

Epicuticular Waxes from Seeds of Uruguayan Grasses

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RESUMEN. "Ceras epicuticulares de semillas de pastos uruguayos". Se describen los componentes principales de las ceras de semillas de *Piptochætium panicoides* y *Echinocloa cruspavonis*. Estas contienen hidrocarburos, ésteres, ácidos y alcoholes grasos libres.

SUMMARY. The main components in *Piptochætium panicoides* and *Echinocloa cruspavonis* seed-waxes are described. They include hydrocarbons, esters, free acids and free alcohols.

INTRODUCCION

Piptochætium panicoides f. *subpapillosum* (Hackel.) Parodi and *Echinocloa cruspavonis* (HBK) Schult. are native grasses from Uruguay. *P. panicoides* is a perennial member of Tribe Stipeae, which grows in coastal dunes and seeds in the late spring¹. *E. cruspavonis* of Tribe Paniceae is an annual which grows in damp soils, being invasive in local rice plantations, and seeding in early Autumn¹. The composition of their seed waxes was analysed to establish their relationship to other grass seed-waxes²⁻⁶.

RESULTS AND DISCUSSION

The wax in *P. panicoides* represents 0.6% of the dry weight of the seeds, while for *E. cruspavonis* the figure is 0.4%. By a combination of preparative

TLC and GC methods^{4, 5} the waxes were separated into fractions as is shown in Table I. The composition of these fractions was determined and is shown in Tables II and III.

No clear taxonomic patterns seem to arise from the data so far collected for Gramineae and seed-wax compositions²⁻⁶. On the other hand there seems to be one between seed maturation season and total wax content, which is higher for summer seeding species. The more usual hydrocarbons for seed waxes are C 29 and C 31, as is the case for leaf waxes⁷. In the seed wax esters the more common acids range from C 16 to C 22, while the alcohols are C 22 to C 28. The free alcohols are usually higher homologues (C 28 and C 30) and the free acids have no clearly defined range of components.

PALABRAS CLAVE: Gramineae; *Piptochætium panicoides*; *Echinocloa cruspavonis*; Ceras de Semillas; Hidrocarburos; Esteres; Acidos libres; Alcoholes libres.

KEY WORDS: Gramineae; *Piptochætium panicoides*; *Echinocloa cruspavonis*; Seed-waxes; Hydrocarbons; Esters; Free acids; Free Alcohols.

FRACTION	<i>P. panicoides</i>	<i>E. cruspavonis</i>
Hydrocarbons	24.5	39.6
Esters	56.0	20.6
Free alcohols	5.9	4.5
Free acids	5.7	26.0
Unidentified	8.1	9.3

Table I. Fractions of *P. panicoides* and *E. cruspavonis* seed waxes. W/W% as determined following methodology of Soler *et al.*⁴

No. C atoms	Hydrocarbons	Esters		Free Alcohols	Free Acids
		Alcohols	Acids		
14					2.3
16			29.9		19.6
18.1			tr		6.3
18			16.8		12.3
20.1					0.7
20			9.8		1.7
21					0.7
22		2.8	6.5	3.2	3.7
23		tr	1.1		0.7
24		4.6	9.8	tr	2.7
25		0.9	1.1	tr	1.7
26		16.5	3.8	6.5	4.0
27	3.9	1.8	2.2	3.2	2.7
28	1.6	45.0	6.0	32.3	12.6
29	22.7	2.8	2.2	3.2	3.3
30	3.1	22.0	8.7	32.3	12.3
31	46.9	0.9	tr	6.5	2.3
32	2.3	2.8	2.2	9.7	7.0
33	19.5			tr	1.0
34				3.2	2.7

Table II. Composition of *P. panicoides* seed wax (weight % as determined by GC; *tr*: traces).

Nº. C atoms	Hydrocarbons	Esters		Free Alcohols	Free Acids
		Alcohols	Acids		
12				3.3	
14		5.0	10.0	3.3	12.0
15			3.0		
16		4.3	22.0	1.6	22.0
17			1.9		
18:1					32.8
18		8.6	15.7		8.0
19			1.8		
20		5.8	9.7	38.2	1.3
21			3.1		4.8
22		43.3	14.8	8.1	4.1
23	3.6		0.9		2.0
24		13.4	6.1	5.0	5.6
25	6.5		0.6		1.0
26	1.1	3.0	1.6	6.0	2.8
27	25.4	1.5	1.1		1.0
28	4.1	3.8	1.6	6.0	2.6
29	39.5				
30	1.8	4.0	2.0	28.2	
31	15.2		0.6		
32		6.1	2.2		
33	2.8				

Table III. Composition of *E. cruspavonis* seed wax (weight % as determined by GC).

Aldehydes and β -diketones found in leaves are not apparent in seed-waxes^{7,8}. The content of hydrocarbons and esters tends to be higher in the seed-waxes than in the leaf waxes^{7,8}.

Experimental

General. Precoated chromatoplates were used for TLC (Merck 5765). Gas chromatography was performed with a Pye 104 and a Shimadzu GC-6AM with dual FID detector. Solvents were re-distilled in glass.

Collection of the waxes. Mature seeds of *P. panicoides* f. *subpapillosum* were collected in Solís, Canelones (Uruguay) on December 1982. The dry seeds (41.0 g) were extracted by dipping in CHCl_3 (10 sec.). The wax (250 mg., 0.61%) was recovered by evaporation of the solvent.

Seeds of *E. cruspavonis* were collected at Sayago (Uruguay) on March 1981. The seeds (32.5 g) were treated in the same way to yield the wax (124 mg., 0.38%).

Chromatographic methods. Preparative TLC and GC methods used were previously described^{4, 5}.

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