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Context

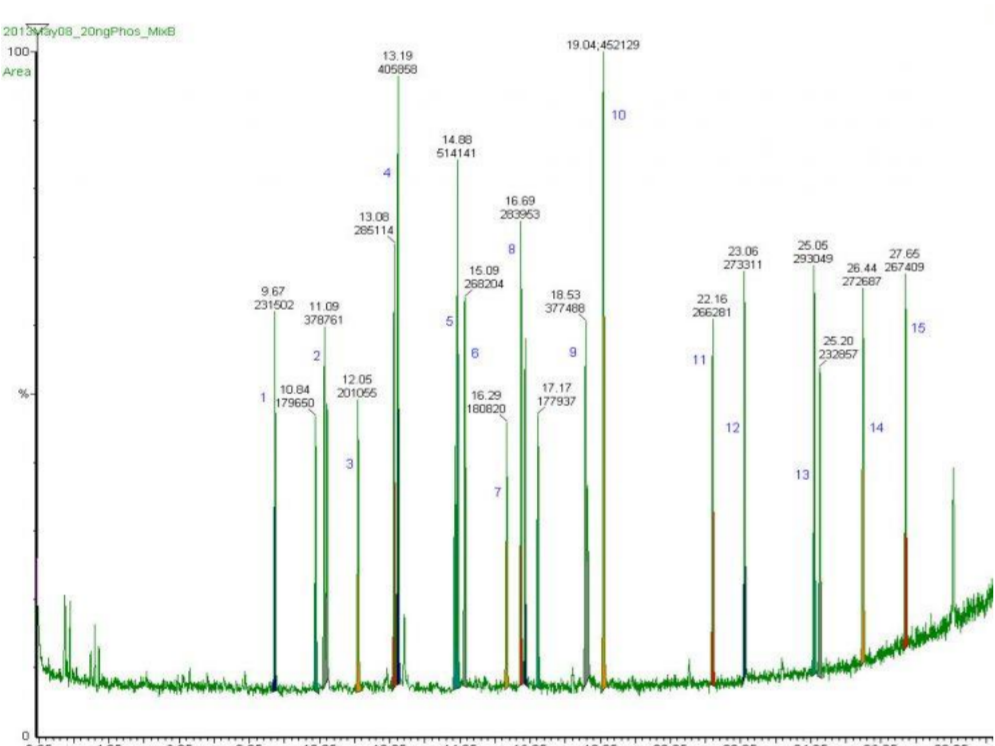
The Laboratory of Chemistry of Natural Molecules (LCNM) has much to offer in terms of research for the African continent which is rich in biotope diversity, agricultural practices and cultures. Its focal point consists in the extraction, purification and characterisation of plant secondary metabolites for applications in agronomy, food industries and biopharmacology. The number of collaborative projects between the LCNM and African research centres and education institutes has been on a steep rise over the last few years. Currently, research projects are running with partners and researchers from Algeria, Tunisia, Morocco, Gabon, Ivory Coast, Senegal, DR Congo and Cameroon. Within this poster, three of them are presented and highlight the relevance of laboratory techniques to solve various topical challenges in Africa.

« Food of the gods »: impact of fermentation methods on the aroma profile of cocoa grown in Ivory Coast



After the harvesting of ripe cocoa pods, the farmers of Ivory Coast need to perform a fermentation step. Otherwise, raw and dried cocoa beans will not develop the typical cocoa flavor during roasting. Even if the fermentation process is natural and occurs spontaneously, diverse fermentation techniques are used to improve its efficiency.

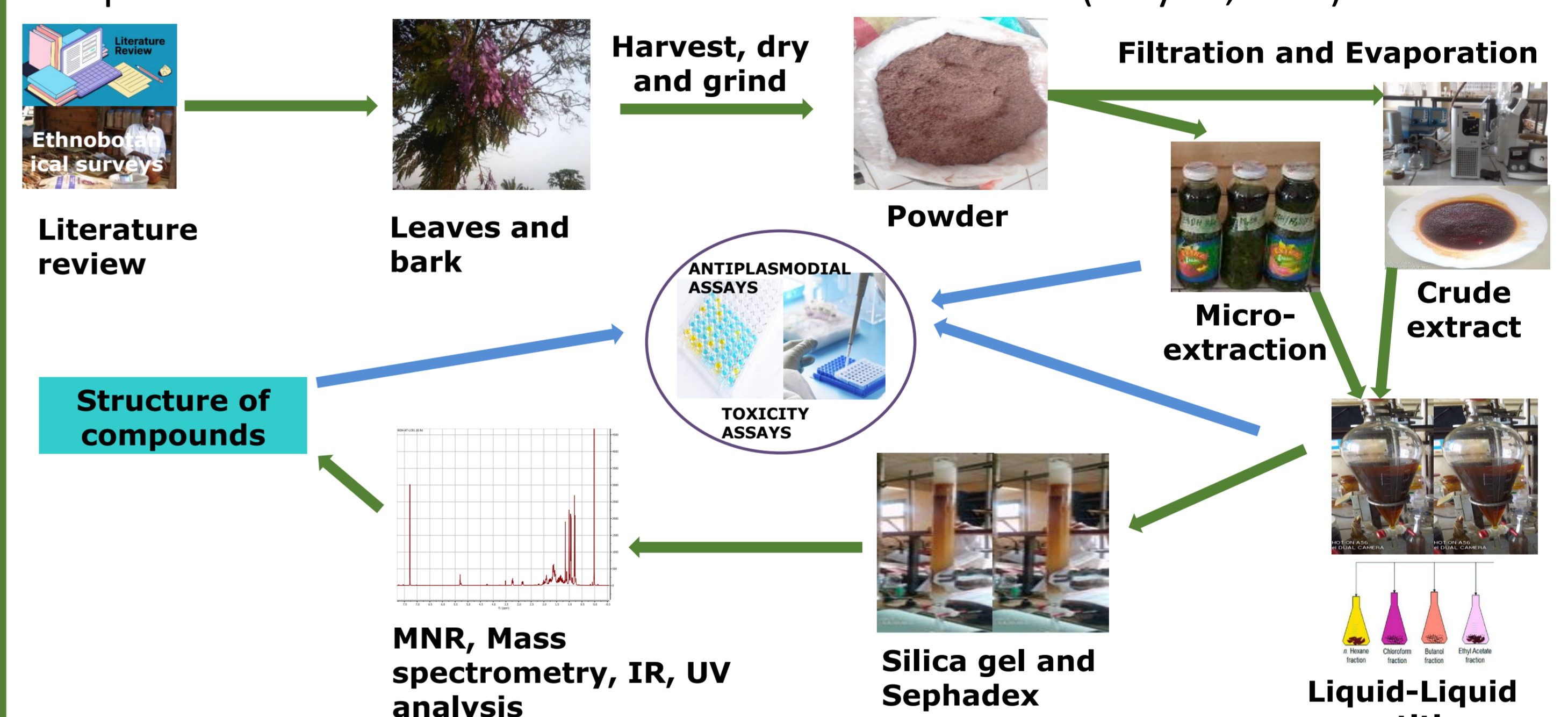
The reactions leading to the cocoa aroma depend on both microbial development and abiotic reactions. Thus, the aromatic profile strongly depends on the initial quality of the pods, temperature during fermentation, access to oxygen, pH, etc. Each fermentation technique leads to a specific setting of those parameters.



The aroma of fermented cocoa can be evaluated through the use of analytical methods such as GC-MS. In this way, a fermentation process can be chosen over another one depending on the desired aromatic profile.

Antiplasmodial-guided investigation of the Cameroonian plant *Lantana camara* L. (Verbenaceae)

Despite great efforts to control and eradicate malaria, this disease is still a major cause of death and poverty in Africa. Malaria disproportionately affects vulnerable groups - including women and children - particularly from the poorest households (WHO, 2021a). There is therefore an urgent need to develop novel and more efficient antimalarials with new mode of actions to combat resistant pathogens, which would lessen the burden of malaria. In this view, *Lantana camara* L. (Verbenaceae) is considered as a promising source of antiplasmodial compounds as this plant is used in traditional medicine to treat malaria (Mayori, 2017).



The investigation of the leaves and roots of *L. camara* led to the isolation and characterisation of eighteen compounds. A good antiplasmodial activity was demonstrated for the crude extract, fractions and some isolated compounds. The use of *L. camara* in traditional medicine to cure malaria seems therefore sensible. In the future, our work could contribute to improving the living conditions of populations through the design of Improved Traditional Medicines (MTA).

RESSAC project: post harvest protection of goods by optimising ethnobotanical practices from Tshopo province, Democratic Republic of Congo

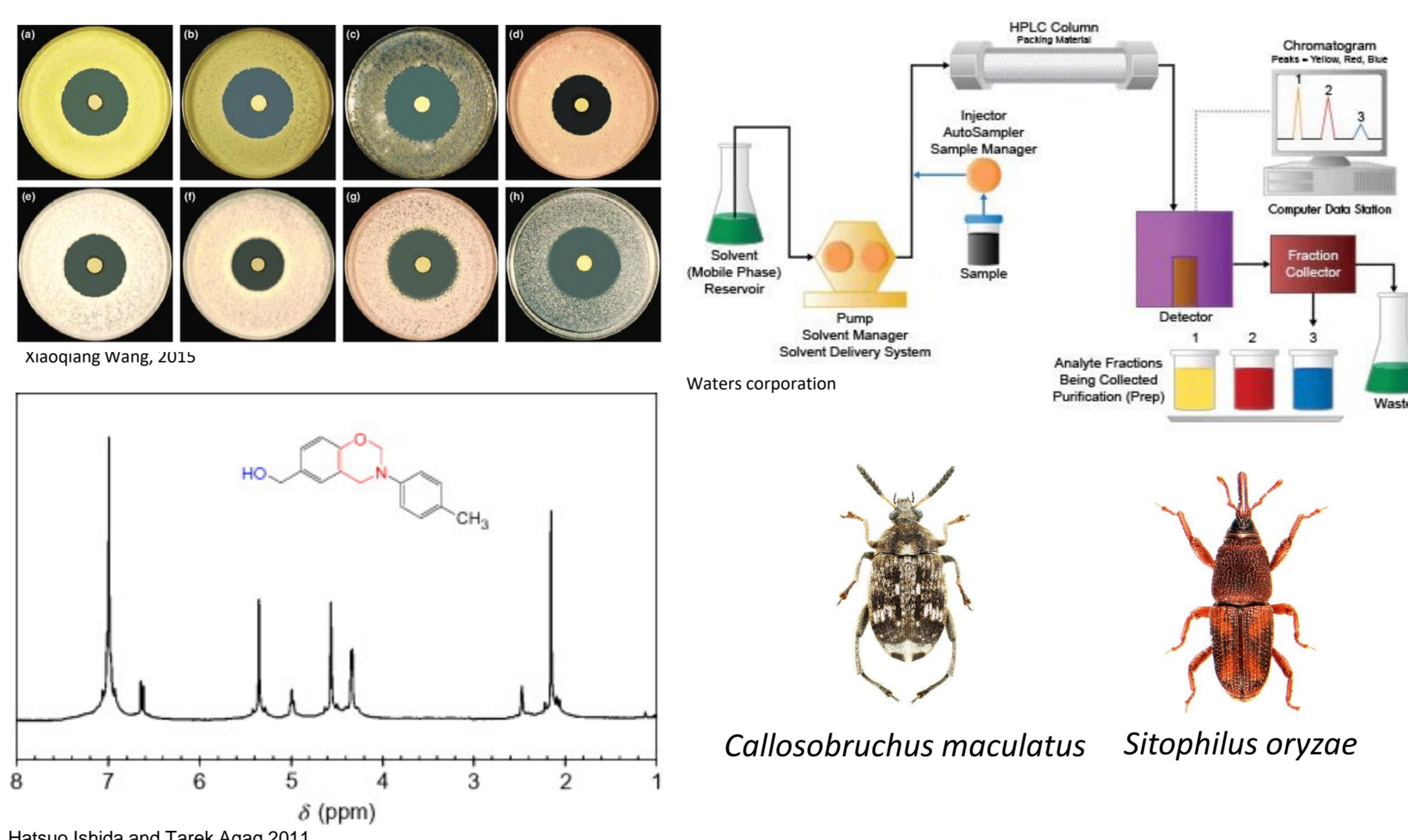
Herbivorous insects and fungi are globally responsible for 30% of post-harvest losses. Nevertheless, there is virtually a lack of data on this phenomenon in enclaved areas like the Tshopo province of DRC: the lost proportion of goods after harvest is unknown, nor the techniques employed to counter these losses. To overcome these obstacles, a program called RESSAC* has been created and is articulated in three sequential fields of study.



Firstly, it is vital to conduct a field study on the present state of storage practices in the territory of Isangi and Yangambi. Besides, an assessment on the pests and ethnobotanical solutions used will be done.

*RESSAC = recherche en écologie et en sciences sociales pour la gestion durable des écosystèmes forestiers d'Afrique Centrale

Hence, a series of potential plant species with insecticide and fungicide properties will be selected. Bio-guided fractionation of these plants will be performed using preparative HPLC and NMR for the characterisation the composition and activity of the different fractions extracted from collected samples.



Subsequently, *in-situ* testing of formulated solutions will take place, along with the monitoring of the acceptability of the newly developed practices. The role of farmer field schools will be of great importance to teach the use of certain uses of the identified species effective against the pests.



By doing so, the program is expected to durably improve the storage practices and valorise sustainably of the natural products available in the Tshopo region of DRC.

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