



Tue 12 May 2026 14:00-15:00

Dr. Andy Chandler-Grevatt

www.mosssafari.com



Introduction

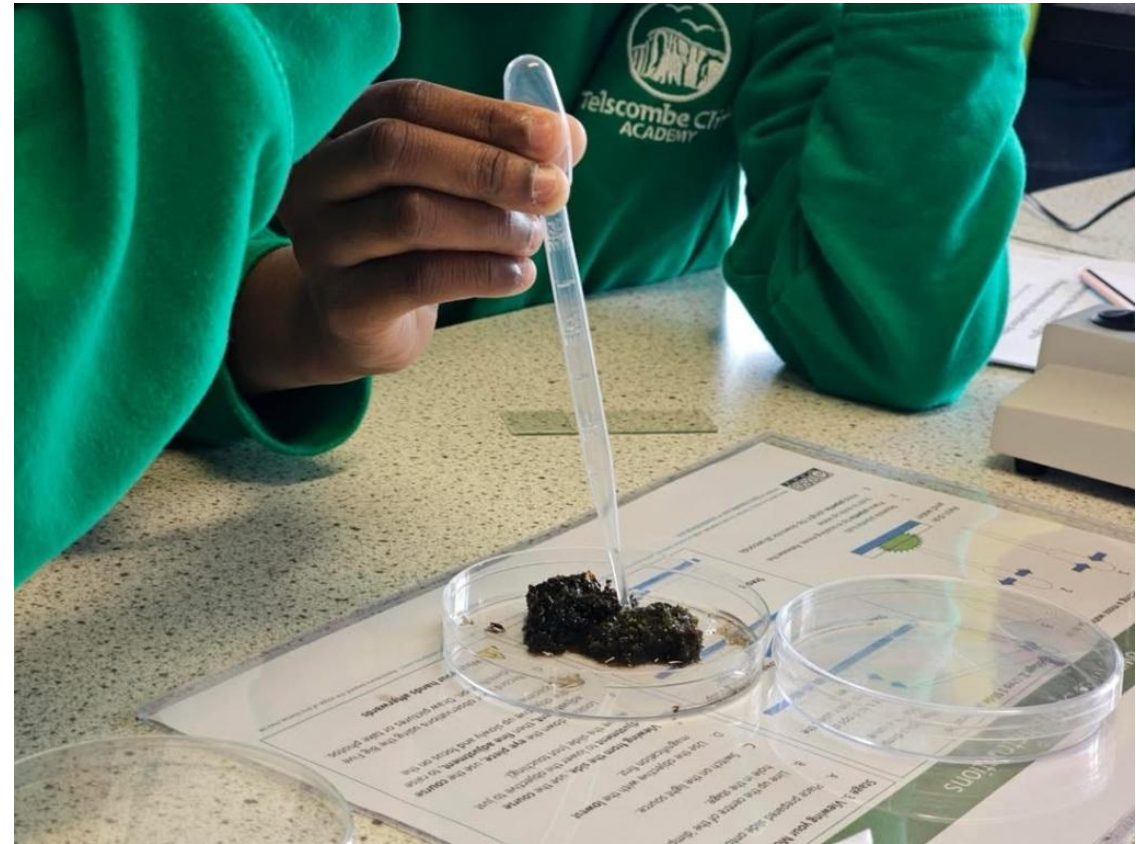
Dr Andy Chandler-Grevatt

- Teacher (CSciTeach), Author, Researcher
- BSc (Hons) & MSc in Biological Sciences
- Doctorate in Science Education
- Teacher: Secondary School Science teacher (10 years), University Lecturer in Science Education and Teacher Training (2006-).
- Author: 96+ textbook / resource publications (Oxford University Press)
- Founder, Moss Safari
- Microscope and moss life enthusiast



Moss Safari: the activity

- Very simple
- No staining
- No specialised skills
- No specialised techniques
- Just - suck, squeeze, observe





Techniques: Sampling

Moss squeeze: Pipette



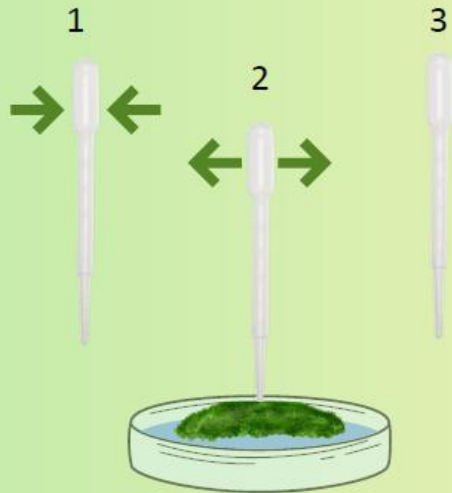
Connect with nature
Promote microscopy
Inspire STEM





Stage 1: Collect

If the moss is not wet, soak it in mineral water for at least 24 hours.

1. Squeeze the pipette bulb.
2. Place pipette tip into the wet moss. Release the bulb, so it sucks up some water.
3. Raise the pipette and sample. Hold it vertical for 30 seconds.

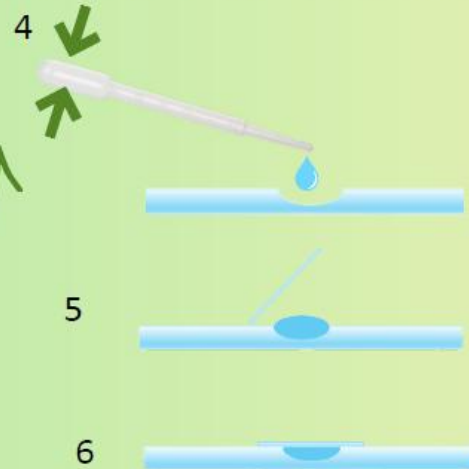




  Wash your hands after handling moss

Stage 2: Prepare

Lay a glass 'dimple' microscope slide on a flat surface. Have a clean coverslip ready.

4. Squeeze 3-4 drops of sample into the dimple on the glass slide.
5. Take a cover slip and place an edge next to the sample.
6. Carefully lower the coverslip onto the sample.

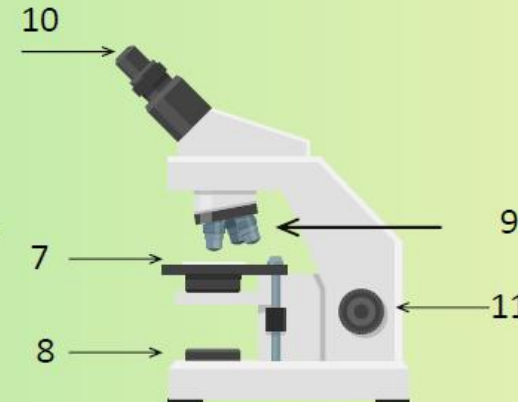



  Clear up and dispose of broken glass carefully and responsibly

Stage 3: Observe

Observe at magnifications $\times 40$ to search and $\times 100$ for more detailed view.

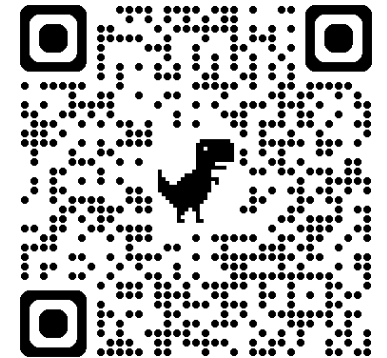
7. Place the prepared slide on the stage, with the dimple over the hole.
8. Switch on the light source.
9. Set the objective to the lowest magnification.
10. Look through the eye piece.
11. Use the focus knob to lower the stage and get the sample into focus.



 While looking through the eye piece, always lower the stage to focus.




© 2025 A. Chandler-Grevatt / Moss Safari. This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License (CC BY-NC 4.0). Schools, universities, and educators are welcome to use, copy, and adapt this content for teaching and learning acknowledging the original source. Commercial reproduction or distribution is not permitted without permission. More information: www.mosssafari.com



<https://mosssafari.com/resources/>

Moss Safari Aims

 Connect with nature

 Promote microscopy

 Inspire STEM

British Science Week 2024 – Live Lesson: Watch now

BBC Teach - Live Lessons



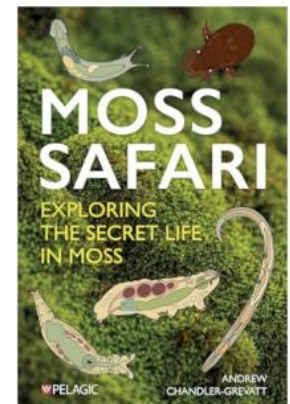
CHANDLER-GREVATT
Inspiring Young Explorers
Through Moss Safari

Dr. Andrew Chandler-Grevatt created Moss Safari, a unique project that inspires young minds to explore the microscopic wonders of moss. In this interview, he shares the inspiration behind the idea, the importance of fostering scientific curiosity in children, and the current state of microscopy popularisation.

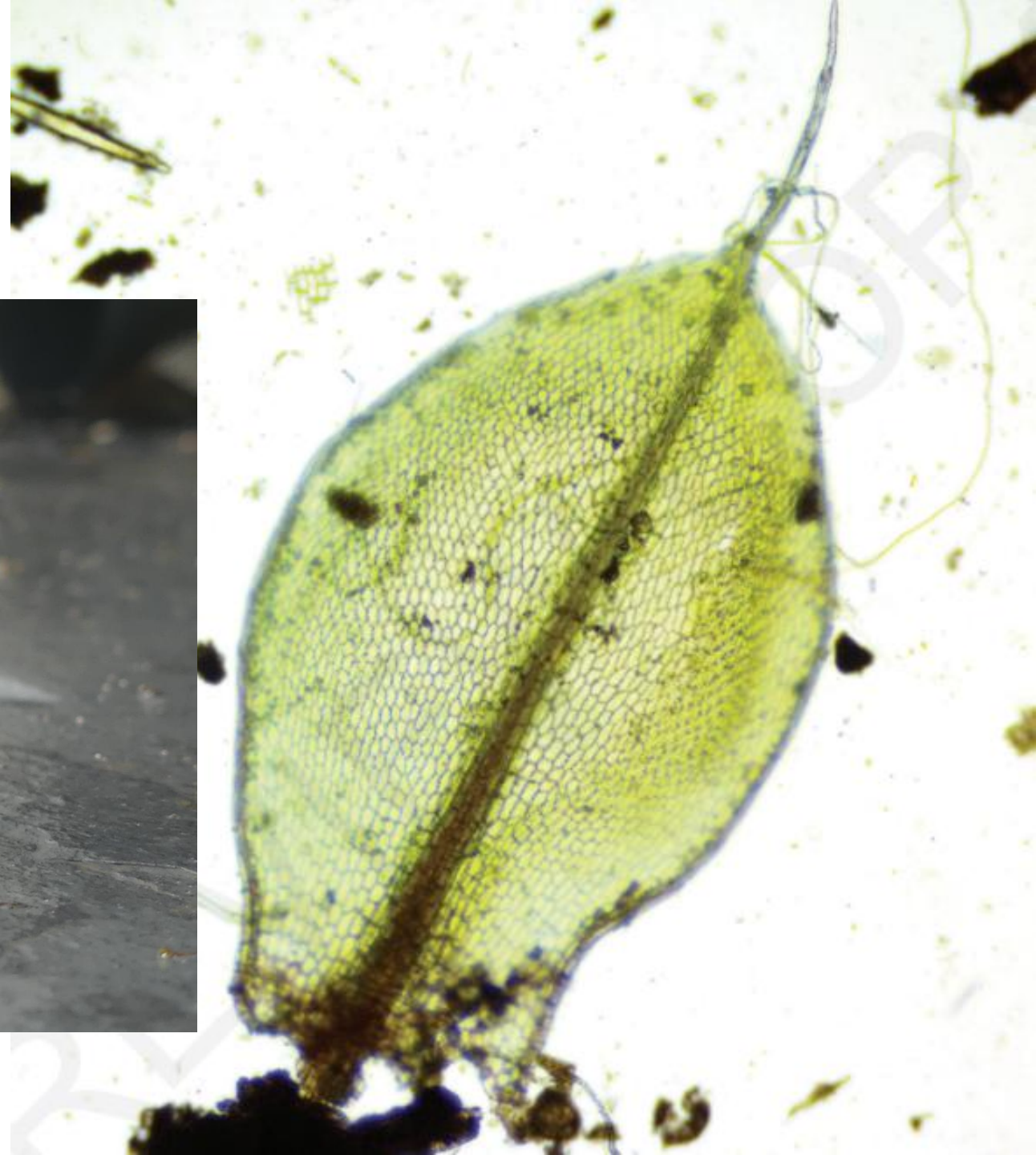
Interviewed by
Dr. Stefan Lukatski

124 | November/December

Interviews

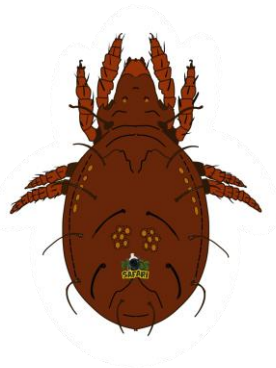


Moss: the terrain

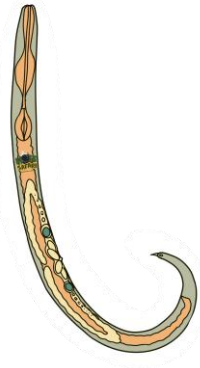


The microscopic Big Five

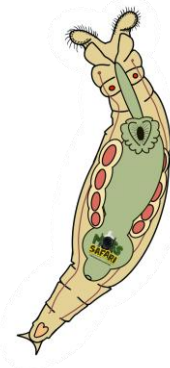
Oribatid mite



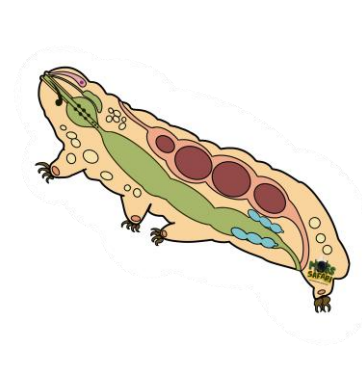
Nematode



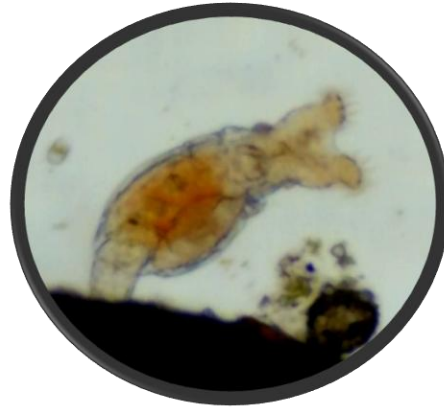
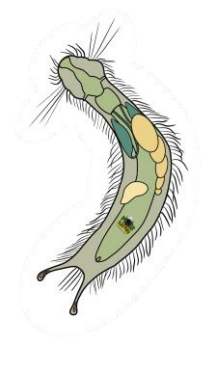
Rotifer



Tardigrade



Gastrotrich













Microscopic Big Five Identification

Doing your Moss Safari: Identification (Beginner)

The microscopic Big Five at 40x

Look through your microscope at magnification 40x. Read the descriptions carefully and look at the pictures to identify the animal you have found.

		<p>Mites</p> <p>Look for:</p> <ul style="list-style-type: none"> A dark pear shaped body 8 legs with hooks on the end Long hairs on the body and legs 	SEEN
		<p>Nematodes (thread worms)</p> <p>Look for:</p> <ul style="list-style-type: none"> A long worm Pointed head end A see through body with darker patches 	SEEN
		<p>Rotifers (wheel animals)</p> <p>Look for:</p> <ul style="list-style-type: none"> A crawling worm-shaped Sometimes two open 'wheel organs' Two toes at the end of the body 	SEEN
		<p>Tardigrades (water bears)</p> <p>Look for:</p> <ul style="list-style-type: none"> A sausage-shaped body 8 short legs with claws A pointed 'snout' shaped mouth 	SEEN
		<p>Gastrotrichs (hairy bellies)</p> <p>Look for:</p> <ul style="list-style-type: none"> A hairy flat worm A forked tail Fast and graceful swimming 	SEEN

Find out more at www.mosssafari.com











© 2025 A. Chandler-Grevatt / Moss Safari. This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License (CC BY-NC 4.0). Schools, universities, and educators are welcome to use, copy, and adapt this content for teaching and learning acknowledging the original source. Commercial reproduction or distribution is not permitted without permission. More information: www.mosssafari.com.

Connect with nature | Promote microscopy | Inspire STEM

Doing your Moss Safari: Identification (Intermediate)

The microscopic Big Five at 40x

These five multicellular organisms are commonly found in moss. Read the descriptions carefully and look at the pictures to identify the animal you have found. Images are not to scale.

		<p>Mites</p> <p>Look for:</p> <ul style="list-style-type: none"> A dark pear-shaped body 8 legs with hooks on the end Long hairs on the body and legs Legs can be moving or tucked away 	SEEN Length range: 0.4-1.0 mm
		<p>Nematodes (thread worms)</p> <p>Look for:</p> <ul style="list-style-type: none"> A long worm Pointed head end See-through body with a darker gut Eggs may be seen in the body as ovals 	SEEN Length range: 0.4-1.0 mm
		<p>Rotifers (wheel animals)</p> <p>Look for:</p> <ul style="list-style-type: none"> A crawling worm-shaped Sometimes two 'wheel organs' open Two toes at the end of the body Egg may be seen in body as a dark oval 	SEEN Length range: 0.2-0.6 mm
		<p>Tardigrades (water bears)</p> <p>Look for:</p> <ul style="list-style-type: none"> A sausage-shaped body 8 stubby legs with claws A pointed snout-shaped mouth Maybe two red or black eye spots 	SEEN Length range: 0.4-0.8 mm
		<p>Gastrotrichs (hairy bellies)</p> <p>Look for:</p> <ul style="list-style-type: none"> A hairy flat worm A forked tail Long 'whiskers' from head Fast and darting when swimming 	SEEN Length range: 0.2-0.4 mm

Find out more at www.mosssafari.com











© 2025 A. Chandler-Grevatt / Moss Safari. This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License (CC BY-NC 4.0). Schools, universities, and educators are welcome to use, copy, and adapt this content for teaching and learning acknowledging the original source. Commercial reproduction or distribution is not permitted without permission. More information: www.mosssafari.com.

Connect with nature | Promote microscopy | Inspire STEM

Doing your Moss Safari: Identification (Advanced)

The microscopic Big Five at 40x

These five multicellular organisms are commonly found in moss. Images are not to scale. This is a starting point. For genus and species, specialised keys are required.

		<p>Oribatid Mites (Phylum: Arthropoda)</p> <p>Look for:</p> <ul style="list-style-type: none"> A dark pear-shaped body and head 8 legs with hooks on the end Long and short hairs arranged on the body and legs Exoskeleton is brown, orange or red in colour 	Length range: 400 µm - 1.0 mm
		<p>Nematodes (Phylum: Nematoda)</p> <p>Look for:</p> <ul style="list-style-type: none"> A long worm Pointed head end, tapered tail Mouth, pharynx, digestive system can be visible within the body Darker oval eggs may be seen in adults 	Length range: 400 µm - 1.0 mm
		<p>Rotifers (Phylum: Rotifera)</p> <p>Look for:</p> <ul style="list-style-type: none"> A crawling worm-shape, sometimes contracted into a ball Sometimes two ciliated 'wheel organs' open Body is in pseudo-segments, with two toes at the end Body often has a pink or red colouration 	Length range: 400 µm - 600 µm
		<p>Tardigrades (Phylum: Tardigrada)</p> <p>Look for:</p> <ul style="list-style-type: none"> A soft, four segmented body 4 pairs of short legs with claws A pointed mouth, buccal pharyngeal apparatus visible inside Some types are red and ornamented 	Length range: 400 µm - 800 µm
		<p>Gastrotrichs (Phylum: Gastrotricha)</p> <p>Look for:</p> <ul style="list-style-type: none"> A flat worm covered in cilia A distinctive forked tail Fast and darting when swimming Cilia are longer around mouth and head 	Length range: 200 µm - 400 µm

Find out more at www.mosssafari.com

Images from: A. Chandler-Grevatt (2023) *Moss Safari. Exploring the secret life in moss.* Pelagic Publishing

© 2025 A. Chandler-Grevatt / Moss Safari. This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License (CC BY-NC 4.0). Schools, universities, and educators are welcome to use, copy, and adapt this content for teaching and learning acknowledging the original source. Commercial reproduction or distribution is not permitted without permission. More information: www.mosssafari.com. Gastrotrich photo credit: David McCarney

Connect with nature | Promote microscopy | Inspire STEM

<https://mosssafari.com/resources/>

Equipment for Moss Safari

Microscope

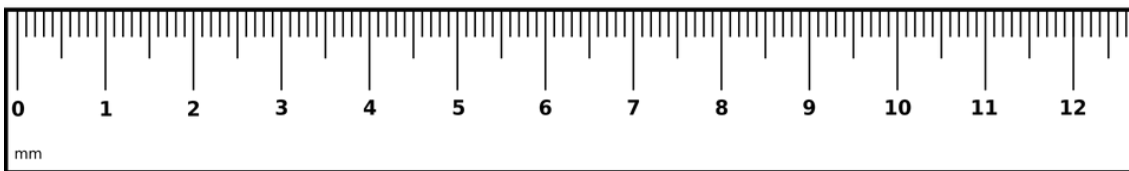
Magnifies objects too small to see with the naked eye.

Magnification x 40 and x 100

Everything we see will be less than 1 mm

x 40 field of view on screen < 1 mm

1000 micrometres in 1 millimetre



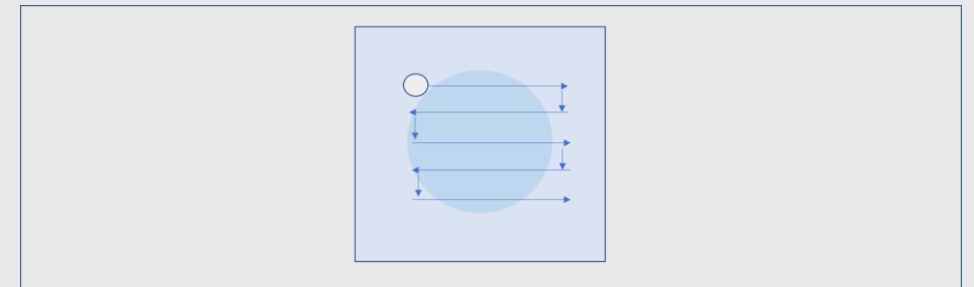
Moss Safari: The expedition and route

Expedition information:

- We will stop at interesting animals or plants.
- We do not chase the wildlife!
- Magnification x 40 (sometimes x 100).
- Focussing takes time.
- No guarantee we will see any of the Big Five, but we will see interesting things.
- I'm always learning...

(Wash your hands afterwards if you do this yourself)

2-3 drops of water from moss





Zig zag spotlight across a 15 mm well













Let's go on a
Moss Safari



Reflections and Questions

- Which of the Big Five did we see?
- What did we learn about their lives, our lives and life itself?
- What did you learn about moss?
- Has your view of the natural world changed? How?




 Doing your Moss Safari: Identification (Intermediate) 
The microscopic Big Five at 40x

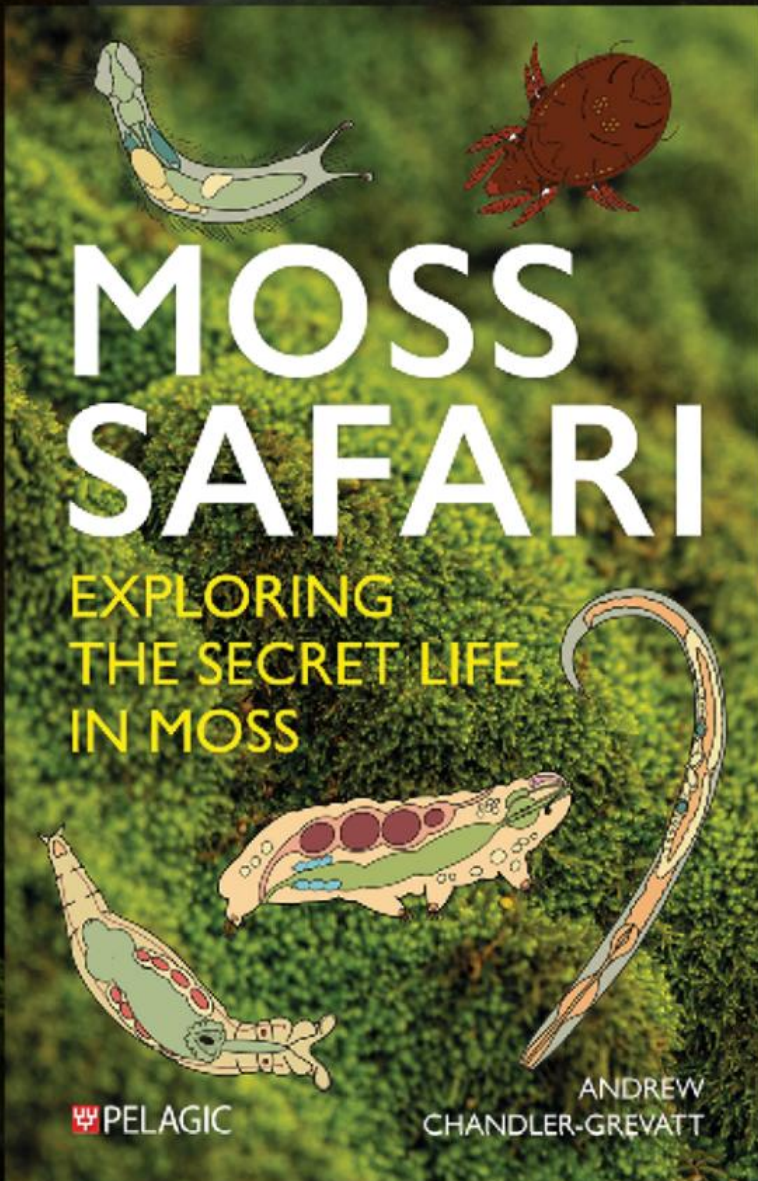
These five multicellular organisms are commonly found in moss. Read the descriptions carefully and look at the pictures to identify the animal you have found. Images are not to scale.

		<p>Mites Look for:</p> <ul style="list-style-type: none">• A dark pear-shaped body• 8 legs with hooks on the end• Long hairs on the body and legs• Legs can be moving or tucked away	<p><input checked="" type="checkbox"/> SEEN</p> <p>Length range 0.4-1.0 mm</p>
		<p>Nematodes (thread worms) Look for:</p> <ul style="list-style-type: none">• A long worm• Pointed head end• See-through body with a darker gut• Eggs may be seen in the body as ovals	<p><input checked="" type="checkbox"/> SEEN</p> <p>Length range 0.4-1.0 mm</p>
		<p>Rotifers (wheel animals) Look for:</p> <ul style="list-style-type: none">• A crawling worm-shaped• Sometimes two 'wheel organs' open• Two toes at the end of the body• Egg may be seen in body as a dark oval	<p><input checked="" type="checkbox"/> SEEN</p> <p>Length range 0.2-0.6 mm</p>
		<p>Tardigrades (water bears) Look for:</p> <ul style="list-style-type: none">• A sausage-shaped body• 8 stubby legs with claws• A pointed snout-shaped mouth• Maybe two red or black eye spots	<p><input checked="" type="checkbox"/> SEEN</p> <p>Length range 0.4-0.8 mm</p>
		<p>Gastrotrichs (hairy bellies) Look for:</p> <ul style="list-style-type: none">• A hairy flat worm• A forked tail• Long 'whiskers' from head• Fast and darting when swimming	<p><input checked="" type="checkbox"/> SEEN</p> <p>Length range 0.2-0.4 mm</p>

 Find out more at www.mosssafari.com 

© 2025 A. Chandler-Grevett / Moss Safari. This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License [CC BY-NC 4.0]. Schools, universities, and educators are welcome to use, copy, and adapt this content for teaching and learning acknowledging the original source. Commercial reproduction or distribution is not permitted without permission. More information: www.mosssafari.com.

 Connect with nature  Promote microscopy  Inspire STEM



Signed + free stickers available from:
<https://ko-fi.com/mossafari/shop>
 Pelagic Publishing – new stock very soon
 (Code MOSS25 for 25% off)
<https://pelagicpublishing.com/products/moss-safari>

 Connect with nature

 Promote microscopy

 Inspire STEM



Thank you

Dr. Andy Chandler-Grevatt

www.mosssafari.com

Moss Safari: What Next?

Share the secret

Word of mouth

'Have you seen this?'

Subscribe free

www.mosssafari.com

Social media

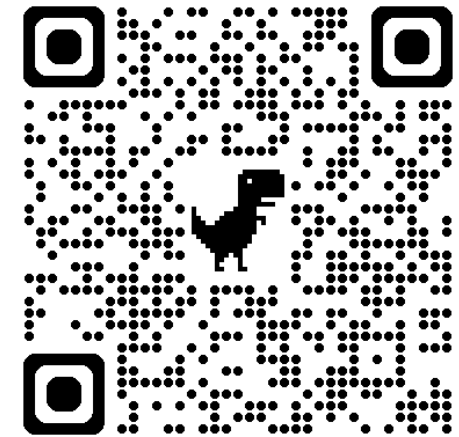
Shares, comments, likes,
pictures

**Recommend to schools,
clubs, team building**

Get the book!



Contact me



www.mosssafari.com

Dr Andy Chandler-Grevatt

a.chandlergrevatt@brighton.ac.uk



Connect with nature

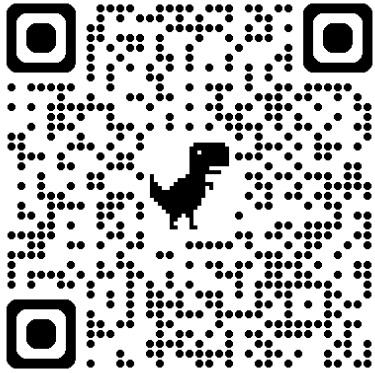


Promote microscopy



Inspire STEM

Support the work of Moss Safari



Moss Safari Tardigrade Pins

£5 each

Buy all 4 and get 20% off with code 20LIN
(£16 for all four plus P&P)

<https://ko-fi.com/mosssafari/link/20LIN>

Moss Safari stickers and badge



Get your Moss Safari Merchandise

- Moss Safari Waterbear vinyl sticker sheet (A5)
- Moss Safari Big Five vinyl sticker sheet (A5)
- Moss Safari Button Badge (25 mm)

Moss Safari Merch Bundle – all 3 – value pack



Discovering Mosses Is that a moss?



- Connect with nature
- Promote microscopy
- Inspire STEM

What is a moss?

Do you know what mosses look like? Use this guide to help you identify mosses and other bryophytes.



Mosses are plants in the group Bryophytes, along with liverworts and hornworts.

Key visual characteristics

- Grow in clumps
- No flowers, seed or fruit
- Shoots with spirally arranged leaves
- Leaves have no central "nerve"
- No roots, instead fine brownish thread-like structures called rhizoids
- Texture: soft, velvety

Where to find mosses

Shady, damp places. Mosses grow in towns and in the countryside in sunny or shady places.



Discovering Mosses How does moss grow?



- Connect with nature
- Promote microscopy
- Inspire STEM

You know what a moss is, but which type of moss is it? This step-by-step guide helps you identify them.

Have you ever noticed moss growing in a certain place? Describe the moss and the same words you use for other mosses and ferns.



It is almost always in nature's cracks.

In fact, these are the first steps we use to identify mosses and other bryophytes. Mosses have growth cushions.



Discovering Mosses Where does moss grow?



- Connect with nature
- Promote microscopy
- Inspire STEM

Use this guide to moss spotting in your local area.

Mosses are small plants that can grow in the cracks, so look carefully.

Use a magnifying glass or a smartphone to take photos.



Take part and share your moss photos on social media.

Use hashtag #iseemoss and tag @mossafari.



Discovering Mosses Some urban mosses

Spotting and identifying urban mosses



Look around your local area to find mosses growing on walls, tree trunks, pavement cracks and around drain covers.

Look for growth forms, leaf shape, thickness, colour and the shapes of any capsules.

As these two pictures show, often more than one type of moss grows in the same space.



Pleurocarpous (mats)

Take part and share

Share your moss photos on social media.

Use hashtag #iseemoss and tag @mossafari.



Silky Wall Feather-moss

Homalothecium senecium



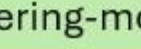
Shiny golden-green mats on walls or tree bark. Flattened, feather-like shoots. Leaves pressed close, giving a silky sheen.

Rough-stalk Feather-moss

Brachythecium rutabulum



Glossy green to yellow-green on soil, walls, or tree bark. Irregular feathery branching. Curved overlapping leaves give a rough look.



© 2023 A. Chandler-Greaves / Moss Safari. This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License. Commercial reproduction or distribution is not permitted without permission. More information: www.mossafari.com. Moss diagram from A. Chandler-Greaves (2020) Moss Safari: Explore the secret life of moss. Pelagic Publishing.

Learn about mosses around you Seven Free Infographics



Discovering Mosses Moss specimen record sheet

Step 1
What you see with the naked eye

Date: _____
Environment: _____
Name: _____
Coordinates: _____
Face: _____

Step 2
Close-up with phone camera or hand lens

Zoom in on stems, leaves, and capsules:
Gametophyte
Leaf shape: _____
Leaf size: (<1 mm), (1-3 mm), (>3 mm).
Nerve (midrib): _____
Leaf edge: _____

Step 3
Hand lens detail or microscope

Look for fine details that separate similar species:
Name: _____
Date: _____
Face: _____

Draw (microscope): _____

Connect with nature
Promote microscopy
Inspire STEM



Discovering Mosses What is a moss plant like?



- Connect with nature
- Promote microscopy
- Inspire STEM

Get down and close to moss plants

Mosses are small, simple plants that don't have true roots, stems, or leaves, but they do have structures that look and act like them.

General appearance

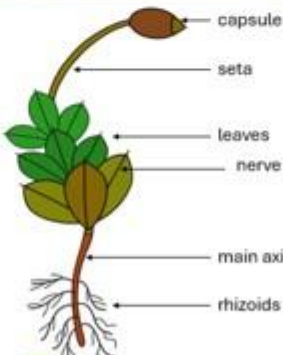
- Grows in clumps in dense tufts, cushions, or carpets (not usually as single plants).
- Small, green, leafy shoots
- Soft, velvety, or sponge-like texture to the touch
- Colours: mostly green, but also yellow-green, dark green, brown, or reddish.

No flowers, fruits, or seeds. Instead a sporophyte made up of thin stalk (seta) with a capsule (spore case).

No leaves. Instead, leaf-like structures with a "nerve" support.

No roots. Instead rhizoids which are fine, brownish, thread-like filaments.

Simple diagram of a moss stem



Try this

- Use a hand lens or phone macro lens to see the growth form clearly.
- Tease out one small moss shoot and identify each part.

Parts of a moss plant: names and purpose

Sporophyte (the spore producing part)
Made up of a stalk (**seta**) and spore case (capsule). When the capsule dries out, it releases spores into the air. The spores grow into new moss plants.

Gametophyte (the main plant you see)
Made up of the stalk (**main axis**), leaves and roots (**rhizoids**). The **rhizoids** anchor the moss to the surface. The main axis supports the plant. The leaves make food by photosynthesis and are supported by the **nerve**. Leaves are often just one cell thick.

Take part and share

Share your moss photos on social media. Use hashtag #iseemoss.

www.mossafari.com



**NEW
FREE
RESOURCES**

<https://mossafari.com/discovering-mosses/>



© 2023 A. Chandler-Greaves / Moss Safari. This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License. Commercial reproduction or distribution is not permitted without permission. More information: www.mossafari.com. Moss diagram from A. Chandler-Greaves (2020) Moss Safari: Explore the secret life of moss. Pelagic Publishing.