

# The Prevalence of Acceptable Quality of Women Herbal Products Sold Online in Malaysia

Nurul Arina Amir Omar<sup>1</sup>, Siti Fatimah Sabran<sup>1\*</sup>

<sup>1</sup>Department of Technology and Natural Resources, Faculty of Applied Sciences and Technology, Universiti Tun Hussein Onn Malaysia (Pagoh Campus), KM 1, Jalan Panchor, 84600 Muar, Johor, MALAYSIA

\*Corresponding Author

DOI: <https://doi.org/10.30880/jsunr.2022.03.02.006>

Received 02 January 2022, Accepted 30 June 2022, Available online 31 December 2022

**Abstract:** The aim of this study is to determine the prevalence of quality herbal products sold online in Malaysia. The quality of herbal products focuses on two specific issues which are the legality of the labelling on herbal products and microbial contamination in herbal products. Using keywords such as 'herbal products', 'jamu', and 'women herbal products' in Malaysian online stores, a total of 110 herbal products were selected. Their labels were observed and analyzed. 90.1% of the selected products are registered and fulfilled the labelling guidelines as required by National Pharmaceutical Registration Authority (NPRA). We obtained 10 samples of the herbal products found for bacterial contamination analysis. Our results show that all of the products contains gram-negative bacteria, but with an acceptable number of colony forming unit (CFU <math><10^7</math>). It is also worth noting that none was contaminated with *Escherichia coli*, *Salmonella* sp. and *Staphylococcus aureus*.

**Keywords:** Labeling, microbial contamination, women herbal products

## 1. Introduction

Herbs can be defined as any plants products that constitute large portion of conventional and alternative medicine (CAM) [1]. Malaysia is rich in medicinal plants that are not only useful in cooking but also beneficial for human health. This useful knowledge needs to be noticed by the public in order to benefit from it. Development of a Malaysian medicine herb identification system may assist this [2]. Based on [3], there are ten medicinal plants that are well-known and used in Malaysia. Herbal medicine is a product containing natural sources such as medicinal plants that undergo drying, crushing or grinding. Herbal products are known to use more than one plant and may contain some active ingredient [4]. Manufacturers that produced herbal products are enforced to comply with Good Manufacturing Practices (GMPs), and importers are required to comply with Good Storage Practices (GSPs) [5].

About 80% of world population used herbal products as their primary healthcare products [6]. People who usually use herbal products in their daily lives are among adult women [7] for various ailments such as heart disease, skin sensitivity, and health factors [8, 9].

The required labelling criteria for product registration by National Pharmaceutical Registration Authority (NPRA) are the products name, name and the strength of the active ingredient contained in the products, dosage form, the batch number or lot number, the manufacturing and expiry date or can be expiry date only, the direction on how to use the products, the intended use of the products, storage conditions, name and address of manufacturer and name and address of marketing authorization holder or the importer [10]. Patients with chronic ailments such as heart disease or cancer need to consult their doctor prior to consuming herbal products as an alternative medicine. It is because the ingredient in the herbal products may have an unexpected outcome, which is especially common in cancer patients. The ingredient in the herbal product may activate the cancer cell and make the situation worse [11].

On the other hand, the herbal products may contain some microbial contamination from the herbal processing procedures. Bacteria that can cause serious health hazard such as *Salmonella* sp., *Escherichia coli*, *Staphylococcus aureus*, *Shigella* sp. and the other Gram positive and negative strains of bacteria [12, 13]. The objectives of this

\* Corresponding author: [fatimahsb@uthm.edu.my](mailto:fatimahsb@uthm.edu.my)

research were i) to identify the labeling compliance on selected herbal products and ii) to determine the microbial contamination in the selected herbal products.

## **2. Methodology**

### **2.1 Collecting and Sampling Herbal Product**

The products were searched using three keywords: 'herbal products', '*jamu*', and 'women herbal products' from online shopping platforms in Malaysia: Platform A, Platform B and Platform C. About 110 products were surveyed from three different platform based on the top products sold. From 110 products surveyed, ten products were bought from the platform. In platform A and B, top four products were bought while in platform C, top two products were bought.

### **2.2 Label Compliance**

The legality of the herbal products was identified based on the product label compliancy [14,15]. Following the labelling criteria as enforced by NPRA, the legally registered herbal products should consist of the product name, the type of the product (such as capsule), the manufacturer's name and address, manufacturing date, expiry date and the registration number of the products that contain MAL code [4].

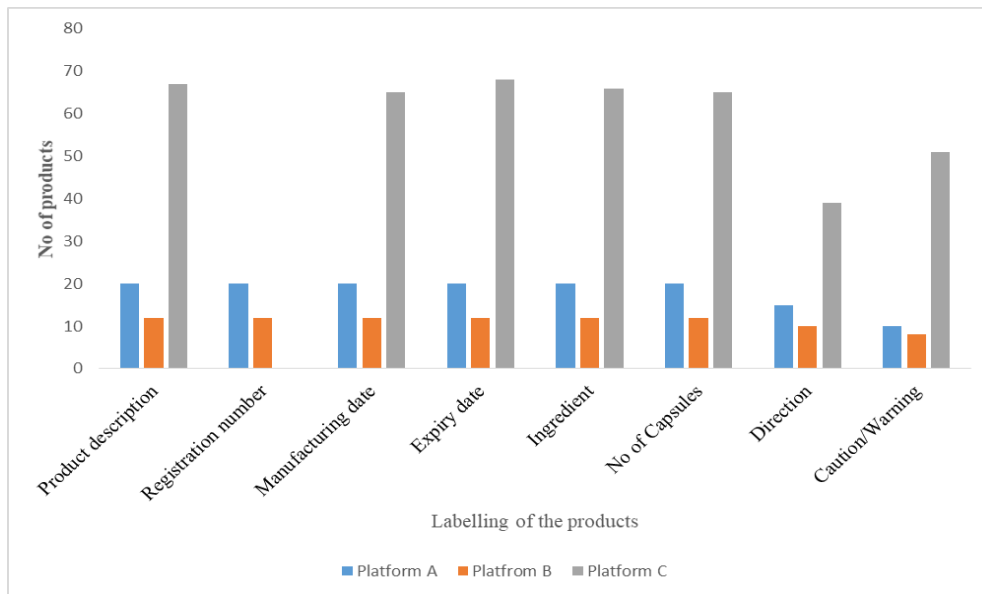
### **2.3 Microbial Contamination Test**

Possible microbial contamination in the herbal product was tested by using total aerobic microbial counts (TAMC) [16]. The raw material in the capsule was taken out and collected in a vial. 1 g of the sample was mixed with 10 mL of casein soy broth and incubated into the incubator at 32°C for 24 hours [16]. After 24 hours of incubating the raw sample, all the samples were taken out and shaken to homogenize the mixture. Then, 10 mL of the mixture of sample and casein soy broth were taken out from each sample and mixed into 100 mL of MacConkey broth and incubated again at 42°C for 48 hours [16]. After 48 hours of incubating the mixture in incubator, the mixture or broth were taken out from the incubator and put in the fume hood. The mixture in the MacConkey broth was sub cultured on MacConkey agar using a cotton swab and incubated at 42°C for 72 hours. The tests were done in triplicates. All the bacteria that had grown on the MacConkey agar were calculated for their colony forming unit (CFU) and were observed for their morphology and photographed for further identification [16].

## **3. Results and Discussion**

### **3.1 Herbal Products Label Compliancy and Registration Status**

Based on the survey made in three different online shopping platforms, 110 herbal products were found by using the same keywords: 'herbal products', '*jamu*', and 'women herbal products'. The product from platform A and B were manufactured and prepared from Malaysia while products in platform C was prepared and manufactured in USA. There are 20 products that followed the NPRA guideline were sold via platform A, 12 herbal products sold in platform B followed the NPRA guideline, and 68 herbal products found in platform C that followed the guideline NPRA. Based on the labelling of the products, only 9.9% or 10 products were not registered in NPRA. Out of the 100 registered herbal products, the mandatory labelling of the three different platforms' herbal products was observed. The result from the observation is stated in Figure 1 below.



**Fig 1 - The mandatory labeling in herbal product labels**

From Figure 1, the online platform that provides the highest product description is platform C while the lowest product description is platform B. This is because via platform C, the product description by the seller is mandatory for them in order to sell their products. It is interesting to note that, registration numbers of herbal products sold in platform A and platform B are local registration numbers, following the NPRA code while registration numbers of herbal products sold in platform C are international code, following the U.S. FDA code.

### 3.2 Microbial Contamination Content

Based on Table 1, ten products were selected observe for possible microbial contamination using TAMC.

**Table 1 - Average number of the bacterial colony and possible identified bacteria**

No	Name	Average CFU	Description	Possible Bacteria
1	<i>Jamu Pink</i>	$8.70 \times 10^4$	<ul style="list-style-type: none"> <li>Pale pink</li> <li>The bacteria dry</li> <li>Have bit mucus around the bacteria colony.</li> </ul>	<ul style="list-style-type: none"> <li><i>Shigella</i> spp</li> </ul>
2	<i>Jamu nenek</i>	$7.73 \times 10^4$	<ul style="list-style-type: none"> <li>Pink</li> <li>Have mucus around the bacteria colony and</li> <li>Foul smell</li> </ul>	<ul style="list-style-type: none"> <li><i>Proteus</i> spp.</li> </ul>
3	<i>Fem Dophilus</i>	$7.07 \times 10^4$	<ul style="list-style-type: none"> <li>Dark pink</li> <li>Have mucus and thick</li> </ul>	<ul style="list-style-type: none"> <li><i>Klebsiella</i> spp</li> </ul>
4	<i>Kunyit Putih</i>	$6.26 \times 10^4$	<ul style="list-style-type: none"> <li>Pale pink</li> <li>Less mucus around the bacteria colony</li> </ul>	<ul style="list-style-type: none"> <li><i>Shigella</i> spp</li> </ul>
5	<i>Jamu Sedap Malam</i>	$5.63 \times 10^4$	<ul style="list-style-type: none"> <li>Pale pink</li> <li>Less mucus around the bacteria colony</li> <li>Thick and close colony</li> </ul>	<ul style="list-style-type: none"> <li><i>Proteus</i> spp.</li> </ul>
6	<i>Jamu Kacip Fatimah</i>	$1.32 \times 10^5$	<ul style="list-style-type: none"> <li>Pale pink</li> <li>Less mucus around bacteria colony</li> <li>Foul smell</li> </ul>	<ul style="list-style-type: none"> <li><i>Shigella</i> spp</li> </ul>
7	<i>Kapsul Manjakani</i>	$1.15 \times 10^5$	<ul style="list-style-type: none"> <li>Pale pink</li> <li>Less mucus around the bacteria colony</li> <li>Foul smell</li> </ul>	<ul style="list-style-type: none"> <li><i>Proteus</i> spp. / <i>Shigella</i> spp</li> </ul>

8	<i>Lady Dream</i>	1.13 x 10 <sup>5</sup>	<ul style="list-style-type: none"> <li>• Pink</li> <li>• Less mucus around the bacteria but dry on the colony</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Shigella</i> spp.</li> </ul>
9	<i>Manjakani Homemade</i>	1.12 x 10 <sup>5</sup>	<ul style="list-style-type: none"> <li>• Pink</li> <li>• Have mucus around the bacteria</li> <li>• Thick colony</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Klebsiella</i> spp.</li> </ul>
10	<i>Vitamin Code</i>	1.03 x 10 <sup>5</sup>	<ul style="list-style-type: none"> <li>• Pink</li> <li>• Have mucus</li> <li>• Foul smell</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Proteus</i> spp.</li> </ul>

CFU: colony-form unit

Based on the observation of the bacteria colony of 10 different products, the highest number of bacteria colonies was found in *Jamu Kacip Fatimah* which has average of 1.32 x 10<sup>5</sup> CFU while the lowest number of bacteria colony formed was found in *Jamu Sedap Malam* with 5.63 x 10<sup>4</sup> CFU. The most possible bacteria found from all the products tested were *Proteus* spp., *Shigella* spp and *Klebsiella* spp. with no growth of harmful bacteria such as *Escherichia coli*, *Salmonella* spp and *Candida albican* [17]. It is important to note that the CFU ranges from 10<sup>4</sup> to 10<sup>5</sup> CFU, which is under the acceptable amount (CFU < 10<sup>7</sup>).

#### 4. Conclusion

From online platform A, platform B and platform C, there are 110 traditional herbal products for women's health that passed the legality requirement by NPRA, with platform C being the highest recorded herbal products (68 items). From this result, it is concluded that platform C is the more reliable online platform to sell and buy herbal products online as compared to platform A and platform B. A total of ten selected products were further analysed for microbial contamination. It is concluded that although the selected products passed the legality requirement, opportunistic bacteria such as *Klebsiella* spp, *Shigella* spp and *Proteus* spp. may still be present in the product.

#### References

- [1] Tachjian, A., Maria, V., & Jahangir, A. (2010). Use of herbal products and potential interactions in patients with cardiovascular diseases. *Journal of the American College of Cardiology*, 55(6),515-525.
- [2] Ibrahim, Z., Sabri, N., & Mangshor, N. N. A. (2018). Leaf recognition using texture features for herbal plant identification. *Indonesian Journal of Electrical Engineering and Computer Science*, 9(1), 152-156.
- [3] n.d. (2016). *Laman Utama*. Jabatan Perhutanan Semenanjung Malaysia - Jabatan Perhutanan Semenanjung Malaysia. Retrieved January 20, 2022, from <https://www.forestry.gov.my/my/tumbuhan-ubatan>
- [4] National Pharmaceutical Regulatory Agency (2021). *Drugs Registration Guidelines Document (3<sup>rd</sup> ed.)*. Malaysia: Ministry of Health.
- [5] Jayaraj, P. (2010). Regulation of traditional and complementary medicinal products in Malaysia. *International Journal of Green Pharmacy (IJGP)*, 4(1).
- [6] Ekor, M., (2014). The growing use of herbal medicines: issues relating to adverse reactions and challenges in monitoring safety. *Frontiers in pharmacology*, 4, 177.
- [7] González-Stuart, A., (2011). Herbal product use by older adults. *Maturitas*, 68(1), 52-55.
- [8] Saokaew, S., Suwankesawong, W., Permsuwan, U., & Chaiyakunapruk, N. (2011). Safety of herbal products in Thailand. *Drug safety*, 34(4), 339-350.
- [9] Welz, A. N., Emberger-Klein, A., & Menrad, K. (2018). Why people use herbal medicine: insights from a focus-group study in Germany. *BMC complementary and alternative medicine*, 18(1), 1-9.
- [10] Raj, R. K., & Chandrul, K. K. (2016). Regulatory Requirements for Cosmetics in Relation with Regulatory Authorities in India against US, Europe, Australia and Asean Countries. *International Journal of Pharma Research and Health Sciences*, 4(5), 1332–1341. <https://doi.org/10.21276/ijprhs.2016.05.01>
- [11] Montbriand, M. J. (2005). Herbs or Natural Products That May Cause Cancer and Harm: Part Four of a Four-Part Series. *Oncology Nursing Forum*, 32(1). <https://doi.org/10.1188/05.onf.e20-e29>
- [12] Al Kahtani, M. D. (2016). Identification and Quantification of Microbial Contaminations Present in Herbal Medicines Commonly Consumed by Women in Riyadh, Saudi Arabia. *Journal of Agricultural Chemistry and Environment*, 6(1), 83-92.
- [13] Aziz, I. H. (2019, February 19). *Suplemen "beracun" di pasaran*. Berita Harian. <https://www.bharian.com.my/bhbongkar/2018/09/472657/suplemen-beracun-di-pasaran>
- [14] Sornchaitawatwong, C., Tadtong, S., & Tangkiatkumjai, M. (2020). The prevalence of acceptable quality herbal products in Thailand. *Journal of Herbal Medicine*, 24, 100391.
- [15] D. G. of Health, (2020, July 15). *Kenyataan Akhbar KPK 15 Julai 2020 – Produk-Produk Kosmetik Yang Dikesan Mengandungi Racun Berjadual*. From the Desk of the Director-General of Health Malaysia.

<https://kpkesehatan.com/2020/07/15/kenyataan-akhbar-kpk-15-julai-2020-produk-produk-kosmetik-yang-dikesan-mengandungi-racun-berjadual/>.

- [16] Malaysian Herbal Monograph Committee (2013). Malaysian Herbal Monographs. Vol:3. ISBN: 9789675221934
- [17] Tankeshwar, A. (2021, June 21). *MacConkey Agar: Composition, Uses, Colony Characteristics*. Microbe Online. <https://microbeonline.com/macconkey-agar-mac-composition-preparation-uses-and-colony-characteristics/>