

PROVEN EFFICACY

CLINICAL STUDY 2 - IN VIVO

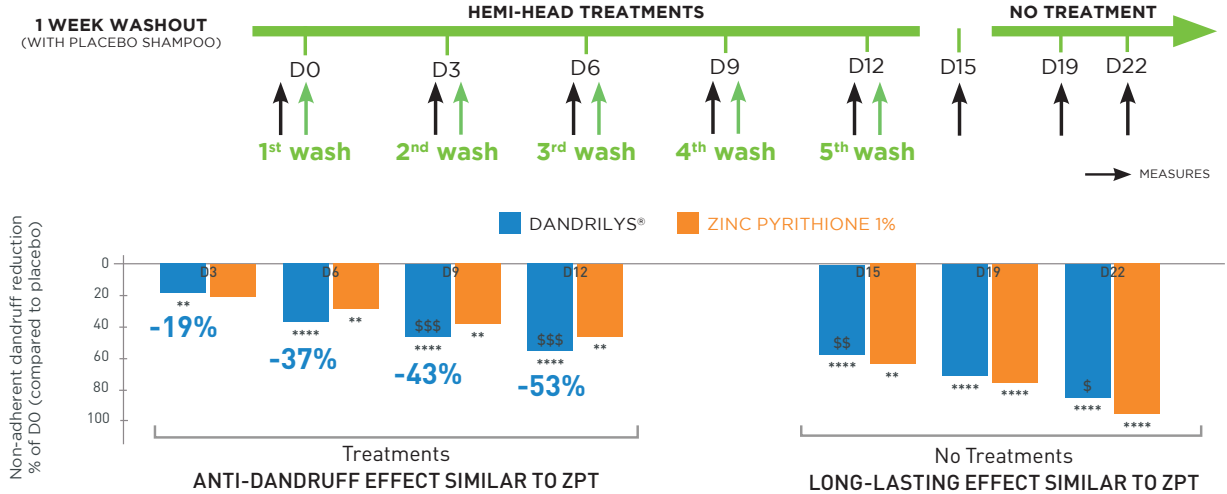
• DANDRILYS®: A SAFE & NATURAL ALTERNATIVE TO ZINC PYRITHIONE

CLINICAL STUDY DESIGN

- > 34 subjects with middle to high level of dandruff (after washout):
- 23 volunteers : Shampoo with DANDRILYS® 1% vs Placebo
- 11 volunteers : Shampoo with DANDRILYS® 1% vs Zinc Pyrithione 1% (anti-dandruff benchmark; ZPT)

EVALUATION PARAMETERS

- > Non-adherent dandruff (expert dermatologist grading; 0-10)
- > Scalp sebum (Sebumeter®)



% DANDRILYS® vs DO, ** p<0.01, **** p<0.0001 vs DO, \$ p<0.05, \$\$ p<0.01, \$\$\$ p<0.001 vs Placebo, No significant difference between DANDRILYS® and ZPT

72H

LONG-LASTING EFFECT

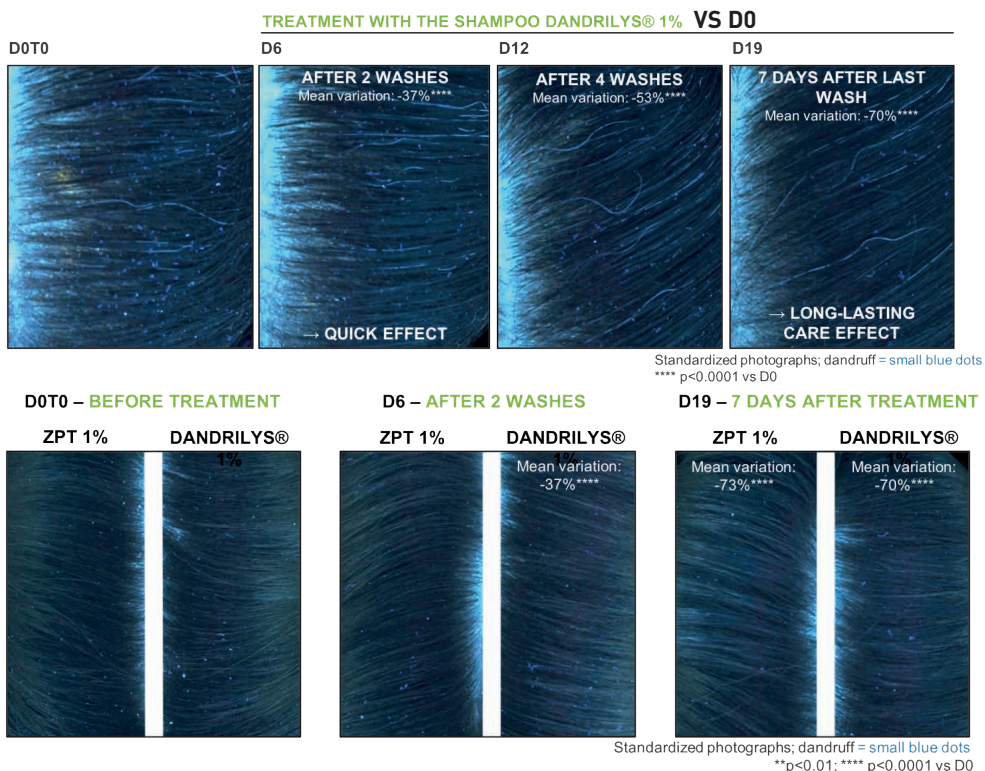
-37%
After 2 washes

DANDRUFF VS DO

33%
After 2 washes

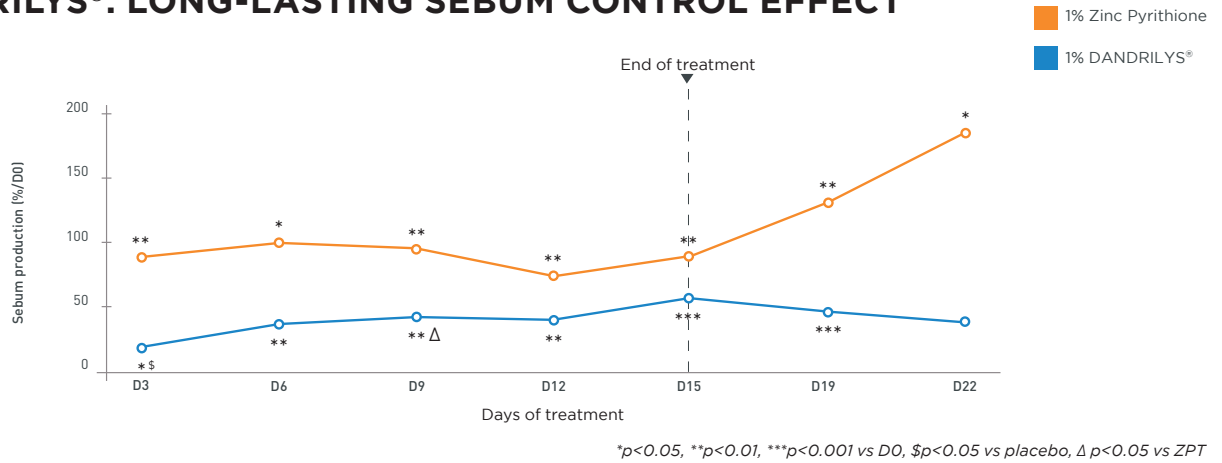
MORE EFFECTIVE VS ZPT

• DANDRILYS® HAS VISIBLE EFFECTS VS DO



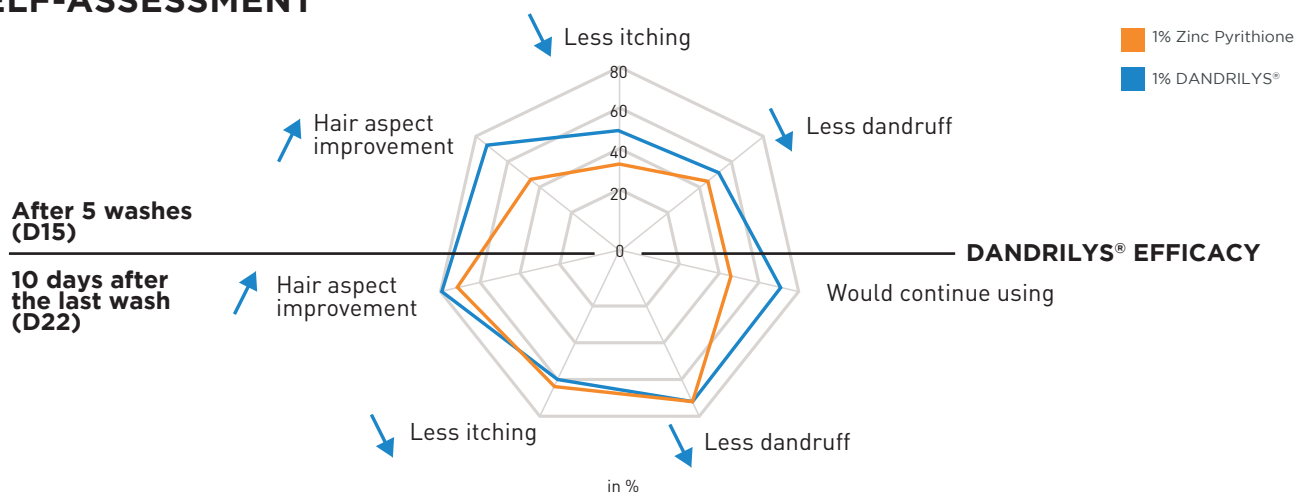
DANDRILYS® is a natural, effective and safe alternative to Zinc Pyrithione 1%.

• DANDRILYS®: LONG-LASTING SEBUM CONTROL EFFECT



DANDRILYS® regulates sebum production DURING & AFTER treatment (contrary to Zinc Pyrithione 1% that has a rebound effect).

• SELF-ASSESSMENT



DANDRILYS® performs better than Zinc Pyrithione from a consumer perception.

DANDRILYS®

TECHNICAL INFORMATION

FORMULATION

Concentration for use: 1-2%

pH for use: 4.0 - 10.0

Caution for use:

Add in formulations at 35-40 °C, while cooling or at any time in cold preparation. Formulation guidelines and stability studies available on demand.

TECHNICAL DATA

Characteristics

Organoleptic Appearance: liquid
Colour: Amber to dark brown

Solubility Water (at 10%): soluble

Storage

Keep in a dark place, in the original packaging, at an ambient temperature between 15° and 25 °C.

Tests of tolerance

- Skin irritation (tested at 5%): Very good skin compatibility
- Sensitization (tested at 5%): Very good skin compatibility
- Eye irritation (tested at 5%): slightly irritant
- Phototoxicity: Not phototoxic
- Mutagenicity test: Not mutagenic

• **INCI name:** Water, Propanediol, Zizyphus joazeiro Bark Extract

• **Preservative:** NONE (exists in versions with preservatives)

• **Authorized:** China

• **Approved:** COSMOS

Raw material approved by ECOCERT GREENLIFE, according to COSMOS Standard

Warning: The information in this document are the result of studies and interpretations based in part on published or generally accepted scientific data. They are provided for information purposes in terms of possible end applications and cannot be considered as instructions for use. We accept no responsibility concerning marketed formulas containing one or more of our products. Compounders must take all necessary precautions and ensure that all legal and administrative formalities have been fulfilled.

Edition, December 2021



Biopôle Clermont-Limagne - 63360 St Beauzire - France
Phone: +33 4 73 33 99 00 - E-mail: greentech@greentech.fr
Web site: www.greentech.fr

Germany: info@greentechgmbh.de
Brazil: contato@greentechbrasil.com
USA: greentechusa@greentechusa.com





FROST & SULLIVAN

2014 INNOVATION

LONG-LASTING ANTI-DANDRUFF

SCALP MICROBIOTA MODULATOR

DANDRILYS[®]



BIOTECHNOLOGIES

GREENTECH

HAIR ISSUE STUDIED BY GREENTECH



DANDRUFF & IRRITATED SCALP

Dandruff is a scalp disorder affecting up to 50% of world population (Piérard-Franchiment *et al.*, 2006) and tending to affect men more than women. Dandruff causes itchy and flaking skin with mild inflammation (it is a mild form of seborrheic dermatitis) (Schartz *et al.*, 2013).

Beside discomfort and bad aspect of scalp, dandruff also has social and psychological impact, affecting self-esteem and confidence (Manuel and Ranganathan, 2001).

Current solutions include Zinc Pyrithione, featuring a strong efficacy but also unpleasant side effects: skin irritation, dryness or allergies, leading to recurrent regulatory reviews.

Greentech designed a natural active ingredient to cleanse scalp and efficiently eliminate dandruff, redness and sebum, with a care effect on scalp microbiota. For a healthy scalp.

ACTIONS

REBALANCES

SCALP
BACTERIOBIOTA
& MYCOBIOTA

ELIMINATES

RAPIDLY
DANDRUFF,
WITH A
72-HOUR ACTION

COMPLETE LONG-LASTING ACTION

ANTI-DANDRUFF,
ANTI-ITCHING &
SEBUM CONTROL

PROMOTES

A HEALTHIER
SCALP

MOLECULES

- **SPECIFIC SAPONINS (JUJUBOSIDES)** : > 10% DRY MATTER
- **POLYSACCHARIDES & SUGARS** : ≈ 30% DRY MATTER

SOURCING

SOURCED FROM
ZIZIPHUS JOAZEIRO BARKS

TRADITIONALLY USED AS PLANT-BASED
MILD DETERGENT, ANTI-DANDRUFF & HAIR
CLEANSER.



COSMETIC USES

- ANTI-DANDRUFF DAILY SHAMPOO & HAIR CONDITIONER
- OIL CONTROL HAIR CARE
- SENSITIVE SCALP HAIR PRODUCTS
- PURIFYING HAIR PRODUCTS
- SCALP HEALTH BOOSTER
- SCALP MICROBIOTA MODULATING PRODUCTS

GREENTECH INNOVATION

> NATURAL & SAFE ALTERNATIVE TO ZINC PYRITHIONE

> MICROBIOTA-POWERED ANTI-DANDRUFF:
REBALANCES BACTERIOBIOTA + MYCOBIOTA

> LONG-LASTING ACTION:
ANTI-DANDRUFF, ANTI-ITCHING & SEBUM CONTROL

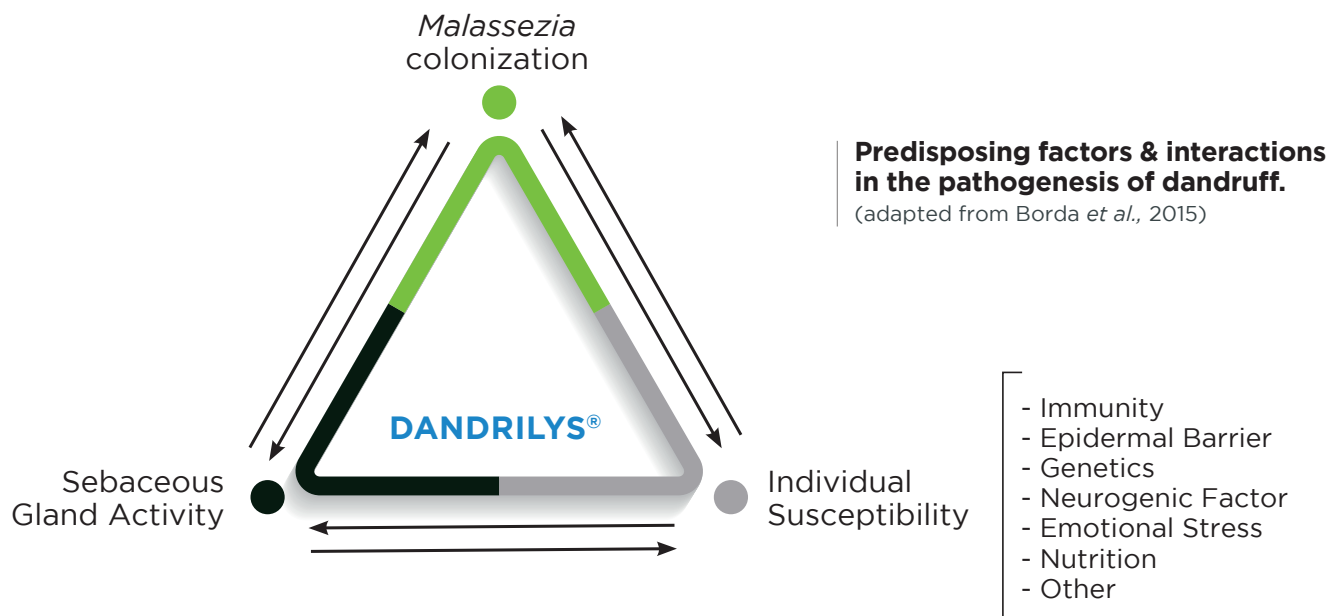
SYSTEMIC APPROACH OF DANDRUFF

SCALP PHYSIOLOGY + MICROBIOTA

Dandruff (also known as *Pityriasis capitis*) is characterized by itchy and flaky scalp with mild inflammatory reaction. It is a mild form of seborrheic dermatitis (Schwartz *et al.*, 2013).

As summarized in the figure below, there are several extrinsic factors (like lack of hygiene, excessive use of hair sprays/gels/wax...) and intrinsic factors (like scalp microbiota dysbiosis, individual susceptibility, hormonal imbalances...) that seem to play a role in dandruff formation.

More precisely, this inflammatory chronic disorder is related to scalp skin barrier disruption, epidermal cellular proliferation and differentiation, as well as shifts in gene expression patterns, and in cytokine and lipid production (Bonnist *et al.*, 2014).



The scalp has a biotic network out of which *Staphylococcus spp.*, *Propionibacterium spp.* and *Malassezia spp.* are known components (the two first being part of bacteria and thus bacteriobiota, the later being part of yeast and thus mycobiota).

Dandruff has been closely associated to a scalp microbiota dysbiosis, with a disbalance in the proportion of these major fungal and bacterial population colonizing the scalp (Park *et al.*, 2012). More precisely, the central dandruff hypothesis remains that the lipophilic yeast *Malassezia*, previously known as *Pityrosporum*, is the main causative agent of dandruff.

Indeed, on the dandruff-afflicted scalp, the level of *Malassezia* increases to almost double the normal level. It has been found that some metabolic products of tryptophan produced by *Malassezia*, for example, indole derivatives, are the main cause of dandruff.

Aware of these mechanisms causing dandruff, GREENTECH R&D has developed a natural solution based on specific saponins (jубosides) from Joazeiro bark to efficiently and quickly treat dandruff and rebalance scalp microbiota for a long-lasting effect.

PROVEN EFFICACY

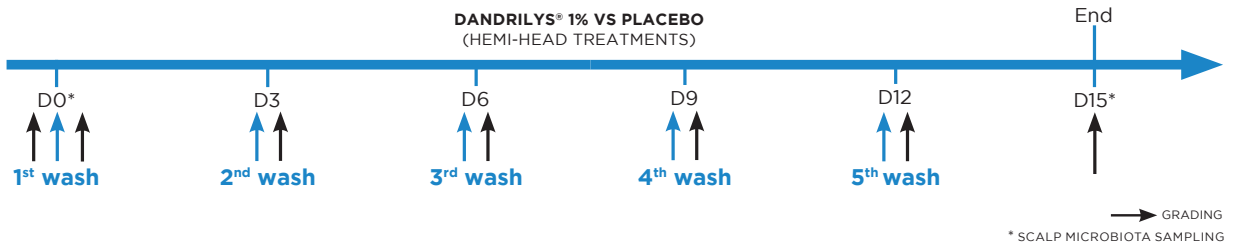
CLINICAL STUDY 1 - IN VIVO

CLINICAL STUDY DESIGN

- > 22 male subjects (40-65 yo) with all hair & scalp types (dry-greasy-normal):
 - 12 with adherent dandruff score ≥ 2.5 and total dandruff score ≥ 4 . Shampoo: DANDRILYS® 1% vs Placebo
 - 10 with healthy scalp (control group). No treatment

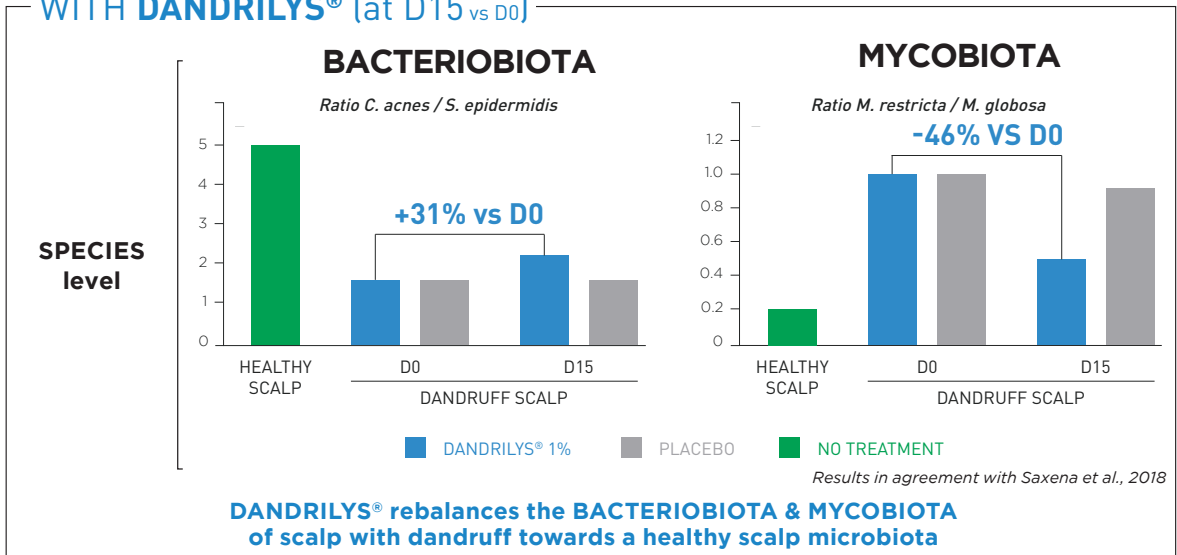
EVALUATION PARAMETERS

- > Scalp microbiota (high throughput DNA sequencing; bacteria: 16S ribosomal RNA; fungi: ITS1 ribosomal DNA)
- > Total dandruff + Erythema/Irritation (for both grading; 0-5)



DANDRILYS® REBALANCES SCALP BACTERIOBIOTA & MYCOBIOTA

WITH DANDRILYS® (at D15 vs D0)



DANDRILYS® DECREASES BOTH DANDRUFF & ITCHING

ANTI-DANDRUFF

-59%****

AFTER 2 WASHES (D3)

-86%****

AFTER 4 WASHES (D9)

ANTI-ITCHING

-54%*

-83%**

* $p < 0.05$; ** $p < 0.01$; **** $p < 0.0001$ vs D0. Significant differences also vs placebo



Illustrative pictures after 5 washes (12 days)
Double blind test on 23 subjects with middle to high level of dandruff (after washout). Shampoo with DANDRILYS® 1% vs placebo.