



IV CONGRESO IBEROAMERICANO DE INGENIERÍA DE LOS ALIMENTOS

Efecto del procesado térmico sobre las propiedades fisicoquímicas y riqueza funcional de frutos de arrayán (*Luma apiculata*)

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Organiza:



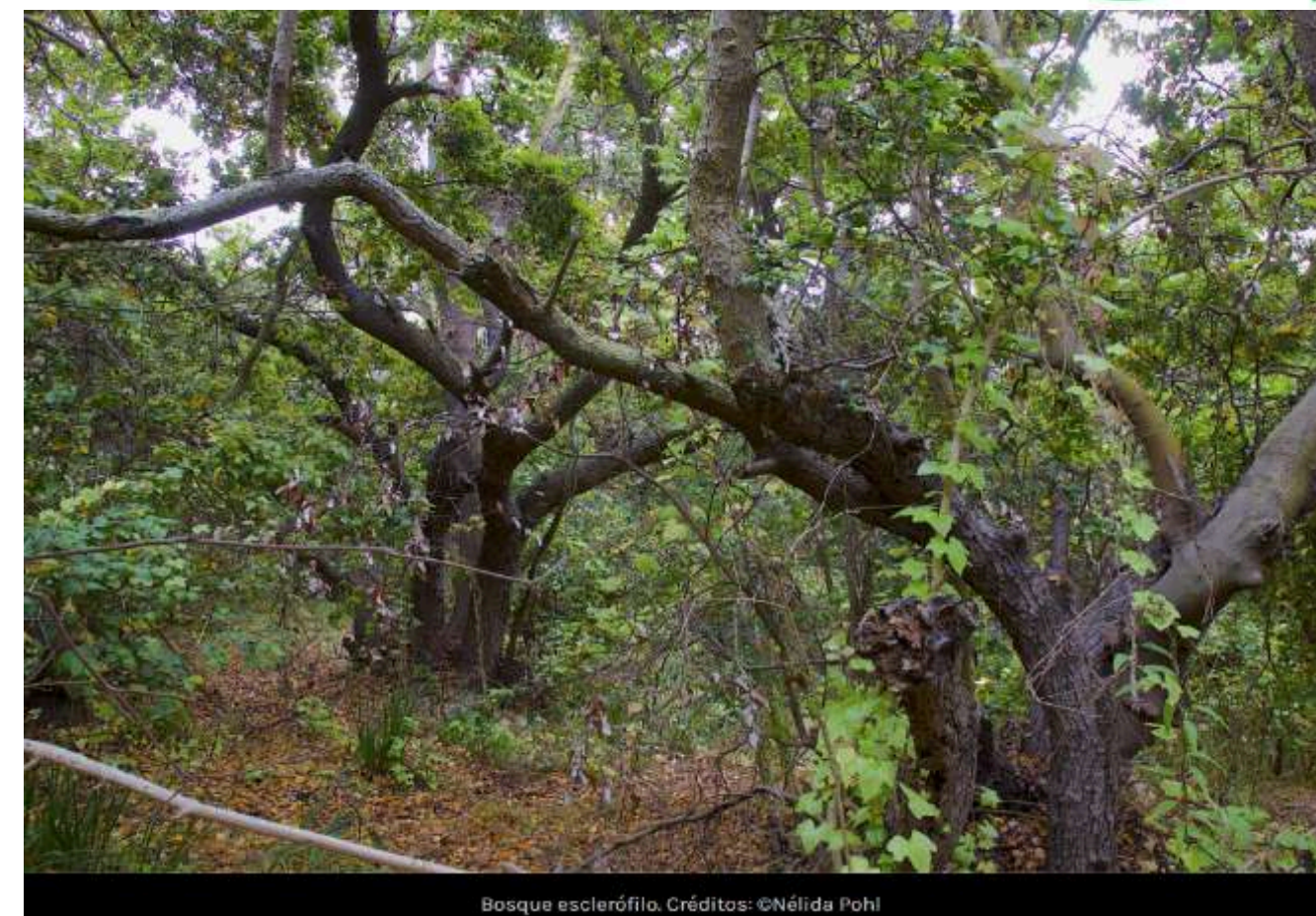
Bosque esclerófilo chileno: Fuente de materias primas con potencial saludable. Caso arrayán



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Bosque esclerófilo. Créditos: ©Nélida Pohl

Los bosques y matorrales esclerófilos de Chile son uno de los 5 ecosistemas de tipo mediterráneo existentes en el mundo. Considerados en estado vulnerable, en peligro o en peligro crítico por la Unión Internacional para la Conservación de la Naturaleza (IUCN),



Review

Patagonian Berries: Healthy Potential and the Path to Becoming Functional Foods

Lida Fuentes ^{1,*}, Carlos R. Figueroa ², Monika Valdenegro ³ and Raúl Vinet ^{1,4}

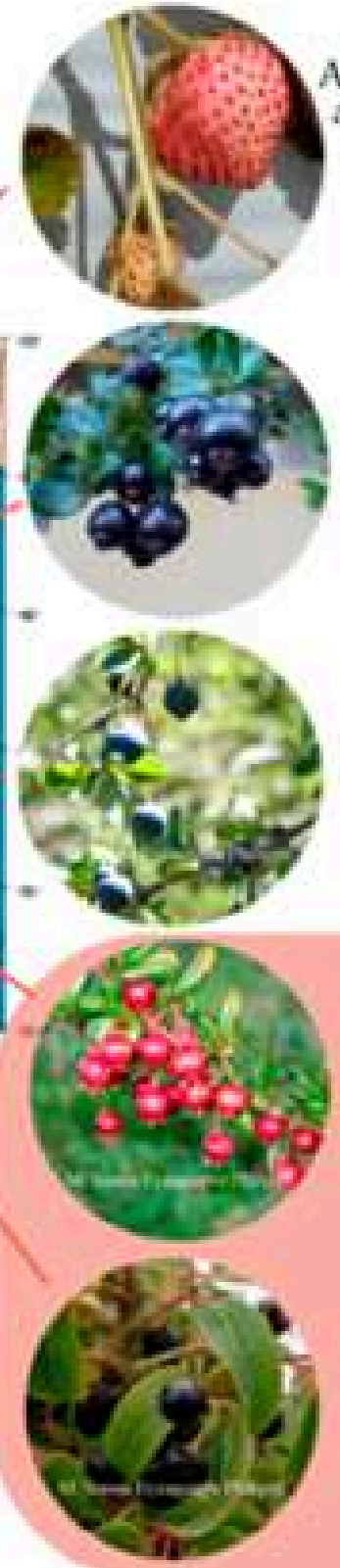
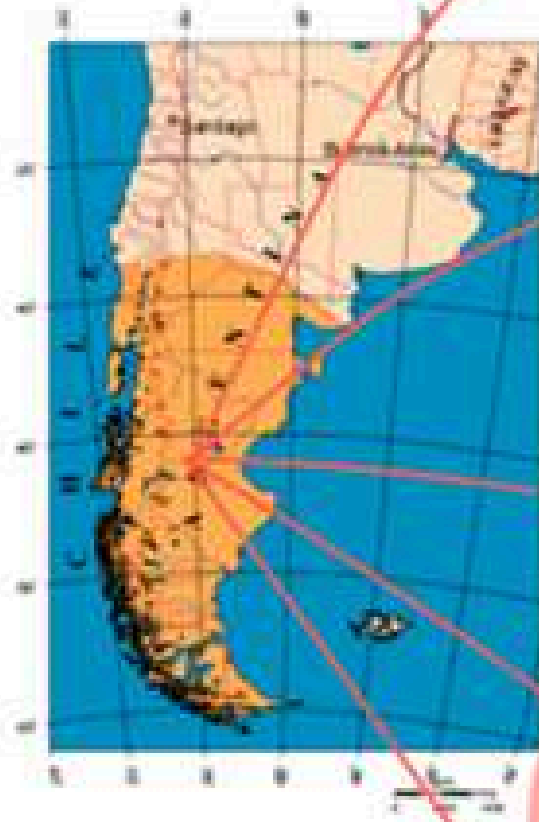


Species	Common Name	Family	Geographic Distribution [16,35]	Traditional Products
<i>Aristotelia chilensis</i> (Mol.) Stuntz.	Maqui	Elaeocarpaceae	Chile: from the Coquimbo to Aysén regions, including Juan Fernández Island (Latitude 31°–40°). Argentina: from Jujuy to Chubut provinces.	Fresh and dried fruit, used to make textile pigments, juice, alcoholic beverages [36,37]
<i>Ugni molinae</i> Turcz.	Murta	Myrtaceae	Chile: From the O'Higgins to Aysén regions, including Juan Fernández Island (Lat. 34°–40°). Argentina: Neuquén, Rio Negro, and Chubut provinces.	Fresh and dried fruit, used for pigment, bakery, jam, and beverages [36,37]
<i>Berberis microphylla</i> G. Forst.	Calafate	Berberidaceae	Chile: From the Metropolitan to Magallanes regions (Lat. 33°–55°). Argentina: From Neuquén to Tierra del Fuego provinces.	Fresh fruit, used to make juice, beer [36,37]
<i>Luma apiculata</i> (DC.) Burret.	Arrayán	Myrtaceae	Chile: From the Coquimbo to Aysén regions (Lat. 31°–40°). Argentina: From Neuquén to Chubut provinces.	Fresh fruit, textile pigments, bakery, jam, aromatics [22,23]
<i>Fragaria chiloensis</i> (L.) Mill.	Chilean strawberry	Rosaceae	Chile: From the O'Higgins to Magallanes regions (Lat. 34°–55°). Argentina: Neuquén and Rio Negro provinces.	Fresh fruit, used to make alcoholic beverages [36,43]

Geographic distribution according to Rodriguez et al., 2018 [35] and Schmeda et al., 2019 [16]. N.D.: not described

Foods **2019**, *8*(8), 289; <https://doi.org/10.3390/foods8080289>





	Antioxidant determination and polyphenols pattern	availability	processing assays	cellular culture	Aortic rings assay	animals assays	clinical trials
Strawberry	✓						
Blueberries	✓		✓		✓		
Olives	✓	✓	✓	✓			
Raspberries	✓	✓	✓	✓	✓	✓	
Black olives	✓	✓	✓	✓	✓	✓	✓

Functional Food potential





Review

Patagonian Berries: Healthy Potential and the Path to Becoming Functional Foods

Liliana Fuentes 1,* , Carlos R. Figueroa 2 , Mariana Valdebenito 3 , and Raúl Viera 1,4 

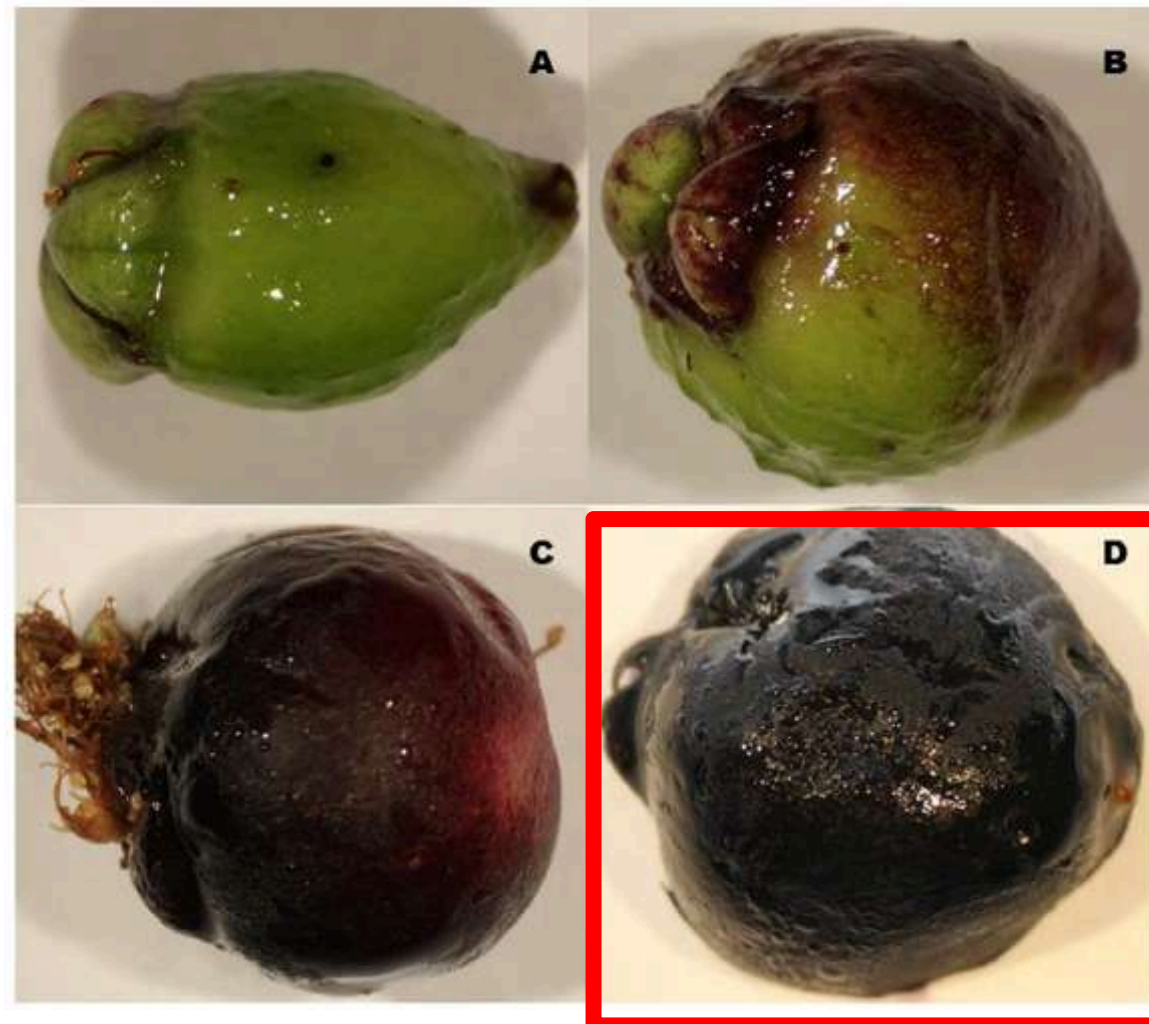
Species Name	Average Antioxidant Capacity Determined by ORAC ($\mu\text{mol}\cdot 100\text{ g DW}^{-1}$) ^a	Average Range of Total Polyphenols Compounds Content ($\text{mg GAE g}^{-1}\text{ DW}^{-1}$) ^a	Number of Non-Anthocyanin Polyphenol Compounds Reported	Principal Non-Anthocyanin Polyphenol Compounds	
Maqui.	37,174 [11,69]	49.7 [70]	13 [15]	Quercetin, dimethoxy-quercetin, quercetin-3-rutinoside, quercetin-3-galactoside, myricetin and its derivatives (dimethoxy-quercetin) and ellagic acid [70]	
Arrayán	62,500 [21]	27.6 [19]	13 [15]	quercetin 3-rutinoside and their derivatives, tannins and their monomers [18,21]	8 [15]



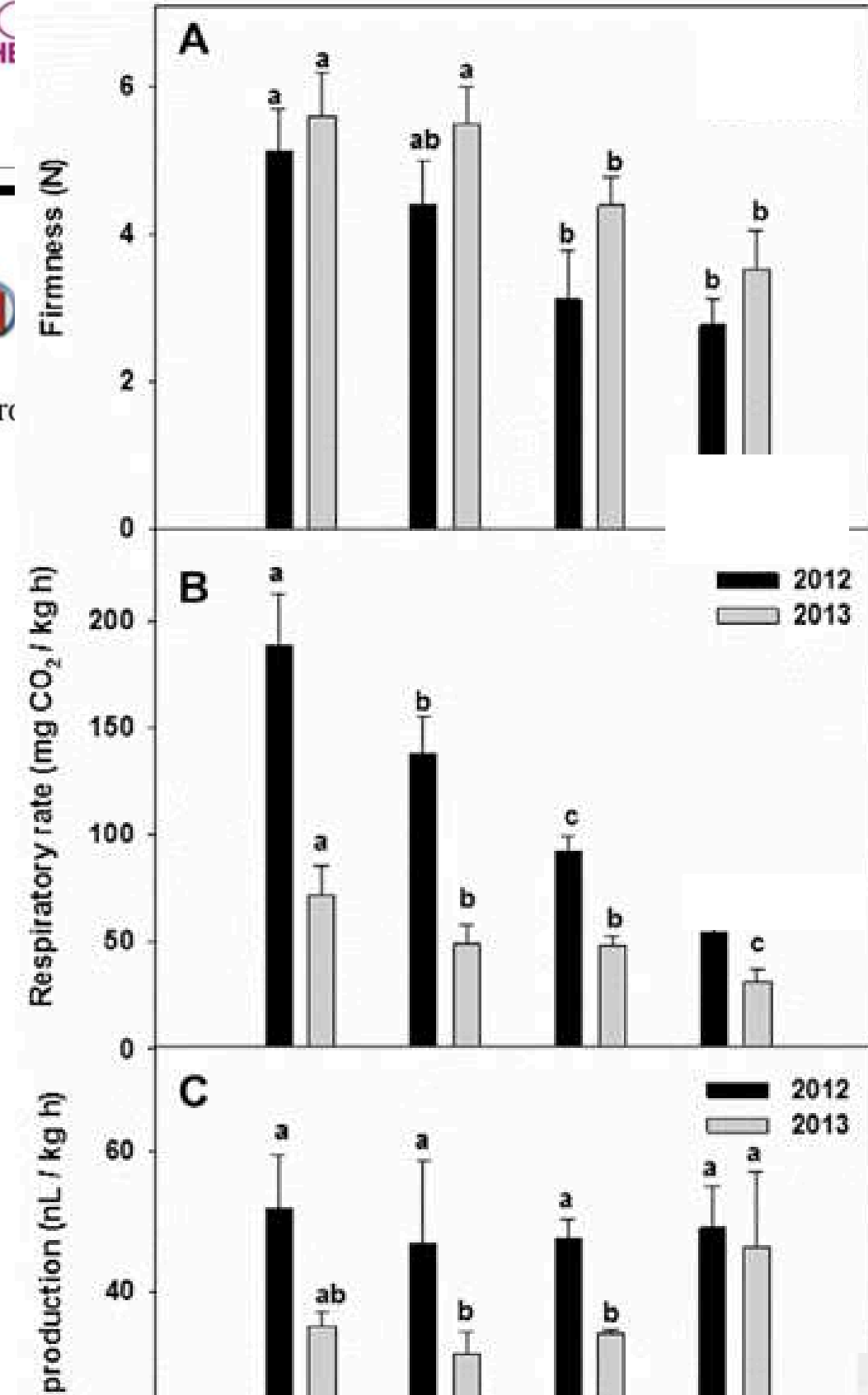


Characterization of fruit development and potential health benefits of arrayan (*Luma apiculata*), a native berry of South America

Lida Fuentes^{a,b,*}, Mónica Valdenegro^{a,c}, María-Graciela Gómez^c, Aníbal Ayala-Raso^d, Evelyn Quiró^e, Juan-Pablo Martínez^{b,a}, Raúl Vinet^{e,a}, Eduardo Caballero^{a,f}, Carlos R. Figueroa^g



- Fruto no climatérico
- Sensible a presencia de etileno



Fuentes et al., Food Chemistry. (2016) <http://doi.org/10.1016/j.foodchem.2015.10.003>



Dra. Lida Fuentes

Estrategia de estabilización por deshidratación en secador de tambor doble rotatorio



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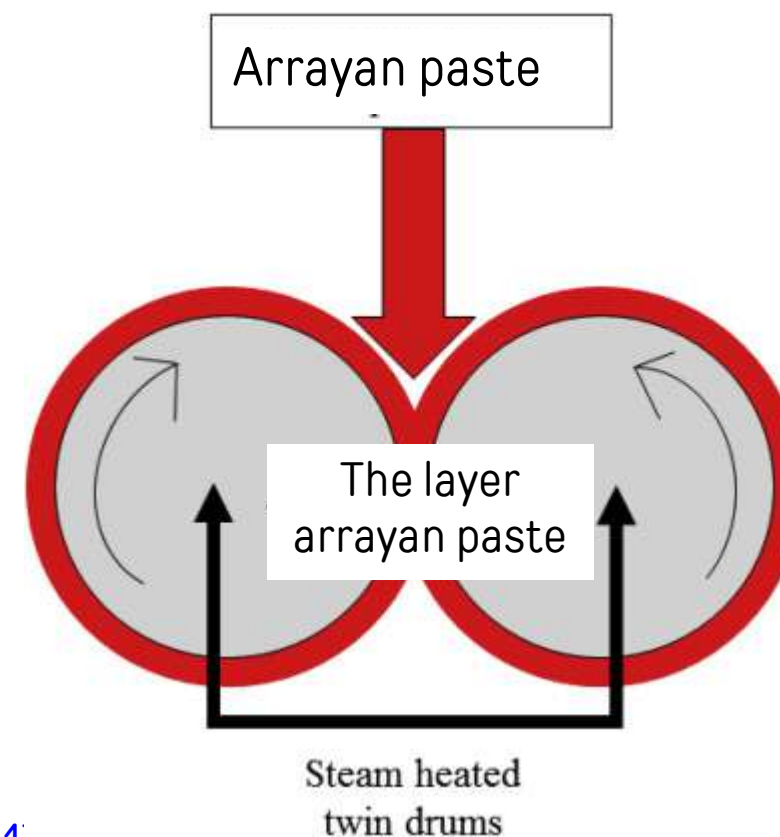
Cosecha
16°brix, color,
La4



Congelado

Pasta madre (prueba
de concepto
diluciones v/v)

Secado Drum
drying (rpm/T^a)



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Effect of drum drying temperature on drying kinetic and polyphenol contents in pomegranate peel

P. Galaz^b, M. Valdenegro^a, C. Ramírez^b, H. Nuñez^b, S. Almonacid^{b,c}, R. Simpson^{b,c,*}



Esquema adaptado de Galaz et al. 2017. <https://doi.org/10.1016/j.jfoodeng.2017.04.002>



Ajustes previos a la estabilización

Raw material processed by batch/replicate \times 500 [g]

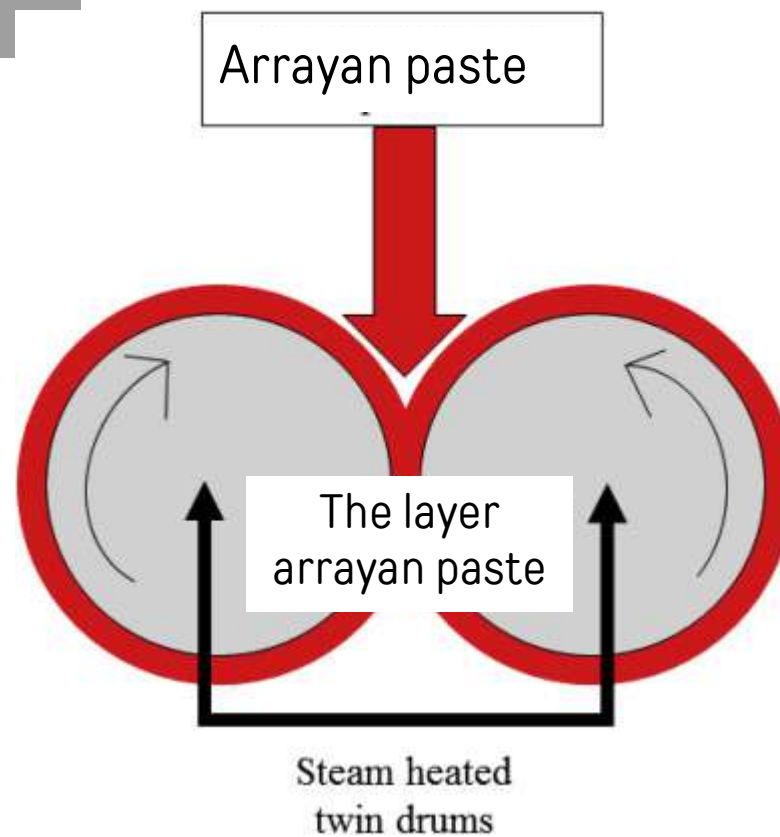
Fixed

Dilution fruit paste:(%): 50/50; 70/30; 80/20.

Drum clearance \times 0.1; 0.2; 0.5; 1.0 mm

Drying temperature (°C)		Rotation speed of drums (rpm) - drying Time (seconds)
100	●	0.50 – 460
110	●	1.0 – 238
120	●	2.0 – 114
130	●	4.0 – 50

Box Behken design, 16 batch.

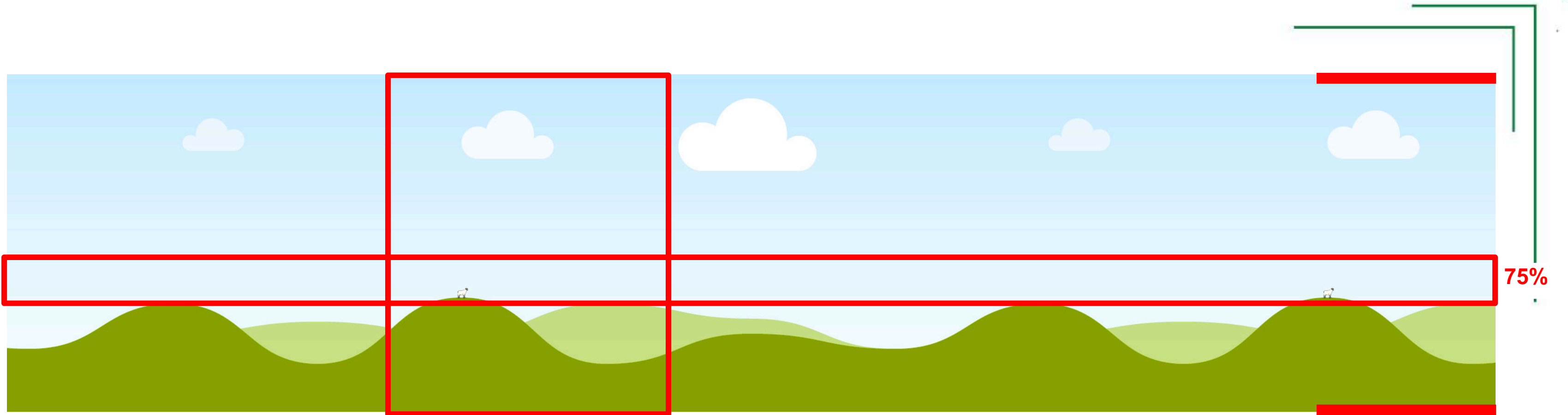


Kinetics of drying at 100, 110, 120 and 130 ° C of the ingredients prepared from arrayan fruit. Target humidity 9,5%





Scavenging of the 1,1-diphenyl-2-picrylhydrazyl Radical (DPPH), Ferric Reducing Antioxidant Power (FRAP), Total Phenolic Content (TPC), Total Flavonoid Content (TFC), Total Anthocyanin Content (TAC) of final ingredient arrayan-based.



Values in the same column marked with the same letter are not significantly different (at $p < 0.05$).

Better combination: 110°C; 2 rpm; drying time 114 s; drum clearance 0.2 mm





ESCUELA DE AGRONOMÍA



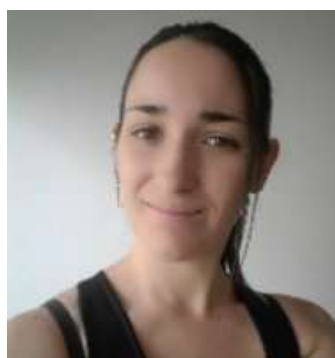
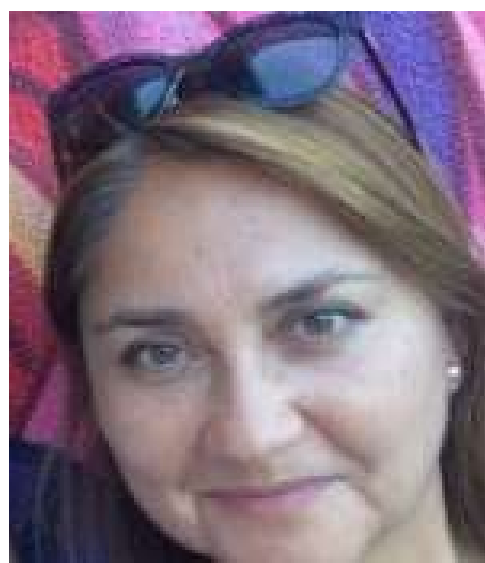
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	F		F	F	F

- ANID Fondecyt 1140817.
- DI PUCV Regular project 039.437. PUCV
- CREAS CONICYT-REGIONAL GORE Región de Valparaíso, R12C1001,
- “Fondo de Investigación del Bosque Nativo” through grant CONAF 064/2011
- CORFO 12IDL1 15150/ 21IDL2 16873.





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Muchas gracias por su atención

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Organiza:

