In Vitro Cytotoxic Activity of Sa-Tri-Lhung-Klod Remedy and Its Herbal Ingredients on Ovarian and Cervical Carcinoma Cell Lines

Janjira Inprasit BATM*,
Srisopa Ruangnoo PhD**,***, Arunporn Itharat PhD**,***

** Master student of Sciences (Applied Thai Traditional Medicine), Faculty of Medicine, Thammasat University, Klongluang, Pathumthani, Thailand*
*** Department of Applied Thai Traditional Medicine, Faculty of Medicine, Thammasat University, Klongluang, Pathumthani, Thailand*
**** Center of Excellence on Applied Thai Traditional Medicine Research (CEATMR), Faculty of Medicine, Thammasat University, Klongluang, Pathumthani, Thailand*

Background: *Sa-Tri-Lhung-Klod is a Thai traditional medicine remedy for postpartum in the lists of The National Drug List of Herbal Medicine Products AD. It consists of seventeen herbs and were obtained by maceration and used in the form of liquor for women's health care such as treatment of amenorrhea, menopause and blood tonic. In addition, it also used for postpartum care for being anti-inflammation in postpartum and prevention of cancer in women.*
Objective: *To investigate cytotoxic activity of Sa-Tri-Lhung-Klod remedy extracts and its herbal ingredients against human ovarian carcinoma cell line (SKOV-3) and cervical adenocarcinoma (HeLa) cell line.*
Material and Method: *Sa-Tri-Lhung-Klod remedy and its plant ingredients were extracted by maceration in 95% ethanol and dried using evaporator. All extracts were tested for cytotoxic activity by sulforhodamine B (SRB) assay.*
Results: *Ethanolic extract of Sa-Tri-Lhung-Klod remedy displayed cytotoxic activity against SKOV-3 and HeLa with IC_{50} values of 72.84±1.07 and 47.24±2.83 µg/ml, respectively. It was classified as "less-active" according to the NCI guideline. However, Caesalpinia sappan, Mammea siamensis and Curcuma comosa showed high cytotoxic activity against SKOV-3 with IC_{50} values of 9.55±1.38, 13.45±0.82 and 14.21±1.30 µg/ml, respectively. The ethanolic extracts of Caesalpinia sappan and Mammea siamensis also exhibited cytotoxic activity against HeLa with IC_{50} values of 6.30±0.06 and 7.72±0.11 µg/ml, respectively.*
Conclusion: *These results support the use of Sa-Tri-Lhung-Klod remedy in Thai traditional medicine for preventing of ovarian cancer and cervical cancer. Caesalpinia sappan, Curcuma comosa and Mammea siamensis were strikingly active against ovarian and cervical cancer cells. Their extracts have the potential for developing as new anti-cancer drugs for women health.*

Keywords: *Sa-Tri-Lhung-Klod remedy, Cytotoxicity, Ovarian cancer, Cervical cancer*

J Med Assoc Thai 2014; 97 (Suppl. 8): S149-S155
Full text. e-Journal: *http://www.jmatonline.com*

Women's cancers, including ovarian and cervical cancer, lead to premature deaths among women worldwide[1]. In Thailand, the National Cancer Institute in Bangkok reported that, the most common cancer in women is breast cancer (37.5%), cervical cancer (14.4%) and ovarian cancer (4.5%)[2]. Many factors related to ovarian cancer and cervical cancer. There are both external and internal factors; i.e. having sex at a young age, age, chemicals such as oral contraceptives, smoking, foods and, most important are the chronic inflammation, infections and genetic disorders[3]. Nowadays, the treatments of ovarian and cervical cancer are several methods such as surgery (19.7%), radiation therapy (21.5%), chemotherapy (3.8%), etc[1]. Surgery is the main treatment for most ovarian and cervical cancers, but there are many several side effects such as pain, fatigue, infection and bleeding or organ dysfunction[4]. However, alternative medicine is now commonly used for cancer patients[5] because generally, it is believed that herbal medicine is safe and has less side-effects than surgery, radiation therapy and chemotherapy[6].

Correspondence to:
Itharat A, Department of Applied Thai Traditional Medicine Center, Faculty of Medicine, Thammasat University, 95 Moo 8 Paholyotin Road, Klongluang, Pathumthani 12120, Thailand.
Phone: 0-2926-9749, Fax: 0-2926-9749
E-mail: iarunporn@yahoo.com

Thai traditional medicine in Thai National List of Essential Medicine called Sa-Tri-Lhung-Klod remedy was used to treat symptoms of women. It was used for treatment such as treating irregular menstruation, amenorrhea, stimulating blood circulation, menopause, postmenopausal, blood tonic, anti-inflammation in postpartum and astringent. These symptoms were predicted as cancer of women such as ovarian cancer and cervical cancer. This remedy consists of seventeen plants. There is no report of cytotoxic activity of this preparation, but the previous studies reported that some single herbs showed cytotoxic activity against cervix cancer cell line (HeLa) such as *Caesalpinia sappan*[7], *Curcuma comosa*[8], *Mammea siamensis*[9], *Mesua ferrea*[10], *Piper nigrum*[11], *Piper ribesioides*, *Piper samentosum* and *Plumbago indica*[12]. Therefore, the objectives of this study are to investigate the cytotoxic activity of Sa-Tri-Lhung-Klod remedy extracts and each of its herb ingredients against two types of human cancer cells from women such as ovarian carcinoma cell line (SKOV-3) and cervical adenocarcinoma cell line (HeLa). These results will support the use of this remedy in Thai traditional medicine for ovarian and cervical cancer.

Material and Method

Chemicals

Dimethyl sulfoxide [$(CH_3)_2SO$)](DMSO) was purchased from RCI Labscan, Thailand. Fetal bovine serum (FBS) was purchased from Biochem, Germany. Hydrochloric acid (HCl) and Sodium hydroxide (NaOH) were purchased from Univar, Australia. Minimum Essential Medium (MEM), Penicillin-Streptomycin (P/S), RPMI medium 1640, Trypan blue stain 0.4% and Trypsin-EDTA were purchased from Gibco, USA. Phosphate buffered saline (PBS) was purchased from Amresco, USA. Sodium bicarbonate ($NaHCO_3$) was purchased from BHD, England. Sulforhodamine B sodium salt ($C_{27}H_{29}N_2NaO_7S_2$) and Tris (hydroxymethyl) aminomethane ($(HOCH_2)_3CNH_2$) were purchased from Sigma-Aldrich, USA. Trichloroacetic acid (Cl_3CCOOH) (TCA) was purchased from Merck, Germany.

Plant materials

The parts of plants of Sa-Tri-Lhung-Klod remedy were collected from several parts of Thailand in 2012, voucher specimens shown in Table 1. The voucher specimens were carried out at the herbarium of Southern Center of Thai Medicinal Plants at Faculty of Pharmaceutical Sciences, Prince of Songkla University, Songkhla, Thailand.

Extraction

The parts of these plants were washed with water, sliced to small pieces, dried in an oven at temperature 50°C and ground to powder. Sa-Tri-Lhung-Klod remedy (270 grams) and its herbal ingredients (50 grams of each) were macerated with 95% ethanol for 3 days, filtered using Whatman No. 1 filter paper and concentrated to dryness by evaporator (Rotavapor R-205, Germany). The marc was macerated twice more times. Filtrates were pooled and dried using an evaporator.

In vitro assay for Cytotoxic activity by SRB assay

Preparation of sample solution

Each sample was initially dissolved in sterile dimethylsulfoxide (DMSO) for ethanolic extracts and prepared sample at concentration 10 mg/ml. The first screening, final concentration of sample solution was prepared at 100 µg/ml. If the percent inhibition of cancer cell by the extract is more than 50%, the extract will be further tested for IC_{50} value. IC_{50} values were determined by preparing as four serial dilutions (200, 100, 20 and 2 µg/ml, respectively) to give the final concentration of 100, 50, 10, 1 µg/ml, respectively.

Human cell lines

Human ovarian carcinoma (SKOV-3) and cervical adenocarcinoma (HeLa) cell lines were purchased from the American Type Culture Collection (ATCC, USA). SKOV-3 was cultured in RPMI-1640 medium and HeLa was cultured in Minimum Essential Media (MEM) with Earle's salt (without glutamine). There supplemented with 10% heated fetal bovine serum, 50 IU/ml penicillin and 50 µg/ml streptomycin. All cell lines were maintained at 37°C in an incubator with 5% CO_2 and 95% humidity.

Cytotoxicity assay

Cells growing as monolayer in 75 cm^2 flask were washed with Phosphate-buffered saline (PBS) and cells detached with 0.025% trypsin-EDTA to make a single cell suspension. 3 ml medium was then added to flask to inactivate trypsin-EDTA. The viable cells were counted in haemocytometer using Trypan Blue Exclusion Test of cell viability[13]. Single cell suspension was diluted with medium to give a final concentration of $3x10^3$ cells/well for each of SKOV-3 or HeLa, respectively. One hundred microlitres per well of these cells suspensions were added in 96-well microtiter plates and incubated at 37°C in 5% CO_2 atmosphere with 95% humidity for 24 hours. Cells were then treated with

Table 1. Plants and part of plants component in Sa-Tri-Lhung-Klod remedy

Botanical name	Family	Plant collected from	Voucher specimen number	Part of used	Thai traditional medicine used
Angelica sinensis	UMBELLIFERAE	China	SKP199010901	Root	Blood tonic, menopause and premenstrual syndrome
Artocarpus heterophyllus	MORACEAE	Nakhon Ratchasima	SKP117010801	Stem	Haemostatic, anti-inflammation, blood tonic and astringent
Caesalpinia sappan	LEGUMINOSAE	Bangkok	SKP098031901	Stem	Blood tonic, menorrhagia, leucorrhoea and diabetes
Carthamus tinctorius	COMPOSITAE	Chiang Mai	SKP051032001	Flower	Blood tonic, cardiac tonic and reduce cholesterol
Curcuma comosa	ZINGIBERACEAE	Phetchabun	SKP201030301	Rhizome	Menorrhagia, leucorrhoea, postpartum uterine bleeding and perimenopausal bleeding
Jasminum sambac	OLEACEAE	Nakhonpathom	SKP129101901	Flower	Asthma, cardiac tonic and fatigue
Maclura cochinchinensis	MORACEAE	Prachuap Khiri Khan	SKP117130301	Stem	Fever, antispasmodic and astringent
Mammea siamensis	GUTTIFERAE	Ratchaburi	SKP083131901	Flower	Cardiac tonic, fever-lowering and enhancement of appetite
Mesua ferrea	GUTTIFERAE	Ratchaburi	SKP083130601	Flower	Astringent, carminative, blood tonic and cardiac tonic
Mimusops elengi	SAPOTACEAE	Ratchaburi	SKP171130501	Flower	Cardiac tonic, expectorate and sore throat
Nelumbo nucifera	NELUMBONACEAE	Ratchaburi	SKP125141401	Pollen	Cardiac tonic, vertigo, faintness and fever
Piper longum	PIPERACEAE	Chanthaburi	SKP146160301	Fruit	Carminative, element tonic and antidiarrheal
Piper nigrum	PIPERACEAE	Chanthaburi	SKP146161401	Fruit	Carminative, element tonic, expectorate and diuretic
Piper ribesioides	PIPERACEAE	Sakhonnakhon	SKP146161801	Stem	Carminative, antiflatulant and element tonic
Piper samentosum	PIPERACEAE	Ratchaburi	SKP146161901	Root	Expectorant, carminative and flatulence
Plumbago indica	PLUMBAGINACEAE	Bangkok	SKP148160901	Root	Carminative, stomachache, antidiarrheic and hemorrhoids
Salacia chinensis	CELASTRACEAE	Ratchaburi	SKP044190301	Stem	Blood tonic, cardiac tonic, carminative and muscle pain
Sa-Tri-Lhung-Klod	-	-	-	-	Amenorrhea, blood tonic, menopause and astringent

extracts. 100 µl sample solution was added and mixed where 1% DMSO solution was used as control solvent. Cells in 96-well plate were incubated in CO_2 incubator for 72 hours. Medium was removed and washed with PBS. 200 µl fresh medium was added, incubated for recovery period of 72 hours and the survival percentage was measured calorimetrically using SRB assay and IC_{50} values were calculated using prism program.

Sulphorhodamine B (SRB) assay

The anti-proliferative assay, SRB (Sulphorhodamine B) assay was performed essentially according to the method of Skehan et al 1990[14]. This assay is used for cell density determination, which was performed to assess growth inhibition by a colorimetric assay by staining total cellular protein with the dye SRB. Cell cultures were fixed with 100 µl of ice-cold 40% Trichloroacetic acid (TCA) per well, incubated at 4°C for 1 hour in refrigerator and washed with distilled water to wash non-viable cells. 50 µl of SRB solution (0.4% w/v in 1% acetic acid) was added per well and allowed contact with cells for 30 minutes and washed with 1% acetic acid. The plate was dried and 100 µl of 10 mM Tris Base pH 10.5 (Tris (hydroxyl methyl) aminomethane) was added. The absorbance (OD) of each well was read at 492 nm. The IC_{50} values were calculated using prism program by plotting the percentage of survival versus the concentrations, interpolated by cubic spine. According to National Cancer Institute guidelines[15] extracts with IC_{50} values <20 µg/ml were considered active.

Statistical analysis

All data are the mean of three replications. Values of different parameters were expressed as the mean ± standard error of mean. Statistical analysis was performed using SPSS (SPSS 13 for windows) statistical software.

Results

The percentage of yields (w/w) of the 95% ethanolic extracts of Sa-Tri-Lhung-Klod remedy and its herbal ingredients were shown in Table 1. The effect of the ethanolic extracts of Thai medicinal preparation and each of its herbal components were studied on two different cancer cell lines: human ovarian carcinoma cell line (SKOV-3) and human cervical adenocarcinoma cell line (HeLa). IC_{50} values are summarized in Table 2.

Discussion

Plant components in Thai traditional medicine, Sa-Tri-Lhung-Klod remedy can be divided into several

Table 2. Cytotoxic activity of 95% ethanolic extracts from Sa-Tri-Lhung-Klod remedy and its herbal ingredients against of human ovarian carcinoma (SKOV-3) and cervical adenocarcinoma cell line (HeLa) by SRB assay (n = 3)

Botanical name	Wt. in remedy (g)	% yield	IC_{50} (µg/ml ± SEM)	
			SKOV-3	HeLa
Angelica sinensis	20	16.33	67.03±2.44	75.93±9.77
Artocarpus heterophyllus	20	9.34	32.58±0.76	33.37±0.39
Caesalpinia sappan	20	8.84	9.55±1.38	6.30±0.06
Carthamus tinctorius	10	15.64	>100	>100
Curcuma comosa	20	6.20	14.21±1.30	35.58±0.10
Jasminum sambac	10	13.10	>100	>100
Maclura cochinchinensis	20	12.20	>100	84.99±0.82
Mammea siamensis	10	32.60	13.45±0.82	7.72±0.11
Mesua ferrea	10	23.98	49.51±3.59	40.05±1.96
Mimusops elengi	10	6.35	>100	>100
Nelumbo nucifera	10	10.72	>100	>100
Piper longum	20	11.96	72.14±1.12	76.39±1.13
Piper nigrum	20	6.01	35.16±1.07	37.20±0.49
Piper ribesioides	20	6.49	40.68±0.32	43.14±6.42
Piper samentosum	10	4.28	77.21±2.04	71.03±4.34
Plumbago indica	20	9.37	73.50±2.16	37.01±0.07
Salacia chinensis	20	6.30	>100	>100
Sa-Tri-Lhung-Klod	270	8.51	72.84±1.07	47.24±2.83

groups according to its use for treatment as follows: *Angelica sinensis, Caesalpinia sappan, Carthamus tinctorius* and *Curcuma comosa* were used for treatment of menopause, premenstrual syndrome[16,17] and as blood tonic[18]. *Artocarpus heterophyllus* and *Maclura cochinchinensis* were used for treatment as antimycobacterial[19], anti-inflammation and astringent[20]. *Piper longum, Piper nigrum, Piper ribesioides, Piper samentosum* and *Plumbago indica* were carminative[21,22] and element tonic[23]. *Jasminum sambac, Mammea siamensis, Mesua ferrea, Mimusops elengi* and *Nelumbo nucifera* were used as cardiac tonic[24], and for vertigo[25] and fever. The last group, *Salacia chinensis* was used for treatment of muscle pain. Thus, it is obvious that Sa-Tri-Lhung-Klod remedy is of various advantages quite good for woman health.

The results show that the ethanolic extract of Sa-Tri-Lhung-Klod remedy displayed cytotoxic activity against human ovarian carcinoma cell line (SKOV-3) and human cervical adenocarcinoma cell line (HeLa) with IC_{50} values of 72.84±1.07 and 47.24±2.83 µg/ml, respectively. It was classified as "less-active" according to the NCI guideline. However, *Caesalpinia sappan, Mammea siamensis* and *Curcuma comosa* showed the high cytotoxic activity against human ovarian carcinoma cell line (SKOV-3) with IC_{50} values of 9.55±1.38, 13.45±0.82 and 14.21±1.30 µg/ml, respectively. The ethanolic extracts of *Caesalpinia sappan* and *Mammea siamensis* also exhibited the cytotoxic activity against human cervical adenocarcinoma cell line (HeLa) with IC_{50} values of 6.30±0.06 and 7.72±0.11 µg/ml, respectively. The previous reports showed that methanolic extract of *Caesalpinia sappan* and theraphin C (compound of *Mammea siamensis*) had IC_{50} values of 15.5 µg/ml and 4.7 µM, respectively[7,9]. In addition, other plants also showed cytotoxic activity against SKOV-3 cell line and HeLa cell line. These are ten plants, i.e. *Angelica sinensis, Artocarpus heterophyllus, Macluraco chinchinensis, Mesua ferrea, Piper longum, Piper nigrum, Piper ribesioides, Piper samentosum, Plumbago indica* and *Salacia chinensis*. Although their extracts were less-active, while pellitorine (compound of *Piper nigrum*), ethanolic extracts of *Piper ribesioides* and *Plumbago indica* were reported as showed high cytotoxic activity against human cervical adenocarcinoma cell line (HeLa) with IC_{50} values of 13.0, 4.6 and 1.5 µg/ml, respectively[11,12].

Conclusion

Purposes of the present study were to investigate the cytotoxicity effects of ethanolic extract of Sa-Tri-Lhung-Klod remedy and each of its plant ingredients. The results indicated that the ethanolic extract of Sa-Tri-Lhung-Klod remedy showed mild cytotoxic activity against ovarian cancer and cervix cancer cell lines. However, the ethanolic extract of some plants as a remedy possesses high potency of cytotoxic activity. These results support the use of this Thai medicinal remedy for preventing cancer in women in the future. The biological activity of this Sa-Tri-Lhung-Klod remedy has never been studied. Thus, the present study will be very useful to provide this information for further research in the development of herbal medicine for use in treating symptoms in women such as preventing cancer in women and for women's overall health care.

Acknowledgement

The National Research University Project of Thailand Office of Higher Education Commission and Center of Excellence on Applied Thai Traditional Medicine Research (CEATMR) supported this work. Faculty of medicine, Thammasat University.

Potential conflicts of interest

It is known that Sa-Tri-Lhung-Klod remedy and its plant ingredients had been used for treating symptoms in women such as menstrual disorders, anti-inflammation in postpartum and as blood tonic for preventing cancer in women. However, the mechanism of action of these components is not yet known. Thus, it should be further tested in animals and humans to support the experimental results.

References

1. World Health Organization. Comprehensive cervical cancer prevention and control: a healthier future for girls and women. WHO Guidance Note, 20 Avenue Appia, 1211. Geneva: WHO; 2013.
2. Attasara P, Buasom R. Hospital-based cancer registry 2011, June. Bangkok: National Cancer Institute, Department of Medical Services, Ministry of Public Health, Thailand; 2011.
3. Mogren I, Stenlund H, Hogberg U. Long-term impact of reproductive factors on the risk of cervical, endometrial, ovarian and breast cancer. Acta Oncol 2001; 40: 849-54.
4. Sohl SJ, Schnur JB, Montgomery GH. A meta-analysis of the relationship between response expectancies and cancer treatment-related side effects. J Pain Symptom Manage 2009; 38: 775-84.
5. Gansler T, Kaw C, Crammer C, Smith T. A population-

based study of prevalence of complementary methods use by cancer survivors: a report from the American Cancer Society's studies of cancer survivors. Cancer 2008; 113: 1048-57.
6. Lynch N, Berry D. Differences in perceived risks and benefits of herbal, over-the-counter conventional, and prescribed conventional, medicines, and the implications of this for the safe and effective use of herbal products. Complement Ther Med 2007; 15: 84-91.
7. Ueda JY, Tezuka Y, Banskota AH, Le Tran Q, Tran QK, Harimaya Y, et al. Antiproliferative activity of Vietnamese medicinal plants. Biol Pharm Bull 2002; 25: 753-60.
8. Niumsakul S, Hirunsaree A, Wattanapitayakul S, Junsuwanitch N, Prapanupun K. An Antioxidative and cytotoxic substance extracted from *Curcuma comosa* Roxb. Journal of Thai Traditional & Alternative Medicine 2007; 5: 24-29.
9. Ngo NT, Nguyen VT, Vo HV, Vang O, Duus F, Ho TD, et al. Cytotoxic Coumarins from the Bark of *Mammea siamensis*. Chem Pharm Bull (Tokyo) 2010; 58: 1487-91.
10. Teh SS, Ee GC, Mah SH, Lim YM, Ahmad Z. Cytotoxicity and structure-activity relationships of xanthone derivatives from *Mesua beccariana*, *Mesua ferrea* and *Mesua congestiflora* towards nine human cancer cell lines. Molecules 2013; 18: 1985-94.
11. Meei LC. Identification of alkaloids of pepper (*Piper Nigrum*) and kadok (*Piper Sarmentosum*) and the biotransformation of piperine using *Aspergillus Niger* [thesis]. Selangor, Darul Ehsan: Universiti Putra Malaysia; 2008.
12. Sakpakdeejaroen I, Itharat A. Study on cytotoxicity and chemical fingerprint of ethanolic extract of Benjakul preparation [thesis]. Bangkok: Thammasat University, Thailand; 2009.
13. Freshney RI. Culture of animal cells: a manual of basic technique. 3rd ed. New York: John Wiley and Sons; 1994.
14. Skehan P, Storeng R, Scudiero D, Monks A, McMahon J, Vistica D, et al. New colorimetric cytotoxicity assay for anticancer-drug screening. J Natl Cancer Inst 1990; 82: 1107-12.
15. Boyed MR. The NCI in vitro anticancer drug discovery screen. In: Teicher BA, Andrews PA, editors. Anticancer drug development guide; preclinical screening, clinical trials and approval. Totowa, NJ: Humana Press; 1997: 23-42.
16. Dong ZB, Li SP, Hong M, Zhu Q. Hypothesis of potential active components in *Angelica sinensis* by using biomembrane extraction and high performance liquid chromatography. J Pharm Biomed Anal 2005; 38: 664-9.
17. Li P, Li SP, Lao SC, Fu CM, Kan KK, Wang YT. Optimization of pressurized liquid extraction for Z-ligustilide, Z-butylidenephthalide and ferulic acid in *Angelica sinensis*. J Pharm Biomed Anal 2006; 40: 1073-9.
18. Fuke C, Yamahara J, Shimokawa T, Kinjo J, Tomimatsu T, Nohara T. Two aromatic compounds related to brazilin from *Caesalpinia sappan*. Phytochemistry 1985; 24: 2403-6.
19. Chang BL, El Feraly FS, Doorenbos NJ. Cudranone: a novel benzophenone derivative from *Cudrania chochinchinensis* var. gerontogea. J Pharm Sci 1977; 66: 908-9.
20. Wei BL, Weng JR, Chiu PH, Hung CF, Wang JP, Lin CN. Antiinflammatory flavonoids from *Artocarpus heterophyllus* and *Artocarpus communis*. J Agric Food Chem 2005; 53: 3867-71.
21. Pichiensunthon C, Jeerawongs V. Traditional pharmacy handbook. Vol.5. Bangkok: Ammarin Publisher; 2004.
22. Wuthithammawech W. Thai traditional medicine. 2nd ed. Bangkok: O.S. Printing; 1997.
23. Ruangnoo S, Itharat A, Sakpakdeejaroen I, Rattarom R, Tappayutpijam P, Pawa KK. In vitro cytotoxic activity of Benjakul herbal preparation and its active compounds against human lung, cervical and liver cancer cells. J Med Assoc Thai 2012; 95 (Suppl 1): S127-34.
24. Kostermans AJGH. A Monograph of the Asiatic and Pacific Species of *Mammea* L. (Guttiferae). Bogor, Indonesia: Lembaga Pusat Penjelidikan Kehutanan; 1961: 26.
25. Saralamp P, Chukul W, Temsiririrkkul R, Clayton T. Medicinal Plants in Thailand, Volume I. Bangkok: Amarin Printing and Publishing; 1996.

การทดสอบฤทธิ์ความเป็นพิษต่อเซลล์มะเร็งของตำรับยาสตรีหลังคลอดและสมุนไพรเดี่ยวที่เป็นส่วนประกอบในตำรับต่อเซลล์มะเร็งรังไข่และมะเร็งปากมดลูก

จันทร์จิรา อินทร์ประสิทธิ์, ศรีโสภา เรืองหนู, อรุณพร อิฐรัตน์

ภูมิหลัง: *ตำรับยาสตรีหลังคลอด เป็นตำรับยาไทยอยู่ในบัญชียาหลักแห่งชาติ ประกอบด้วยพืชสมุนไพร 17 ชนิด ใช้โดยการหมักเป็นยาดองเหล้าเพื่อดูแลสุขภาพของผู้หญิง เช่น รักษาภาวะขาดประจำเดือน อาการวัยหมดประจำเดือน บำรุงโลหิต นอกจากนี้ยังใช้สำหรับเป็นยาบำรุงสุขภาพหลังคลอดเพื่อป้องกันการอักเสบหลังคลอด ซึ่งอาการดังกล่าวนี้อาจก่อให้เกิดโรคมะเร็งในผู้หญิงได้*

วัตถุประสงค์: *เพื่อศึกษาฤทธิ์ความเป็นพิษต่อเซลล์มะเร็งรังไข่ชนิด SKOV-3 และเซลล์มะเร็งปากมดลูกชนิด HeLa ของสารสกัดตำรับยาสตรีหลังคลอดและสารจากพืชสมุนไพรเดี่ยว*

วัสดุและวิธีการ: *ทำการสกัดสารจากพืชแต่ละชนิดและตำรับรวมโดยวิธีการหมักด้วยเอทานอล 95% และทำให้แห้งด้วยเครื่องกลั่นระเหยแห้งหลังจากนั้น นำสารสกัดที่ได้ทั้งหมดมาทดสอบฤทธิ์ความเป็นพิษต่อเซลล์มะเร็งด้วยวิธี SRB assay*

ผลการศึกษา: *สารสกัดเอทานอลของตำรับยาสตรีหลังคลอด มีความสามารถน้อยในการยับยั้งเซลล์มะเร็งรังไข่และมะเร็งปากมดลูก โดยมีค่า IC_{50} เท่ากับ 72.84±1.07 และ 47.24±2.83 μg/ml ตามลำดับอย่างไรก็ตาม แก่นฝางเสน ดอกสารภี และว่านชักมดลูก มีศักยภาพสูงในการยับยั้งเซลล์มะเร็งรังไข่ โดยมีค่า IC_{50} เท่ากับ 9.55±1.38, 13.45±0.82 และ 14.21±1.30 μg/ml ตามลำดับ และฤทธิ์ความเป็นพิษต่อเซลล์มะเร็งปากมดลูกของสารสกัดแก่นฝางเสน และดอกสารภีมีค่า IC_{50} เท่ากับ 6.30±0.06 และ 7.72±0.11 μg/ml ตามลำดับ*

สรุป: *ผลเหล่านี้ใช้เป็นข้อมูลสนับสนุนการใช้ตำรับยาสตรีหลังคลอดในทางการแพทย์แผนไทย เพื่อป้องกันการเกิดโรคมะเร็งรังไข่และมะเร็งปากมดลูก โดยเฉพาะอย่างยิ่งแก่นฝางเสน ว่านชักมดลูก และดอกสารภี มีศักยภาพสูงในการยับยั้งเซลล์มะเร็งทั้งสองชนิด*