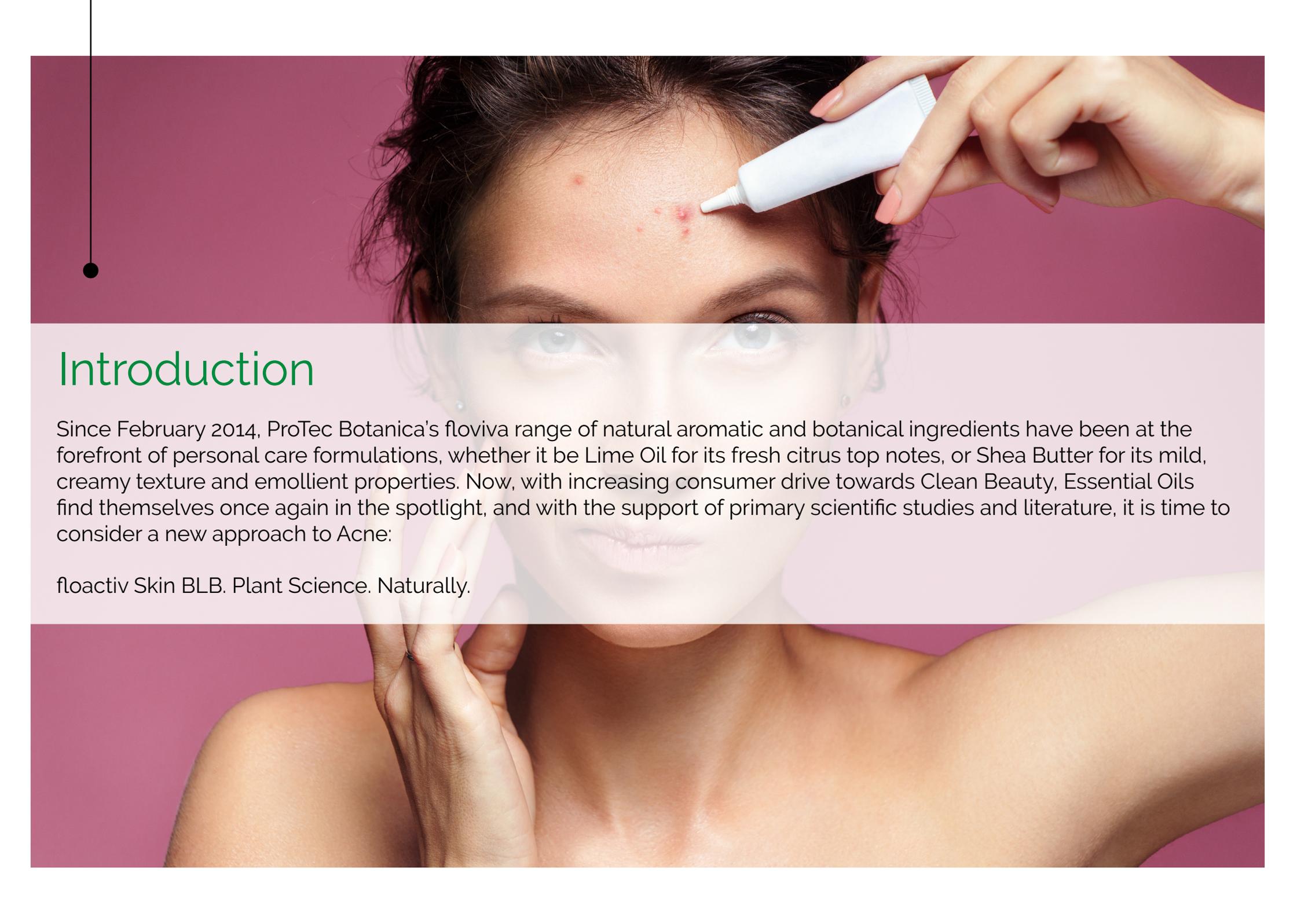


Pr**o**Tec  Botanica floactiv 

P L A N T S C I E N C E . N A T U R A L L Y .



Introduction

Since February 2014, ProTec Botanica's floviva range of natural aromatic and botanical ingredients have been at the forefront of personal care formulations, whether it be Lime Oil for its fresh citrus top notes, or Shea Butter for its mild, creamy texture and emollient properties. Now, with increasing consumer drive towards Clean Beauty, Essential Oils find themselves once again in the spotlight, and with the support of primary scientific studies and literature, it is time to consider a new approach to Acne:

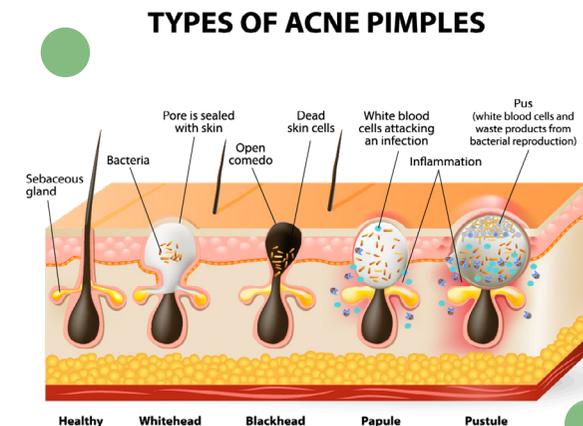
floactiv Skin BLB. Plant Science. Naturally.

Acne and existing treatments

Acne Vulgaris, commonly known as Acne, is a chronic and inflammatory skin condition often associated with puberty and early adulthood. Characterised by the presence of potentially painful comedones, Acne is estimated to affect 650 million people worldwide, with up to 95% of adolescents in Western industrialised countries affected by Acne to some extent, and 20 to 35% developing moderate or severe Acne ⁽¹⁾. The presence of Acne may lead to complications such as scarring and mental health disorders such as low self-esteem, anxiety and depression.

Although not fully understood, several causes of Acne are noted, including increased sebum production in the sebaceous follicle (usually during puberty), the proliferation of bacteria such as *Cutibacterium acnes* and *Staphylococcus epidermidis* within the follicles, and resulting inflammation of the pilosebaceous unit.

Current treatments for Acne usually involve the use of topical antibiotics such as clindamycin and erythromycin, and benzoyl peroxide may also be used to reduce bacteria in the follicle. The skin should also be regularly cleaned with non-alkaline cleansers to reduce the build-up of sebum ⁽²⁾.

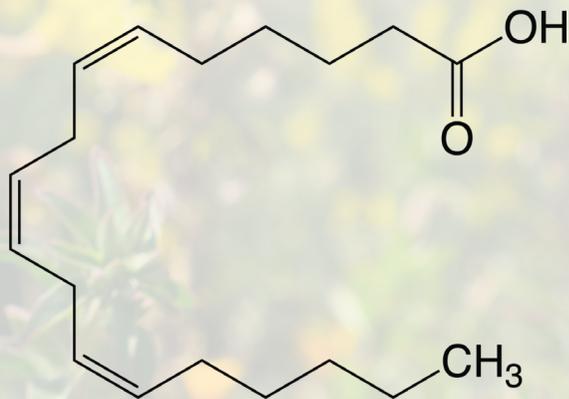


Inflammation and GLA

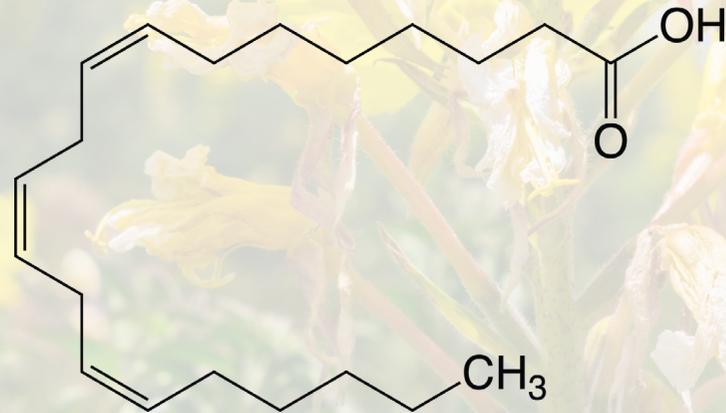
To reduce inflammation, we have chosen Borage and Evening Primrose Oils, selected for their high gamma-linolenic acid (GLA) content. GLA has been shown to reduce inflammation when it is metabolised to dihomo-gamma-linolenic acid (DGLA), and in turn, DGLA is further metabolised to produce anti-inflammatory prostaglandin E1, and thromboxane A1^(3,4).

In combination, these two oils work to combat the inflammation caused by skin bacteria such *C. acnes* and *S. epidermidis*. Of course, we also need oils to reduce the levels of these bacteria in the skin. These bacteria metabolise excess sebum and follicular cell debris to produce short-chain fatty acids which have been shown to upregulate inflammatory gene expression in sebocytes and follicular keratinocytes located in the pilosebaceous unit⁽⁵⁾.

GLA (Omega 6)



DGLA





Antibacterial Essential Oils

Lavender Oil has been shown to be highly effective at killing *C. acnes* bacteria⁽⁶⁾, likely owing to its high concentrations of Linalool and Linalyl Acetate, components which account for 50-60% of Lavender Oil⁽⁷⁾, a synergy may be further supported by minor components such as 1,8-Cineole and Terpinene-4-ol⁽⁸⁾.

Rosemary Oil has also been shown to be effective against *C. acnes*, likely due to components such as alpha-pinene, beta-pinene and 1,8-Cineole^(8,9,10). Alpha and beta-pinene have been shown to inhibit the growth of various gram-positive bacteria, with alpha-pinene particularly potent against *S. epidermidis*⁽¹¹⁾. In addition, Rosemary Oil has been found to possess anti-inflammatory properties, through inhibition of nf-kappa B transcription and suppression of the arachidonic acid cascade⁽¹²⁾.

Thyme Oil has demonstrated effectiveness at killing both *C. acnes* and *S. epidermidis*, exhibiting short kill times and low minimum inhibitory concentrations⁽⁶⁾. Thymol, the major component, has been shown to be fundamental and works in synergy with the other components of Thyme Oil⁽¹³⁾.



floactiv Skin BLB

floactiv Skin BLB is a blend of pure and natural essential oils and vegetable oils, carefully selected for their efficacy and skilfully blended to reduce acne in a topical formulation. Years of research by the scientific community has led us to select a total of five oils for blending, each chosen to reduce inflammation, and to reduce bacteria in the follicle.

Description: A liposoluble active ingredient from plant origin, pale yellow to yellow in colour with a subtle herbaceous odour profile.

INCI: Borago Officinalis Seed Oil, Oenothera Biennis Oil, Lavandula Angustifolia Oil, Rosmarinus Officinalis Leaf Oil, Thymus Vulgaris Oil

Recommended use level: 1%

ISO 16128: Natural Index 1.0 (or 100%) Natural Origin Index 1.0 (or 100%)

COSMOS: This product meets the COSMOS-standard and can be used in COSMOS-certified formulations.



References

- (1) NICE (2021) Acne vulgaris: How common is it? Available at: <https://cks.nice.org.uk/topics/acne-vulgaris/background-information/prevalence/> (accessed 14/02/2022)
- (2) NICE (2021) Acne vulgaris: Scenario: Management of acne vulgaris in primary care. Available at: <https://cks.nice.org.uk/topics/acne-vulgaris/management/primary-care-management/> (accessed 14/02/2022)
- (3) Kapoor, R., & Huang, Y.-S. (2006). Gamma Linolenic Acid: An Antiinflammatory Omega-6 Fatty Acid. *Current Pharmaceutical Biotechnology*, 7(6), 531–534. <https://doi.org/10.2174/138920106779116874>
- (4) Sun, G. Y., Shelat, P. B., Jensen, M. B., He, Y., Sun, A. Y., & Simonyi, A. (2010). Phospholipases A2 and Inflammatory Responses in the Central Nervous System. *NeuroMolecular Medicine*, 12(2), 133–148. <https://doi.org/10.1007/s12017-009-8092-z>
- (5) Sanford, J. A., O'Neill, A. M., Zouboulis, C. C., & Gallo, R. L. (2019). Short-Chain Fatty Acids from Cutibacterium acnes Activate Both a Canonical and Epigenetic Inflammatory Response in Human Sebocytes. *The Journal of Immunology*, 202(6), 1767–1776. <https://doi.org/10.4049/jimmunol.1800893>
- (6) Zu, Y., Yu, H., Liang, L., Fu, Y., Efferth, T., Liu, X., & Wu, N. (2010). Activities of Ten Essential Oils towards Propionibacterium acnes and PC-3, A-549 and MCF-7 Cancer Cells. *Molecules*, 15(5), 3200–3210. <https://doi.org/10.3390/molecules15053200>
- (7) Kwiatkowski, P., Łopusiewicz, Ł., Kostek, M., Drożdżowska, E., Pruss, A., Wojciuk, B., Sienkiewicz, M., Zielińska-Bliźniewska, H., & Dołęgowska, B. (2019). The Antibacterial Activity of Lavender Essential Oil Alone and In Combination with Octenidine Dihydrochloride against MRSA Strains. *Molecules*, 25(1), 95. <https://doi.org/10.3390/molecules25010095>
- (8) Karpanen, T. J., Worthington, T., Hendry, E. R., Conway, B. R., & Lambert, P. A. (2008). Antimicrobial efficacy of chlorhexidine digluconate alone and in combination with eucalyptus oil, tea tree oil and thymol against planktonic and biofilm cultures of Staphylococcus epidermidis. *Journal of Antimicrobial Chemotherapy*, 62(5), 1031–1036. <https://doi.org/10.1093/jac/dkn325>
- (9) Fu, Y., Zu, Y., Chen, L., Efferth, T., Liang, H., Liu, Z., & Liu, W. (2007). Investigation of Antibacterial Activity of Rosemary Essential Oil against Propionibacterium acnes with Atomic Force Microscopy. *Planta Medica*, 73(12), 1275–1280. <https://doi.org/10.1055/s-2007-981614>
- (10) Esmael, A., Hassan, M. G., Amer, M. M., Abdelrahman, S., Hamed, A. M., Abd-raboh, H. A., & Foda, M. F. (2020). Antimicrobial activity of certain natural-based plant oils against the antibiotic-resistant acne bacteria. *Saudi Journal of Biological Sciences*, 27(1), 448–455. <https://doi.org/10.1016/j.sjbs.2019.11.006>
- (11) Leite, A. M., Lima, E. de O., Souza, E. L. de, Diniz, M. de F. F. M., Trajano, V. N., & Medeiros, I. A. de. (2007). Inhibitory effect of beta-pinene, alpha-pinene and eugenol on the growth of potential infectious endocarditis causing Gram-positive bacteria. *Revista Brasileira de Ciências Farmacêuticas*, 43(1), 121–126. <https://doi.org/10.1590/S1516-93322007000100015>
- (12) Borges, R. S., Ortiz, B. L. S., Pereira, A. C. M., Keita, H., & Carvalho, J. C. T. (2019). Rosmarinus officinalis essential oil: A review of its phytochemistry, anti-inflammatory activity, and mechanisms of action involved. *Journal of Ethnopharmacology*, 229, 29–45. <https://doi.org/10.1016/j.jep.2018.09.038>
- (13) Taleb, M., Abdeltawab, N., Shamma, R., Abdelgayed, S., Mohamed, S., Farag, M., & Ramadan, M. (2018). Origanum vulgare L. Essential Oil as a Potential Anti-Acne Topical Nanoemulsion—In Vitro and In Vivo Study. *Molecules*, 23(9), 2164. <https://doi.org/10.3390/molecules23092164>



ProTec Botanica

+44 (0) 20 3761 3002 | info@protecbotanica.com

www.protecbotanica.com

