DAVIS EXPEDITION FUND

REPORT ON EXPEDITION / PROJECT

Expedition/Project Title: Socio-ecological dynamics of miombo woodlands in east Angola

Location: Moxico Province, Angola

Group Members: Luisa Escobar Alvarado

Aims: To study the characteristics of anthropogenically undisturbed miombo and *Cryptosepalum* forests and to understand human impacts on vegetation types in southeast Angola

Photography consent form attached: ☒ Yes
(*please refer to your award letter*) ☐ No

Outcome (a minimum of 500 words):-

This expedition involved visiting five villages in rural east Angola where in the previous year I have conducted work to understand local perceptions of diversity and ecology of vegetation and uses of tree species. Around each village, five 50x50 m vegetation plots were established, and all trees within each plot were measured (DBH and height) and identified. Those five plots were established according to each of the different vegetation types classified by locals, in total 26 plots were set up (one was established on a previous trip). Other characteristics of the trees and plots were also recorded, such as vernacular names; canopy, grassy, and shrubby cover; dominant shrubs; bark thickness of dominant species; uses of the vegetation cover; as well as soil samples were taken.
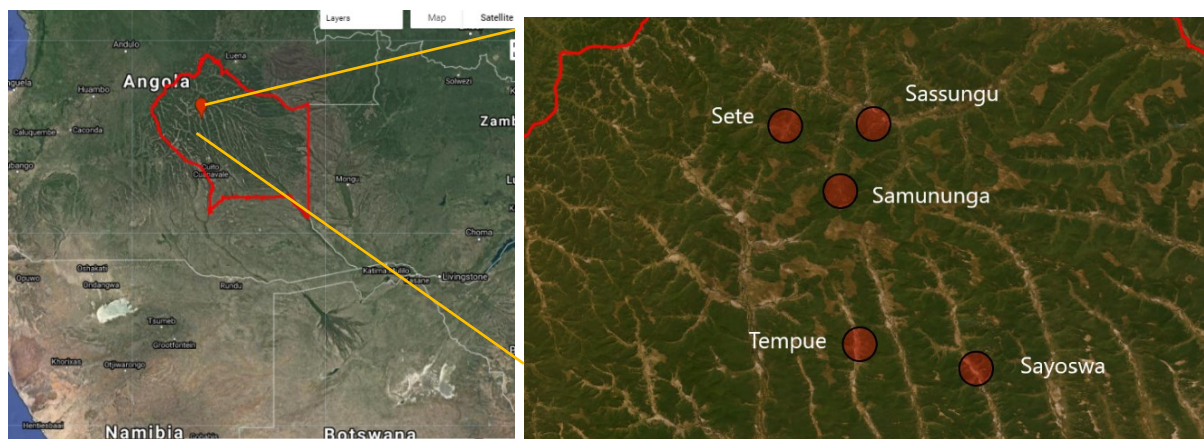

Figure 1. On the left, landscape where the project is developed in east Angola, and on the right, villages where vegetation plots were established.

In terms of forest ecology, initial analyses showed that 60% of all the trees measured were representative of only 5 tree species (highlighted in grey, table 1). The 20 species shown in table 1 made up about 90% of the trees measured (table 1).

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Table 1. Most dominant tree species in the highlands of east Angola

Tree spp	% of all trees measured
Cryptosepalum exfoliatum	33.5
Erythrophleum africanum	8.5
Burkea africana	7.3
Diplorhynchus condylocarpon	5.4
Julbernardia paniculata	4.5
Diospyros batocana	3.6
Brachystegia spiciformis	3.6
Brachystegia longifolia	3.3
Dialium englerianum	2.8
Monotes africanus	2.2
Hymenocardia acida	2.0
Pterocarpus angolensis	1.9
Baphia massaiensis	1.9
Brachystegia bakeriana	1.8
Terminalia brachystemma	1.6
Guibourtia coleosperma	1.4
Parinari curatellifolia	1.4
Diospyros pseudomespilus brevicalyx	1.2
Bobgunnia madagascariensis	1.2
Monotes spp	1.2

The tallest heights were recorded for (decreasing order) *Diplorhynchus condylocarpon, Parinari curatellifolia, Burkea africana, Julbernardia paniculata, Brachystegia spiciformis, Cryptosepalum exfoliatum, Erythrophleum africanum, Pteleopsis anisoptera, Brachystegia bakeriana,* and *Guibourtia coleosperma.* The largest DBH were recorded for (decreasing order) *Brachystegia spiciformis, Monotes spp., Guibourtia coleosperma, Diospyros batocana, Dialium englerianum, Julbernardia paniculata, Erythrophleum africanum, Cryptosepalum exfoliatum, Burkea africana,* and *Albizia antunesiana*.

After a simple analysis of the diversity of species on the plots, we found that the open and dense woodlands (classified such as according to locals) have the highest number of different tree species, specially the dense woodlands with around 25-30 different species per plot (figure 2). All of the plots established in dense woodlands (or *Vusaki* in the local language Luchaze) were strongly dominated by *Cryptosepalum exfoliatum*. Open woodlands were slightly less diverse and were mostly dominated by *Julbernardia paniculata, Erythrophleum africanum, Diospyros batocana* and *Brachystegia spiciformis.* In terms of stem density, dense woodlands had the highest per plot (figure 3), being about 4 times higher than in open woodlands and about 10 times higher than in savannas.

In addition, we were able to record 58 different tree species in the landscape (figure 4), out of which 45 have been identified by its scientific name. We collected vouchers of 55 of these species, which were taken to the herbarium in ISCED Huila, Angola. Vernacular names and uses (food, honey, firewood, medicine, artefact, etc.) were also recorded.
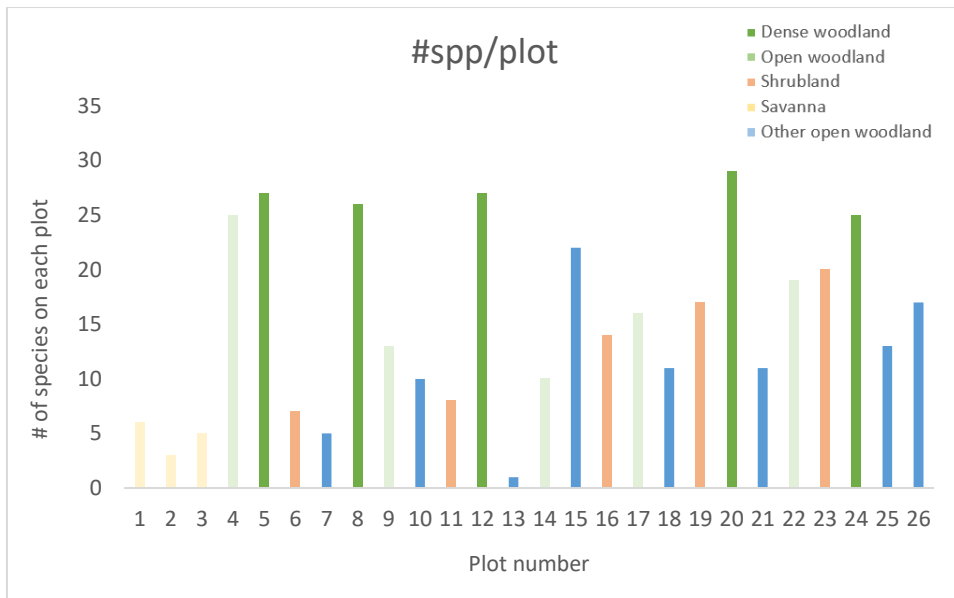
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Figure 2. Species richness on each plot established in east Angola. Dense woodlands tend to have the highest numbers and savannas the lowest.
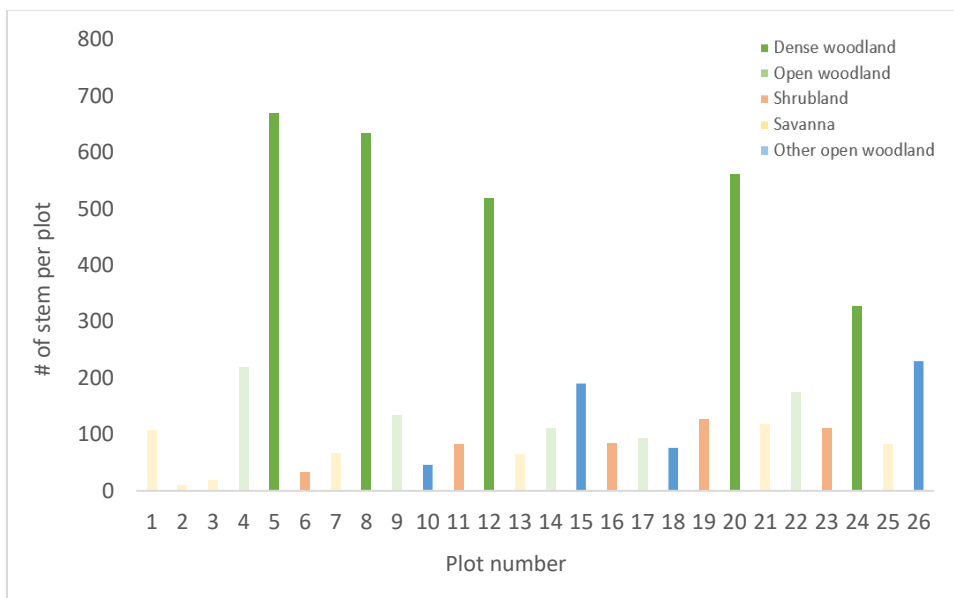

Figure 3. Stem density on each plot established in east Angola. Dense woodlands tend to have the highest numbers.

Figure 4. Pictures of the most dominant tree species (from upper left to bottom right): *Cryptosepalum exfoliatum, Erytrophleum africanum, Burkea africana, Diplorhynchus condylocarpon, Julbernardia paniculata,* and *Diospyros batocana.*

Further analyses with the data collected during this expedition will help create a vegetation map of this area of Angola. In addition, providing a more accurate classification of the vegetation can help understand management, fire regimes and changes through time of this region, which ultimately can help to learn how to preserve it. We hope by placing this work in the broader scientific context, to contribute to achieve a better understanding of vegetation patterns of miombo woodlands in Africa and of other vegetation types such as dry evergreen forests, like those of *Cryptosepalum* dominated landscapes. Lastly, while incorporating local ecological knowledge into the scientific process we aim to produce a more comprehensive view of this landscape and its social, political and ecological components where the rights of those who inhabit and own the place are acknowledged and respected.