



KÜTAŞ

**GUZELBAHCE PLANT LABORATORY
ADULTERATION PRESENTATION**

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Laboratory Manager**



OREGANO

- *Origanum vulgare* and *Origanum Onites* are the primary commercial types of oregano currently grown in Aegean and Marmara Regions of Turkey.
- Oregano is a multi purpose plant heavily used in Food, Cosmetics and Medicine industries.
- *Origanum Onites* L has the greatest share among oregano being exported by Turkey



OREGANO

- The primary component of Onites volatile oil is Carvacrol. Other types of oregano may contain such components as Thymol and Linalool.
- Origanum Onites is also used as a popular medicine, and is widely used in medicine and as spice in dishes.
- Oregano leaves, and volatile oil has seperate applications in industry.



OREGANO

- In culinary applications oregano is heavily used to flavour meat dishes, vegetables, as ingredient in sauces and salad dressings, cheese manufacturing and meat packing. As a medicine, oregano is commonly used against digestive system illnesses, respiratory diseases, indigestion, lack of appetite and coughing.



OREGANO

- In the last decade, oregano has faced a rise in adulteration with some manufacturers blending cistus, olive leaves, myrtle and other botanicals for economic gains. These adulterants generally contain little to no volatile oil.



OREGANO REGIONAL SPREAD IN TURKEY



Turkey





PHYSICAL PROPERTIES OF ADULTERANTS



Myrtle Leaves

Olive Myrtle Leaves

Cistus



Wild Strawberry Leaves

Hazelnut Leaves

Sumac leaves

Economic Adulteration of Oregano



Origanum Vulgare Leaves

Origanum Onites Leaves

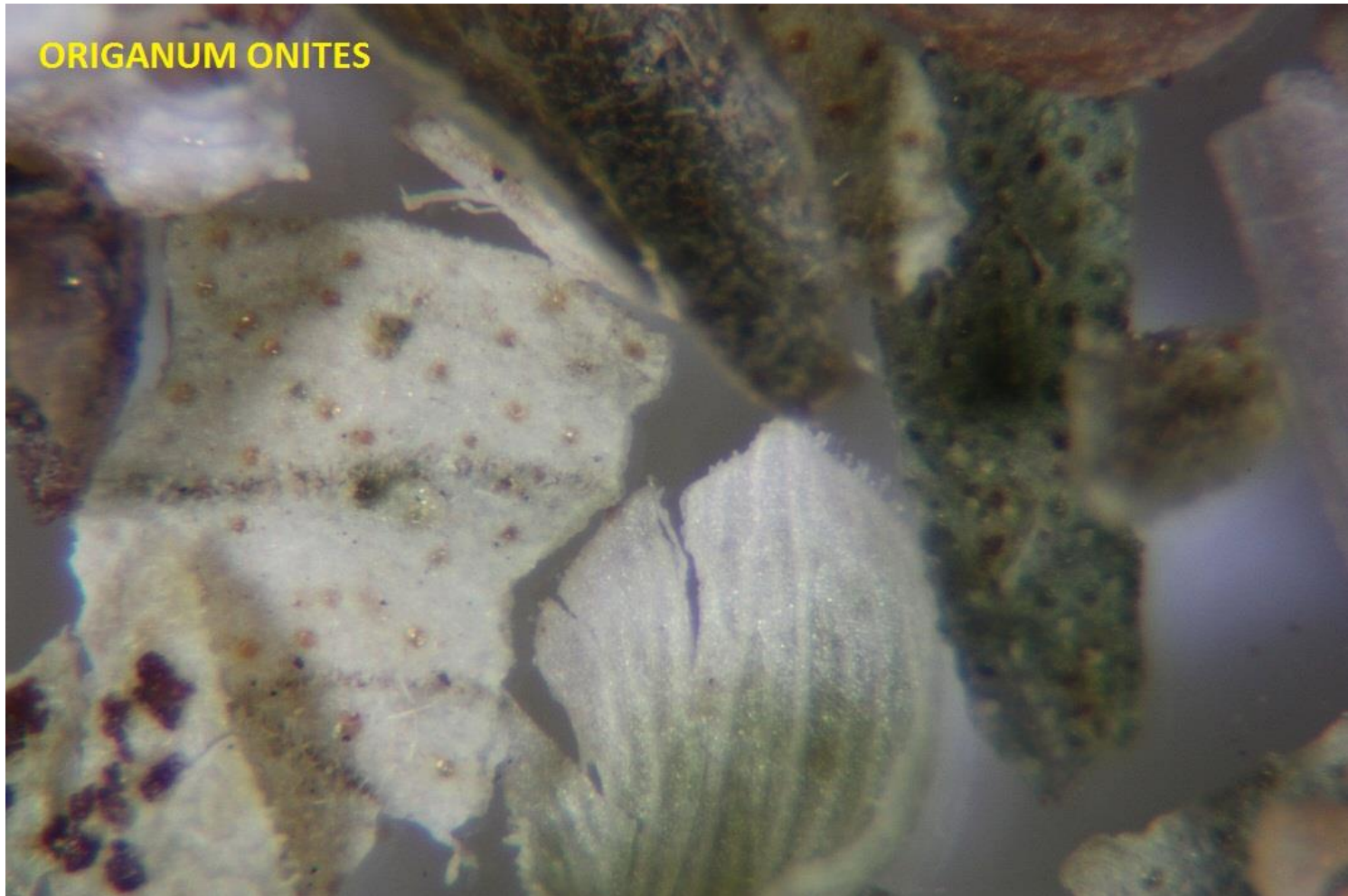


Origanum Onites

- Also known as «Izmir oregano», it has oval shaped, pale green colored leaves that display oil drops on their surface when viewed under microscope. Onites is widely cultivated in Western Turkey.
- Carvacrol volatile oil components gives it a bitter/sweet taste, and in nature plants contain 2 to 4 percent volatile oil.

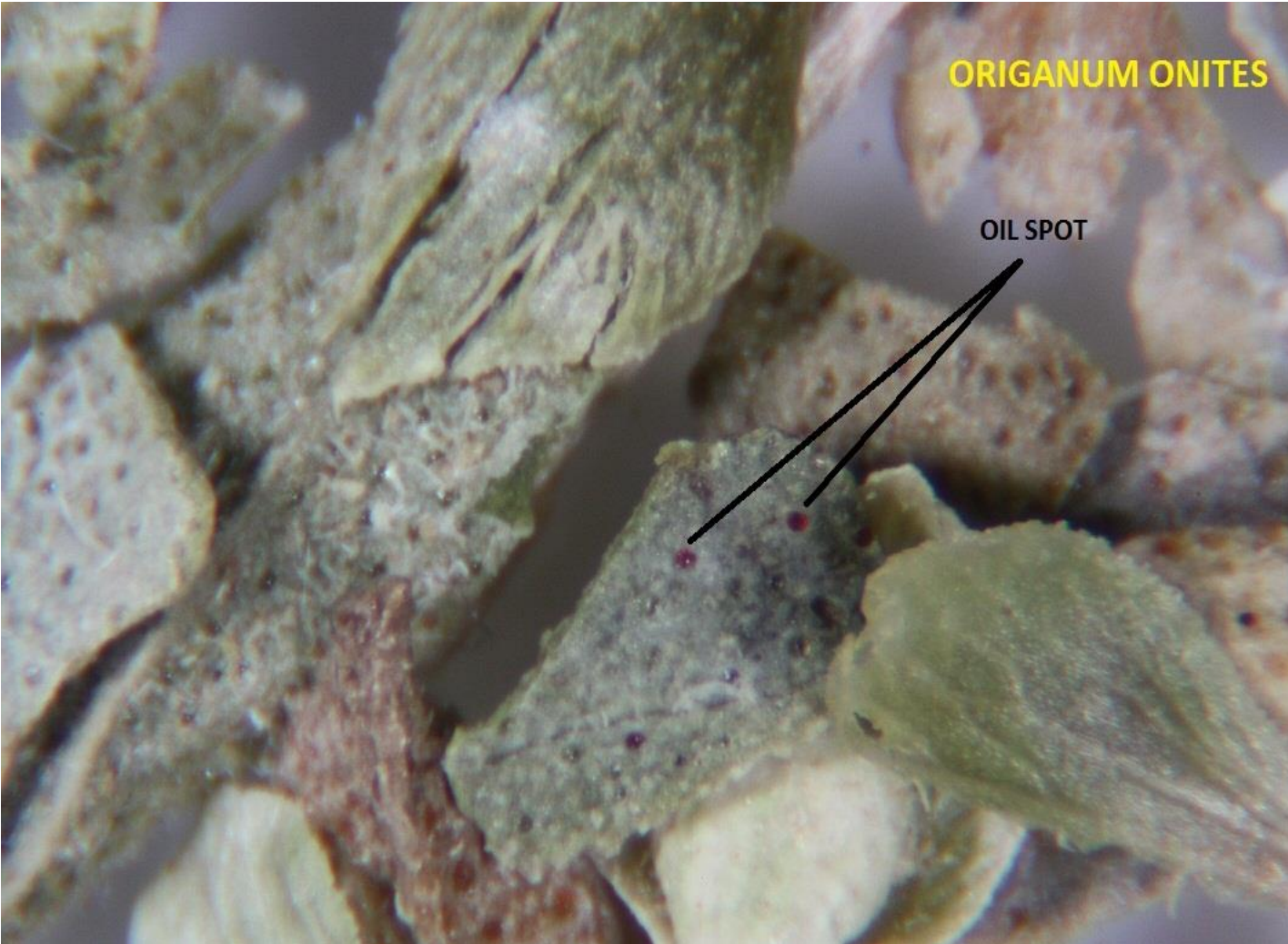


ORIGANUM ONITES



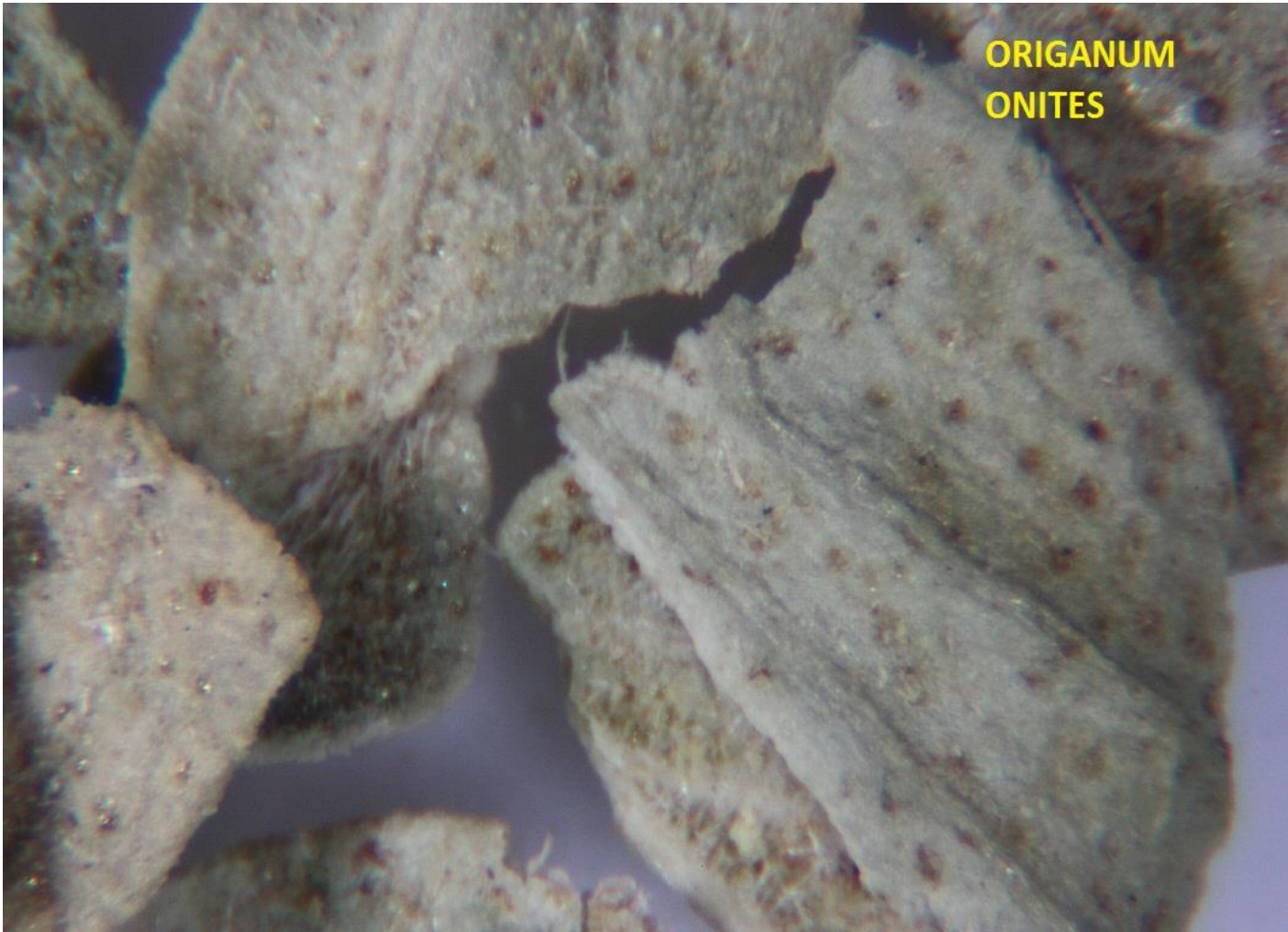


ORIGANUM ONITES





ORIGANUM ONITES



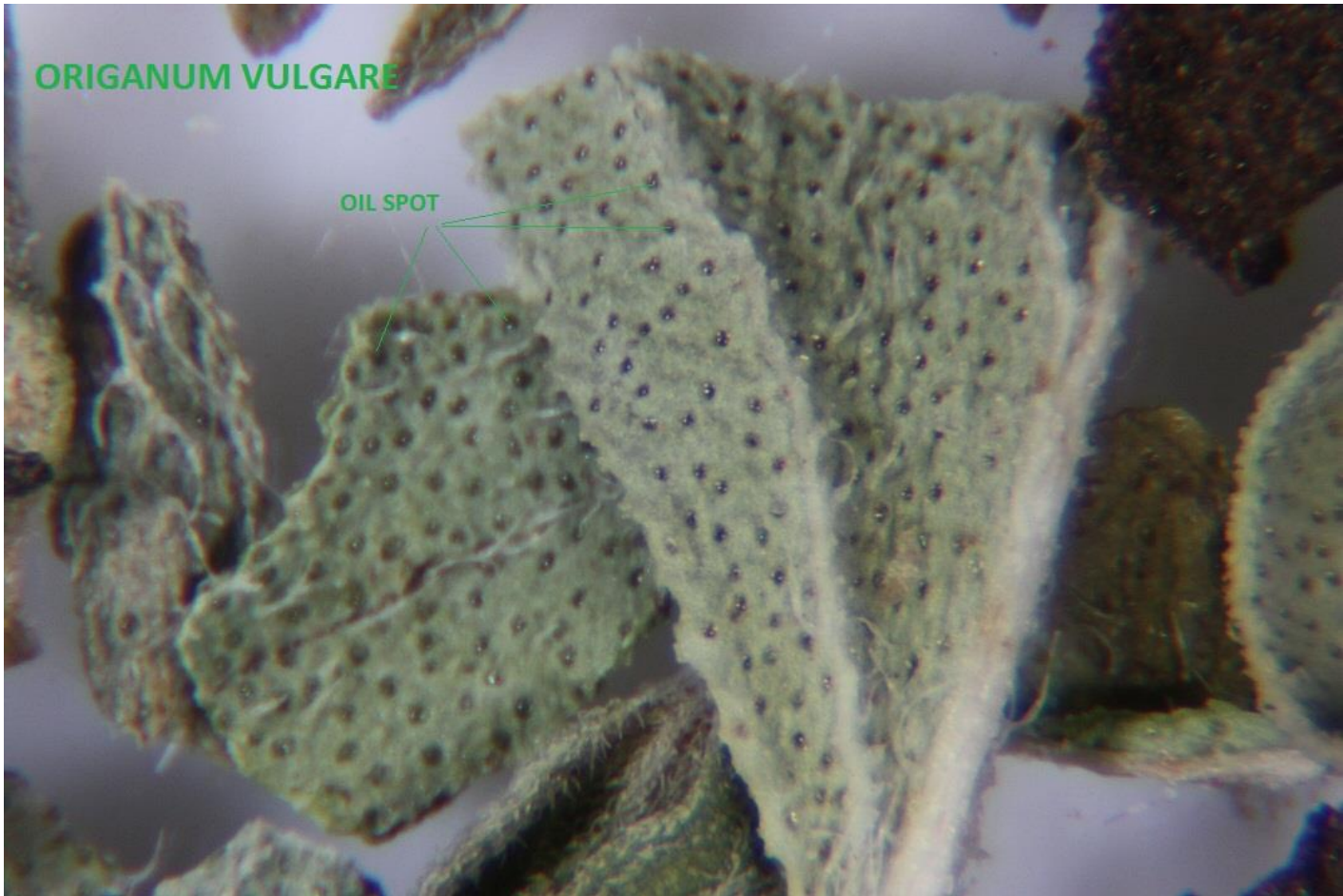


ORIGANUM VULGARE

- Also known as «Canakkale oregano», it has oval shaped dark green colored leaves.
- When viewed under the microscope, leaves contain significant amounts of oil spots. Origanum Vulgare is cultivated in Western Turkey.
- Thymol volatile oil components gives it a bitter taste, and in nature plants contain 2 to 6 percent volatile oil.

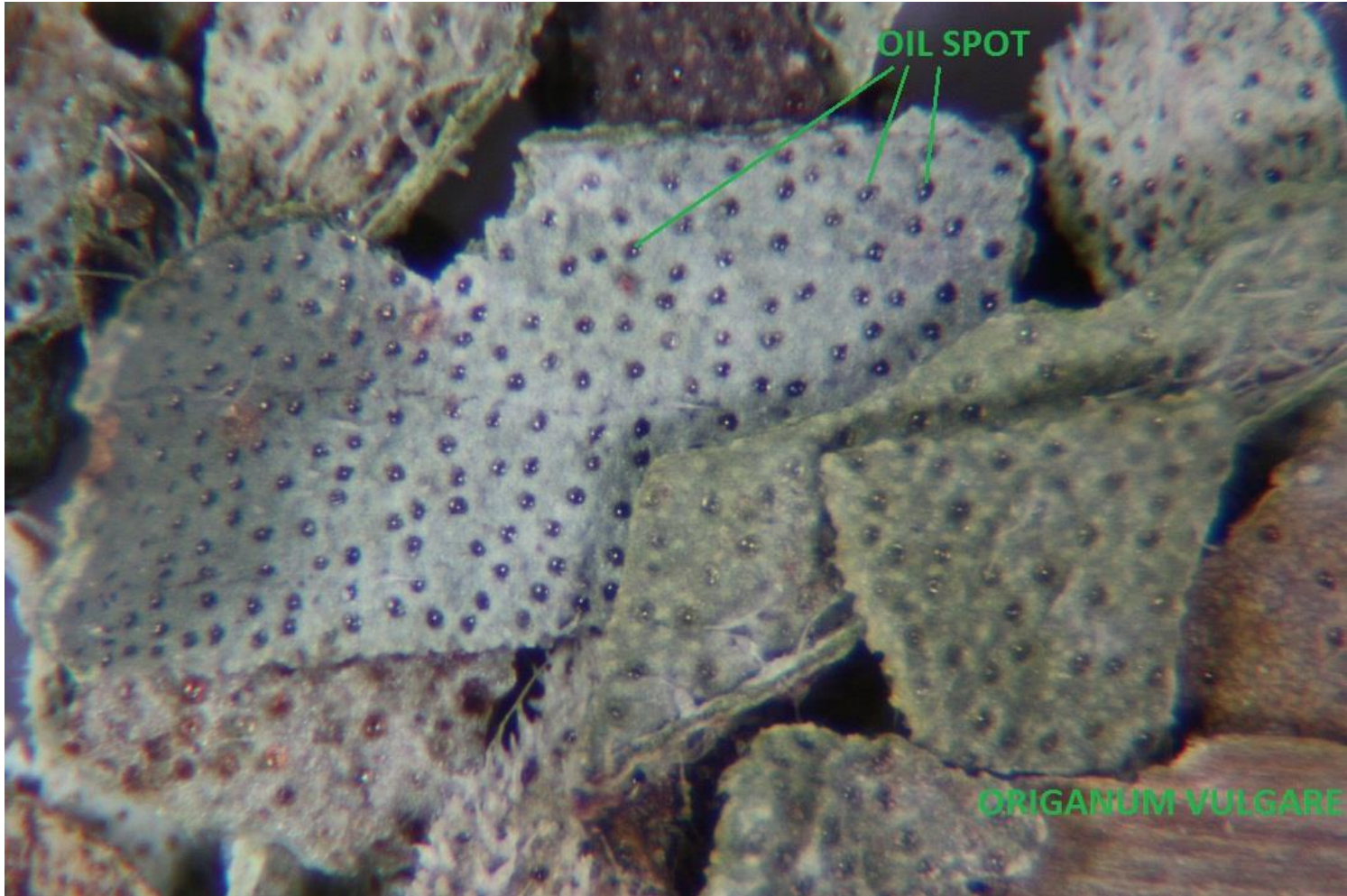


ORIGANUM VULGARE



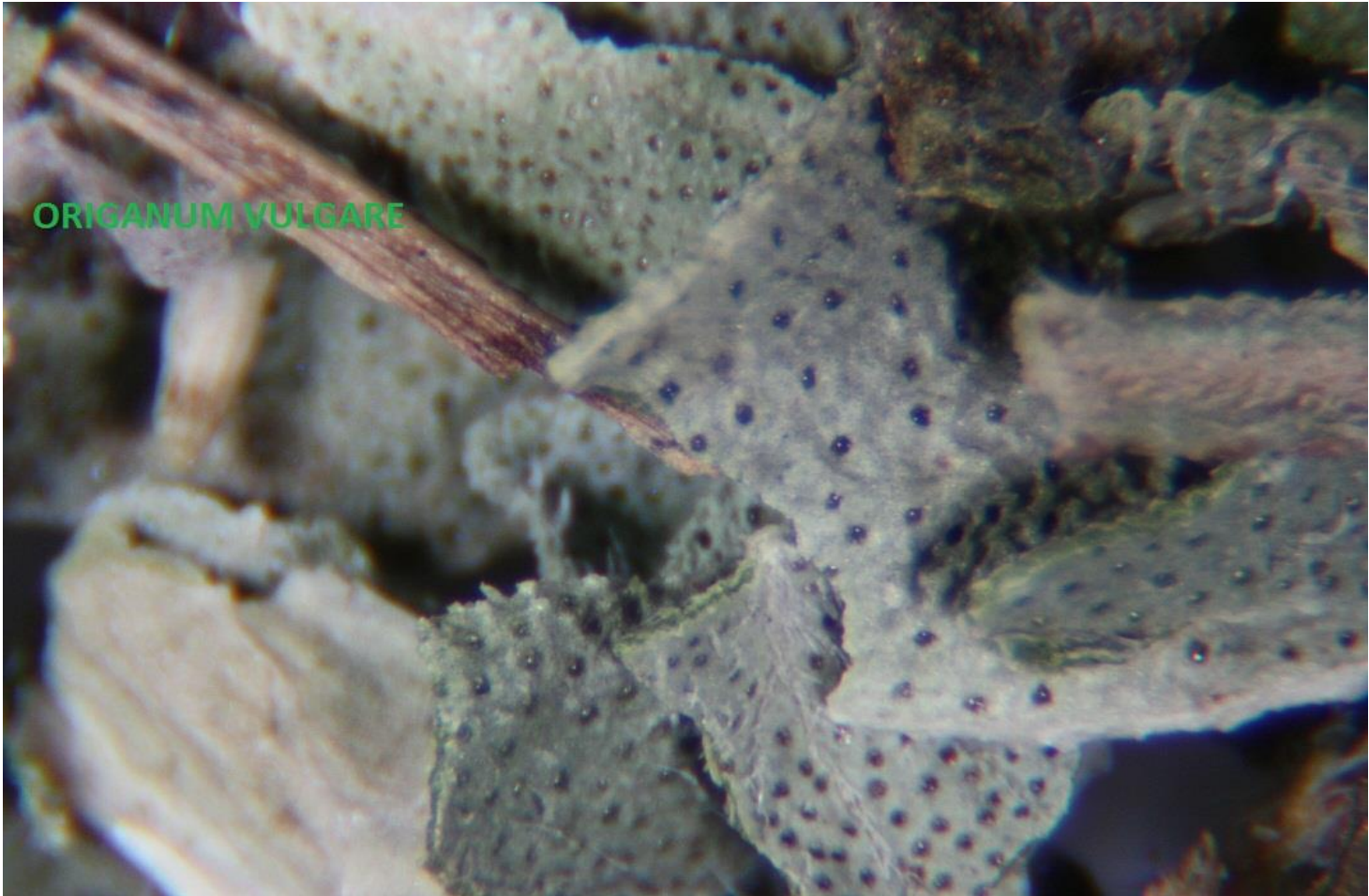


ORIGANUM VULGARE





ORIGANUM VULGARE





OLIVE LEAVES

- When viewed under microscope, leaves display a wafer like structure, and clear cuts. Color is grey/green. Can also be viewed visually with careful inspection.
- Most commonly used adulterant. Has a view enhancing property, unlike Myrtle leaves that contain significant amount of stems.
- When viewed under microscope, very clearly discernable from oregano.
- No oil spots on leaves.

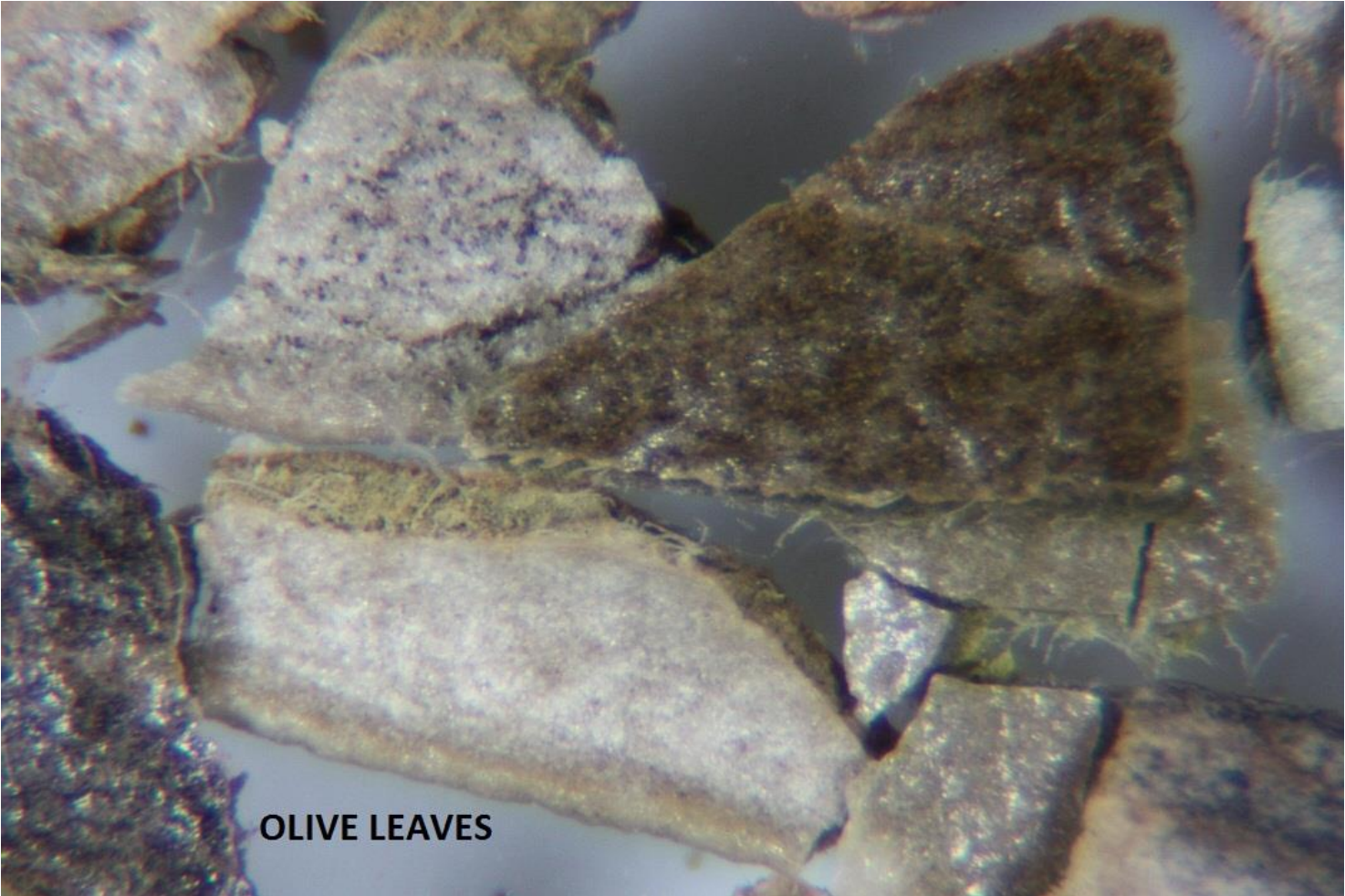


OLIVE LEAVES





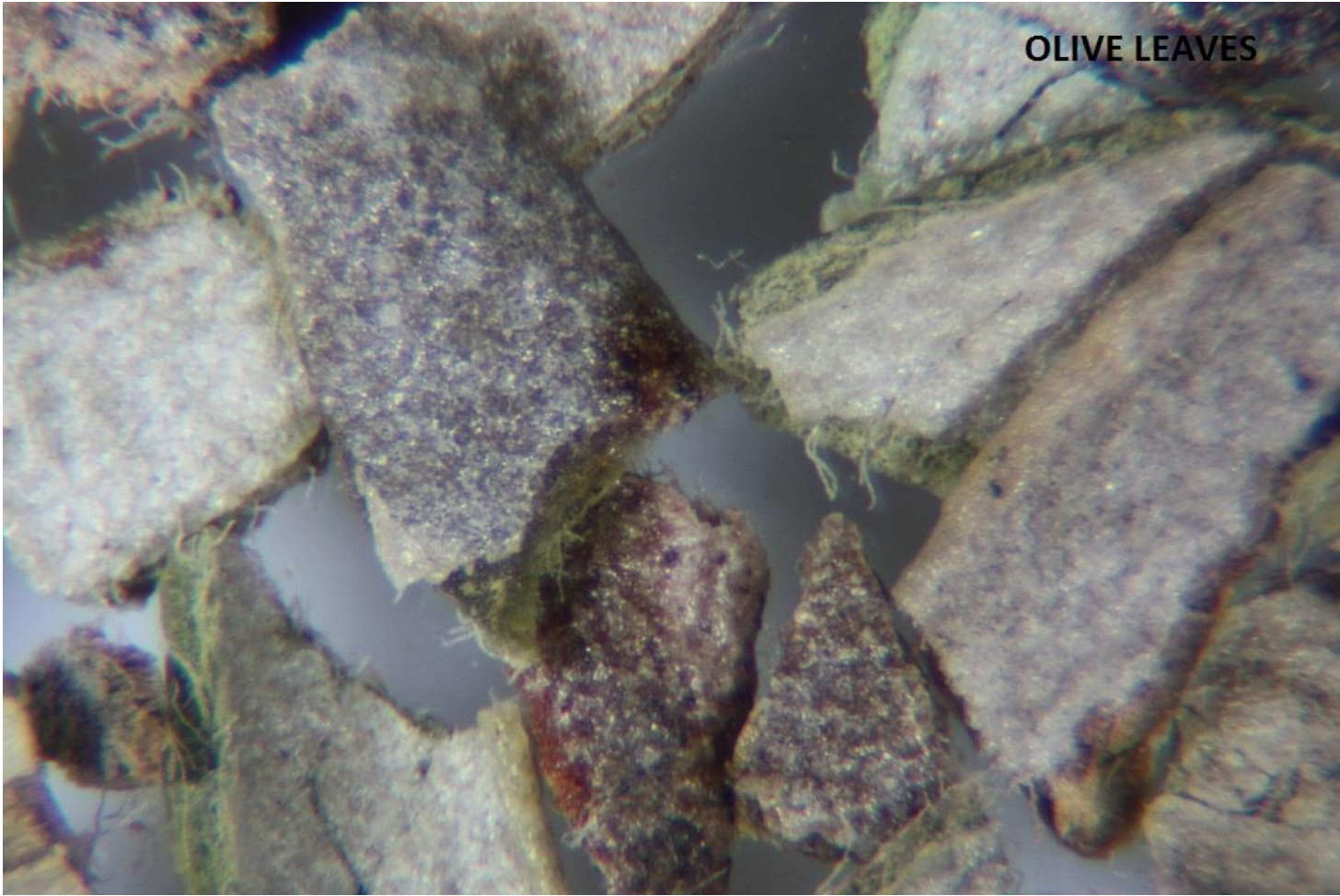
OLIVE LEAVES



OLIVE LEAVES



OLIVE LEAVES





MYRTLE LEAVES

- Has physical structure allowing for clean cuts. Myrtle is the only adulterant containing volatile oil. Contains 1-1.5% volatile oil. Has green/yellow color, and enhances appearance of oregano as it does not contain stems.
- Easy to discern from oregano under microscope. Heavily used as adulterant recently.



MYRTLE LEAVES

MERSİN YAĞRAĞI





MYRTLE LEAVES



MERSİN YAPRAĞI



MYRTLE LEAVES

MERSİN YAPRAĞI





CISTUS

- Has hairy, bumpy texture, and very low volatile oil. Volatile oil levels are between %0,20 -0,60.
- When viewed under microscop, has visible star like structures on its surface, and bumpy texture. Use as adulterant has dropped recently.



CISTUS





CISTUS





CISTUS





THANK YOU

Züleyha KAHYA TIRMAN
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