



Short Communication

ISSN: 0975-248X  
CODEN (USA): IJPSPP

## **Biologically Active Triterpenes from *Eugenia pisiformis* Cambess. (Myrtaceae)**

**C. A. Oliveira, C. B. Viana, R. C. C. Martins\***

*Federal University of Rio de Janeiro, Institute of Natural Products Research, 21941-902, Rio de Janeiro, RJ, Brazil*

### **ABSTRACT**

In Brazil, *Eugenia pisiformis*, which belongs to botanical family Myrtaceae occurs in the states of Rio de Janeiro, Espírito Santo, Maranhão and Bahia. A specimen of *E. pisiformis* collected in Itatiaia National Park, State of Rio de Janeiro had its leaves, were studied because there are no phytochemical data in the literature for this plant so far. From the ethanolic extract of the leaves 3 substances were isolated and identified as the cycloartane-type triterpene 24-methylenepollinastanol, oleanane-type triterpene uvaol and ursane-type triterpene erythrodiol. All of them present significant biological properties, according to the literature and 24-methylenepollinastanol have never been isolated from this species, genus or family.

**Keywords:** Myrtaceae, *Eugenia pisiformis*, triterpene, cycloartane.

### **INTRODUCTION**

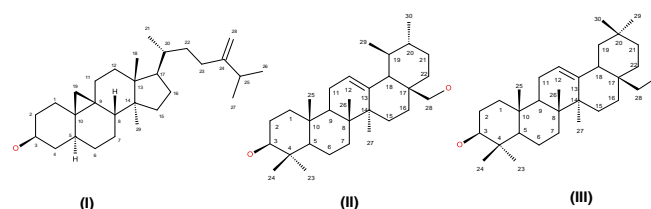
Myrtaceae is a plant family, which comprises about 142 genera, 17 tribes and 5500 species distributed in temperate tropical regions in both hemispheres. [1-2] *Eugenia* is a genus from Myrtaceae that comprises about 1,009 species, spreading from Mexico to Argentina. In Brazil, it occurs mainly in the Midwest and Southeast regions, as trees or shrubs. From *Eugenia* species have been isolated several types of secondary metabolites, mainly phenolic, including flavonoids, catechins and tannins, as well as terpenoid substances [3-5] many of them possessing significant biological activities such as anti-inflammatory and bactericidal properties. *Eugenia pisiformis* Cambess. is a species that occurs in the Atlantic Forest, mainly in states of Rio de Janeiro, Espírito Santo, Maranhão, Paraná and Bahia.

**\*Corresponding author: Dr. R. C. C. Martins,**

Adjunct Professor, Laboratório de Pesquisa de Metabolismo Especial, Institute of Natural Products Research, HSS-20, 21941-902, Rio de Janeiro, RJ, Brazil;  
**E-mail:** [roberto@nppn.ufrj.br](mailto:roberto@nppn.ufrj.br)

**Received:** 23 February, 2017; **Accepted:** 15 March, 2017

As a part of a study which aims to search biologically active compounds in the genus Myrtaceae, *E. pisiformis* was chosen because there are, so far, no records of phytochemical studies for this plant in the literature.



**Fig. 1: Triterpenes 24-methylenepollinastanol (1), uvaol (2) and erythrodiol (3).**

### **MATERIALS AND METHODS**

Leaves of *E. pisiformis* were collected at Itatiaia National Park, in Rio de Janeiro state, Brazil in May, 2014. Fresh material was dried in oven at 40°C during 48 hours and grounded to a fine powder in a knife mill. Powder of the leaves was then extracted by percolation with cold ethanol and the resultant ethanolic extract was submitted to several chromatographic steps. These

procedures led to the isolation and further identification of 3 triterpenes by HRESI-MS and NMR.

## RESULTS AND DISCUSSION

Cycloartane-type *nor*-triterpene 24-methylenopolinastanol ((3 $\beta$ , 5 $\alpha$ )-14-methyl-9, 19-cycloergost-24(28)-en-3-ol) (**I**) was isolated and structurally characterized through analysis by 1D and 2D NMR spectra. Molecular formula C<sub>29</sub>H<sub>48</sub>O was confirmed by HRESI-MS experiments. Ursane-type triterpene uvaol (3 $\beta$ -urs-12-ene-3, 28-diol) (**II**) and oleanane-type erythrodiol (3 $\beta$ -olean-12-ene-3, 28-diol) (**III**) were also isolated and structurally characterized by 1D and 2D NMR and HRESI-MS (Fig. 1).

24-methylenepolinastanol has already been isolated from the following species: *Holarrhena curtisii* (Apocynaceae) [6], *Musa sapientum* (Musaceae) [7], *Cajanus cajan* (Fabaceae) [8], Fenugreek (Fabaceae) [9], Dwarf cavendish (Musaceae). [10] Although there is not yet any biological property related to this compound, literature describes cycloartane triterpenes as biologically active substances, showing important properties such as citotoxic [11], antiprotozoal [11], antiacetylcholinesterase [12] and anti-inflammatory [13] among several others. Thus, 24 methylenepolinastanol might be a potential candidate as a biologically active substance. Additionally, an extensive search in the literature and virtual databases confirmed that this compound have never been isolated before from this species, from the genus *Eugenia* or Myrtaceae. This class of triterpenes is very uncommon in both *Eugenia* and Myrtaceae.

Triterpene uvaol has already been isolated from several plants used in folk medicine and it has confirmed antioxidant [14], antibacterial [15], antiviral [16] and anti-inflammatory [17] activities. In the genus *Eugenia*, there are reports of the triterpenes uvaol and erythrodiol in the species: *E. umbelliflora*, *E. uniflora* and *E. catharinae*. [18, 4]

As a first phytochemical study, *E. pisiformis* has showed itself as a potential source of biologically active triterpenes. It has also showed to be able to metabolize uncommon cycloartane-type triterpenes. Phytochemical studies keep on going, as these are only the preliminary results for this plant.

## ACKNOWLEDGEMENTS

Authors would like to thank CAPES for the scholarship and IPPN-UFRJ for the financial support for this work.

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Source of Support: Nil, Conflict of Interest: None declared.