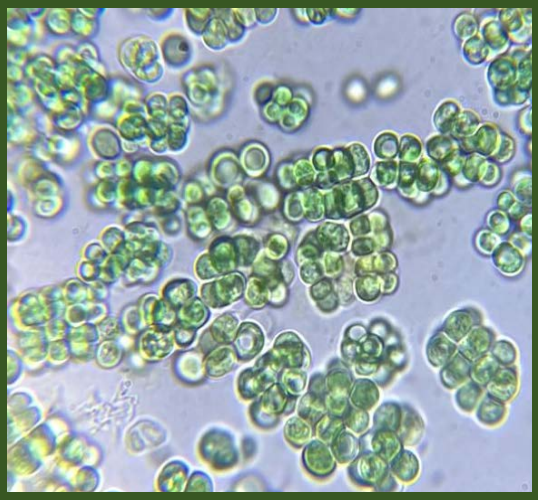

KSA Algae Living Library

Microalgae and cyanobacteria isolated from the Kingdom of Saudi Arabia

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KAUST

KAUST CIRCULAR CARBON INITIATIVE

Sustainable & Synthetic Biotechnology group

KSA Algae Living Library – a resource of locally isolated microalgae and cyanobacteria from the Kingdom of Saudi Arabia

This document contains information on microalgae and cyanobacteria which have been isolated from numerous environments within the Kingdom of Saudi Arabia (KSA) that are part of the Living Library of KSA species maintained within the Sustainable & Synthetic Biotechnology (SSB) group on KAUST campus. Information found in this document includes the species identifiers, microscopy image(s), sample location, as well as preliminary growth data when available. New species are routinely being isolated and added to this collection. Those featured here without full definitions or growth information are in process and will be added to this living document as data becomes available.

Authors: Dr. Bárbara Catarina Bastos de Freitas has led isolation efforts and project management in the lab of Prof. Kyle J. Lauersen. Lab activities are contributed to by Dr. Adriana Barsotti.

Contribution:

- Strains KAUST 005– *Tetradesmus obliquus* and KAUST 020 – *Monoraphidium dybowskii*, were taken by DAB-KSA for further analysis in scale-up cultivations.

This document and effort is made possible by the Circular Carbon Initiative, grant 4769: "Bioprospecting algal species from the Red Sea and KSA for carbon reuse and conversion to commodities."

The main goal of this project is isolate, cultivate, characterize and generate a living library of KSA photosynthetic microbes that can be cultivated in salt or fresh waters, for carbon, nitrogen, and phosphorous waste-stream reuse applications.

This document was last updated on: May 27, 2024

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1 Introduction

Algae are diverse organisms which can be found in all environments around the globe. They are ancient and have complex evolutionary histories, most of these organisms are photosynthetic, using light for energy and carbon dioxide (CO_2) as a carbon source for growth. Like plants, algae naturally represent carbon reuse vehicles as they convert inorganic CO_2 into all of their respective bio-molecules: proteins, lipids, carbohydrates, and specialty chemicals but they do not produce the complex structural tissues of their higher-plant counterparts.

Algae can be grown with simple inputs such as trace minerals, carbon dioxide, (sun)light, and water, with some single-celled microalgae exhibiting rapid doubling times that far exceed the growth rates of higher plants. Their cultivation can be performed in photobioreactors, built on any land-type, use waste- or sea water, do not compete with farming resources, and can even be coupled to point sources of CO_2 emissions.

Algae are polyphyletic, and have evolved different properties related to their individual environmental niches. This biodiversity is barely explored and requires increased attention as each may hold unique value for different human-use applications, indeed algal biomass itself has been developed into a valuable commodity in the food and medicinal sectors. Different algae have specialized value for different reasons, some hyper accumulate triacylglycerols (oils), which can be converted into hydrocarbon or oleochemicals, others secrete polysaccharides, which have value as medicines and cosmetics, others produce specialty pigments, or even specialty antiviral compounds. As the Kingdom of Saudi Arabia is looking to diversify its sustainable technologies, the development and bio-prospecting of local algae strains from the Kingdom may hold value for a number of industries. Sourcing local strains is of importance for their ability to cope with the harsh environments of this region in outdoor cultivation concepts and to avoid issues of invasive species or cross border intellectual property with regards to the Nagoya protocol. The extreme environments of the region, have likely yielded microbes with advanced biochemistries, capable of surviving the harsh UV and light radiation as well as high temperatures. Algal biodiversity has been generally underexplored in the KSA.

2 Notes

We performed morphological identification of the isolated algae by microscopic observation. The strains were molecularly identified by amplification and sequencing using different primers (listed in Table 1). The total DNA was extracted from frozen cellular pellets (pellets were obtained by centrifuging 2 mL of each monoculture) using Quick-DNA Fungal/Bacterial Miniprep Kit (Zymo Research). The PCR reactions were performed using Phusion Green Hot Start II High-Fidelity PCR Master Mix (Thermo Scientific). PCR clean-up was performed with DNA Clean. & Concentrator^{TM} -25 (Zymo Research), and Sanger sequencing was performed on PCR products.

Other data to be collected includes growth data and biomass composition. We tested the feasibility of cultivating the local strains using outdoor light and temperature conditions of Thuwal, Saudi Arabia (22°18'16.6"N 39°06'07.9"E) by weather simulation in Algem photobioreactors. For each local strain, we grew six experimental conditions: constant light, 12 h:12 h light:dark, either at 25°C or 30°C and 325 µmol photons m^{-2} s^{-1} (µE) as controls. and 4 different temperature and light conditions that each represent one of the four seasons in Thuwal, Saudi Arabia. The weather data used for this experiment consisted of temperature, and photosynthetically active radiation (PAR) measurements (10 min intervals) recorded at the Coastal and Marine Resources Core Lab (CMR) at KAUST between January and December 2014. Local weather station data were used to generate a representative week from each of February (Winter), May (Spring), August (Summer), and November (Autumn) from 2014 in the reactors. This is a living document and will be updated regularly.

For inquiries regarding growth data, biomass composition, and comprehensive details on growth conditions, we invite you to make formal inquiries. Requests for this information can be directed to Professor Kyle J. Lauersen and Dr. Bárbara Bastos de Freitas (Curator), who will provide guidance on the protocol for processing such requests.

Table 1. List of primers used, including primer sequences, annealing temperature, specificity, product size.

Primer	Marker (locus/gene; abbreviated name	Sequence	Annealing temperature (°C)	Designed specificity	Product size (bp)
Cdm F	18S ribosomal DNA; small subunit; 18S	GTCAGAGGTGAAATTCTTGGATTTA	62.2	Universal algae	730
Cdm R		AAGGGCAGGGACGTAATCAACG	67.7		
ITS1 F modified	Internal transcribed spacer 1; ITS1	AGGAGAAGTCGTAACAAGGT	61.3	Universal algae	250-1000
ITS2T R		TTCGCTGCGTTCTTCATCGTT	65.9		
Cya106 F	16S ribosomal DNA; Cya16S	CGGACGGGTGAGTAACGCGTGA	71.2	Cyanobacteria	500
Cya781b R		GACTACAGGGGTATCTAATCCCTTT	64.2		
RbcL F	Ribulose-1,5-bisphosphate carboxylase/oxygenase -Large subunit; rbcL	AACCTTTCATGCGTTGGAGAGA	65.3	Universal algae	500
RbcL R		CCTGCATGAATACCACCAGAAGC	66.5		

3 Microalgae within the Living Library

The following pages contain information sheets on each isolate, the strain code contains a number which represents its sample.

Location data of sampling is provided in longitude and latitude. Whenever possible a picture of the site is provided. GIS visualization by Abhishekh P. Vijayan (Figure 1). The sampling collection location is shown in Figure 2 and will be updated regularly.

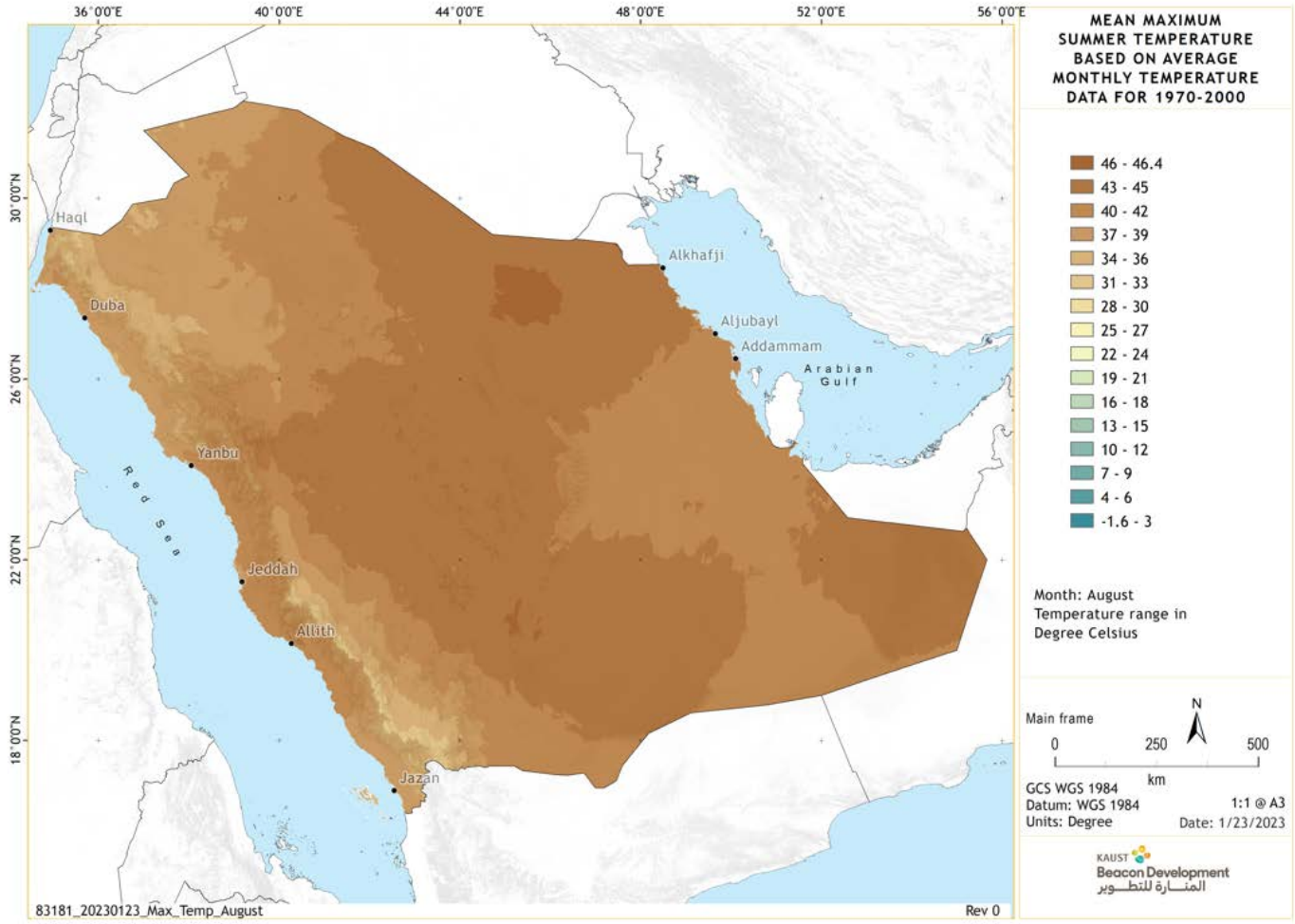


Figure 1. GIS visualization.

Figure 2. Sample collection location (the green markers represent the location where sampling were made).

Identification of new isolates follows the following steps

- Isolation to monoculture achieved
- Microscopic morphological identification
- Genetic identification and confirmation of species identity

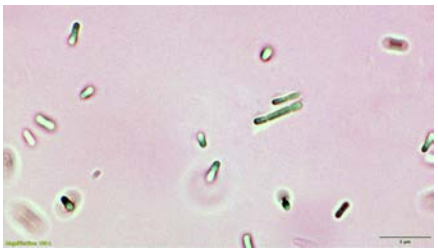
KAUST 001 - *Synechococcus elongatus*

Freshwater *Synechococcus elongatus* isolated from a pond in a hot spring outside of town Al Lith, located southwest of Mecca in the Red Sea coast region.
Cultivation medium: BG-11
GPS coordinate: 20°27'35.3"N 40°28'11.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 16S ribosomal DNA – Cya106 F/Cya781b R- used in a BLAST search, the sequence identity of 100% shows that *Synechococcus elongatus* PCC 11802 is a relative.

KAUST 002 - *Synechococcus elongatus*



Freshwater *Synechococcus elongatus* isolated from the mud in a hot spring outside of town Al Lith, located southwest of Mecca in the Red Sea coast region.

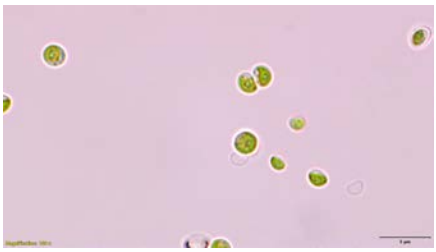
Cultivation medium: BG-11

GPS coordinate: 20°27'35.3"N 40°28'11.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 16S ribosomal DNA – Cya106 F/Cya781b R- used in a BLAST search, the sequence identity of 99.77% shows that *Synechococcus elongatus* PCC 11801 is a relative.

KAUST 003 - *Trebouxiophyceae* sp.



Freshwater *Trebouxiophyceae* sp. isolated from a hot spring outside of town Al Lith, located southwest of Mecca in the Red Sea coast region.

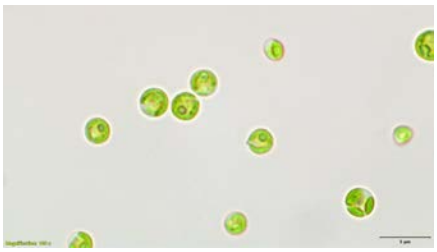
Cultivation medium: BG-11

GPS coordinate: 20°27'35.3"N 40°28'11.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 18S ribosomal DNA – Cdm F/Cdm R- used in a BLAST search, the sequence identity of 100% shows that *Trebouxiophyceae* sp. BZ-2019 is a relative.

KAUST 004 - *Parachlorella kessleri*



Freshwater *Parachlorella kessleri* isolated from a hot spring outside of town Al Lith, located southwest of Mecca in the Red Sea coast region.

Cultivation medium: BG-11

GPS coordinate: 20°27'35.3"N 40°28'11.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 100% shows that *Parachlorella kessleri* is a relative.

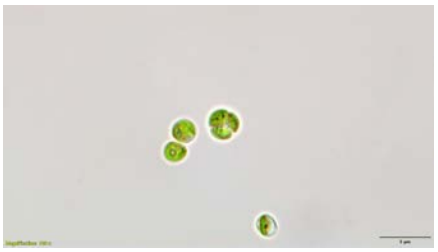
KAUST 005 - *Tetradesmus obliquus*

Freshwater *Tetradesmus obliquus* isolated from a hot spring outside of town Al Lith, located southwest of Mecca in the Red Sea coast region.
Cultivation medium: BG-11
GPS coordinate: 20°27'35.3"N 40°28'11.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 99.60% shows that *Tetradesmus obliquus* is a relative.

KAUST 006 - *Chlorella* sp.



Freshwater *Chlorella* sp. KU211 isolated from a hot spring outside of town Al Lith, located southwest of Mecca in the Red Sea coast region.

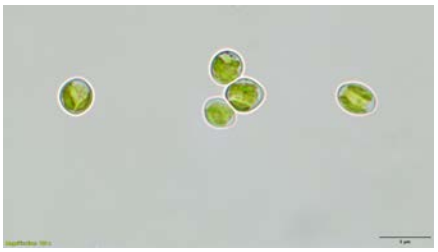
Cultivation medium: BG-11

GPS coordinate: 20°27'35.3"N 40°28'11.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 100% shows that *Chlorella* sp. KU211 is a relative.

KAUST 007 - *Auxenochlorella* pyrenoidosa

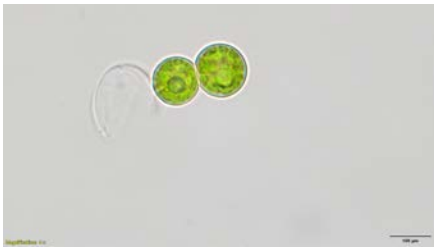


Seawater *Auxenochlorella pyrenoidosa* isolated from a hot spring outside of town Al Lith, located southwest of Mecca in the Red Sea coast region.
Cultivation medium: F/2 with Red Sea Water
GPS coordinate: 20°27'35.3"N 40°28'11.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 100% shows that *Auxenochlorella pyrenoidosa* is a relative.

KAUST 008 - *Asterarcys* sp.



Freshwater *Asterarcys* sp. isolated at King Abdullah University of Science and Technology (Thuwal, Makkah), in the mid-Red Sea coast region.

Cultivation medium: BG-11

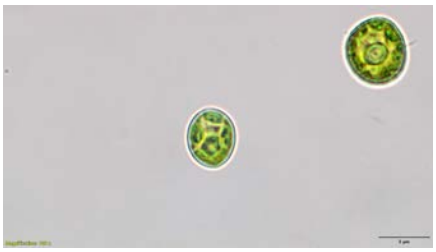
GPS coordinate: 22°18'28.0"N 39°06'23.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Ribulose-1,5-bisphosphate carboxylase/oxygenase -Large subunit -RbcL F /RbcL R - used in a BLAST search, the sequence identity of 99.65% shows that *Asterarcys* sp. is a relative.

Detailed information about this strain is available under license agreement or subscription.

KAUST 009 - *Enallax costatus*



Freshwater *Enallax costatus* isolated at King Abdullah University of Science and Technology (Thuwal, Makkah), in the Red Sea coast region.

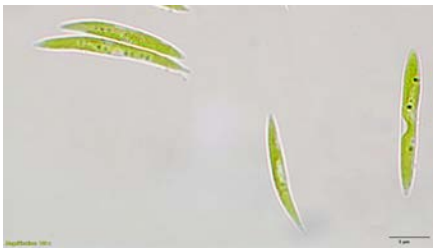
Cultivation medium: BG-11

GPS coordinate: 22°18'28.0"N 39°06'23.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Ribulose-1,5-bisphosphate carboxylase/oxygenase -Large subunit -RbcL F /RbcL R - used in a BLAST search, the sequence identity of 98.46% shows that *Enallax costatus* is a relative.

KAUST 010 - *Monoraphidium* sp.



Freshwater *Monoraphidium* sp. at King Abdullah University of Science and Technology (Thuwal, Makkah), in the Red Sea coast region.

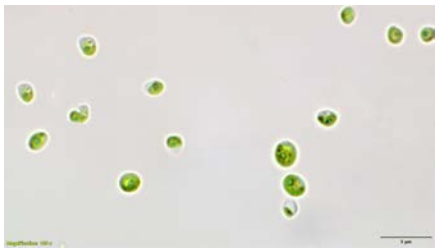
Cultivation medium: BG-11

GPS coordinate: 22°18'28.0"N 39°06'23.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 100% shows that *Monoraphidium* sp. Zaqeq 32 is a relative.

KAUST 011 - *Chlorella* sp.



Freshwater *Chlorella* sp. isolated from the desert region of Al Ula, located in the Medina Region in north-western Saudi Arabia.

Cultivation medium: BG11

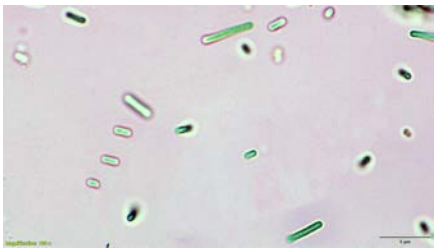
GPS coordinate: 26°36'59.99"N 37°54'59.99"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Ribulose-1,5-bisphosphate carboxylase/oxygenase -Large subunit -RbcL F /RbcL R - used in a BLAST search, the sequence identity of 100% shows that *Chlorella sp.* MOW 10 is a relative.

Detailed information about this strain is available under license agreement or subscription.

KAUST 012 - Cyanobacterium of currently unknown identity



Freshwater cyanobacterium isolated from the Deserts regions of Al Ula, located in the Medina Region in north-western Saudi Arabia.

Cultivation medium: BG-11

GPS coordinate: 26°36'59.99"N 37°54'59.99"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 013 - *Chlorella sorokiniana*

Freshwater *Chlorella sorokiniana* isolated from a hot spring called Al Lith, located southwest of Mecca in the Red Sea coast region.

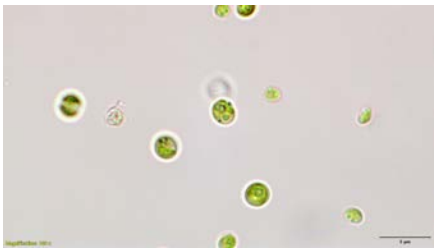
Cultivation medium: BG-11

GPS coordinate: 20°27'35.3"N 40°28'11.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 18S ribosomal DNA – Cdm F/Cdm R- used in a BLAST search, the sequence identity of 100% shows that *Chlorella sorokiniana* is a relative.

KAUST 014 - *Chlorella* sp.



Freshwater *Chlorella* sp. isolated from the Deserts regions of Al Ula, located in the Medina Region in north-western Saudi Arabia.

Cultivation medium: BG-11

GPS coordinate: 26°36'59.99"N 37°54'59.99"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 99.69% shows that *Chlorella* sp. is a relative.

KAUST 015 – *Chlorella* sp.

Freshwater *Chlorella* sp. isolated from the Deserts regions of Al Ula, located in the Medina Region in north-western Saudi Arabia.

Cultivation medium: BG-11

GPS coordinate: 26°36'59.99"N 37°54'59.99"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Ribulose-1,5-bisphosphate carboxylase/oxygenase -Large subunit -RbcL F /RbcL R - used in a BLAST search, the sequence identity of 100% shows that *Chlorella sp.* MOW 12 is a relative.

KAUST 016 - *Micractinium* sp.

Freshwater *Micractinium* sp. isolated from a hot spring called Al Lith, located southwest of Mecca in the Red Sea coast region.

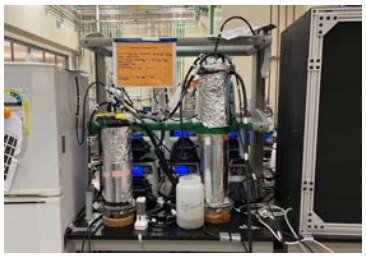
Cultivation medium: BG-11

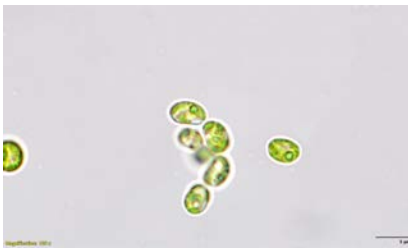
GPS coordinate: 20°27'35.3"N 40°28'11.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 18S ribosomal DNA – Cdm F/Cdm R- used in a BLAST search, the sequence identity of 100% shows that *Micractinium* sp. is a relative.

KAUST 017 - *Coelastrella* sp.





Freshwater *Coelastrella* sp. CORE isolated from Anaerobic Membrane Bioreactor (AnMBr) effluent at King Abdullah University of Science and Technology (Thuwal, Makkah), in the Red Sea coast region.

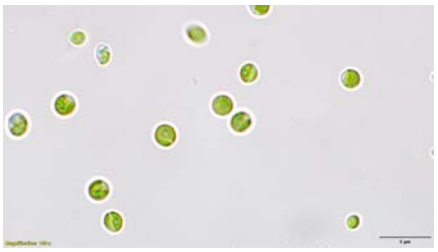
Cultivation medium: BG-11

GPS coordinate: 22°18'35.8"N 39°06'12.4"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 100% shows that *Coelastrella* sp. CORE -2 is a relative.

KAUST 018 - *Chlorella thermophila*



Freshwater *Chlorella thermophila* isolated from a hot spring called Al Lith, located southwest of Mecca in the Red Sea coast region.

Cultivation medium: BG-11

GPS coordinate: 20°27'35.3"N 40°28'11.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 99.42% shows that *Chlorella thermophila* is a relative.

KAUST 019 - *Raphidocelis subcapitata*

Freshwater *Raphidocelis subcapitata* isolated from a greenhouse at National Aquaculture Group (NAQUA) facilities.

Cultivation medium: BG-11

GPS coordinate: 20°19'16.1"N 40°02'27.9"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 18S ribosomal DNA – Cdm F/Cdm R- used in a BLAST search, the sequence identity of 96.09% shows that *Raphidocelis subcapitata* is a relative.

KSA 020 - *Monoraphidium dybowskii*

Freshwater *Monoraphidium dybowskii* isolated from a greenhouse at National Aquaculture Group (NAQUA) facilities.

Cultivation medium: BG-11

GPS coordinate: 20°19'16.1"N 40°02'27.9"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 99.26% shows *Monoraphidium dybowskii* is a relative.

KAUST 021 - *Asterarcys* sp.

Freshwater *Asterarcys* sp. isolated from a greenhouse at National Aquaculture Group (NAQUA) facilities.

Cultivation medium: BG-11

GPS coordinate: 20°19'16.1"N 40°02'27.9"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Ribulose-1,5-bisphosphate carboxylase/oxygenase -Large subunit -RbcL F /RbcL R - used in a BLAST search, the sequence identity of 99.70% shows *Asterarcys* sp. GP-2019 is a relative.

Detailed information about this strain is available under license agreement or subscription.

KAUST 022 - *Nostoc* sp.

Freshwater cyanobacterium isolated from a greenhouse at National Aquaculture Group (NAQUA) facilities.

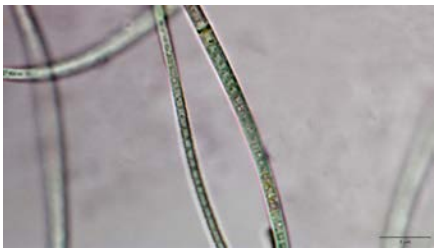
Cultivation medium: BG-11

GPS coordinate: 20°19'16.1"N 40°02'27.9"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 023 – *Leptolyngbya* sp.



Freshwater *Leptolyngbya* sp. isolated from a greenhouse at National Aquaculture Group (NAQUA) facilities.

Cultivation medium: BG-11

GPS coordinate: 20°19'16.1"N 40°02'27.9"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 16S ribosomal DNA – Cya106 F/Cya781b R- used in a BLAST search, the sequence identity of 100% shows that *Leptolyngbya* sp. CENA131 is a relative.

Detailed information about this strain is available under license agreement or subscription.

KAUST 024 - Diatom of currently unknown identity

Seawater diatom isolated from a pond at National Aquaculture Group (NAQUA) facilities.

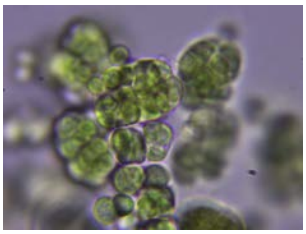
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 20°19'17.4"N 40°02'27.9"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 025 - *Chlorokybus* sp.



Freshwater green alga isolated from a biocrust in a volcano area (Harrat Kishb - lava field).

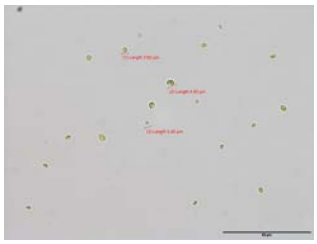
Cultivation medium: BG-11

GPS coordinate: 22°54'00.0"N 41°08'12.1"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 026 - *Chlorella variabilis*



Freshwater *Chlorella variabilis* isolated from the soil of a greenhouse at National Aquaculture Group (NAQUA) facilities.

Cultivation medium: BG-11

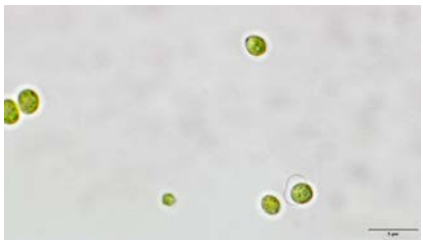
GPS coordinate: 20°16'13.0"N 39°55'46.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Ribulose-1,5-bisphosphate carboxylase/oxygenase -Large subunit -RbcL F /RbcL R - used in a BLAST search, the sequence identity of 100% shows that *Chlorella variabilis* is a relative.

Detailed information about this strain is available under license agreement or subscription.

KAUST 027 - *Chlamydomonas* sp.



Freshwater "*Chlamydomonas* sp." isolated from soil samples from Al Wahba Crater.

Cultivation medium: BG-11

GPS coordinate: 22°54'22.0"N 41°08'07.0"E

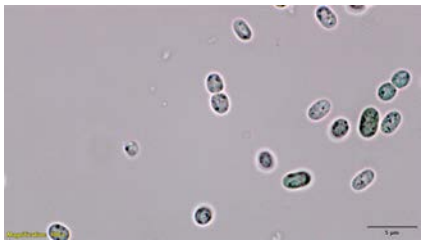
Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 92.71% shows that the strain currently identified as "*Chlamydomonas* sp. HyS1201A1" is a relative.

**Chlamydomonas* taxonomy is currently undergoing revision, and true identity by ITS is not conclusive. Therefore, the name is indicated in quotations.

Detailed information about this strain is available under license agreement or subscription.

KAUST 028 - *Cyanobacterium aponinum*



Freshwater *Cyanonbacterium aponinum* isolated from AlSafwa cement company.

Cultivation medium: BG-11

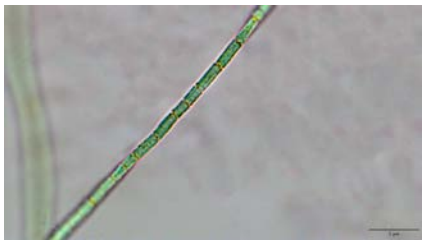
GPS coordinate: 22°33'17.0''N 39°26'11.0''E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 16S ribosomal DNA – Cya106 F/Cya781b R- used in a BLAST search, the sequence identity of 100% shows that *Cyanobacterium aponimun* is a relative.

Detailed information about this strain is available under license agreement or subscription.

KAUST 029 - Cyanobacterium of currently unknown identity



Freshwater cyanobacterium isolated from AlSafwa cement company.

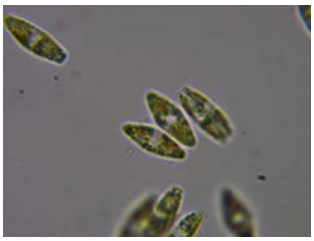
Cultivation medium: BG-11

GPS coordinate: 22°33'17.0''N 39°26'11.0''E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 030 - Diatom of currently unknown identity



Seawater diatom isolated from Red Sea in the coral region called Ana Coral.

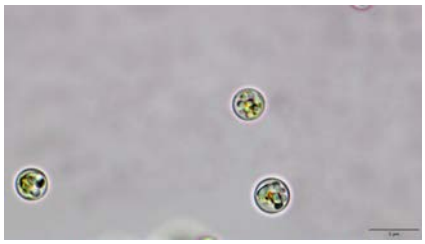
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 21°39'19.7"N 38°52'27.1"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 031 - *Ulvophyceae* sp.

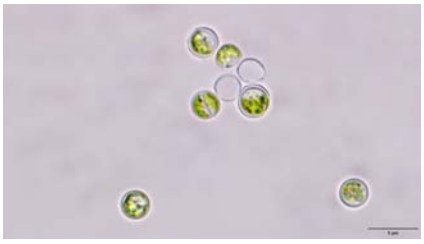


Seawater *Ulvophyceae* sp. isolated from Red Sea in the coral region called Ana Coral.
Cultivation medium: F/2 with Red Sea Water
GPS coordinate: 21°39'19.7"N 38°52'27.1"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 18S ribosomal DNA – Cdm F/Cdm R- used in a BLAST search, the sequence identity of 96.09% shows that *Ulvophyceae* sp. is a relative.

KAUST 032 - Green alga of currently unknown identity



Seawater green alga isolated from Red Sea in the coral region called Rose Reef.

Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 21°39'19.7"N 38°52'27.1"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 033 – *Leptolyngbya tenuis*

Seawater *Leptolyngbya tenuis* isolated from Red Sea in the coral region called Cement Reef.

Cultivation medium: F/2 with Red Sea Water

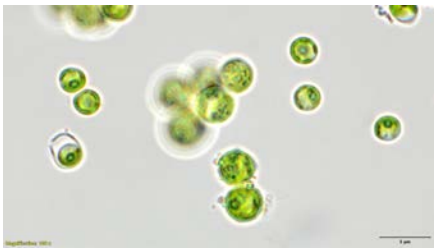
GPS coordinate: 22°22'26.0"N 38°51'20.0"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 16S ribosomal DNA – Cya106 F/Cya781b R- used in a BLAST search, the sequence identity of 100% shows that *Leptolyngbya tenuis* is a relative.

Detailed information about this strain is available under license agreement or subscription.

KAUST 034 - Green alga of currently unknown identity



Seawater green alga isolated from Red Sea in the coral region called Cement Reef.

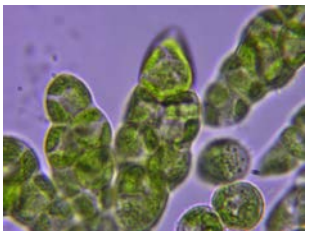
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 22°22'26.0"N 38°51'20.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 035 - Green alga of currently unknown identity



Freshwater green alga isolated from volcanic soil (Harrat Kishb - lava field).

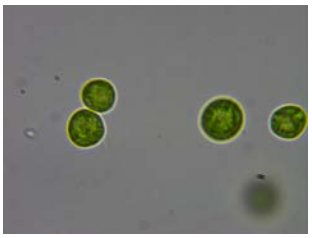
Cultivation medium: BG-11

GPS coordinate: 22°54'00.0"N 41°08'12.1"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 036 - *Chromochloris zofingiensis*



Freshwater *Chromochloris zofingiensis* isolated from a biocrust in Taif.

Cultivation medium: BG-11

GPS coordinate: 21°17'02.8"N 40°25'29.3"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 18S ribosomal DNA – Cdm F/Cdm R- used in a BLAST search, the sequence identity of 96.69% shows that *Chromochloris zofingiensis* is a relative.

KAUST 037 - *Nostoc commune*

Freshwater *Nostoc commune* isolated from a biocrust in Taif.

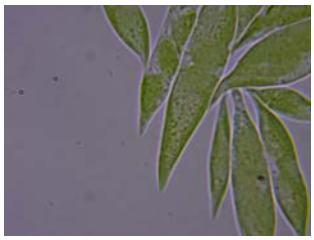
Cultivation medium: BG-11

GPS coordinate: 21°17'02.8"N 40°25'29.3"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 038 - Green alga of currently unknown identity



Freshwater green alga isolated from a white volcano area (Harrat Khaybar- Felsic volcano).

Cultivation medium: BG-11

GPS coordinate: 25°35'18.6"N 39°45'25.1"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

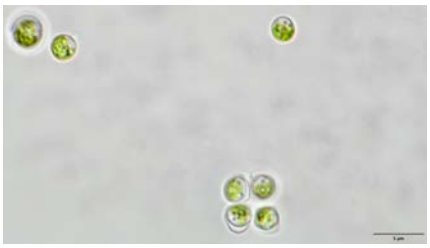
KAUST 039 - *Dunaliella* sp.

Seawater *Dunaliella* isolated from a pond at National Aquaculture Group (NAQUA) facilities.
Cultivation medium: F/2 with Red Sea Water
GPS coordinate: 20°19'07.7"N 40°02'44.9"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 040 – “CCAP 293/7”



Unicellular Microulva isolated by John Archer’s team.

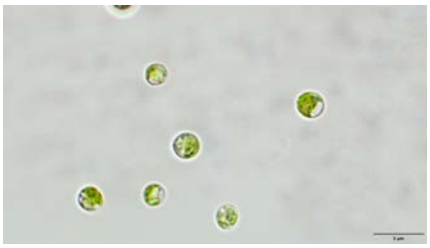
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 22°22'37.8"N 39°03'18.1"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 041 – “CCAP 293/9”



Unicellular Microulva isolated by John Archer’s team.

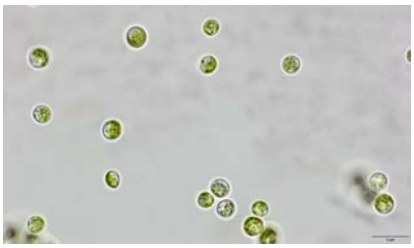
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 22°22'37.8"N 39°03'18.1"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 042 – “CCAP 293/8”



Unicellular Microulva isolated by John Archer’s team.

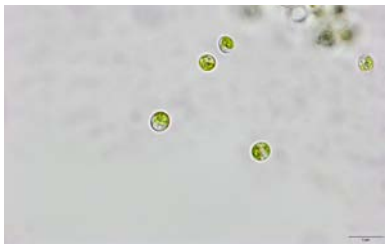
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 22°22'37.8"N 39°03'18.1"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 043 – “CCAP 293/10”



Unicellular Microulva isolated by John Archer’s team.

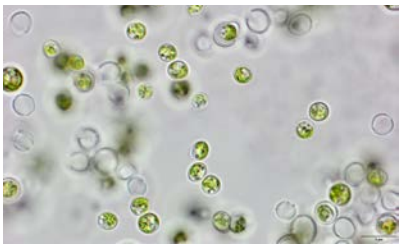
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 22°22'37.8"N 39°03'18.1"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 044 - “CCAP 1479/18”



Unicellular Microulva isolated by John Archer’s team.

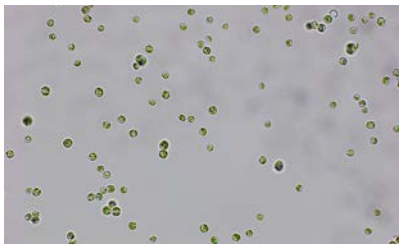
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 22°22'37.8"N 39°03'18.1"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 045 – “CCAP 1479/22”



Unicellular Microulva isolated by John Archer’s team.

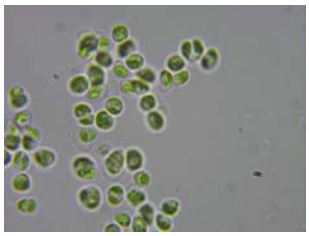
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 22°22'37.8"N 39°03'18.1"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 046 - Green alga of currently unknown identity



Freshwater green alga isolated at King Abdullah University of Science and Technology (Thuwal, Makkah), in the Red Sea coast region.

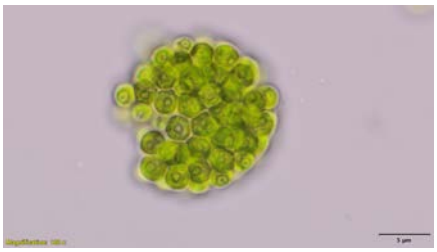
Cultivation medium: BG-11

GPS coordinate: 22°18'29.0"N 39°06'23.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 047 - Green alga of currently unknown identity



Freshwater green alga isolated at a volcanic area – Al Wahbah well.

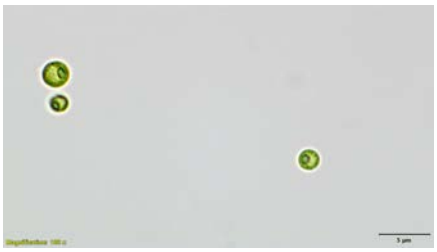
Cultivation medium: BG-11

GPS coordinate: 22°54'22.0"N 41°08'07.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 048 - *Chlamydomonas reinhardtii*



Freshwater "*Chlamydomonas reinhardtii*" isolated from an Oasis at a volcanic area – Al Wahbah well.

Cultivation medium: BG-11

GPS coordinate: 22°54'22.0"N 41°08'07.0"E

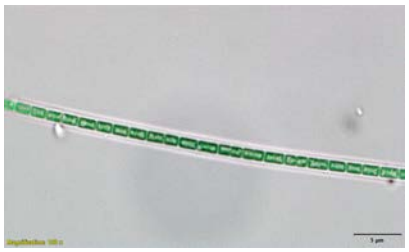
Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 86% shows that "*Chlamydomonas reinhardtii*" is a relative.

**Chlamydomonas* taxonomy is currently undergoing revision, and true identity by ITS is not conclusive. Therefore, the name is indicated in quotations.

Detailed information about this strain is available under license agreement or subscription.

KAUST 049 - Cyanobacterium of currently unknown identity



Freshwater cyanobacterium isolated at Moon Valley desert.

Cultivation medium: BG-11

GPS coordinate: 23°37'36.8"N 38°48'29.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 050 - Green alga of currently unknown identity

Freshwater green alga isolated at Moon Valley desert.

Cultivation medium: BG-11

GPS coordinate: 23°37'36.8"N 38°48'29.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 051 - Cyanobacterium of currently unknown identity

Freshwater cyanobacterium isolated from tanks in the city of Asfan.

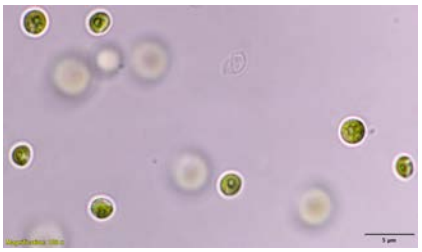
Cultivation medium: BG-11

GPS coordinate: 21°50'34.0"N 39°24'14.6"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 052 - Green alga of currently unknown identity



Freshwater green alga isolated from tanks in the city of Asfan.

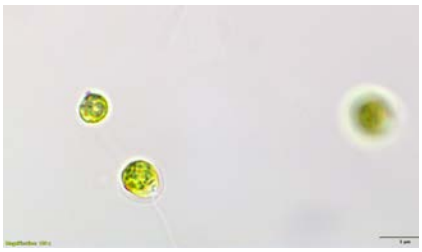
Cultivation medium: BG-11

GPS coordinate: 21°50'34.0"N 39°24'14.6"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 053 - *Chlamydomonadales* sp.



Seawater "*Chlamydomonadales* sp." isolated from Al Wahbah crater.

Cultivation medium: F/2 with 50% Red Sea water.

GPS coordinate: 22°54'04.0"N 41°08'21.1"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 18S ribosomal DNA – Cdm F/Cdm R- used in a BLAST search, the sequence identity of 97.59% shows that "*Chlamydomonadales* sp." is a relative.

**Chlamydomonas* taxonomy is currently undergoing revision, and true identity by 18S is not conclusive. Therefore, the name is indicated in quotations.

Detailed information about this strain is available under license agreement or subscription.

KAUST 054 - *Dunaliella polymorpha*

Seawater *Dunaliella polymorpha* isolated from Al Wahbah crater.

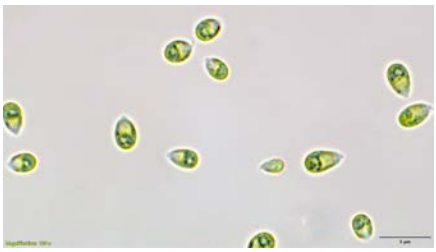
Cultivation medium: F/2 with 50% Red Sea water.

GPS coordinate: 22°54'04.0"N 41°08'21.1"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 77.87% shows that *Dunaliella polymorpha* is a relative.

KAUST 055 - *Lobochlamys* sp.



Seawater "*Lobochlamys* sp." isolated from Al Wahbah crater.

Cultivation medium: F/2 with 50% Red Sea water.

GPS coordinate: 22°54'04.0"N 41°08'21.1"E

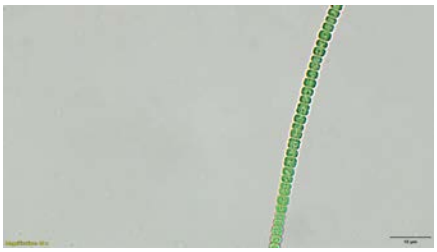
Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 18S ribosomal DNA – Cdm F/Cdm R- used in a BLAST search, the sequence identity of 97% shows that "*Lobochlamys* sp." is a relative.

**Chlamydomonas* taxonomy is currently undergoing revision, and true identity by 18S is not conclusive. Therefore, the name is indicated in quotations.

Detailed information about this strain is available under license agreement or subscription.

KAUST 056 - Cyanobacterium of currently unknown identity



Freshwater cyanobacterium isolated from Al Wahbah crater.

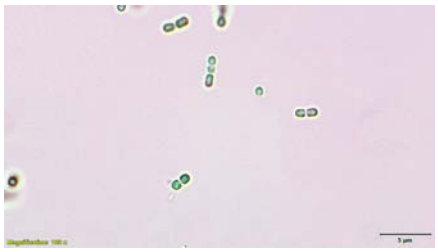
Cultivation medium: BG-11.

GPS coordinate: 22°54'04.0"N 41°08'21.1"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 057 - Cyanobacterium of currently unknown identity



Seawater cyanobacterium isolated from North Beach at King Abdullah University of Science and Technology (Thuwal, Makkah), in the mid-Red Sea coast region.

Cultivation medium: F/2 with 50% Red Sea water.

GPS coordinate: 23°37'02.6"N 38°48'17.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 058 - Diatom of currently unknown identity

Seawater diatom isolated from North Beach at King Abdullah University of Science and Technology (Thuwal, Makkah), in the mid-Red Sea coast region.

Cultivation medium: F/2 with 50% Red Sea water.

GPS coordinate: 23°37'02.6"N 38°48'17.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 059 - Cyanobacterium of currently unknown identity

Seawater cyanobacterium isolated from North Beach at King Abdullah University of Science and Technology (Thuwal, Makkah), in the mid-Red Sea coast region.

Cultivation medium: F/2 with 50% Red Sea water.

GPS coordinate: 23°37'02.6"N 38°48'17.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 060 - Cyanobacterium of currently unknown identity

Freshwater cyanobacterium isolated from the Dunes of Masturah desert.

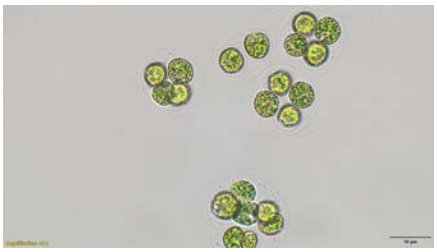
Cultivation medium: BG-11.

GPS coordinate: 23°37'02.6"N 38°48'17.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 061 - *Pleodorina illinoisensis*



Freshwater *Pleodorina illinoisensis* isolated from hot springs of Wadi Zee Valley.

Cultivation medium: BG-11.

GPS coordinate: 22°43'27.6"N 39°48'37.5"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 18S ribosomal DNA – Cdm F/Cdm R - used in a BLAST search, the sequence identity of 99.13% shows that *Pleodorina illinoisensis* is a relative.

KAUST 062 - *Coelastrum microporum*

Freshwater *Coelastrum microporum* isolated from hot springs of Wadi Zee Valley.

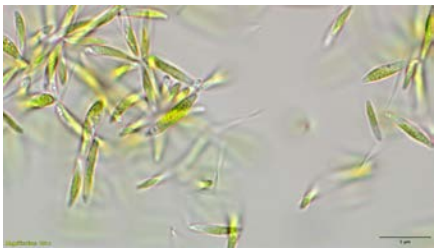
Cultivation medium: BG-11.

GPS coordinate: 22°43'27.6"N 39°48'37.5"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 98.24% shows that *Coelastrum microporum* is a relative.

KAUST 063 - Green alga of currently unknown identity



Freshwater green alga isolated from hot springs of Wadi Zee Valley.

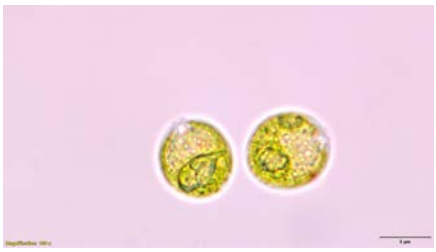
Cultivation medium: BG-11.

GPS coordinate: 22°43'27.6"N 39°48'37.5"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 064 - *Chlamydomonas* sp.



Freshwater *"Chlamydomonas* sp." isolated from hot springs of Wadi Zee Valley.

Cultivation medium: BG-11.

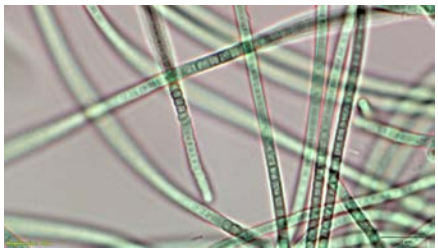
GPS coordinate: 22°43'27.6"N 39°48'37.5"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 91.84% shows that the strain currently identified as "*Chlamydomonas* sp. KU108" is a relative.

**Chlamydomonas* taxonomy is currently undergoing revision, and true identity by ITS is not conclusive. Therefore, the name is indicated in quotations.

KAUST 065 – *Phormidesmis molle*



Freshwater *Phormidesmis molle* isolated from hot springs of Wadi Zee Valley.

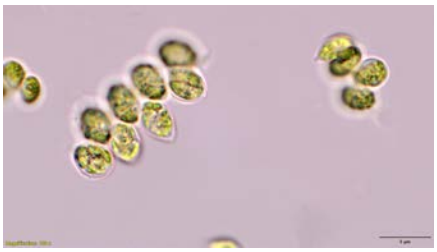
Cultivation medium: BG-11.

GPS coordinate: 22°43'27.6"N 39°48'37.5"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 16S ribosomal DNA – Cya106 F/Cya781b R- used in a BLAST search, the sequence identity of 100% shows that *Phormidesmis* molle DS2_D14 is a relative.

KAUST 066 - Green alga of currently unknown identity



Freshwater green alga isolated from hot springs of Wadi Zee Valley.

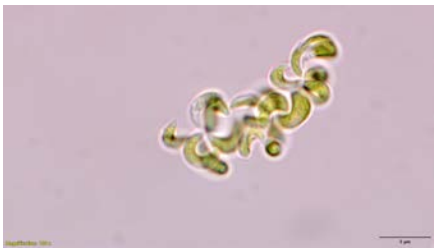
Cultivation medium: BG-11.

GPS coordinate: 22°43'27.6"N 39°48'37.5"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 067 - *Scenedesmus* sp.



Freshwater *Scenedesmus* sp. isolated from hot springs of Wadi Zee Valley.

Cultivation medium: BG-11.

GPS coordinate: 22°43'27.6"N 39°48'37.5"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 18S ribosomal DNA – Cdm F/Cdm R - used in a BLAST search, the sequence identity of 99.13% shows that *Scenedesmus* sp. KNUA019 is a relative.

KAUST 068 - *Nitzschia* sp.

Seawater *Nitzschia* sp. isolated from hot springs of Wadi Zee Valley.

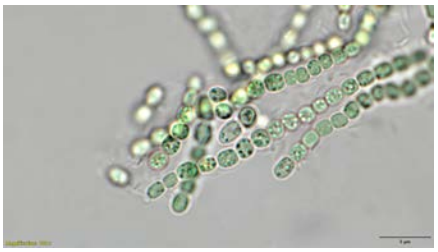
Cultivation medium: F/2 with 50% Red Sea water.

GPS coordinate: 22°43'27.6"N 39°48'37.5"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 18S ribosomal DNA – Cdm F/Cdm R- used in a BLAST search, the sequence identity of 100% shows that *Nitzschia* sp. is a relative.

KAUST 069 - *Anabaenopsis* sp.



Freshwater *Anabaenopsis* sp. isolated from hot springs of Wadi Zee Valley.

Cultivation medium: BG-11.

GPS coordinate: 22°43'27.6"N 39°48'37.5"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 16S ribosomal DNA – Cya106 F/Cya781b R- used in a BLAST search, the sequence identity of 100% shows that *Anabaenopsis* sp. is a relative.

KAUST 070 - *Fistulifera saprophila*

Seawater *Fistulifera saprophila* isolated from hot springs of Wadi Zee Valley.

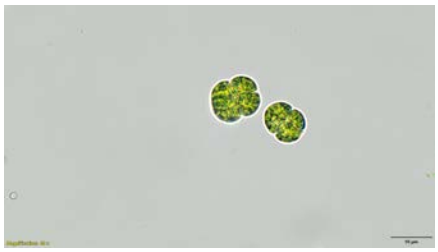
Cultivation medium: F/2 with 50% Red Sea water.

GPS coordinate: 22°43'27.6"N 39°48'37.5"E

Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 18S ribosomal DNA – Cdm F/Cdm R- used in a BLAST search, the sequence identity of 100% shows that *Fistulifera saprophila* is a relative.

KAUST 071 - Green alga of currently unknown identity



Freshwater green alga isolated from hot springs of Wadi Zee Valley.

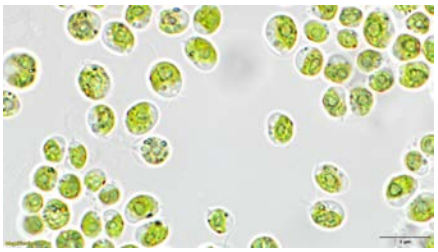
Cultivation medium: BG-11.

GPS coordinate: 22°43'27.6"N 39°48'37.5"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 072 - *Chlamydomonas* sp.



Freshwater *"Chlamydomonas* sp." isolated during a sandstorm at King Abdullah University of Science and Technology (Thuwal, Makkah), in the mid-Red Sea coast region.

Cultivation medium: BG-11

GPS coordinate: 22°18'28.0"N 39°06'23.0"E

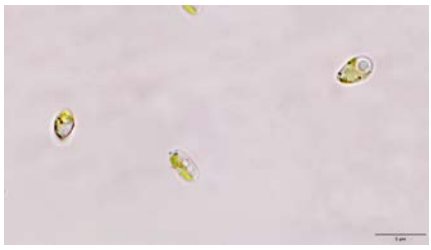
Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 95.22% shows that the strain currently identified as "*Chlamydomonas* sp. YACCYB80" is a relative.

**Chlamydomonas* taxonomy is currently undergoing revision, and true identity by ITS is not conclusive. Therefore, the name is indicated in quotations.

Detailed information about this strain is available under license agreement or subscription.

KAUST 073 - Green alga of currently unknown identity



Freshwater green alga isolated during a sandstorm at King Abdullah University of Science and Technology (Thuwal, Makkah), in the mid-Red Sea coast region.

Cultivation medium: BG-11

GPS coordinate: 22°18'28.0"N 39°06'23.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 074 - Green alga of currently unknown identity

Freshwater green alga isolated during a sandstorm at King Abdullah University of Science and Technology (Thuwal, Makkah), in the mid-Red Sea coast region.

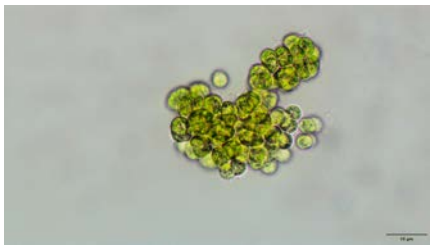
Cultivation medium: BG-11

GPS coordinate: 22°18'28.0"N 39°06'23.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 075 - Green alga of currently unknown identity

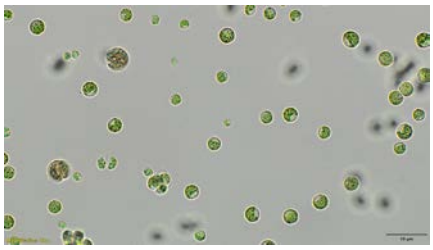


Freshwater green alga isolated during a sandstorm at King Abdullah University of Science and Technology (Thuwal, Makkah), in the mid-Red Sea coast region.
Cultivation medium: BG-11
GPS coordinate: 22°18'28.0"N 39°06'23.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 076 - Green alga of currently unknown identity



Freshwater green alga isolated from Duba Corniche, at the Eiffel tower monument.

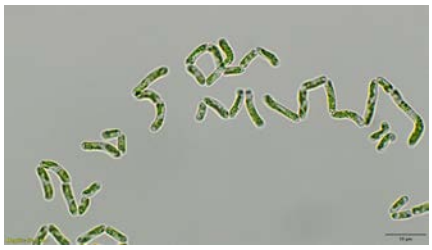
Cultivation medium: BG-11

GPS coordinate: 27°21'11.1"N 35°40'38.6"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 077 - Cyanobacterium of currently unknown identity



Freshwater cyanobacterium isolated from Duba Corniche, at the Eiffel tower monument.

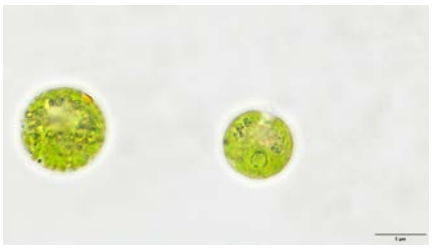
Cultivation medium: BG-11

GPS coordinate: 27°21'11.1"N 35°40'38.6"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 078 - *Chlamydomonas reinhardtii*



Freshwater "*Chlamydomonas reinhardtii*" isolated from Duba Corniche, at the Eiffel tower monument.
Cultivation medium: BG-11
GPS coordinate: 27°21'11.1"N 35°40'38.6"E

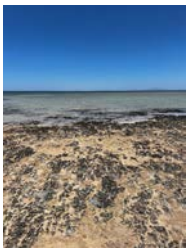
Strain Identification

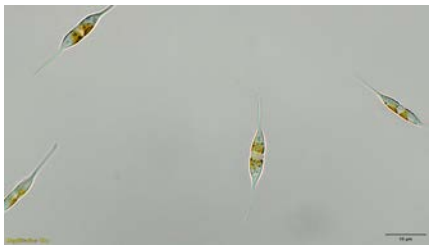
Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of Internal transcribed spacer 1 - ITS1 F (modified)/ITS2T R - used in a BLAST search, the sequence identity of 91.43% shows that *Chlamydomonas reinhardtii* is a relative.

**Chlamydomonas* taxonomy is currently undergoing revision, and true identity by ITS is not conclusive. Therefore, the name is indicated in quotations.

Detailed information about this strain is available under license agreement or subscription.

KAUST 079 - Diatom of currently unknown identity





Seawater diatom isolated from Haddah Beach North, at NEOM Region.

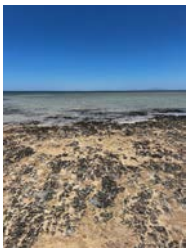
Cultivation medium: F/2 with Red Sea Water

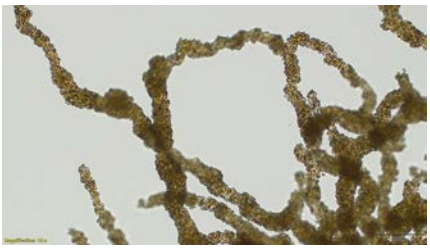
GPS coordinate: 28°04'54.1"N 34°50'08.4"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 080 - Diatom of currently unknown identity





Seawater diatom isolated from Haddah Beach North, at NEOM Region.

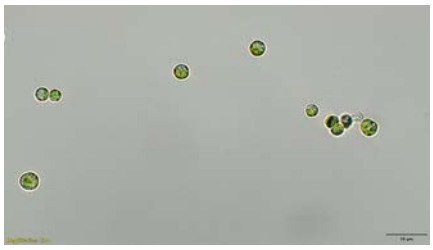
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 28°04'54.1"N 34°50'08.4"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 081 - Green alga of currently unknown identity



Seawater green alga isolated from Haddah Beach South, at NEOM Region.

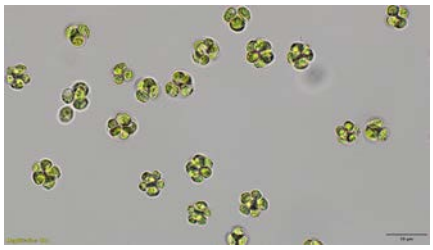
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 28°04'32.7"N 34°51'29.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 082 - Green alga of currently unknown identity



Seawater green alga isolated from Haddah Beach South, at NEOM Region.

Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 28°04'32.7"N 34°51'29.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 083 - Diatom of currently unknown identity

Seawater diatom isolated from NEOM Region, at the cost of Royal Tulip Resort.

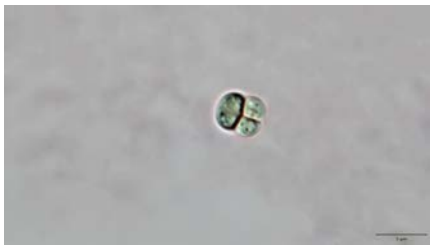
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 28°02'55.6"N 35°13'00.7"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 084 - Cyanobacterium of currently unknown identity



Freshwater cyanobacterium isolated from rocks at Haddah Beach South, at NEOM Region.

Cultivation medium: BG-11

GPS coordinate: 28°04'32.7"N 34°51'29.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 085 - Cyanobacterium of currently unknown identity

Freshwater cyanobacterium isolated from rocks at Haddah Beach South, at NEOM Region.

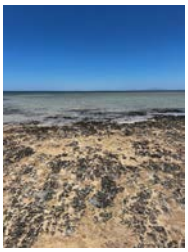
Cultivation medium: BG-11

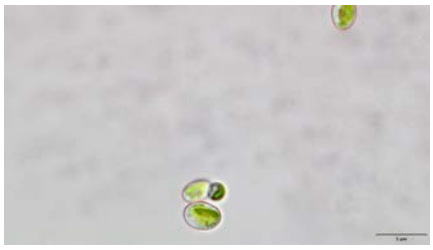
GPS coordinate: 28°04'32.7"N 34°51'29.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 086 - Green alga of currently unknown identity





Freshwater green algae from rocks at Haddah Beach North, at NEOM Region.

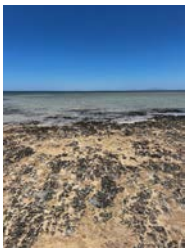
Cultivation medium: BG-11

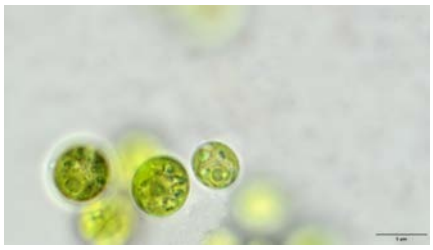
GPS coordinate: 28°04'32.7"N 34°51'29.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 087 - *Chlamydomonas isabeliensis*





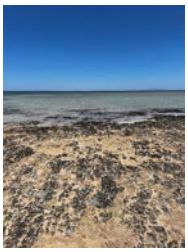
Freshwater "*Chlamydomonas isabeliensis"* isolated from rocks at Haddah Beach North, at NEOM Region.
Cultivation medium: BG-11
GPS coordinate: 28°04'32.7"N 34°51'29.8"E

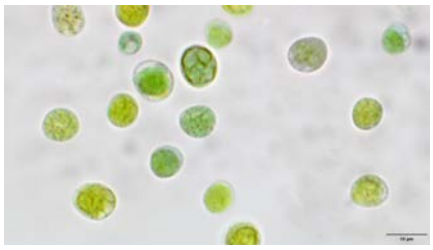
Strain Identification

Besides the morphological taxonomy, according to the DNA amplification for the partial sequence of 18S ribosomal DNA – Cdm F/Cdm R- used in a BLAST search, the sequence identity of 99.27% shows that the strain currently identified as "*Chlamydomonas isabeliensis"* is a relative.

**Chlamydomonas* taxonomy is currently undergoing revision, and true identity by 18S is not conclusive. Therefore, the name is indicated in quotations.

KAUST 088 - Cyanobacterium of currently unknown identity





Freshwater cyanobacterium isolated from rocks at Haddah Beach North, at NEOM Region.

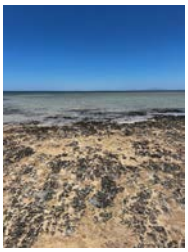
Cultivation medium: BG-11

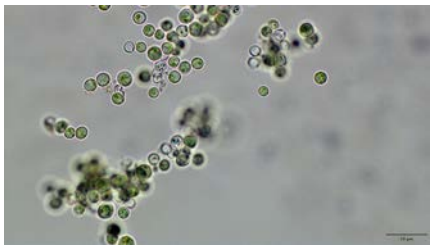
GPS coordinate: 28°04'32.7"N 34°51'29.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 089 - Green alga of currently unknown identity





Seawater green alga isolated from rocks at Haddah Beach North, at NEOM Region.

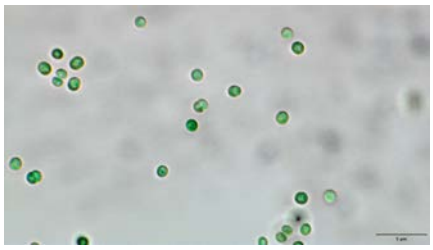
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 28°04'32.7"N 34°51'29.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 090 – Cyanobacterium of currently unknown identity



Freshwater cyanobacterium isolated from the coast at Jubail.

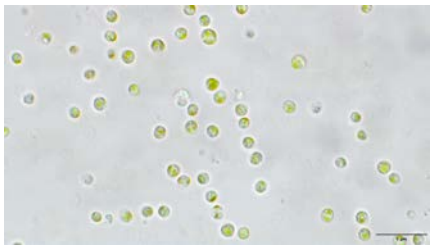
Cultivation medium: BG-11

GPS coordinate: 27°05'02.0"N 49°32'07.9"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 091 - Green alga of currently unknown identity



Seawater green alga isolated from the coast at Jubail.

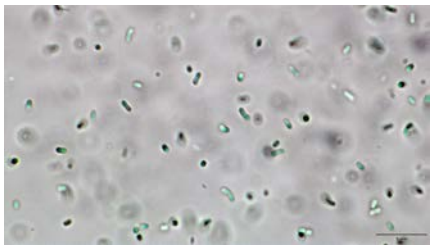
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 27°05'02.0"N 49°32'07.9"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 092 - Cyanobacterium of currently unknown identity



Freshwater cyanobacterium isolated from a bridge close to the coast at Jubail.

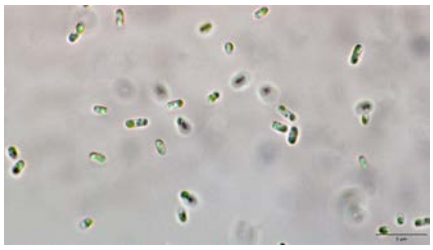
Cultivation medium: BG-11

GPS coordinate: 27°07'14.0"N 49°34'16.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 093 – Cyanobacterium of currently unknown identity



Seawater cyanobacterium isolated from a bridge close to the coast at Jubail.

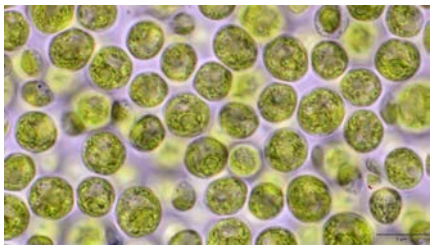
Cultivation medium: F/2 with Red Sea Water

GPS coordinate: 27°07'14.0"N 49°34'16.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 094 - Green alga of currently unknown identity



Freshwater green alga isolated from a bridge close to the coast at Jubail.

Cultivation medium: BG-11

GPS coordinate: 27°07'14.0"N 49°34'16.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 095 - *Chlamydomonas* sp.

Freshwater "*Chlamydomonas* sp." isolated from Jubail area.

Cultivation medium: BG-11

GPS coordinate: 27°05'02.0"N 49°32'22.3"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 096 - Green alga of currently unknown identity

Freshwater green alga isolated from Jubail area.

Cultivation medium: BG-11

GPS coordinate: 27°05'02.0"N 49°32'22.3"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 097 - Cyanobacterium of currently unknown identity

Freshwater cyanobacterium isolated from Jubail area.

Cultivation medium: BG-11

GPS coordinate: 27°05'02.0"N 49°32'22.3"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 098 - Cyanobacterium of currently unknown identity

Freshwater cyanobacterium isolated from Jubail area.

Cultivation medium: BG-11

GPS coordinate: 27°05'02.0"N 49°32'22.3"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 099 - Green alga of currently unknown identity

Freshwater green alga isolated from Mangroves at Dammam area (Abu Hadriah Highway).

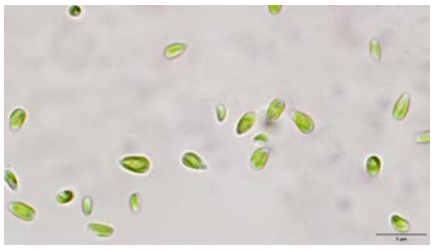
Cultivation medium: BG-11

GPS coordinate: 26°49'26.0"N 49°34'37.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 100 - Green alga of currently unknown identity



Freshwater green alga isolated from a bark tree at Deffi Park at Jubail.

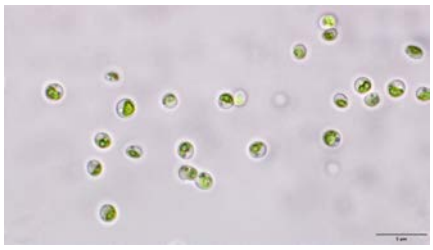
Cultivation medium: BG-11

GPS coordinate: 27°08'43.0"N 49°32'07.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 101 - Green alga of currently unknown identity



Freshwater green alga isolated from a bark tree at Deffi Park at Jubail.

Cultivation medium: BG-11

GPS coordinate: 27°08'43.0"N 49°32'07.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 102 - Cyanobacterium of currently unknown identity

Freshwater cyanobacterium isolated from a bark tree at Deffi Park at Jubail.

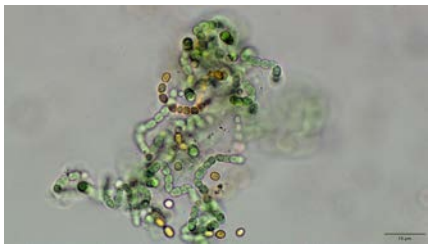
Cultivation medium: BG-11

GPS coordinate: 27°08'43.0"N 49°32'07.0"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 103 - Cyanobacterium of currently unknown identity



Freshwater cyanobacterium isolated from the Deserts regions of Al Ula, located in the Medina Region in north-western Saudi Arabia.

Cultivation medium: BG-11

GPS coordinate: 26°36'59.99"N 37°54'59.99"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 104 - Cyanobacterium of currently unknown identity

Freshwater cyanobacterium isolated from the Deserts regions of Al Ula, located in the Medina Region in north-western Saudi Arabia.

Cultivation medium: BG-11

GPS coordinate: 26°36'59.99"N 37°54'59.99"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 105 - Green alga of currently unknown identity

Freshwater green alga isolated from the area of Jeddah Corniche.

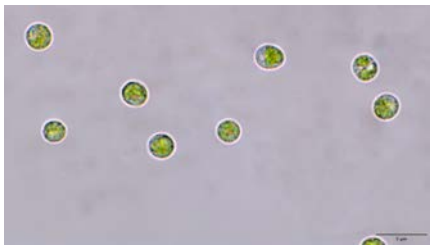
Cultivation medium: BG-11

GPS coordinate: 21°35'43.8"N 39°06'19.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 106 - Green alga of currently unknown identity



Freshwater green alga isolated from the area of Jeddah Corniche.

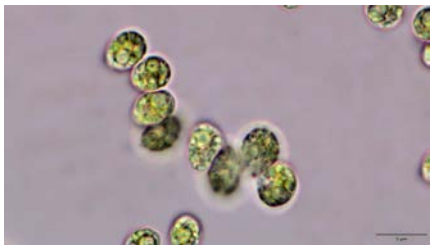
Cultivation medium: BG-11

GPS coordinate: 21°35'43.8"N 39°06'19.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 107 - Green alga of currently unknown identity



Freshwater green alga isolated from the area of Jeddah Corniche.

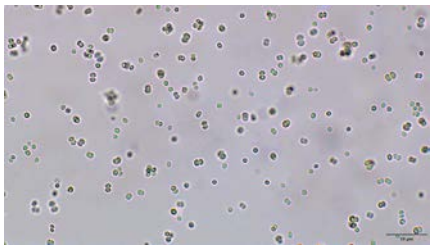
Cultivation medium: BG-11

GPS coordinate: 21°35'43.8"N 39°06'19.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 108 - Cyanobacterium of currently unknown identity



Freshwater cyanobacterium isolated from the area of Jeddah Corniche.

Cultivation medium: BG-11

GPS coordinate: 21°35'43.8"N 39°06'19.8"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 109 - Green alga of currently unknown identity

Freshwater green alga isolated from the area of Khulays, Makkah Region.

Cultivation medium: BG-11

GPS coordinate: 22°8'39"N 39°35'49"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KAUST 110 - Green alga of currently unknown identity

Freshwater green alga isolated from the Deserts regions of Al Ula, located in the Medina Region in north-western Saudi Arabia.

Cultivation medium: BG-11

GPS coordinate: 26°36'59.99"N 37°54'59.99"E

Strain Identification

Detailed information about this strain is available under license agreement or subscription.

KSA Algae Living Library

Microalgae and cyanobacteria isolated from the Kingdom of Saudi Arabia

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