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Identification of Medicinal Chemicals (BKO) Piroxicam in Jamu Pegal Linu Preparations in Makassar City

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Abstract
The aim of the research was to identify Piroxicam in herbal medicine for rheumatic pain circulating in Makassar. There are several traditional medicines that contain medicinal chemicals. Research has been conducted on the identification of medicinal chemicals (BKO) on several rheumatic herbs preparations in herbs shops in Makassar. The BKO which is often included in rheumatic herbs is the NSAID group, one of which is piroxicam. This inspection was conducted to know the presence of the chemical drug piroxicam contained within rheumatic herbs preparations and the samples used were 5 samples. The method used was a qualitative test using thin layer chromatography (TLC) consisting of a mobile phase mixed with n-hexane and acetone (7:3) and a stationary phase using Silica Gel GF254. The results of the TLC examination from 5 samples of herbal medicine added BKO piroxicam contained 3 samples including herbs A, B, and C because they had the same stain color at the same Rf value as the piroxicam. Some of the rheumatic herbs circulating in Makassar contain medicinal chemicals in the form of piroxicam.

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INTRODUCTION

Jamu is a type of traditional medicine that is believed not to cause side effects that harm the body and is safe for use for a long time, compared to the use of chemical drugs. Jamu pegal linu is generally used by hard workers and people who are elderly or elderly (Fatimah, et al., 2017). The use of these herbs can reduce pain due to pain, fatigue, relieve pain in muscles and bones, improve blood circulation, the immune system becomes stronger (Padanun & Minarsih, 2021). Herbs that function as aches and pains are herbal medicines that are often consumed in the community. In this herbal medicine product, it is often added with medicinal chemicals (BKO) to make it more attractive in promoting its efficacy. Based on PERMENKES RI No. 7 2012 regarding the registration of traditional medicines, medicinal chemicals (BKO) are prohibited from being contained in traditional medicines (Made, 2022). Some herbal medicines for rheumatic pain contain paracetamol (Fatimah., et al, 2017; Made, M. N. N., 2022) . There are also herbal medicines for rheumatic pain that contain diclopenac sodium other medicinal chemicals (Padanun & Minarsih, T. 2021; Rahmatullah, S., Slamet, S., & Fikri, A. 2018; Husna, F. & Mita, S.R. 2020).

BKOs that are often found in herbal products such as phenylbutazone, sildenafil citrate, paracetamol, glibenclamide, dexamethasone, siutramine, allopurinol, antalgin, taladafil and piroxicam (Sidoretno & Rz, 2018). The medicinal chemical that is often included in the mixture of jamu pegal linu that can relieve pain is piroxicam. This BKO is often included in jamu pegal linu because piroxicam is included in the class of analgetic drugs which can reduce pain and

inflammation in the joints (Cahyaningtias, N., Amaniyah, L. R., & Widodo, H.S. 2022). Therefore, the effect of BKO piroxicam is the same as the benefits of jamu pegal linu as a reliever of body aches. The addition of medicinal chemicals (BKO) such as piroxicam carelessly (the dose does not match the dose) and used for a long time can cause diarrhea, blurred vision, anorexia, and hypertension (Rahmatullah et al., 2018). The aim of the research was to identify Piroxicam in herbal medicine for rheumatic pain circulating in Makassar. There are several traditional medicines that contain medicinal chemicals.

METHOD

Materials

Piroxicam (comparative standard), n-hexane, acetone, silica gel GF 254, filter paper, aluminum foil.

Tools

Extraction equipment (sonicator), stirring rod, porcelain cup, beaker, funnel, waterbath, analytical balance, vial, measuring cup, oven, tweezers, chamber, capillary pipe, UV light 254 and 366 nm.

Sample Extraction by Maceration

The sample of this study is herbal medicine for rheumatic pain circulating in Makassar. Samples of herbal medicine A as much as 3 grams were dissolved with 60 ml of n-hexane, extracted for 20 minutes using sonication, then filtered and collected the liquid extract of herbal medicine. The same was done for samples B, C, D, and E (Sarker, S. D., & Nahar, L. 2012).

Preparation of Piroxicam Standard Solution

10 mg piroxicam powder was dissolved in 10 ml n-hexan. 2.5 ml was taken and 5 ml n-hexan was added (Husna, F. & Mita, S.R. 2020).

Identification Test Using Thin Layer Chromatography (TLC)

N-Hexan extracts of herbs A, B, C, D, E and piroxicam was identified using thin layer chromatography (TLC). The size of the plate used is 7 x 6 cm, the TLC. The mobile fase used is : n-hexan: acetone (7: 3). Observation using UV 254 nm and 366 nm. The stains that appear on the standard comparison and herbal medicine are observed for color and calculate the Rf value (Bayani, et. al., 2023., Parawansa, et. al., 2023).

RESULTS AND DISCUSSION

Jamu pegal linu was obtained from herbal medicine shops in Makassar using purposive sampling technique with sample characteristics, namely herbal medicine that is most commonly demanded by consumers, indications can treat aches and pains, samples in powder or capsule form and have different brands from each herbal medicine shop. The number of samples was 5 samples of herbal medicine for rheumatic pain. The identification of medicinal chemicals in herbal medicine has been carried out by Husna, F & Mita, S.R., using the TLC method, but the difference is in the samples and standards.

Made, M. N. N., research on the identification of medicinal chemicals in herbal medicine for rheumatic pain uses paracetamol as a standard. The five samples of herbal medicine for rheumatic pain which is generally found in the sample including green meniran (Phyllanthi herba), cinnamon bark (Cinnamomi cortex), galangal (Languas galanga rhizoma), ginger (Curcuma xanthorrhiza rhizoma), galangal (Kaempferia galanga rhizoma), ginger (Zingiber

officinale rhizoma), black pepper fruit (Piperis nigri fructus) (Alyidrus, R., Ariastiwi, D. A., & Mardi, Y. 2019). Several plants can be used to relieve aches and pains. The plant is kratom is widely used for pain management (Masriani, at al., 2023).

Thin layer chromatography (KLT) is a qualitative examination that can separate components in two different material phases, namely the stationary phase and the mobile phase based on different levels of interaction. A compound in the mixture can be identified using KLT by looking at the equation of the Rf value of the standard comparator with the Rf value of the sample. KLT is also a simple analytical technique, economical, easy to use and does not require a lot of samples for analysis (Husna & Mita, 2020).

In this analysis, 20 x 20 cm KLT plates were activated before testing by heating in an oven at 100°C for 5 minutes which aims to maximize the ability to absorb the plate because it can remove the water content contained in the plate (Hamka *et al.,* 2022). Meanwhile, the use of mobile phase is selected according to the results of the selection of mobile phases that have been carried out on several kinds of organic solvent mixtures. The optimization results are shown in table 1.

Table 1. Mobile Phase Optimization

Mobile Phase	Piroxicam Comparator Standard Stain	Sample Stain
Chloroform: ethyl acetate (1:9)	Identified	Tailed
Acetone: Chloroform: n-hexan (7:2:1)	Identified	Stacked
Acetone: chloroform: n-hexane (6:3:1)	Identified	Stacked
N-hexan: acetone (6:4)	Identified	Stacked
N-hexan: acetone (4:6)	Not detected	Tailed
N-hexan: acetone (7:3)	Detected	Not stacked and tailed

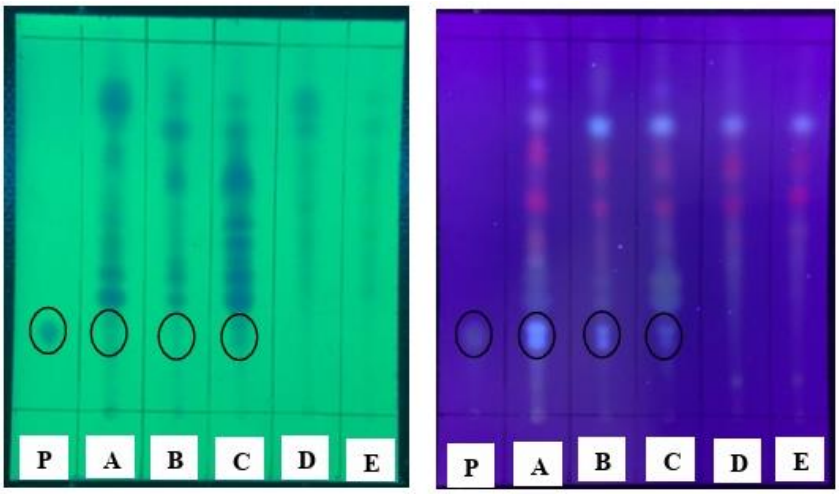
Based on the optimization results, the mobile phase: n-hexane: acetone (7:3) is the mobile phase or eluent chosen in this study, because in this mobile phase, the separation of the standard comparison piroxicam and herbal medicine samples does not overlap and does not tail. The identification results show the presence of stains or spots from Piroxicam standards that have the same color and Rf value as stains or spots from herbal samples. The color of stains on herbal samples and piroxicam is seen under UV light 254 and 366 nm. The results of the Rf calculation can be seen in table 2.

Table 2**.** Calculation Results of Rf Values of Standard Comparator and Samples of Linu Pain Herbs

No.	Samples and Standards	Rf Value	Description
1.	A herb		
		1. 0,254	+
		2. 0,309	-
		3. 0,381	-
		4. 0,418	-
		5. 0,490	-
		6. 0,618	-
		7. 0,763	-
		8. 0,836	-
		9. 0,927	-

2.	Herb B			
		1.	0,254	+
		2.	0,309	-
		3.	0,381	-
		4.	0,472	-
		5.	0,6	-
		6.	0,690	-
		7.	0,818	-
		8.	0,927	-
3.	Herb C			
		1.	0,254	+
		2.	0,309	-
		3.	0,381	-
		4.	0,472	-
		5.	0,6	-
		6.	0,690	-
		7.	0,818	-
		8.	0,927	-
4.	Herb D			
		1.	0,090	-
		2.	0,418	-
		3.	0,490	-
		4.	0,6	-
		5.	0,690	-
		6.	0,927	-
5.	E herbs			
		1.	0,109	-
		2.	0,454	-
		3.	0,509	-
		4.	0,618	-
		5.	0,690	-
		6.	0,927	-
6.	**Comparator Standard Piroxicam**		0,254	+

Based on the calculation of the Rf value shown in table 2, the standard Rf value of piroxicam comparison is 0.254. The results of the analysis of all samples, namely 5 herbal medicine samples, there are 3 herbal medicine samples that have the same Rf value as the standard piroxicam Rf value, namely herbal medicine samples A, B, and C of 0.254. Meanwhile, herbal medicine D and E have different Rf values from the standard piroxicam comparison, even though the spot or stain color is likely.



(a) UV 254 nm (b) UV 366 nm

Figure 1. Thin layer chromatogram sample and Piroxicam (*Source: Personal documentation*)

Based on the results of KLT testing that has been studied on 5 jamu pegal linu found in jamu shops in Makassar, it is known that there are 3 brands of jamu containing piroxicam medicinal chemicals including jamu A, B and C. The identification of medicinal chemicals in herbal medicine has been carried out by Husna, F & Mita, S.R., using the TLC method, but the difference is in the samples and standards. Made, M. N. N., research on the identification of medicinal chemicals in herbal medicine for rheumatic pain uses paracetamol as a standard.

CONCLUSION

Based on research conducted by means of qualitative analysis using KLT, it was found that there was jamu pegal linu found in jamu shops in Makassar identified in which there were medicinal chemicals in the form of piroxicam. The identification of piroxicam in this study is different from research that has been carried out by several previous studies. When compared with the same research, this study identified piroxicam in herbal medicine circulating in Makassar. whereas the same study did not identify piroxicam.

RECOMMENDATIONS

Further research can be done to determine the level of BKO Piroxicam in jamu pegal sciatica which is identified as containing BKO.

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