

Trends in Natural Product Research – PSE Young Scientists' Meeting
Budapest, June 19th-21st, 2019

PO-35

doi: 10.14232/tnpr.2019.po35

Isolation of phenanthrenes from the moss *Paraleucobryum longifolium*

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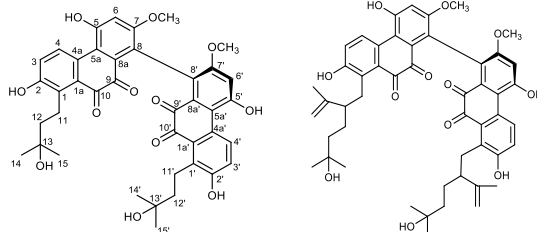
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Paraleucobryum longifolium (Ehrh. ex Hedw.) Loeske (Dicranaceae) is distributed in Northern America, Asia and Europe. The plant has 4-8 mm long whitish or grayish green, glossy leaves, and it grows on cliffs, tree trunks, and rotten logs, in the moderate zone. In a screening experiment, different extracts of *P. longifolium* showed antibacterial and antiproliferative effects [1], so it was chosen for further preparative work to identify secondary metabolites.



From the methanolic extract of the moss, compounds **1-2** were isolated as amorphous compounds with dark violet color. The separation required the combination of chromatographic methods, including vacuum liquid chromatography on silica gel and on reversed phase silica gel, gel filtration and RP-HPLC. The structures were determined by spectroscopic methods, such as NMR, HRESIMS spectroscopy. The identified compounds are the first 9,10-phenanthrenequinone dimers, in which the monomers are connected through their C-8 atoms. The presence of these compound in this plant may explain the observed bioactivities, since monomeric 9,10-phenanthraquinones have been reported to have strong antibacterial effects.

Acknowledgements

This work was supported by the National Research, Development and Innovation Fund (K115796) and the János Bolyai Re-search Scholarship of the Hungarian Academy of Sciences.

References

[1] M Vollár et al. *Molecules*, 2018; 23: E1520.