

Quality Control of Botanicals by HPTLC Analytical Method

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INTRODUCTION

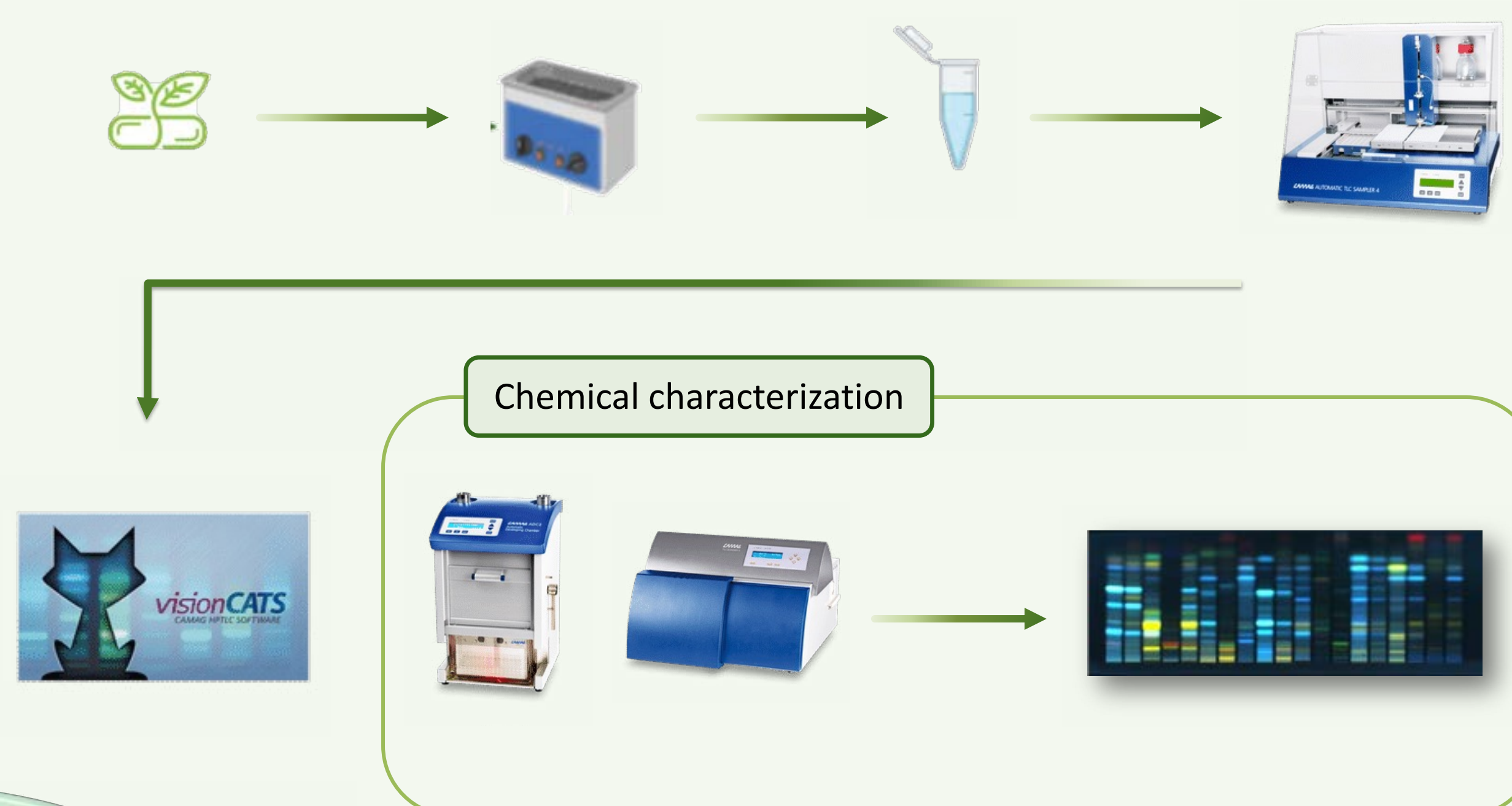
In recent years, the trade of botanical drugs has significantly increased due to imports from countries with poor environmental pollution control and the use of pesticides and herbicides in agriculture, such as Eastern Europe, Asia, and Africa. Additionally, products sold are often subject to adulteration or falsification, making quality control essential.

This situation has necessitated guidelines to ensure the quality of commercialized products. These guidelines are found in Pharmacopoeias, which provide identification assays and minimum quality requirements for any substance used as is or in preparations for therapeutic purposes, both magistral and officinal.

However, legislation on botanical drugs remains very deficient, and the botanical drugs used often do not meet the chemical-physical and pharmacological requirements necessary for proper therapeutic use.

EXPERIMENTAL PLAN

The samples are extracted in a suitable solvent, the extract is brought to a known concentration, and then analysed using HPTLC and compared with standard substances.



AIM

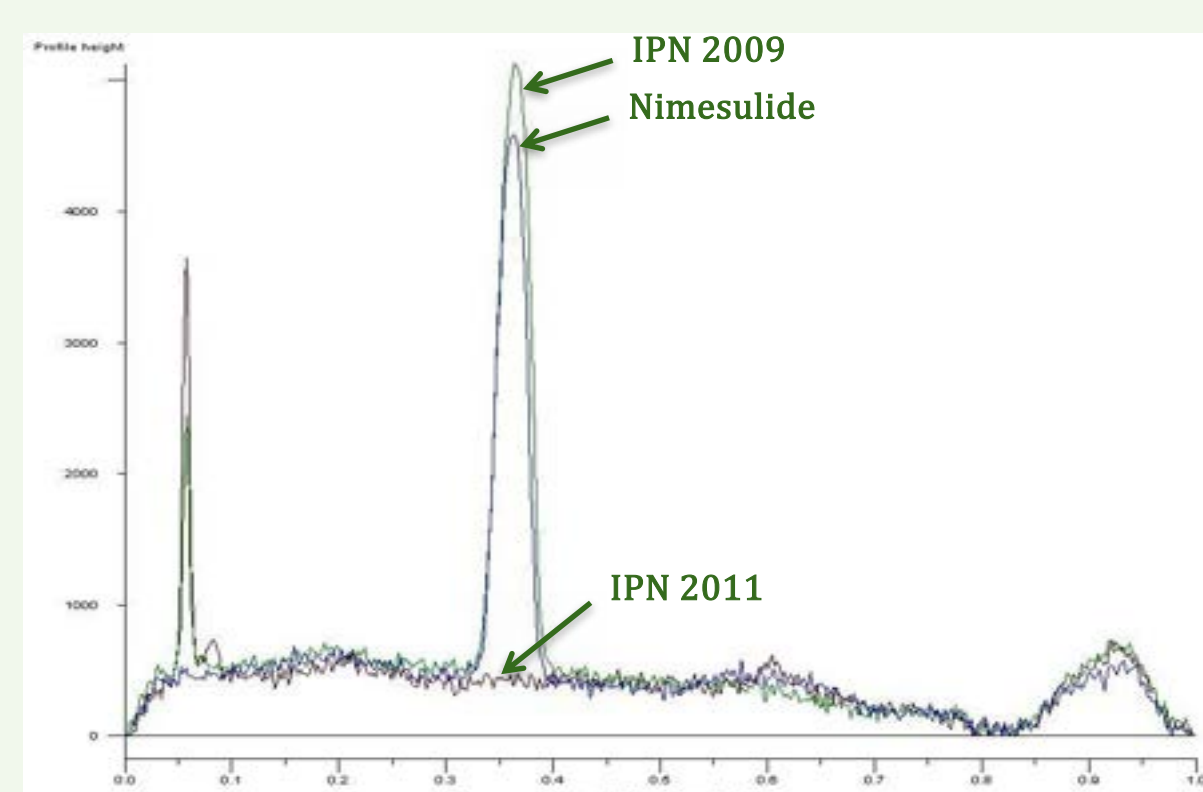
Identify any adulteration and/or falsification of food supplements.

RESULTS

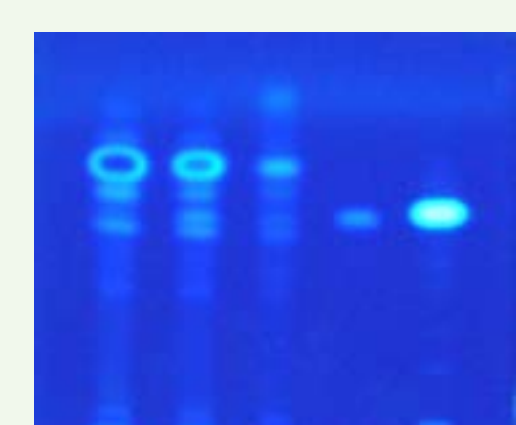
The Nimesulide case



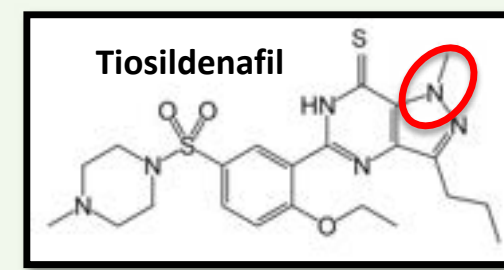
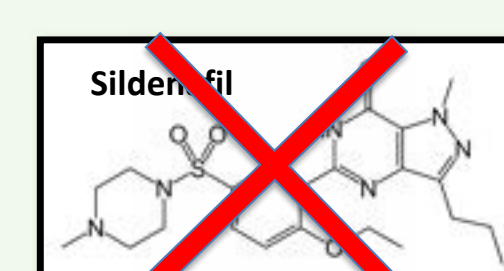
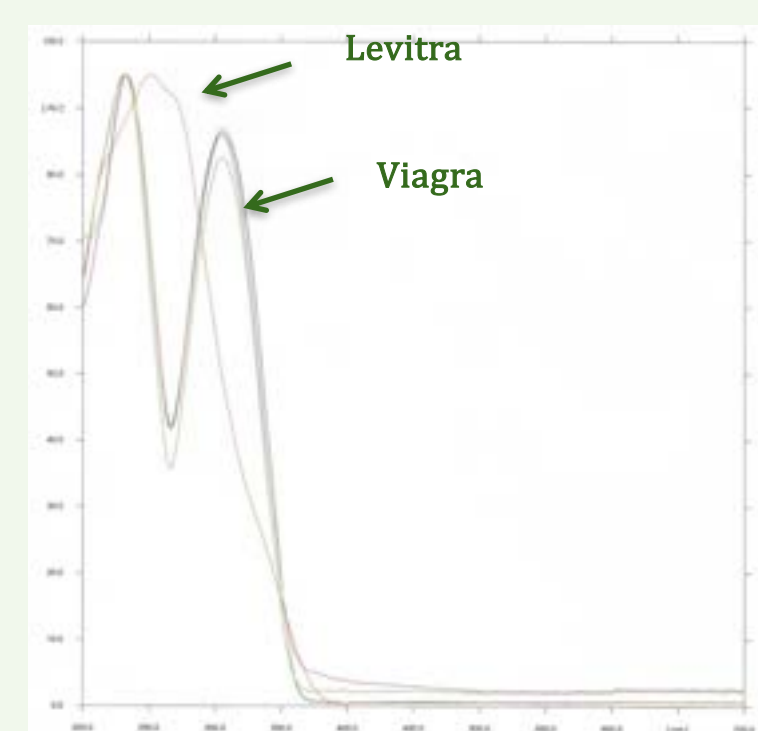
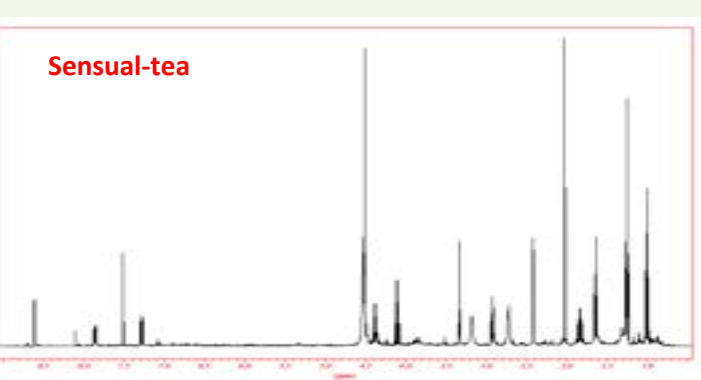
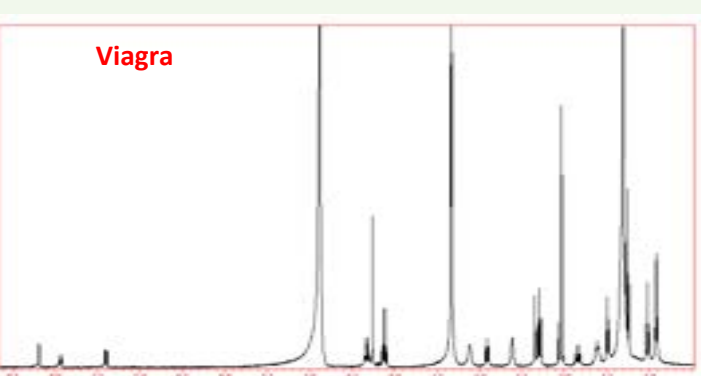
HPTLC plate under UV 254 nm: 1. IPN 2009; 2. IPN 2011; 3-5. Nimesulide at 3 different concentrations



The Sensual-tea case



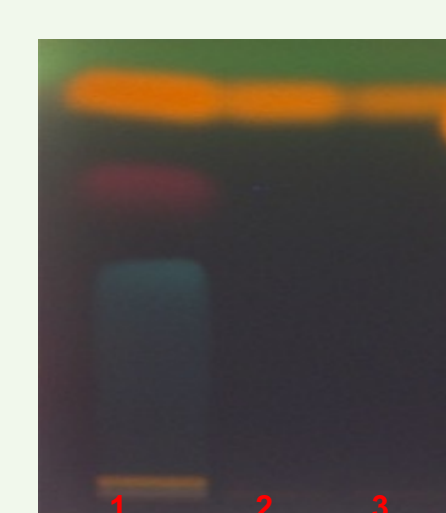
HPTLC plate under UV 366 nm: 1-3. Sensual tea at 3 different concentrations; 4. Viagra; 5. Levitra



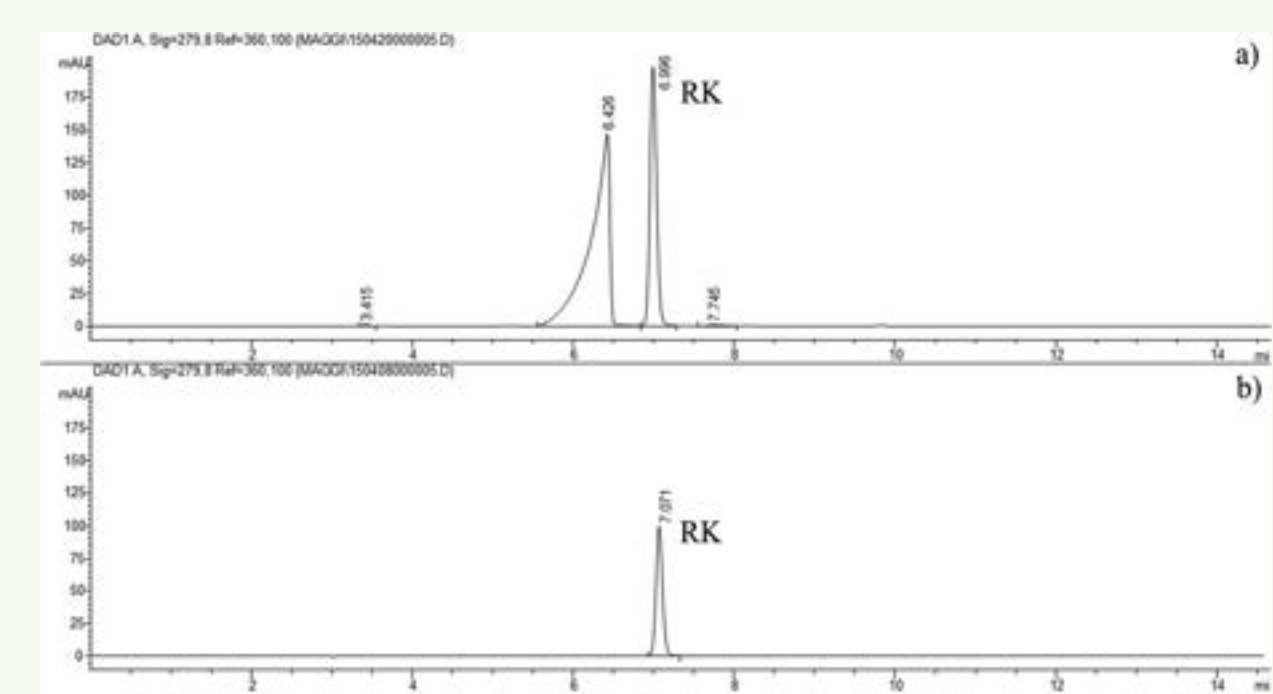
The raspberry case



HPTLC plate under white light: 1. Raspberry food supplement; 2-3. Raspberry ketone at 2 different concentrations



HPTLC plate under UV 366 nm: 1. Raspberry food supplement; 2-3. Raspberry ketone at 2 different concentrations



HPLC-DAD Chromatogram of Extract of Food Supplement (a) and Analytical Standard of Raspberry Ketone (RK) (b)

Discussions

Nimesulide case: An Italian food supplement aimed at promoting normal joint function, containing parthenium, chaste tree, devil's claw, and magnesium, exhibited an immediate response upon consumption. HPTLC analysis revealed that the product available on the market in 2009 was adulterated with nimesulide.

Sensual tea case: The analyzed product was marketed as a dietary supplement containing herbal extracts, intended for enhancing sexual function in both males and females. By employing HPTLC and NMR spectroscopy, the presence of a sildenafil derivative, thiosildenafil, was identified.

Raspberry Ketone case: Analyses conducted using HPTLC and HPLC-DAD on a commercially available product containing raspberry juice revealed an abnormal quantity of RK, not consistent with the natural content of the juice.

In conclusion...

The reported data confirm the need of adequate controls on marketed food supplements and the necessity of a complete adherence between labelling and real constitution of the product.