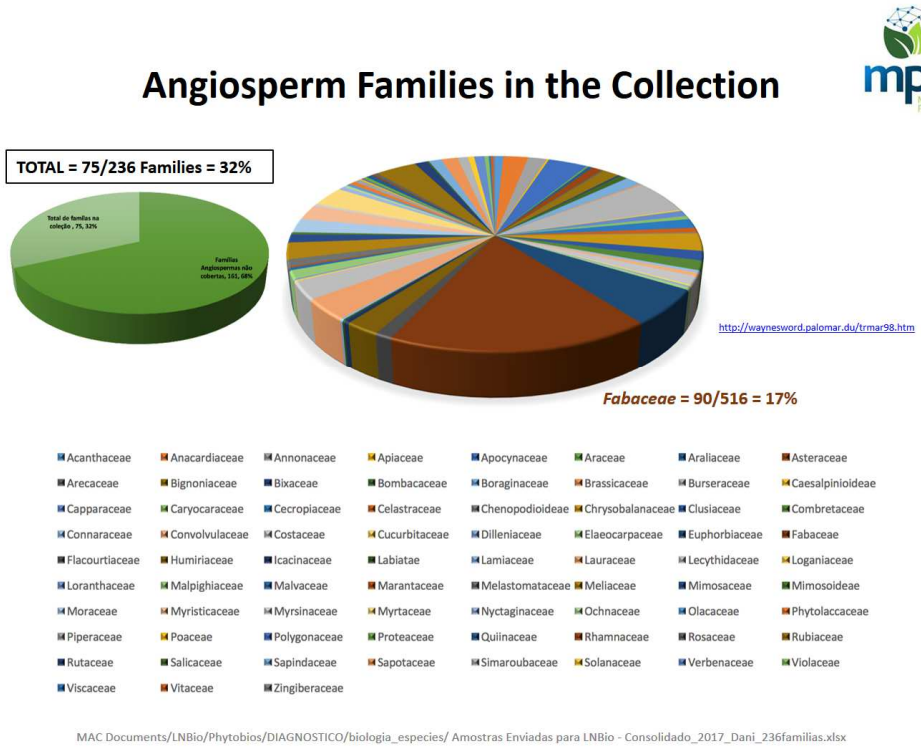
LNBio's Brazilian Biodiversity Botanical Library

This is a highly curated, totally new and very well-preserved collection of plant extracts from four Brazilian biomes. We warrant at least 300 different species in the collection, but the library grows continuously and we will probably have more at the time of your screening. Nevertheless, it must be considered that the main strength of this library will never be its size, but its broad coverage of botanical families' endemic to Brazil, besides several important characteristics described below.



1- **Largest world biodiversity:** Brazil houses over 55,000 angiosperm species from the 250,000 already described in the world. This is over one fifth of the world botanical biodiversity, with many species endemic only to Brazil. Brazil has 6 very different biomes. The Phytobios/LNBio library regularly get samples from:

- ***Amazonian forest*:** the largest world's rain forest (green spots in the map);
- ***Atlantic forest*:** a rainforest smaller than Amazonia, but with about 7 times more different species for the same area (blue spots in the map);
- ***Cerrado*:** a biome similar to African savannas, considered a "hot spot" with higher chance of active metabolites (brown spots);
- ***Caatiga*:** in indigenous language means "white forest". It is wet 3 months per year, when all life thrives. The remaining 9 months are completely dry, with temperatures over 35°C. The leaves fall and the soil gets dry and white. The naked trees become white, after long exposure to the sun, unshielded by any clouds. It is another "hot spot" with higher chance of active metabolites (yellow spots);

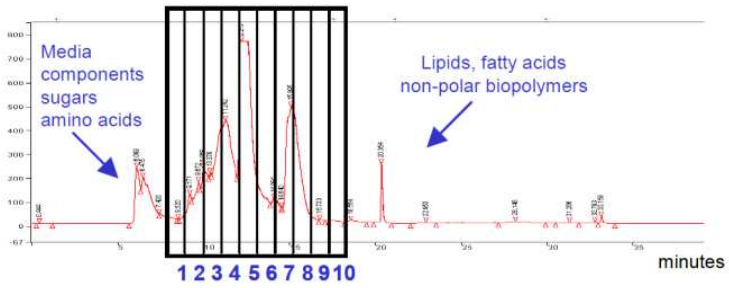
This huge biodiversity remained very little exploited by pharma and cosmetic companies, due to very restrictive regulations relieved in 2015. Please, see below the current collecting places.

2- **Regulatory compliance:** all samples are collected in compliance with Brazilian and international regulations (Nagoya protocol).

3- **Traceability:** each sample is accompanied by:
   - Precise collecting location by GPS;
   - Plant identification by a qualified botanical taxonomist. It demands coming to the field at least two times: one when the plant is not flowering and the other to get the flowers for botanical identification. The samples' chemical composition is totally different in these two times.
   - Deposit of testimony exsiccate in a certified herbarium.

4- **Tests repeatability assurance:** each collection gets at least 5 Kg of leaves (and/or roots and/or barks). After processing, each sample gives about 20 g of dry extract, enough for many test repetitions. The robust traceability also allows getting more samples from the same species, whenever needed.

5- **State-of-the-art processing:**
   - Phytobios/LNBio are developing know-how to clean the samples from tannins and other promiscuous substances, thus increasing the proportion of potentially active metabolites.
   - Each sample is fractioned in 9 (nine) chromatographic fractions, and immediately plated in 384 wells plates and frozen for further assays. Therefore 10 (ten) samples = 9 fractions + the crude extract are available for testing. This processing allows access to low concentration and yet unknown substances that are generally hide by the majoritarian substances.



6- **State-of-the-art compound identification:** all samples are submitted to analysis by mass spectrometry + molecular networking technique. These identify the known compounds and clusterizes the unknown nearby those already known by charge/mass similarities of their fragments.

7- **Virtual dereplication:** the compounds' identification described prevents "hits" with repeated compounds/clusters to progress in the pipeline.

8- **State-of-the art quality control:** each sample/fraction is submitted to mass spectrometry analysis as soon as possible. This is repeated periodically to catch natural products expected decays.

9- **Continuous enlargement and replacement:** the Phytobios/LNBio natural products library is an alive being. Expeditions are planned to go on for many years, continuously increasing the number of samples and replacing the decayed ones.

10- **Chemical space coverage:** the continuous expeditions/collections are guided by chemotaxonomy aiming at filling gaps in the "chemical space". Plant families know to produce chemical structures underrepresented within our library are prioritized for collections.

11- **Tailoring:** the continuous expeditions can prioritize the collections of plat families/orders that have shown larger quantities of promising "hits" for a specific target/assay. This allows the repetition of assays with new extracts/fractions expected to have structural analogs of those "hits".