



Development of a larvicidal nanoemulsion containing *Siparuna guianensis* Aublet essential oil

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Siparuna guianensis Aublet belongs to the family Siparunaceae and is popularly known as capitú and negramina (1). It is widely used in folk medicine and essential oil from this species was considered a potential larvicidal agent against *Aedes aegypti* and *Culex quinquefasciatus* (2). However, poor water solubility of essential oils is considered a technological problem for their application as effective larvicidal products. On this context, O/W nanoemulsions have been considered potential innovative products for this purpose (3). The aim of the present study was to evaluate larvicidal activity of nanoemulsions containing essential oil from *S. guianensis* against *A. aegypti* and *C. quinquefasciatus* larvae. Leaves of *S. guianensis* were collected in June 2014 at the Macapá, AP and a voucher specimen was deposited in the herbarium of Institute of Scientific and Technological Research of Amapá (IEPA) (Register number: 12819). Essential oil was extracted from the fresh leaves (1 kg) by hydrodistillation, using a Clevenger apparatus. Chemical analysis was performed by gas-liquid chromatography coupled to mass spectrometry (GC-MS). Nanoemulsion was obtained by a low energy method using 95.5% (w/w) of water, 0.25% (w/w) of essential oil and 0.25% (w/w) of polysorbate 80. The essential oil and polysorbate 80 were mixed and stirred at 500 rpm using a magnetic stirrer for 30 min. Then, water was added and the mixture was stirred at 500 rpm for 60 min. Nanoemulsion was stored under room temperature (20 ± 2 °C) and analyzed after 1, 7, 21 and 30 days of preparation. Droplet size and polydispersity of the nanoemulsion was determined by photon correlation spectroscopy. Nanoemulsion was diluted with water for injection (1:25) and measurements were performed in triplicate. Results were expressed as the mean diameter and standard deviation. Preliminary chemical analysis showed that this essential oil has monoterpenes, including α -pinene and myrcene, and sesquiterpenes including γ -cadinene, δ -cadinene and *epi*- α -cadinol. Aliphatic ketones were also found in this oil. Nanoemulsion presented fine translucent aspect and bluish reflect, which is characteristic of this disperse system. Small mean droplet size was observed, ranging from 176.0 ± 12.26 at day 0 to 152.6 ± 1.562 after 30 days of storage. Moreover, low polydispersity index was observed (< 0.500) suggesting stability of the nanoemulsion. DL50 (24 h) for *A. aegypti* and *C. quinquefasciatus* were respectively 13.28 ppm and 24.93 ppm (expressed as essential oil content). This study contributes to nanobiotechnology of natural products, presenting a potential larvicidal nanoemulsion prepared with *S. guianensis* essential oil.

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