

NOTAS E COMUNICAÇÕES

THE ESSENTIAL OILS OF *Piper reticulatum* L. AND *P. crassinervium* H. B. K.*

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ABSTRACT - Essential oils from leaves and thin branches of *Piper reticulatum* and *P. crassinervium* collected in the north region of Brazil, were obtained by steam distillation and analyzed by GC/MS. The oil of *P. reticulatum* was dominated by β -elemene (24.6%) and β -caryophyllene (16.7%). The major compounds identified in the oil of *P. crassinervium* were β -caryophyllene (17.7%), γ -elemene (14.4%) and b-elemene (10.9%).

Key-Words: *Piper reticulatum*, *Piper crassinervium*, Piperaceae, β -caryophyllene, γ -elemene, β -elemene.

Os Óleos Essenciais de *Piper reticulatum* L. e *P. crassinervium* H. B. K.

RESUMO - Os óleos essenciais das folhas e galhos finos de *Piper reticulatum* e de *P. crassinervium*, coletados na região norte do Brasil, foram obtidos por arraste à vapor e analisados através de GC/MS. O óleo de *P. reticulatum* é constituído principalmente por β -elemeno (24,6%) e β -cariofileno (16,7%). Os principais compostos identificados no óleo de *P. crassinervium* foram β -cariofileno (17,7%), γ -elemeno (14,4%) e β -elemeno (10,9%).

Palavras-chave: *Piper reticulatum*, *Piper crassinervium*, Piperaceae, β -cariofileno, γ -elemeno, β -elemeno.

Piper reticulatum L. (Syn: *Artanthe ruiziana* Miq., *Enckea lata* (Kunth) Kunth, *E. reticulata* (L.) Miq., *E. smilacifolia* (Kunth) Kunth, *Macropiper latum* (Kunth) C. Presl., *Piper discophorum* C.DC., *P. duchassaingii* C.Dc., *P. latum* Kunth, *P. pangoense* C.DC., *P. smilacifolium* Kunth, *P. tarapotianum* C.DC.), is a branching small shrub, distributed in the West India and Central and South Americas (Yuncker, 1972). *Piper crassinervium* Kunth (Syn: *Artanthe enckeoides* Miq., *A. exserens* Miq., *Peltobryon exserens* (Miq.) Miq., *Piper annulatum* Trel., *P. crassamentum* Trel., *P. papyraceum* Trel., *P. propinquum* var. *brevistylum* Trel., *P. propinquum* var. *grande* Trel., *P. propinquum* var. *propinquum*, *P. pseudopropinquum* C.DC., *P. rufescens* C.DC., *P. san-luisense* Trel., *P. submultiplinerve* C.DC., *Steffensia crassinervia* Kunth., between other synonymy species), is a branching shrub or small tree 2-5 m high, distributed in Amazon, including Brazil, Colombia, Equador and Peru

(Yuncker, 1972). Two 6-substituted 5,6-dihydropyran-2-ones were isolated from *P. reticulatum* (Maxwell *et al.*, 1998). Concerning the chemical composition of volatiles of the essential oil from *P. crassinervium* no references could be found.

The leaves and thin branches of *Piper reticulatum* and *P. crassinervium* were collected in the city of Rio Branco (AC), Brazil. Voucher specimens were deposited in the Herbarium of Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus (AM), Brazil. Air-dried leaves and thin branches (150g), were submitted to steam distillation in a Clevenger-type apparatus for 4 h to produce essential oils in 0.5% and 0.2% yields, respectively. The oils were analyzed by CG/MS using a Finnigan Mat system equipped with a SE-54 fused silica capillary column (30 m x 0.25 mm; 0.25 mm film thickness) with the following conditions; temperature programmed at 60°C-240°C (3°C/min); injector temperature, 220°C; carrier

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gas, helium, adjusted to a linear velocity of 32 cm/s (measured at 100°C); injection type, splitless (1mL, of a 1:1000 hexane soln.); split flow was adjusted to 20:1; septum sweep was a constant 10 mL/min; mass spectra, 70 eV (in EI mode); ion source temperature and connection parts, 180°C. Individual components were identified by comparison of both mass spectrum and their GC retention data with those of authentic compounds previously analyzed and stored in the data system or existing in the literature (Adams, 1995). The retention indices were calculated for all volatiles constituents using a homologous series of *n*-alkanes recorded under the same operating conditions. The quantitative data were obtained by electronic integration of the TIC peak areas.

The compounds identified in the oils are listed in Table 1. The two oils were mainly sesquiterpenoid in nature; nevertheless

they were different from each other. *P. reticulatum* contained β -elemene (24.6%) and β -caryophyllene (16.7%) as its main constituents, followed by up to 14% not identified sesquiterpenes. In *P. crassinervium* essential oil, the major components were β -caryophyllene (17.7%), γ -elemene (14.4%), and β -elemene (10.9%). According our previous works some species of *Piper* that grows in Amazon showed essential oils rich on sesquiterpenes (Gottlieb *et al.*, 1981; Santos *et al.*, 1998; Andrade *et al.*, 1998; Luz *et al.*, 2000) or phenylpropanoids (Ramos *et al.*, 1986; Maia *et al.*, 1987; Maia *et al.*, 1993; Maia *et al.*, 1998).

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Table 1. Volatiles (%) from *Piper reticulatum* and *P. crassinervium*.

| Constituents | RI* | <i>P. reticulatum</i> | <i>P. crassinervium</i> |
|----------------------------|-----------|-----------------------|-------------------------|
| α -Pinene | 940 | 2.2 | 1.4 |
| Camphene | 943 | | 0.1 |
| β -Pinene | 977 | 7.5 | 1.5 |
| Myrcene | 988 | 0.5 | 0.2 |
| p-Cymene | 1021 | | 0.1 |
| Limonene | 1026 | 0.3 | 0.1 |
| 1,8-Cineole | 1028 | | 0.1 |
| Linalool | 1098 | 1.4 | 0.5 |
| Myrtenal | 1195 | 0.3 | |
| Germacrene C | 1328 | | 0.4 |
| δ -Elemene | 1337 | 0.5 | 4.3 |
| α -Cubebene | 1350 | 0.3 | 0.1 |
| α -Copaene | 1377 | 1.7 | 0.4 |
| Germacrene A | 1386 | 1.1 | 0.7 |
| β -Elemene | 1417 | 24.6 | 10.9 |
| β -Caryophyllene | 1424 | 16.7 | 17.7 |
| α -Gurjunene | 1443 | | 0.2 |
| α -Humulene | 1454 | 1.6 | 1.3 |
| Aromadendrene | 1465 | | 0.8 |
| Hydrocarbon sesquiterpenes | 1485 | 6.3 | 2.1 |
| Chamigrene | 1490 | | 5.9 |
| γ -Elemene | 1500 | | 14.4 |
| δ -Guaiene | 1511 | 1.2 | 1.0 |
| δ -Cadinene | 1523 | 0.5 | 0.6 |
| Nerolidol | 1564 | 6.3 | 0.4 |
| Oxygenated sesquiterpenes | 1588-1613 | 7.2 | 10.0 |
| Dilapiolle | 1629 | 2.1 | 0.6 |
| Torreyol | 1649 | 1.0 | 0.9 |
| Oxygenated sesquiterpenes | 1654-1675 | 0.8 | 1.2 |

*Retention Index on SE-54

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