Phylloporia (Basidiomycota, Hymenochaetaceae) in tropical Africa: an overview



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- The genus *Phylloporia* – Introduction

- Hymenochaetaceae, Basidiomycota
- Distributed predominantly in tropical areas
- Morpho-ecologically highly heterogeneous genus
- Trophic ecology not yet fully understood

Typical *Hymenochaetaceae* :

Brownish lignicolous basidiomes

Positive xantochroic reaction

Hymenial setae

Saprotrophic (« White rot »)

- The genus *Phylloporia* – Taxonomy

- **Taxonomy (concept of « morpho- and ecological type »)** :
  - Informal classification in **morpho-ecological types** (**MET**), complexes of species easy to recognize (Yombiyeni et al. 2015)

P. pectinata ME type

P. bibulosa ME type

P. spathulata ME type

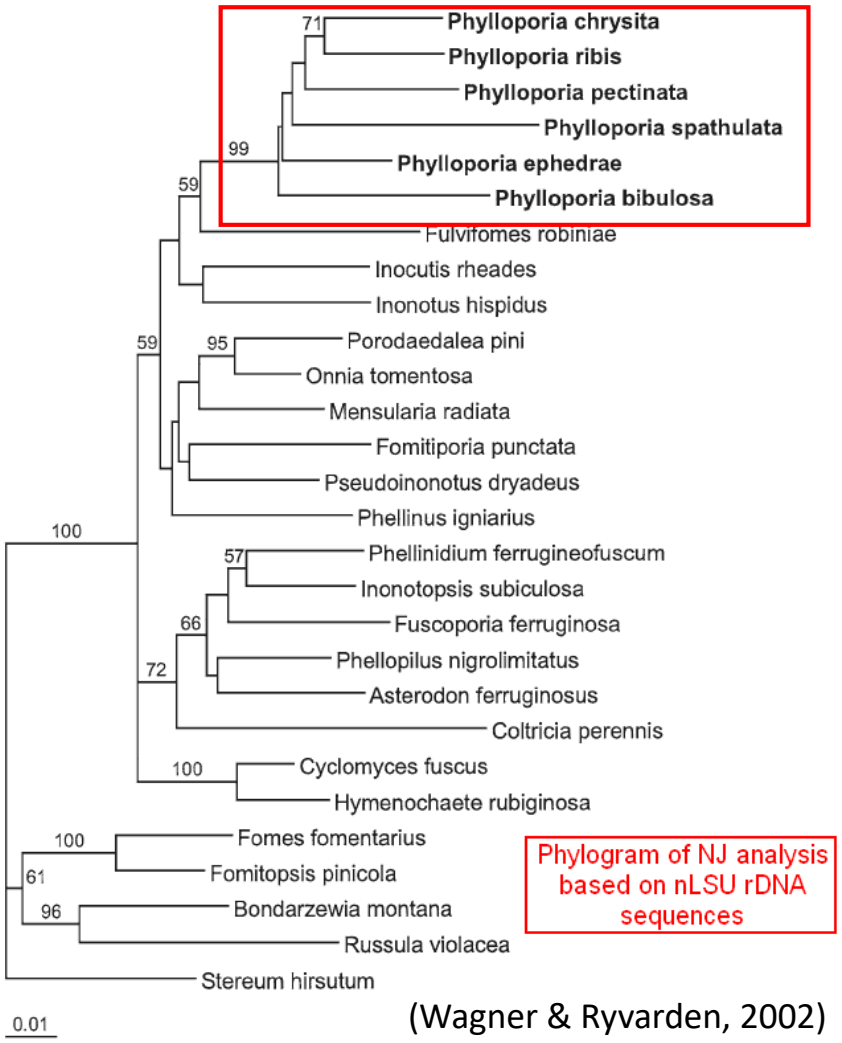
  - Species recognition within each MET can be difficult (e.g., similar basidiomes shape and size, hyphal system, basidiospores shape and size)
  - However, **high level of hosts plant specificity** and high level of endemism

- The genus *Phylloporia* – Phylogeny

- **Phylogenetic classification (concept of « phylospecies »):**
  - ➢ Monophyletic clade, separated from the other genera of Hymenochaetaceae (Wagner & Ryvarden, 2002);
  - ➢ Current phylogenies are all based on partial sequences of **28S rDNA**;

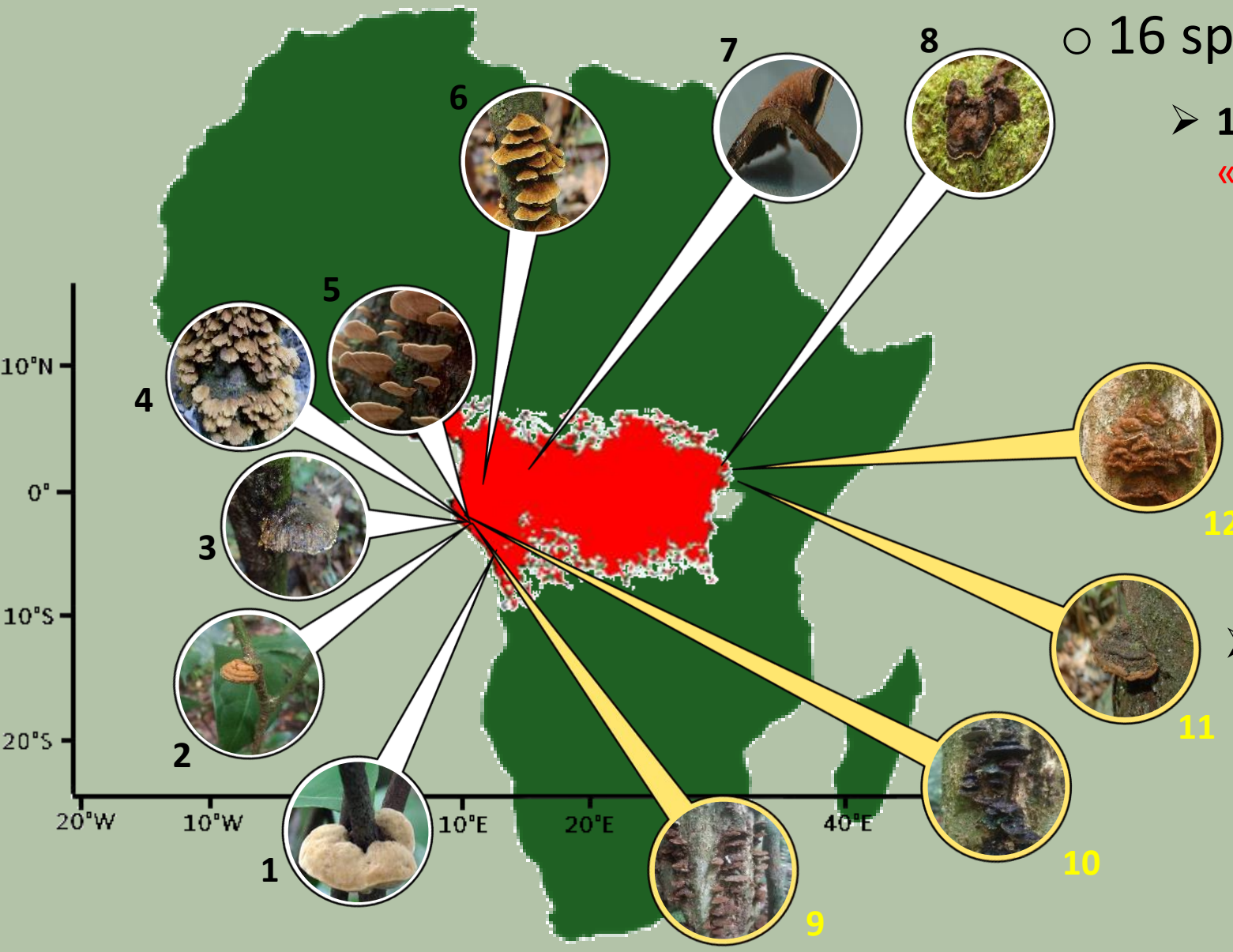
=> suitable for species delimitation but not to resolve affinities between species (e.g., pertinence of the MET)

« Consolidated » species concept :
A sp. = A unique morphologic, ecologic and phylogenetic species



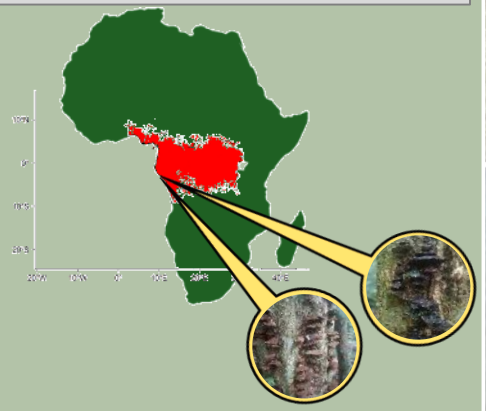
(Wagner & Ryvarden, 2002)

- *Phylloporia* in tropical Africa– An overview



- 16 species reported in tropical Africa
  - **12 species** are endemics (10 from the « Guineo-Congolian » phytogeographic region)
    1. *P. litoralis*
    2. *P. rinorea*
    3. *P. inonotoides*
    4. *P. gabonensis*
    5. *P. flabelliforma*
    6. *P. fulva*
    7. *P. afrospathulata*
    8. *P. minutispora*
    9. ***P. warneckeae (sp.nov.)***
    10. ***P. memecylonis (sp. nov.)***
    11. ***P. kakamega (sp. nov.)***
    12. ***P. elgonii (sp. nov.)***
  - **4 others species** (*P. weberiana*, *P. frutica*, *P. spathulata and P. chrysites*), presumably circumtropical, **should be still confirmed in Africa**

– 4 new species in tropical Africa–
P. warneckeae vs *P. memecylonis*

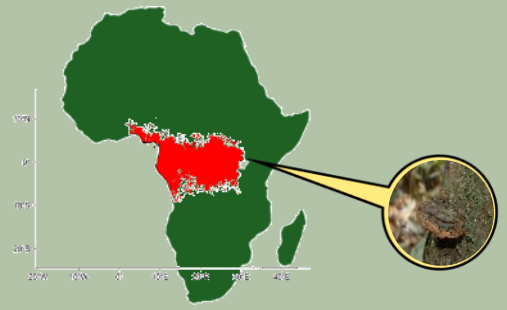


- Localisation : Rabi, Southwestern Gabon (lower Guinean rainforest)
- **Sympatric** in the understory compartment
- Phylogenetically closely related (**sister clades**)
- Share most of theirs morphological and ecological characters (both belong to ***P. fulva* MET**)
- Different **host plants** (resp. *Warneckea* sp. Vs *Memecylon* sp., two **Melastomataceae**)

Host specialization might be a strong driver of speciation in *Phylloporia*

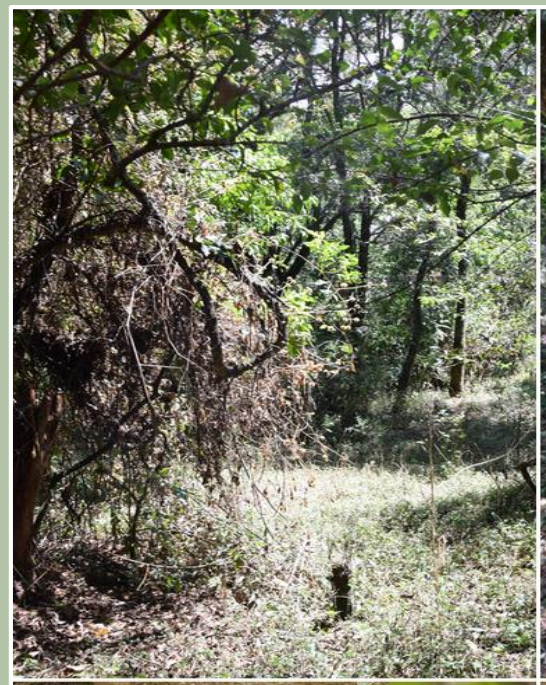
– 4 new species in tropical Africa–
P. kakamega

- Localisation
  - Kakamega forest, Kenya



- Ecology :
  - Growing on **small-stemmed**, **living trunk** of ***Rawsonia lucida*** (Achariaceae), understory of a relict forest of the Eastern edge of Guineo-Congolian rainforest

- Morphology :
  - ***P. weberiana* MET**
  - Morphologically, differs from the other species by a cinnamon to dark brown pileus and very small pores (10-11/mm)



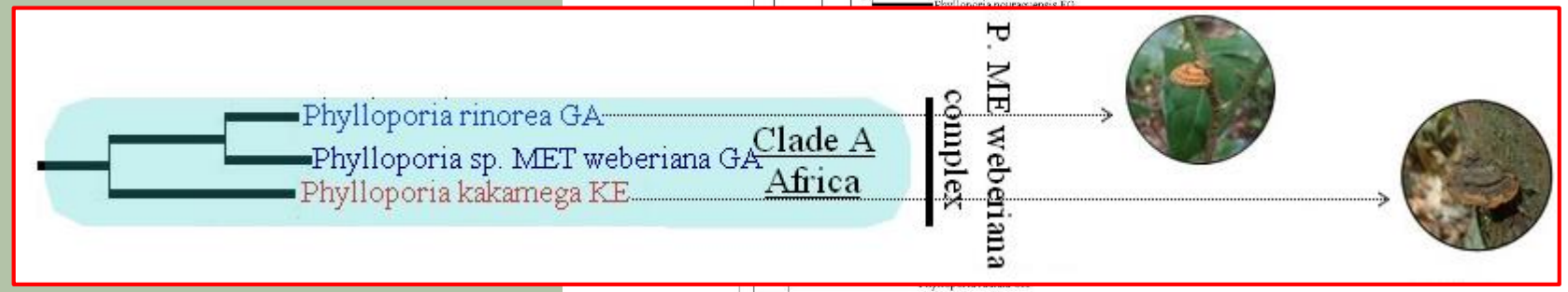

- *Phylloporia* in tropical Africa– *P. elgonii*

- Localisation
  - **Mount Elgon** national park, Kenya

- Ecology :
  - Growing on **small-stemmed**, **living trunk** of ***Turrea cf. holstii*** (Meliaceae), understory of the lowland, east African **Afromontane forest**
- Morphology :
  - ***P. pectinata MET***
  - Morphologically, differs from the other species by the large size of theirs basidiomes (reaching up to 25 cm wide)

- *Phylloporia* in tropical Africa– DNA multilocus phylogenetic analysis

- Data set
  - 3 partial house-keeping genes sequenced (28s,Rpb_2,tef $_{1-\alpha}$)
  - Still does not provide a clear phylogenetic structure of the genus
  - Clues about the affinities of some taxa and the pertinence of certain MET
- Link between MET and phylogeny in tropical Africa?
  - ✓ **Clade A** : *P. kakamega/ P. rinorea/ Phylloporia* sp. MET *weberiana*



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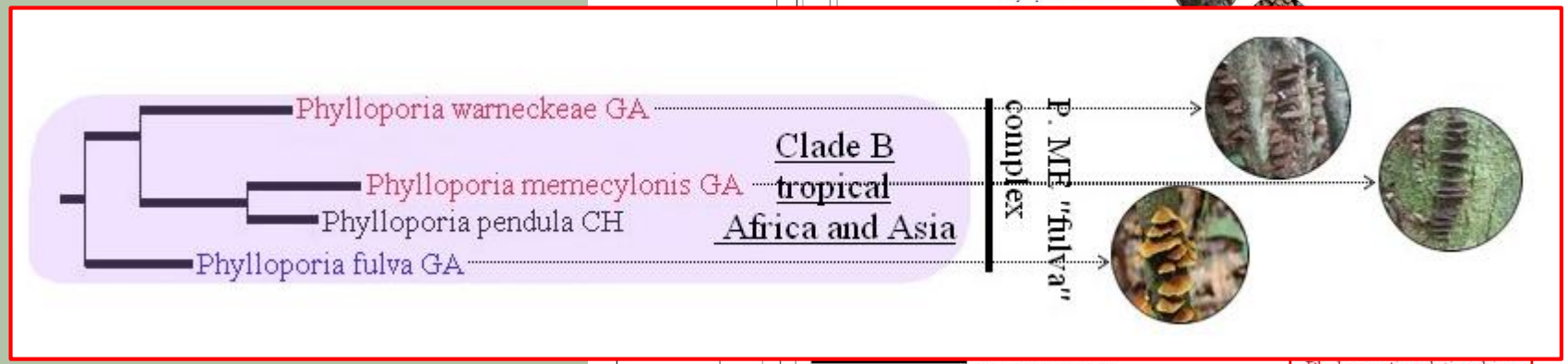

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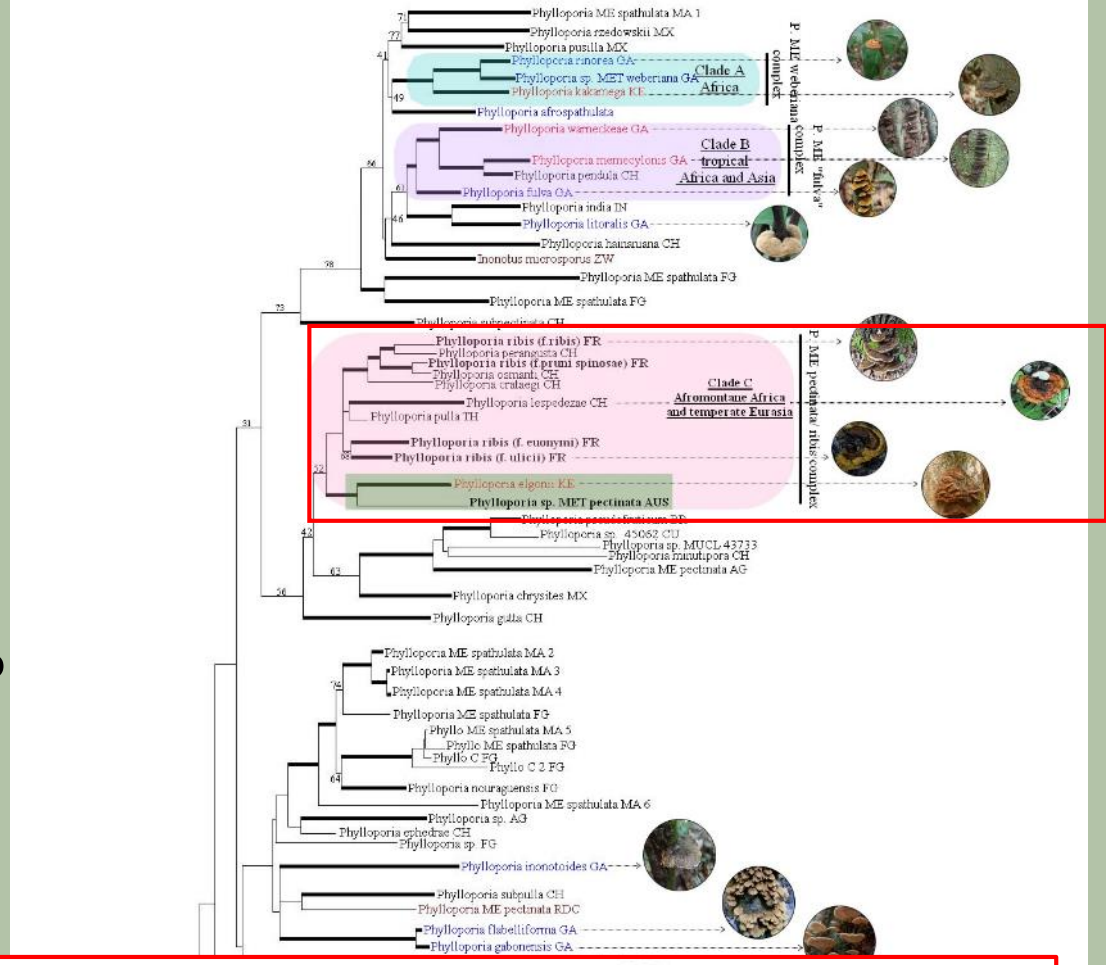
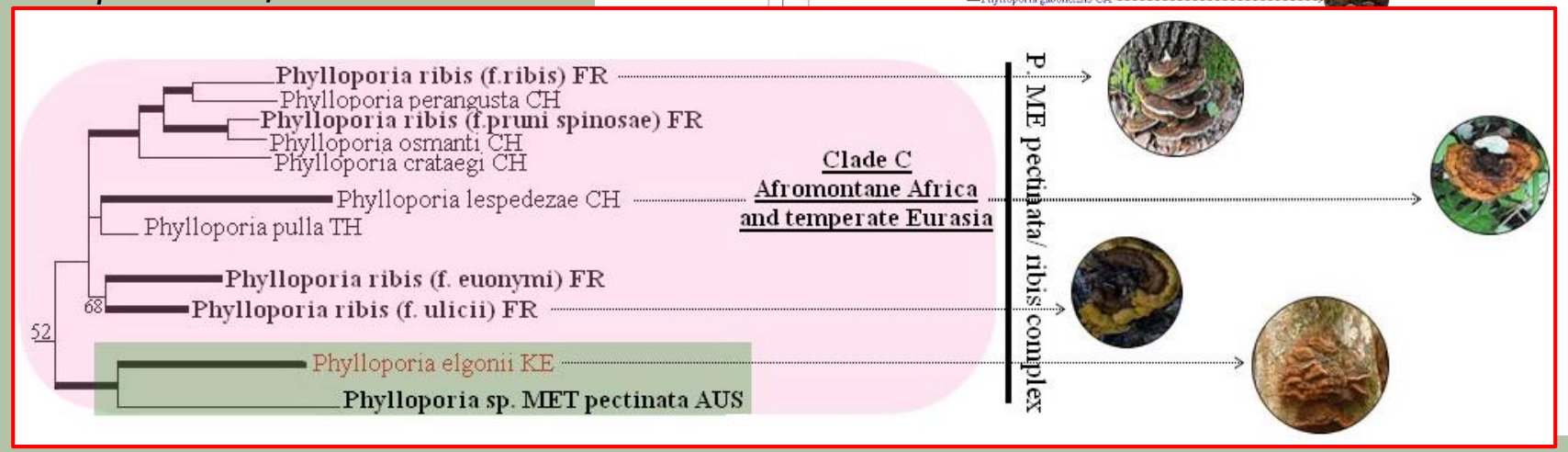
  - ✓ **Clade C** : *P. elgonii/ Phylloporia* sp. MET *pectinata/ P.* MET *ribis*





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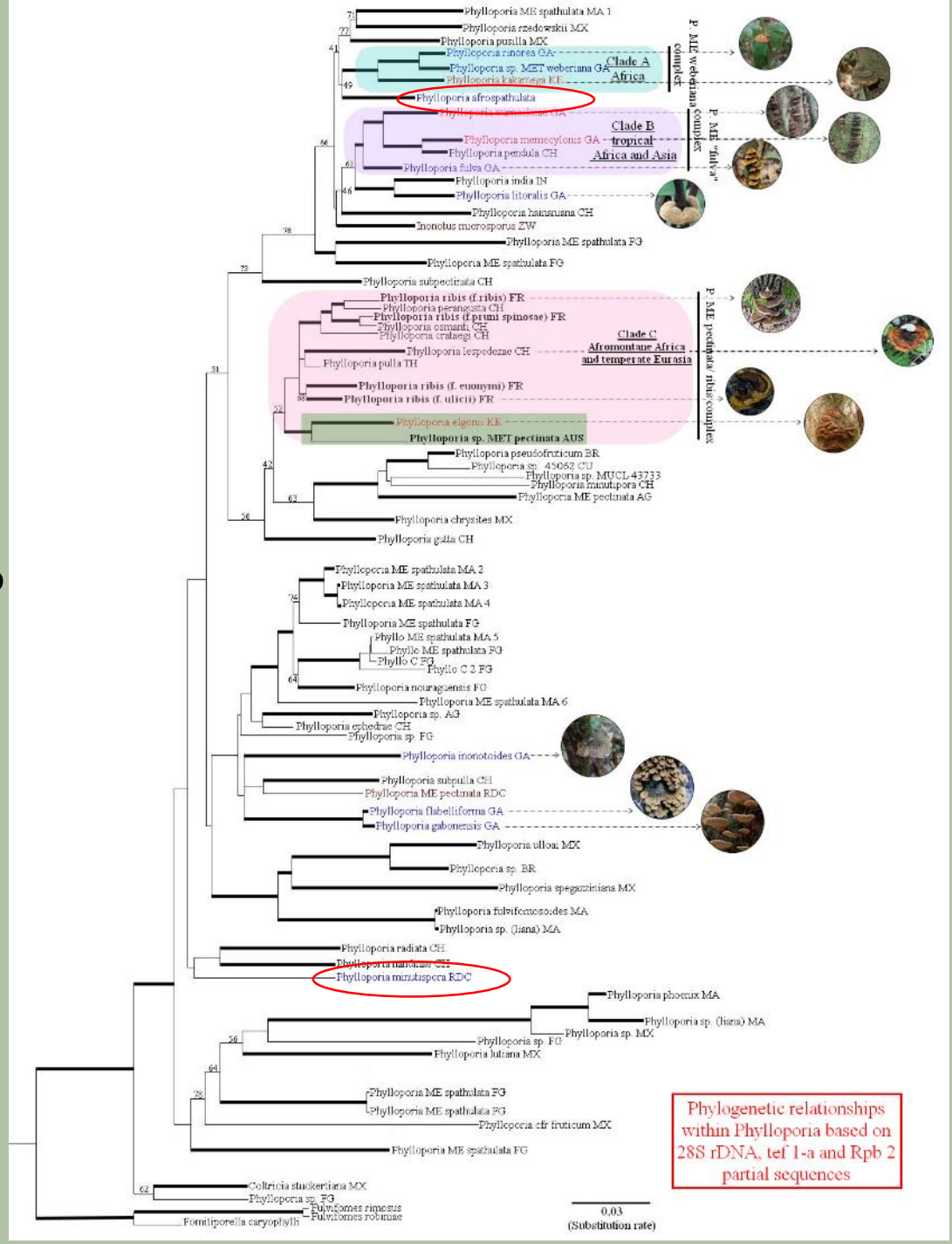
MET and biogeography possibly explain common evolutionary history (clade A, B and C)… or a convergent evolution (e.g. *P. spathulata* MET)!



- *Phylloporia* in tropical Africa– Take-home message

- *P. warneckeae*, *P. memecylonis*, *P. kakamega* and *P. elgonii* are considered **as new species**
- The African rainforests **are still poorly surveyed**
- The **host specialization** might be **a strong driver of speciation**, especially in sympatry (e.g *Phylloporia warneckeae* vs *Phylloporia memecylonis*)
- Our multilocus phylogenetic analysis not resolve the internal structure of the genus, but provides some clues to understand **the evolutionary history of *Phylloporia*** in tropical Africa