Trichological Analysis for the Identification of Bovine Breeds

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Introduction

As a result of greater competition for resources and growing demand for animal products, livestock systems are now more productive and efficient. Animal Genetic Resources (AGR) are crucial for maintaining diverse livelihoods and ensuring the security of the world's food supply. The native cattle in Brazil are thought to be less productive under some circumstances, but they do exhibit distinctive traits of both rusticity and survival that may be required to assure possibility for future adaptation. Products with geographic indications are described as instances of policy to increase the competitiveness of goods from regional breeds in Europe, highlighting their distinction and qualification.

Description

The study's premise is that trichological analysis, which has a low execution cost and is just as effective as the use of molecular markers for species separation, is a feasible option for the characterisation of breeds in a productive setting. The microstructural patterns of the cuticle scales and the examination of hair medullary cells can be used to identify animals using this approach. These techniques also allow for the classification of order, family, gender and species [1].

According to Quadros and Monteiro-Filho, the transversely oriented cuticular scales are orientated transversely to the longitudinal axis of the hair. Since it is shared by numerous orders of mammals, this form of cuticular pattern cannot be utilised to distinguish between species. The scales in the erratic pattern might be longitudinal, transverse, or oblique with respect to the greatest axis of the hair. Additionally, the scales' dimensions might change.

De Marinis and Asprea noted that the domestication process led to alterations in a number of the cuticular traits and the uniformity that resulted made it difficult to distinguish between different species [2]. Similarities between the traits examined in these local breeds were anticipated and they were discovered between Curraleiro Pé-Duro and Bovino Pantaneiro. However, similarities between Bos taurus taurus (Caracu) and Bos taurus indicus were surprising (Nelore). It is possible, but not certain, that the modifications in these cattle might have been brought about through selection programmes and genetic improvement introduced into Caracu breeds to increase traits linked to meat and milk outputs [3].

The nomenclature that De Marinis, Asprea, Quadros and Monteiro-Filho employed and on which this study is based, however, differs from other nomenclatures. Guard hair orientation on the cuticle scales for Quadros and Monteiro-Filho might be transverse or uneven, i.e., they did not exhibit the two patterns described by De Marinis and Asprea. Only because Curraleiro Pé-Duro and Bovino Pantaneiro breeds had a transverse pattern, as opposed to the group Caracu and Nelore's uneven pattern, was breed distinction in two groups by scales evaluation conceivable. The study by De Marinis and Asprea did not define the breed or breeds utilised to represent the European bovine breeds, hence it was unable to draw the conclusion that this pattern is a more prevalent trait for these species.

Although professional opinions were taken into consideration, the hair comparison study is basically subjective and the results and conclusions are not yet quantitative. As a result, in order to lessen subjectivity in this work, both the morphological and the morphometric properties of the hair microstructures were identified. Serrano, et al. and Egito, noted that indigenous cattle, such as Bovino Pantaneiro cattle, have undergone genetic introgression from zebu strains. The scientists claimed that because to likely historical miscegenations, it was possible to confirm the introgression of genes of zebu origin in the Bovino Pantaneiro breed. In comparison to the Nelore breed, the Bovino Pantaneiro breed has a lesser degree of divergence [4].

The data were evaluated using multivariate approaches after evaluating the information discovered by individually assessing the morphological and morphometric data of guard hair microstructures. This choice was chosen in light of the fact that univariate studies can yield insufficient information, particularly when there is a link between the variables. The findings showed that genetic and trichological methods for classifying individuals within breed groups are comparable and as a result, trichological analysis may be used as a breed marker for bovine cattle. According to Alberts, et al., this gives researchers more flexibility in selecting methodologies based on the study's goals [5].

Conclusion

We draw the conclusion that trichological analysis is a practical technique for identifying cow breeds. Its potential application to additional mammal species of importance for animal production should be investigated because it is a straightforward, inexpensive and non-intrusive technique that can even be used as a breed tracing tool.

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Conflict of Interest

The author shows no conflict of interest towards this manuscript.

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