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### Current research:

Dr. Al Ashhab group focuses on microbial ecology, their adaptation and ecosystems services under extreme environmental conditions ranging from; arid soil, agriculture, water, microbial biofilms and aquaculture.

מחקר נוכחי:

הקבוצה של ד"ר אשרף אל אלהב מתעניינת בפיזיולוגיה ואינטראקציה בין מיקרואורגניזמים בתנאים סביבתיים קיצוניים כמו ים המלח, מיקוד העבודה שלנו בקהילות החיידקים ייחודיים הנמצאים במים, אדמה ועל הצמחים של אזורים צחיחים לשם מיון של אלה המבטאים גנים האחראים לפעילות מטבולית מעניינת. בנוסף הקבוצה שלנו מפתחת מערכות "הנדסה מיקרוביולוגית" כגון: לטיפול בשפכים, בביופילם ובמערכות סביבתיות שונות כולל המערכת הדנטלית ימית ותעשיית הקוסמטיקה. המחקר שלנו הראה יישומים רחבי טווח ונתן אפשרות לשיתוף פעולה הדוק עם החקלאו

### Research students

in progress

– Educational consulting for postdoctoral student Dr. sagar nayak at BGU. Thesis in fish diet and their immunity

– Co-advisor Master student, Miss Danit parker, BGU. Thesis in desert plant microbiome.

### Research grants

1. Microbial diversity in arid and semi arid environment (2008-2010). Funded by Israeli Science Foundation (as participant)
2. Biofouling during desalination of tertiary treated wastewater.(2010-2014) Funded by Israeli Science Foundation and the german science foundation (MOST-BMBF) (as participant).
3. An infrastructure of fresh water microbiome and ecosystem integrity. (2014-2016). Funded by Israeli Science Foundation (as participant).
4. Microbiome of disease and sick fish aquaculture, tools toward fish immunity enhancement in aquaculture and using microbial probiotics. (2017-2018). Funded by ICA Foundation (as PI).
5. The use of Acacia microbiome phyllosphere as a biological control in arid agriculture. (2016-2019). Funded by ICA Foundation (as PI).
6. The Skin Microbiome as a Diagnostic and Therapeutic Tool in Fish Farming. (2019-2020). Funded by ICA Foundation (as PI).
7. Biocontrol of agricultural fungal pathogens using newly isolated microbial antifungal properties (2019-2020). Funded by ADSSC-TAU (as PI).
8. Engineering of camel microbiome and utilization for UV radiation protection (2019-2020). Funded by ICA (as PI)

## Patents

1. 2019, US Patent No. 62/885,386. Entitled: "BACTERIA AND METHODS OF USE THEREOF"
2. 2019, US Patent No. 62/891,437. Entitled: "FISH SKIN MICROBIOME"

## List of Publications:

- **Al-Ashhab A.**, Meshner S., Alexander-Shani R., Brandwein M., Bar-Lavan Y., Winters G. 2020. Temporal and spatial changes in phyllosphere microbiome of acacia trees growing in super arid environments. Microbial Ecology, Under review. doi: <https://doi.org/10.1101/2020.01.02.893446>
- Cytryn E., Patil H., Gatica J., Zolti A., Dror B., Benet-Perelberg A., Naor A., **Al-Ashhab A.**, Marman S., Hasan N., Colwell R., Sher D., Minz D. 2019. Temporal resistome and microbial community dynamics in an intensive aquaculture facility with prophylactic antibiotic treatment. Environmental Science & Technology, under review.
- Marmen S.<sup>PD</sup>, **Al-Ashhab A.**<sup>PD</sup>, Aharonovich D.<sup>c</sup>, Blank L.<sup>c</sup>, Sher D.<sup>PI</sup> The role of land use types and water chemical properties in structuring the microbiomes of a connected lake system. Frontiers in Microbiology.

- Marmen S.<sup>PD</sup>, **Al-Ashhab A.**<sup>PD</sup>, Aharonovich D.<sup>C</sup>, Blank L.<sup>C</sup>, Sher D.<sup>PI</sup> 2019, The effect of environment and seasonality on the distribution of toxinogenic cyanobacteria in a semi-arid region. *Toxicon- Oxford*, 158(1).
- Stavi I.<sup>PI</sup>, Rozenberg T., **Al-Ashhab A.**<sup>C</sup>, Argaman E.<sup>C</sup>, Groner E.<sup>PI</sup>, 2018. Failure and collapse of ancient agricultural stone terraces: On-Site effects on soil and vegetation. *Water*, 10(10), 1400; <https://doi.org/10.3390/w10101400>. Cited: 2, IF: 2.1, SJR: 0.63, Q1.
- Marmen S.<sup>PD</sup>, Blank L., **Al-Ashhab A.**<sup>PD</sup>, Malik A.<sup>S</sup>, Ganzert L.<sup>C</sup>, Lalar M.<sup>S</sup>, Grossart H. P.<sup>PI</sup> and Sher D.<sup>PI</sup> The role of land use types and water chemical properties in structuring the microbiome of a connected lakes system. *BioRxiv*, preprint.
- Stavi I.<sup>PI</sup>, Rozenberg T., **Al-Ashhab A.**<sup>C</sup>, Argaman E.<sup>C</sup>, Groner E.<sup>PI</sup>, 2018. Single session of chiseling tillage for soil and vegetation restoration in severely degraded shrublands. *Water*, 10(6):775. doi: 10.3390/w10060755. Cited: 0, IF: 2.1, SJR: 0.63, Q1.
- Brandwein M.<sup>S</sup>, Fuks G.<sup>C</sup>, Israel A.<sup>T</sup>, **Al-Ashhab A.**<sup>C</sup>, Nejman D.<sup>PD</sup>, Straussman R.<sup>C</sup>, Hodak E.<sup>C</sup>, Harari M.<sup>C</sup>, Steinberg D.<sup>C</sup>, Bentwich Z.<sup>C</sup>, Shental N.<sup>C</sup>, Meshner S.<sup>PI</sup> Temporal stability of the healthy human skin microbiome following Dead Sea climatotherapy. *Acta Dermato Venereologica*, 98(2):256-261. doi: 10.2340/00015555-2769. Cited: 1, IF: 3.1, SJR: 1.09, Q1.
- **Al-Ashhab A.**<sup>S</sup>, Sweity A.<sup>S</sup>, Bayramoglu B.<sup>S</sup>, Herzberg M.<sup>PI</sup>, Gillor O.<sup>PI</sup> Biofouling of reverse osmosis membranes: effects of cleaning on biofilm microbial communities, membrane performance, and adherence of extracellular polymeric substances. *Biofouling*, 33(5):397-409. doi: 10.1080/08927014.2017.1318382. Cited: 3, IF: 2.8, SJR: 0.84, Q1.
- **Al-Ashhab A.**<sup>S</sup>, Gillor O.<sup>PI</sup>, Herzberg M.<sup>PI</sup>. 2014. Biofouling of reverse-osmosis membranes under different shear rates during tertiary wastewater desalination: microbial community composition. *Water Research*, 67:86-95. doi: 10.1016/j.watres.2014.09.007. Cited: 27, IF: 7.1, SJR: 2.6, Q1.
- Lusine Ghazaryan L.<sup>PD</sup>, Tonoyan L.<sup>S</sup>, **Al-Ashhab A.**<sup>S</sup>, Ines S.<sup>C</sup>, Gillor O.<sup>PI</sup> The role of stress in colicin regulation. *Archives of microbiology*, 196(11):753-64. doi: 10.1007/s00203-014-1017-8. Cited: 9, IF: 2.1, SJR: 0.76, Q1
- **Al-Ashhab A.**<sup>S</sup>, Gillor O.<sup>PI</sup>, Herzberg M.<sup>PI</sup> Biofouling of reverse-osmosis membranes during tertiary wastewater desalination: microbial community composition. *Water research*, 50:341-9. doi: 10.1016/j.watres.2013.10.044. Cited: 35, IF: 7.1, SJR: 2.6, Q1.
- Pasternak Z.<sup>PD\*</sup>, **Al-Ashhab A.**<sup>S\*</sup>, Gatica J.<sup>S\*</sup>, Gafny R.<sup>C</sup>, Avraham S.<sup>C</sup>, Minz D.<sup>PI</sup>, Gillor O.<sup>PI</sup>, Jurkevitch E.<sup>PI</sup> Spatial and temporal biogeography of soil microbial communities in arid and semiarid regions. *PLoS One*, 8(7):e69705. doi: 10.1371/journal.pone.0069705. Cited: 53, IF: 4.5, SJR: 1.78, Q1.

- Pasternak Z.<sup>PD\*</sup>, **Al-Ashhab A.**<sup>S\*</sup>, Gatica J.<sup>S</sup>, Roni Gafny R.<sup>C</sup>, Frenk S.<sup>C</sup>, Minz D.<sup>PI</sup>, Gillor O.<sup>PI</sup>, and Jurkevitch E.<sup>PI</sup> Optimization of molecular methods and statistical procedures for forensic fingerprinting of microbial soil communities. *International Research Journal of Microbiology*, 3(11):363-3727.
- Bachar A.<sup>PD</sup>, **Al-Ashhab A.**<sup>S</sup>, Soares M.I.M.<sup>PI</sup>, Sklarz M.Y<sup>C</sup>, Angel R.<sup>C</sup>, Unger E.D.<sup>C</sup>, and Gillor O.<sup>PI</sup> Soil microbial abundance and diversity along a low precipitation gradient. *Microbial Ecology*, 60(2):453-461. doi: 10.1007/s00248-010-9727-1. Cited: 108, IF: 3.6, SJR: 1.27, Q1.