SYNERGIE SKIN
CLEAN SCIENCE

CLINICAL DATA – POLYGONUM AVICULARE EXTRACT

Polygonum Aviculare Extract

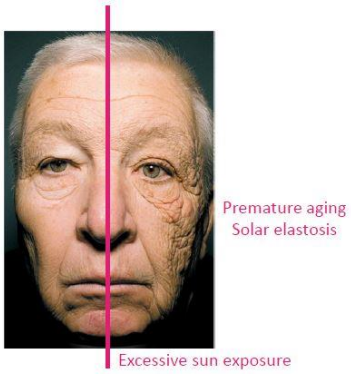
- Knotgrass extract
- For a total bio-protection against sun damage and premature ageing
- Thermal ageing protection
- Inhibition of Cathepsin G Activity
- *In vivo* skin firmness and elasticity enhancement
- Clinical results on wrinkle reduction of sun exposed volunteers.

Causes of skin ageing

- Intrinsic ageing/chronological ageing is an inevitable and continuous process (biological clock of skin cells).
- Extrinsic ageing is factored by outside influences pollution, smoking, sun (photo-ageing) -> premature skin ageing

69 year old truck drive with strong case of photo-ageing. In the 28 years he spent driving trucks, the man's face received far more sunlight on the left side with the sun streaming in through the driver's side window.

Sun exposure is responsible for 90% of premature skin ageing.



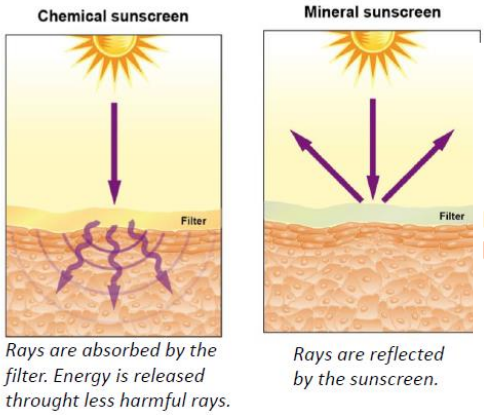
Sun: friend or enemy?

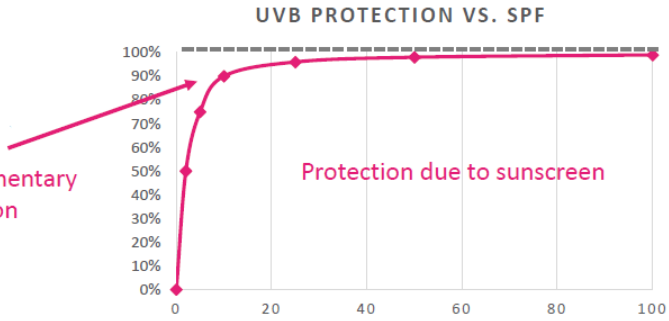
- Sun is needed
  - Source of energy for life
  - Provides essential Vitamin D (Indispensable for bone growth and calcium absorption)
  - Stimulates endorphin production (happiness and euphoria feelings)
- Dangers of sun over exposure
  - Sun burns
  - Premature ageing/solar elastosis? (photo-ageing)
  - Pigmentation irregularities/hyperpigmentation
  - Melanomes/skin cancer

How to benefit from the sun without its negative effects?

Sun protection in cosmetic products

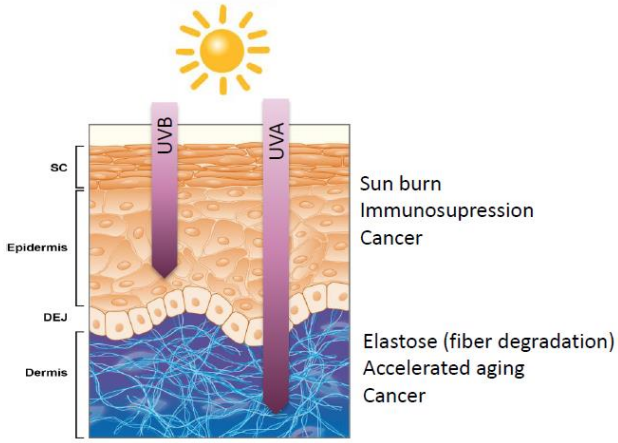
- Classical protection against UV: chemical filters or physical filters (mineral filters) to stop rays at the surface of the skin (efficacy dependent on SPF but never reaches 100%)
- Complementary action with a biological cell protection for DNA, mitochondria, fibres, to counteract rays which have passed through the sunscreens and reached the skin.





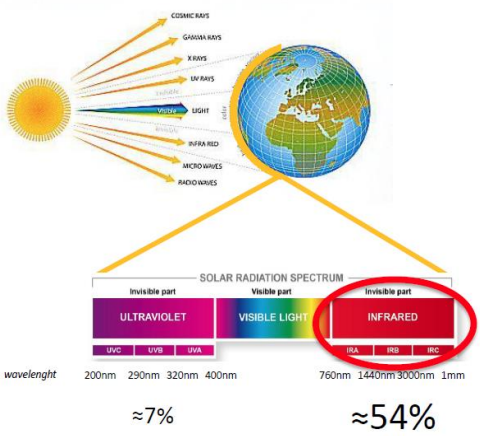
What is well known about photo-ageing?

- For many years, photo-ageing was attributed only to UV.
- UVC are stopped by ozone layer
- UVB penetrates epidermis and UVA reaches dermis.



Solar radiation

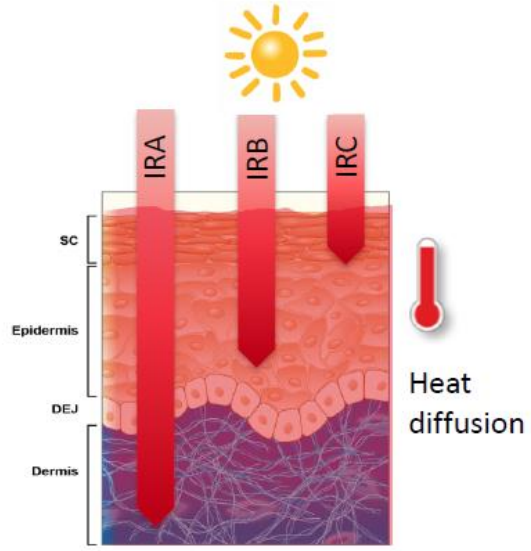
- Starting 150 million kilometres (93 million miles) away, solar electromagnetic radiation reaches Earth after atmosphere filtration.



Breakthrough approach of photo-ageing

Recent studies describe that infrared (IR) rays are also involved in photo-ageing.

- IRA penetrate epidermal and dermal layers. IRB and IRC are absorbed only by epidermal layers.
- Direct action of IR rays
- Indirect action of IR Rays due to the conversion of absorbed IR into heat = thermal ageing.

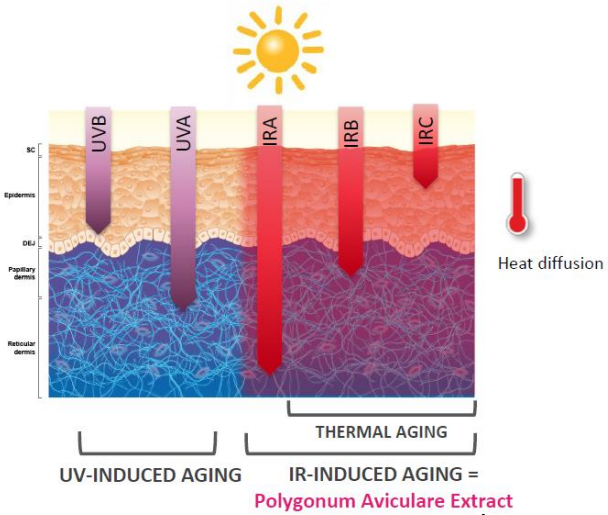


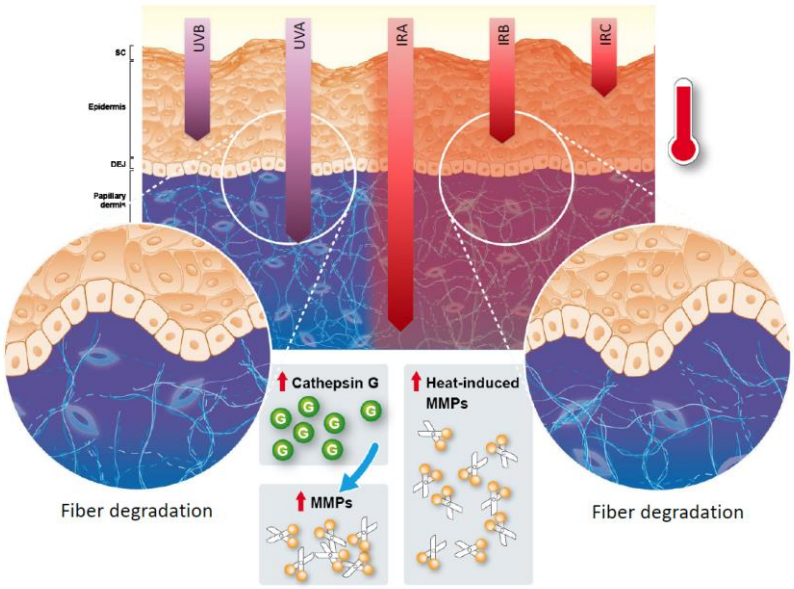
IR-induced skin damage

- Many scientific articles have been published since 2008 describing:
  - Up-regulation of matrix MMP-1. MMP-3
  - Formation of ROS
  - Modulation of tropoelastin expression
  - Degradation of collagen & Elastic fibres
  - Solar elastosis

IR induce all the signs for premature ageing.

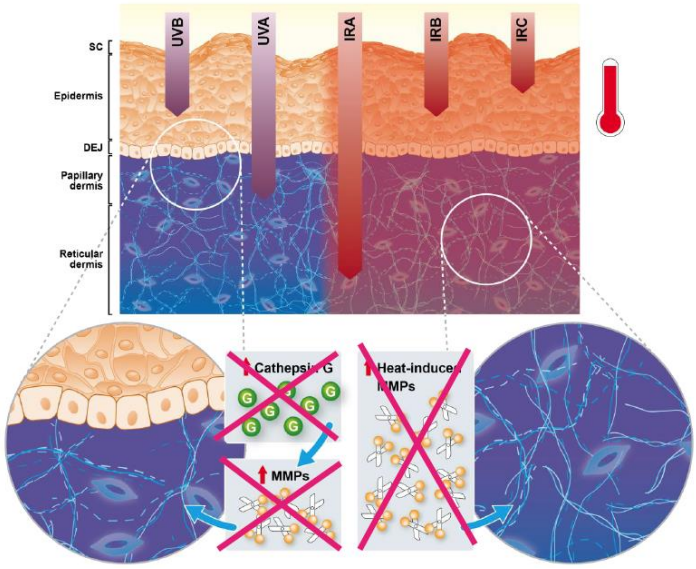
Photo-ageing = UV-induced ageing + Polygonum Aviculare Extract & Thermal ageing.





Polygonum Aviculare Extract, new and global approach to fight photo-ageing.

1. Decrease in wrinkles
2. Elasticity and firmness enhancement
3. Protection of elastic fibres
4. Decrease UV-, IR- & heat-induced MMP production
5. Cathepsin G inhibition.

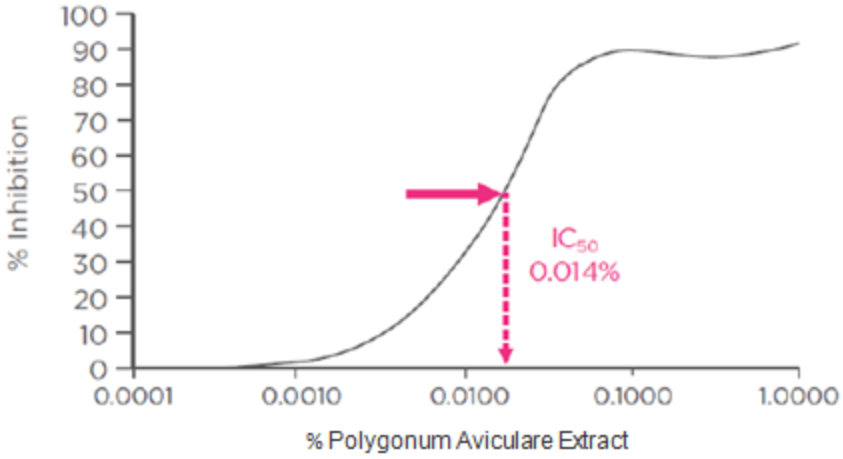


- Knotgrass extract rich in flavonoids
- Plant used in phytotherapy and Chinese medicine for lowering blood pressure, anti-rheumatic, and hypoglycaemic agent, treatment of intestinal discomfort.

***In vitro –Ex vivo* studies**

1. Inhibition of Cathepsin G activity
2. Decrease in UV-, IR-and heat-induced MMP-1 production
3. Protection of papillary dermis & reticular dermis.

Inhibition of Cathepsin G Activity



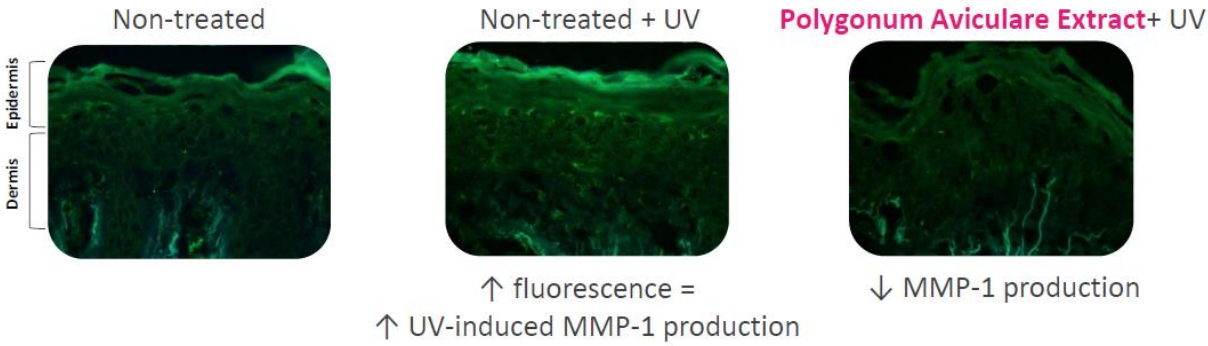
IC_{50} = concentration needed to inhibit 50% of the enzyme activity.

Polygonum Aviculare Extract strongly inhibits Cathepsin G activity.

Decrease in UV-induced MMP-1 on skin explants

Protocol

- A solution with 2% Polygonum Aviculare Extract was applied daily on skin explants vs. untreated.
- At D5, irradiation by UV (29J/cm² UVA+2J/cm² UVB)
- At D6 (1 day after irradiation), immunostaining of MMP-1, image analysis by an expert.

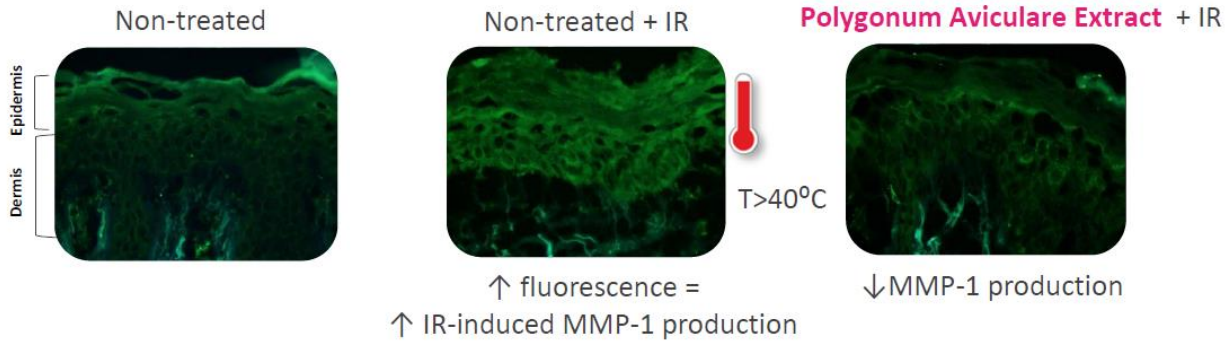


Polygonum Aviculare Extract reduces UV-induced MMP-1 production.

Decrease in IR-induced MMP-1 on skin explants

Protocol

- A solution with 2% Polygonum Aviculare Extract was applied daily on skin explants vs. untreated.
- At D5, irradiation by IRA (720J/cm²)
- At D6 (1 day after irradiation), immunostaining of MMP-1, image analysis by an expert.

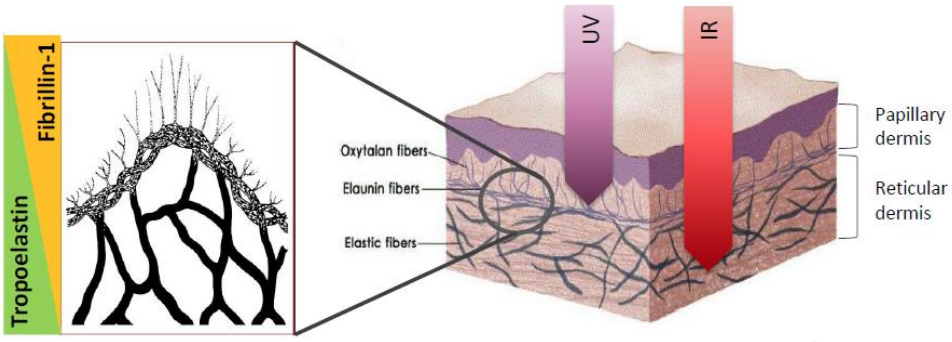


Polygonum Aviculare Extract reduces IR-induced MMP-1 production.

Why skin loses its elasticity after repeated sun exposure?

Skin elasticity is due to 3 types of elastic fibres constituted of tropoelastin (protein) and fibrillin-1 (glycoprotein) in different proportions:

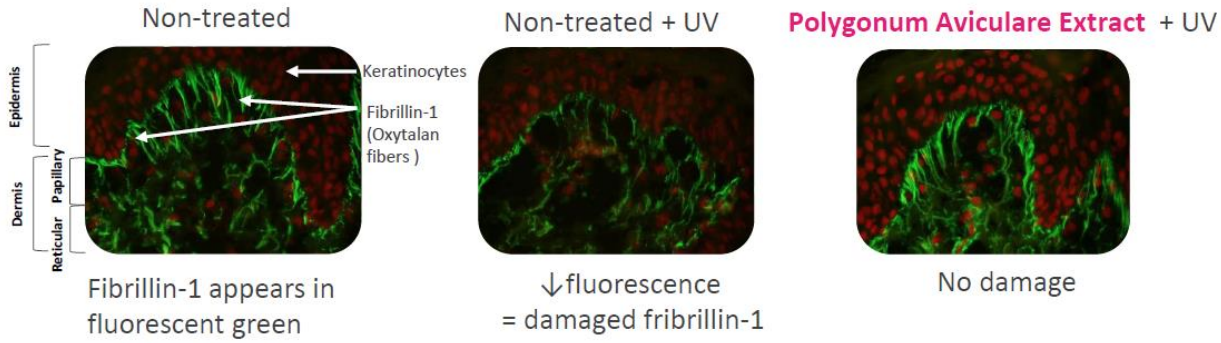
- Oxytalan fibres vertically located in the papillary dermis (up dermis)
- Elaunin fibres form a parallel network to DJE and assure the junction between papillar dermis and reticular dermis (low dermis)
- Mature elastic fibres located in reticular dermis.



Papillary dermis protection on skin explants

Protocol

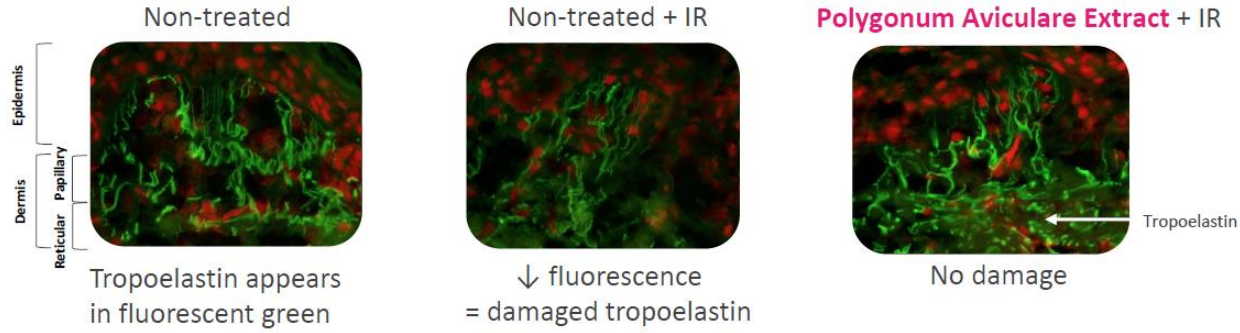
- A solution with 2% Polygonum Aviculare Extract was applied daily on skin explants vs. untreated.
- At D5, irradiation by UV (29J/cm^2 UVA+2J/cm^2 UVB)
- At D6 (1 day after irradiation), immunostaining of fibrillin-1, image analysis by an expert.



Polygonum Aviculare Extract protects papillary dermis integrity from UV damage with a fast action to preserve a better skin elasticity.

Reticular dermis protection on skin explants
Protocol

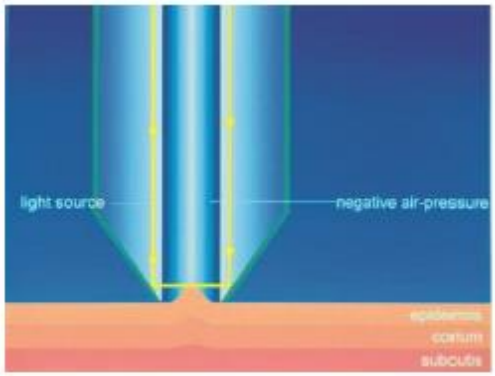
- A solution with 2% Polygonum Aviculare Extract was applied daily on skin explants vs. untreated.
- At D5, irradiation by IRA (720J/cm^2)
- At D6 (1 day after irradiation), immunostaining of tropoelastin, image analysis by an expert.



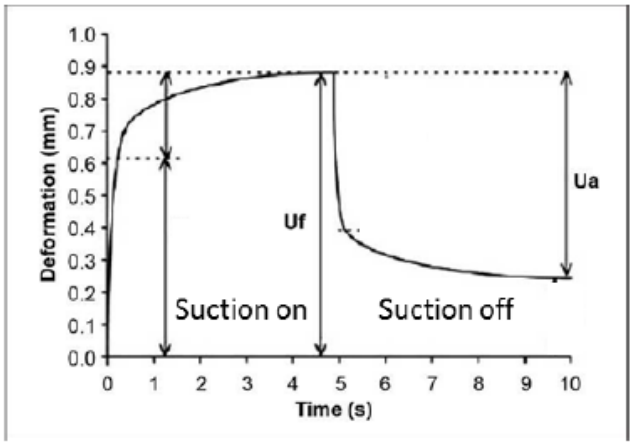
Polygonum Aviculare Extract protects reticular dermis integrity from IR damage to preserve a better skin elasticity.

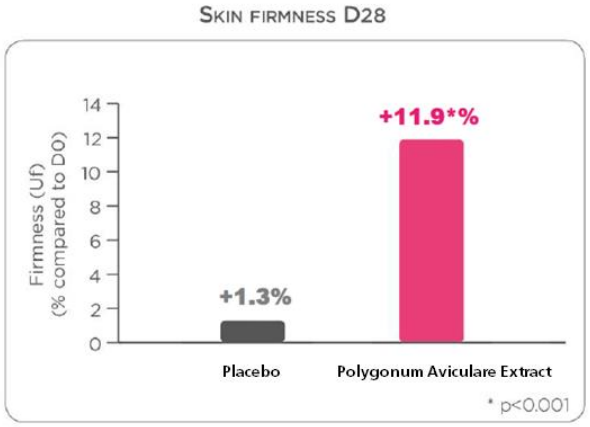
Clinical evaluation of firmness and elasticity
Protocol

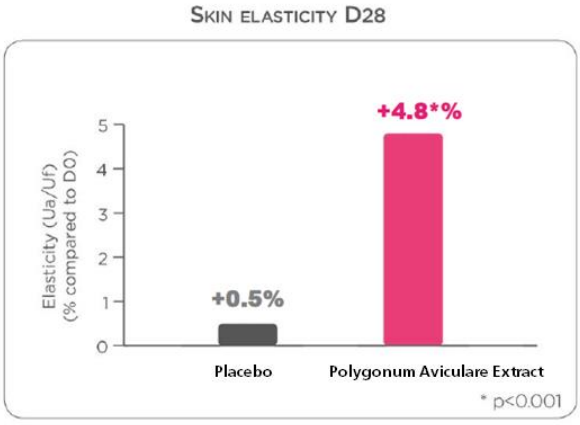
- 20 women (aged between 35 to 65 years) regularly exposed to sun
- Twice daily application on forearm of a cream with 2% Polygonum Aviculare Extract vs. a placebo during 28 days (no sunscreen used)
- Test done during high summer season = high sun exposure.
- Skin firmness and elasticity were measured by Cutometer.
    - Firmness = resistance of the skin to the suction = Uf
    - Elasticity – ability to return into its original position = Ua/Uf



Suction





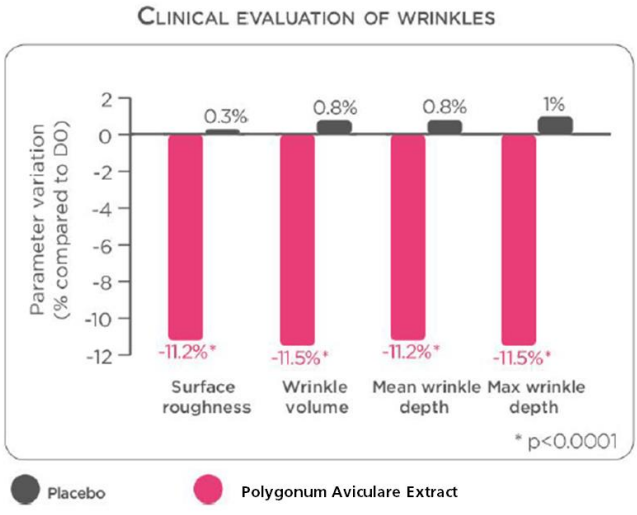


Polygonum Aviculare Extract increases skin firmness and elasticity limiting sun damages.

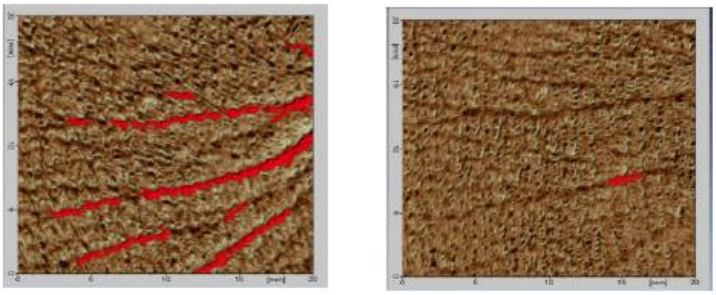
Clinical evaluation of wrinkles

Protocol

- 20 women (aged between 35 to 65 years) regularly exposed to sun.
- Twice daily application of a cream with 2 % Polygonum Aviculare Extract on split-face versus a placebo during 28 days (no sunscreen used)
- Test done during high summer season = high sun exposure.
- Crow's feet wrinkle measurements with DermaTOP-blue (*in vivo* 3D scanner) at D0 and D28.



D0 D28



Roughness	Up to 27.5%
Wrinkle volume	Up to 25.5%
Mean wrinkle depth	Up to 22.7%
Max wrinkle depth	Up to 24.4%

Polygonum Aviculare Extract improves skin surface and wrinkles parameters to provide a youthful appearance.

D0 D28

Volunteer # 150

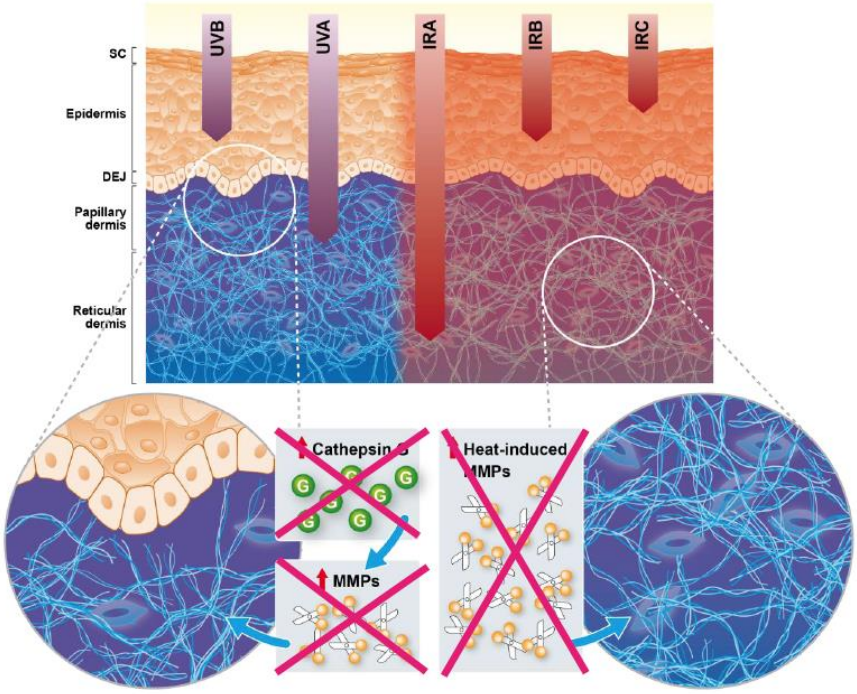
Clear wrinkle reduction.

D0 D28

Volunteer # 144

Visible smoothing effect.

Summary



↓Wrinkles

↑Elasticity & Firmness

↑Tropoelastin & Fibrillin-1

↓MMPs

↓Cathespin G

Features and benefits

FEATURES	BENEFITS
Natural botanical extract	Nature inspired answer for sun care and photo-ageing
Unique anti-ageing mechanism of action via Cathepsin G inhibition	Modulates the origin on sun-induced MMP production
Fights IR-induced ageing and thermal ageing	• New strategy for a global action against visible signs of sun damage and premature ageing • Complementary to classical UV protection
Outstanding results on repeated sun exposed volunteers	• Improvement of firmness and elasticity • Reduction of the appearance of wrinkles