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Lampiran Tabel 1. Frekuensi kemunculan tipe infeksi virus penyakit kerdil udang windu pada pembenihan di Sulawesi Selatan

Tipe Infeksi	Frekuensi Kemunculan					
	Musim Hujan			Musim Kemarau		
	Takalar	Barru	Pinrang	Takalar	Barru	Pinrang
Infeksi Tunggal						
IHHNV	2	0	3	2	6	3
MBV	1	2	3	0	0	0
HPV	0	0	0	0	0	0
Infeksi Ganda						
IHHNV+ MBV	8	13	2	9	8	6
IHHNV+HPV	7	0	0	1	1	3
MBV+HPV	0	0	0	0	0	0
Infeksi Tripel						
IHHNV+ MBV+HPV	25	1	6	8	5	6
Tidak terinfeksi	7	4	6	10	10	12
Terinfeksi	43	16	14	20	20	18
Jumlah Sampel	50	20	20	30	30	30

Lampiran Tabel 2. Frekuensi kemunculan tipe infeksi virus penyakit kerdil udang windu di tambak Sulawesi Selatan

Lokasi	Tipe Infeksi	Frekuensi Kemunculan			
		Musim Hujan		Musim Kemarau	
		Normal	Kerdil	Normal	Kerdil
Takalar	*Infeksi Tunggal*				
	MBV	3	6	2	2
	IHHNV	3	1	1	1
	HPV	0	0	0	0
	Infeksi Ganda				
	MBV+IHHNV	6	7	3	4
	IHHNV+HPV	0	5	1	2
	MBV+HPV	1	2	0	1
	Infeksi Tripel				
	MBV+IHHNV+HPV	2	3	3	2
	Tidak terinfeksi	15	6	10	8
	Terinfeksi	15	24	10	12
Jumlah Sampel		30	30	20	20
Maros	*Infeksi Tunggal*				
	MBV	-	25	-	-
	IHHNV	-	0	-	-
	HPV	-	0	-	-
	Infeksi Ganda				
	MBV+IHHNV	-	4	-	-
	IHHNV+HPV	-	0	-	-
	MBV+HPV	-	0	-	-
	Infeksi Tripel				
	MBV+IHHV+HPV	-	4	-	-
	Tidak terinfeksi	-	6	-	-
	Terinfeksi	-	33	-	-
Jumlah Sampel		-	39	-	-

Lanjutan Lampiran Tabel 2.

Lokasi	Tipe Infeksi	Frekuensi Kemunculan			
		Musim Hujan		Musim Kemarau	
		Normal	Kerdil	Normal	Kerdil
Pangkep	*Infeksi Tunggal*				
	MBV	-	0	3	-
	IHHNV	-	0	0	-
	HPV	-	0	0	-
	Infeksi Ganda				
	MBV+IHHNV	-	0	0	-
	IHHNV+HPV	-	0	0	-
	MBV+HPV	-	0	0	-
	Infeksi Tripel				
	MBV+IHHNV+HPV	-	0	0	-
	Tidak terinfeksi	-	10	0	-
	Terinfeksi	-	0	3	-
Jumlah Sampel		-	10	3	-
	Infeksi Tunggal				
Barru	MBV	-	-	-	0
	IHHNV	-	-	-	0
	HPV	-	-	-	0
	Infeksi Ganda				
	MBV+IHHNV	-	-	-	0
	IHHNV+HPV	-	-	-	0
	MBV+HPV	-	-	-	0
	Infeksi Tripel				
	MBV+IHHNV+HPV	-	-	-	0
	Tidak terinfeksi	-	-	-	20
	Terinfeksi	-	-	-	0
Jumlah Sampel		-	-	-	20
	Infeksi Tunggal				
Pinrang	MBV	3	5	0	3
	IHHNV	3	3	2	0
	HPV	0	0	0	0
	Infeksi Ganda				
	MBV+IHHNV	10	8	2	5
	IHHNV+HPV	1	3	0	4
	MBV+HPV	0	0	0	0
	Infeksi Tripel				
	MBV+IHHNV+HPV	4	4	4	2
	Tidak terinfeksi	12	9	14	6
	Terinfeksi	21	23	8	14
Jumlah Sampel		33	32	22	20

Lampiran Tabel 3. Prevalensi virus MBV, IHHNV dan HPV pada benih udang windu pada musim hujan dan kemarau

Lokasi	Prevalensi Virus (%)								
	Musim Hujan					Musim Kemarau			
	Jumlah Pembenihan	MBV	IHHNV	HPV	Lokasi	Jumlah Pembenihan	MBV	IHHNV	HPV
Takalar	5	10	70	50	Takalar	3	40	70	30
		80	100	100			80	80	50
		70	70	30			60	50	10
		90	90	90	Barru	3	20	60	0
		90	90	50			30	50	30
Barru	2	80	80	10			80	90	30
		80	60	0	Pinrang	3	0	0	0
Pinrang	2	80	50	50			50	80	40
		30	60	10			70	100	50
Rerata		67.78	74.44	43.33	Rerata		47.78	64.44	26.67
STDEV		28.19	16.67	35	STDEV		27.74	29.63	19.36

Keterangan: STDEV = Standar Deviasi

Lampiran Tabel 4a. Prevalensi virus MBV, IHHNV dan HPV pada udang windu di tambak pada musim hujan dan kemarau

Lokasi	Prevalensi Virus (%)											
	Musim Hujan						Musim Kemarau					
	Normal			Kerdil			Normal			Kerdil		
	MBV	IHHNV	HPV	MBV	IHHNV	HPV	MBV	IHHNV	HPV	MBV	IHHNV	HPV
Takalar	40	43.33	16.67	60	53.33	36.67	40	40	20	45	45	25
Maros	-	-	-	74.36	10.26	0	0	0	0	0	0	0
Pangkep	0	0	0	100	0	0	0	0	0	0	0	0
Barru	0	0	0	0	0	0	0	0	0	0	0	0
Pinrang	51.52	54.55	15.15	53.13	56.25	21.88	27.27	36.36	18.18	50	55	30
Rerata	22.88	24.47	7.95	57.50	23.97	11.71	13.45	15.27	7.64	19	20	11
STDEV	26.83	28.62	9.21	36.82	28.47	16.86	18.96	20.95	10.48	26.08	27.61	15.17

Keterangan: STDEV = Standar Deviasi

Lampiran Tabel 4b. Prevalensi virus MBV, IHHNV dan HPV pada udang windu di tambak pada musim hujan dan kemarau

Lokasi	Prevalensi Virus (%)											
	Musim Hujan						Musim Kemarau					
	Normal			Kerdil			Normal			Kerdil		
	MBV	IHHNV	HPV	MBV	IHHNV	HPV	MBV	IHHNV	HPV	MBV	IHHNV	HPV
Takalar	40	43.33	16.67	60	53.33	36.70	40	40	20	45	45	25
Pinrang	51.52	54.55	15.15	53.13	56.25	21.88	27.27	36.36	18.18	50	55	30
Rerata	45.76	48.94	15.91	56.56	54.79	29.27	33.64	38.18	19.01	47.50	50	27.50
STDEV	8.14	7.93	1.07	4.86	2.06	10.46	9.00	2.57	1.29	3.54	7.07	3.54

Keterangan: STDEV = Standar Deviasi

Lampiran Tabel 5. Hasil analisis korelasi antara kualitas air pembenihan dengan prevalensi virus MBV, IHHNV dan HPV pada musim hujan.

			MBV	IHHNV	HPV
Spearman's rho	PH	Correlation Coefficient	-.131	.456	.732*
		Sig. (2-tailed)	.737	.218	**.025**
		N	9	9	9
	SUHU	Correlation Coefficient	-.132	-.246	-.580
		Sig. (2-tailed)	.735	.524	.102
		N	9	9	9
	SALINITAS	Correlation Coefficient	.241	.025	.128
		Sig. (2-tailed)	.531	.948	.742
		N	9	9	9

*. Correlation is significant at the 0.05 level (2tailed).

Lampiran Tabel 6. Hasil analisis korelasi Spearman antara kualitas air pembenihan dengan prevalensi virus MBV, IHHNV dan HPV pada benih di musim kemarau

			PH	SUHU	SALINITAS
Spearman's rho	MBV	Correlation Coefficient	.120	-.412	-.050
		Sig. (2-tailed)	.797	.358	.915
		N	7	7	7
	IHHNV	Correlation Coefficient	-.037	-.412	.050
		Sig. (2-tailed)	.937	.358	.915
		N	7	7	7
	HPV	Correlation Coefficient	-.038	-.424	-.124
		Sig. (2-tailed)	.935	.344	.791
		N	7	7	7

**. Correlation is significant at the 0.01 level (2-tailed).

Lampiran Tabel 7. Analsis korelasi antara kualitas air dengan prevalensi virus MBV, IHHNV dan HPV pada udang normal di musim hujan

			MBV	IHHNV	HPV
Spearman's rho	PH	Correlation Coefficient	.546	.346	.562
		Sig. (2-tailed)	.128	.362	.115
		N	9	9	9
	SUHU	Correlation Coefficient	.026	-.306	-.351
		Sig. (2-tailed)	.946	.424	.354
		N	9	9	9
	SALINITAS	Correlation Coefficient	.161	-.373	-.379
		Sig. (2-tailed)	.679	.323	.314
		N	9	9	9

Lampiran Tabel 8. Analisis korelasi antara kualitas air dengan prevalensi virus MBV, IHHNV dan HPV pada udang normal pada musim kemarau

Correlations

			PH	SUHU	SALINITAS
Spearman's rho	MBV	Correlation Coefficient	-.258	.316	-.775
		Sig. (2-tailed)	.742	.684	.225
		N	4	4	4
	IHHNV	Correlation Coefficient	-.258	.632	-.775
		Sig. (2-tailed)	.742	.368	.225
		N	4	4	4
	HPV	Correlation Coefficient	-.258	.316	-.775
		Sig. (2-tailed)	.742	.684	.225
		N	4	4	4

**. Correlation is significant at the 0.01 level (2-tailed).

Lampiran Tabel 9. Analisis korelasi antara kualitas air dengan prevalensi virus MBV, IHHNV dan HPV pada udang kerdil di musim hujan

Correlations

			MBV	IHHNV	HPV
Spearman's rho	PH	Correlation Coefficient	.530	.294	.597
		Sig. (2-tailed)	.280	.571	.211
		N	6	6	6
	SUHU	Correlation Coefficient	-.131	-.393	-.664
		Sig. (2-tailed)	.805	.441	.150
		N	6	6	6
	SALINITAS	Correlation Coefficient	.414	-.207	.105
		Sig. (2-tailed)	.414	.694	.843
		N	6	6	6

Lampiran Tabel 10. Analsis korelasi antara kualitas air dengan prevalensi virus MBV, IHHNV dan HPV pada udang kerdil di musim kemarau

Correlations

			MBV	IHHNV	HPV
Spearman's rho	PH	Correlation Coefficient	-.816	-.544	.272
		Sig. (2-tailed)	.184	.456	.728
		N	4	4	4
	SUHU	Correlation Coefficient	.333	.833	.333
		Sig. (2-tailed)	.667	.167	.667
		N	4	4	4
	SALINITAS	Correlation Coefficient	.544	-.544	-.544
		Sig. (2-tailed)	.456	.456	.456
		N	4	4	4

Lampiran Tabel 11. Analisis prevalensi virus HPV pada benih udang windu berdasarkan musim

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.495[a]	1	.019		
Continuity Correction[b]	4.786	1	.029		
Likelihood Ratio	5.534	1	.019		
Fisher's Exact Test				.028	.014
Linear-by-Linear Association	5.464	1	.019		
N of Valid Cases[b]	180				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 31.50.

b. Computed only for a 2x2 table

Lampiran Tabel 12. Analisis prevalensi virus IHHNV pada benih udang windu berdasarkan musim

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.121[a]	1	.145		
Continuity Correction[b]	1.676	1	.196		
Likelihood Ratio	2.128	1	.145		
Fisher's Exact Test				.195	.098
Linear-by-Linear Association	2.109	1	.146		
N of Valid Cases[b]	180				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 27.50.

b. Computed only for a 2x2 table

Lampiran Tabel 13. Analisis prevalensi virus MBV pada benih berdasarkan musim

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.379[a]	1	.007		
Continuity Correction[b]	6.581	1	.010		
Likelihood Ratio	7.435	1	.006		
Fisher's Exact Test				.010	.005
Linear-by-Linear Association	7.338	1	.007		
N of Valid Cases[b]	180				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 38.00.

b. Computed only for a 2x2 table

Lampiran Tabel 14. Analisi Prevalensi MBV, IHHNV dan HPV pada benih antara musim hujan dengan kemarau

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.994[a]	5	.010
Likelihood Ratio	15.097	5	.010
Linear-by-Linear Association	1.013	1	.314
N of Valid Cases	540		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 27.50.

Lampiran Tabel 15. Analisis prevalensi tidak terinfeksi dengan terinfeksi pada musim hujan dan kemarau

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.100[a]	1	.043		
Continuity Correction[b]	3.361	1	.067		
Likelihood Ratio	4.044	1	.044		
Fisher's Exact Test				.056	.034
Linear-by-Linear Association	4.070	1	.044		
N of Valid Cases[b]	140				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.71.

Lampiran Tabel 16. Analisis prevalensi tipe infeksi virus pada benih di musim hujan

Test Statistics

	Hujan
Chi-Square	39.051[a]
df	4
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 15.6.

Lampiran Tabel 17. Analsis prevalensi tipe infeksi virus pada benih antara musim hujan dan kemarau

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.838[a]	4	.065
Likelihood Ratio	9.779	4	.044
Linear-by-Linear Association	.372	1	.542
N of Valid Cases	144		

a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 4.58.

Lampiran Tabel 18. Analisis prevalensi tipe infeksi virus pada benih pada musim kemarau

Test Statistics

	Kemarau
Chi-Square	32.333[a]
df	4
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 13.2.

Lampiran Tabel 19. Analisis prevalensi virus pada udang kerdil antara musim hujan dengan kemarau

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.039[a]	5	.959
Likelihood Ratio	1.039	5	.959
Linear-by-Linear Association	.059	1	.809
N of Valid Cases	306		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.37.

Lampiran Tabel 20. Analisis prevalensi virus pada udang normal antara musim hujan dengan kemarau

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.117[a]	5	.682
Likelihood Ratio	3.140	5	.678
Linear-by-Linear Association	.111	1	.739
N of Valid Cases	315		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.20.

Lampiran Tabel 21. Analisis prevalensi virus antara normal dengan kerdil pada musim hujan

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.868[a]	5	.432
Likelihood Ratio	4.904	5	.428
Linear-by-Linear Association	.269	1	.604
N of Valid Cases	375		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.89.

Lampiran Tabel 22. Analisis prevalensi virus antara normal dengan kerdil pada musim kemarau

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.711[a]	5	.592
Likelihood Ratio	3.721	5	.590
Linear-by-Linear Association	.259	1	.610
N of Valid Cases	246		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.27.

Lampiran Tabel 23. Analsis prevalensi tipe tidak terinfeksi dengan terinfeksi pada udang kerdil di musim hujan

Test Statistics

	VAR00007
Chi-Square	27.040[a]
df	1
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 50.0.

Lampiran Tabel 24. Analsis prevalensi tipe tidak terinfeksi dengan tipe terinfeksi pada udang kerdil di musim kemarau

Test Statistics

	VAR00007
Chi-Square	9.000[a]
df	1
Asymp. Sig.	.003

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 50.0.

Lampiran Tabel 25. Analisis prevalensi tipe tidak terinfeksi dengan terinfeksi pada udang normal di musim hujan

Test Statistics

	VAR00007
Chi-Square	4.840[a]
df	1
Asymp. Sig.	.028

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 50.0.

Lampiran Tabel 26. Analsis prevalensi tipe tidak terinfeksi dengan terinfeksi pada udang normal di musim kemarau

Test Statistics

	VAR00007
Chi-Square	1.960[a]
df	1
Asymp. Sig.	.162

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 50.0.

Lampiran Tabel 27. Analisis prevalensi tipe infeksi antara udang normal dan kerdil pada musim hujan

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.034[a]	6	.318
Likelihood Ratio	7.894	6	.246
Linear-by-Linear Association	.027	1	.871
N of Valid Cases	139		

a. 4 cells (28.6%) have expected count less than 5. The minimum expected count is .91.

Lampiran Tabel 28. Analisis prevalensi tipe infeksi antara udang normal dan kerdil pada musim kemarau

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.409[a]	5	.004
Likelihood Ratio	18.772	5	.002
Linear-by-Linear Association	1.435	1	.231
N of Valid Cases	111		

a. 3 cells (25.0%) have expected count less than 5. The minimum expected count is 1.19.

Lampiran Tabel 29. Analsis prevalensi tipe infeksi pada udang kerdil di musim hujan

Test Statistics

	Hujan
Chi-Square	31.763[a]
df	6
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 10.9.

Lampiran Tabel 30. Analsis prevalensi tipe infeksi pada udang kerdil antara musim hujan dengan kemarau

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.772[a]	6	.707
Likelihood Ratio	4.577	6	.599
Linear-by-Linear Association	.754	1	.385
N of Valid Cases	143		

a. 5 cells (35.7%) have expected count less than 5. The minimum expected count is .94.

Lampiran Tabel 31. Analsis tipe infeksi virus udang kerdil pada musim kemarau

Test Statistics

	Kemarau
Chi-Square	12.030[a]
df	4
Asymp. Sig.	.017

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 13.4.

Lampiran Tabel 32. Analsis tipe infeksi virus udang normal pada musim hujan

Test Statistics

	Hujan
Chi-Square	35.952[a]
df	5
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 10.5.

Lampiran Tabel 33. Analsis tipe infeksi virus udang normal antara musim hujan dengan kemarau

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.908[a]	5	.113
Likelihood Ratio	9.592	5	.088
Linear-by-Linear Association	3.047	1	.081
N of Valid Cases	107		

a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is .82.

Lampiran Tabel 34. Analsis prevalensi tipe infeksi virus udang normal pada musim kemarau

Test Statistics

	Kemarau
Chi-Square	14.636[a]
df	4
Asymp. Sig.	.006

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 8.8.

Lampiran Tabel 35. Nilai kualitas air untuk pembenihan

Lokasi	pH	Suhu (^{o}C)	Salinitas (ppt)
TKH1 (Takalar m. hujan)	7.14	28	25.8
TKH2	7.3	25	26.2
TKH3	7.23	27	26.7
TKH4	7.23	27	26.7
TKH5	7.39	29	25.5
TKK1 (Takalar m. kemarau)	7.53	31	34
TKK2	7.67	32	35
TKK3	7.62	32	35
BH1 (Barru m. hujan)	6.6	28	25
BH2	6.7	28	27
BK1 (Barru m. kemarau)	7.53	32	34
BK2	7.49	33	34
BK3	7.33	33	35
PH1 (Pinrang m. hujan)	6.43	27	26
PH2	6.41	29	24
PK1(Pinrang m. kemarau)	6.72	32	35
PK2	7.57	30	30
PK3	7.59	31	30

Lampiran Tabel 36. Nilai kualitas air tambak untuk udang normal

Lokasi	pH	Suhu (^{o}C)	Salinitas (ppt)
TKTH1 (Takalar m. hujan)	7.9	28	21
TKTH2	7.9	28	21
TKTH3	7.8	28	22
TKTK1 (Takalar m. kemarau)	8	32	35
TKTK2	7.9	33	35
PTH1 (Pinrang m. hujan)	7.7	28	10
PTH2	7.6	28	21
PTH3	7.8	28	22
PTH4	7.7	29	21
PTK1 (Pinrang m kemarau)	7.9	33	37
PTK2	7.9	35	35

Lampiran Tabel 37. NIlai kualitas air tambak untuk udang kerdil

Lokasi	pH	Suhu (^oC)	Salinitas (ppt)
TKTH1 (Takalar m. hujan)	7.9	28	21
TKTH2	7.9	28	21
TKTH3	7.8	28	22
TKTK1 (Takalar m. kemarau)	8	32	35
TKTK2	7.9	33	35
PTH1 (Pinrang m. hujan)	7.6	28	21
PTH2	7.8	28	22
PTH3	7.7	29	21
PTK1 (Pinrang m kemarau)	7.9	33	37
PTK2	7.9	35	35

Lampiran Tabel 38. Nilai parameter kualitas air berdasarkani kebutuhan optimal udang windu

Parameter Kualitas Air	Kebutuhan Optimal Udang Windu
Suhu (^oC)	26 - 31^oC (Poernomo, 1979). 28 ± 1^oC (Wardoyo dan Djokosetyanto, 1988)
Salinitas (ppt)	28 - 30 ppt (Cholik, 1986)
pH	7,5 - 8,5 (Chie, 1992)

Lampiran Gambar 1. Prosedur Ekstraksi DNA Sesuai Petunjuk QiAMP DNA Mini Kit

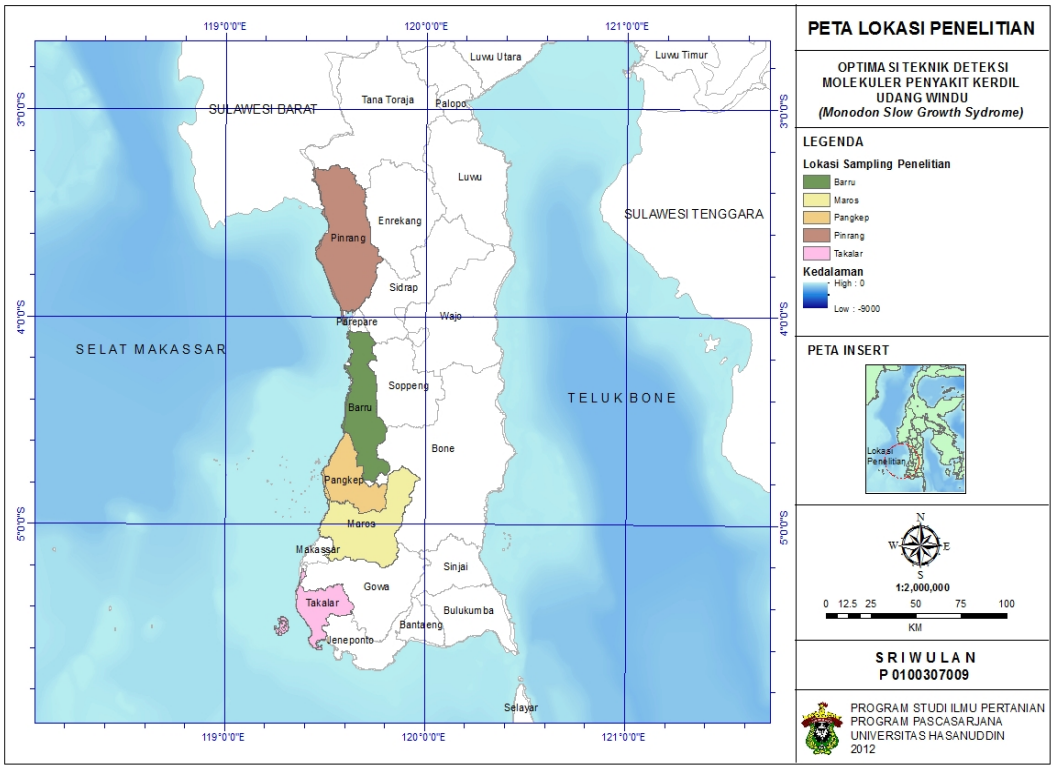
Ekstraksi DNA dilakukan dengan menggunakan Kit Qiagen DNA Mini Kit menggunakan protokol untuk jaringan. Ekstraksi dilakukan dengan mengikuti petunjuk pabrikan dengan beberapa modifikasi. Secara berurutan ekstrasi DNA dilakukan sebagai berikut:

1. Udang yang telah difiksasi pada alkohol 100% dibersihkan beberapa kali.
2. Sampel udang besar, bagian hepatopankreas, insang dan pleipodnya diambil kemudian dihaluskan dengan menggunakan mortar. Benur udang/PL digerus keseluruhan badannya sampai halus.
3. Ambil 3 buah tabung eppendorf 1.5 mL dan tambahkan masing-masing larutan ATL sebanyak 180 µL.
4. Letakkan sampel udang tersebut masing-masing ke dalam tabung eppendorf 1.5 mL tersebut.
5. Selanjutnya ditambahkan larutan proteinase K sebanyak 20 µL ke dalam tabung, vorteks dan selanjutnya lakukan sentrifus cepat.
6. Tabung kemudian diinkubasi pada suhu 56^{o}C selama semalam atau 3 jam tergantung jenis jaringan. Dalam kasus inkubasi selama 3 jam sebaiknya dilakukan vorteks setiap selang 1 jam untuk menjamin bahwa jaringan terlisis dengan sempurna.
7. Setelah inkubasi lakukan sentrifuse cepat sehingga seluruh cairan yang melengket pada dinding tabung akan menuju ke dasar tabung. Buang supernatant.

8. Tambahkan larutan 200 µL buffer AL, vortex selama 15 detik, lalu inkubasi pada 70^{o}C selama 10 menit. Lakukan sentrifus cepat dan buang supernatan.
9. Selanjutnya ditambahkan 200 µL ethanol 99.5% (ethanol absolute).
10. Larutan dari tabung eppendorf selanjutnya dipindahkan pada QIAamp Mini spin column (dalam 2 mL tabung koleksi), pada saat memindahkan larutan agar tidak menyentuh dinding dari tabung. Tutup penutup tabung dan sentrifus pada 8000 rpm selama 1 menit, letakkan QIAamp column pada tabung koleksi yang baru dan buang tabung koleksi yang sudah mengandung filtrat.
11. Tambahkan 500 µL buffer AW1 tanpa menyentuh dinding tabung, tutup penutup, lalu sentrifus 8000 rpm selama 1 menit, letakkan kembali column pada tabung koleksi yang baru dan buang tabung koleksi yang mengandung filtrat.
12. Tambahkan 500 µL buffer AW2 pada column tanpa menyentuh pinggir tabung, tutup lalu sentrifus pada 14000 rpm selama 3 menit.
13. Buang filtrate lalu tempatkan kembali column pada tabung koleksi yang sama, lalu sentrifus kembali pada 14000 rpm selama 1 menit.
14. Selanjutnya QIAamp column diletakkan pada tabung eppendorf 1.5 mL dan ditambahkan buffer AE sebanyak 100 µL, inkubasi pada suhu kamar selama 1 menit, sentrifus pada 8000 rpm selama 1 menit.

15. Langkah 13 diulangi dengan menambahkan lagi larutan buffer AE sebanyak 100 µL pada tabung yang sama, lalu diikubasi 1 menit dan selanjutnya disentrifus pada 8000 rpm selama 1 menit. Total larutan DNA yang diperoleh adalah 200 µL.
16. Hasil ekstrak DNA disimpan pada suhu – 20^{o}C sebelum digunakan

Lampiran Gambar 2. Peta Lokasi Penelitian



Lampiran Gambar 3. Hasil BLAST IHHNV asal Sulawesi Selatan

```
>  gb|AY362547.1|  Infectious hypodermal and hematopoietic necrosis
virus from Thailand
nonstructural protein 2 (NS2), nonstructural protein
1 (NS1), and capsid protein genes, complete cds
Length=3667
 Score =  429 bits (232),  Expect = 5e-117
 Identities = 278/301 (92%), Gaps = 0/301 (0%)
 Strand=Plus/Plus

Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            ||||||||||||||||||||||||||||||||||||||||||| ||||||||||||||||
Sbjct  578  ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTAGACCCACTACCGAACAA  637

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || |||||||||||||||| ||||| ||||||||||||||||||||| ||||||||
Sbjct  638  CTTCTTAATATGTCTGAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  697

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
            ||||||||||||||||  |||||||| | ||||| ||||||||||||||||||||||||
Sbjct  698  CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGTGGATAACCTGGGA  757

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGACTCCATC  240
            || ||||||||| ||||||||||||||||||||||||||||||||||  ||||| |
Sbjct  758  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAAAACTCCGTT  817

Query  241  AGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACATC  300
             ||| |  |||||||||||| | ||||| ||||||||||||||||||||||||||||||
Sbjct  818  GGAAGTGTTGGAAACAGTGATGACAGGGGTCAAAAGAGACAGAGAGGAATTACTTACATC  877

Query  301  A  301
            |
Sbjct  878  A  878


>  gb|JN616415.1|  Infectious hypodermal and hematopoietic necrosis
virus isolate
IHHNV-VN NS2 (NS2), NS1 (NS1), and capsid protein genes, complete
cds
Length=3815
 Score =  424 bits (229),  Expect = 3e-115
 Identities = 277/301 (92%), Gaps = 0/301 (0%)
 Strand=Plus/Plus
Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            ||||||||||||||||||||||||||||||||||||||||||| ||||||||||||||||
Sbjct  666  ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTAGACCCACTACCGAACAA  725

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || |||||||||||| ||||| ||||| ||||||||||||||||||||| ||||||||
Sbjct  726  CTTCTTAATATGTCTCAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  785

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
            ||||||||||||||||  |||||||| | ||||| ||||||||||||||||||||||||
Sbjct  786  CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGTGGATAACCTGGGA  845

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGACTCCATC  240
            || ||||||||| ||||||||||||||||||||||||||||||||||  ||||| |
Sbjct  846  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAAAACTCCCTT  905

Query  241  AGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACATC  300
             ||| |  |||||||||||| | ||||| ||||||||||||||||||||||||||||||
Sbjct  906  GGAAGTGTTGGAAACAGTGATGACAGGGGTCAAAAGAGACAGAGAGGAATTACTTACATC  965

Query  301  A  301
            |
```

```
Sbjct  966  A  966
```

> gb|JN098516.1| Infectious hypodermal and hematopoietic necrosis virus isolate
N19 nonstructural protein 1 gene, partial cds
Length=429
 Score = 424 bits (229), Expect = 3e-115
 Identities = 277/301 (92%), Gaps = 0/301 (0%)
 Strand=Plus/Plus

```
Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            |||||||||||||||||||||||||||||||||||||||||| ||||||||||||||||
Sbjct  42   ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTAGACCCACTACCGAACAA  101

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || ||||||||||||  |||||  ||||| ||||||||||||||||||||||  ||||||||
Sbjct  102  CTTCTTAATATGTCTCAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  161

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
            ||||||||||||||||||  ||||||||  | |||||  ||||||||||||||||||||||
Sbjct  162  CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGTGGATAACCTGGGA  221

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGACTCCATC  240
            || |||||||||  ||||||||||||||||||||||||||||||||||  |||||  |
Sbjct  222  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAAAACTCCCTT  281

Query  241  AGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACATC  300
             ||| |  ||||||||||| | |||||  ||||||||||||||||||||||||||||||
Sbjct  282  GGAAGTGTTGGAAACAGTGATGACAGGGGTCAAAAGAGACAGAGAGGAATTACTTACATC  341

Query  301  A  301
            |
Sbjct  342  A  342
```

gb|AY355307.1| Infectious hypodermal and hematopoietic necrosis virus isolate
Taiwan B nonstructural protein 2, nonstructural protein 1,
and capsid protein genes, complete cds
Length=3749
 Score = 424 bits (229), Expect = 3e-115
 Identities = 277/301 (92%), Gaps = 0/301 (0%)
 Strand=Plus/Plus

```
Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            |||||||||||||||||||||||||||||||||||||||||| ||||||||||||||||
Sbjct  585  ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTAGACCCACTACCGAACAA  644

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || ||||||||||||  |||||  ||||| ||||||||||||||||||||||  ||||||||
Sbjct  645  CTTCTTAATATGTCTCAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  704

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
            ||||||||||||||||||  ||||||||  | |||||  ||||||||||||||||||||||
Sbjct  705  CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGTGGATAACCTGGGA  764

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGACTCCATC  240
            || |||||||||  ||||||||||||||||||||||||||||||||||  |||||  |
Sbjct  765  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAAAACTCCCTT  824

Query  241  AGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACATC  300
             ||| |  ||||||||||| | |||||  ||||||||||||||||||||||||||||||
Sbjct  825  GGAAGTGTTGGAAACAGTGATGACAGGGGTCAAAAGAGACAGAGAGGAATTACTTACATC  884

Query  301  A  301
            |
Sbjct  885  A  885
```

> gb|AY102034.1| Infectious hypodermal and hematopoietic necrosis virus nonstructural protein 2, nonstructural protein 1 (NS1), and structural protein genes, complete cds

Length=3216

Score = 424 bits (229), Expect = 3e-115

Identities = 277/301 (92%), Gaps = 0/301 (0%)

Strand=Plus/Plus

```
Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            ||||||||||||||||||||||||||||||||||||||||||| ||||||||||||||||
Sbjct  158  ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTAGACCCACTACCGAACAA  217

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || ||||||||||||  |||||  ||||| ||||||||||||||||||||||  ||||||||
Sbjct  218  CTTCTTAATATGTCTCAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  277

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
            ||||||||||||||||||  ||||||||  | |||||  ||||||||||||||||||||||
Sbjct  278  CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGTGGATAACCTGGGA  337

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGACTCCATC  240
            || |||||||||  ||||||||||||||||||||||||||||||||||||  |||||  |
Sbjct  338  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAAAACTCCCTT  397

Query  241  AGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACATC  300
             ||| |  ||||||||||| | |||||  ||||||||||||||||||||||||||||||||
Sbjct  398  GGAAGTGTTGGAAACAGTGATGACAGGGGTCAAAAGAGACAGAGAGGAATTACTTACATC  457

Query  301  A  301
            |
Sbjct  458  A  458
```

> gb|AY124937.1| Infectious hypodermal and hematopoietic necrosis virus isolate East Africa non-structural protein 1 (NS1) and structural protein genes, complete cds

Length=2935

Score = 418 bits (226), Expect = 1e-113

Identities = 276/301 (92%), Gaps = 0/301 (0%)

Strand=Plus/Plus

```
Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            |||||||||||||||||||||||||||||||||||||||||| || || ||||||||||||||
Sbjct  97   ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGTCTAGATCCACTACCGAACAA  156

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Sbjct  157  CTTCTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACTCTCAAACT  216

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
             ||||||||||||||||  |||||||||| |||||  |||||| ||||||||||||||||
Sbjct  217  ACTCCAAGAACTTCAACACCAGAACAAAGTGATCCTAAGGTCTTCGTGGATAACCTGGGA  276

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGACTCCATC  240
            || |||||||||  ||||||||||||||||||||||||||||||||||||||  |||||| |
Sbjct  277  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAAGACTCCCTT  336

Query  241  AGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACATC  300
             ||| | || ||||||||  | |||||  || ||||||||||||||||||||||||||||||
Sbjct  337  GGAAGTGCTAGAAACAGTAATGACAGGGGTGAAAAGAGACAGAGAGGAATTACTTACATC  396

Query  301  A  301
            |
Sbjct  397  A  397
```

> gb|GQ411199.1| Infectious hypodermal and hematopoietic necrosis virus strain IN-07, complete genome
Length=3908
 Score = 412 bits (223), Expect = 5e-112
 Identities = 275/301 (91%), Gaps = 0/301 (0%)
 Strand=Plus/Plus

```
Query  1     ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
             ||||||||||||||||||||||||||||||||||| ||||| ||||||||||||||||||
Sbjct  744   ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAAAGCCTAGACCCACTACCGAACAA  803

Query  61    CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
             || ||||||||||||  ||||| ||||| ||||||||||||||||||||||| ||||||||
Sbjct  804   CTTCTTAATATGTCTCAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  863

Query  121   CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
             ||||||||||||||||  |||||||| | ||||| ||||||||| ||||||||||||||
Sbjct  864   CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGCGGATAACCTGGGA  923

Query  181   ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGACTCCATC  240
             || ||||||||| ||||||||||||||||||||||||||||||||||||  ||||| |
Sbjct  924   ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAAAACTCCCTT  983

Query  241   AGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACATC  300
              ||| |  |||||||||||| | ||||| ||||||||||||||||||||||||||||||
Sbjct  984   GGAAGTGTTGGAAACAGTGATGACAGGGGTCAAAAGAGACAGAGAGGAATTACTTACATC  1043

Query  301   A  301
             |
Sbjct  1044  A  1044
```

> gb|EU848309.1| Infectious hypodermal and hematopoietic necrosis virus strain Indian-07 nonfunctional non-structural protein 1 (NS1) gene, partial sequence
Length=1896
 Score = 412 bits (223), Expect = 5e-112
 Identities = 275/301 (91%), Gaps = 0/301 (0%)
 Strand=Plus/Plus

```
Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            ||||||||||||||||||||||||||||||||||| ||||| ||||||||||||||||||
Sbjct  97   ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAAAGCCTAGACCCACTACCGAACAA  156

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || ||||||||||||  ||||| ||||| ||||||||||||||||||||||| ||||||||
Sbjct  157  CTTCTTAATATGTCTCAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  216

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
            ||||||||||||||||  |||||||| | ||||| ||||||||| ||||||||||||||
Sbjct  217  CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGCGGATAACCTGGGA  276

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGACTCCATC  240
            || ||||||||| ||||||||||||||||||||||||||||||||||||  ||||| |
Sbjct  277  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAAAACTCCCTT  336

Query  241  AGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACATC  300
             ||| |  |||||||||||| | ||||| ||||||||||||||||||||||||||||||
Sbjct  337  GGAAGTGTTGGAAACAGTGATGACAGGGGTCAAAAGAGACAGAGAGGAATTACTTACATC  396

Query  301  A  301
            |
Sbjct  397  A  397
```

> gb|EU518246.1| Infectious hypodermal and hematopoietic necrosis virus non-structural protein 2 gene, complete cds
Length=1092
 Score = 412 bits (223), Expect = 5e-112
 Identities = 275/301 (91%), Gaps = 0/301 (0%)
 Strand=Plus/Plus

```
Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            |||||||||||||||||||||||||||||||||||| ||||| ||||||||||||||||
Sbjct  153  ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAAAGCCTAGACCCACTACCGAACAA  212

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || |||||||||||| ||||| ||||| ||||||||||||||||||||||| ||||||||
Sbjct  213  CTTCTTAATATGTCTCAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  272

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
            ||||||||||||||||||  |||||||| | ||||| ||||||||| ||||||||||||
Sbjct  273  CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGCGGATAACCTGGGA  332

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGACTCCATC  240
            || ||||||||| ||||||||||||||||||||||||||||||||||  ||||| |
Sbjct  333  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAAAACTCCCTT  392

Query  241  AGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACATC  300
             ||| |  |||||||||||| | ||||| ||||||||||||||||||||||||||||||
Sbjct  393  GGAAGTGTTGGAAACAGTGATGACAGGGGTCAAAAGAGACAGAGAGGAATTACTTACATC  452

Query  301  A  301
            |
Sbjct  453  A  453
```

> gb|GQ475529.1| Infectious hypodermal and hematopoietic necrosis virus non-structural protein, non-structural protein 1, and capsid protein genes, complete cds
Length=3601
 Score = 407 bits (220), Expect = 3e-110
 Identities = 275/302 (91%), Gaps = 2/302 (1%)
 Strand=Plus/Plus

```
Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            |||||||||||||||||||||||||||||||||||| |||||||||||||||||||||
Sbjct  538  ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTAGACCCACTACCGAACAA  597

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || |||||||||||||||| ||||| |||||||||||||||||||||| ||||||||
Sbjct  598  CTTCTTAATATGTCTGAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  657

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
            ||||||||||||||||  |||||||| | ||||| |||||||| ||||||||||||||
Sbjct  658  CCTCCAAGAACTTCAACACCAGAACAAACTCATCCTAAGGTCTGCATGGATAACCTGGGA  717

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGAC-TCCAT  239
            || ||||||||| |||||||||||||||||||||||||||||||||||  || ||| |
Sbjct  718  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAA-ACCTCCCT  776

Query  240  CAGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACAT  299
              ||| |  ||||||||||  | ||||| || |||||||||||||||||||||||||||
Sbjct  777  TGGAAGTGTTGGAAACAGTAATGACAGGGGTGAAAAGAGACAGAGAGGAATTACTTACAT  836

Query  300  CA  301
            ||
Sbjct  837  CA  838
```

>gb|AF218266.2| Infectious hypodermal and hematopoietic necrosis virus, complete genome
Length=3909
 Score = 401 bits (217), Expect = 1e-108
 Identities = 274/302 (91%), Gaps = 2/302 (1%)
 Strand=Plus/Plus

```
Query  1     ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
             |||||||||||||||||||||||||||||||||||||||| |||  ||||||||||||||||
Sbjct  746   ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGACCCTAAACCCACTACCGAACAA  805

Query  61    CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
             || |||||||||||||||||| ||||| |||||||||||||||||||||| ||||||||
Sbjct  806   CTTCTTAATATGTCTGAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  865

Query  121   CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
             ||||||||||||||||||  |||||||| | ||||| ||||||||||||||||||||||||
Sbjct  866   CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGTGGATAACCTGGGA  925

Query  181   ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGAC-TCCAT  239
             || ||||||||| ||||||||||||||||||||||||||||||||||||  || ||| |
Sbjct  926   ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAA-ACCTCCCT  984

Query  240   CAGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACAT  299
               ||| |  ||||||||||  | ||||| || ||||||||||||||||||||||||||||
Sbjct  985   TGGAAGTGTTGGAAACAGTAATGACAGGGGTAAAAAGAGACAGAGAGGAATTACTTACAT  1044

Query  300   CA  301
             ||
Sbjct  1045  CA  1046
```

>gb|EF633688.1| Infectious hypodermal and hematopoietic necrosis virus isolate Fujian, complete genome
Length=3833
 Score = 401 bits (217), Expect = 1e-108
 Identities = 274/302 (91%), Gaps = 2/302 (1%)
 Strand=Plus/Plus

```
Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            |||||||||||||||||||||||||||||||||||||||| |||  ||||||||||||||||
Sbjct  675  ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGACCCTAAACCCACTACCGAACAA  734

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || |||||||||||||||||| ||||| |||||||||||||||||||||| ||||||||
Sbjct  735  CTTCTTAATATGTCTGAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  794

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
            ||||||||||||||||||  |||||||| | ||||| ||||||||||||||||||||||||
Sbjct  795  CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGTGGATAACCTGGGA  854

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGAC-TCCAT  239
            || ||||||||| ||||||||||||||||||||||||||||||||||||  || ||| |
Sbjct  855  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAA-ACCTCCCT  913

Query  240  CAGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACAT  299
              ||| |  ||||||||||  | ||||| || ||||||||||||||||||||||||||||
Sbjct  914  TGGAAGTGTTGGAAACAGTAATGACAGGGGTAAAAAGAGACAGAGAGGAATTACTTACAT  973

Query  300  CA  301
            ||
Sbjct  974  CA  975
```

> gb|AY355308.1| Infectious hypodermal and hematopoietic necrosis virus isolate
Taiwan C nonstructural protein 2, nonstructural protein 1, and capsid protein genes, complete cds
Length=3742
GENE ID: 1457864 Ihahnvgp3 | structural protein
[Infectious hypodermal and hematopoietic necrosis virus]
(10 or fewer PubMed links)
Score = 401 bits (217), Expect = 1e-108
Identities = 274/302 (91%), Gaps = 2/302 (1%)
Strand=Plus/Plus

```
Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            ||||||||||||||||||||||||||||||||||||||||| |||  ||||||||||||||||
Sbjct  580  ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGACCCTAAACCCACTACCGAACAA  639

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || |||||||||||||||||| ||||| ||||||||||||||||||||| ||||||||
Sbjct  640  CTTCTTAATATGTCTGAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  699

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
            ||||||||||||||||||  |||||||| | ||||| |||||||||||||||||||||||
Sbjct  700  CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGTGGATAACCTGGGA  759

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGAC-TCCAT  239
            || ||||||||| ||||||||||||||||||||||||||||||||||||  || ||| |
Sbjct  760  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAA-ACCTCCCT  818

Query  240  CAGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACAT  299
              ||| |  ||||||||||  | ||||| || ||||||||||||||||||||||||||
Sbjct  819  TGGAAGTGTTGGAAACAGTAATGACAGGGGTAAAAAGAGACAGAGAGGAATTACTTACAT  878

Query  300  CA  301
            ||
Sbjct  879  CA  880
```

> gb|AY355306.1| Infectious hypodermal and hematopoietic necrosis virus isolate
Taiwan A nonstructural protein 2 and nonstructural protein 1 genes, complete cds; and capsid protein gene, partial cds
Length=3742
Score = 401 bits (217), Expect = 1e-108
Identities = 274/302 (91%), Gaps = 2/302 (1%)
Strand=Plus/Plus

```
Query  1     ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
             ||||||||||||||||||||||||||||||||||||||||| |||  ||||||||||||||||
Sbjct  1024  ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGACCCTAAACCCACTACCGAACAA  1083

Query  61    CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
             || |||||||||||||||||| ||||| ||||||||||||||||||||| ||||||||
Sbjct  1084  CTTCTTAATATGTCTGAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  1143

Query  121   CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
             ||||||||||||||||||  |||||||| | ||||| |||||||||||||||||||||||
Sbjct  1144  CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGTGGATAACCTGGGA  1203

Query  181   ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGAC-TCCAT  239
             || ||||||||| ||||||||||||||||||||||||||||||||||||  || ||| |
Sbjct  1204  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAA-ACCTCCCT  1262

Query  240   CAGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACAT  299
               ||| |  ||||||||||  | ||||| || ||||||||||||||||||||||||||
Sbjct  1263  TGGAAGTGTTGGAAACAGTAATGACAGGGGTAAAAAGAGACAGAGAGGAATTACTTACAT  1322

Query  300   CA  301
             ||
Sbjct  1323  CA  1324
```

GENE ID: 1457863 Ihahnvgp1 | ORF 2
[Infectious hypodermal and hematopoietic necrosis virus]
(10 or fewer PubMed links)
Score = 401 bits (217), Expect = 1e-108
Identities = 274/302 (91%), Gaps = 2/302 (1%)
Strand=Plus/Plus

```
Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            ||||||||||||||||||||||||||||||||||||||||| |||  ||||||||||||||||
Sbjct  612  ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGACCCTAAACCCACTACCGAACAA  671

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || |||||||||||||||| ||||| ||||||||||||||||||||| ||||||||
Sbjct  672  CTTCTTAATATGTCTGAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  731

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
            ||||||||||||||||  |||||||| | ||||| ||||||||||||||||||||||||
Sbjct  732  CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGTGGATAACCTGGGA  791

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGAC-TCCAT  239
            || ||||||||| ||||||||||||||||||||||||||||||||||||  || ||| |
Sbjct  792  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAA-ACCTCCCT  850

Query  240  CAGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACAT  299
              ||| |  ||||||||||  | ||||| || ||||||||||||||||||||||||||||
Sbjct  851  TGGAAGTGTTGGAAACAGTAATGACAGGGGTAAAAAGAGACAGAGAGGAATTACTTACAT  910

Query  300  CA  301
            ||
Sbjct  911  CA  912
```

GENE ID: 1457863 Ihahnvgp1 | ORF 2
[Infectious hypodermal and hematopoietic necrosis virus]
(10 or fewer PubMed links)
Score = 401 bits (217), Expect = 1e-108
Identities = 274/302 (91%), Gaps = 2/302 (1%)
Strand=Plus/Plus

```
Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            ||||||||||||||||||||||||||||||||||||||||| |||  ||||||||||||||||
Sbjct  695  ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGACCCTAAACCCACTACCGAACAA  754

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || |||||||||||||||| ||||| ||||||||||||||||||||| ||||||||
Sbjct  755  CTTCTTAATATGTCTGAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  814

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
            ||||||||||||||||  |||||||| | ||||| ||||||||||||||||||||||||
Sbjct  815  CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGTGGATAACCTGGGA  874

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGAC-TCCAT  239
            || ||||||||| ||||||||||||||||||||||||||||||||||||  || ||| |
Sbjct  875  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAA-ACCTCCCT  933

Query  240  CAGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACAT  299
              ||| |  ||||||||||  | ||||| || ||||||||||||||||||||||||||||
Sbjct  934  TGGAAGTGTTGGAAACAGTAATGACAGGGGTAAAAAGAGACAGAGAGGAATTACTTACAT  993

Query  300  CA  301
            ||
Sbjct  994  CA  995
```

```
>  gb|AY590121.1|  Infectious hypodermal and hematopoietic necrosis
virus from New
Caledonia non-structural protein 1 and non-structural protein
2 genes, partial cds
Length=392
 Score =  401 bits (217),  Expect = 1e-108
 Identities = 274/302 (91%), Gaps = 2/302 (1%)
 Strand=Plus/Plus

Query  1    ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
            |||||||||||||||||||||||||||||||||||||| |||  ||||||||||||||||
Sbjct  68   ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGACCCTAAACCCACTACCGAACAA  127

Query  61   CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
            || |||||||||||||||||| ||||| |||||||||||||||||||||| ||||||||
Sbjct  128  CTTCTTAATATGTCTGAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  187

Query  121  CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
            ||||||||||||||||||  |||||||| | ||||| ||||||||||||||||||||||||
Sbjct  188  CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGTGGATAACCTGGGA  247

Query  181  ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGAC-TCCAT  239
            || ||||||||| ||||||||||||||||||||||||||||||||||||||  || ||| |
Sbjct  248  ATTCGAGAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAA-ACCTCCCT  306

Query  240  CAGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACAT  299
              ||| |  ||||||||||  | ||||| || ||||||||||||||||||||||||||||
Sbjct  307  TGGAAGTGTTGGAAACAGTAATGACAGGGGTAAAAAGAGACAGAGAGGAATTACTTACAT  366

Query  300  CA  301
            ||
Sbjct  367  CA  368


>  gb|JN377975.1|  Infectious hypodermal and hematopoietic necrosis
virus strain
KLV-2010-01, complete genome
Length=3914
 Score =  396 bits (214),  Expect = 5e-107
 Identities = 273/302 (90%), Gaps = 2/302 (1%)
 Strand=Plus/Plus
Query  1     ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGAGCCTGGACCCACTACCGAACAA  60
             |||||||||||||||||||||||||||||||||||||| |||  ||||||||||||||||
Sbjct  751   ATTTCTCCAAGCCTTCTCACCCCAGGTCCAAATCAAGACCCTAAACCCACTACCGAACAA  810

Query  61    CTACTTAATATGTCTGAAGAATTGTTCAAGTTTTCAGACGAGGAAGACAACCCTCAAACT  120
             || |||||||||||||||||| ||||| |||||||||||||||||||||| ||||||||
Sbjct  811   CTTCTTAATATGTCTGAAGAACTGTTCCAGTTTTCAGACGAGGAAGACAACTCTCAAACT  870

Query  121   CCTCCAAGAACTTCAACAGGAGAACAAAGTTATCCTGAGGTCTGCGTGGATAACCTGGGA  180
             ||||||||||||||||||  |||||||| | ||||| ||||||||||||||||||||||||
Sbjct  871   CCTCCAAGAACTTCAACACCAGAACAAACTGATCCTAAGGTCTGCGTGGATAACCTGGGA  930

Query  181   ATACGAGAGGGAGCAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAGGAC-TCCAT  239
             || ||| ||||| ||||||||||||||||||||||||||||||||||||||  || ||| |
Sbjct  931   ATTCGAAAGGGAACAGGAAACGGAACAATTCAACTTGGAAGTGAATCAGAA-ACCTCCCT  989

Query  240   CAGAAATACTGGAAACAGTGTTAACAGGCGTCAAAAGAGACAGAGAGGAATTACTTACAT  299
               ||| |  ||||||||||  | ||||| || ||||||||||||||||||||||||||||
Sbjct  990   TGGAAGTGTTGGAAACAGTAATGACAGGGGTAAAAAGAGACAGAGAGGAATTACTTACAT  1049

Query  300   CA  301
             ||
Sbjct  1050  CA  1051
```

CURRICULUM VITAE

A. DATA PRIBADI

Nama : Dr. Ir. Sriwulan, M.P.
Tempat /Tanggal Lahir : Pattallassang, 30 Juni 1966
Jenis Kelamin : Perempuan
Status Perkawinan : Kawin
Alamat Rumah : Perum Dosen UNHAS Blok BG 85, Makassar
Telp./Faks. : 0411-586922
Alamat e-mail : sriwulancinga@yahoo.com
Status Sipil :

a. Nama Suami : Dr. Ir. Hilal Anshary, M.Sc.
b. Nama Anak : Ainun Jariah Hilal Anshary

B. RIWAYAT PENDIDIKAN

a. Pendidikan Formal :

- Tamat SD Tahun 1978 di SDN No. 42 Takalar
- Tamat SLTP tahun 1981 di SMP Neg. I Takalar
- Tamat SLTA tahun 1984 di SMA Neg. I Takalar
- Sarjana (S1) tahun 1989 di Universitas Hasanuddin
- Magister (S2) tahun 2003 di Univiersitas Hasanuddin
- Doktoral (S3) tahun 2012 di Universitas Hasanuddin

b. Pendidikan Non Formal:

Tahun	Jenis Pelatihan(Dalam/ Luar Negeri)	Penyelenggara	Jangka waktu
2001	Kursus singkat “Polimerase chain reaction dan aplikasinya”	Fakultas Kedokteran UNHAS	9-10 April
2004	Workshop “Isolasi, karakterisasi dan purifikasi protein hasil rekayasa genetika”	Fakultas Kedokteran UNHAS	12 Agustus

2004	Tatap Muka dan Mandiri Tahap Satu Program Applied Aproach/Ancangan Aplikasi (AA) Angkatan VI	P3AI UNHAS Makassar	27 Sept. – 16 Oktober 2004
2005	Pelatihan penggunaan multimedia dan website	Jurusan Perikanan UNHAS	23 Juni
2005	Pelatihan data base bagi staf administrasi dan pejabat struktural	Fakultas Ilmu Kelautan dan Perikanan UNHAS	28-29 Juni
2007	Kursus singkat ” Modified polymerase chain reaction (PCR), prinsip dasar dan aplikasinya	Faculty of Marine Sciences and Fisheries, UNHAS	17 Desember
2008	Pelatihan Isolasi dan Kloning Gen	Laboratorium Bioteknologi Sekolah Farmasi ITB Bandung	20 Maret – 10 Mei
2008	Pelatihan dan Workshop Penyusunan Proposal Penelitian dan Penulisan Publikasi Ilmiah	Indonesian Managing Higher Education and Relevance (I-MHERE) dan Fakultas Farmasi, UNHAS. Makassar	24 – 26 November
2008	Pelatihan dan Workshop Implementation Unit I-MHERE “Program Improvement of Graduate Competency and Relevance in Job Opportunities” pada sub program “Improvement the Quality of Teaching Process”	Indonesian Managing Higher Education and Relevance (I-MHERE) dan Jurusan Perikanan, Fakultas Ilmu Kelautan dan Perikanan, UNHAS, Makassar	15 – 19 Desember
2009	Lokakarya penyusunan GBRP dan modul pembelajaran	Fakultas Ilmu Kelautan dan Perikanan UNHAS	6-7 Juli

2009	Pelatihan Metode Pempelajaran SCL (Student Center Learning) Bagi Dosen Fakultas Ilmu Kelautan dan Perikanan, UNHAS	Kerjasama Fakultas Ilmu Kelautan dan Lembaga Kajian dan Pengembangan Pendidikan (LKPP) UNHAS, Makassar	18 – 20 Agustus
2009	Aplikasi Multiplex PCR dan Molecular Cloning	Laboratorium Bioteknologi Sekolah Farmasi ITB Bandung	30 Agustus – 29 Oktober
2009	Health promoting settings: Concepts methodology and practices	Centre of Environment and Population Health, Griffith School of Environment, Australia.	2nd to 4th of December 2009

C. PEKERJAAN

- Pekerjaan : Dosen FIKP UNHAS
- NIP/NIK : 19660630 199103 2 002
- Bidang Keahlian : Parasit dan Penyakit Ikan
- Golongan / Pangkat : III d/Penata TK I
- Jabatan Akademik : Lektor
- Perguruan Tinggi : Universitas Hasanuddin
- Alamat Kantor :Jl. Perintis Kemerdekaan KM 10, Makassar
- Telp./Faks. : 0411-585188 / 0411-588828

D. PENGALAMAN PENELITIAN

Tahun	Judul Penelitian	Ketua/anggota Tim	Sumber Dana
2011	Pengendalian penyakit bintik putih (white spot disease) dengan vaksin rekombinan yang mengekspresikan gen VP 26 pada udang windu (*P. monodon*)	Anggota	Unggulan Perguruan Tinggi

2010	Multipleks PCR untuk analisis virus penyebab penyakit kerdil pada benih udang windu (*Penaeus monodon*) di Sulawesi Selatan.	Ketua	I-MHERE UNHAS
2010	Potensi pengembangan teknik deteksi molekuler untuk perbaikan metode pengawasan parasit zoonosis dari ikan laut di perairan Selat Makassar dan sekitarnya	Anggota	Hibah Kompetitif Penelitian Sesuai Prioritas Nasional
2010	Deteksi molekuler larva parasit *Anisakis* spp dari beberapa spesies ikan laut di perairan Selat Makassar	Anggota	RESEARCH GRANT I-MHERE
2010	Seleksi induk udang windu (*Penaeus monodon*) bebas virus WSSV dan MBV dari berbagai lokasi potensial di Sulawesi Selatan.	Anggota	STRANAS DIKTI
2009	Pengembangan gen sintetik vp26 WSSV sebagai vaksin rekombinan untuk pengendalian infeksi WSSV pada udang windu (*Penaeus monodon*)	Ketua	Dikti/Hibah Bersaing
2008-2009	Pengendalian multipel infeksi ektoparasit pada ikan beronang (*Siganus* spp) melalui stimulasi system kekebalan non-spesifik	Anggota	Dikti/Hibah Bersaing
2006-2007	Karakterisasi dan kloning gen pengkode protein VP 28 WSSV sebagai kandidat vaksin untuk mengontrol penyakit bintik putih pada udang windu (*Penaeus monodon*)	Ketua	Dikti/Hibah Pekerti
2006-2007	Penggunaan mikroflora saluran pencernaan sebagai probiotik untuk meningkatkan pertumbuhan dan kelangsungan hidup ikan gurame (*Asphronemus* Gouramy Lacepede)	Anggota	Hibah Bersaing Dikti
2004-2005	Peningkatan peran mikroba saluran pencernaan untuk memacu pertumbuhan ikan bandeng	Anggota	Hibah Pekerti II Dikti

2004	Infeksi parasit pada ikan hias air tawar pada beberapa pembudidaya di Sulawesi Selatan	Anggota	Dikti/Hibah Fundamental
2003	Biology and pathology of monogenean and *Amyloodinium ocellatum* (a protozoan parasite) infecting rabbit fish in South Sulawesi.	Anggota	Funded by Indonesia Toray Science Foundation
2003	Pola penyebaran penyakit udang di Sulawesi Selatan	Anggota	Balitbangda Sul-Sel

E. PUBLIKASI/JURNAL

Tahun	Judul	Penerbit/Jurnal
1997	A study on parasites infecting rabbit fish (*Siganus canaliculatus*) maintained in floating net cages around Barrang Lompo Island, South Sulawesi.	Torani, 6: 209-214
1997	A study of parasites infecting some marine fish maintained in floating net cages around Makassar strait	Torani, 7: 119-126
2004	Studi aplikasi dosis dan frekuensi vaksin WSSV untuk pengendalian penyakit WSSV pada udang windu (*Penaeus monodon*)	Buletin Penelitian, Seri Hayati Vol. 7 No. 2
2005	Studi tentang produksi telur, tingkat penetasan telur dan ketahanan hidup oncomiracidia *Dactylogyrus vastator* (parasit Monogenea) pada suhu berbeda	Torani. Vol. 15 No. 4.
2005	Occurence and pathology of dinoflagellida *Amyloodinium ocellatum* and monogenea of rabbit fish *Siganus javus* in recirculation system	Torani Vol. 15. N0.5 (Special edition)
2006	Pathological responses of rabbit fish, *Siganus guttatus* against infection of protozoan *Amyloodinium ocellatum.*	Omni Akuatika Vol.1 No.2.

2009	Mikroflora saluran pencernaan ikan gurame (*Ospheranomus gouramy*, Lacepede)	Torani Vol.19 No.1
2010	Amplification and cloning of vp28 open reading frame (ORF) of white spot syndrome virus Indonesian isolate in *Escherichia coli*	Prosiding. Enhancing Indonesian Fish Production and Competitiveness in International Market. ISBN: 97-979-3893-24-2.
2010	Analysis of V*ibrio* spp composition changes of tiger shrimp (P*enaeus monodon*) cultivated in South Sulawesi	idem
2010	Parasitic infections of ornamental Comet Carp and Goldfish Carp cultivated in Makassar	Prosiding SEMINASKAN VII. ISBN: 978-979-19942-7-9.
2011	Deteksi Virus Penyebab Penyakit Kerdil pada Benih Udang Windu (*Penaeus monodon*) dengan Multipleks PCR	*Journal of Fisheries Sciences*. XIII(1): 1-7
2012	Multipleks PCR untuk deteksi simultan virus MBV, IHHNV dan HPV pada benih udang windu (*Penaeus monodon*) di kabupaten Pinrang	*Inpres.* .Jurnal Ilmiah Sains dan Teknologi Seri Ilmu Pertanian
2012	Pengembangan multipleks PCR (MPCR) untuk mendeteksi virus penyakit kerdil udang windu di tambak pada musim berbeda	Jurnal Ilmiah Sains dan Teknologi Seri Ilmu Pertanian. Vol. 13 N0. 2 Agustus 2013.

F. SEMINAR/WORKSHOP

Tahun	Judul Kegiatan	Penyelenggara
2012	Pemakalah di : Konferensi Nasional VIII Pengelolaan Sumberdaya Pesisir, Laut dan Pulau- pulau Kecil Di Mataram 22-24 Oktober 2012	Universitas Mataram
2011	Deteksi Virus Penyebab Penyakit Kerdil pada Benih Udang Windu (*Penaeus monodon*) dengan Multipleks PCR	SEMINASKAN PERIKANAN DI UGM

2010	SEMINASKAN 2010	UGM Yogyakarta
2009	Pengembangan komoditi unggulan udang dalam rangka meningkatkan ekspor dan pendapatan petani tambak Kabupaten Pinrang	Badan Perencanaan Pembangunan Daerah dan Penanaman Modal Kabupaten Pinrang, Sulawesi Selatan. 28 April 2009
2008	Biomonitoring of marine pollution using cholinesterase activity of tropical green mussel (*Perna viridis*)	Jurusan Perikanan UNHAS. 19 November 2008
2007	Budidaya teripang pasir ditinjau dari berbagai aspek	Fakultas Ilmu Kelautan dan Perikanan UNHAS. 5 Des.2007
2006	Chemical and biological investigation of selected cyanobacteria	Jurusan Perikanan UNHAS. 27 September 2006
2006	An application of multi-sensor satellite remote sensing on albacore tuna, *Thunus alalunga*, fishing ground formation in relation to oceanographic conditions of nothwestern north Pacific	Jurusan Perikanan UNHAS. 14 Juni 2006
2006	Kinerja pertumbuhan kepiting bakau *Scylla serrata* Forsskal pada berbagai salinitas media	Jurusan Perikanan UNHAS. 15 Pebruari 2006
2006	Individual bassed model of fish	Jurusan Perikanan UNHAS. 18 Januari 2006
2006	Efek samping kosmetik	Fakultas Kedokteran UNHAS. 26 Januari 2006
2005	Kemampuan bakteri asam laktat indigenous untuk menurunkan kadar laktosa dan potensinya sebagai agensia probiotik	Jurusan Perikanan UNHAs. 30 November 2005
2005	Membedah potensi dan prospek akuakultur: Dimensi empiris, teknologi, bisnis dan lingkungan	Masyarakat Akuakultur Indonesia bekerjasama dengan Badan Riset Kelautan dan Perikanan. 23-25 Nopember 2005.
2005	Ectoparasites as biological indicator for the environmental conditions within and around Indonesian mariculture facilities	Jurusan Perikanan UNHAS. 12 Oktober 2005

2005	Penyuntikan ekstrak ganglion toraks kepiting karak (*Neoepisesarum latondi*) prospektif dikembangkan sebagai metode alternatif pematangan gonad kepiting bakau (*Scylla olivacea*)	Jurusan Perikanan UNHAS. 12 Oktober 2005.
2005	Simposium pembelajaran program pemberdayaan masyarakat pesisir kawasan Wallacea dan Selat Makassar	Direktorat Pemberdayaan Masyarakat Pesisir, Direktorat Jenderal Kelautan, Pesisir dan Pulau-pulau Kecil, Departemen Kelautan dan Perikanan bekerjasama dengan Divisi Kelautan UNHAS. 28 September 2005
2005	Peningkatan kapasitas dan peran jurusan perikanan dalam penyelenggaraan kegiatan akademik dan pembangunan perikanan	Lokakarya Jurusan Perikanan UNHAS di Malino. 5-7 Agustus 2004.
2004	Ekspose hasil kajian teknologi Balai Budidaya Air Payau Takalar 2004	Balai Budidaya Air Payau Takalar. 16 Desember 2004
2004	Lokakarya pembuatan modul praktikum	Jurusan Perikanan. 9 Juni 2004
2003	Aplikasi teknik PCR dan ELISA dalam bidang perikanan	Balai Riset Perikanan Budidaya Air Payau. 9-10 Desember 2003
2002	Workshop: strengthening women"s political participation in Indonesia	International IDEA & South Sulawesi Woman Caucus. 30 September 2002
2001	Seminar and workshop on coral reef management	UNHAS. 20 september 2001
2001	Teknik perencanaan proyek, penyusunan proposal dan implementasi proyek	Lembaga Penelitian UNHAS. 5 Pebruari 2001
2000	Trend fishing technology in millenium III	The fisheries resources utilization student association faculty of marine and fisheries sciences,

		UNHAS. 14 Agustus 2000
2000	Kadar fosfor optimum dalam pakan benih ikan jambal siam (*Pangasius sutchi* Fowler)	Jurusan Perikanan UNHAS. 5 Juni 2000
2000	Kajian aspek biologi reproduksi kepiting rajungan (*Portunus pelagicus*) di perairan Pulau Salemo Kabupaten Pangkep	Jurusan Perikanan UNHAS. 20 Maret 2000

Makassar, 28 Juli 2012

Sriwulan