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**Various condensed tannins from tropical plants.  
Potential multipurpose nutraceuticals in ruminant feed**  
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## INTRODUCTION

Condensed tannins (CT) are **complex polyphenolic secondary metabolites** from plants. **Protein-CT complexes in ruminants** could result in affection of **rumen fermentation** (Min et al., 2001), allow **availability of amino-acids** and induce a gastrointestinal **nematicidal action** (Marie-Magdeleine et al., 2010).

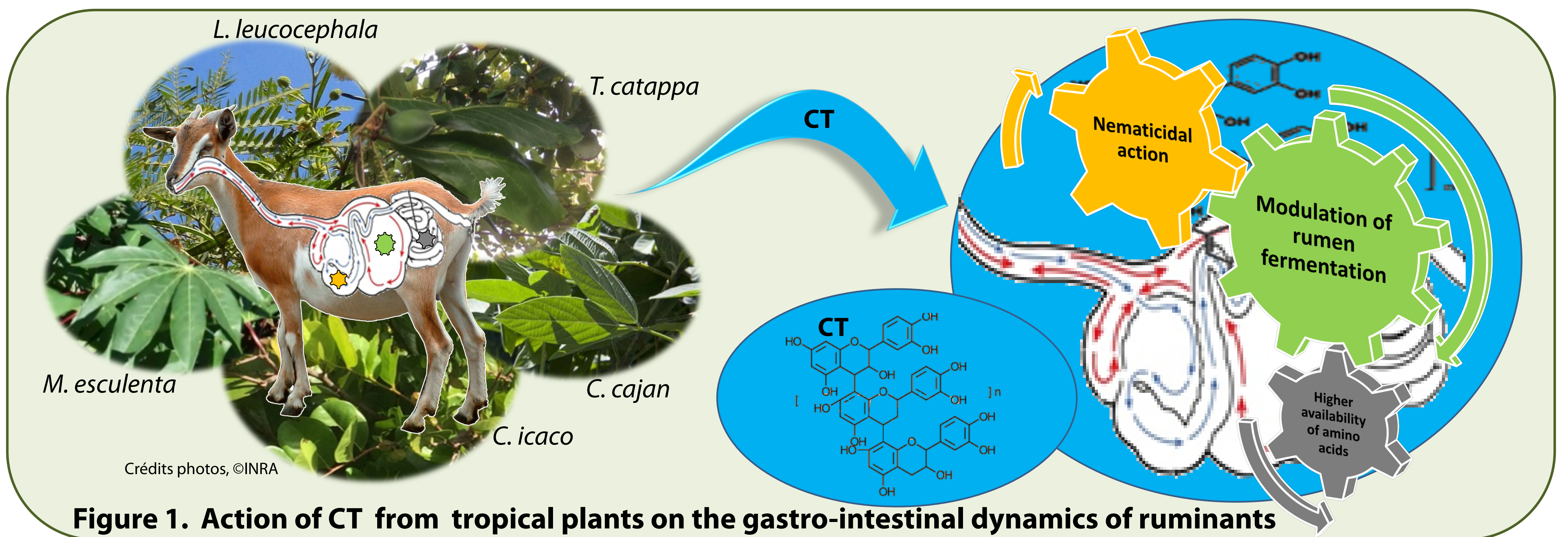


Figure 1. Action of CT from tropical plants on the gastro-intestinal dynamics of ruminants

## MATERIALS AND METHODS

Study of CT from **5 tropical plants** : *Manihot esculenta*, *Chrysobalanus icaco*, *Cajanus cajan*, *Terminalia catappa*, *Leucaena leucocephala*.

• Chemical **quantification and elucidation**: Vanilin-H<sub>2</sub>SO<sub>4</sub> assay; **thiolysis, HPLC, LC-MS**.

• Biological activity : **Anthelmintic** (in vitro against *H. contortus* exsheathment, with 6 concentrations and repetitions, PBS control).

**Fermenting** (incubation of pure plant substrates in rumen mixed bacteria cultures (2:1, v/v) for 24h at 39°C; with 3 repetitions and perennial ryegrass (PRG) as control).

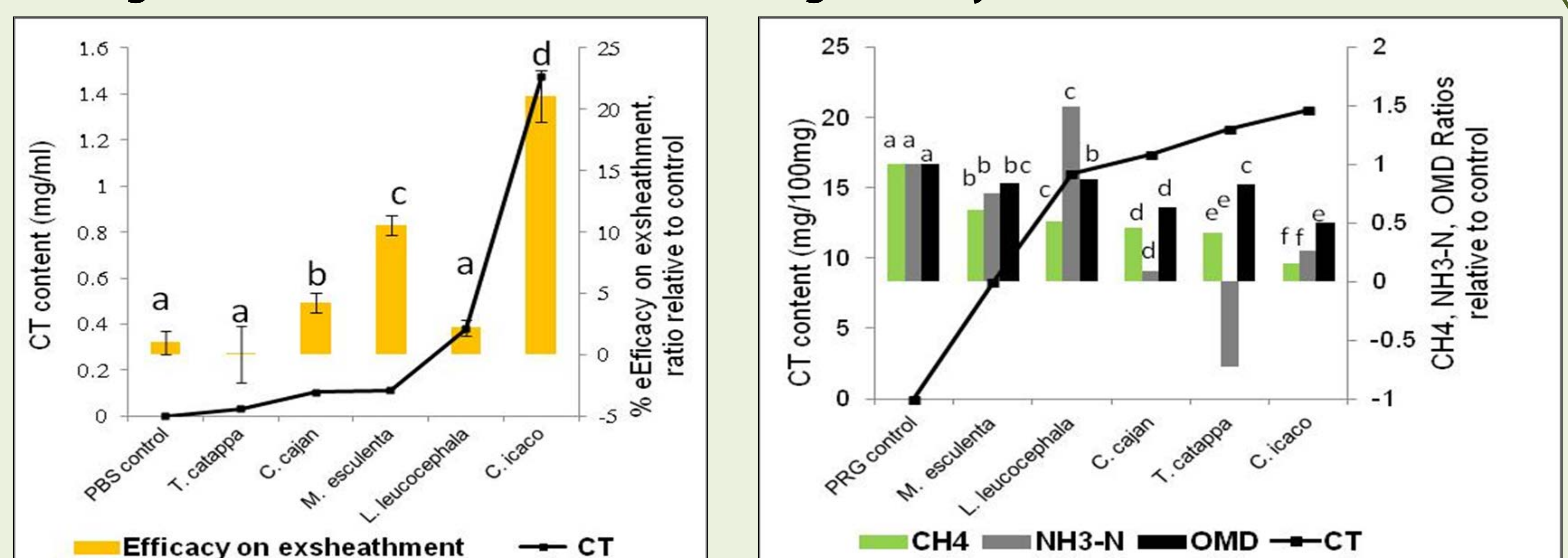
## RESULTS

Table 1. Condensed tannins elucidation

Plant	CT content in extract (mg/100mg)	mDP	PC/PD ratio	cis/trans ratio	% galloyl groups
<i>T. catappa</i>	1.69	15.32	10.69	24.69	19.23
<i>C. cajan</i>	11.39	7.84	0.85	3.25	0.00
<i>L. leucocephala</i>	26.77	3.27	0.59	2.38	26.44
<i>M. esculenta</i>	44.31	7.23	0.16	2.18	37.44
<i>C. icaco</i>	58.97	9.19	0.01	1.67	4.51

- Qualitative and quantitative CT variability in plant species
- Plants with high CT content
- Some high Galloylation levels (biological activity,)

Figure 2. Anthelmintic and fermenting activity, relative to CT content



- Close CT levels but different efficiencies (*C. cajan* vs *M. esculenta*)
- Different CT levels but same efficiency (*L. Leucocephala* vs *T. catappa*)
- Higher CT level and less efficiency (*L. Leucocephala* and *M. esculenta*/ *C. cajan*)

- Inhibition of CH<sub>4</sub> production with CT ↑
- NH<sub>3</sub>-N: Close CT levels but different efficiencies (*T. catappa* vs *C. icaco*; *L. leucocephala* vs *C. cajan*)
- OMD : Different CT levels but same efficiency (*M. esculenta* vs *T. catappa*/ *L. Leucocephala*)

High effect (p<0.001) on nematicidal activity and fermentation profile

## CONCLUSION

To our knowledge, this is the **first comprehensive CT analysis for these plants**. It seems that **condensed tannins** qualitative and quantitative composition may **influence bio-reactivity and nutraceutical feed value**.

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**References** Marie-Magdeleine, C., Boval, M., Philibert, L., Borde, A., Archimède, H., 2010. Livestock Science 131, 234-239.

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