

## Volatile fractions from limoncillo llanero (*Siparuna thecaphora*) fruit of Colombia by HS-SPME and supercritical carbon dioxide extraction

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Palavras Chave: *Siparuna thecaphora*, limoncillo llanero, CO<sub>2</sub> extraction, SFE.

### Introdução

The *Siparuna thecaphora* fruit has a good and delicate citrus aroma. In the neotropics is using the infusion of the leaves and fruits as a remedy against headache, diarrhea, fever, gastralgia and other psychosomatic disorders. Extracts of *Siparuna* have shown to have antimalarial activity<sup>1</sup>. Some clinical studies have been conducted about various species of *Siparuna*<sup>2,3</sup>. Moreover, was determined the composition of essential oil from *S. thecaphora* leaves obtained by hidrodestilación<sup>4</sup>.

In this work we succeeded in obtaining, using different techniques (HS-SPME and SFE CO<sub>2</sub>), the volatile fractions from *S. thecaphora* fruits. The extracts obtained by SFE were submitted to sensorial analysis. The extract from SFE with the best sensory properties and SPME extracts were analyzed by GC-MS. The SPME and SFE extracts were compared with a SDE extract using ethyl ether.

### Resultados e Discussão

In the SDE extract, the predominant compounds were sesquiterpenes (47.5%), oxygenated monoterpenes (23.0%), oxygenated sesquiterpenes (20.4%) and monoterpenes (6.2%), being the main atractilone (12.9%), curzerene (11.9%), germacrene B (10.2%), germacrene D (9.8%), geranial (8.1%) and neral (8.1%). In the SPME extracts, the main compounds were oxygenated monoterpenes (78.1%) and monoterpenes (10.5%). The most representative compounds in these extracts were geranial (59.8%), geraniol (10.0%) and neral (7.2%). In the SFE extract were the main oxygenated monoterpenes (54.5%), monoterpenes (18.0%) and sesquiterpenes (8.8%). Among the most representative compounds were geranial (22.1%), neral (15.6%), geraniol (7.9%) and nerol (4.5%).

The volatile fractions from the *S. thecaphora* fruit obtained by HS-SPME using different fibers (PDMS, PDMS/DVB and CARBOXEN) and by SFE using CO<sub>2</sub> as solvent to different extraction conditions (T: 40, 50 and 60 °C; P: 10.4, 13.8 and 17.3 MPa). The SFE extract with the best aroma was obtained to 60 °C-17.3 MPa. The SPME fiber in that were obtained the best results was the PDMS.

The results obtained in this studied were different markedly from those reported for *S. Thecaphora* leaves from Costa Rica<sup>4</sup>, in this one were the main compounds sesquiterpenes (52.1%) and monoterpenes (36.9%), being the majors germacrene D (32.7%),  $\alpha$ -pinene (16.3%),  $\beta$ -pinene (13.8%) and  $\beta$ -caryophyllene (4.1%).

### Conclusões

The methods of simultaneous distillation extraction (SDE), solid phase microextraction (HS-SPME) and SFE CO<sub>2</sub> allowed obtained volatile extracts from *S. thecaphora* fruit, identifying more than 100 compounds of different chemical structures, such as monoterpenes, oxygenated monoterpenes, sesquiterpenes and oxygenated sesquiterpenes. Among the most representative components identified were the neral, geranial, germacrene D, germacrene B, atractilone and curzerene.

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<sup>1</sup><http://www.sloth.ots.ac.cr/local/florura2/families/siparunacea.pdf>. 22/octubre/2007.

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