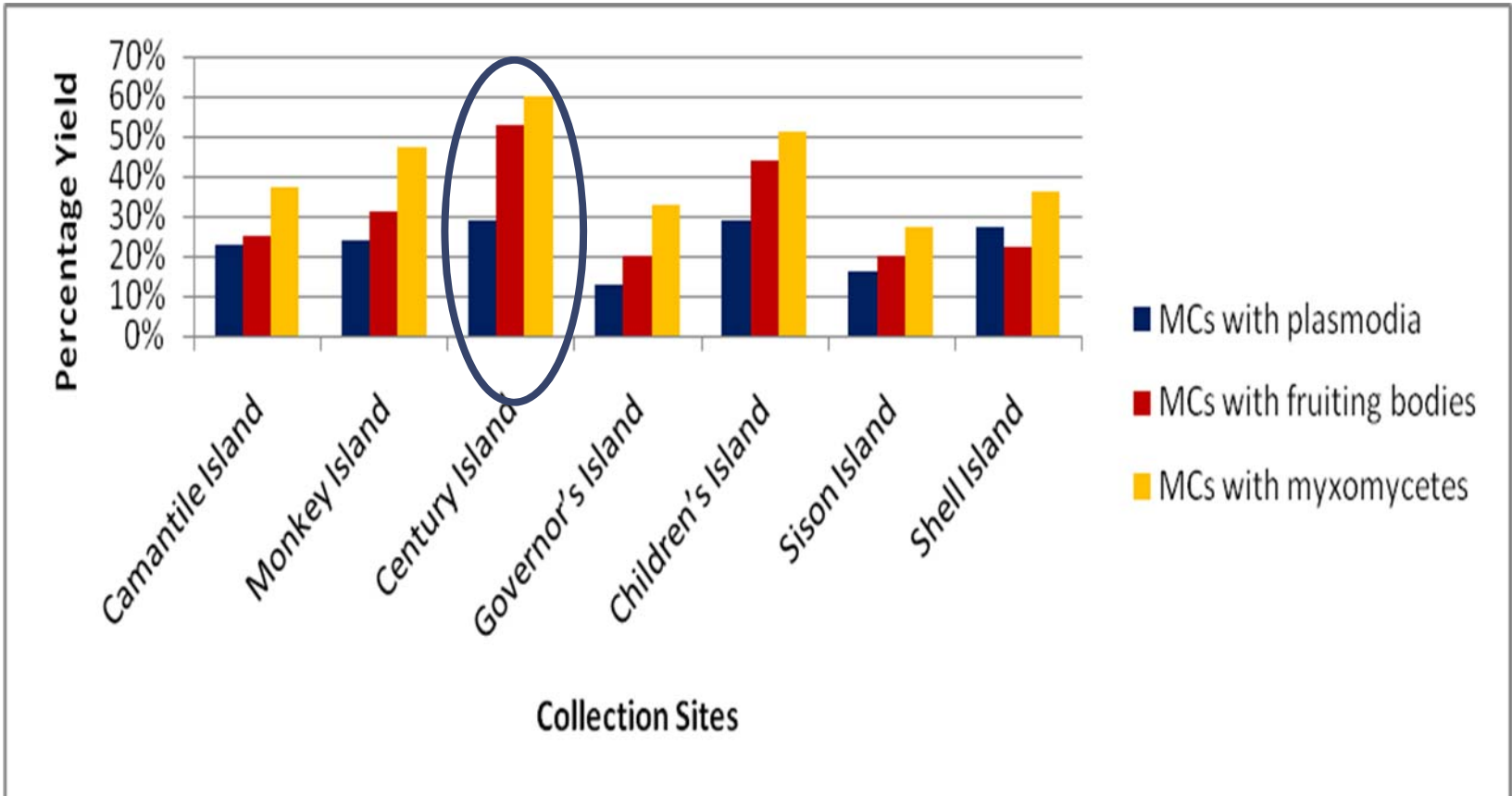
## Dictyostelids of Mt. Arayat National Park, Pampanga



Three species of *Dictyostelium* isolated from soil samples collected in montane forests of Mt. Arayat.

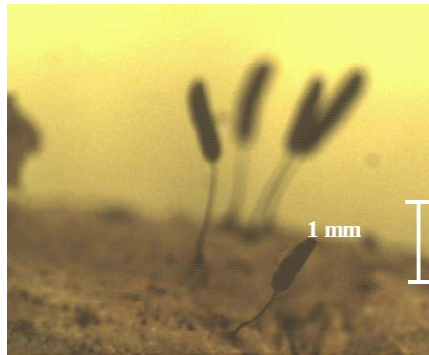
# Our Results

Myxomycete productivity in the selected island sites

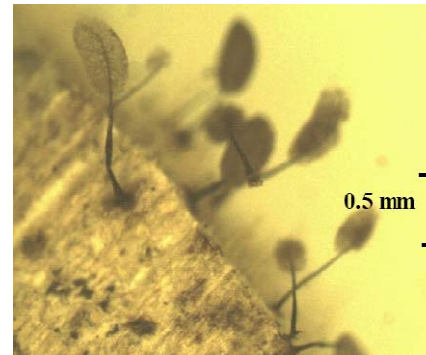


# Our Results

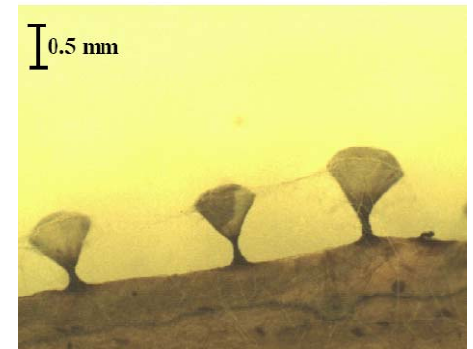
## Myxomycetes Collected From the Hundred and Anda Islands



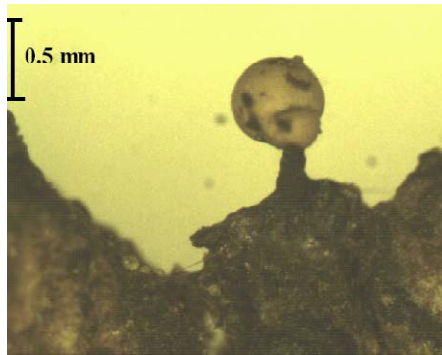
*Comatricha* sp. 1



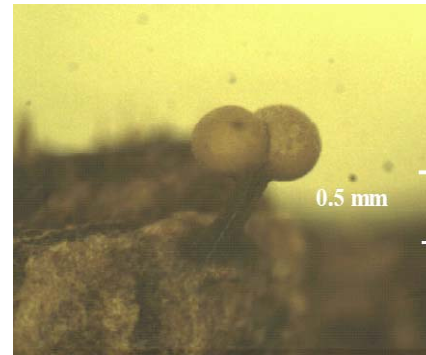
*Comatricha* sp. 2



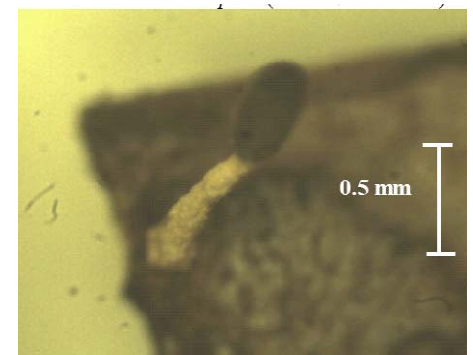
*Craterium* sp. 2



*Perichaena* minor



*Perichaena* pedata



*Diachea* leucopodia



# Our Results

## Abundance of Myxomycetes in Different Island Sites

*Arcyria cinerea*  
*Collaria arcyrionema*  
*D. hemisphaericum*  
*Didymium nigripes*  
*D. iridis*  
*P. echinosporum*  
*Physarum sp.*

**Monkey Island**

*Arcyria cinerea*  
*Arcyria sp.*  
*D. hemisphaericum*  
*Didymium iridis*  
*D. squamulosum*  
*Collaria arcyrionema*  
*Comatricha spp.*  
*Lepidoderma tigrinum*  
*Perichaena depressa*  
*Physarum spp.*  
*Stemonitis fusca*

**Century Island**

*Arcyria cinerea*  
*Arcyria denudata*  
*Arcyria sp.*  
*D. hemisphaericum*  
*D. squamulosum*  
*Perichaena minor*  
*P. pedata*  
*P. echinosporum*  
*P. compressum*  
*Physarum sp.*

**Camantiles Island**



*Arcyria cinerea*  
*Arcyria sp.*  
*D. hemisphaericum*  
*D. squamulosum*  
*D. iridis*  
*D. minus*  
*Didymium sp.*  
*Collaria arcyrionema*  
*Calomyxa metallica*  
*Physarum spp.*  
*Physarum cinereum*

**Children's Island**

*Arcyria cinerea*  
*Arcyria sp.*  
*Didymium hemisphaericum*  
*Physarum sp.*

**Governor's Island**

*Arcyria cinerea*  
*A. denudata*  
*Didymium indis*  
*D. squamulosum*

**Sison Island**

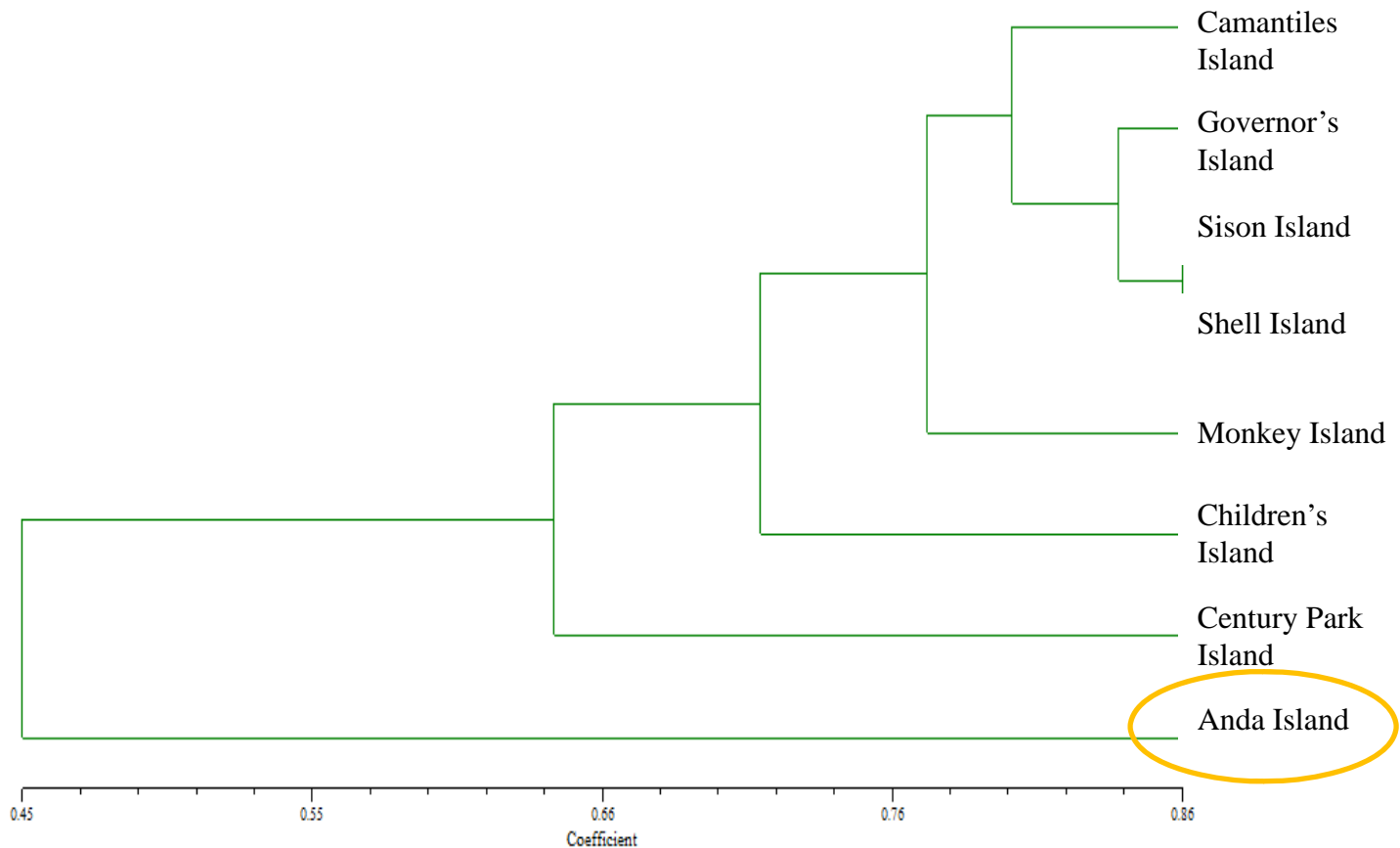
*Arcyria cinerea*  
*Comatricha nigra*  
*Perichaena chrysoesperma*  
*Physarum bogoriense*

**Shell Island**

**Abundant** and **rare** species collected from Hundred Islands

# Results and Discussion

Cluster analysis of the different island sampling sites in Pangasinan based on their simple matching coefficient (Ssm) values



# New Records for Philippine Myxomycetes

- ✓ *Elaeomyxa miyazakiensis*
- ✓ *Lepidoderma tigrinum*
- ✓ *Perichaena pedata*
- ✓ *Physarum decipiens*



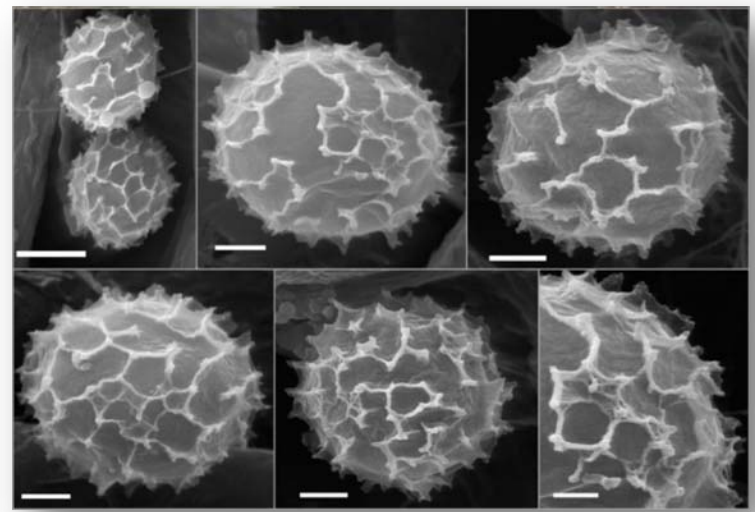
*Perichaena pedata*



*Elaeomyxa miyazakiensis*

# A New Species of Myxomycetes

A species identified as belonging to the genus *Craterium* is new to science.



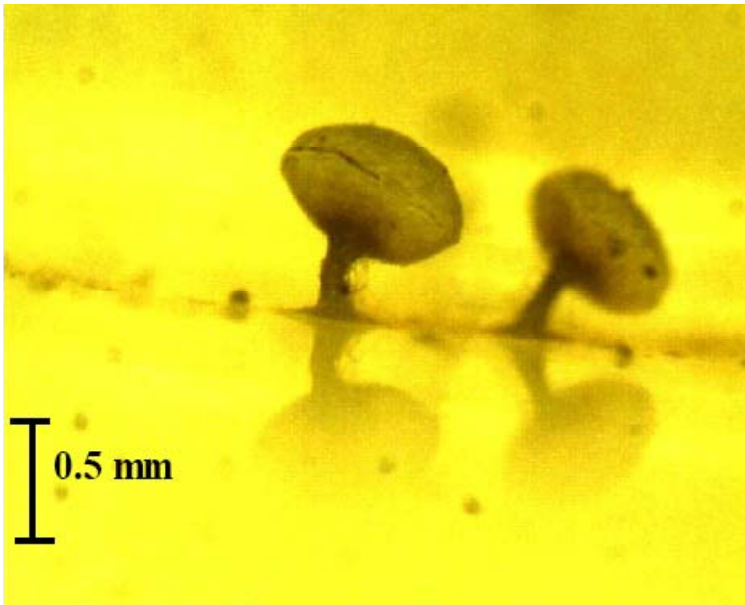
Sporocarp and spores (SEM) of the new species of *Craterium* sp.

*Photo courtesy of David Mitchell and Gabriel Moreno*

**Proposed Name: *Craterium retisporum* sp. nov.**

# Another New Species of Myxomycetes?

Another species belonging to the genus *Craterium* could be again new to science.



***Craterium* sp. 1  
(3m AN08 AL04A)**

No SEM or taxonomic descriptions made yet.

# Summary & Conclusions

- ✓ High myxomycete yield (60-70 %) was noted on substrates collected from selected highlands and islands of Luzon.
- ✓ A total of 35 species belonging to at least 13 genera were identified from the highland and island sites.
- ✓ Four species were identified as new records for the Philippines and one species is new to science.
- ✓ Differences and similarities in myxomycete assemblages were noted between and within the highland and island collection sites.

# Implications of Our Research Study

- ✓ The Philippines harbors many unique species.
  - ❖ four new records:
    - *Elaeomyxa miyazakiensis*
    - *Lepidoderma tigrinum*
    - *Perichaena pedata*
    - *Physarum decipiens*
  - ❖ one new species: *Craterium retisporum* sp. nov.
  
- ✓ Myxomycetes can be tapped for novel, bioactive metabolites or enzymes of biotechnological applications.

# Acknowledgements

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**Maraming Salamat Po!**