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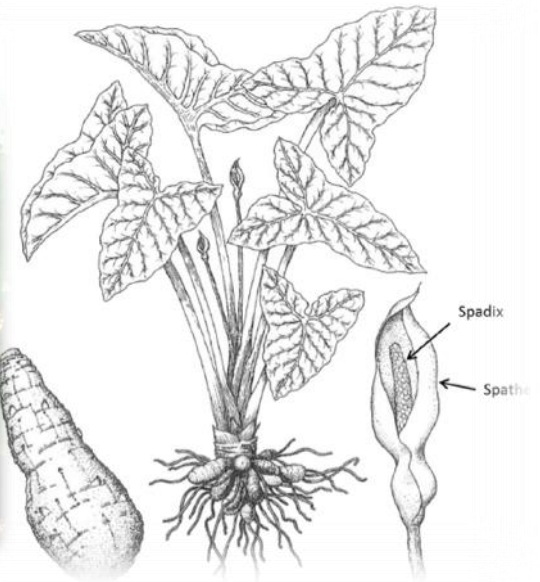
Characterization of functional properties of starch from the “Malanga

PhD candidates: Jehannara Calle, Yaiza Benavent and Raquel Garzón
Prof.: PhD. Cristina Molina Rosell

Common names of Malanga worldwide

Xanthosoma sagitifulium

Mafafa, Otoe, Malanga, Cocoñame, Ocumo, Bore, Yautía, Chonque, Macabo, Rascadera, Quequisque and Tania



Colocasia esculenta

Mexico: Taro

Brazil: Cará

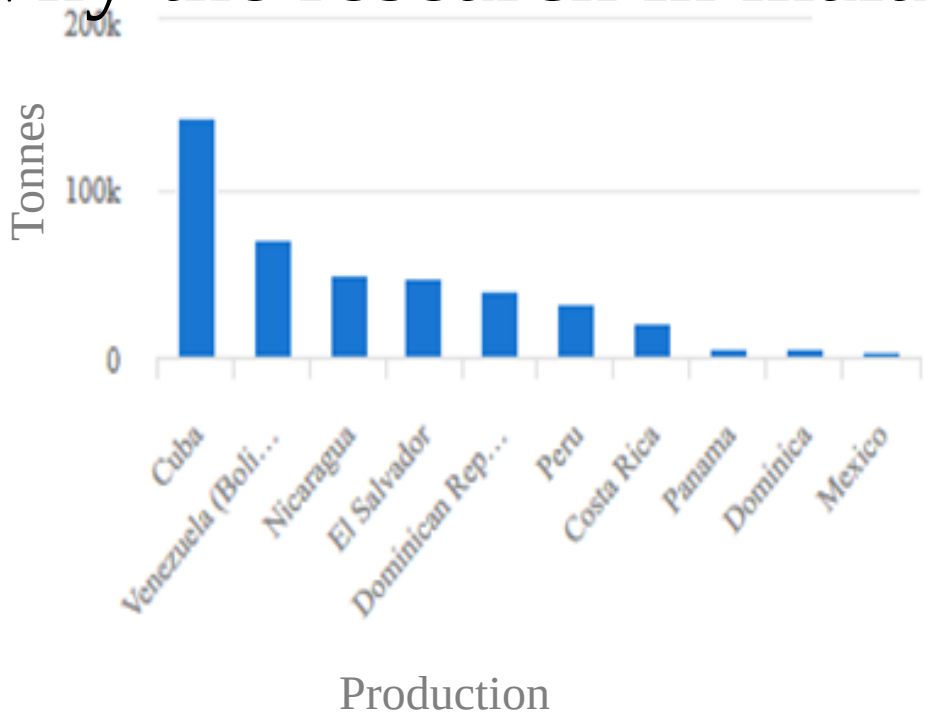
Dominican Republic: Yautía coco

Puerto Rico, Guatemala, Honduras, Spain and Cuba: Malanga

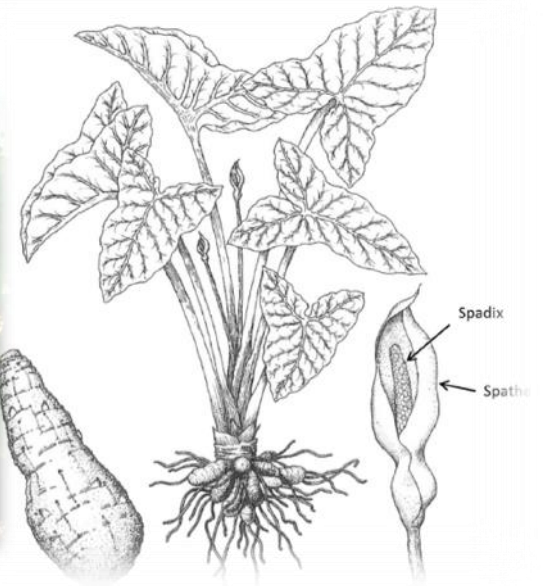
Canary Islands and Costa Rica: Yam

http://www.fao.org/faostat/es/#data/QC/visualize

Why the research in malanga?



Production



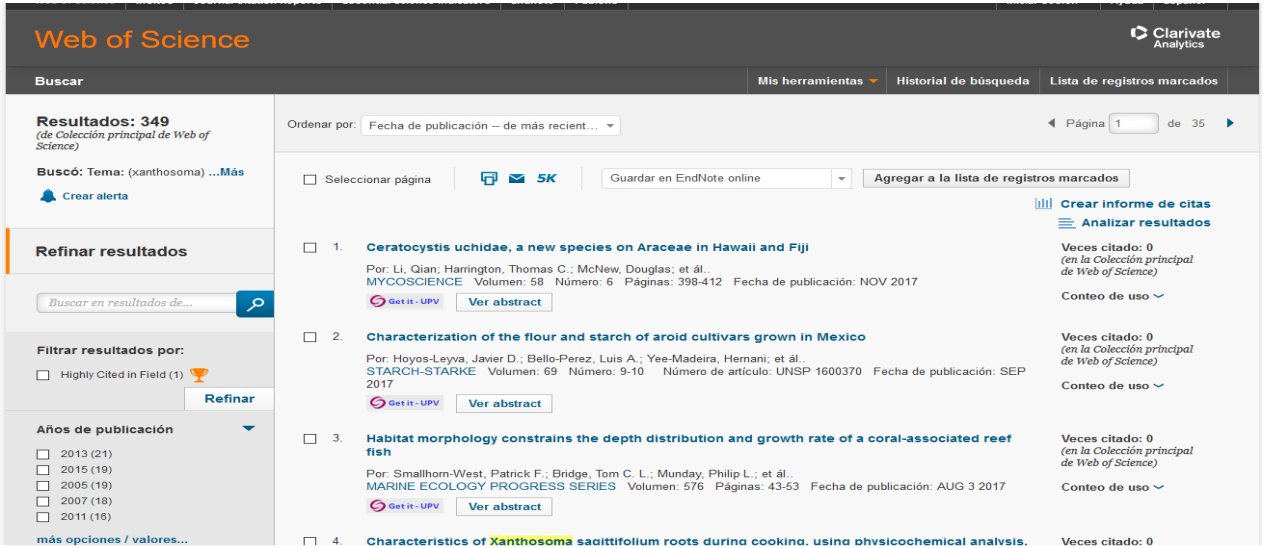
- Rich in starch
- Small granules
- Highly digestible

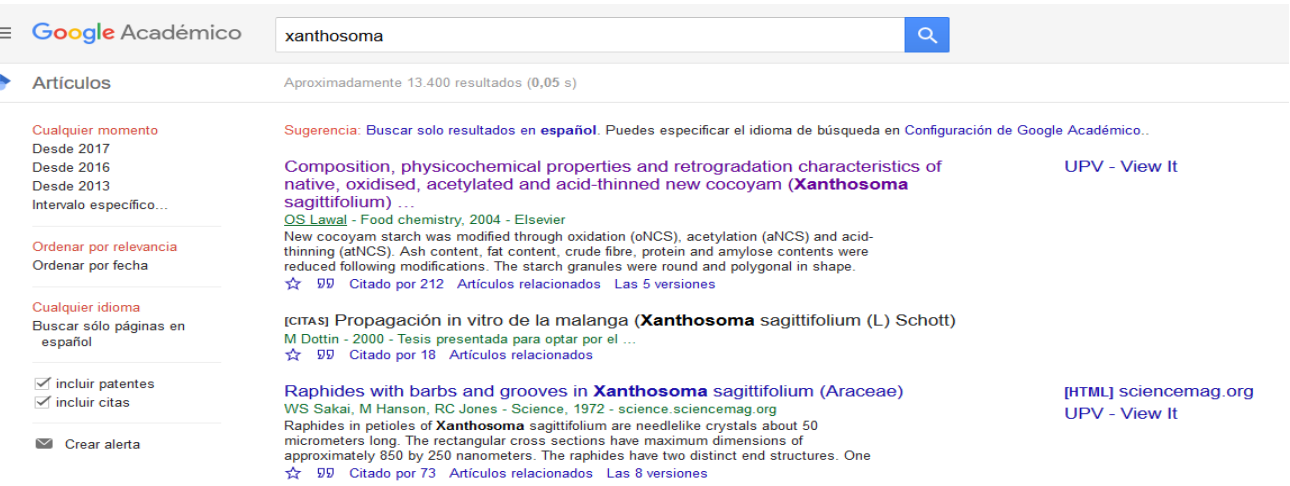
Cormels (human consumption)
Corms (guarantee further farming)

Darko *et al.*, 2014

http://www.fao.org/faostat/es/#data/QC/visualize

State of the art. Search engines: Web of science, Google scholar and Scopus





Rhizome as an alternative for non-conventional flours or starch to be used in different baked goods

349 articles: flour and products
59 articles: starch

13.400 results: flour and products (0.05s)
3.000 results: starch (0.21s)

Different researches about baked goods

Journal of Culinary Science & Technology

ISSN: 1542-8052 (Print) 1542-8044 (Online) Journal homepage: http://www.tandfonline.com/loi/wcsc20

Evaluation of Cocoyam-Wheat Composite Flour in Pastry Products Based on Proximate Composition, Physicochemical, Functional, and Sensory Properties

P. T. Akonor, C. Tortoe & E. S. Buckman

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To link to this article: http://dx.doi.org/10.1080/15428052.2017.1333937

Flour Composite (wheat and malanga) baked goods

Vol.3, No.1, 22-29 (2014)
http://dx.doi.org/10.4236/jacen.2014.31004

Journal of Agricultural Chemistry and Environment

Cocoyam (corms and cormels)—An underexploited food and feed resource

Patricia G. Owusu-Darko[1*], Alistair Paterson[2], Emmanuel L. Omenyo[3]

Review (Darko *et al.*,2014)

- reduce postharvest losses
- food security problems

Physicochemical properties of food grade acetylated cocoyam (*Xanthosoma sagittifolium*) starches

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original scientific paper
DOI: 10.17508/CJFST.2016.8.2.02

Summary

It is not specified (corms and corms) (Tijani *et al.*, 2016)

Aim

To evaluate the potential of corms as a source of starch and the comparison of the functional properties of the starches from the corms and cormels of the same species.

Materials and methods

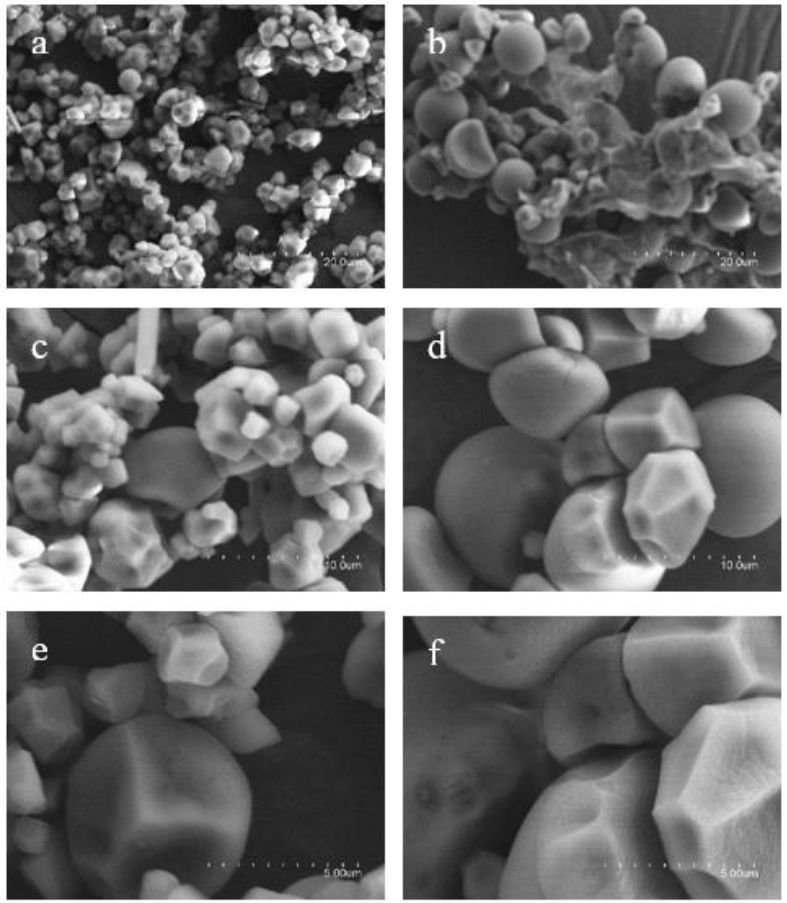
Corms and cormels
MX-2007

- Starch isolation

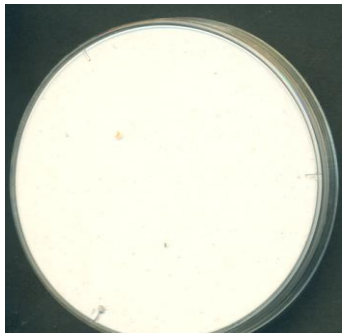
Physical properties:
- Color
- Microstructure (SEM)
- Thermal properties (DSC)
- Pasting behavior (RVA)

Chemical properties
- amylose content

Morphology of the malanga starch



Xanthosoma corms



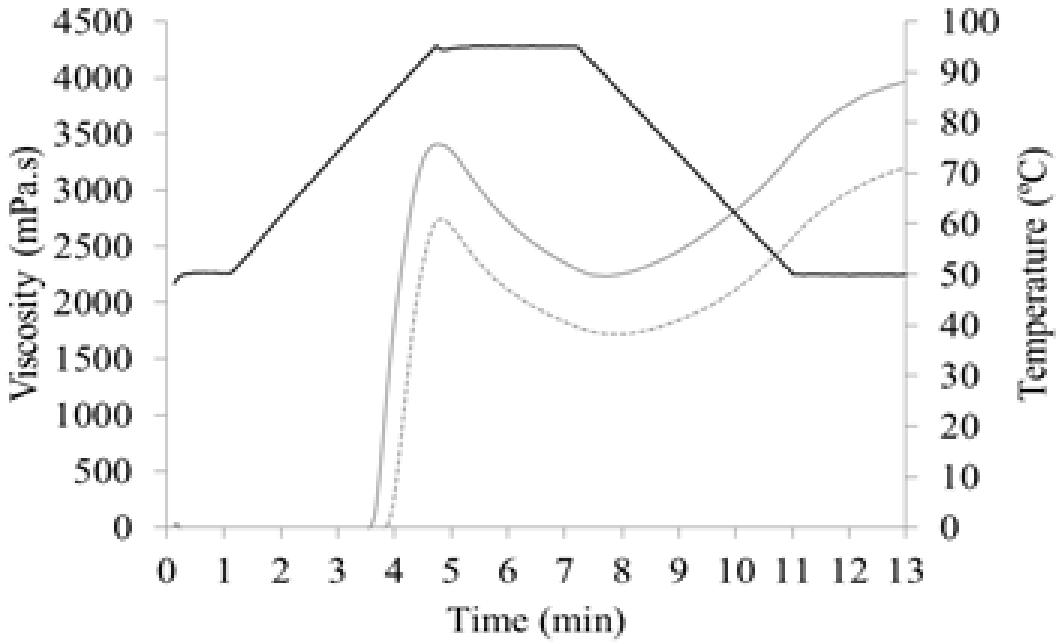
Xanthosoma cormels

- Polygonal, irregular shapes
- Granules diameters ranged from 1 to 5 μm
- Main differences: cormels' starch appeared as big aggregates where small granules were glued to each other

Amylase leached out and they acted as gluing material Dura and Rosell (2014)

Corms (a) and cormels (b) malanga granules at lower (2 000x) magnifications, c and d at medium (5 000x) and e and f at higher (10 000x) magnifications, respectively.

Pasting forming and DSC



	To (°C)	Tp (°C)	Tc (°C)	ΔH (J/g)
X. cormels	74 ±0.25b	79±0.35b	87±0.48	18.82±1.37
X. corms	72±0.28a	76±0.35a	86±0.04	16.80±0.19
P-value	0.0109	0.0122	0.0748	0.1759

Thermal transition at lower temperatures

Setback and breakdown
(higher amylose contents cormels:
27.65 %)

Conclusions

Physicochemical properties of corm and cormels starches from the same species, were significantly different which open the possibility to exploit both starches depending on their physicochemical properties.

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- Food Research Institute for the Food Industry. Cuba

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Thank you