

# THE MYSTERY OF PLANTS

BY NAZEEMA DUARTE



How do plants protect themselves from their enemies?  
Plants have enemies? Indeed. Plants are exposed in the environment to insects and animals and environmental changes like heat or cold. Since a plant cannot run away, it has developed mechanisms to protect itself. Please read more about these mechanisms or "protection methods"

## Trichomes (hairs)

Trichomes are hair like structures which can be made of one cell or multiple cells. A trichome can also be singular\* or branched. The size, form, density\* and location of these hairs can vary greatly between plants as well as different parts of the same plant. Hairs can prevent frost damage in areas where frost can become a problem. Dense iridescent\* hairs can reduce burning and water loss which would protect the plant itself. The hairs could also "trap" water from fog/mist. Depending on the hairs and prey, the hairs acts as a deterrent\* to be eaten.

## Pictures

Fig 12 x/s Leaf. *Hippia frutescens*. A trichome on the epidermis\* (Magnification: 400x)



## Definitions\*

*singular - a single thing*

*density - how concentrated something is*

*iridescent - shiny, glowing, colourful*

*deterrent - to prevent*

*epidermis - the outer layer of the skin*

## Pictures

*Hippia frutescens*



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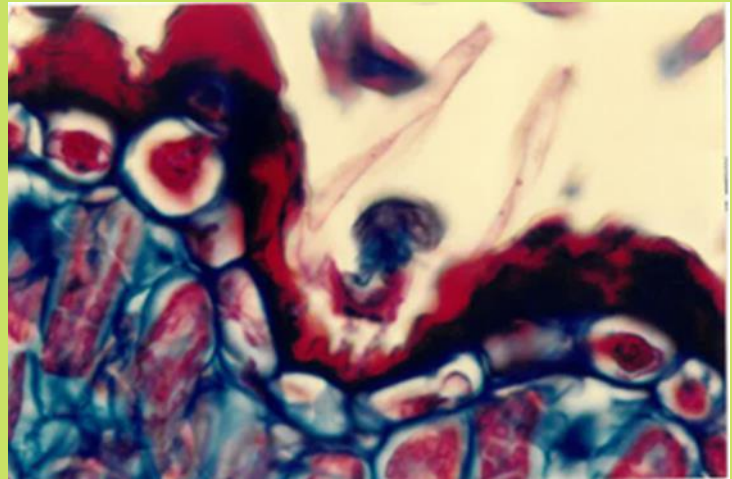
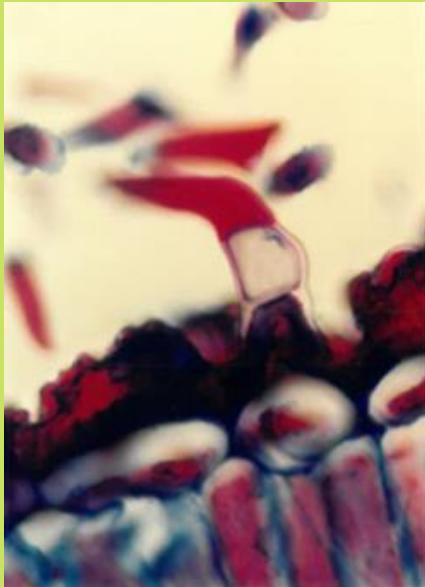
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My studies related to Medical Bioscience, specifically how *Elytropappus rhinocerotis* commonly known as renosterbos/sie and *Pelargonium triste* also known as kaneelbol/kaneeltjie (medicinal plants) can impact the health and metabolism of animals.



## Pictures

Fig 19 x/s Leaf. *Penzia incana*. Trichomes  
(Magnification: 400x)



## Pictures

*Penzia incana*.





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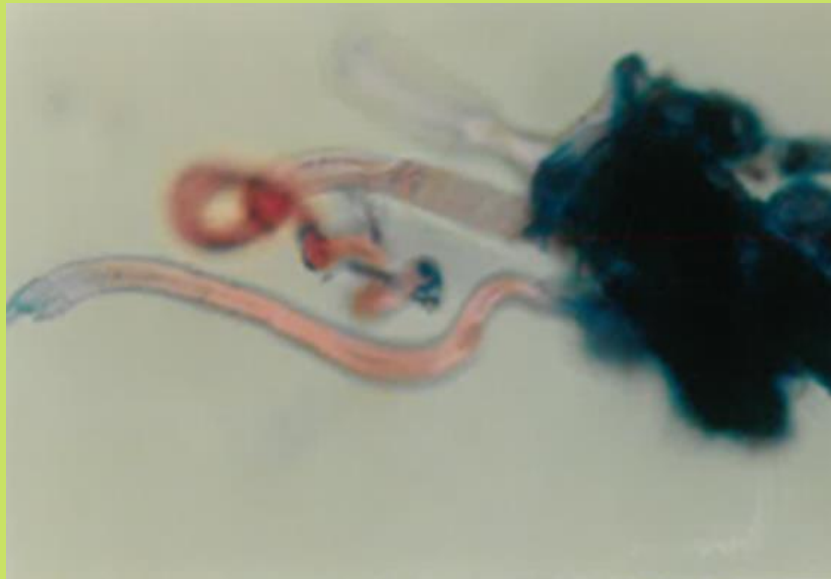
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Environmental stress urges plants to adapt by way of coping or modifying tissue types or cells to accommodate external pressures. Cells in plants and animals perform specific functions in the organism. For this to happen, sometimes the cells need to change/evolve/modify to perform the specialised function. These specialised cells can indicate what type of speciality the plant has.

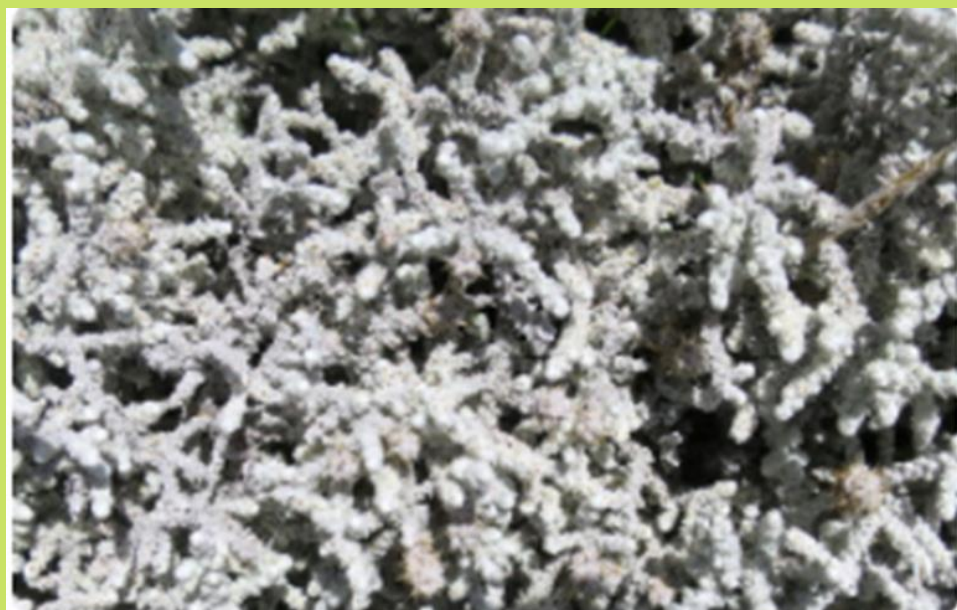
## Pictures

Fig 19 x/s Leaf. *Stoebe plumose*. Trichomes on adaxial surface  
(Magnification: 400x)



## Pictures

*Stoebe plumose*



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## Glands

A gland is a plant structure which secretes\* one or more products. This may be located on leaves and stems and secrete externally or be internal to the plant and secrete into a canal or reservoir\*. The compound\* which is discharged\* through these glands can be a defense mechanism\* to prevent being eaten and infected or to attract insects and animals to assist with its reproduction\*.

## Pictures

Fig 7 x/ls *Elytropappus rhinocerotis*

(Magnification: 400x)



Gland  
Palisade cells  
Sclereids  
Vascular bundle

## Definitions\*

*secretes* - to produce or release a liquid

*reservoir* - a storage place for something, like water

*compound* - something that is made up of several parts

*discharged* - flowing out of liquid

*mechanism* - a system that performs a function

*reproduction* - the process by which living things produce babies

## Pictures

*Elytropappus rhinocerotis*



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## Pictures

Fig 7 x/ls *Osmotopsis astericoides*. Red stained gland  
(Magnification: 400x)



## Pictures

*Osmotopsis astericoides*





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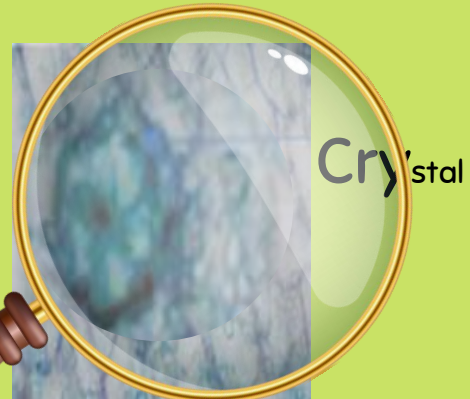
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## Crystals

Crystals can be any shape or may be found in any tissue\* of a cell\*. These crystals can perform multiple\* functions within the plant. These functions being to regulate\* the type of mineral\* found in the plant, the refraction\* of light or it can be a defense mechanism to prevent predation\*.

## Pictures

Fig 2D: Crystal.  
(Magnification: 400x)



## Definitions\*

*tissue - distinct types of material of which animals or plants are made*

*cell - the smallest unit in the body that can live on its own*

*multiple - having more than one*

*regulate - to control something so that it operates properly*

*mineral - naturally occurring chemical compounds*

*refraction - the change in direction of light as it moves*

*predation - the killing by one living organism of another for food*

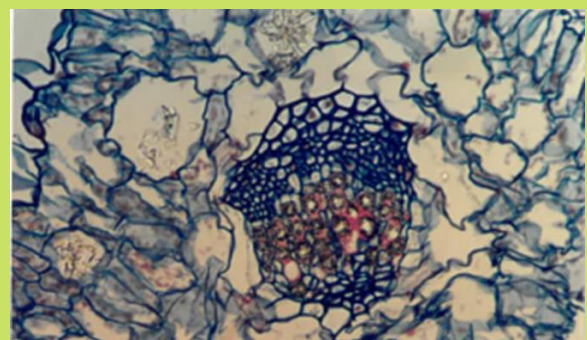
*vascular - consisting of a vessel or vessels to carry substances like blood*

## Pictures

*Galenia africana*




Fig 26 x/s Leaf. *Galenia africana*. Vascular\* bundle  
(Magnification: 400x)



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Take a good look at a plant next time,  
and try to imagine how it needs to survive in nature  
by using nothing else but its own structure to fight the elements

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and try to imagine how it needs to survive in nature  
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