

## Poster

### Synergistic effects of essential oil components: inhibition of cruzain

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**Introduction.** American trypanosomiasis, Chagas disease, is a great cause of human morbidity and mortality in the Neotropics. Although there is currently no effective treatment for this parasitic disease, a number of potential biochemical targets have been identified, including the cysteine protease cruzain. For thousands of years, plant products and their modified derivatives have been rich sources for clinically useful drugs, and higher plants are a promising source of new antiparasitic compounds [1].

**Objectives.** To test various two-component combinations of essential oil components for synergistic and/or antagonistic effects on inhibition of cruzain.

**Methods.** The activities of Croton bark essential oils and essential oil components against recombinant cruzain [2] were measured by a fluorescence assay using Z-Phe-Arg-AMC-HCl as the fluorescent enzyme substrate.

**Results.** Synergism in cruzain inhibition is generally observed in combinations of the sesquiterpenes beta-caryophyllene, germacrene D, or alpha-copaene with other essential oil components. Thus, for example, limonene, beta-caryophyllene, and germacrene D, individually, are inactive (IC-50 > 500 ug/mL), but 1:1 mixtures of limonene + beta-caryophyllene and limonene + germacrene D are very active (IC-50 = 7.2 and 7.6 ug/mL, respectively).

**Conclusion.** The observed synergistic effects on the inhibition of cruzain explain the fact that many essential oils show much greater activity than the major components alone [3].

Keywords: synergism, cruzain, beta-caryophyllene, germacrene D, alpha-copaene

#### Selected References

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