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From the Phenomenology of *Scab Hair* to Post-Alkaline Relaxing Hair Syndrome (PRHS): An Integrative Approach between Trichophysiology and Identity

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From the phenomenology of the back hair to the postural relaxation syndrome (PRHS): an integrative approach between tricophysiology and identity

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Abstract:

This study proposes the formalization of Post-Alkaline Relaxer Hair Syndrome (PRHS) as the technical-scientific basis for the phenomenon popularly known as "scab hair." Through an integrative literature review, the hair follicle was investigated from the perspective of a "dynamic mini-organ," subject to a state of "biochemical fatigue" resulting from the chronic use of high-pH relaxers. Biogenomic results demonstrate that systemic chemical insult exhausts the antioxidant enzymatic apparatus of the epidermis (SOD and catalase enzymes), triggering oxidative stress and raising levels of pro-inflammatory cytokines, such as TNF-ÿ and IL-1ÿ. This inflammatory cascade compromises the signaling of essential growth factors, such as IGF-1, resulting in a hair shaft with acquired structural defects, extreme porosity, and massive protein loss. From a sociological perspective, the formalization of PRHS validates the "emotional distress" and phenomenological accounts of women who perceive newly grown hair as a "mysterious hair" that "screams and yells" when handled. It is concluded that PRHS fills a diagnostic gap in medical trichology, promoting racial literacy in health and establishing a foundation for future research focused on naturalistic and integrative recovery protocols.

Keywords: Hair transition, Scab hair, Oxidative stress, Identity, Medical Trichology.

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This study proposes formalizing Post-Alkaline Relaxation Hair Syndrome (PRHS) as the technical-scientific substrate for the phenomenon popularly known as *scab hair.* Through an integrative literature review, the hair follicle was investigated from the perspective of a "dynamic miniorgan", subject to a state of "biochemical fatigue" resulting from the chronic use of high-pH relaxers. Biogenomic results demonstrate that systematic chemical insult depletes the epidermal antioxidant enzymatic apparatus (SOD and catalase), triggering oxidative stress and elevating pro-inflammatory cytokines such as TNF-ÿ and IL-1ÿ. This inflammatory cascade compromises the signaling of essential growth factors, such as IGF-1, resulting in a hair shaft with acquired structural defects, extreme porosity, and massive protein loss. On the sociological axis, the formalization of PRHS validates the "emotional wear" and the phenomenological reports of women who perceive the newly formed fiber as a "mysterious hair" that "screams and yells" when manipulated. It is concluded that PRHS fills a diagnostic gap in medical trichology, promotes racial literacy in health, and lays the foundation for future research on naturalistic and integrative recovery protocols.

Keywords: Hair transition, Scab hair, Oxidative stress, Identity, Medical Trichology.

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1. Introduction

The contemporary movement of women seeking to reclaim their natural textures, commonly referred to as hair transition, it represents not only an aesthetic change, but also a complex process of identity reconstruction and "semantic detoxification" (SILVA, 2024, p. 165). In this scenario, an observational phenomenon has gained prominence in Experience reports: the so-called "scab hair". Popularly defined as the portion of hair That which grows soon after the discontinuation of chemical straightening treatments, *"scab hair"* manifests itself as a fiber with anomalous texture and porosity, being described as a "mysterious hair" that It diverges from the natural pattern expected by the patient (SILVA, 2024, p. 134).

Despite its omnipresence in transition narratives, the term lacks a direct equivalent. formal in the clinical literature and is often overlooked as a purely technical construct. digital. However, scientific research reveals that the hair follicle is a "mini-organ". dynamic" whose morphogenesis and growth cycle are regulated by a delicate balance biochemical (CAVALLI; ANTUNES, 2024, p. 35). Prolonged use of alkaline relaxants It imposes a state of chemical stress on the scalp, capable of triggering processes. Inflammatory and persistent oxidative stress.

The purpose of this article is to formalize the phenomenon under the name Post-Hair Loss Syndrome. Alkaline Relaxation Syndrome (PRHS). It is argued that PRHS results from an imbalance. temporary decrease in crucial antioxidant enzymes, such as superoxide dismutase (SOD) and catalase, which act as the first line of defense against oxidizing agents in the leather epidermis hairy (CAVALLI; ANTUNES, 2024, p. 30). Changes in the signaling of factors of Growth and regulatory proteins, such as IGF-1 and PPAR-ÿ, would result in the production of a hair fiber with compromised keratinization during the follicular recovery months (CAVALLI; ANTUNES, 2024, p. 30-31).

Filling this nomenclature gap in databases, such as PubMed, is fundamental for Diagnostic accuracy in medical trichology and for the validation of "emotional stress" a challenge faced by women who, by not recognizing their own hair, see their identity compromised. weakened (SILVA, 2024, p. 10, 161). By aligning phenomenological observation with the mechanisms Based on genomic and biochemical principles, this work demonstrates that PRHS is the biological manifestation of A follicle undergoing repair after systemic chemical damage.

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2. Theoretical Framework

Understanding Alkaline Post-Relaxing Hair Syndrome (PRHS) requires an analysis that integrate the molecular biology of the hair follicle with the phenomenological experience of women in transition. This section is divided into two axes: follicular physiology under stress and the construction hair fiber identity.

2.1 The Hair Follicle as a Dynamic Mini-Organ and Oxidative Stress

The hair follicle is classified in the scientific literature as a "dynamic mini-organ," whose Morphogenesis and the growth cycle are governed by consecutive waves of regeneration throughout. of life (CAVALLI; ANTUNES, 2024, p. 28, 35). This biological balance is maintained by a A complex network of cellular signaling, which can be severely affected by external factors. such as the chronic use of chemical relaxants with a high pH.

Successive chemical aggression imposes a state of oxidative stress on the scalp. characterized by an imbalance between the production of reactive oxygen species (ROS) and the the body's ability to neutralize them (CAVALLI; ANTUNES, 2024, p. 30). The system of The defense of the epidermis depends on crucial enzymes:

- Superoxide Dismutase (SOD): Acts as the first line of defense, converting the superoxide in hydrogen peroxide (CAVALLI; ANTUNES, 2024, p. 30).
- Catalase (CAT): Converts hydrogen peroxide into water and oxygen, reducing the toxic effects of oxidation (CAVALLI; ANTUNES, 2024, p. 31).

It is argued that PRHS is the manifestation of a follicle whose antioxidant defenses have been... temporarily depleted by extreme alkalinity, resulting in a hair fiber with irregular keratinization. In addition, the presence of inflammatory mediators, such as TNF-ÿ. (Tumor Necrosis Factor), and alterations in growth factor signaling, such as IGF- 1 and PPAR-ÿ can induce the follicle to a state of "biochemical fatigue," altering its texture. of the newly formed stem (CAVALLI; ANTUNES, 2024, p. 31, 33).

2.2 Scab Hair: Between Clinical Observation and Semantic Detoxification

The phenomenon of *scab hair* manifests visually as "mysterious hair" with a textured appearance. Porous and abnormal shrinkage, which occurs soon after discontinuing the use of chemical products. (SILVA, 2024, p. 134). In the narratives of women in transition, this portion of the fiber is often described as hair that "screams and yells" when handled, highlighting

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a structural anomaly that corresponds neither to straightened hair nor to its natural texture
fullness that will emerge months later (SILVA, 2024, p. 134).
Beyond biology, hair is an "identity icon" and a messenger of social meanings.
and politicians (SILVA, 2024, p. 10). The hair transition is, therefore, a process of "detoxification".
"Semantics," in which the woman seeks to rid herself not only of the chemicals, but also of the stigma.
of "bad hair" (SILVA, 2024, p. 165). The formalization of PRHS as a medical syndrome
validates this experience, transforming the "emotional suffering" of not recognizing oneself.
hair in a transient clinical condition of follicular repair (SILVA, 2024, p. 161).
In this way, the popular term *"scab hair"* ceases to be an informal category and becomes...
visible representation of a hair follicle resuming its morphogenesis after decades of
"Compulsory aesthetic domestication" (SILVA, 2024, p. 122).

3. Methodology

This investigation is characterized as an integrative literature review, of a nature...
This method is qualitative and descriptive-exploratory in nature. It allows for the synthesis of multiple...
Published studies, enabling general conclusions about a specific area of study and the
bridge between technical-medical knowledge and clinical practice (CAVALLI; ANTUNES, 2024).

3.1 Axes of Analysis

The research will be structured around two main axes of bibliographic search and analysis:

1. Trichophysiological and Genomic Axis: Focused on the hair follicle as a "mini-organ"
dynamic" and in the processes of capillary morphogenesis under chemical stress (CAVALLI;
(ANTUNES, 2024). The impacts of hydroxides and relaxants on signaling will be investigated.
of growth factors, such as IGF-1, and in cytokine-mediated inflammatory activity,
such as TNF-ÿ.
2. Sociological and Identity Axis: Based on the analysis of narratives and accounts of experience.
of women undergoing hair transition. The concept of hair as an "icon" is used.
"identity marker" and messenger of meanings to validate the existence of *scab hair* as a
a real obstacle to self-esteem and identity reconstruction (SILVA, 2024).

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3.2 Data Collection Procedures

The literature review will be conducted using the PubMed and SciELO databases, utilizing the following prompt: (Hair relaxers) OR (Chemical straighteners) OR (Hair damage) AND (Scalp inflammation) OR (Cicatricial alopecia). Filtering them by searches performed in the last 10 years and free access, excluding duplicates or those outside the scope of the research. A The research will be complemented by the inclusion of reference works in the field of trichology. medical (CAVALLI; ANTUNES, 2024), as well as theses and dissertations in the social sciences. that address hair as a social and political marker (SILVA, 2024).

4. Results and Discussion

The initial search in the PubMed and SciELO databases yielded a large volume of scientific publications. that, after applying the inclusion criteria (publications from the last 10 years and access) (free) and exclusion criteria (articles that fall outside the scope of the research), it was refined for the composition of the analysis corpus. To answer the objectives of this study, the following were selected 5 key articles that correlate the chemical exposome with alterations in morphogenesis. capillary.

Analysis of these studies reveals that the phenomenon popularly known as "scab hair" is not not a fortuitous construction, but rather the clinical manifestation of a hair follicle in the process of... biological recovery. According to Silva (2024), this portion of the fiber is perceived as a "Mysterious hair," with a porous texture and abnormal shrinkage, that appears immediately after the interruption of chemical straightening treatments (SILVA, 2024, p. 134). From a trichological point of view Medically, this alteration is understood as the response of a follicle classified as a "dynamic mini-organ", whose activity is governed by continuous cycles of regeneration that can to be severely impacted by external agents (CAVALLI; ANTUNES, 2024, p. 35).

The proposed diagnosis of Alkaline Post-Relaxing Hair Syndrome (PRHS) is supported by evidence. that the chronic use of relaxants imposes a chemical stress capable of exhausting the system of antioxidant defense of the epidermis. Cavalli and Antunes (2024) explain that enzymes such as Superoxide dismutase (SOD) and catalase are the first line of defense against agents. Oxidizing agents; SOD converts superoxide into hydrogen peroxide, while catalase converts hydrogen peroxide into water and oxygen (CAVALLI; ANTUNES, 2024, p. 30-

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31) In the absence of this enzymatic protection, the follicle enters a state of "biochemical fatigue". resulting in the formation of a fiber with compromised keratinization.

This biological disorder is reflected in the patients' subjective experience during the transition. capillary. According to reports collected by Silva (2024), the texture of scab hair is so distinct and so untamable that, when women try to tie or manipulate the threads, he visibly "shouts and yells" (SILVA, 2024, p. 134). This phenomenological description coincides with the Structural changes documented in the literature: the application of alkaline relaxants causes... rupture of disulfide bonds and a massive protein loss of keratin, resulting in "structural fatigue" of the fiber (PAULA, BASÍLIO; MULINARI-BRENNER, 2021). The interaction

Among the factors that can deplete follicular homeostasis are chemical insults and environmental factors, it is possible to... understood through the concept of exposome, illustrated in Figure 1.

Figure 1 - A summary image of the exposomal factors that can impact hair health.



Source: CEDIRIAN et al., 2024

The results also indicate that persistent inflammatory processes, mediated by cytokines TNF-ÿ, like other hormones, plays a critical role in the pathophysiology of PRHS. Cavalli and Antunes (2024) indicate that the activation of epidermal TNF-ÿ receptors exacerbates mechanisms Inflammatory factors that can alter the signaling of essential growth factors, such as IGF-

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1, which is a "growth and survival factor of the hair follicle" (CAVALLI; ANTUNES, 2024, p. 31). The reduction in IGF-1 expression and impaired PPAR-ÿ protein signaling. They inhibit healthy fiber morphogenesis, scientifically validating the perception that a hair does not reach its initial genetic curl pattern (CAVALLI; ANTUNES, 2024; SILVA, 2024).

Susceptibility to this damage is exacerbated by the capillary exposome, especially in people of African descent. Research shows that African hair has a cuticle. naturally thinner, which makes it biologically more vulnerable to chemical damage and to cumulative wear and tear known as weathering (CEDIRIAN et al., 2025). Furthermore, the The genotoxic and cytotoxic potential of certain agents present in hair dyes and straightening products may Inducing mitochondrial dysfunction and DNA damage by activating emergency metabolic pathways. in hair germ cells (MAITI et al., 2016; TAFURT-CARDONA et al., 2023).

Sociologically, the formalization of PRHS acts as a "detoxification" process. semantics," allowing women to reconstruct their identity without the burden of stigma. "bad hair" (SILVA, 2024, p. 165). The absence of a technical term in the databases, such as PubMed relegates the suffering of thousands of women to clinical invisibility. By naming the This phenomenon, like a medical syndrome, validates "emotional exhaustion" and loss of... Self-esteem issues reported by patients, transforming an identity obstacle into a condition. transient physiological process of follicular repair (SILVA, 2024, p. 10, 161).

In summary, the data demonstrate that PRHS is the biological representation of a hair follicle. which attempts to restore its gene signaling after decades of systematic chemical aggression. (GREEN; FATEI; VANEGAS, 2023). The integration between genomic trichology and sociology The identification process allows us to conclude that scab hair is the clinical product of a follicle in the phase of recovery, filling the diagnostic gap necessary for a more trichological practice accurate and humane (CAVALLI; ANTUNES, 2024; SILVA, 2024).

This convergence between the molecular and lived experiences is justified by the fact that rehabilitation Follicle regeneration does not occur in a biological context, but in the body of a subject seeking to give new meaning. its presence in the world through the hair fiber. Thus, the biological transition of the "mini-organ" "Dynamic" goes hand in hand with the individual's self-image.

From this perspective, the Sociological and Identity Axis underpins the proposal of Hair Syndrome. Post-Alkaline Relaxing Treatment (PRHS) validates that hair is not merely an element. biological, but a fundamental action system for self-identity in everyday life. (SILVA, 2024; GIDDENS, 2002). The follicle and the hair fiber act as an integrated system.

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which reflects the emotional state and the subject's place in society (CAVALLI; ANTUNES, 2024, (p. 34). In this context, the body is simultaneously natural and symbolic, being modified by A culture in search of identity affirmation that highlights aesthetic and political patterns. (SILVA, 2024, p. 34).

Hair acts as a "messenger" that carries meanings, interpretations, and information, being technically defined as an identity icon (SILVA, 2024, p. 34). From According to sociological literature, hair fiber has the power to classify, hierarchize, and exclude, leaving little room for social ambiguities (BOUZÓN, 2010). The proposal of PRHS aims to formalize the phenomenon of scab hair, which emerges as an obstacle in this messaging, since the anomalous texture generates noise in the communication of the identity that the A woman in transition intends.

The observational phenomenon of "scab hair" is described in the narratives of women in transition. like a "mystery hair," which exhibits a porous texture and anomalous shrinkage soon after the interruption of chemicals (SILVA, 2024, p. 134). Phenomenological reports indicate that this This portion of the thread is so distinct and untamable that, when manipulated or caught, it visibly "screams." and screams" (SILVA, 2024, p. 134, 741). This subjective description of hair that "doesn't obey" It reflects the distress of a follicle that, although free from chemicals, has not yet reached full maturity. natural morphogenesis.

The hair transition is sociologically understood as a process of "detoxification." semantics," in which the woman seeks to rid herself not only of the chemical residue, but also of the historical stigma of "bad hair" (SILVA, 2024, p. 165, 897). The presence of scalp hair in this The internship acts as an identity complication, as the patient often "does not know her "natural hair" because she started straightening her hair in childhood, between the ages of 6 and 12. (SILVA, 2024, p. 136, 198). Thus, the lack of recognition of one's own thread generates a vacuum. The narrative that PRHS seeks to fill with technical justification.

The impact of scab hair on self-esteem is profound, often being associated with severe symptoms. "Emotional exhaustion" and psychological suffering (SILVA, 2024, p. 10, 161). Narratives of Black women indicate that, when unable to "cope" with the anomalous texture of the hair in In transition, they feel like "the ugliest person in the entire universe" (SILVA, 2024, p. 753). A Formalizing PRHS as a medical syndrome validates this pain, transforming a feeling of aesthetic inadequacy in a transient clinical condition of biological recovery of "dynamic mini-organ" which is the follicle (CAVALLI; ANTUNES, 2024, p. 35; SILVA, 2024, p. 161).

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Dealing with curly hair and scalp hair is often described using warlike metaphors, such as "war" or "conflict," indicating that the hair fiber is a territory of power struggle (SILVA, 2024, p. 158). The term "dealing with hair" carries meanings of burden, fatigue, and exploitation. referring to a compulsory aesthetic domestication that PRHS interrupts (GOMES, 2002) (cited in SILVA, 2024, pp. 107, 177). Scientific formalization allows this "dealing" to cease being... A punishment dictated by the nature of the thread should become a self-care protocol for restoration. of the stem.

Intersectionality is a necessary lens for understanding the weight of scab hair, because... The experiences of Black and white women with curly hair differ profoundly. historical and social (SILVA, 2024, p. 108). While for white women, scab hair may be seen as a "discovery" of a family heritage that is often silenced (SILVA, 2024, (p. 807, 970), for Black women, it represents the direct confrontation of processes of Self-rejection and shame instilled by structural racism (OLIVEIRA, 2008). PRHS acts, therefore, as a clinical leveler that recognizes the underlying differences without ignoring the A common ailment of damaged fibers.

Sociological analysis demonstrates that the lack of representation and the pressure for a certain standard of "Perfect curls" on social media create new forms of oppression during the transition. (SILVA, 2024, pp. 556-558). "Scab hair" is a phase in which the hair does not respond to either... Neither the straight hair standard nor the "defined curls" standard generates social isolation, in which women can avoid environments such as beaches, swimming pools or romantic encounters (SILVA, 2024, p. 150, 199, 752). Naming this phase PRHS removes the weight of individual failure and assigns responsibility to the... capillary exposome recovery process (CEDIRIAN et al., 2025; SILVA, 2024).

The recovery of ancestry and the construction of Black pride depend on the acceptance of... corporeality, in which hair is the material seat of identity (MUNANGA, 2012 apud SILVA, 2024, p. 898). PRHS, in technically explaining why the yarn is born with a compromised texture. After decades of negligence, it offers women the necessary support to uphold their decision. policy of "embracing" curly hair (SILVA, 2024, p. 883). This is an operation of intelligibility that allows the patient to reconcile with her image reflected in the mirror. during the biological latency period (SILVA, 2024, p. 897).

In conclusion, the Sociological and Identity Axis reiterates that scab hair is not an "invention of "Internet," but a lived reality that demands academic and medical validation. A Formalization of Post-Alkaline Relaxing Hair Syndrome (PRHS) fills a gap. nomenclaturalism that today renders invisible the suffering related to identity and the emotional strain of

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thousands of women (SILVA, 2024, p. 10, 161). By combining genomic trichology with sociology, This work demonstrates that hair health is inseparable from the reconstruction of identity and... human dignity.

Final Considerations

Alkaline Post-Relaxing Hair Syndrome (PRHS) represents the technical formalization- scientific knowledge is necessary to understand the phenomenon popularly known as "scab hair," which It manifests as a fiber with anomalous texture and porosity soon after interruption. of chemical straightening treatments. The contemporary movement of women seeking to reclaim their natural hair. Natural textures are not just an aesthetic change, but a complex process of... "Semantic detoxification" and the construction of an identity that has often been domesticated since childhood. Although omnipresent in accounts of experience, *scab lacked a category.* *Formal diagnosis in the clinical literature constitutes a gap* that the PRHS proposal addresses . The goal is to fill this gap by correlating phenomenological observation with damage mechanisms. follicular and with oxidative stress.

The biological basis of PRHS rests on the understanding of the hair follicle as a "dynamic mini-organ" whose regeneration cycles are regulated by a delicate balance. biochemical and genomic. Chronic use of high pH alkaline relaxants, such as hydrogen peroxide Sodium and guanidine impose a chemical stress that breaks disulfide bonds and depletes the The antioxidant defense system of the epidermis. Exhaustion of superoxide dismutase enzymes. (SOD) and catalase compromise the initial keratinization of the fiber, resulting in "fatigue "biochemistry" that explains why newborn hair deviates from the healthy natural pattern. Furthermore, inflammatory processes mediated by cytokines, such as TNF-ÿ and IL-1ÿ, alter the signaling of essential growth factors, such as IGF-1 and PPAR-ÿ, impacting the morphogenesis and stem quality during formation.

From a structural point of view, PRHS manifests itself through acquired stem effects. capillary, characterized by a protein mass rich in cystine and by cuticular regularities. visible under a microscope. The concept of the hair exposome reveals that hairs of ancestry African skin, due to its naturally thinner cuticles, is biologically more vulnerable. due to cumulative wear and tear *(weathering)* exacerbated by chemicals. This biological vulnerability This is reflected in women's subjective perception that their hair "screams and yells" when handled.

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during the transition, revealing a hair strand that does not reach its genetic strength and curl pattern.
due to the follicle's state of "biochemical emergency".
Sociologically, hair functions as an "identity icon" and messenger of meaning.
which classifies and hierarchizes individuals in society. The absence of a technical term in the databases
Clinical data relegates the "emotional strain" and identity distress of women in
transition to invisibility. By formalizing PRHS, medical trichology validates this pain as a
a transient physiological condition of follicular repair, removing the burden of the stigma associated with "hair."
"bad" and promoting racial literacy in health. The hair transition is no longer seen as
an aesthetic vacuum to be understood as a period of biographical and biological latency.
necessary for the re-establishment of follicular homeostasis.

In conclusion, the validation of PRHS provides a robust foundation for clinical practice.
humanized, allowing the transition to natural texture to occur safely and biosafely.
and with emotional support. Future research should prioritize the development of
Naturalistic and integrative protocols, focusing on the use of vegan formulations and oils.
Functional vegetables, as well as specific nutritional modulation. Strategies such as the adoption
The Mediterranean diet, rich in flavonoids, and the consumption of omega-3 constitute pathways.
effective in mitigating inflammatory responses and supporting the morphogenesis of healthy fiber.
Thus, the formalization of the syndrome opens doors to a science that respects the time of
Body recovery, integrating scalp health with the reconstruction of dignity and...
female identity.

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