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STUDIES ON CHILEAN LICHENS, XII. CHEMOTAXONOMY OF THE GENUS *PSOROMA*

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Psoroma (Pannariaceae) is a lichen genus found predominantly in the Southern Hemisphere. New Zealand and South America are the main centers of speciation (1). Chemical studies have revealed that the genus is characterized by a tendency to accumulate chlorinated depsidones biogenetically related to β-orcinol (2–6). The diaryl ether leprolomin (4), the biphenyl contortin (7), dibenzofuran derivatives (8), and zeorin (2) have been reported.

In this paper we report the secondary metabolites present in 18 taxa of *Psoroma* collected in central southern Chile and in maritime Antarctica. Our earlier results are also included (6).

Three distinct groups of taxa could be discerned from the observed chemical patterns (Table 1). The first group accumulated only chlorinated depsidones of the β-orcinol series, although these substances were also present in the species of the second group.

The second group possessed a more complex chemistry. These taxa accumulated diploicin, a chlorinated depsidone of the orcinol series, leprolomin, and (+)-usnic acid in addition to the compounds found in the first group. In the third group, the unrelated substances porphyrilic acid methyl ester, atranorin, norstictic acid, and ergosterol peroxide were present. Leprolomin is a biphenyl ether first isolated from *Psoroma leprolomun* (4). This compound, can be considered as a chemical marker for *Psoroma*, because it has not been reported for any other lichen genus.

According to Galloway (1), the genus *Psoroma* includes a heterogeneous group of taxa which could be segregated into two or more independent genera. It is conceivable that chemical data may help to distinguish these segregates.

EXPERIMENTAL

PLANT MATERIAL AND EXTRACTION.—The collection sites of the *Psoroma* species are indicated in Table 1. Voucher specimens have been deposited in the herbarium of the School of Pharmacy, Universidad de Valparaíso. The air-dried lichen thalli were extracted twice at room temperature with anhydrous Me_2CO (24 h).

IDENTIFICATION.—The identification of each compound was based on tlc (9), optical rotation, ir, ^{1}H-nmr, and ms data and by comparison with authentic samples.

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TABLE 1. Distribution of Secondary Metabolites in Chilean Members of the Genus *Psoroma*.

Species	Source[a]	Vicanicin	Isovicanicin	Pannarin	Dechloropannarin	Diploicin	Leprolomin	Usnic Acid	Norstictic Acid	Ergosterol Peroxide	Atranorin	Porphyrilic Acid Methyl Ester	References
GROUP 1													
Psoroma contortum Stirton													
Chemical Strain I	1	(+)		(+)									
Chemical Strain II	2			(+)									
Psoroma dimorphum Malme	3	(+)		(+)									
Psoroma hispidillum Nyl.	2–4	(+)											
Psoroma microphyllizans (Nyl.) D. Galloway													
Chemical Strain I	3	(+)		(+)									
Chemical Strain II	5	(+)											
Psoroma pholidotoides (Nyl.) Trevisan	3–6	(+)											
Psoroma pulchrum Malme	7	(+)		(+)									Piovano *et al.* (6)
Psoroma sphinctrinum (Mont.) Nyl.	5–7	(+)											
Psoroma soccatum R. Br. ex. Crombie	7				(+)								
GROUP 2													
Psoroma athrophyllum Stirton	8		(+)				(+)						
Psoroma calliginosum													
Chemical Strain I[b]	3	(+)		(+)		(+)	(+)						Piovano *et al.* (6)
Chemical Strain II	7						(+)						
Psoroma implexum Stirton	3	(+)					(+)						
Psoroma leprolomum (Nyl.) Malme	7	(+)					(+)						
Psoroma pallidum Nyl.													
Chemical Strain I	7	(+)		(+)	(+)								Piovano *et al.* (6)
Chemical Strain II	7	(+)			(+)		(+)						
Psoroma patagonicum Malme													
Chemical Strain I	3	(+)		(+)			(+)						
Chemical Strain II	7	(+)											
Psoroma reticulatum (Hue) Zahlbr.													
Chemical Strain I	7			(+)			(+)	(+)					
Chemical Strain II	3	(+)					(+)	(+)					
Chemical Strain III	9			(+)				(+)					Piovano *et al.* (6)
GROUP 3													
Psoroma contextum Stirton	3								(+)				
Psoroma hypnorum (Vahl) S.F. Gray	10									(+)			
Psoroma tenue Henssen var. *tenue*	10										(+)	(+)	

[a]1, Punta Arenas; 2, Puyehue National Park; 3, Villarrica National Park; 4, Los Alerzales National Park; 5, Huerquehue National Park; 6, Robinson Crusoe Island; 7, Conguillio National Park; 8, Lago Yelcho, Aysen; 9, Rio Cisnes, Aysen; 10, Robert Island, Antarctica.

[b]Corresponds to an incorrectly determined species (*Psoroma dimorphum*) reported previously in Piovano *et al.* (6).

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