

**TITLE:** EVALUATION OF ANTIMICROBIAL EXTRACT ACTIVITY OF COCOA NIBS

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**ABSTRACT:**

Studies have shown that the seeds of cocoa (*Theobroma cacao* L.), after fermentation and drying, act beneficially for health in diseases like cardiovascular diseases, due to the relevant amounts of phenolic compounds known for several biological activities, such as antimicrobial activity and antioxidant. Currently, the state of Pará is the largest Brazilian producer of cocoa beans, with 53.3% of total production in 2018. This study aimed to evaluate the antimicrobial activity of extracts of cocoa from Pará. Six samples of beans of 500g each were dried in the sun in two different ways: drying in an extended tarpaulin (L1, L2 and L3) and drying in barge with fixed ballast and mobile cover (B1, B2 and B3), after 7 days fermentation. To obtain the nibs, the beans were cut and separated from the hull and the germ, later triturated. The crude extract was obtained using 10 g of samples which were placed in a flask with 50ml of shaking solution for 1h at 25°C, followed by vacuum filtration; this process was repeated 2 times in the filtrate. Total polyphenols (PT) were determined by the Folin-Ciocalteu method expressed in milligrams of quercetin equivalent per gram of dry extract (mgEQ.gES-1). Antibacterial potential (PAB) of the extracts was evaluated by the Disk Diffusion (DD) test, in triplicate, proposed by CLSI (2009). The Six-millimeter paper disks was impregnated with 10 µl of extract against 6 bacteria were: *Bacillus cereus* (Bc), *Enterococcus faecalis* (Ef), *Staphylococcus aureus* (Sa), *Listeria monocytogenes* (Lm), *Escherichia coli* (Ec) and *Salmonella Typhi* (St). The halos were measured and expressed in millimeters. PAB is considered as inhibition halos  $\geq 8$  mm. The PT content (mgEQ.gES-1) ranged from 31.33 (B2) to 40.72 (B3). The mean values of the DD test showed PAB that were above the reference value, the lowest result found was  $8.87 \pm 0.59$  mm for the B3 extract inhibiting Ec and the best results were:  $13.65 \pm 0.16$  mm for the extract B3 inhibiting Ef,  $12.35 \pm 0.64$  mm for the L1 extract inhibiting Lm and  $12.20 \pm 0.56$  mm for the L3 extract inhibiting Sa. In view of the results, it was concluded that the extracts of cocoa presented an excellent antimicrobial activity, regardless of the type of drying. Secondly, the antimicrobial action of plant extracts may be due to phenolic compounds, so it may be interesting to evaluate the impact of these compounds on final products, such as chocolate, in order to increase their shelf life.

**Keywords:** *Theobroma cacao*; potential antibacterial; phenolic compounds.

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