

## Oral presentation

### **Discovery and characterization of novel cyclotides in *Psychotria leptothyrsa* Miq. var. *longicarpa* Val., a plant endemic to Palau (Micronesia).**

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**Introduction.** Cyclotides are a relatively new group of plant proteins isolated from three families: Violaceae, Rubiaceae, and Cucurbitaceae. Research suggests the medicinal properties (anti-tumor, uterotonic, and HIV inhibition) they display are partially due to the exceptional enzymatic and thermal stability provided by their compact, cyclic structure. Their natural function may be host defense, a speculation supported by antibacterial and antimicrobial activity. Although hundreds have been identified, few (roughly 80) have been characterized by amino acid sequencing.

**Objectives.** After screening several species of *Psychotria* for cyclotides, the main objectives included isolating, purifying and sequencing the cyclotides discovered in *P. leptothyrsa* var. *longicarpa*.

**Methods.** Eleven species of *Psychotria* were selected based on reported medicinal use or availability in cultivated gardens. Standard extraction and identification techniques were used to isolate cyclotides. Mass spectrometry, RP-HPLC, LC-MS, and nanospray MS-MS sequencing were used to purify and characterize cyclotides.

**Results.** Twelve cyclotides were identified in aerial tissues of *P. leptothyrsa* var. *longicarpa*; six of those cyclotides (Psyle A - F) were characterized and are novel proteins. Psyle A - F were purified and Psyle A was synthesized for use in bioassays to evaluate their possible anti-oxidant and anti-tumor properties.

**Conclusion.** *P. leptothyrsa* var. *longicarpa* is the fifth rubiaceous and second psychotrian species known to possess cyclotides. Bioactivity studies of cyclotides in *Psychotria* may reveal new medicinally useful compounds. Plans to investigate cyclotide distribution in, and cultural uses of, *Psychotria* spp. in Palau may identify new cyclotides and provide supporting data that traditional knowledge enhances the search for plant-based therapies.

Keywords: *Psychotria*, cyclotides

#### Selected References

1. Göransson U, Svargard E, Claeson P, Bohlin L. 2004. Novel strategies for isolation and characterisation of cyclotides: The discovery of bioactive macrocyclic plant polypeptides in the Violaceae. *Current Protein and Peptide Science* 5(5):317-330.

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