

# VEGETATIVE MULTIPLICATION IN *THAMNOLIA VERMICULARIS* (SW.) SCHAER

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As indicated in speciality literature *Thamnolia vermicularis* (Sw.) Schaer does not produce apothecia and multiplies exclusively vegetative; this prompted us to uncover the mechanism of this way of multiplication. We observed that the propagules involved in multiplication detach themselves in the shape of strips, due to the previous formation of a separation zone. We also observed that the thallus lobes are not hollow as asserted in the speciality literature, but contain a lax pseudodiaphragmatic plectenchyma, serving the same purpose as the diaphragmatic tissue in aeriferous canals of aquatic plants. Research will be continued.

*Key words:* *Thamnolia vermicularis*, photobiont, apothecium, pseudodiaphragmatic prosoplectenchyma, zone of separation, propagules.

## INTRODUCTION

*Thamnolia vermicularis* (Sw.) Schaer (Fig. 1) was part of the *Usneaceae* family; at present it is integrated in *Icmadophilaceae* family. Morphologically it has a conical fruticose thallus, which is weakly branched, excepting some specimens branching in certain periods of the year for vegetative multiplication.

The photobiont is represented by a species of the genus *Trebouxia* of the *Chlorococcaceae* family. In Romania *Thamnolia vermicularis* (Sw.) Schaer is found altogether everywhere in the alpine zones of mountain chains. In the Bucegi mountains it grows on stony ground, within the *Nardus stricta* association.

## MATERIAL AND METHOD

For tracking the mode of multiplication in the species mentioned, we used material collected in the Bucegi mountains in different periods of the year. The material was hydrated in the laboratory and sectioned by razor or microtome. Microtome sections (7–12  $\mu\text{m}$ ) were stained with Ehrlich haematoxyline, razor cuttings were stained with blue cotton. Preparations were photographed on a Dokuval microscope.

## RESULTS AND DISCUSSION

The consulted literature asserts that *Thamnolia vermicularis* reproduces exclusively vegetative; till now apothecia were not identified and the mechanism of vegetative reproduction is unknown.

For this reason we chose this species for an investigation. The analysis of preparations and of material revealed that our taxon multiplies by thallus fragmentation.

In consulted works the species is presented as having a fistulous thallus, on our sections we noticed that the interior is occupied by hyphae loosely disposed, which resemble the diaphragmatic tissue of some aquatic plants (Figure 2). Only at complete maturity the thallus becomes fistulous, but merely at the lobe base. The pseudodiaphragmatic prosoplectenchyme serves to prevent the collapse of tubulous lobe and to maintain it in a normal vertical position even at times of maximum humidity.

Multiplication by thallus fragmentation occurs in the shape of longitudinal strips, which are detached at the level of preformed separation zones (Figures 3.1 and 3.2). These strips are formed in a centrifugal order, from the medullar zone towards the upper cortex (Figures 4.1 and 4.2).

Thallus strips are cohesive for a time thanks to the hyphae of the diaphragm mycellium (Figure 5). When these are ruptured strips are freed. We think that the complete separation of strips may be due to the important variations of temperature and humidity in the alpine zone.

#### PRELIMINARY CONCLUSIONS

The species being analysed has adapted itself very well to the extreme conditions at high altitudes; by natural selection the most advantageous mode of reproduction has been chosen.

From the material under research results that the mechanism of vegetative reproduction by thallus fragmentation, not known till now, is not the only mode of reproduction of the species.

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Fig. 1. *Thamnolia vermicularis*.

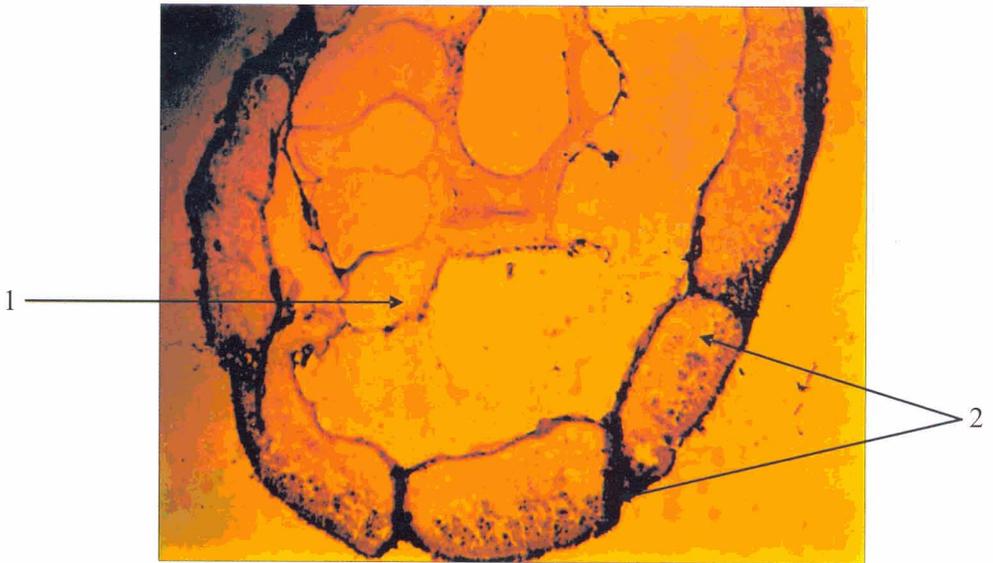


Fig. 2. *Thamnolia vermicularis*: pseudodiafragmatic prosoplectenchyma (1) and the separation zones (2) in transverse section (orig., magnification oc.  $10 \times$  ob. 40).

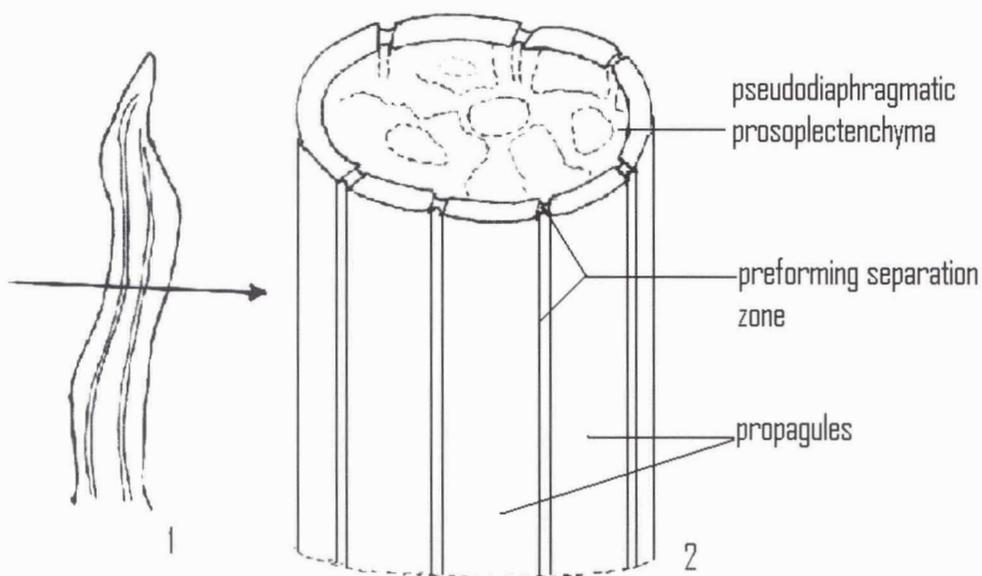
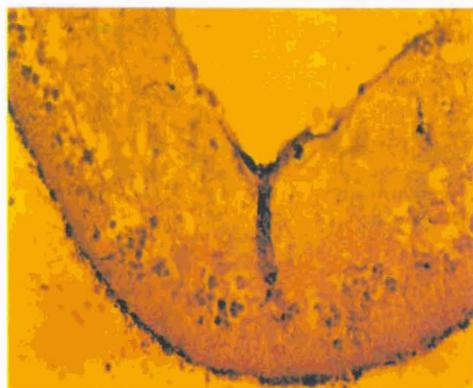
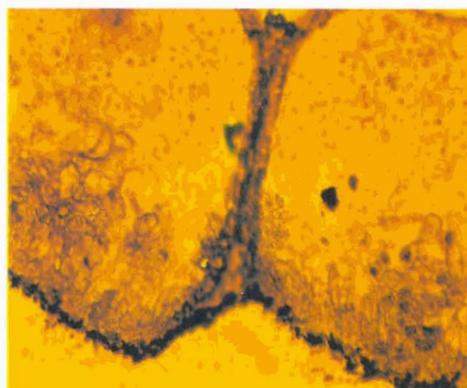


Fig. 3. *Thamnolia vermicularis*: schematic representation of separation zones; 1 – thallus lobe, the arrow shows the sectioning level; 2 – much enlarged transversal and tangential section (orig.).



1



2

Fig. 4. *Thamnolia vermicularis*: sections which show the formation of separation zones; 1 – initial stage of separation wall formation; 2 – finished separation wall (orig., magnification oc. 10 × ob.40).



Fig. 5. *Thamnolia vermicularis*: longitudinal lichen strip, photographed from above (orig., magnification oc. 10 × ob.40).

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