



# The 7th International Electronic Conference on Medicinal Chemistry (ECMC 2021)

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## Phytochemical MS profile of Cuban *Piper aduncum* L. subspecies

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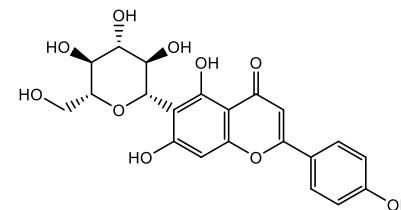
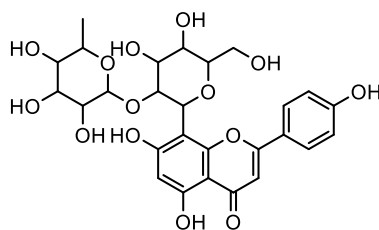
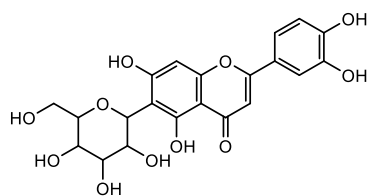
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# Phytochemical MS profile of Cuban *Piper aduncum* L. subspecies

## Graphical Abstract



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**Abstract:** Identity of active principles of medicinal plants is very important in quality control and safety of herbal products. *Piper aduncum* (*Piperaceae*) is a recognize medicinal plant in Latin America. In Cuba this specie is segregated as *P. aduncum* subsp. *ossanum* and *P. aduncum* subsp. *aduncum*, the latter has not been phytochemically investigated in Cuba. **This study aims to compare profiles of non-volatile compounds of the aqueous and ethanolic extracts of Cuban *P. aduncum* subspecies by MS.** Leaves of both subspecies were used to prepare a decoction and an ethanolic extracts that yield two subfractions. Analysis was perform by ultra-performance liquid chromatography (UPLC) coupled to electrospray ionisation quadrupole time-of-flight mass spectrometry (ESI/QTOF/MS). 35 metabolites standard reference compounds were assessed by comparison with MS spectra of the plants extracts. Also tentatively assigned compounds were proposed by matching measured  $m/z$  with previous reported of compounds in *P. aduncum*. Occurrence of two flavone C-glucosides were confirmed among the main compounds of decoction and aqueous ethanolic subfraction of both subspecies, isoorientin was not previously reported in *P. aduncum*. Tentatively assigned main compounds in decoction and aqueous ethanolic subfraction are also similar in both subspecies, 2''-O- $\alpha$ -rhamnosyl-4'-O-methylvitexin was the most prominent peak. In oleaginous ethanolic subfraction peaks are coincident with reported derived benzoic acid compounds. This is the first phytochemical approach to *P. aduncum* subsp. *aduncum*. Results also can be of quimiotaxonomic interest. MS profiles obtained in both subspecies can serve for quality control of *P. aduncum* in Cuba.

**Keywords:** Fingerprint; Flavonoids; Medicinal Plant; Phytochemistry; *Piper aduncum*



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## Introduction

*Piper aduncum* L. (*Piperaceae*)  
(*P. angustifolium* R. et Pav., *P. elongatum* Vahl.)



Widely use as medicinal plant  
in Latin America

Active: 29 bacteria and 28  
fungi of interest in human  
and veterinary medicine or  
agriculture

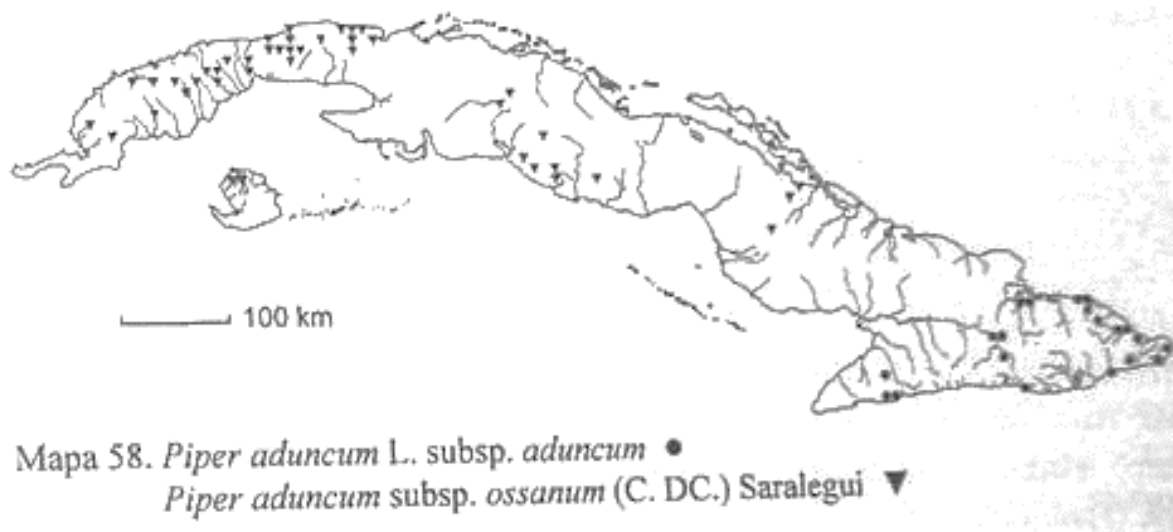
Phytochemistry: flavonoids,  
chromenes, benzoic acid  
derivates, essential oils.



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## Introduction



**Figure 1-** Intraspecific distribution of *Piper aduncum* in Cuba

Only endemic *P. aduncum* subsp. *ossanum* has been phytochemically studied, 2''-O- $\alpha$ -rhamnosyl-4'-O-methylvitexin isolated (Larionova et al., 2010).

Differences in non volatile compounds between subspecies?



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## Results and discussion

Ethanollic extracts when concentrated to 1/3 of initial volume yields a brown aqueous fraction (EAF) with sweet smell and syrupous texture and, a greenish spice smelling oily fraction (EOF), that attach to glass surface, easily separated by decantation.

QTOF-ESI-MS pattern of both *P. aduncum* subspecies non-volatile compounds of decoction and EAF, provide a very similar chromatographic fingerprints, main peaks correspond to C-glycosides of flavones apigenin and luteolin (Figure 2).



## Results and discussion

In both subspecies by comparison with 13 flavonoids reference compounds (eight previously referred in *P. aduncum*), were confirmed the presence of: isoorientin, orientin 2''-O-rhamnoside, vitexin-2''-O-rhamnoside and isovitexin as main metabolites in decoctions and EAF of both subspecies. Isoorientin was not documented previously in *P. aduncum*. Whereas none of the other reference compound analyzed were detected in any plant extracts.

Other tentatively assigned main compounds from these extracts are: isoswertiajaponin or methylorientin and cytisoside or swertisin, positional isomers previously isolated in this plant (Masuoka et al., 2003; Thao et al., 2016), .



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## Results and discussion

2''-O- $\alpha$ -rhamnosyl-4'-O-methylvitexin extracted in Havana from *P. aduncum* subspecie *os anum* was reported with anti-inflammatory and antiulcerogenic activity (González et al., 2000; Martínez et al., 2004). Also in Peru in laboratory conditions was determined the gastroprotector and antisecretor effect of ethanolic extract and fractions of *P. aduncum* (Arrollo et al., 2013). Thus presence of C-glycoside flavones as main compounds in decoction extracts and EAF of both Cuban *P. aduncum* can be related to its traditional uses.

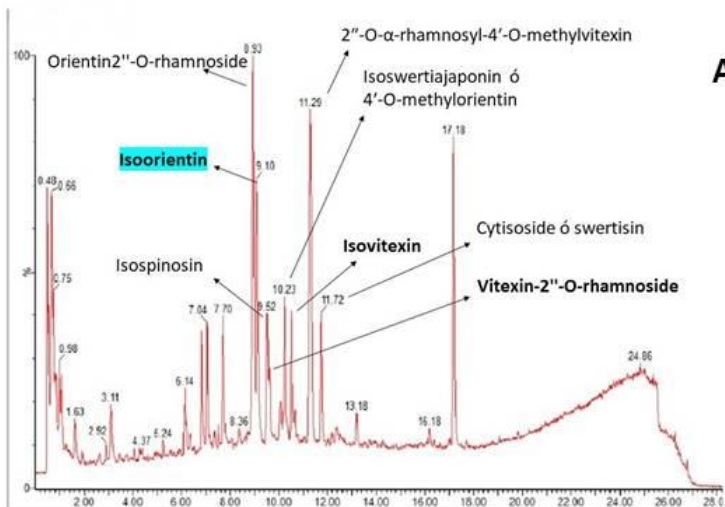
This is the first phytochemical approach to *P. aduncum* subsp. *aduncum* in Cuba.



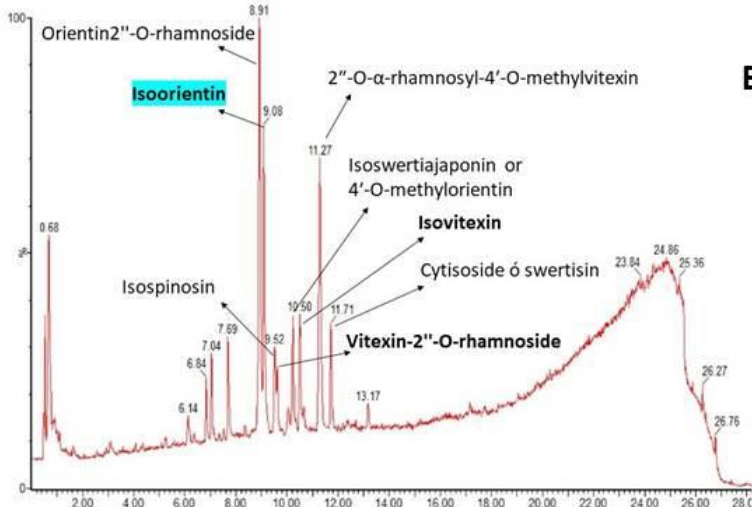
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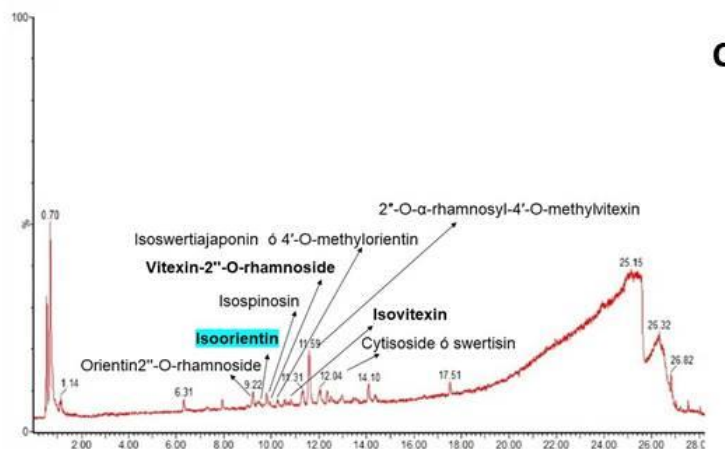




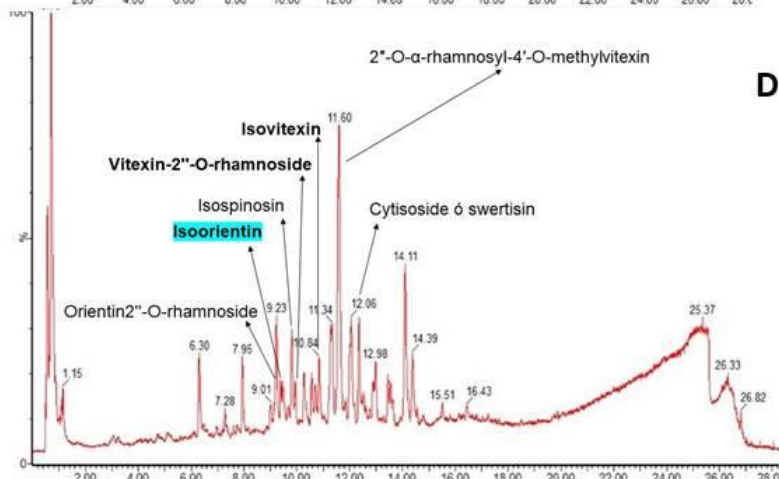
A



B



C



D

**Figure 2-** UPLC-QTOF/MS base peak chromatogram of *P. aduncum* subsp. *ossanum*: A- decoction, B- ethanolic aqueous fraction; *P. aduncum* subsp. *aduncum*: C- decoction, D- ethanolic aqueous fraction.



## Conclusions

MS profiles obtained in both subspecies can serve as fingerprinting for quality control of *P. aduncum* in Cuba.

It is the first time isoorientin is reported in *P. aduncum*.

Results also could be of ethnopharmacological and quimiotaxonomic interest.



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