# CHEMICAL COMPOSITION OF COPAIBA OILRESIN FROM THE PORTO DIAS AND SANTA QUITERIA EXTRACTIVE SETTLEMENT PROJECTS, IN ACRE

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## 1. Introduction

The oleoresin from species of the *Copaifera* genus (Caesalpiniaceae, Leguminosae) is obtained by the extraction of the stem. The genus includes 72 species of which 17 are endemic in Brazil. *Copaifera* genus is native to tropical regions of Latin America and also found in West Africa. Floristic surveys and inventories report occurrence of "copaibeiras" throughout the state of Acre, with densities ranging from 0.07 trees $ha^{-1}$ to 2.0 trees $ha^{-1}$. In Acre Copaiba is classified into six groups by local producers. Its classification in based on the morphological characteristics of the bark and leaf. That is black copaiba, white copaiba, yellow copaiba, red copaiba and marimari copaiba[1]. Studies have shown that there are differences in the production of oleoresin between different species. In Acre the oleoresin average production is estimated in 2.92L/tree[2]. The oleoresin is composed of sesquiterpenes and diterpenes.

## 2. Methods

Nine samples of oleoresin were collected (2009-2010) in forest areas of two extractive settlement projects (PAE): Porto Dias (four samples) and Santa Quiteria (five samples). These extractive settlements are part of Kamukaia Project coordinated by EMBRAPA Acre. Sufficient quantities of each sample were derivatized with diazomethane and the analyses were performed on a gas chromatograph (HP 6890N Network CG System) fitted with a 30 m × 0.32 mm × 0.25 µm film thickness HP-5 capillary column and operating in split mode at a ratio of 1:50 (split/splitless injector). Helium was used as carrier gas (flow: 2,5 mL/min, inlet pressure: 26.06 psi). The initial oven temperature was 110 °C (held for 2 min) to 140 at 5 ºC/min and then 160 to 290 at 5ºC/min. The injection volume was 1 µL of a 3 mg/mL solution of each sample (oil) in $CH_2Cl_2$. The percentage compositions were obtained from electronic integration measurements using flame ionization detection (FID, 270°C). Injections were carried out in triplicate and standard deviations were considered. Samples were also analyzed on an HP 6890N CG-MS apparatus fitted with an HP-5 MS capillary column (30 m × 0.32 mm × 0.25 µm film thickness) and processed using MSD Productivity ChemStation Software. The chromatographic conditions were the same as above. The mass analyzer operated at an ion source temperature of 280 °C, electron impact ionization energy of 70 eV and an acquisition mass range of 40 to 500 *m*/*z* (3.66 scan/sec).

## 3. Results

The sesquiterpenes and diterpenes percentage of all samples are presented in Table 1.

**Table 1.** Percentge of sesquiterpenes and diterpenes of the nine Copaiba samples from Porto Dias (PD) and Santa Quiteria (SQ) extractive settlement projects.

| | Copaibas samples | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **PD1** | **PD2** | **PD3** | **PD4** | **SQ1** | **SQ2** | **SQ3** | **SQ4** | **SQ5** |
| **Sesquiterpenes** | | | | | | | | | |
| *hydrocarbons* | 78.89 | 57.3 | 53.89 | 57.57 | 50.31 | 56.26 | 71.74 | 71.91 | 72.87 |
| *oxygenated* | 2.68 | 0 | 0 | 0.27 | 12.04 | 0.49 | 2.74 | 2.07 | 9.07 |
| **Diterpenes** | 13.23 | 40.57 | 43.42 | 42.31 | 22.68 | 39.72 | 22.91 | 17.01 | 16.83 |
| Total identified | 94.74 | 97.87 | 97.32 | 99.15 | 85.04 | 96.47 | 97.39 | 90.99 | 98.87 |

## 4. Conclusion

All samples showed a high content of sesquiterpene hydrocarbons. Only one sample (SQ1) showed a high content of oxygenated sesquiterpene, and its main representative was caryophyllene oxide. Among the diterpenes, kaurenoic acid (3.7 to 16.7%) and hardwickic acid (2.6 to 20.4%) were the most abundant and were present in almost all samples.

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[1] Leite, A., Alechandre, A., Rigamonte- Azevedo, O. C., Campos, C.A., Oliveira, A. Recomendações para manejo sustentável do óleo de copaíba. Rio Branco, AC, UFAC, SEFE, 2001, 38p.