

Dr. Felister N. Mbwaga

Department of Pharmacognosy and Traditional Medicine, Lake Zone Health Research Institute, Mwanza, Tanzania

VOLUME01 ISSUE01 (2024)

Published Date: 28 December 2024 // Page no.: - 78-82

ABSTRACT

In Tanzania, many people trust and rely on herbal remedies for their health needs, including for sensitive issues like erectile dysfunction (ED). These products are popular because they are seen as natural, affordable, and safe. But is that always the case? Our investigation set out to answer this question by looking at herbal products sold for ED in the Mwanza region. We collected and tested 40 different herbal remedies from local vendors. What we found was alarming. A staggering 62.5% of these products—more than half—were secretly mixed with powerful synthetic drugs used in prescription medications like Viagra (sildenafil) and Cialis (tadalafil). Some of these products contained dangerously high amounts of these drugs, in one case reaching nearly one and a half times the maximum recommended daily dose. This hidden adulteration is a serious public health risk. Consumers believe they are taking a natural remedy, but they are unknowingly ingesting potent pharmaceuticals in unregulated doses. This report sheds light on the scale of this problem and calls for urgent action to protect the health and safety of the Tanzanian public.

Keywords: Herbal Medicine, Erectile Dysfunction, Adulteration, Sildenafil, Tadalafil, Public Health, Tanzania, HPTLC, Market Surveillance, Consumer Safety.

INTRODUCTION

Across Tanzania, and indeed much of Africa, traditional medicine is not just an alternative—it's a way of life. For generations, communities have relied on herbal remedies passed down through families and healers [2, 3]. There's a deeply held belief in the power of nature to heal, and these products are often the first choice for many because they are affordable, accessible, and culturally familiar [1]. This trust is profound; for many, the local healer or market vendor is a more approachable figure than a doctor in a clinic.

This is especially true for personal and sensitive health conditions like erectile dysfunction (ED). ED is a common issue that affects millions of men worldwide, impacting their well-being, confidence, and relationships [4, 5]. While modern medicine offers effective treatments like sildenafil (the active ingredient in Viagra) and tadalafil (Cialis), many men prefer to seek out herbal solutions. They may do so to avoid the perceived stigma of a clinical diagnosis, or simply because they believe a "natural" product will be gentler and have fewer side effects [8].

Unfortunately, this trust is being exploited on a massive scale. A dangerous and deceptive trend has emerged where so-called "herbal" products are secretly laced with the very same synthetic drugs they are supposed to replace [7]. Unscrupulous producers do this for a simple reason: it makes their products work. By adding a dose of sildenafil or tadalafil, they can guarantee a physiological

effect. This builds the product's reputation through word-of-mouth, ensuring repeat customers and boosting sales [9].

The user, however, is left completely in the dark, caught in a dangerous deception. They are taking a potent prescription drug without a doctor's supervision, without knowing the dose, and without being warned of the potentially life-threatening risks. For a man with a heart condition who takes nitrate medication for chest pain, for example, unknowingly taking one of these adulterated products could trigger a sudden, catastrophic drop in blood pressure [4].

This isn't a new problem in Tanzania. The authorities have previously been forced to intervene, banning popular products like "Vumbi la Mkongo" and "AKAYABAGU" after laboratory tests confirmed they were spiked with sildenafil [10, 11]. But these actions often feel like a game of whack-a-mole; as soon as one product is removed, others appear in its place. We wanted to know: how widespread is this issue today? Is it confined to a few bad actors, or is it a systemic problem? To find out, we decided to conduct a focused investigation in Mwanza, a major city and economic hub in northwestern Tanzania.

METHODS

Our approach was designed to be a real-world snapshot of the market. We wanted to test the products that are actually available to the average person in Mwanza.

Our research team went to the places where people buy these remedies. Between April and May 2023, we visited a variety of vendors across the Nyamagana and Illemela districts. We didn't limit ourselves to formal shops; we purchased products from registered herbal clinics, pharmacies, informal street vendors, and bustling market stalls. This strategy ensured we captured a representative sample of the entire market. In total, we purchased 40 different products that were all being sold with the claim of treating erectile dysfunction. Each sample was given a unique code, and we carefully documented its form (powder, liquid, capsule, etc.) and the seller's instructions for use.

Laboratory Analysis: Uncovering the Truth

Back in the laboratory, our goal was to find out what was really inside these products. We used a reliable and cost-effective scientific technique called High-Performance Thin-Layer Chromatography (HPTLC). This method is excellent for separating chemical compounds and is well-suited for detecting synthetic drugs hidden in complex herbal mixtures [11, 12, 13].

The process worked like this:

1. Sample Preparation: First, we had to get the potential drugs out of the herbal matrix. For powders and capsules, we carefully weighed a portion and used methanol, a solvent, to dissolve and extract any active ingredients. For liquids, we used a measured volume.
2. Creating a Benchmark: Science requires comparison. We prepared pure, known standard solutions of sildenafil and tadalafil. These would act as our "fingerprints" for identification.
3. The Chromatogram: We spotted tiny, precise

amounts of each sample extract and the pure standards onto a special silica-coated plate. This plate was then placed in a developing chamber with a specific solvent mixture. As the solvent slowly moved up the plate, it carried the different chemical components with it at different speeds.

4. Identification and Quantification: After the process was complete, we could see how far the spots from the herbal samples had traveled and compare them to the spots from our pure drug standards. If a spot from a sample matched the position of the sildenafil standard, we knew the product was adulterated with sildenafil. The same process was used for tadalafil. To find out how much drug was present, we used a special scanner to measure the size and intensity of the spot. By comparing this measurement to the spots from our standards of known concentrations, we could accurately calculate the dose of the hidden drug in each product.

RESULTS

Our laboratory analysis confirmed our fears—and then some. The results paint a disturbing picture of the herbal market in Mwanza, revealing a problem that is both widespread and dangerous.

A Market Saturated with Adulterated Products

More than half of the products we tested were a sham. Out of 40 samples, a staggering 25 (or 62.5%) were adulterated with either sildenafil, tadalafil, or a combination of both. This means that for every ten "herbal" aphrodisiacs on the market in Mwanza, more than six contain hidden synthetic drugs. The most common trick was to mix in both drugs, which we found in 14 of the products, subjecting users to an untested cocktail of pharmaceuticals.

Table 1: Proportions of Adulteration in Aphrodisiac-Claimed Herbal Products (n=40)

Adulterant	Frequency	Proportion (%)	95% Confidence Interval
Sildenafil	2	5.0%	0.6–16.9%
Tadalafil	9	22.5%	10.8–38.4%
Sildenafil + Tadalafil	14	35.0%	20.6–51.7%
Total Adulterated	25	62.5%	46.0–77.2%
None Detected	15	37.5%	22.8–54.0%

Dangerously High and Unpredictable Doses Even more shocking than the prevalence of adulteration was the amount of drugs we found. The doses were wildly inconsistent, showing a complete and dangerous lack of

quality control. The amount of sildenafil detected ranged from a small, likely ineffective 3.5 mg dose to an incredibly dangerous 146 mg.

To put that in perspective, the maximum recommended

daily dose for sildenafil is 100 mg. Two of the products we tested contained more than this maximum limit. Imagine taking one and a half times the maximum dose of

a prescription painkiller without knowing it. That is the level of risk consumers are being exposed to.

Table 2: Amounts of Sildenafil and Tadalafil Detected in Selected Adulterated Herbal Products

Sample ID	Adulterant(s)	Quantity of Adulterant Detected
3504/23	Sildenafil and Tadalafil	123 mg and 0.9 mg
0504/23	Sildenafil and Tadalafil	3.5 mg and 6.4 mg
0704/23	Sildenafil and Tadalafil	58 mg and 2.3 mg
2804/23	Sildenafil	40.6 mg
0804/23	Sildenafil	146 mg
2904/29	Tadalafil	6.5 mg
3604/23	Sildenafil and Tadalafil	32.7 mg and 9.5 mg
4004/23	Tadalafil	6.3 mg

DISCUSSION

These findings are more than just numbers on a page; they represent a profound betrayal of public trust and a serious, immediate threat to public health. People who buy these products are actively trying to use a natural approach to their health. Instead, they are being deceived into taking potent pharmaceuticals without their knowledge or consent. This is not just a local problem; it is a regional crisis, with similar findings reported in Kenya, Uganda, and Nigeria, suggesting a widespread, systemic failure to protect consumers across East Africa [14, 15, 16].

The consequences of this deception can be severe. A person taking a product with 146 mg of sildenafil is at a heightened risk of priapism (a painful, prolonged erection that can cause permanent damage), severe headaches, visual disturbances, and other serious side effects. For someone with an underlying heart condition, the risk is even greater and potentially fatal [4].

The fact that many products contained a cocktail of both sildenafil and tadalafil is particularly troubling. These two drugs have different durations of action and have never been clinically tested for safety when taken together. In essence, the manufacturers of these products are conducting a reckless and uncontrolled medical experiment on the public, with no regard for the potential interactions or compounded side effects.

This situation points to a clear and critical failure in the regulation of the herbal medicine market. Despite past

efforts by authorities, these dangerous products are still easy to find and buy from both formal and informal sellers. It is clear that the current system is not working and that a much more robust, proactive, and sustained system of surveillance and enforcement is needed to get these products off the shelves and hold the manufacturers accountable.

CONCLUSION AND RECOMMENDATIONS

Our investigation confirms that the market for herbal ED remedies in Mwanza is flooded with illegally adulterated products. This is not a minor issue; it is a major public health crisis that puts uninformed consumers at risk every day. The deep-seated trust that people place in traditional medicine is being abused for profit, and it is time for decisive, coordinated action.

Based on our findings, we strongly urge the following actions:

- For Regulatory Bodies like the TMDA:
 - Ramp Up Enforcement: Conduct frequent, unannounced inspections and testing of herbal products across the country, not just in major cities. This should include deploying mobile testing units to reach remote and informal markets.
 - Impose Harsh Penalties: Ensure that manufacturers and sellers of adulterated products face severe consequences, including hefty fines and criminal charges, to create a meaningful deterrent.
 - Launch Public Awareness Campaigns: Use radio,

television, social media, and community outreach programs to inform the public in multiple languages about the dangers of these products and how to identify and report potentially unsafe remedies.

- For Doctors and Healthcare Workers:

- Always Ask: Make it a routine practice to ask patients about their use of herbal supplements, especially when prescribing medications for cardiovascular conditions, diabetes, or hypertension.
- Educate Your Patients: Take the time to inform them about the specific risks of adulterated products and the potential for life-threatening drug interactions. Provide a safe and non-judgmental space for them to discuss these issues.

- For the Research Community:

- Broaden the Scope: Conduct larger-scale, nationwide studies to understand the full extent of this problem across all regions of Tanzania.
- Use Advanced Technology: Employ more sensitive analytical methods like LC-MS/MS to create a comprehensive profile of all adulterants present, including other PDE-5 inhibitors and their chemical analogues.
- Understand the "Why": Conduct sociological and anthropological research to better understand the cultural and personal motivations that drive consumers to choose these products. This knowledge is crucial for designing public health messages that resonate and lead to real behavioral change.

REFERENCES

1. A. Shankar, A. Dubey, D. Saini, and C. P. Prasad, "Role of Complementary and Alternative Medicine in Prevention and Treatment of COVID-19: An Overhyped Hope," *Chinese Journal of Integrative Medicine* 26, no. 8 (2020): 565–567, <https://doi.org/10.1007/s11655-020-2851-y>.

2. A. Liwa, R. Roediger, H. Jaka, et al., "Herbal and Alternative Medicine Use in Tanzanian Adults Admitted With Hypertension-Related Diseases: A Mixed-Methods Study," *International Journal of Hypertension* 2017 (2017): 9, 5692572, <https://doi.org/10.1155/2017/5692572>.

3. N. Chaachouay, A. Douira, and L. Zidane, "Herbal Medicine Used in the Treatment of Human Diseases in the Rif, Northern Morocco," *Arabian Journal for Science and Engineering* 47, no. 1 (2022): 131–153, <https://doi.org/10.1007/s13369-021-05501-1>.

4. F. Mazzilli, "Erectile Dysfunction: Causes, Diagnosis and Treatment: An Update," *Journal of Clinical Medicine* 11, no. 21 (2022): 6429, <https://doi.org/10.3390/jcm11216429>.

5. A. Kessler, S. Sollie, B. Challacombe, K. Briggs, and M. Van Hemelrijck, "The Global Prevalence of Erectile Dysfunction: A Review," *BJU International* 124, no. 4 (2019): 587–599, <https://doi.org/10.1111/bju.14813>.

6. R. G. Saltzman, R. Golan, T. A. Masterson, A. Sathe, and R. Ramasamy, "Restorative Therapy Clinical Trials for Erectile Dysfunction: A Scoping Review of Endpoint Measures," *International Journal of Impotence Research* 35, no. 8 (2023): 720–724, <https://doi.org/10.1038/s41443-022-00610-3>.

7. K. O. Abuga, "Adulteration of Herbal Preparations," *East and Central African Journal of Pharmaceutical Sciences* 24, no. 1 (2021): 1–2.

8. K. Leisegang and R. Finelli, "Alternative Medicine and Herbal Remedies in the Treatment of Erectile Dysfunction: A Systematic Review," *Arab Journal of Urology* 19, no. 3 (2021): 323–339, <https://doi.org/10.1080/2090598X.2021.1926753>.

9. F. Akuamoa, T. F. H. Bovee, R. van Dam, et al., "Identification of Phosphodiesterase Type-5 (PDE-5) Inhibitors in Herbal Supplements Using a Tiered Approach and Associated Consumer Risk," *Food Additives & Contaminants: Part A* 39, no. 6 (2022): 1021–1032, <https://doi.org/10.1080/19440049.2022.2052972>.

10. BBC News, "Kwanini dawa ya asili ya 'mkongo' imepigwa marufuku Tanzania-BBC News Swahili" 2022, [cited 2025 Mar 27]. Available from: <https://www.bbc.com/swahili/articles/cpejy0kyze4o>.

11. C. J. Mwankuna, E. E. Mariki, F. P. Mabiki, H. M. Malebo, B. Styrihave, and R. H. Mdegela, "Thin Layer Chromatographic Method for Detection of Conventional Drug Adulterants in Herbal Products," *Separations* 10, no. 1 (2023): 23, <https://doi.org/10.3390/separations10010023>.

12. T. S. Reddy, A. S. Reddy, and P. S. Devi, "Quantitative Determination of Sildenafil Citrate in Herbal Medicinal Formulations by High-Performance Thin-Layer Chromatography," *JPC-Journal of Planar Chromatography-Modern TLC* 19, no. 112 (2006): 427–431, <https://doi.org/10.1556/JPC.19.2006.6.4>.

13. E. A. Abourashed, M. S. Abdel-Kader, and A. A. M. Habib, "HPTLC Determination of Sildenafil in Pharmaceutical Products and Aphrodisiac Herbal Preparations," *JPC-Journal of Planar Chromatography-Modern TLC* 18, no. 105 (2005): 372–376, <https://doi.org/10.1556/JPC.18.2005.5.7>.

14. S. W. A. Sifuma, J. W. Mwangi, P. C. Mutai, D. B. Ongarora, and N. M. Njuguna, "Evaluation of Adulteration of Herbal Medicine Used for Treatment of Erectile Dysfunction in Nairobi County, Kenya," *International Journal of Pharmaceutical Sciences and Research (IJPSR)* 13, no. 5 (2022): 2095–2100.

EUROPEAN JOURNAL OF EMERGING BIOMED RESEARCH

15. K. Dumba, W. Kwiringira, J. Namukobe, and M. Ntale, "Identification and Analysis of Adulterants in Aphrodisiac Herbal Medicines Sold by Private Herbal Clinics, Pharmacies and Herbal Drug Shops in Kampala, Uganda," *East and Central African Journal of Pharmaceutical Sciences* 24, no. 1 (2021): 3-14.
16. A. L. Tama, A. Musa, M. A. Usman, and S. Awwalu, "Evaluation of Sildenafil as an Undeclared Adulterant in Herbal Aphrodisiac Preparations by HPLC," *Saudi Journal of Medical and Pharmaceutical Sciences* 6, no. 2 (2020): 168-172, <https://doi.org/10.36348/sjmps.2020.v06i02.004>.