



# *Salicornia bigelovii: a halophytic case study from farm to fork for MENA*

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# *Salicornia bigelovii*: C3 succulent annual salt marsh species



1

It is well-adapted  
in hot and dry  
areas

2

It is irrigated with  
high saline water  
(seawater,  
brackish  
groundwater,  
reject brine from  
desalination,  
aquaculture  
effluents, etc.)

3

Multipurpose  
halophyte (food,  
feed, industrial,  
pharmaceutical  
etc.)

# Implementation farms in Abu Dhabi

**TABLE 11.2**  
**The Characteristics of the Eight Farms in Abu Dhabi Emirate.  $EC_{GW}$  Is the Electrical Conductivity of the Groundwater;  $EC_{RO-BRINE}$  Is the Electrical Conductivity of the Reject Brine from RO-desalination**

## Farms with Salicornia and Tilapia Component

Farm 453



$EC_{GW} = 22.3$  dS/m  
 $EC_{RO-BRINE} = 40.2$  dS/m

Farm 17



$EC_{GW} = 28.7$  dS/m  
 $EC_{RO-BRINE} = 30.0$  dS/m

Farm 79



$EC_{GW} = 20.2$  dS/m  
 $EC_{RO-BRINE} = 24.9$  dS/m

Farm 168



$EC_{GW} = 12.9$  dS/m  
 $EC_{RO-BRINE} = 28.6$  dS/m

## Farms with Salicornia Component Only

Farm 211



$EC_{GW} = 26.8$  dS/m  
 $EC_{RO-BRINE} = 36.8$  dS/m

Farm 658



$EC_{GW} = 12.7$  dS/m  
 $EC_{RO-BRINE} = 20.8$  dS/m

Farm 136



$EC_{GW} = 21.5$  dS/m  
 $EC_{RO-BRINE} = 31.0$  dS/m

Farm 364



$EC_{GW} = 20.0$  dS/m  
 $EC_{RO-BRINE} = 21.7$  dS/m

**TRY OUR NEW QUINOA - KALE CHICKEN BURGER**  
**MADE WITH SALICORNIA!**   
**LESS SODIUM. FULL FLAVOUR.**



TASTE OF AUTHENTICITY



**Salicornia** <https://global-food.com/product-category/al-areesh/salicornia-burger/>

Salicornia, also known as asparagus of the sea, sea bean, samphire – has taken the culinary world by storm with its taste and nutritional benefits.

The International Center for Biosaline Agriculture (ICBA), a non-profit agricultural research center, is helping local farmers to grow Salicornia through an initiative funded under the Live Innovation Grant Programme of Expo 2020 Dubai. Salicornia, a salt-loving plant, is grown using reject brine from inland desalination units. This nutritious local vegetable is resilient to heat, drought, and salinity, and thrive in the UAE's environments. A versatile veggie that is locally grown in the UAE making it a suitable raw material, Salicornia is rich in immunity-building properties and is an excellent source of vitamins and minerals. It is also a natural antioxidant. When used in dishes, Salicornia helps reduce the use of salt by up to **40 percent**.

## Quinoa-Kale Chicken Burger - The better burger

Developed in collaboration with the ICBA, our **Quinoa-Kale Chicken Burger** with Salicornia is the healthier and tastier alternative to traditional meat burgers. Using Salicornia means the burger patties have **40%** less sodium content, and with the infusion of Quinoa and Kale as key ingredients, they have 25 percent more protein, 4 times more calcium, 12 times less fat and 90 percent fewer calories than traditional chicken burgers.

Available at Union Coop, Aswaaq and Emirates Coop and priced at **AED 23**



# CULINARY EXPLORATION OF SB FOR DIFFERENT FOOD USES

Rock samphire smoked tilapia with quinoa



Chef: Doxis Bekris

Salicornia juice



Chef: Bilal Saleh

Salicornia and rock samphire bread



Chef: Luca Cobre

Salicornia jelly



Salicornia smoothie



Salicornia cheesecake with camel milk and cheese



Crackers of Salicornia and rock samphire



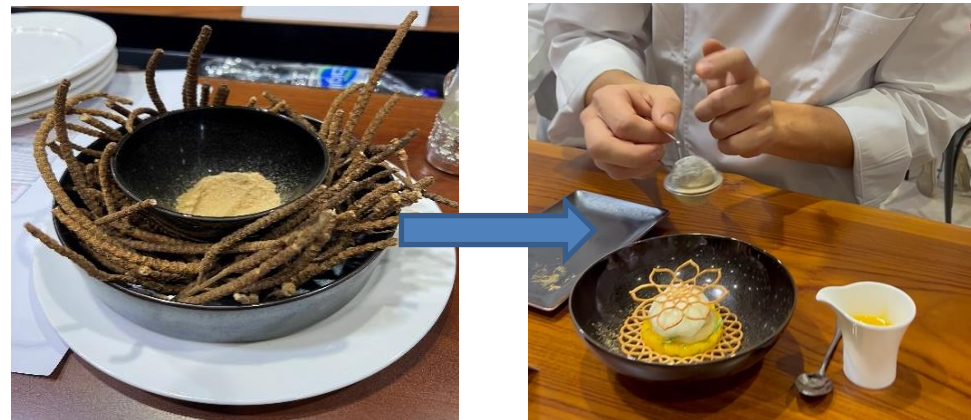
Salicornia crackers



Dishes prepared by the young Chefs from Burj Al Arab Hotel® during the YouthX Competition that took place on 9<sup>th</sup> of November 2022 in Dubai, United Arab Emirates



Dried powder of *S. bigelovii* tips used as garnish in sweets



Dry *S. bigelovii* tips used in fish stock



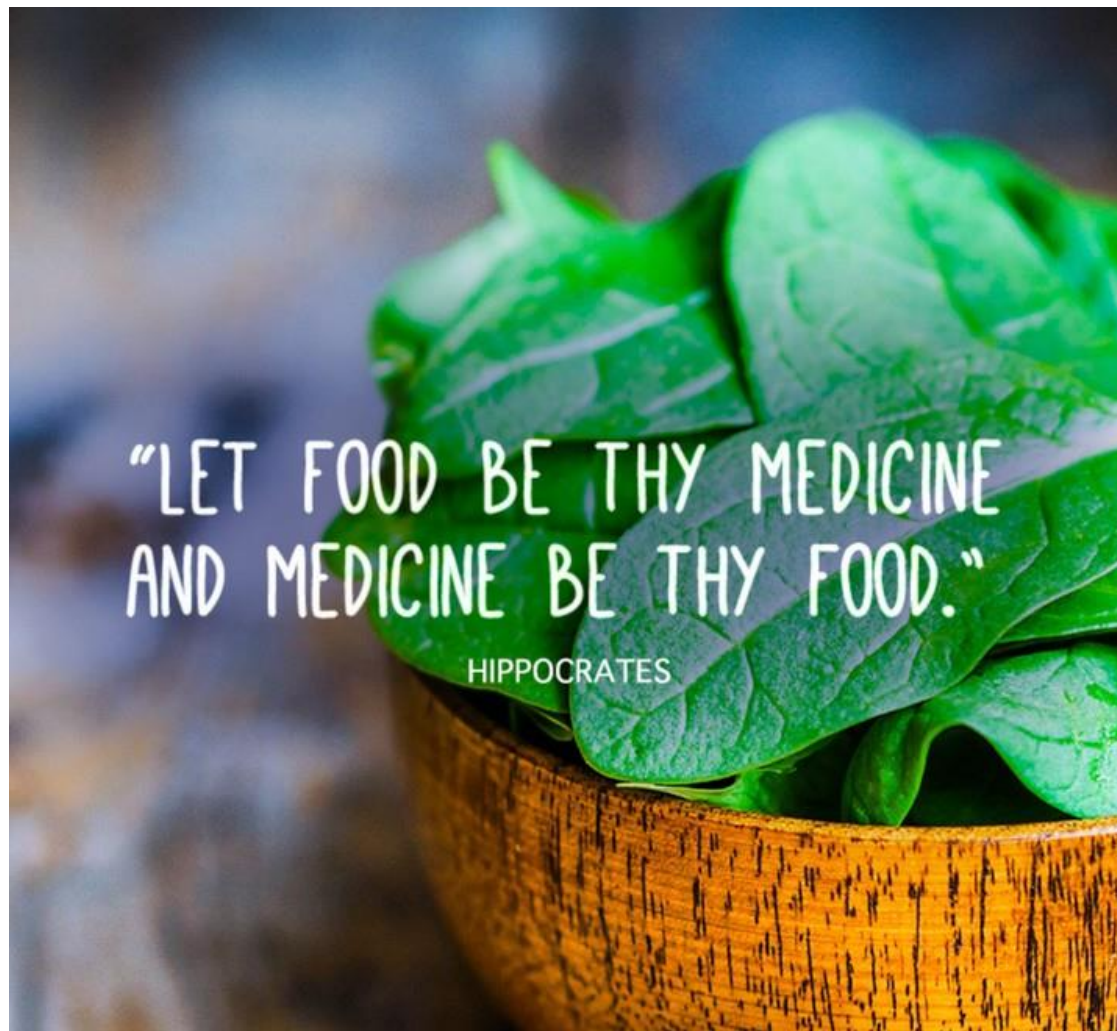


# Versatility in Salicornia uses as food



Salicornia Masterclass at Top Table at the Gulfood 2022  
with *Chef Ilias Doulamis*, Executive Chef at Conrad Hilton

# Functional Foods



# Halophytes

*Foods or food ingredients that provide health benefits beyond meeting basic nutrition needs. Inclusion of these types of foods can provide further protection against chronic disease and condition development.*



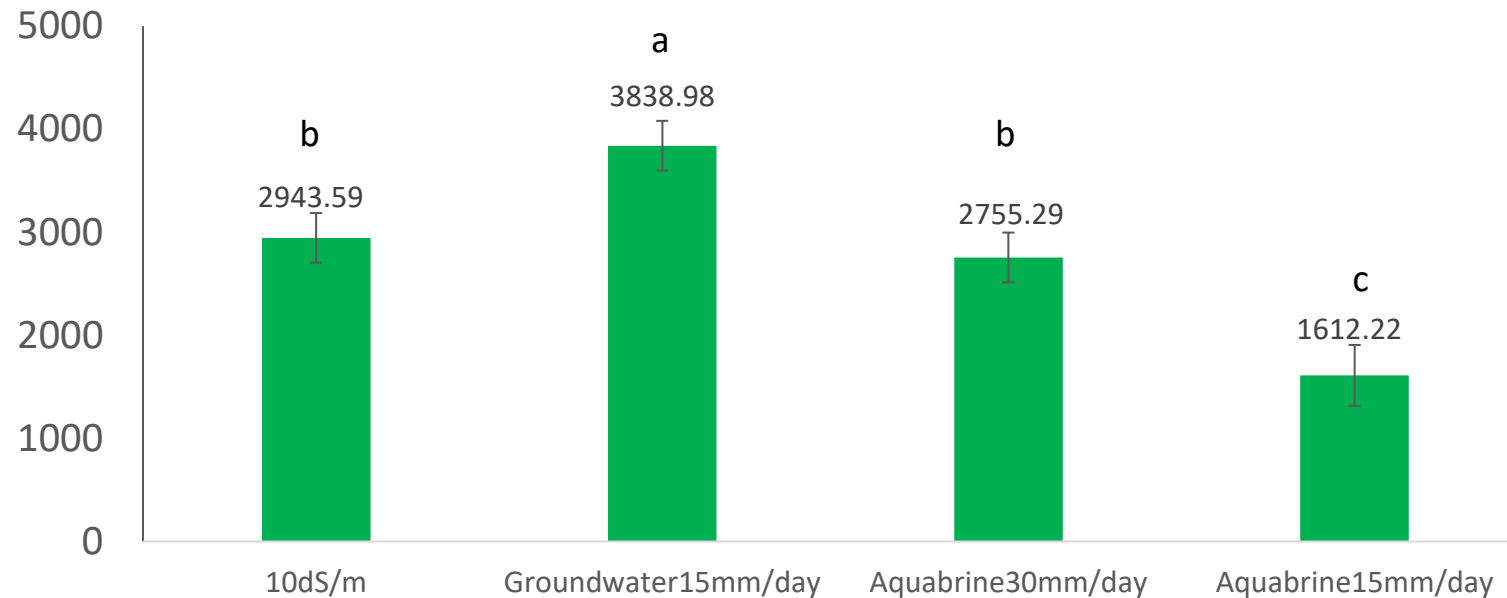
# *Salicornia bigelovii* tips collected 6 months after sowing

## Bubblers

EC<sub>Groundwater</sub> = 25 dS/m

EC<sub>Aquabrine</sub> = 37 dS/m

## Flavonoids (ppm)



## Management practices

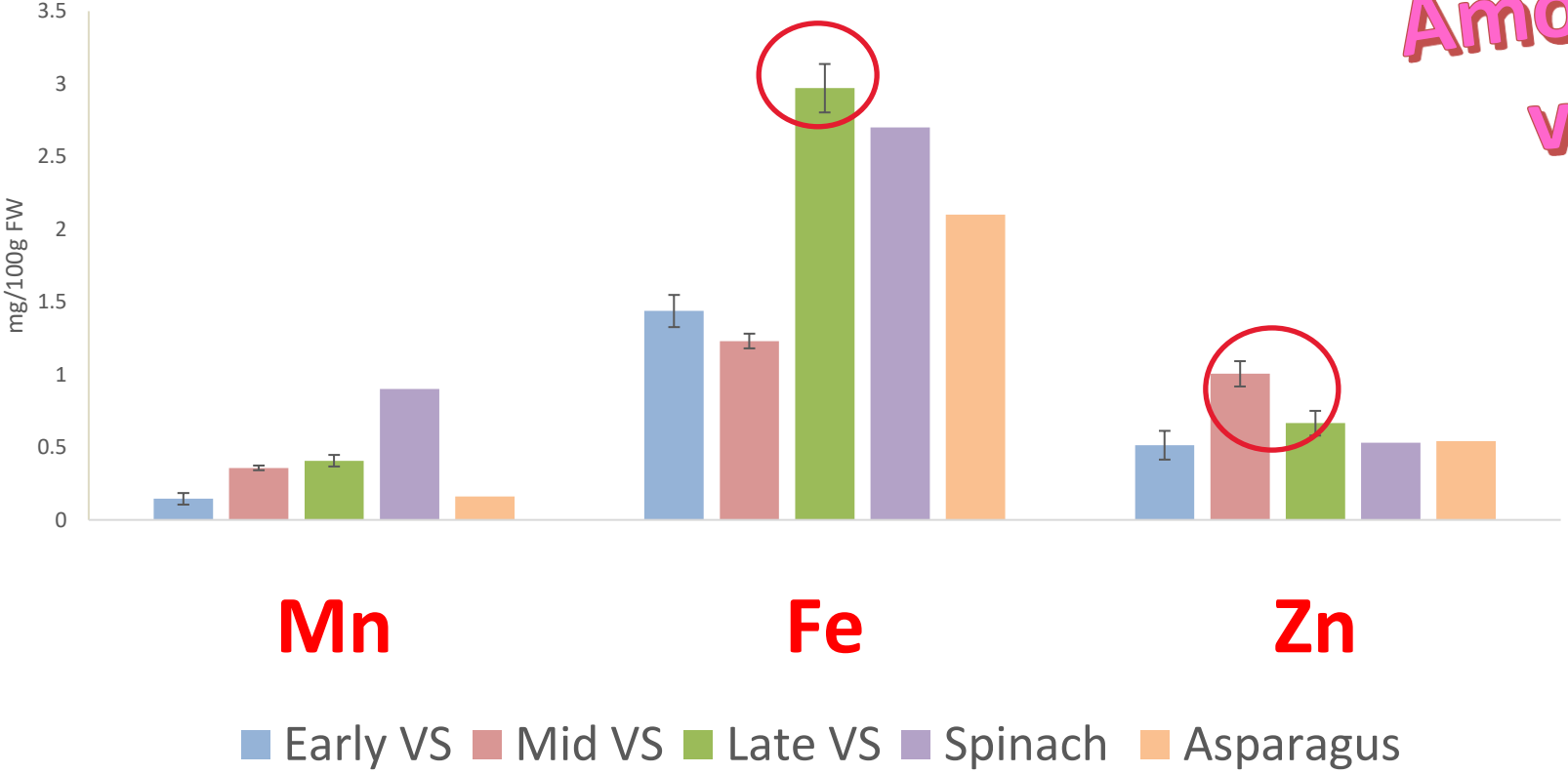


Optimum salinity for SB growth

**Flavonoids** possess a number of medicinal benefits, including anticancer, antioxidant, anti-inflammatory, and antiviral properties. They also have neuroprotective and cardio-protective effects. These biological activities depend upon the type of flavonoid, its (possible) mode of action, and its bioavailability.

# Microminerals

Among different vegetative stages



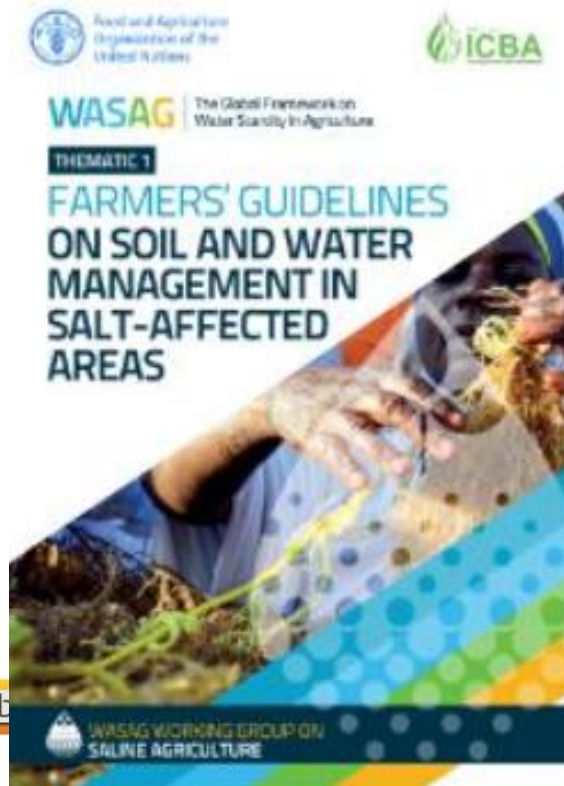
# NbS project

*Salicornia sinus-persica*

- Interspecific variation
- Wild vs. Domesticated
- Palatability of the local wild *Salicornia* species
-

# FAO/WASAG – Saline Agriculture Working group

- <https://www.fao.org/wasag/working-groups/saline-agriculture/en/>



## AG – The Global Framework on Water Scarcity in Agriculture

Overview Working groups Partners Ongoing initiatives Resources News Events

- Water and migration
- Disaster preparedness
- Financing mechanisms
- Water and nutrition
- Sustainable agricultural water use
- Saline agriculture

- About the Team
- Publications
- Events

### Saline agriculture



This working group focuses on identifying practicable solutions that maximize opportunities offered by biosaline agriculture in the context of climate change towards developing more climate-resilient, sustainable and innovative farming systems tailored for the salt-affected areas. It mainly focuses on supporting sustainable food production in increasingly saline environments while contributing to the restoration and/or protection of productive natural resources affected by salinity and water scarcity.

With sea level rise due to climate change, salinity intrusion will increase and not only affect agricultural production, but also the living conditions of farmers, the quality of natural resources and the whole



### Related links

- Global Soil Partnership
- Webinar: Saline Agriculture Scaling up Opportunities and Challenges
- International Symposium on the use of nonconventional waters for achieving food security

### Key Publications

- World Water Day 2020 Agriculture
- Thematic 1: Farmers' guidelines on soil and water management in salt-affected areas

### Contact us

For more information, please contact:

[Water-Scarcity@fao.org](mailto:Water-Scarcity@fao.org)



Food and Agriculture  
Organization of the  
United Nations

# THANK YOU



International Network of  
Salt-Affected Soils

**eHALOPH and the economic uses of salt-tolerant plants**

**13 February, 2024**



GLOBAL SOIL  
PARTNERSHIP