December 2, 2023

Make a Möbius Strip and A Sweaty Plant Adaptation

**Student Activity Worksheet: A sweaty plant adaptation**

**Directions:** Working with your partner, watch the video “Movie S3” from the primary source article, “[Harvesting](https://www.pnas.org/doi/full/10.1073/pnas.2313134120) [of aerial humidity with natural hygroscopic salt excretions,](https://www.pnas.org/doi/full/10.1073/pnas.2313134120)” and answer the first question. Read the *Science News* article “[Salty sweat helps one desert plant stay hydrated](https://www.sciencenews.org/article/salt-sweat-desert-plant-hydrated)” and answer the rest of the questions with your partner.

# Videos as scientific data

1. Before reading the *Science News* article, watch the video “Movie S3” from the primary source article, “[Harvesting of aerial humidity with natural hygroscopic salt excretions.](https://www.pnas.org/doi/full/10.1073/pnas.2313134120)” Discuss what you observe. What is changing?
2. After reading the *Science News* article, watch the same video again. Based on your understanding from the article, what do you think you see in the video?
3. What type of video is it? Why do you think scientists chose to record that type of video?
4. What scientific question was materials scientist Marieh Al-Handawi investigating?
5. Brainstorm another scientific question that this type of video could help answer.
6. What is the relationship between the primary source article and the *Science News* article? Is it helpful to have access to both? Why or why not?

# Drawing chemical adaptations

1. Draw a picture of the Athel tamarisk plant in its natural environment. Make sure your image indicates different aspects of the unique environment. Use figures in the primary research article or other sources to find the information that you need.
2. With your partner, discuss the plant’s adaptation that was studied in the article and talk about why it

was beneficial to its survival. Write down your answers.

1. Draw a molecular diagram of the interaction between the salts and the water from the humidity in the air. Use your knowledge of the composition of the salts, or ionic crystalline substances such as sodium chloride, gypsum and lithium sulfate, named in the article. Feel free to look up information as needed.
2. Using your knowledge of intermolecular attraction and electrostatic, or Coulombic, attraction forces, explain why this plant adaptation might be more successful at collecting water from the air than an adaptation related only to leaf structure.
3. Explain why you think the humidity level would impact the amount of water that could be collected on a plant. Draw a quick diagram using water molecules to represent two different relative humidity levels: 50 percent humidity and 80 percent. Why might this plant harvest more water at lower humidity levels compared to other plants that lack this adaptation?
4. What other questions do you have about how the Athel tamarisk uses this process to get water?

*Student answers will vary but questions may include: How does the plant take in the water from its surface?*



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