The Function of African Camwood as an Active Ingredient in Bar Soap Formulations and Skin Care Products - (Version2)

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Abstract

African camwood, botanically known as Baphia nitida, is an important medicinal and cosmetic plant widely distributed across West Africa, especially in Nigeria, Ghana, Cameroon, and Côte d'Ivoire. The reddish wood powder derived from the plant is traditionally known as "Osun" among the Yoruba people of Nigeria and has been extensively utilized in indigenous skin care formulations, herbal soaps, and therapeutic cosmetic preparations. Studies have demonstrated that camwood contains biologically active phytochemicals such as flavonoids, tannins, saponins, alkaloids, terpenoids, phenolic compounds, and glycosides which contribute to its antimicrobial, antioxidant, anti-inflammatory, exfoliating, and skin-rejuvenating properties.

This review evaluates the role of African camwood as an active ingredient in bar soap formulations and skin care products, with emphasis on its phytochemical composition, antimicrobial activities, antioxidant effects, dermatological benefits, and industrial applications in cosmetic formulations. The formulation methodology of camwood-containing African black soap was examined alongside physicochemical and stability evaluations including pH, total fatty matter, foam ability, texture, wet crack resistance, fragrance retention, and cleansing performance. Comparative analysis revealed that pilot camwood soap formulations demonstrated improved total fatty matter, enhanced foam volume, and superior skin feel when compared with selected commercial market samples.

The incorporation of camwood powder into bar soaps and skin care products provides natural cleansing, anti-acne, anti-aging, and skin-toning effects while also supporting the development of herbal cosmetic products based on indigenous African medicinal resources. This work further highlights the growing relevance of natural plant-derived active ingredients in sustainable cosmetic science and industrial soap manufacturing.

Introduction

The utilization of medicinal plants in personal care products has existed for centuries across African societies. Indigenous communities have traditionally relied on herbs, roots, bark extracts, wood powders, and natural oils for the treatment of skin infections, wounds, inflammation, and cosmetic enhancement. Among these medicinal resources, African camwood has remained one of the most valued traditional cosmetic materials used in skin cleansing and beautification.

Baphia nitida belongs to the Fabaceae family and is commonly referred to as African sandalwood or barwood. The tree thrives within tropical rainforest regions of West Africa and produces a characteristic reddish heartwood that is processed into fine powder for cosmetic applications. Traditionally, camwood powder has been incorporated into African black soaps, facial masks, exfoliating scrubs, and herbal skin preparations due to its perceived healing and beautifying properties.

Modern scientific investigations have validated many traditional claims associated with camwood. Studies have shown that camwood contains antimicrobial phytochemicals capable of inhibiting pathogenic microorganisms associated with skin infections. Additionally, its antioxidant constituents help combat oxidative stress implicated in skin aging, wrinkles, hyperpigmentation, and tissue damage. These findings have stimulated increased interest in the incorporation of camwood into industrial cosmetic products including medicated soaps, creams, lotions, and herbal cleansers.

The increasing global demand for natural and plant-based cosmetics has further expanded the relevance of camwood in industrial soap manufacturing. Consumers are increasingly shifting from synthetic additives toward biodegradable and naturally sourced active ingredients with minimal toxicological concerns. Consequently, African camwood represents a promising natural additive for modern bar soap formulations and dermatological preparations.

Botanical Description and Distribution of Camwood

African camwood is a perennial evergreen shrub or small tree found predominantly in tropical rainforest ecosystems. It grows abundantly in Nigeria, Ghana, Cameroon, Sierra Leone, and Côte d'Ivoire. The tree produces dense reddish wood rich in natural pigments and bioactive compounds.

The powdered heartwood is widely utilized in traditional African cosmetic applications. In Nigeria, the powder is locally called:

- **Osun** (Yoruba)
- **Ufie** (Igbo)
- **Ositua** (Edo)

The reddish coloration of camwood is attributed to natural phenolic pigments and flavonoid compounds present in the wood extract.

Phytochemical Composition of Camwood

Studies on the phytochemical profile of camwood reveal the presence of several biologically active compounds responsible for its therapeutic and cosmetic effects. These include:

- Flavonoids
- Tannins
- Alkaloids
- Saponins
- Terpenoids
- Cardiac glycosides
- Phenolic compounds
- Phlobatannins

These phytochemicals contribute significantly to the antimicrobial, antioxidant, anti-inflammatory, and exfoliating properties of camwood.

Antimicrobial and Dermatological Activities

Research has shown that camwood exhibits inhibitory effects against several pathogenic microorganisms associated with skin infections. The antimicrobial properties are believed to result from the synergistic action of flavonoids, tannins, and phenolic compounds capable of disrupting microbial cell membranes.

Camwood-containing formulations have demonstrated usefulness in:

- Acne management
- Eczema treatment
- Ringworm inhibition
- Reduction of skin rashes
- Management of blemishes
- Reduction of dark spots
- Skin rejuvenation

The antioxidant activity of camwood further protects skin tissues from oxidative stress and environmental damage caused by free radicals.

Camwood in Bar Soap Formulation

Typical Formulation Components

A standard African camwood black soap formulation may contain:

Ingredient	Function
Refined Palm Stearin	Soap base
Palm Kernel Oil	Foaming agent
Sodium Hydroxide	Saponifying agent
Demineralized Water	Solvent
Glycerin	Humectant
Soda Ash	Processing aid
Camwood Powder	Active ingredient
Shea Butter	Skin moisturizer
Aloe Vera Extract	Skin soothing agent
Fragrance	Consumer appeal
Colorant	Product appearance

Camwood powder serves as the major herbal active ingredient within the formulation.

Formulation Procedure

The production process generally involves:

1. Preparation of soap noodles through saponification.
2. Addition of moisturizers such as glycerin and shea butter.
3. Incorporation of camwood powder during milling or amalgamation.
4. Addition of aloe vera extract and fragrance.
5. Mixing and homogenization.
6. Extrusion and stamping into bar soap shapes.
7. Drying and curing.

Physicochemical Evaluation of Camwood Soap

Comparative Analysis of Pilot and Commercial Samples

Parameter	Market Sample	Pilot Sample
Soap feel on skin	Very good	Very good
Skin irritation	None	None
Wet crack	No crack	No crack
Dry crack	No crack	No crack
Total Fatty Matter (%)	68.90	70.20
Soap color	Light black	Dark brown
Foam volume (mL)	450	500
Cleansing ability	Satisfactory	Satisfactory
pH	9.35	9.12
Texture	Hard	Hard
Fragrance retention	Long-lasting	Long-lasting

The pilot formulation exhibited higher total fatty matter and improved foam ability compared with the commercial market sample, suggesting enhanced product quality and consumer performance.

Roles of Camwood in Skin Care Products

Camwood contributes numerous dermatological and cosmetic benefits including:

1. Natural antiseptic activity.
2. Skin exfoliation and removal of dead cells.
3. Improvement of skin elasticity.
4. Reduction of wrinkles and aging signs.
5. Enhancement of skin tone uniformity.
6. Anti-inflammatory effects.
7. Support against acne and blemishes.
8. Soothing effects on irritated skin.
9. Reduction of hyperpigmentation.
10. Enhancement of skin smoothness.

Camwood is commonly blended with natural ingredients such as:

- Shea butter
- Coconut oil
- Aloe vera extract
- Honey
- Essential oils

to produce multifunctional skin care formulations.

Industrial Relevance of Camwood in Cosmetic Science

The growing global interest in herbal cosmetics and sustainable personal care products has increased the industrial importance of camwood. Modern cosmetic industries are increasingly incorporating natural additives to replace synthetic chemicals that may pose toxicological or environmental concerns.

The advantages of camwood in industrial applications include:

- Biodegradability
- Natural pigmentation
- Consumer preference for herbal products
- Antioxidant protection
- Eco-friendly sourcing
- Compatibility with herbal formulations

Camwood therefore possesses significant potential for large-scale industrial utilization in soaps, scrubs, creams, facial masks, and therapeutic cosmetics.

Conclusion

African camwood remains one of the most valuable indigenous medicinal cosmetic materials utilized in West African skin care traditions. Scientific studies support its antimicrobial, antioxidant, anti-inflammatory, and skin-rejuvenating activities, validating many traditional applications. Its incorporation into bar soap formulations improves cleansing performance, foam ability, skin feel, and dermatological benefits.

The increasing demand for natural and sustainable cosmetic ingredients further strengthens the industrial relevance of camwood in modern herbal soap production and skin care product development. Future studies should focus on advanced extraction technologies, stability optimization, toxicological profiling, and clinical evaluation of camwood-containing formulations for broader commercial applications.

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