

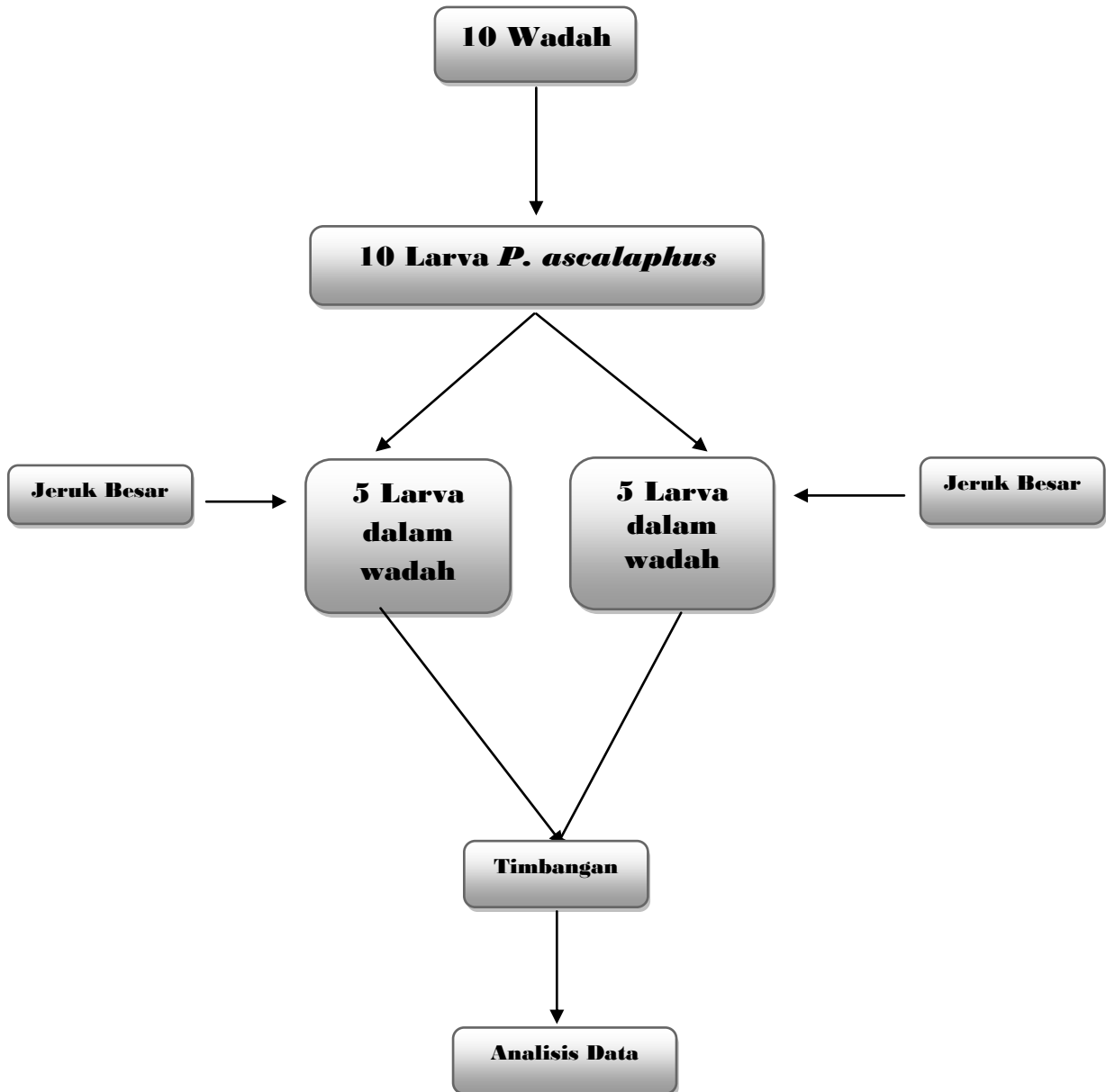
DAFTAR PUSTAKA

- Achmad, A., 1998. **Habitat dan pola sebaran kupu-kupu jenis komersil di Hutan Wisata Bantimurung Sulawesi Selatan.** Majalah Ilmiah Flora dan Fauna.
- Amir, Nooerdjito, dan Kahono, 2003. **Serangga Taman Nasional Gunung Halimun Jawa Barat.** BCP JICA. Bogor. hal. 123-140.
- Anugrahjuni, 2009. **Metamorfosis kupu-kupu.** ([http:// wordpress.com/biologi-in/html](http://wordpress.com/biologi-in/html), diakses tanggal 16 Oktober 2011).
- Arief, A. N., 1996. **Sebaran beberapa jenis kupu-kupu di habitat pinggir sungai pada musim kemarau dan siklus hidup *Papilio satapses* di Taman Wisata Alam Bantimurung Kabupaten Maros.** Skripsi Sarjana Kehutanan Fapertahut Unhas. Ujung pandang.
- Astuti, D. dan J. Peggie, 1991. **Pakan Buatan Larva Kupu *Papilio*.** **Prosiding Seminar Hasil Penelitian dan Pengembangan Sumber Daya Hayati 1990/1991.** Bogor, 15 Mei 1991. **Proyek Penelitian Dan Pengembangan Sumber Daya Hayati.** Puslitbang Biologi – LIPI. hal. 366-372.
- Astuti, D., 1993. **Pemeliharaan Beberapa Jenis Larva Kupu *Papilio* di Laboratorium Pada Berbagai Jenis Daun Inang Jeruk.** Puslitbang Biologi – LIPI. hal. 69-75.
- Bernays, E. A. and Chapman R. F., 1994. **Host-Plant Selection by Phytophagous Insects.** Chapman & Hall. ITP. New York. 312 hal.
- Braby, M. F., 2000. **Butterflies of Australia Their Identification, Biology and Distribution.** Vol One. CSIRO Publishing. Canberra.
- Borrer, Triphorn dan Johnson, 1992. **Pengenalan Pelajaran Serangga. Edisi ke 6.** UGM Press. Yogyakarta.
- Chapman, R. F., 1975. **The Insect Structure and Function.** The English University Press. London. 819p.
- Dalimartha, S., 2000. **Atlas Tumbuhan Obat Indonesia Jilid2.** Trubus Agriwidya. Jakarta.
- Fleming, W. A., 1983. **Butterflies of West Malaysia and Singapore. Second Edition.** Longeman. Kuala Lumpur.
- Gullan, P. J. and Cranston P. S., 2000. **The Insect on Outline of Entomology. The 2nd ed.** Blackwell Publishing. USA. 470 hal.
- Gilmour, D., 1986. **The metabolism of insect. Oliver & Boyd.** Edimburgh. London.

- Hardiyanto, 2010. **Tanaman Jeruk**. ([http://blog.com/page/tanaman jeruk](http://blog.com/page/tanaman%20jeruk), diakses tanggal 15 Oktober 2011).
- Hendronofrin, 2010. **Kupu-kupu**. (<http://blogspot.com/2010/01/html>, diakses tanggal 27 Oktober 2011).
- Keiluhu, P. C., 1994. **Pengamatan siklus hidup dan perilaku kupu-kupu sayap burung *Troides hypolitus cellularis* di Taman Wisata Alam Bantimurung Kabupaten Maros**. Skripsi Sarjana Kehutanan Fapertahun Unhas. Ujung pandang.
- Kevan, P. G. and Baker H. G., 1983. **Insect as Flower Visitor and Pollinators**. *Ann. Rev. Entomol.* 28: 407-453.
- Mani, M. S., 1982. **General Entomology**. 3rd ed. Oxford & IBH Publ. Co., New Delhi. Pages 733.
- Mastriq dan Rosariyanto, 2005. **Buku Panduan Lapangan Kupu-kupu Untuk Wilayah Membrano Sampai Pegunungan Cyclops**. Conservation International Indonesia. Jakarta.
- Mattimu, A. A., 1977. **Identifikasi dan inventarisasi jenis kupu-kupu di Daerah Bantimurung, Sulawesi Selatan**. *Proyek Penelitian Unhas*.
- Miles, M.B. dan Hubberman, A. M., 1992. **Analisis Data Kualitatif**. Universitas Indonesia Press. Jakarta.
- Muhammad, S., 2011. **Turunkan Kolesterol dengan Jeruk Besar**. (<http://matematikacerdas.wordpress.com/2011/03/11/turunkan-kolesterol-dengan-jeruk-bali/>). diakses pada tanggal 27 Oktober 2011).
- Noerdjito dan Amir M., 1992. **Kekayaan Kupu-kupu di Cagar Alam Bantimurung Sulawesi Selatan dan Sekitarnya**. Di dalam: Nasution *et al.*, editor. *Prosiding Seminar Hasil Penelitian dan Pengembangan Sumber Daya Hayati 1991/1992*; Bogor, 6 Mei 1992. PPPSDH Puslitbang Biologi, LIPI. hal. 330-337.
- Odum, E. P., 1979. **Fundamentals of Ecology**. Third Ed WB Saunders Company. Philadelphia.
- Prasetyo, R. dan I. Amin, 2010, **Kupu-kupu ke Mana Engkau Terbang**, (<http://www.MajalahTempoOnline.com>, diakses tanggal 15 Oktober 2001).
- Reynolds, S. E., Nottingham and Stephens, 1985. **Foot and Water Economy and Its Relation to Growth in Fifth-instar Larvae of the Tobacco Hornworm**. *Manduca sexta*. *J. Ins. Physiol.* 31: 119-127.
- Robinson, T., 1995. **Kandungan Organik Tumbuhan Tinggi**. Kosasih Padmawinata. ITB Bandung. Bandung.

- Rouly, H., 2001, **Studi Siklus Hidup dan Teknik Pemeliharaan Kupu-kupu pada Pohon Jeruk (Citrus sp) dalam Kandang**, *Skripsi*. Jurusan Ilmu Ternak, Fakultas Peternakan, Institut Pertanian Bogor.
- Rukmana, S. H., 2002. **Bunga Raya**. Kanisius. Semarang.
- , 2006. **Jeruk Besar Potensi dan Prospeknya**. Kanisius. Yogyakarta.
- , 2009. **Jeruk Nipis**. Kanisius. Yogyakarta. 17 hal.
- Said, M., 2011. **Kupu-Kupu Spesies Langkah Bantimurung Terancam Punah**. Majalah Ilmiah Flora dan Fauna.
- Salmah, S., 1994. **Kupu-kupu di Daerah Aliran Sungai (DAS) Batang Anai**. Sumatra Nature Study Center. Padang. 11 pages.
- Sarwono, 1992. **Jeruk Nipis dan Pemanfaatannya**. Penebar Swadaya. Jakarta.
- Sastrodiharjo, 1984. **Pengantar Entomologi Terapan**. Penerbit ITB Bandung.
- Sembel, D. T., 1993. **A Scientific Approach to the Roles of Butterflies with Special Emphasis on Pests of Crops**. The Paper Presented at International Butterfly Conference, Ujung Pandang. 11 hal.
- Sihombing, 1999. **Nilai Ekonomi Kupu-kupu**. Erlangga. Jakarta.
- Smart, P., 1991. **The Illustrated Encyclopedia of Butterfly World in Colour**. Paul Smart Press.
- Soedarto, 1989. **Entomologi Kedokteran**. ECG. Jakarta.
- Stavenga, Stowe, Siebke, Zeil, and Arikawa, 2004. **Butterfly wing colours: scale beads make white pe\ierid wings brighter**. Proc R Soc Lond B 271: 1577- 1584.
- Sterry, P., 1995. **Butterflies and Moths. A portrait of The Animals World**. Magna Books. England.
- Tarumingkeng, PHD dan Rudy, C., 1994. **Nilai Ekonomi Kupu-kupu**. Erlangga. Jakarta.
- Tjitrosoepomo, G., 1985, **Morfologi Tumbuhan**. Gajah Mada University Press. Yogyakarta. hal. 81-82, 126, 236-237.
- Tripehorn C. A. and Johnson N. F., 2005. **Borrer and Delong's Introduction to the Study of Insect. Edisi ke 7**. Tomson. Australia.
- Tsukada, E. and Y. Nishiyama, 1982. **Butterflies of the South East Asian Island**. Vol. I. Papilionidae. Plapac Co., Ltd. Japan. 214-457 hal.

Lampiran 1. Skema bagan kerja



Lampiran 2. Tabel hasil pengamatan perlakuan daun jeruk nipis dan jeruk besar terhadap perkembangan kupu *Papilio ascalaphus*.

Hari	Daun Jeruk Besar			Keterangan	Daun Jeruk kecil			keterangan
	Panjang (cm)	Berat ulat (gram)	Berat pakan (gram)		Panjang (cm)	Berat ulat (gram)	Berat pakan (gram)	
1	0,4	0	0		0,4	0	0	
2	0,4	0	0		0,4	0	0	
3	0,5	0	0		0,5	0	0	
4	0,6	0	0		0,5	0	0	
5	0,6	0	0		0,6	0	0	
6	0,7	0	0.02		0,8	0	0	
7	1	0	0.05		1	0.05	0,01	
8	1,2	0.06	0.10		1,1	0.11	0.02	
9	1,5	0.10	0.12		1,5	0.10	0,05	
10	1,7	0.13	0.15		1,6	0.15	0,09	
11	2	0.21	0.16		1,8	0.10	0,10	
12	2,1	0.25	0.24		2	0.18	0	Instar I
13	2,2	0.31	0.42		2,1	0.22	0,07	
14	2,3	0.26	0.10	Instar I	2,3	0.28	0,13	
15	2,5	0.33	0.28		2,4	0.32	0,24	
16	2,6	0.49	0.33		2,6	0.46	0,38	
17	2,7	0.50	0.41		2,7	0.57	0,41	
18	2,7	0.51	0.44		2,8	0.82	0,47	
19	2,7	0.52	0.63		2,9	0.86	0,53	
20	2,8	0.54	0.70		3	0.92	0,10	
21	2,9	0.63	0.83		3,1	1.14	0,06	Instar II
22	3	0.70	0.96		3,2	1.24	0,50	
23	3,3	0.76	1.06		3,5	1.45	0,59	.
24	3,5	0.82	0.21		3,6	1.50	0,73	
25	3,8	1.06	0.06	Instar II	3,8	1.62	0,82	
26	4	1.10	0.14		3,9	1.80	0,82	
27	4	1.30	0,21		4	2.16	0,23	Instar III
28	4,1	1.37	0,37		4,2	2.31	0,10	
29	4,2	1.44	0,42		4,3	2.45	1,05	
30	4,3	1.49	0,48		4,5	2.53	1,32	
31	4,4	1.53	0,55		4,6	2.72	1,38	.
32	4,6	1.62	0,63		4,7	2.95	1,50	.
33	4,7	1.67	0,03		4,8	3.35	1,71	
34	5	1.71	0,16	Instar III	5	3.56	1,77	
35	5	1.76	1,13		5,1	3.67	1,84	
36	5,1	2.37	1,32		5,2	3.73	1,97	
37	5,1	2.77	1,56		5,3	3.60	2,03	
38	5,2	2.96	1,72		5,5	3.72	0,67	Instar IV

Lanjutan lampiran 2.

39	5.3	3.15	1.85		3.7	2.19		pupa
40	5.5	3.54	1.92					
41	5.5	3.72	1.97					
42	5.6	3.87	2.13					
43	5.6	3.96	2.19					
44	5.7	4.16	2.23					
45	5.8	4.36	1.06	Instar IV				
46	4.3	2.55		pupa				
Ket:	Pupa-menetas= 12 hari				Pupa-menetas= 8 hari			

Lampiran 3. Kegiatan Penelitian



Gambar 1. Tempat pelaksanaan penelitian (Laboratorium Penangkaran Kupu-kupu TN Babul).



a

b

Gambar 2. Pakan larva kupu *P. ascalaphus*. Daun jeruk besar (a) dan jeruk nipis (b).

Lanjutan lampiran 3.



a



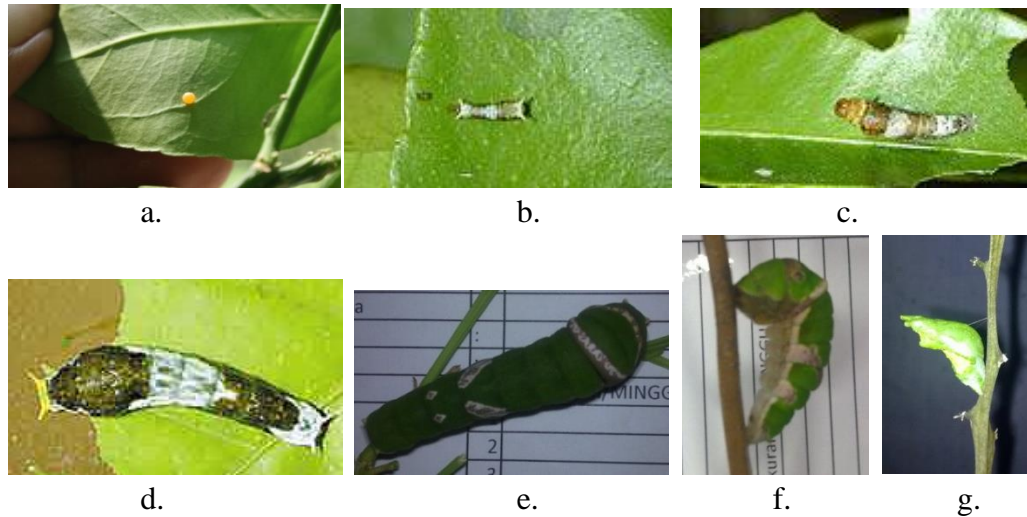
b



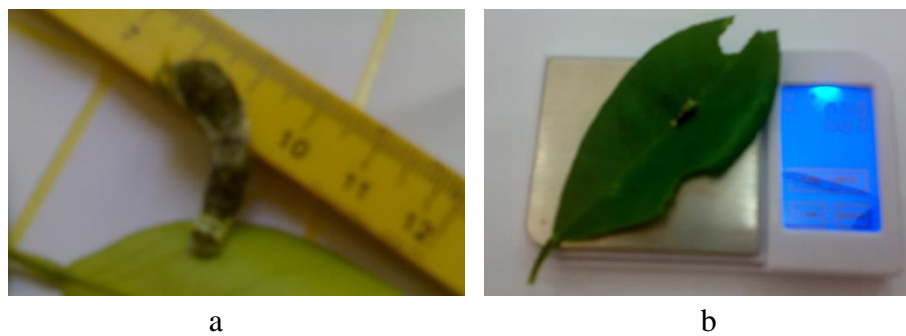
c

Gambar 2. Tempat pemeliharaan larva dari instar I-III (a), larva instar IV (b), dan pupa (c).

Lampiran 4. Gambar tahapan perkembangan kupu-kupu *Papilio ascalaphus*



Gambar 3. Telur kupu-kupu *Papilio ascalaphus* (a), larva instar I (b), larva instar II (c), larva instar III (d), larva instar IV (e), prapupa (f), dan pupa (g).



Gambar 4. Pengukuran larva (a) dan penimbangan larva (b).



Gambar 5. Kupu-kupu *Papilio ascalaphus* betina (a) dan jantan (b).

Lampiran 5. Hasil uji-t berat badan larva kupu-kupu *P. ascalaphus*

Instar I

Group Statistics

	DAUN JERUK	N	Mean	Std. Deviation	Std. Error Mean
BERAT BADAN (cm)	DAUN JERUK BESAR	14	.0943	.11647	.03113
	DAUN JERUK KECIL	12	.0575	.06730	.01943

Independent Samples Test

	Levene's Test for Equality of Variances	t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
BERAT BADAN (gr)	Equal variances assumed	5.391	.029	.963	24	.345	.03679	.03819	-.04203	.11560
	Equal variances not assumed			1.003	21.284	.327	.03679	.03669	-.03946	.11303

Instar II

Group Statistics

	DAUN JERUK	N	Mean	Std. Deviation	Std. Error Mean
BERAT BADAN (gr)	DAUN JERUK BESAR	11	.6236	.20086	.06056
	DAUN JERUK KECIL	9	.6211	.32628	.10876

Lanjutan lampiran 5.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
BERAT BADAN (gr)	Equal variances assumed	4.724	.043	.021	18	.983	.00253	.11869	-.24683	.25188
	Equal variances not assumed			.020	12.750	.984	.00253	.12449	-.26695	.27200

Instar III

Group Statistics

		DAUN JERUK	N	Mean	Std. Deviation	Std. Error Mean
BERAT BADAN (gr)	DAUN JERUK BESAR		9	1.4700	.19391	.06464
	DAUN JERUK KECIL		6	1.6283	.31978	.13055

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
BERAT BADAN (gr)	Equal variances assumed	1.211	.291	-1.20	13	.251	-.1583	.13173	-.4429	.12625
	Equal variances not assumed			-1.09	7.471	.311	-.1583	.14567	-.4985	.18177

Lanjutan lampiran 5.

Instar IV

Group Statistics

	DAUN JERUK	N	Mean	Std. Deviation	Std. Error Mean
BERAT ULAT (gr)	DAUN JERUK BESAR	11	3.3291	.80647	.24316
	DAUN JERUK KECIL	11	3.1445	.56097	.16914

Independent Samples Test

	Levene's Test for Equality of Variances	t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
BERAT BADAN (gr)	Equal variances assumed	1.338	.261	.623	20	.540	.18455	.29620	-.43332	.80241
	Equal variances not assumed			.623	17.841	.541	.18455	.29620	-.43814	.80723

Lampiran 6. Hasil uji-t konsumsi pakan larva kupu-kupu *P. ascalaphus*

Instar I

Group Statistics					
	DAUN JERUK	N	Mean	Std. Deviation	Std. Error Mean
BERAT PAKAN (gr)	DAUN JERUK BESAR	14	.0971	.12003	.03208
	DAUN JERUK KECIL	12	2.0850	3.75177	1.08304

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
BERAT PAKAN (gr)	Equal variances assumed	25.577	.000	-1.988	24	.058	-1.988	.99982	-4.0514	.07567
	Equal variances not assumed			-1.835	11.019	.094	-1.988	1.0835	-4.3722	.39644

Instar II

Group Statistics					
	DAUN JERUK	N	Mean	Std. Deviation	Std. Error Mean
BERAT PAKAN (gr)	DAUN JERUK BESAR	11	.5373	.32287	.09735
	DAUN JERUK KECIL	9	13.7956	16.60820	5.53607

Lanjutan lampiran 6.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
BERAT PAKAN (gr)	Equal variances assumed	30.879	.000	-2.664	18	.016	-13.26	4.9777	-23.716	-2.8005
	Equal variances not assumed			-2.395	8.005	.044	-13.26	5.5369	-26.025	-.49149

Instar III

Group Statistics

	DAUN JERUK	N	Mean	Std. Deviation	Std. Error Mean
BERAT PAKAN (gr)	DAUN JERUK BESAR	9	.3322	.20614	.06871
	DAUN JERUK KECIL	6	.6150	.22775	.09298

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
BERAT PAKAN (gr)	Equal variances assumed	.000	.996	-2.499	13	.027	-.2828	.11316	-.52725	-.03831
	Equal variances not assumed			-2.446	10.075	.034	-.2828	.11561	-.54012	-.02543

Lanjutan lampiran 6.

Instar IV

Group Statistics

	DAUN JERUK	N	Mean	Std. Deviation	Std. Error Mean
BERAT PAKAN (gr)	DAUN JERUK BESAR	11	1.7345	.41659	.12561
	DAUN JERUK KECIL	11	7.4245	19.76636	5.95978

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
BERAT PAKAN (gr)	Equal variances assumed	4.625	.044	-.955	20	.351	-5.690	5.9611	-18.125	6.74465
	Equal variances not assumed			-.955	10.009	.362	-5.690	5.9611	-18.971	7.59057

Lampiran 7. Hasil uji-t lama fase perkembangan larva kupu-kupu *P. ascalaphus*

Jenis daun	N	Mean	St. Dev	SE Mean
Jeruk nipis	5	9.40	2.30	1.0
Jeruk besar	5	11.60	1.95	0.87

Difference = mu (Daun_jeruk_Besar) - mu (Daun_jeruk_Kecil)

Estimate for difference: 2.20000

95% lower bound for difference: -0.30867

T-Test of difference = 0 (vs >): T-Value = 1.63
P-Value = 0.071 DF = 8

Both use Pooled StDev = 2.1331

Lampiran 8. Hasil uji-t panjang tubuh larva kupu-kupu *P. ascalaphus*

Instar I

Group Statistics

	DAUN JERUK	N	Mean	Std. Deviation	Std. Error Mean
PANJANG ULAT (cm)	DAUN JERUK BESAR	14	1.2286	.72157	.19285
	DAUN JERUK KECIL	12	1.0167	.57814	.16689

Independent Samples Test

	Levene's Test for Equality of Variances	t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2- tailed)	Mean Diffe rence	Std. Error Differe nce	95% Confidence Interval of the Difference	
									Lower	Upper
PANJANG ULAT (gr)	Equal variances assumed	1.660	.210	.816	24	.422	.21190	.25953	-.32374	.74755
	Equal variances not assumed			.831	23.913	.414	.21190	.25504	-.31457	.73838

Instar II

Group Statistics

	DAUN JERUK	N	Mean	Std. Deviation	Std. Error Mean
PANJANG ULAT (cm)	DAUN JERUK BESAR	11	2.9545	.41076	.12385
	DAUN JERUK KECIL	9	2.6556	.33582	.11194

Lanjutan lampiran 8.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PANJANG ULAT (gr)	Equal variances assumed	.317	.580	1.754	18	.096	.29899	.17048	-.05917	.65715
	Equal variances not assumed			1.791	17.998	.090	.29899	.16694	-.05175	.64973

Instar III

Group Statistics

	DAUN JERUK	N	Mean	Std. Deviation	Std. Error Mean
PANJANG ULAT (cm)	DAUN JERUK BESAR	9	4.3667	.34278	.11426
	DAUN JERUK KECIL	6	3.6667	.29439	.12019

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PANJANG ULAT (gr)	Equal variances assumed	.210	.655	4.086	13	.001	.70000	.17130	.32992	1.07008
	Equal variances not assumed			4.221	11.997	.001	.70000	.16583	.33868	1.06132

Lanjutan lampiran 8.

Instar IV

Group Statistics

	DAUN JERUK	N	Mean	Std. Deviation	Std. Error Mean
PANJANG ULAT (cm)	DAUN JERUK BESAR	11	5.4000	.27203	.08202
	DAUN JERUK KECIL	11	4.8364	.42017	.12669

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means							
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper	
PANJANG ULAT (gr)	Equal variances assumed	2.513	.129	3.735	20	.001	.56364	.15092	.24882	.87845
	Equal variances not assumed			3.735	17.130	.002	.56364	.15092	.24541	.88187

Lampiran 9. Hasil uji-t terhadap berat badan, berat pakan, dan panjang tubuh kupu-kupu *P. ascalaphus*.

Fase	Berat Badan		Berat Pakan		Panjang Tubuh	
	Nilai Sig	Kesimpulan	Nilai Sig	Kesimpulan	Nilai Sig	Kesimpulan
Instar I	0.327	Terima H0	0.094	Terima H0	0.414	Terima H0
Instar II	0.984	Terima H0	0.044	Terima H1	0.090	Terima H0
Instar III	0.311	Terima H0	0.034	Terima H1	0.001	Terima H1
Instar IV	0.541	Terima H0	0.362	Terima H0	0.002	Terima H1

Dengan menggunakan uji nilai tengah independent (independent sample t-test) untuk kesamaan dua rata-rata, maka dapat disusun Hipotesis sebagai berikut:

H0: Tidak ada perbedaan pengaruh antara pemberian pakan daun jeruk nipis dan jeruk besar terhadap perkembangan berat badan, konsumsi pakan, lama fase pertumbuhan, dan panjang tubuh kupu-kupu *Papilio ascalaphus*.

H1: Pemberian pakan daun jeruk besar lebih berpengaruh terhadap perkembangan berat badan, konsumsi pakan, lama fase pertumbuhan, dan panjang tubuh kupu-kupu *Papilio ascalaphus*.

Dengan Kriteria Uji : Tolak H0 jika $t_{hitung} > t_{table}$ selain dari itu maka H0 diterima.