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The Effect of Meniran Herbs Extract (*Phyllanthus niruri* Linn) on the Histological Spectrum of the Uterus and Oviduct Rats (*Rattus Norvegicus*)

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ABSTRACT

Background The use of plants as natural medicinal ingredients is increasingly in demand by the public because the plants are considered to have lower negative effects than chemical drugs. The effect of mineran herbs extract (*Phyllanthus niruri* Linn) on the histological spectrum of the uterus and oviduct rat (*Rattus Norvegicus*) had been studied. **Aim of Study** Aim of this study to explore the effect of meniran herbs extract (*Phyllanthus niruri* Linn) on the histological spectrum of the uterus and oviduct rat (*Rattus Norvegicus*) **Methods** Wistar rats have been challenged with 2% NaCl in drinking water to result in fibrotic uterus and oviduct. *Phyllanthus niruri* extract (200 mg/Kg) turned into given orally for 4 weeks. Matrix extracellular abundance turned into decided via way of means of HE Staining and measured via way of means of METAVIR Fibrosis Score. The result of this examine have been assayed via way of means of SPSS 16. **Results** *P. niruri* extract was potent to reduce the matrix extracellular in 2% NaCl-induced rats compared to control group ($p < 0.05$) in uterus. Meanwhile, *P. niruri* extract was not able to decrease the matrix extracellular in 2% NaCl-induced rats compared to control group ($p > 0.05$) in oviduct. **Conclusion** *P. niruri* extract was potent to decrease the matrix extracellular in the uterus of the rats, but in oviduct.

1. Introduction

The use of plants as natural medicinal ingredients is increasingly in demand by the public because the plants are considered to have lower negative effects than chemical drugs. The development and research of traditional medicine (especially herbs) is in line with the needs of the national market which is starting to pay great attention to the traditional medicine.¹ Meniran (*Phyllanthus niruri* Linn) is a wild plant (weed) commonly found in fields, rocky soil, on river banks, and moist forests. It grows spread across almost all over Indonesia at an altitude about 1 to 1000 meter above sea level. The results of the phytochemical screening of the ethanolic extract showed the presence of *flavonoid compounds* (*quersetin*, *isoquersetin*,

astragalin) and *polyphenols*. The main content of meniran (*Phyllanthus niruri* L.) in the form of *flavonoids* and *flavonoid glycosides* inhibits the action of *xanthine oxidase* and *superoxidase enzymes* so it can be used in anti-inflammation. The Meniran herbs also contain the essential oil compounds, phenols, tannins, alkaloids, steroids, anthraquinones, arbutin and triterpenes.²

Unhealthy conditions of reproductive organs often result in disturbances of reproduction itself. The reproductive status can be seen through the histology of the female reproductive organs, which can be seen through the histology of the reproductive organs including the uterus and oviduct. The main function of the uterus is as a place for implantation while the

oviduct is as a place for fertilization to take place. So that, when there is interference with these two organs, the reproductive function will also be disturbed. The estrogen receptors are found in brain cells and target cells that are specific to female reproduction, such as the uterus and breast. So that, when there is hormone regulation changing in the lining of the uterine wall, especially the endometrium and myometrium, the uterus and oviduct change.³ Estrogen can cause a marked proliferation of the endometrial stroma and increases the development of the endometrial gland which helps to provide nutrition to the implanted ovum.⁴ The estrogen can stimulate the motility of the oviduct which will produce peristalsis that helps the ovum move to the uterus. A decrease in endometrial thickness in women with endometriosis may impact the preparation and acceptance of their endometrium for pregnancy. The knowledge of reproduction as a whole is a means of improving the fertility.⁵ Based on this background, there is a need for research on the effect of the Mineran Herbs extract (*Phyllanthus niruri* Linn) on the histological spectrum of the uterus and oviduct Rat (*Rattus norvegicus*).

Phyllanthus niruri (neighborhood name : meniran) extract is applied in treating oviduct and uterus disease. It incorporate quercitine that be capable of growth the expression of PPAR- γ . The activation drives PPAR- γ shapes heterodimer with retinoid X receptors (RXRs) in order co-repressor is synthesized which can block TGF- β 1 expression.⁶

Based at the description above, *Phyllanthus niruri* extract remedy to the 2% sodium chloride-induced rats is maximum in all likelihood expected to be anti-fibrotic through describing matrix extracellular that stained through HE staining withinside the uterus and oviduct organ. 2% NaCl is capable of result in the fibrotic organ at the rats.⁷

2. Methods

The research design was experimental study, post-test only with control group design. The study had been affirmed by ethical clearance number 40/EC/FK-06/UNIZAR/X/2020, Faculty of Medicine, Al-Azhar Islamic University, Mataram, NTB.

Preparation Extract of *Phyllanthus niruri*

P. niruri plants were harvested from Alung village, Mekar Damai dorp, Praya districts, Central Lombok regency, West Nusa Tenggara province, Indonesia. Furthermore. It was determined by the study center of herb science, Faculty of Health Science, University of Nahdlatul Wathan Mataram. *P. niruri* plants were extracted by maceration methods in 70% ethanol.

Procedure of Experimental

Wistar rats (3 months old) received normal (CTRL) or high salt intake (2% NaCl in drinking water) for 4 weeks. Rats from the group on a high salt intake were administered vehicle (SALT) or *Phyllanthus* extract (PE) (200 mg/kg) (SALT-PE) during the last week of high salt diet.^{7,8} Matrix extracellular abundance of uterus and oviduct were determined by HE Staining and measured by METAVIR Fibrosis Score. The results of this study were assayed by SPSS 16.

Analysis of Data

The result of this study were tested by SPSS 16. Data was examined for bivariate. Bivariate test was Kruskal-Wallis test ($p < 0.05$).

3. Result

HE Staining of Uterus and oviduct

Figure 1 & 2 confirmed the variations of matrix extracellular in treatment group vs the control group. It way that *Phyllanthus* extract become capable of lessen the abundance of matrix extracellular withinside the uterus, but not withinside the oviduct in sodium chloride -induced fibrotic rats.

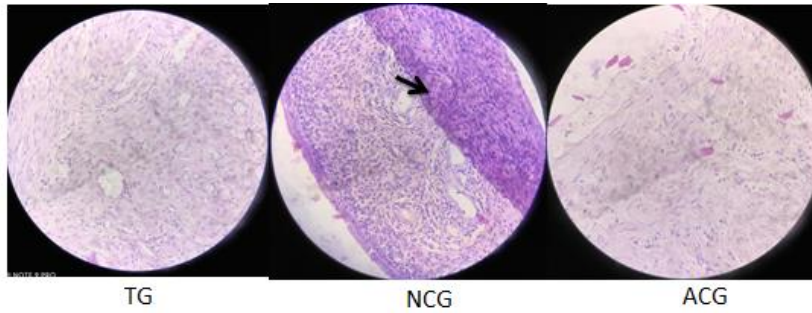
Table 1 and 2 showed the METAVIR fibrosis score of uterus and oviduct in the treatment group vs the control group. Bivariate test was Kruskal-Wallis test showed the p value < 0.05 of uterus, but not in oviduct. It means there were the significant differences between treatment vs control group in uterus. Therefore, *Phyllanthus* extract was more potent to reduce the matrix extracellular of uterus in sodium chloride -

induced fibrotic rats.

TG = induced by 2% NaCl + 200 mg/Kg *P.niruri*

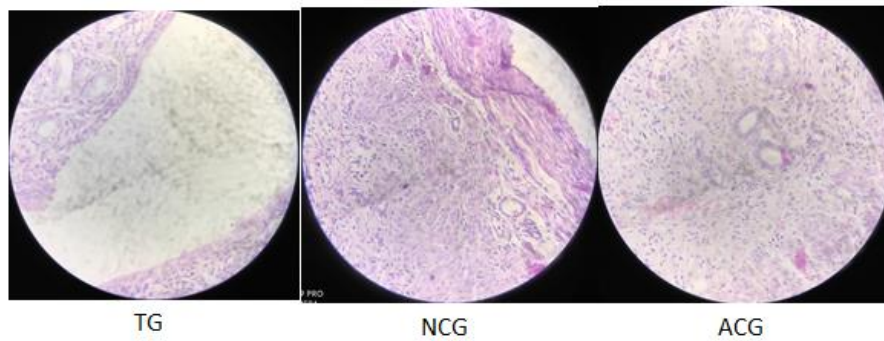
extract; NCG = induced by 2% NaCl without treatment;

ACG = no induction and treatment



TG (treatment group) = induced by 2% NaCl + 200 mg/Kg *P.niruri* extract; NCG (NaCl-control group) = induced by 2% NaCl without treatment; ACG (aquadest-control group) = no induction and treatment. → = matrix extracelluler.

Figure 1. HE staining of uterus



TG (treatment group) = induced by 2% NaCl + 200 mg/Kg *P.niruri* extract; NCG (NaCl-control group) = induced by 2% NaCl without treatment; ACG (aquadest-control group) = no induction and treatment.

Figure 2. HE staining of oviduct

Table 1. METAVIR Uterus Fibrosis Score of treatment group

Group	Fibrosis score Mean	P value
Treatment group (TG)	1 ± 0.00	0.04
NaCl-control group (NCG)	3.9 ± 0.2	
Aquadest-control group (ACG)	1.5 ± 0.7	

Table 2. METAVIR Oviduct Fibrosis Score of treatment group

Group	Fibrosis score Mean	P value
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Treatment group (TG)	0.6 ± 0.00	0.1
NaCl-control group (NCG)	3.9 ± 0.1	
Aquadest-control group (ACG)	2.3 ± 1.5	

4. Discussion

Based on figure 1& 2 and table 1 & 2 in this research showed the difference of treatment and control group significantly ($p < 0.05$) in uterus, but not in oviduct ($p > 0.05$). They indicated that *P. niruri* become powerful to lower the abundance of matrix extracellular withinside uterus which triggered the fibrosis, but not in oviduct. 2% NaCl consumption become observed with the aid of using a 2.5-fold growth in aortic collagen abundance and with the aid of using a discount of sensitivity of aortic explants to the vasorelaxant impact of SNP following endothelin-1-prompted constriction.⁷

Effects of aqueous extract of *P. niruri* on some rats organs of CCl₄ triggered hepatotoxic rats were studied previously. High ranges of malondialdehyde (MDA) were decided withinside the CCl₄ test organisation with huge cut price of MDA ranges in all companies on *P. niruri* extract administration. Highest ranges of glutathione (GSH) were placed in *P. niruri* organisation. Activities of alanine transaminase, aspartate transaminase and alkaline phosphatase enzymes were significantly reduced withinside the recovery organisation (*P. niruri* treatment after CCl₄ injection). Histopathology of liver showed lesser degree of inflammation in all *P. niruri* dealt with companies on the identical time because the seminiferous tubules and renal showed eosinophilic protein casts with signs and signs of tubular damage and degeneration. Testes moreover showed decreased amount of mature spermatozoa. The results advocate that *P. niruri* has anti-oxidant and hepato-defensive interest with associated deleterious effects on testes and kidney.⁹

Phyllanthus niruri extract permits to maintain near organ characteristic and forestalls histopathological changes thru ameliorating oxidative stress, inflammation, fibrosis and apoptosis on the identical time as enhancing proliferation of the organ in diabetes

mellitus. Administration of *Phyllanthus sp* extract notably decreased the levels of collagen and tissue inhibitors of matrix metalloproteinases (TIMPs); and simply modulated the expression of Matrix metalloproteinases (MMPs).¹⁰

5. Conclusion

P. niruri extract was potent to decrease the matrix extracellular in the uterus, but not in the oviduct of the rats.

6. Acknowledgments

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7. References

1. Badan POM RI. 2010. Acuan Sediaan Herbal. Volume Kelima Edisi Pertama. Jakarta.
2. Murugaiyah, Vikneswaran, 2008. Phytochemical, Pharmacological, and Pharmacokinetic Studies of *Phyllanthus Niruri* Linn Lignans as Potensial Antihyperuricemic Agents. Malaysia: Universiti Sains Malaysia.
3. Heffner, Linda J dan Schust, Danny J. 2006. At a Glance Sistem Reproduksi. Edisi Kedua. Jakarta: Erlangga.
4. Sitasiwi, Agung Janika. 2011. Hubungan Kadar Hormon Estradiol 17-β dan Tebal Endometrium Uterus Mencit (*Mus musculus* l.) Selama Satu Siklus Estrus. Laboratorium Biologi Struktur dan Fungsi Hewan Jurusan Biologi FMIPA Universitas Diponegoro.
5. Umami, Riza., D. Pande Made., Winarsih, Sri. 2014. Pengaruh Vitamin C dan E terhadap Histologi Tuba Fallopi pada Tikus yang Dipapar MSG. *Jurnal Kedokteran Brawijaya*. Vol.28. No.2.

6. Rotman, N., Wahli, W., 2010, PPAR modulation of kinase-linked receptor signaling in physiology and malady. *Physiology* 25: 176-185.
7. Grigorova, Y.N., Juhasz, O., Zernetkina, V., Fishbein, K.W., Lakatta, E.G., Fedorova, O.V., and Bagrov, A.Y., 2016. Aortic Fibrosis, Induced by High Salt Intake in the Absence of Hypertensive Response, Is Reduced by a Monoclonal Antibody to Marinobufagenin. *American J. of Hypert.* 29(5) : 641-646.
8. Amin, A.Z. et al., 2013. Gene expression profiling reveals underlying molecular mechanism of hepatoprotective effect of Phyllanthus niruri on thioacetamide-induced hepatotoxicity in Sprague Dawley rats. *BMC Complementary and Alternative Medicine* 2013, 13:160.
9. Manjrekar, A. P., Jisha, V., Bag, P. P., Adhikary, B., Pai, M. M., Hegde, A., & Nandini, M., 2008. Effect of Phyllanthus niruri Linn. treatment on liver, kidney and testes in CCl4 induced hepatotoxic rats. *Indian J. Exp. Bio.* 46: 514-520.
10. Narayanan, B.S., Latha, P., & Rukkumani, R., 2010. Protective effects of Phyllanthus amarus on fibrotic markers during alcohol and polyunsaturated fatty acid-induced toxicity. *Toxicol Mech Methods.* 21(1):48-52.