



## CHEMICAL COMPOSITION AND OVICIDAL EFFECT OF THE ESSENTIAL OIL FROM LEAVES OF FIVE PIPERACEAE SPECIES ON *Tibraca limbativentris* EGGS (HEMIPTERA: PENTATOMIDAE)

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**Abstract:** Among the pest insects found in rice fields the *Tibraca limbativentris* Stål, 1860, causes significant losses to rice farmers. Considering this, our study aimed to verify the ovicidal action of essential oils from five Piperaceae species. To obtain the essential oils were used leaves of *Piper marginatum* Jacq., and *Piper malacophyllum* Pels., both collected in Novo Progresso/PA, Brazil; *Piper aduncum* L. and *Piper tuberculatum* Jacq., both collected in Tangará da Serra/MT, Brazil; and *Piper gaudichaudianum* Kuntze collected in Curitiba/PR, Brazil. Oil extractions were made by drag of water vapor and from these oils were carried dilutions for use in bioassays (concentrations: 0.25; 0.5; 1.0; 2.0 and 4.0% using Tween<sup>®</sup> 20 at 5% for solubilization). Oil was analyzed by GC-MS (60–240 °C at 3°C min rate) in a Varian 431-GC coupled to a Varian 220-MS instrument. The components identification was carried and calculated according to the equation of Van den Dool & Kratz [1]. Subsequently, the MS acquired for each component was matched with those stored in the Wiley/NBS mass spectral library of the GC-MS system and with other published mass spectral data [2]. Nine compounds were identified for *P. aduncum*, being the most abundants: z-carpacin (11.9%), myristicin (24.3%) and dillapiole (53.6%). Fourteen compounds were identified for *P. malacophyllum*, being the most abundants: o-cymene (6.3%), bulnesol (7.0%),  $\alpha$ -guaiene (9.6%), trans- $\beta$ -guaiene (15.8%) and  $\alpha$ -bulnesene (20.7%). Thirteen compounds were identified for *P. marginatum*, being the most abundants: prezizane (7.6%), spathulenol (9.3%) and E-isolemicin (10.0%). Nineteen compounds were identified for *P. gaudichaudianum*, being the most abundants:  $\beta$ -duprezianene (5.3%), fokienol (5.5%),  $\alpha$ -guaiene (8.3%), globulol (10.3%), 5-epi-7-epi- $\alpha$ -Eudesmol (13.3%) and longipinanol (19.1%). Nineteen compounds were identified for *P. tuberculatum*, being the most abundants: 9-epi-E-carryophyllene (7.1%), trans-muurolo-4(14),5-diene (9.9%),  $\alpha$ -guaiene (13%), dillapiole (13.8%) and myristicin (15.5%). All Piperaceae species showed ovicidal activity. The observed LC<sub>50</sub> values on *T. limbativentris* eggs demonstrate that both younger eggs as older eggs were susceptible to tested oils. These results may be related with the potential toxicity of the main compounds found in each species (dillapiole, myristicin, cubebene,  $\alpha$ -guaiene, longifolene, prezizane, spathulenol, sabinene and  $\delta$ -2-carene). Considering this, we highlight the use of leaves of different *Piper* species for application as a bioracional and organic phyto-insecticide.

**Keywords:** *Piper aduncum*; *Piper gaudichaudianum*; *Piper malacophyllum*; *Piper marginatum*; *Piper tuberculatum*.

### References:

- [1] Van den Dool, H.; Kratz, P.D. J. A generalization of the retention index system including linear temperature programmed gas—liquid partition chromatography. *Chromatogr. A*, 1963, 11, 463-467.
- [2] Adams, R.P.; Identification of essential oil components by Gas chromatography/Mass Spectroscopy. Allured Publishing Corporation, (2007).