

HPTLC: A USEFUL SUPPORT FOR RESEARCH AND DEVELOPMENT OF ACTIVE INGREDIENTS FROM SELECTED PLANTS

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INTRODUCTION

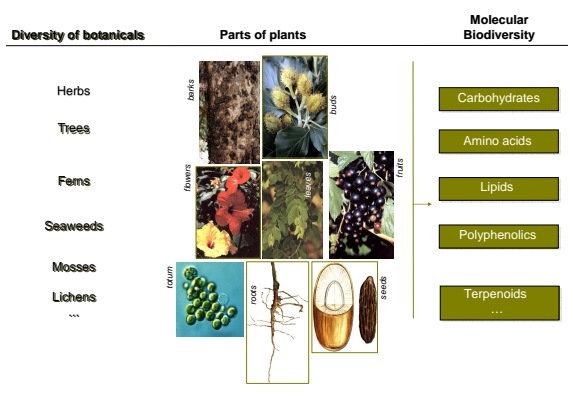
The aim of LABC, belonging to the Laboratoires LVMH R&D, is to develop active ingredients from plants, for cosmetic applications. Our research is based on the broad diversity of plants. Each plant is made of some specific parts which produce lots of different metabolites. It contributes to giving a great source of molecules, which we call biodiversity in phytochemical compounds or 'Molecular Biodiversity'.

The selection of plants is carried out through a specific approach and phytochemical studies. Thanks to our expertise and our worldwide network of experts in ethnobotany, botany and pharmacology, we can focus on some parts of the plants. Most of them are original medicinal plants and their traditional uses are a guide for potential effectiveness on skin. Because most of the time only a few bibliographic data is available, phytochemical investigations, especially by HPTLC, are performed in LABC.

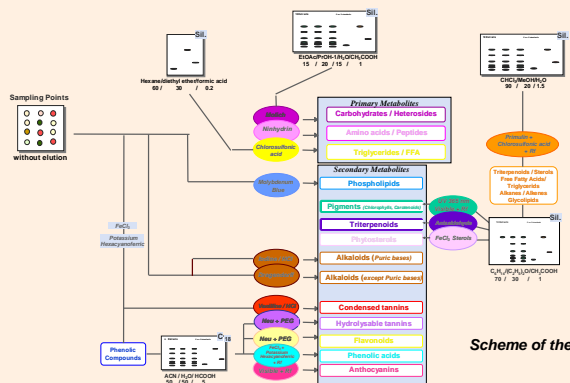
This leads to the knowledge of the composition of different extracts : this is important not only to determine phytochemical and biological markers, but also to ensure the safety of the cosmetic natural ingredients.

HPTLC is a major step in our investigations with the aim of setting up a 'phytochemical identity card' of the extracts by phytochemical screening.

FROM BIODIVERSITY TO BIODIVERSITIES



METHOD FOR PHYTOCHEMICAL SCREENING



Scheme of the main used conditions

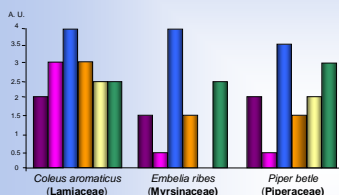
Some alcohol extracts of dried parts of plants are first studied, to realize their 'Phytochemical Identity Card'.

Thanks to its large combination of elutive systems and specific staining reagents, HPTLC is the most fitting technique to study such complex samples.

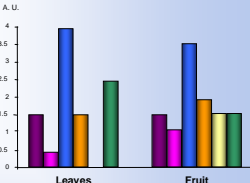
This relevant method enables us to detect the main components present in unknown extracts, and constitutes our first step of phytochemical characterization.

MOLECULAR MAP FOR DIFFERENT PLANTS

1 – One part : Leaves



2 – One plant : Embelia ribes

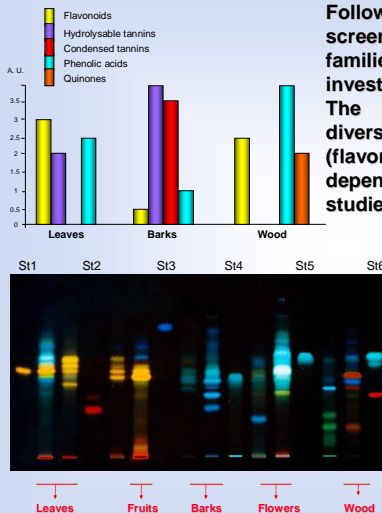


These diagrams (obtained after phytochemical screening) summarize the molecular diversity within the same part of different plants, and also within the different parts of a same plant. The leaves of plants from different botanical families show a specific biodiversity in terms of kinds of compounds. For fruit and leaves from one plant, ratios are also typical, according to the specificity of the part.

FOCUS ON POLYPHENOLIC FIELD

Following the global phytochemical screening, details of the specific families can be obtained by further investigations.

The HPTLC plate illustrates the diversity within phenolic derivatives (flavonoids, tannins, quinones...) depending on plants and parts studied.



Standards :
 St1 – isoquercitrin
 St2 – alizarin
 St3 – gallic acid
 St4 – ellagic acid
 St5 – chlorogenic acid
 St6 – butein + mangiferin

System of migration :
 Stationary phase : RP18F254_s
 Mobile phase : CH₂CN/H₂O/HCOOH
 50 50 5
 Detection :
 Staining : Neu reagent + Peg solution,
 by spraying - in UV at 366 nm

CONCLUSION

HPTLC is a hardcore technique in the research of the main phytochemical compounds present in the parts of the plants which are of interest. This method is fast in terms of results obtained for several extracts studied in a single run. Moreover, the specifically coloured spots give a rapid global overview of the composition of an extract.

HPTLC is the way to explore the wide range of the molecular area found in a complex extract. The obtained 'phytochemical identity card' enables us to focus on an more in depth extract, in order to study structural analysis such as : densitometry, complementary chromatographic techniques, mass spectrometry...).

Moreover, HPTLC is not only useful for research but also for development. The knowledge of the effective and/or specific compound(s) is carried out by the correlation of both biological and HPTLC results : These compounds are called 'biological and/or phytochemical markers'. The presence and concentration of these markers will be followed by HPTLC during the different steps of the development of the natural active cosmetic ingredient.