

DAFTAR PUSTAKA

- Allocca, M., Zola, S., & Bellosta, P. 2018. 'The Fruit Fly, *Drosophila melanogaster*: The Making of a Model (Part I)'. *Drosophila Melanogaster - Model for Recent Advances in Genetics and Therapeutics*.
- Álvarez-Rendón, J. P., Salceda, R., & Riesgo-Escovar, J. R. 2018. '*Drosophila melanogaster* as a Model for Diabetes Type 2 Progression'. *BioMed Research International*.
- Brisco, P. 2015. 'RNA Purification: A Rapid and Versatile Protocol for the Isolation of Total RNA'. *Promega Notes*, 64.
- Broughton, S., Alic, N., Slack, C., Bass, T., Ikeya, T., Vinti, G., Tommasi, A. M., Drieger, Y., Hafen, E., & Partridge, L. 2008. 'Reduction of DILP2 in *Drosophila* triages a metabolic phenotype from lifespan revealing redundancy and compensation among DILPs'. *PLoS ONE*, 3(11), 3–11.
- Danilov, A., Shaposhnikov, M., Shevchenko, O., Zemskaya, N., Zhavoronkov, A., & Moskalev, A. 2015. 'Influence of non-steroidal anti-inflammatory drugs on *Drosophila melanogaster* longevity'. *Oncotarget*, 6(23), 19428–19444.
- FlyBase: A Database for *Drosophila melanogaster* and molecular biology. Tersedia pada link <https://flybase.org/> (diakses pada tanggal 24 Mei 2021)
- Grönke, S., Clarke, D. F., Broughton, S., Andrews, T. D., & Partridge, L. 2010. 'Molecular evolution and functional characterization of *Drosophila* insulin-like peptides'. *PLoS Genetics*, 6(2).
- Kannan, K., & Fridell, Y. C. 2013. 'Functional implications of *Drosophila* insulin-like peptides in metabolism , aging , and dietary restriction'. 4(October), 1–9.
- Keser, D., & Karataş, A. 2012. 'Effects of aspirin and acetaldehyde on longevity and metamorphosis duration of *Drosophila melanogaster*'. *Fresenius Environmental Bulletin*, 21(9 A), 2758–2765.
- Liao, S. 2020. '*Drosophila* Insulin-Like Peptide 8 (DILP8) in Ovarian Follicle Cells Regulates Ovulation and Metabolism'. *Frontiers in Endocrinology*, 11(July), 7–11.
- Mirzoyan, Z., Sollazzo, M., Allocca, M., Valenza, A. M., Grifoni, D., & Bellosta, P. 2019. '*Drosophila melanogaster*. A model organism to study cancer'. *Frontiers in Genetics*, 10(March), 1–16.

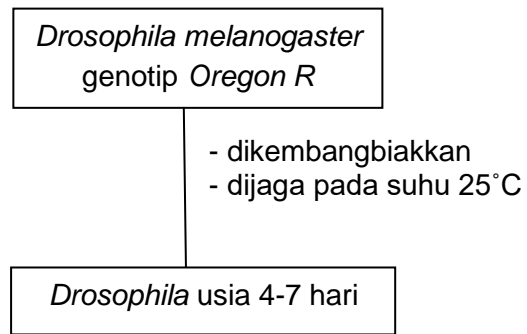
- Nässel, D. R. 2012. 'Insulin-producing cells and their regulation in physiology and behavior of *Drosophila* 1'. *Canadian Journal of Zoology*, 90(4), 476–488.
- Partridge, L., Alic, N., Bjedov, I., & Piper, M. D. W. 2011. 'Ageing in *Drosophila*: The role of the insulin/Igf and TOR signalling network'. *Experimental Gerontology*, 46(5), 376–381.
- Piper, M. D. W., & Partridge, L. 2018. '*Drosophila* as a model for ageing'. *Biochimica et Biophysica Acta - Molecular Basis of Disease*, 1864(9), 2707–2717.
- Post, S., Karashchuk, G., Wade, J. D., Sajid, W., De Meyts, P., & Tatar, M. 2018. '*Drosophila* insulin-like peptides DILP2 and DILP5 differentially stimulate cell signaling and glycogen phosphorylase to regulate longevity'. *Frontiers in Endocrinology*, 9(MAY), 1–16.
- Post, S., Liao, S., Yamamoto, R., Veenstra, J. A., Nässel, D. R., & Tatar, M. 2018. '*Drosophila* insulin-like peptide dilp1 increases lifespan and glucagon-like Akh expression epistatic to dilp2'. *BioRxiv*.
- Qaid, M. M., & Abdelrahman, M. M. 2016. 'Role of insulin and other related hormones in energy metabolism-A review'. *Cogent Food & Agriculture*, 2(1), 1–18.
- Rath, P. C., & Prasad, R. S. S. 2017. 'Topics in Biomedical Gerontology'. *Springer science*.
- Ritu, N., Asheesh, S., & Dinesh, B. 2012. 'An Overview of Randomized Controlled Trials'. *International Journal of Research in Pharmacy and Science*, 2(March), 53–66.
- Semaniuk, U., Piskovatska, V., Strilbytska, O., Strutynska, T., Burdyliuk, N., Vaiserman, A., Bubalo, V., Storey, K. B., & Lushchak, O. 2020. '*Drosophila* insulin-like peptides: from expression to functions – a review'. *Entomologia Experimentalis et Applicata*, 1–14.
- Song, C., Zhu, C., Wu, Q., Qi, J., Gao, Y., Zhang, Z., Gaur, U., Yang, D., Fan, X., & Yang, M. 2017. 'Metabolome analysis of effect of aspirin on *Drosophila* lifespan extension'. *Experimental Gerontology*, 95(2016), 54–62.
- Staats, S., Lüersen, K., Wagner, A. E., & Rimbach, G. 2018. '*Drosophila melanogaster* as a Versatile Model Organism in Food and Nutrition Research'. *Journal of Agricultural and Food Chemistry*, 66(15), 3737–3753.
- Stephenson, R., & Metcalfe, N. H. 2013. '*Drosophila melanogaster*: A fly through its history and current use'. *Journal of the Royal College of*

Physicians of Edinburgh, 43(1), 70–75.

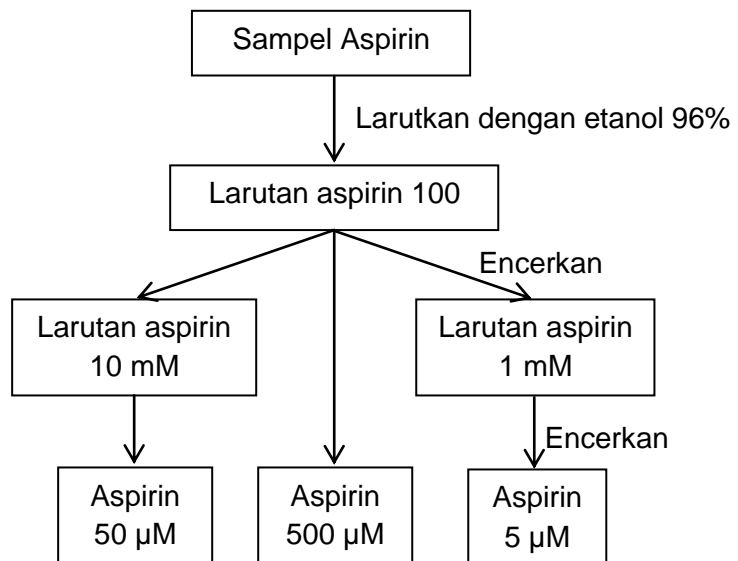
- Tollefsbol, T. O. 1993. 'Biological aging'. *Journal of Cross-Cultural Gerontology* (Vol. 8, Issue 3).
- Zamri, M., Haji, B., Hodges, M. D., Boylan, M., Achall, R., Shirras, A., & Broughton, S. J. 2015. 'The *Drosophila* Insulin Receptor Independently Modulates Lifespan and Locomotor Senescence'. *PLoS ONE*, 1–21.
- Ziegler, A. B., Manière, G., & Grosjean, Y. 2018. 'Jhl-21 plays a role in *Drosophila* insulin-like peptide release from larval IPCs via leucine transport'. *Scientific Reports*, 8(1), 1–11.

LAMPIRAN

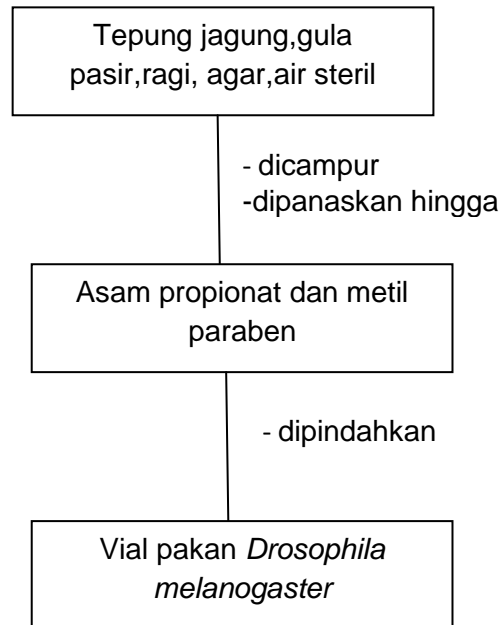
Lampiran 1. Penyiapan Hewan Uji



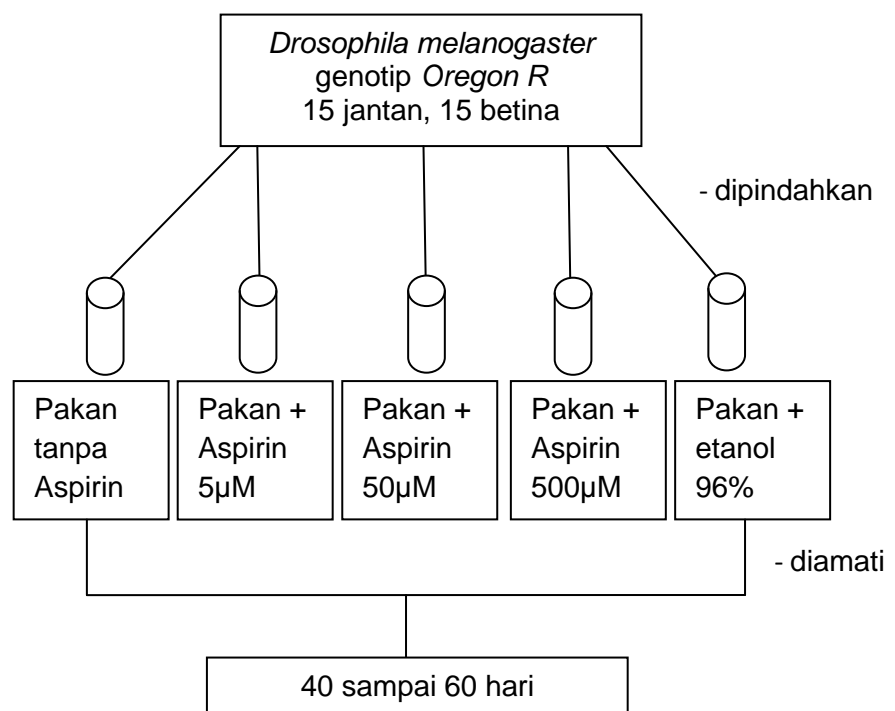
Lampiran 2. Penyiapan sampel



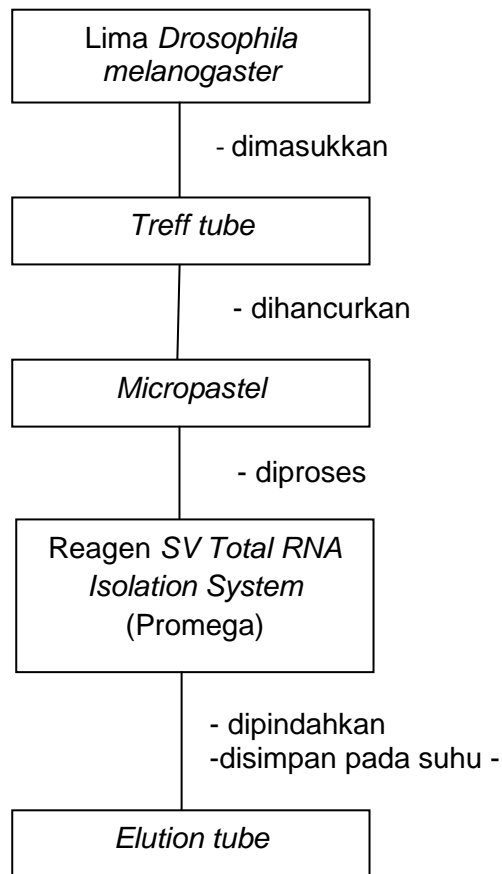
Lampiran 3. Penyiapan Pakan



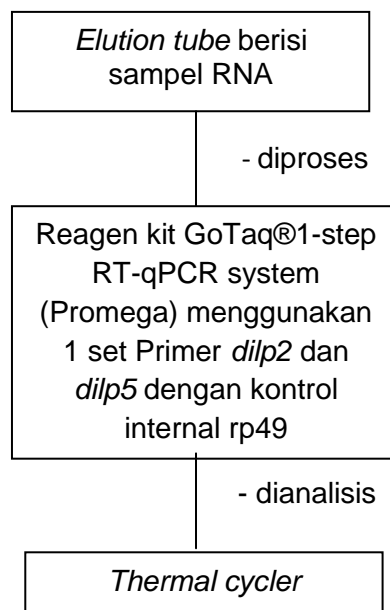
Lampiran 4. Uji Survival



Lampiran 5. Penyiapan sampel RNA



Lampiran 6. Pengujian dengan PCR



Lampiran 7. Perhitungan pengenceran aspirin

Pembuatan larutan aspirin 100 mM (100×10^{-3} M)

$$M = \frac{m}{MR} \times \frac{1000}{ml}$$

$$100 \times 10^{-3} = \frac{m}{180,16} \times \frac{1000}{25}$$

$$10^{-3} = \frac{10m}{4.504}$$

$$4,504 = 10 m$$

$$m = 0,4504 \text{ gram (ad 25 ml EtOH 96\%)}$$

Dibuat pengenceran dengan konsentrasi 10 mM :

$$N_1 \times V_1 = N_2 \times V_2$$

$$100 \times V_1 = 10 \times 5 \text{ ml}$$

$$V_1 = 0.5 \text{ ml}$$

$$V_1 = 500 \mu\text{l (larutan aspirin 100 mM, ad 5 ml etOH 96\%)}$$

Dibuat pengenceran dengan konsentrasi 1 mM :

$$N_1 \times V_1 = N_2 \times V_2$$

$$100 \times V_1 = 1 \times 5 \text{ ml}$$

$$V_1 = 0.05 \text{ ml}$$

$$V_1 = 50 \mu\text{l (larutan aspirin 100 mM, ad 5 ml etOH 96\%)}$$

Pembuatan pakan *Drosophila* yang mengandung aspirin dengan konsentrasi 500 μM

$$500 \mu\text{M} = 500 \times 10^{-3} \text{ mM}$$

$$N_1 \times V_1 = N_2 \times V_2$$

$$100 \times V_1 = 500 \times 10^{-3} \times 5 \text{ ml}$$

$$V_1 = 25 \times 10^{-3} \text{ ml}$$

$$V_1 = 25 \mu\text{l (dari larutan aspirin 100 mM, ad 5 ml pakan)}$$

Pembuatan pakan *Drosophila* yang mengandung aspirin dengan konsentrasi 50 μM

$$50 \mu\text{M} = 50 \times 10^{-3} \text{ mM}$$

$$N_1 \times V_1 = N_2 \times V_2$$

$$10 \times V_1 = 50 \times 10^{-3} \times 5 \text{ ml}$$

$$V_1 = 25 \times 10^{-3} \text{ ml}$$

$$V_1 = 25 \mu\text{l} \text{ (dari larutan aspirin 10 mM, ad 5 ml pakan)}$$

Pembuatan pakan *Drosophila* yang mengandung aspirin dengan konsentrasi 5 μM

$$5 \mu\text{M} = 5 \times 10^{-3} \text{ mM}$$

$$N_1 \times V_1 = N_2 \times V_2$$

$$1 \times V_1 = 5 \times 10^{-3} \times 5 \text{ ml}$$

$$V_1 = 25 \times 10^{-3} \text{ ml}$$

$$V_1 = 25 \mu\text{l} \text{ (dari larutan aspirin 1 mM, ad 5 ml pakan)}$$

Lampiran 8. Data Hasil Uji *Survival*

Tabel 2 Data Hasil Uji *Survival*

No	Tanggal	Kontrol Sehat	Kontrol pelarut	Aspirin 5 uM	Aspirin 50 uM	Aspirin 500uM
1	210109	30/30	29/30	30/30	30/30	30/30
2	210110	30/30	29/30	30/30	29/30	30/30
3	210111	30/30	28/30	30/30	29/30	30/30
4	210112	30/30	28/30	30/30	29/30	30/30
5	210113	30/30	28/30	30/30	29/30	30/30
6	210114	30/30	28/30	30/30	29/30	30/30
7	210115	30/30	28/30	30/30	29/30	30/30
8	210116	30/30	28/30	30/30	29/30	30/30
9	210117	30/30	28/30	30/30	29/30	30/30
10	210118	30/30	28/30	30/30	29/30	30/30
11	210119	29/30	28/30	29/30	29/30	30/30
12	210120	29/30	28/30	29/30	29/30	30/30
13	210121	29/30	28/30	29/30	29/30	30/30

14	210122	28/30	28/30	28/30	29/30	30/30
15	210123	28/30	28/30	28/30	29/30	30/30
16	210124	28/30	28/30	28/30	29/30	30/30
17	210125	25/30	28/30	28/30	29/30	30/30
18	210126	24/30	28/30	28/30	29/30	30/30
19	210127	24/30	28/30	28/30	29/30	30/30
20	210128	24/30	28/30	28/30	29/30	30/30
21	210129	24/30	26/30	27/30	29/30	30/30
22	210130	24/30	26/30	27/30	29/30	30/30
23	210131	24/30	26/30	27/30	29/30	29/30
24	210201	23/30	26/30	27/30	29/30	29/30
25	210202	23/30	26/30	27/30	29/30	29/30
26	210203	23/30	26/30	27/30	29/30	29/30
27	210204	22/30	25/30	27/30	29/30	29/30
28	210205	22/30	23/30	27/30	29/30	29/30
29	210206	22/30	23/30	26/30	29/30	29/30
30	210207	20/30	23/30	26/30	29/30	29/30
31	210208	20/30	23/30	26/30	29/30	23/24
32	210209	20/30	23/30	26/30	29/30	21/24
33	210210	19/30	22/30	24/30	29/30	21/24
34	210211	19/30	22/30	24/30	29/30	20/24
35	210212	19/30	21/30	24/30	29/30	19/24
36	210213	19/30	21/30	22/30	29/30	19/24
37	210214	17/30	21/30	22/30	26/30	18/24
38	210215	17/30	20/30	21/30	25/30	18/24
39	210216	16/30	18/30	20/30	25/30	17/24
40	210217	15/30	16/30	20/30	24/30	15/24
41	210218	12/30	14/30	18/30	22/30	12/24
42	210219	12/30	14/30	18/30	22/30	12/24
43	210220	12/30	13/30	18/30	22/30	12/24
44	210221	11/30	9/30	18/30	20/30	10/24
45	210222	10/30	6/30	10/30	17/30	10/24
46	210223	10/30	6/30	10/30	17/30	10/24
47	210224	9/30	5/30	9/30	15/30	9/24
48	210225	5/30	4/30	9/30	13/30	8/24
49	210226	5/30	4/30	9/30	11/30	8/24
50	210227	4/30	4/30	9/30	11/30	7/24
51	210228	1/30	2/30	7/30	11/30	6/24
52	210301	1/30	0/30	7/30	10/30	5/24
53	210302	1/30	0/30	7/30	8/30	4/24
54	210303	0/30	0/30	4/30	6/30	3/24

Lampiran 9. Data Statistik

Tabel 3 Tabel Log-rank Uji *Survival* Kontrol Sehat : Kontrol Pelarut

Log-rank (Mantel-Cox) test	
Chi square	0.02088
df	1
P value	0.8851
P value summary	ns
Are the survival curves sig different?	No

Tabel 4 Tabel Log-rank Uji *Survival* Kontrol Pelarut : Aspirin 5 μ M

Log-rank (Mantel-Cox) test	
Chi square	5.933
df	1
P value	0.0149
P value summary	*
Are the survival curves sig different?	Yes

Tabel 5 Tabel Log-rank Uji *Survival* Kontrol Pelarut : Aspirin 50 μ M

Log-rank (Mantel-Cox) test	
Chi square	13.75
df	1
P value	0.0002
P value summary	***
Are the survival curves sig different?	Yes

Tabel 6 Tabel Log-rank Uji *Survival* Kontrol Pelarut : Aspirin 500 μ M

Log-rank (Mantel-Cox) test	
Chi square	11.24
df	1
P value	0.0008
P value summary	***
Are the survival curves sig different?	Yes

Tabel 7 Tabel Post Hoc Test Uji Ekspresi Gen *dilp2*

Post Hoc Tests						
Multiple Comparisons						
Dependent Variable: EkspresiGen						
Tukey HSD						
(I) Perlakuan	(J) Perlakuan	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Kontrol Pelarut	Aspirin 5 uM	.30900000	.14517193	.223	-.1558916	.7738916
	Aspirin 50 uM	.19866667	.14517193	.550	-.2662250	.6635583
	Aspirin 500 uM	-.29600000	.14517193	.251	-.7608916	.1688916
Aspirin 5 uM	Kontrol Pelarut	-.30900000	.14517193	.223	-.7738916	.1558916
	Aspirin 50 uM	-.11033333	.14517193	.870	-.5752250	.3545583
	Aspirin 500 uM	-.60500000*	.14517193	.013	-1.0698916	-.1401084
Aspirin 50 uM	Kontrol Pelarut	-.19866667	.14517193	.550	-.6635583	.2662250
	Aspirin 5 uM	.11033333	.14517193	.870	-.3545583	.5752250
	Aspirin 500 uM	-.49466667*	.14517193	.038	-.9595583	-.0297750
Aspirin 500 uM	Kontrol Pelarut	.29600000	.14517193	.251	-.1688916	.7608916
	Aspirin 5 uM	.60500000*	.14517193	.013	.1401084	1.0698916
	Aspirin 50 uM	.49466667*	.14517193	.038	.0297750	.9595583

*. The mean difference is significant at the 0.05 level.

Tabel 8 Tabel Post Hoc Test Uji Ekspresi Gen *dilp5*

Post Hoc Tests						
Multiple Comparisons						
Dependent Variable: EkspresiGen						
Tukey HSD						
(I) Perlakuan	(J) Perlakuan	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Kontrol Pelarut	Aspirin 5 uM	-.15436667	.05200498	.070	-.3209049	.0121716
	Aspirin 50 uM	-.05996667	.05200498	.670	-.2265049	.1065716
	Aspirin 500 uM	-.19903333*	.05200498	.021	-.3655716	-.0324951
Aspirin 5 uM	Kontrol Pelarut	.15436667	.05200498	.070	-.0121716	.3209049
	Aspirin 50 uM	.09440000	.05200498	.333	-.0721383	.2609383
	Aspirin 500 uM	-.04466667	.05200498	.825	-.2112049	.1218716
Aspirin 50 uM	Kontrol Pelarut	.05996667	.05200498	.670	-.1065716	.2265049
	Aspirin 5 uM	-.09440000	.05200498	.333	-.2609383	.0721383
	Aspirin 500 uM	-.13906667	.05200498	.105	-.3056049	.0274716
Aspirin 500 uM	Kontrol Pelarut	.19903333*	.05200498	.021	.0324951	.3655716
	Aspirin 5 uM	.04466667	.05200498	.825	-.1218716	.2112049
	Aspirin 50 uM	.13906667	.05200498	.105	-.0274716	.3056049

*. The mean difference is significant at the 0.05 level.

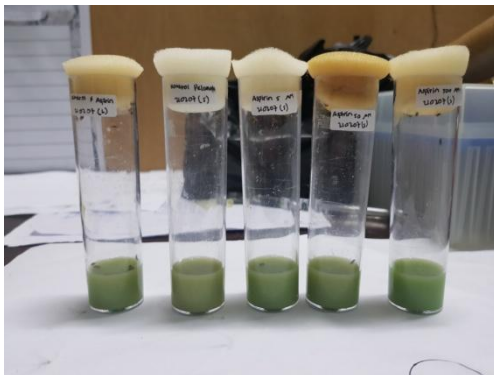
Lampiran 10. Dokumentasi Penelitian



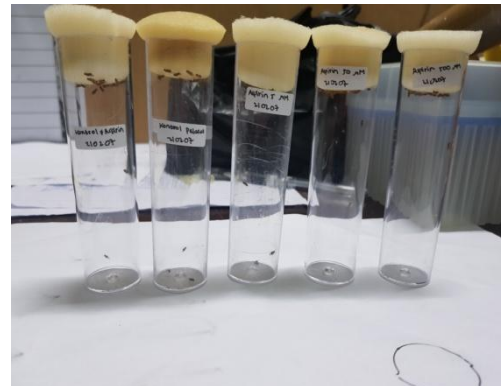
Gambar 10. Pembuatan Pakan *Drosophila melanogaster*



Gambar 11. Proses Pemisahan Lalat



Gambar 12. Uji Survival



Gambar 13. Sampel Isolasi RNA



Gambar 14. Proses Isolasi RNA



Gambar 15. Proses PCR