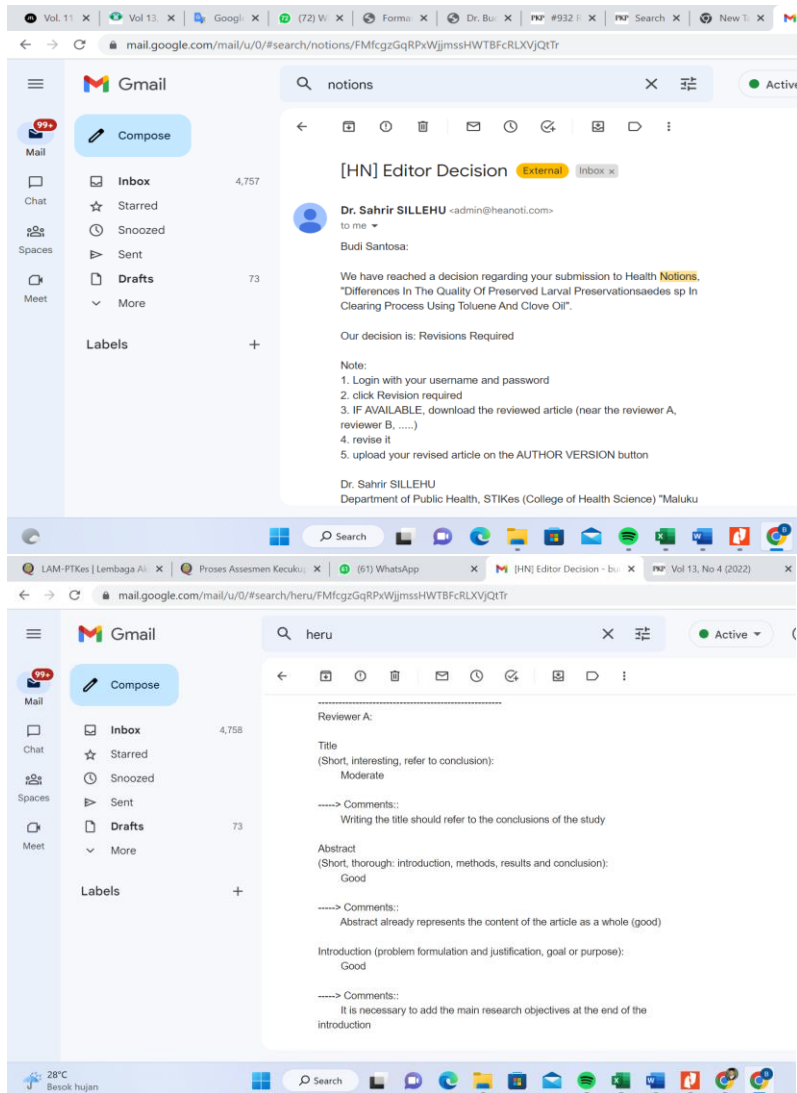


KORESPONDENSI ARTIKEL "Differences In The Quality Of Preserved Larval Preservationsaesdes sp In Clearing Process Using Toluene And Clove Oil DI JURNAL HEALTH NOTIONS. JURNAL NASIONAL SINTA 4

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2. PERMINTAAN REVISI



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Methods
(Time and location, type and design of study, population and sample, variable(s), data collection and instruments, data analysis):
Moderate

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The content of the method is incomplete, it should include:
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-- measurement of each variable (data collection)
--data analysis

Results
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Inaccurate numbering of tables and figures.
all figures and tables should be written in English

Discussion (facts, comparators, opinion of author):
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Conclusion
(short, comprehensive, qualitative, relevant):
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Citations & References
(relevant, up to date, research results dominate):
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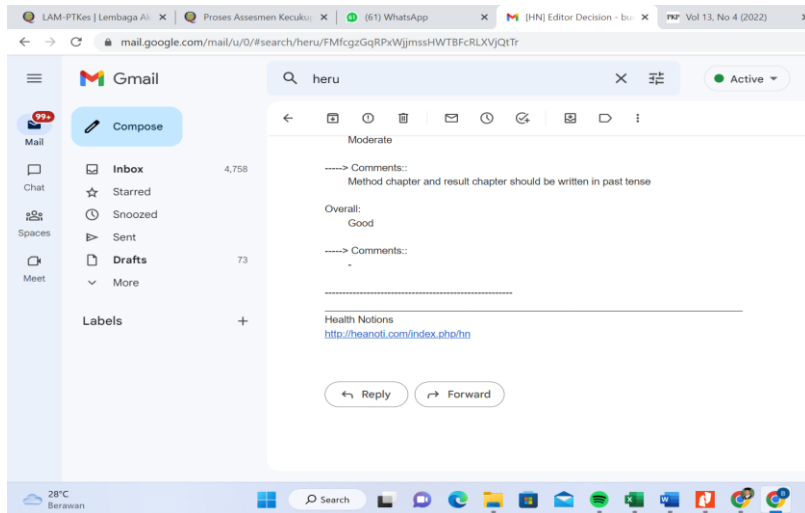
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adequate and properly written references, both in citations and bibliography

Novelty and innovation:
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Differences In The Quality Of Preserved Larval Preservations *Aedes sp* In Clearing Process Using Toluene And Clove Oil

Diah Kinanti Rahayu¹, Budi Santosa^{2(CA)}, Toeti Rahajoe², Tulus Ariyadi³

¹ DIV Health Analyst Study Program, Faculty of Nursing and Health, University of Muhammadiyah Semarang; diahkinantirahayu@gmail.com

^{2(CA)} Master of Clinical Laboratory Science, Faculty of Nursing and Health, University of Muhammadiyah Semarang; budisantosa@unimus.ac.id (Corresponding Author)

² Master of Clinical Laboratory Science, Faculty of Nursing and Health, University of Muhammadiyah Semarang; toeti.rahajoe@gmail.com

³ D III Health Analyst Study Program, Faculty of Nursing and Health, University of Muhammadiyah Semarang; mustoels@gmail.com

ABSTRACT

The purpose of making entomological preserved preparations was to identify insect morphology, which went through the stages of fixation, dehydration, clearing and mounting. Clearing is a step that aims to make the insect structure visible, clear and transparent, the materials used for the clearing process are toluene and clove oil which have carbon compounds and minimal toxicity. The purpose of this study was to determine the quality of preparations preserved by *Aedes sp* larvae in the clearing process using toluene and clove oil. This type of

research is analytic with a cross sectional approach with two treatments, namely toluene and clove oil, with 16 samples for each treatment. Preserved preparations of *Aedes* sp larvae were observed microscopically to assess the quality of preserved preparations which included the clarity of preparations, color quality, and the integrity of the parasite's limbs. The results showed that in the clearing treatment with toluene, 5 preparations were of good quality, 4 preparations of good quality, and 7 preparations of poor quality. Clearing treatment with clove oil obtained 12 preparations of good quality and 4 preparations of moderate quality. The Mann-Whitney statistical test showed a significance value of 0.032 with a significance level of 0.05, so it can be concluded that there are differences in the quality of preparations preserved by *Aedes* sp larvae in the clearing process using toluene and clove oil.

Keywords: quality of preparations; *aedes* sp; toluene; clove oil.

INTRODUCTION

Preserved preparations are samples of pathological and anatomical specimens that are placed or smeared on the surface of glass objects or slides with or without staining, which aims to identify, recognize, and observe the morphology of the parasite.⁽¹⁾ One of the parasites that still disturbs the environment and humans is *Aedes* sp larvae, because *Aedes* sp larvae can breed into adult mosquitoes which are one of the vectors of DHF (Dengue Hemorrhagic Fever) disease in humans which is transmitted through its bite on the human body.⁽²⁾

The process of making permanent preserved preparations begins with a fixation process using KOH solution for exoskeleton thinning, a dehydration process using a graded alcohol solution for the withdrawal of water molecules, a clearing process for clarification and a mounting process for tissue adhesion⁽¹⁾. The clearing process aims to clear the tissue preparations so that the insect structure looks clearer, clearer and transparent when observed using a microscope⁽³⁾.

The clearing process usually uses a solution of benzol, toluene, xylol, acetone and clove oil⁽¹⁾. Clearing generally uses xylol solution, because xylol solution is a solution with a high refractive index and quickly attracts alcohol, but xylol solution has the disadvantage that it is flammable, if soaking is too long the tissue becomes dry and brittle, the preparations do not last long and xylol solution is a chemical that is toxic so that it can give side effects to the body when exposed continuously⁽⁴⁾. Then the xylol solution can be replaced with other materials that have the same solvent characteristics⁽¹⁾.

Toluene solution is a colorless aromatic hydrocarbon compound (Ghofur, Suparyati and Qolbi). Toluene and xylol belong to the benzene group which has almost the same chemical formula⁽⁶⁾. In addition to toluene solution as a substitute solution, clove oil can be used as a clearing solution to clarify preparations.

Clove oil is an essential oil derived from the clove plant (*Syzygium aromaticum*) which is part of a hydrocarbon compound that has nonpolar properties so that it can attract alcohol in preparations.⁽¹⁾ Clove oil is obtained from clove bud oil, clove stalks oil, and clove leaf oil.⁽⁷⁾ Clove oil has the advantages of faster purification, relatively cheaper prices, and does not contain toxins. The disadvantage of clove oil is that it can only clean the tissue transferred from 96% alcohol concentration.⁽¹⁾

MATERIALS AND METHODS

The type of research used is analytical research with a cross sectional approach that examines the difference between the clearing process using toluene and clove oil on samples of *Aedes* sp.

The research was carried out at the Parasitology Laboratory of the Health Analyst DIV Study Program, University of Muhammadiyah Semarang in May 2022. The sample in this study was *Aedes* sp larvae obtained from ovitraps placed in the Gemah Sari area, Tembalang sub-district, Semarang City. *Aedes* sp larvae as many as 32 samples were made to make quality preparations of preserved *Aedes* sp larvae with 2 treatments to see the color, clarity, and integrity of *Aedes* sp larvae preparations. The tools in this research are: microscope, tweezers, tissue, cotton, object glass, deck glass (cover glass), wide-mouthed bottle, beaker glass, measuring cup, dropper. The materials used for this study were: samples of *Aedes* sp larvae, graded alcohol ranging from concentrations of 30%, 50%, 70% and 96%, aquadest, 10% KOH solution, emtellan, clove oil and toluene.

How to make preserved preparations are: soak *Aedes* sp larvae in 10% KOH solution for 24 hours, second soak *Aedes* sp larvae in 30% alcohol for 5 minutes, third soak *Aedes* sp larvae in 50% alcohol for 5 minutes, fourth soak *Aedes* sp larvae into 70% alcohol for 5 minutes, the five *Aedes* sp larvae soaked in 96% alcohol for 5 minutes, the six *Aedes* sp larvae preparations were added to the toluene clearing agent for 5

minutes with 3 repetitions while the clove oil clearing agent was soaked for 15 minutes with 1 repetition, and finally mounting or closing the preparation using entellan.

RESULTS

Table 4. The results of the percentage of the quality of the preserved preparations of *Aedes sp* larvae based on different clearing treatments.

Clearing Treatment	Quality of Preserved Preparations of <i>Aedes sp</i> Larvae					
	Well	%	Pretty good	%	Bad	%
<i>Toluene</i>	7	43.75	4	25	5	31.25
Clove Oil	12	75	4	25	0	0

Based on table 4, it was found that the quality of preparations for preserved *Aedes sp* larvae with the clearing process using toluene showed that 7 preparations were good with a percentage of 43.75%, 4 preparations were quite good with a percentage of 25% and 5 preparations were bad with a percentage of 31.25%. While the clearing process using clove oil obtained 12 good preparations with a percentage of 75%, 4 preparations were quite good with a percentage of 25% and no results were obtained with poor quality preparations in the clove oil treatment.

An illustration of the quality comparison of preparations preserved by *Aedes sp* larvae in the clearing process using a clearing agent toluene and clove oil can be seen in the following graphic results:



Figure 14. Comparison of the quality results of preparations preserved by *Aedes sp*.

Based on Figure 14. It shows that the results of the quality of preparations preserved by *Aedes sp* larvae with clearing treatment using clove oil have a higher score than the clearing treatment using toluene.

Then this study will determine whether the clearing treatment using clearing agent toluene and clove oil affects the quality of preparations preserved *Aedes sp* larvae can be used with the Mann-Whitney test, the following is the Mann-Whitney test from this study.

Table 5. Mann-Whitney test results on the quality of preparations preserved by *Aedes sp* larvae

Clearing Treatment	Value Significance
<i>Toulen</i>	0.032
Clove Oil	

Based on table 5. Showing the results of the Mann-Whitney test, the Sig value is 0.032, so $p = 0.032$ when $\alpha = 0.05$ is used, then $p < \alpha$, so H_0 is rejected, which means that there is a difference in clearing results between being given the toluene treatment and the treatment. clove oil.

DISCUSSION

Based on microscopic observation data on the preserved preparations of *Aedes* sp larvae based on the clearing process using toluene and clove oil, different results were obtained, in the table of the cleaning process using toluene obtained 7 (43.75%) preparations with good quality, 4 (25%) preparations with fairly good quality, and 5 (31.25%) preparations with poor quality. The clearing process using clove oil obtained 12 (75%) preparations with good quality, 4 (25%) preparations with moderately good quality, and no preparations with poor quality were found.

The preparations were said to be in good category including good color, clarity and morphological integrity of *Aedes* sp larvae, and quite good category because the incomplete clearing was still not transparent and the morphological color still looked black which made the morphology difficult to observe and the limbs of the *Aedes* sp larvae were still present. The loss can be caused by the concentration of KOH solution that is too high and the length of immersion time or other factors such as when sampling *Aedes* sp larvae⁽⁸⁾. Preserved preparations containing air bubbles are caused by the mounting process using less than perfect entellan which can result in poor quality preparations⁽¹⁾.

Based on the results of the Mann-Whitney test showed that the significance of toluene and clove oil was 0.032 or < 0.05 . This indicates that there is a difference between the treatment of toluene and clove oil.

CONCLUSION

Based on the research that has been done, the following conclusions are obtained:

1. Larvae of *Aedes* sp in the clearing process using a clearing agent toluene produced 7 preserved preparations in the good category, 4 preserved preparations in the moderately good category, and 5 preparations in the poor category.
2. Larvae of *Aedes* sp in the clearing process using clove oil as a clearing agent produced 12 preserved preparations in good category, 4 preserved preparations in good enough category, and no preparations in poor category were obtained.
3. Based on the Mann-Whitney test, it was concluded that "There is a difference in results between being given clearing treatment using toluene clearing agent and clearing treatment using clove oil clearing agent on the quality of preserved preparations (good, good enough, and bad)".

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PERBEDAAN KUALITAS PREPARAT AWETAN LARVA *Aedes sp* PADA PROSES CLEARING MENGGUNAKAN TOLUEN DAN MINYAK CENGKEH

Differences In The Quality Of Preserved Larval Preservation *saedes sp* In Clearing Process Using Toluene And Clove Oil

Diah Kinanti Rahayu¹, Budi Santosa^{2*}, Toeti Rahajoe², Tulus Ariyadi³

¹*Program Studi DIV Analisis Kesehatan, Fakultas Ilmu Keperawatan dan Kesehatan, Universitas Muhammadiyah Semarang.*

^{2*}*S2 Ilmu Laboratorium Klinis, Fakultas Ilmu Keperawatan dan Kesehatan, Universitas Muhammadiyah Semarang*

³*Program Studi D III Analisis Kesehatan, Fakultas Ilmu Keperawatan dan Kesehatan, Universitas Muhammadiyah Semarang*

Info Artikel

Abstrak

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(Short, interesting, refer to conclusion):
Moderate

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Writing the title should refer to the conclusions of the study. **revised**

Commented [R2]: (Short, thorough: introduction, methods, results and conclusion):

Good
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Abstract already represents the content of the article as a whole (good)

Introduction (problem formulation and justification, goal or purpose):
Good

Keyword

Kualitas preparat, *Aedes sp*,
Toluen, Minyak cengkeh.

Pembuatan preparat awetan entomologi bertujuan untuk mengidentifikasi morfologi serangga, yang melalui tahapan *fiksasi, dehidrasi, clearing* dan *mounting*. *Clearing* merupakan tahapan yang bertujuan menjadikan struktur serangga terlihat jelas, jernih dan transparan, bahan yang digunakan untuk proses *clearing* adalah *toluen* dan minyak cengkeh yang mempunyai senyawa karbon dan toksisitas yang minimal. Tujuan dari penelitian ini adalah untuk mengetahui kualitas preparat awetan larva *Aedes sp* pada proses *clearing* menggunakan *toluen* dan minyak cengkeh. Jenis penelitian ini adalah analitik dengan pendekatan *cross sectional* dengan dua perlakuan yaitu *toluen* dan minyak cengkeh, dengan 16 sampel setiap perlakuan. Preparat awetan larva *Aedes sp* diamati secara mikroskopis untuk menilai kualitas preparat awetan yang meliputi kejernihan preparat, kualitas warna, dan keutuhan anggota tubuh parasit. Hasil penelitian menunjukkan bahwa pada perlakuan *clearing* dengan *toluen* diperoleh 5 preparat kualitas baik, 4 preparat kualitas cukup baik, dan 7 preparat kualitas buruk. Perlakuan *clearing* dengan minyak cengkeh diperoleh 12 preparat kualitas baik dan 4 preparat kualitas cukup baik. Uji statistik Mann-Whitney menunjukkan nilai signifikansi sebesar 0,032 dengan taraf kemaknaan 0,05, sehingga dapat disimpulkan bahwa ada perbedaan kualitas preparat awetan larva *Aedes sp* pada proses *clearing* menggunakan *toluen* dan minyak cengkeh.

***Corresponding Author :**

Budi Santosa

Magister Ilmu Laboratorium Klinis/Medis, Muhammadiyah Semarang, Semarang Indonesia 50273

E-mail : budisantosa@unimus.ac.id

Pendahuluan

Preparat awetan merupakan sampel spesimen patologi maupun anatomi yang di letakkan atau dioleskan di permukaan objek glass atau slide dengan pewarnaan atau tanpa pewarnaan, yang bertujuan untuk mengidentifikasi, mengenali, dan melihat morfologi parasit (Septiani, 2018). Parasit yang masih banyak mengganggu lingkungan dan manusia salah satunya yaitu larva *Aedes sp*, karena larva *Aedes sp* dapat berkembang biak menjadi nyamuk dewasa yang merupakan salah satu vektor penyakit DBD (Demam Berdarah Dengue) pada manusia yang penularannya melalui gigitannya pada tubuh manusia (Sari, 2018).

Proses pembuatan preparat awetan permanen diawali dengan proses *fiksasi* menggunakan larutan KOH untuk penipisan *eksoskeleton*, proses *dehidrasi* menggunakan larutan alkohol bertingkat untuk penarikan molekul air, proses *clearing* untuk penjernihan dan proses *mounting* untuk perekatan jaringan (Septiani, 2018).

Proses *clearing* yang bertujuan untuk menjernihkan jaringan preparat sehingga struktur serangga terlihat lebih jelas, jernih dan transparan saat diamati menggunakan mikroskop (Lael, B. F., B. Santosa, 2018).

Proses *clearing* biasanya menggunakan larutan *benzol*, *toluen*, *xylol*, *acetone* dan minyak cengkeh (Septiani, 2018). *Clearing* umumnya menggunakan larutan *xylol*, karena larutan *xylol* merupakan larutan dengan indeks refraksi tinggi serta cepat menarik alkohol tetapi larutan *xylol* mempunyai kekurangan yaitu mudah terbakar, jika perendaman terlalu lama maka jaringan menjadi kering dan rapuh maka preparat tidak bertahan lama dan larutan *xylol* merupakan bahan kimia yang bersifat toksik sehingga mampu memberikan efek samping pada tubuh apabila terpapar terus menerus (Faridah, Tulus and Fitri, 2019). Maka larutan *xylol* dapat diganti dengan bahan yang lain yang memiliki karakteristik pelarut yang sama (Septiani, 2018).

Larutan *toluen* merupakan senyawa hidrokarbon aromatik yang tidak berwarna (Ghofur, Suparyati and Qolbi). Toluene dan

xylol termasuk golongan benzena yang mempunyai rumus kimia yang hampir sama (Damayanti, Ariyadi and Ayuning, 2022). Selain larutan *toluen* sebagai larutan pengganti, minyak cengkeh dapat digunakan sebagai larutan *clearing* yang menjernihkan preparat.

Minyak cengkeh merupakan minyak atsiri yang berasal dari tanaman cengkeh (*Syzygium aromaticum*) yang merupakan bagian dari senyawa hidrokarbon yang memiliki sifat nonpolar sehingga bisa menarik alkohol pada preparat (Septiani, 2018). Minyak cengkeh diperoleh dari bunga cengkeh (*clove bud oil*), tangkai atau gagang bunga cengkeh (*clove stalks oil*), dan dari daun cengkeh (*clove leaf oil*) (Syahbanuari, Yusniwati and Efendi, 2020). Minyak cengkeh mempunyai kelebihan yaitu penjernihan lebih cepat, harga relatif lebih murah, dan tidak mengandung racun. Kekurangan minyak cengkeh yaitu hanya dapat menjernihkan jaringan yang dipindahkan dari alkohol konsentrasi 96% (Septiani, 2018).

Bahan dan Metode

Jenis penelitian yang digunakan yaitu penelitian analitik dengan pendekatan *cross sectional* yang menguji perbedaan antara proses *clearing* menggunakan *toluen* dan minyak cengkeh pada sampel larva *Aedes sp*. Penelitian dilaksanakan di Laboratorium Parasitologi Prodi DIV Analisis Kesehatan Universitas Muhammadiyah Semarang pada bulan Mei 2022. Sampel dalam penelitian ini adalah Larva *Aedes sp* yang diperoleh dari ovitrap yang diletakkan di daerah Gemah sari, kecamatan Tembalang, Kota Semarang dengan cara purposive sampling. Larva *Aedes sp* sebanyak 32 sampel dilakukan pembuatan kualitas preparat awetan larva *Aedes sp* dengan 2 perlakuan untuk melihat warna, kejernihan, dan keutuhan preparat larva *Aedes sp*. Alat – alat pada penelitian ini adalah : mikroskop, pinset, tissue, kapas, *objek glass*, *deck glass* (kaca penutup), botol bermulut lebar, beker glass, gelas ukur, pipet tetes. Bahan yang digunakan untuk penelitian ini adalah : sampel larva *Aedes sp*, alkohol bertingkat mulai dari konsentrasi 30%, 50%,

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It is necessary to add the main research objectives at the end of the introduction
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- type and design
- time and location
- population-sample-sampling
- variable
- measurement of each variable (data collection)
- data analysis.

revised

70% dan 96%, aquadest, larutan KOH 10%, *entellan*, minyak cengkeh dan *toluen*.

Cara pembuatan preparat awetan adalah : rendam larva *Aedes sp* ke dalam larutan KOH 10% selama 24 jam, kedua rendam larva *Aedes sp* kedalam alkohol 30% selama 5 menit, ketiga rendam larva *Aedes sp* kedalam alkohol 50% selama 5 menit, keempat rendam larva *Aedes sp* kedalam alkohol 70% selama 5 menit, kelima rendam larva *Aedes sp* kedalam alkohol 96% selama 5 menit, keenam preparat larva *Aedes sp* di masukan ke *clearing agent toluen* selama 5 menit dengan pengulangan sebanyak 3 kali sedangkan *clearing agent* minyak cengkeh direndam selama 15 menit dengan 1 kali pengulangan, dan terakhir *mounting* atau penutupan preparat menggunakan *entellan*.

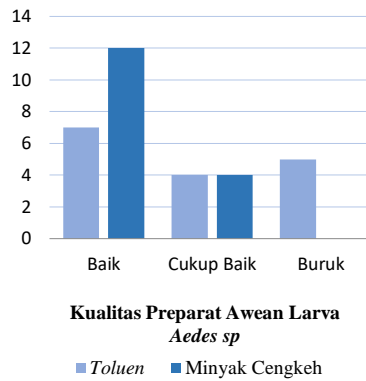
Hasil

Tabel 4. Hasil presentase kualitas preparat awetan larva *Aedes sp* berdasarkan perlakuan *clearing* yang berbeda.

Perlakuan <i>Clearing</i>	Kualitas Preparat Awetan Larva <i>Aedes sp</i>					
	Baik	%	Cukup Baik	%	Buruk	%
<i>Toluen</i>	7	43,75	4	25	5	3,25
Minyak Cengkeh	12	75	4	25	0	0

Berdasarkan tabel 4 didapatkan hasil kualitas preparat awetan larva *Aedes sp* dengan proses *clearing* menggunakan *toluen* menunjukkan hasil 7 preparat baik dengan presentase 43,75% , 4 preparat cukup baik dengan presentase 25% dan 5 preparat buruk dengan presentase 31,25%. Sedangkan proses *clearing* menggunakan minyak cengkeh didapatkan 12 preparat baik dengan presentase 75%, 4 preparat cukup baik dengan presentase 25% dan tidak didapatkan hasil dengan preparat kualitas buruk pada perlakuan minyak cengkeh.

Gambaran perbandingan kualitas preparat awetan larva *Aedes sp* pada proses *clearing* menggunakan *clearing agent toluen* dan minyak cengkeh dapat di lihat pada hasil grafik berikut ini :



Gambar 14. Hasil perbandingan kualitas preparat awetan larva *Aedes sp*.

Berdasarkan gambar 14. Menunjukkan bahwa hasil kualitas preparat awetan larva *Aedes sp* dengan perlakuan *clearing* menggunakan minyak cengkeh lebih tinggi skor penilaian dibandingkan dengan perlakuan *clearing* menggunakan *toluen*.

Kemudian penelitian ini akan mengetahui apakah perlakuan *clearing* menggunakan *clearing agent toluen* dan minyak cengkeh berpengaruh terhadap kualitas preparat awetan larva *Aedes sp* dapat digunakan dengan uji Mann-Whitney berikut adalah uji Mann-Whitney dari penelitian ini.

Tabel 5. Hasil uji Mann-Whitney pada kualitas preparat awetan larva *Aedes sp*

Perlakuan <i>Clearing</i>	Nilai Signifikansi
<i>Toluen</i>	0,032
Minyak Cengkeh	

Berdasarkan tabel 5. Menunjukkan hasil uji Mann-Whitney di dapatkam nilai Sig adalah 0,032, jadi $p = 0,032$ bila digunakan $\alpha = 0,05$, maka $p < \alpha$, sehingga H_0 ditolak, yang artinya ada perbedaan hasil *clearing* antara diberi perlakuan *toluen* dengan perlakuan minyak cengkeh.

Commented [R5]: Results (data presentation and interpretation):
 Moderate
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 Inaccurate numbering of tables and figures. all figures and tables should be written in English
 Discussion (facts, comparators, opinion of author):
 Good

Pembahasan

Berdasarkan data pengamatan secara mikroskopis terhadap preparat awetan larva *Aedes sp* berdasarkan proses *clearing* menggunakan *toluen* dan minyak cengkeh di dapatkan hasil yang berbeda, pada tabel proses *clearing* menggunakan *toluen* diperoleh 7 (43,75%) preparat dengan kualitas baik, 4 (25%) preparat dengan kualitas cukup baik, dan 5 (31,25%) preparat dengan kualitas buruk. Proses *clearing* menggunakan minyak cengkeh diperoleh 12 (75%) preparat dengan kualitas baik, 4 (25%) preparat dengan kualitas cukup baik, dan tidak ditemukan preparat dengan kualitas buruk.

Preparat dikatakan dalam kategori baik meliputi warna, kejernihan dan keutuhan morfologi larva *Aedes sp* yang baik, dan kategori cukup baik dikarenakan *clearing* yang belum sempurna masih belum transparan dan warna morfologi masih terlihat hitam yang menyebabkan morfologi sulit untuk diamati dan anggota tubuh larva *Aedes sp* masih ada yang hilang dapat disebabkan oleh konsentrasi larutan KOH yang terlalu tinggi dan lamanya waktu perendaman atau faktor lain seperti saat pengambilan sampel larva *Aedes sp* (Iswara and Nuroini, 2017). Preparat awetan yang terdapat gelembung udara disebabkan oleh proses *mounting* menggunakan *entellan* kurang sempurna yang dapat menghasilkan kualitas preparat menjadi buruk (Septiani, 2018).

Berdasarkan hasil uji Mann-Whitney menunjukkan bahwa hasil signifikansi dari toluen dan minyak cengkeh adalah 0,032 atau $< 0,05$. Hal ini menunjukkan adanya perbedaan antara perlakuan toluen dan minyak cengkeh.

Kesimpulan

Berdasarkan penelitian yang telah dilakukan didapatkan kesimpulan sebagai berikut :

1. Larva *Aedes sp* pada proses *clearing* menggunakan *clearing agent* toluen

menghasilkan sebanyak 7 preparat awetan dengan kategori baik, 4 preparat awetan dengan kategori cukup baik, dan 5 preparat dengan kategori buruk.

2. Larva *Aedes sp* pada proses *clearing* menggunakan *clearing agent* minyak cengkeh menghasilkan sebanyak 12 preparat awetan dengan kategori baik, 4 preparat awetan dengan kategori cukup baik, dan tidak didapatkan hasil preparat dengan kategori buruk.
3. Berdasarkan uji Mann-Whitney disimpulkan bahwa “ Ada perbedaan hasil antara diberi perlakuan *clearing* menggunakan *clearing agent* toluen dengan perlakuan *clearing* menggunakan *clearing agent* minyak cengkeh terhadap kualitas preparat awetan (baik, cukup baik, dan buruk) ”.

Saran

1. Di perlukan penelitian lebih lanjut tentang pembuatan awetan nyamuk *Aedes sp* pada proses *clearing* menggunakan *clearing agent* berbeda.
2. Di perlukan penelitian lebih lanjut tentang proses *clearing* dengan variasi waktu *clearing* yang berbeda.

Commented [R6]: Conclusion
(short, comprehensive, qualitative, relevant):
Good

Novelty and innovation:
Moderate

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Writing: systematics, grammar and spelling:
Moderate

Overall:
Good

Daftar Pustaka

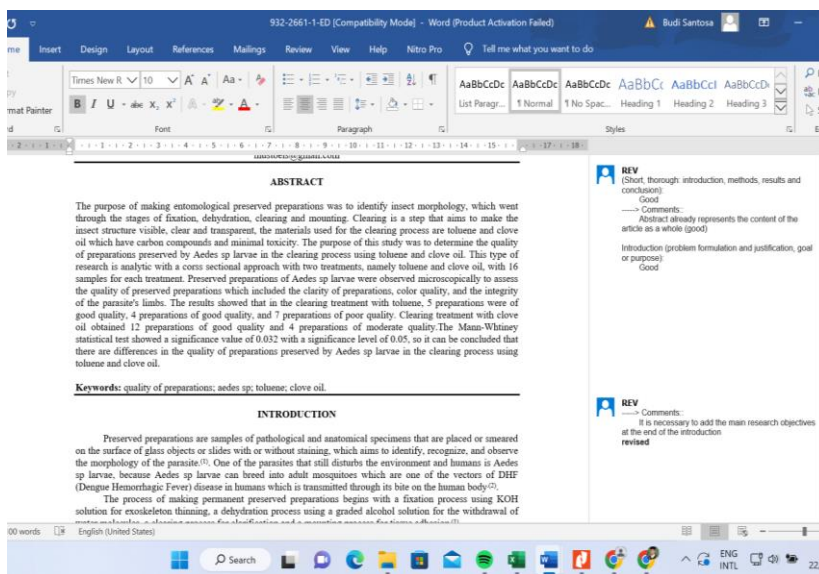
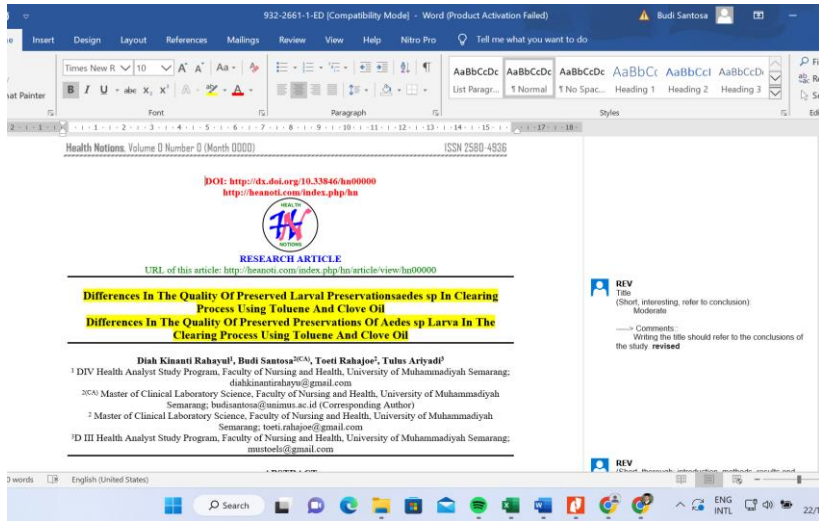
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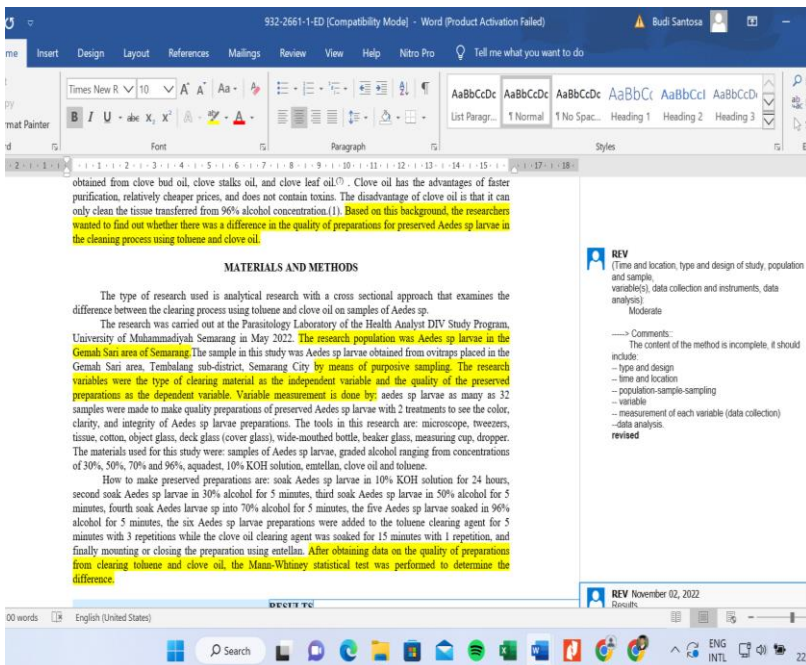
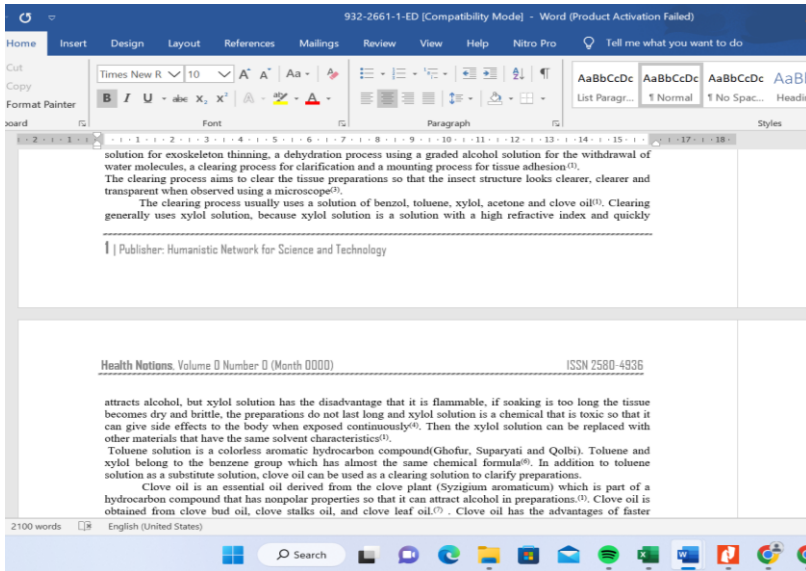
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Commented [R7]: Citations & References
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3. HASIL PERBAIKAN





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RESULTS

Table 4. The results of the percentage of the quality of the preserved preparations of *Aedes sp* larvae based on different clearing treatments.

Table 1. The results of the percentage of the quality of the preserved preparations of *Aedes sp* larvae based on different clearing treatments

Clearing Treatment	Quality of Preserved Preparations of <i>Aedes sp</i> Larvae					
	Well	%	Pretty good	%	Bad	%
Toluene	7	43.75	4	25	5	31.25
Clove Oil	12	75	4	25	0	0

Based on table 4, it was found that the quality of preparations for preserved *Aedes sp* larvae with the clearing process using toluene showed that 7 preparations were good with a percentage of 43.75%, 4 preparations were quite good with a percentage of 25% and 5 preparations were bad with a percentage of 31.25%. While the clearing process using clove oil obtained 12 good preparations with a percentage of 75%, 4 preparations were quite good with a percentage of 25% and no results were obtained with poor quality preparations in the clove oil treatment.

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REV Results (data presentation and interpretation) Moderate
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An illustration of the quality comparison of preparations preserved by *Aedes sp* larvae in the clearing process using a clearing agent toluene and clove oil can be seen in the following graphic results:

Clearing Agent	Baik	Cukup Baik	Buruk
Toluene	7	4	5
Minyak Cengkeh	12	4	0

Figure 14. Comparison of the quality results of preparations preserved by *Aedes sp*.
Figure 1. Comparison of the quality results of preparations preserved by *Aedes sp*.

Based on Figure 14, it shows that the results of the quality of preparations preserved by *Aedes sp* larvae with clearing treatment using clove oil have a higher score than the clearing treatment using toluene. Then this study will determine whether the clearing treatment using clearing agent toluene and clove oil

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Then this study will determine whether the clearing treatment using clearing agent toluene and clove oil affects the quality of preparations preserved Aedes sp larvae can be used with the Mann-Whitney test, the following is the Mann-Whitney test from this study.

Table 5. Mann-Whitney test results on the quality of preparations preserved by Aedes sp . larvae

Clearing Treatment	Value Significance
Toulen	0.032
Clove Oil	

Based on table 5. Showing the results of the Mann-Whitney test, the Sig value is 0.032, so $p = 0.032$ when $\alpha = 0.05$ is used, then $p < \alpha$, so H_0 is rejected, which means that there is a difference in clearing results between being given the toluene treatment and the treatment. clove oil.

DISCUSSION

Based on microscopic observation data on the preserved preparations of Aedes sp larvae based on the clearing process using toluene and clove oil, different results were obtained, in the table of the clearing process using toluene obtained 7 (43.75%) preparations with good quality, 4 (25%) preparations with fairly good quality, and 5 (31.25%) preparations with poor quality. The clearing process using clove oil obtained 12 (75%) preparations with good quality, 4 (25%) preparations with moderately good quality, and no preparations with poor quality were found.

The preparations were said to be in good category including good color, clarity and morphological integrity of Aedes sp larvae, and quite good category because the incomplete clearing was still not transparent and the morphological color still looked black which made the morphology difficult to observe and the limbs of the Aedes sp larvae were still present. The loss can be caused by the concentration of KOH solution that is too high and the length of immersion time or other factors such as when sampling Aedes sp larvae⁽¹⁾. Preserved preparations containing air bubbles are caused by the mounting process using less than perfect entellan which

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the Aedes sp larvae were still present. The loss can be caused by the concentration of KOH solution that is too high and the length of immersion time or other factors such as when sampling Aedes sp larvae⁽¹⁾. Preserved preparations containing air bubbles are caused by the mounting process using less than perfect entellan which can result in poor quality preparations⁽²⁾.

Based on the results of the Mann-Whitney test showed that the significance of toluene and clove oil was 0.032 or <0.05. This indicates that there is a difference between the treatment of toluene and clove oil.

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CONCLUSION

Based on the research that has been done, the following conclusions are obtained:

1. Larvae of Aedes sp in the clearing process using a clearing agent toluene produced 7 preserved preparations in the good category, 4 preserved preparations in the moderately good category, and 5 preparations in the poor category.
2. Larvae of Aedes sp in the clearing process using clove oil as a clearing agent produced 12 preserved preparations in good category, 4 preserved preparations in good enough category, and no preparations in poor category were obtained.

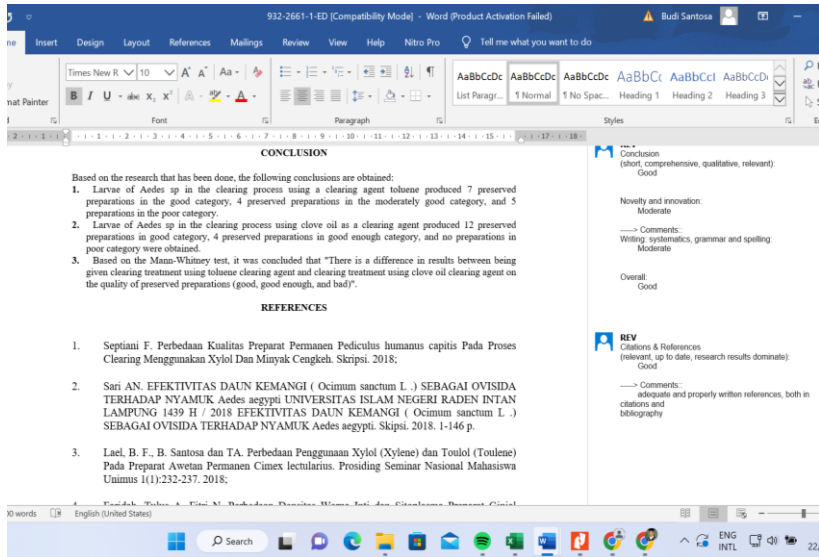
REV
 Conclusion (short, comprehensive, qualitative, relevant)
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Novelty and innovation:
 Moderate

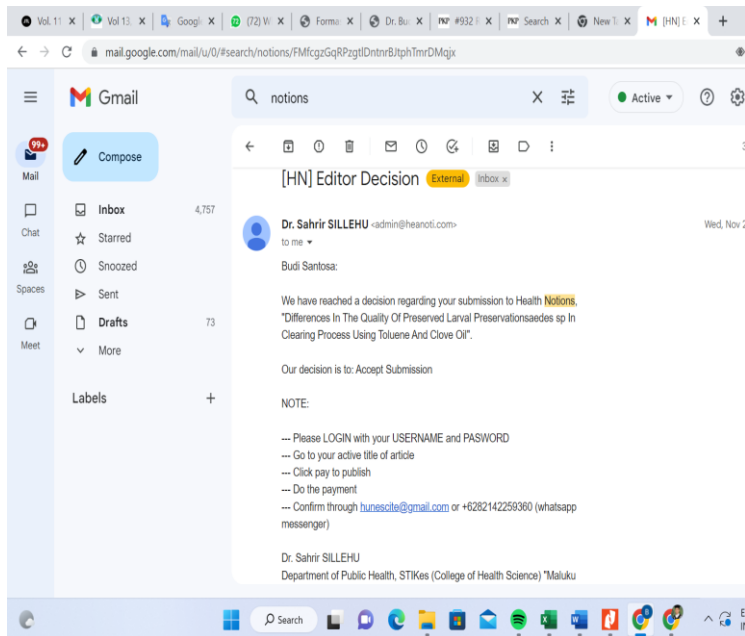
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4. ACCEPTED



5. PUBLISH

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Last modified	2022-11-07	

SUBMISSION METADATA

AUTHORS

Name	Budi Santosa
Affiliation	Universitas Muhammadiyah Semarang
Country	Indonesia
Bio Statement	—

Principal contact for editorial correspondence.

TITLE AND ABSTRACT

Title
Differences In The Quality Of Preserved Larval Preservationsaesdes sp In Clearing Process Using Toluene And Clove Oil

Abstract
The purpose of making entomological preserved preparations was to identify insect morphology, which went through the stages of fixation, dehydration, clearing and mounting. Clearing is a step that aims to make the insect structure visible, clear and transparent, the materials used for the clearing process are toluene and clove oil which have carbon compounds and minimal toxicity. The purpose of this study was to determine the quality of preparations preserved by Aedes sp larvae in the clearing process using toluene and clove oil. This type of research is analytic with a cross sectional approach with two treatments, namely toluene and clove oil, with 16 samples for each treatment. Preserved preparations of Aedes sp larvae were observed microscopically to assess the quality of preserved preparations which included the clarity of preparations, color quality, and the integrity of the parasite's limbs. The results showed that in the clearing treatment with toluene, 5 preparations were of good quality, 4 preparations of good quality, and 7 preparations of poor quality. Clearing treatment with clove oil obtained 12 preparations of good quality and 4 preparations of moderate quality. The Mann-Whitney statistical test

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