

BIOGEOGRAPHY
and ZONES of ENDEMISM
of AFROTROPICAL *ACRAEA*

Vol. I

Dominique Bernaud

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SUMMARY

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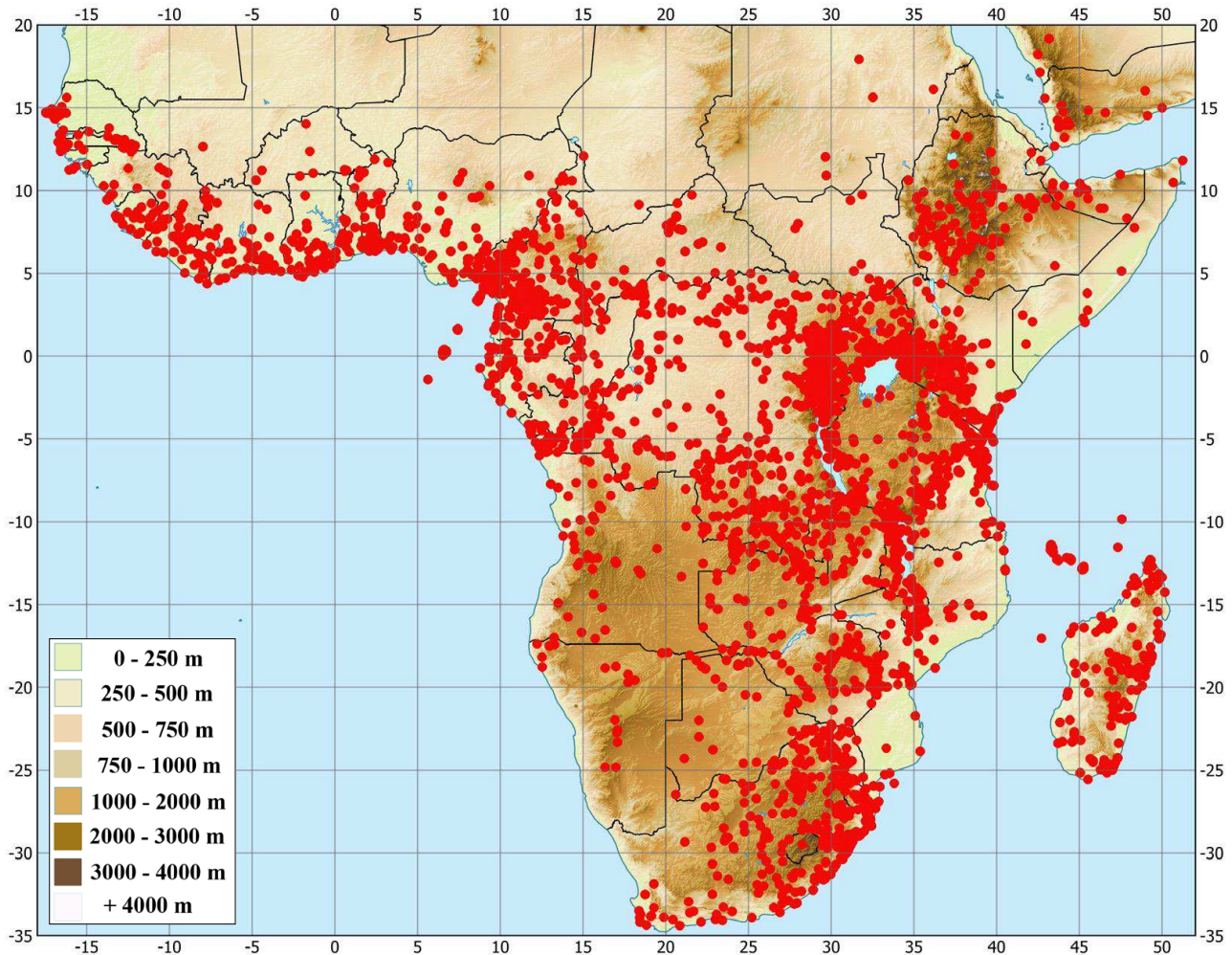
Foreword.	7
Introduction.	9
Presentation of the African Plant Database.	12
Acknowledgements.	14

Part I : Sources of the biogeography of Afrotropical *Acraea*.

Method used and principles adopted.	16
References and cartography of biogeographical zones.	23
References.	23
Climates of tropical Africa.	35
Relief of tropical Africa.	42
Land cover of Africa.	44
Classification, habitus, habitat and trophic character of Afrotropical <i>Acraea</i> .	47
Phylogenetic classification of <i>Acraea</i> .	48
Molecular analysis of <i>Acraea</i> .	53
Characters of the habitus.	58
Transparency.	61
Polymorphism, cline and climate.	62
The hostplants used.	63
List of taxa associated with the known data.	65

Part II : Zones of endemism.

Identification of the zones of endemism.	73
The main boundaries of the zones of endemism.	76
Detailed description of the zones of endemism.	80
The Western zone (<i>lepidochorion</i> 1).	81
The Ridge zone and the São Tomé zone (<i>lepidochoria</i> 2 and 3).	87
The Ethiopian zone (<i>lepidochorion</i> 4).	94
The Madagascar zone (<i>lepidochorion</i> 5).	100
The Southern zone (<i>lepidochorion</i> 6).	106
The Zambezian zone (<i>lepidochorion</i> 7).	112
The Eastern zone (<i>lepidochorion</i> 8).	118
The Albertine Rift zone (<i>lepidochorion</i> 9).	125
The Central zone (<i>lepidochorion</i> 10).	131
The Sudanian zone (<i>lepidochorion</i> 11).	137



We show on the above map all the localities identified in our database (at the time of this publication), for which we have confirmed records of *Acraea*. Despite the volume of work done, we can see that some areas remain nearly unexplored, such as northern and southern Mozambique, or southern Angola.

There are definitely new discoveries to be made in these areas.

Moreover, for each collecting locality, thanks to the WorldClim.com site, we have recorded in our database, based on geographical coordinates :

- Altitude in m.
- Average yearly rainfall in mm.
- Rainfall of the wettest quarter in mm.
- Rainfall of the driest quarter in mm.
- Average yearly temperature in degrees Celsius.
- Maximum temperature in degrees Celsius.
- Minimum temperature in degrees Celsius.

The collecting localities have also been verified and confirmed by the ones of the GeoNames site (www.geonames.org). This database is one of the most comprehensive on the Web and also delivers substantial information for each locality.

All this geographical work has been realised thanks to the constant help and support from Cyrille Chatelain of the Geneva herbarium.

The level of detail in each layer is extremely instructive on the state of the land cover in 2019. The possibility to visualize the cultivated and the built up areas emphasizes the shrinking of the original land cover, which is jeopardizing the importance of the *Acraea* populations, without however reducing their diversity as most populations find refuge areas.



- Forest
- Forest-savanna mosaic
- Savanna
- Shrubland
- Cropland
- Desert
- Lakes and oceans
- Built-up

The more detailed map above shows the various land covers around Lake Victoria in 2019. Most of the area is now cultivated land. We can also see (in red) the importance of the built up areas (cities of Kampala and Nairobi). The forested areas are to be found only around the mountains (refuge zone for *Acraea*). We recently trekked the periphery of Mt. Kenya and we sadly noticed that the forest was reduced to a small ring around the massif, the rest of the area being now only cultivated or built-up land.

In these conditions, it is urgent to study the ecology of the species rather than collect them (breedings, *in situ*, photos of imagos, identification of hostplants).

This constitutes most of our work today, as we have for quite some time now replaced the butterfly net by a camera, which also presents the advantage of being allowed by the relevant authorities to visit and survey restricted areas, such as national parks.

Identification of the zones of endemism

We identified 11 zones of endemism based on the distribution of the taxa.

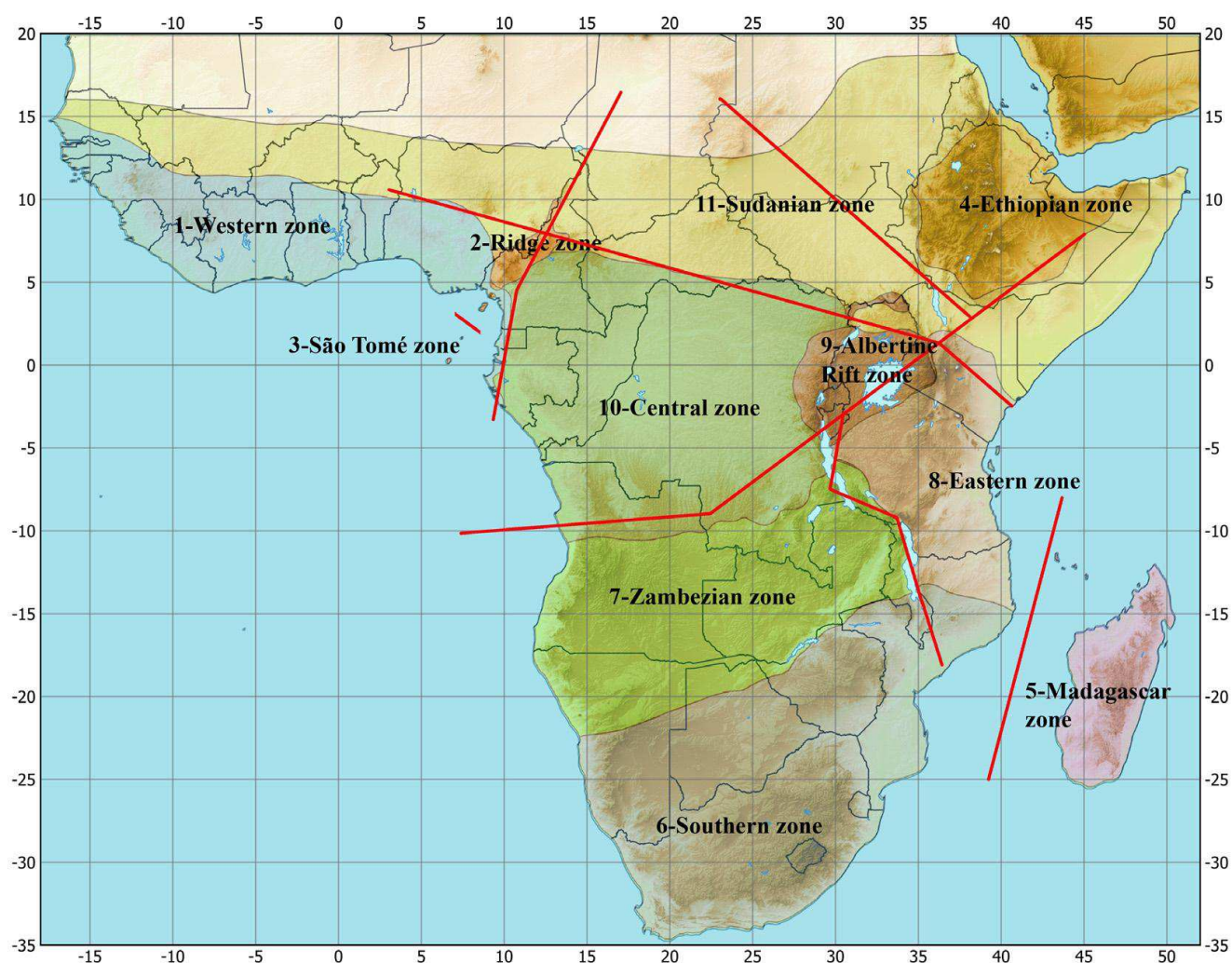
The breakdown of the regional zones of endemism by F. White was our starting point, even if we often distance ourselves from it.

We show hereunder the map of all these zones of endemism. They rarely overlap but there is always a gray area between each zone.

The red lines represent the main natural barriers (mountains, rifts, lakes, deserts, forests, sea) which certainly have an impact on the isolation of some populations.

Regarding these natural barriers, we must mention the book *"Les insectes actuels témoins des passés de l'Afrique, Philippe Le Gall et al., in International Journal of Entomology, 2013"* : *"Le rôle du Rift africain est encore difficile à apprécier. Les études faunistiques sont très généralement restreintes à des analyses sous-régionales ou restent simplement descriptives. Hormis l'analyse des faunes montagnardes, peu de synthèses comparent les régions ouest et est africaines. La complexité des forces évolutives à l'œuvre, soulèvement global de la région orientale, volcanisme récent, présence de chaînes montagneuses anciennes, assèchements du climat à l'Est et maintien de grands massifs forestiers à l'Ouest, complique l'analyse du message contenu dans les faunes actuelles. On dispose là d'un chantier de recherches plein de promesses à condition de l'étendre au-delà du simple rôle du Rift"*.

Our work meets exactly the goal of the authors by offering detailed data which corroborate the global assessments expressed by some.

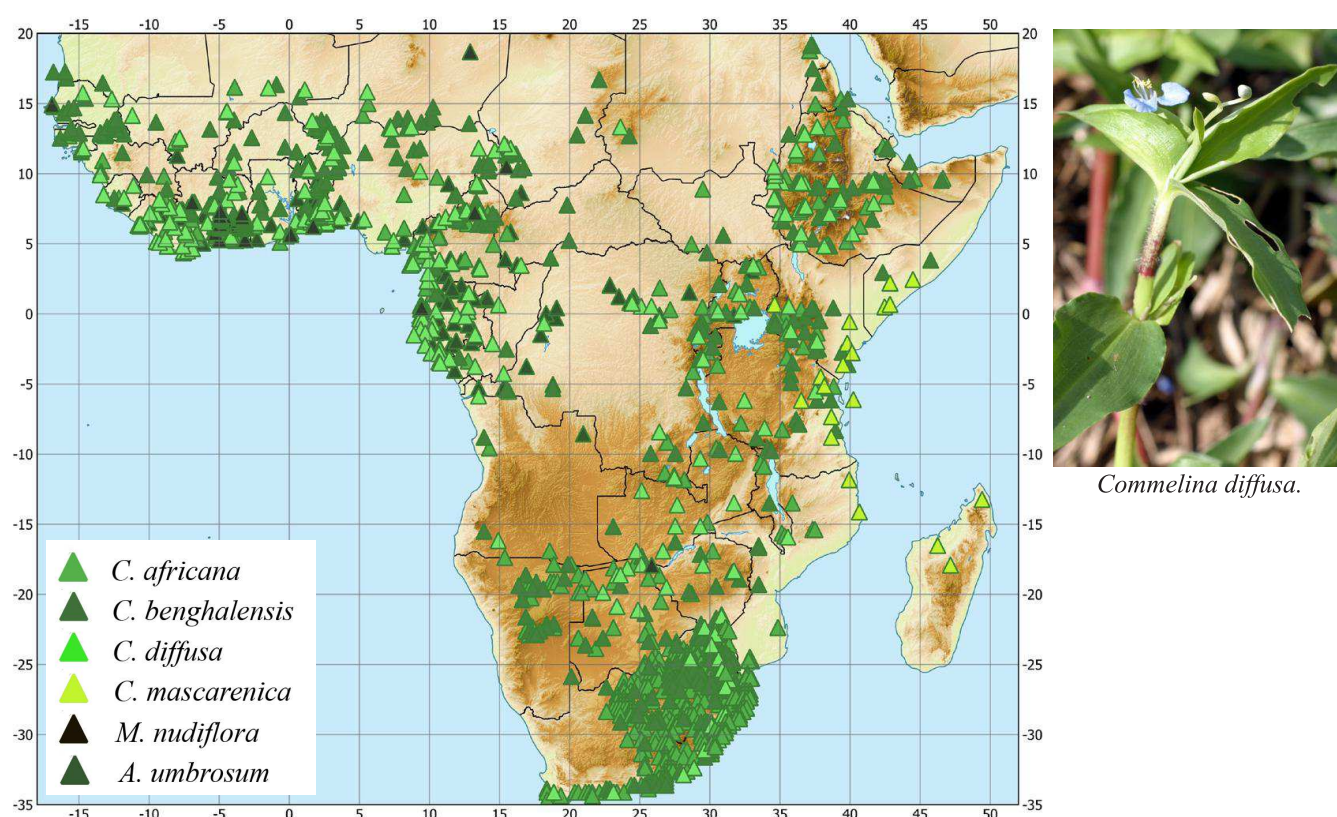


The African Plant Database (APD) site provides maps of the plants distribution in Africa together with comments on the types of habitats of these plants. We reproduce these comments for our hostplants with the authorization of the Geneva Herbarium. The maps were created using the QGIS software.

Monocotyledoneae (Liliopsida) - 5 plants :

Class	SubClass	Order	Family	Species
Liliopsida	Commelinidae	Commelinales	Commelinaceae	<i>Commelina africana</i>
Liliopsida	Commelinidae	Commelinales	Commelinaceae	<i>Commelina benghalensis</i>
Liliopsida	Commelinidae	Commelinales	Commelinaceae	<i>Commelina diffusa</i>
Liliopsida	Commelinidae	Commelinales	Commelinaceae	<i>Murdannia nudiflora</i>
Liliopsida	Commelinidae	Commelinales	Commelinaceae	<i>Aneilema umbrosum</i>

On our map we added *C. mascarenica* which grows in Madagascar and which could be a hostplant.



Three *Acraea* are known to use Commelinales : *encedon*, *encoda* and *lycoa*.

The panafrican distribution of these plants is in harmony with the one of the *Acraea*. Only *Murdannia nudiflora* is confined to the western part of the continent.

On the other hand the Commelinales are not the exclusive plants of these species who also use Rosales and Fabales.

The plants of the genus *Commelina* are found in the following habitats (APD source):

1- *africana* : "Overgrazed areas ; *Combretum*, *Stereospermum*, *Acacia* woodland ; moist grassy places ; forests (eventually degraded) ; swamps ; mist forest ; sunny places ; in shade ; riverine forest margins ; edge of montane forest ; 900-3,300 m alt.";

2- *diffusa* : "Forest with *Podocarpus latifolius*, *Olea capensis*, *Syzygium guineense* in deep shade on floor ; forest edge ; farmbush ; edges of swamps and drainage ditches ; wet or inundated soils under light or slight shade ; sandy banks ; meadows, plantations ; 1-2,400 m alt.".