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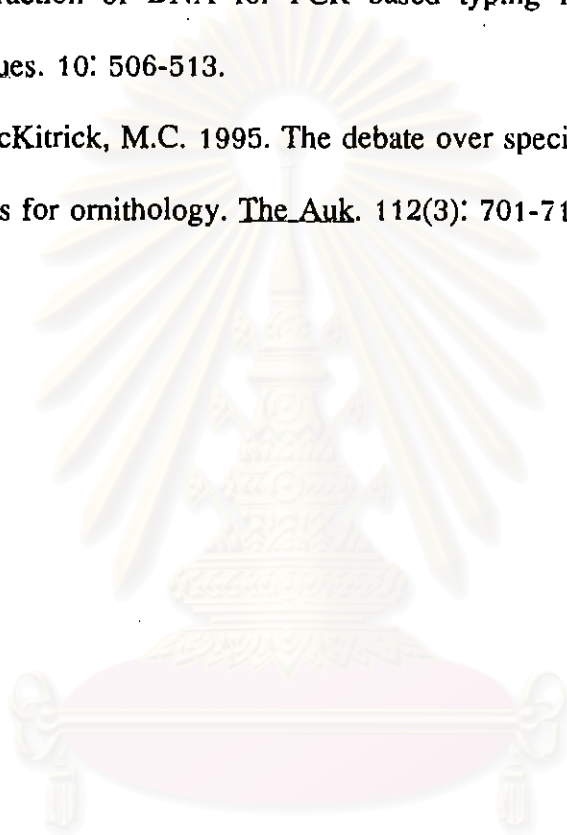
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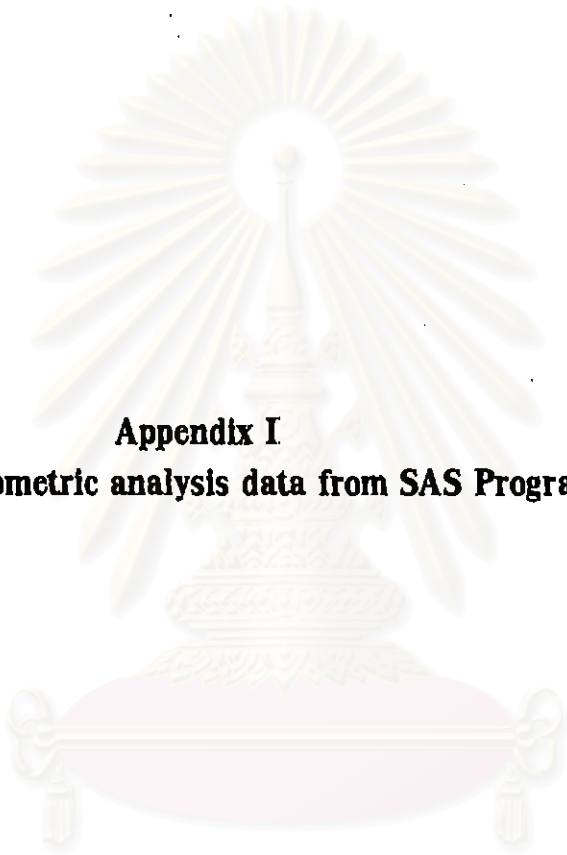
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สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย



Appendix I
Morphometric analysis data from SAS Program

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

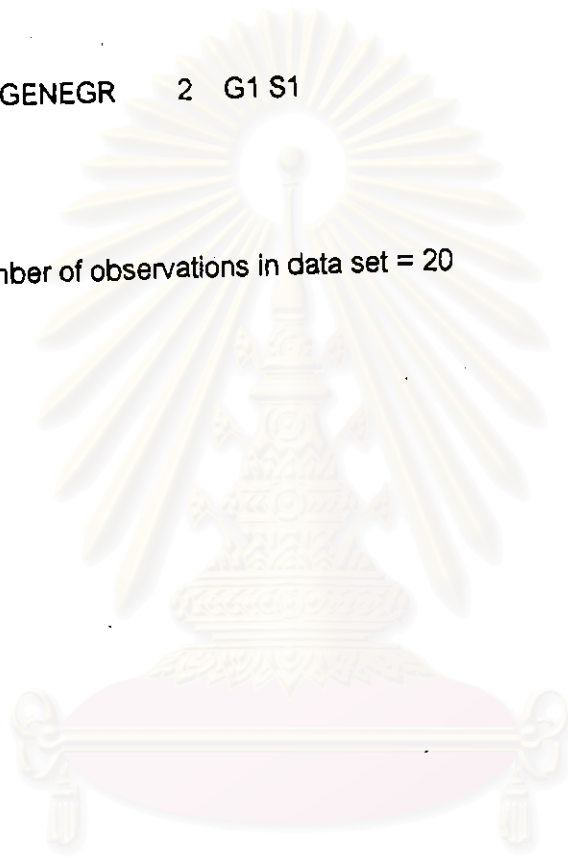
Analysis of Variance Procedure

Class Level Information

Class Levels Values

GENEGR 2 G1 S1

Number of observations in data set = 20



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

2

Analysis of Variance Procedure

Dependent Variable: WGT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	0.01250000	0.01250000	0.24	0.6320
Error	18	0.94812000	0.05267333		
Corrected Total	19	0.96062000			

R-Square	C.V.	Root MSE	WGT Mean
0.013012	24.59879	0.229507	0.93300000

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

3

Analysis of Variance Procedure

Dependent Variable: WGT

Source	DF	Anova SS	Mean Square	F Value	Pr > F
GENEGR	1	0.01250000	0.01250000	0.24	0.6320



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

4

Analysis of Variance Procedure

Class Level Information

Class Levels Values

GENEGR 2 G1 S1

Number of observations in data set = 20



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

5

Analysis of Variance Procedure

Dependent Variable: BL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	0.20000000	0.20000000	10.06	0.0053
Error	18	0.35800000	0.01988889		
Corrected Total	19	0.55800000			

R-Square	C.V.	Root MSE	BL Mean
0.358423	10.00198	0.141028	1.41000000

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

6

Analysis of Variance Procedure

Dependent Variable: BL

Source	DF	Anova SS	Mean Square	F Value	Pr > F
GENEGR	1	0.20000000	0.20000000	10.06	0.0053



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

7

Analysis of Variance Procedure

Class Level Information

Class	Levels	Values
GENEGR	2	G1 S1

Number of observations in data set = 20



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

8

Analysis of Variance Procedure

Dependent Variable: WL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	0.68450000	0.68450000	0.06	0.8117
Error	18	210.84500000	11.71361111		
Corrected Total	19	211.52950000			

R-Square	C.V.	Root MSE	WL Mean
0.003236	10.59766	3.422515	32.2950000

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

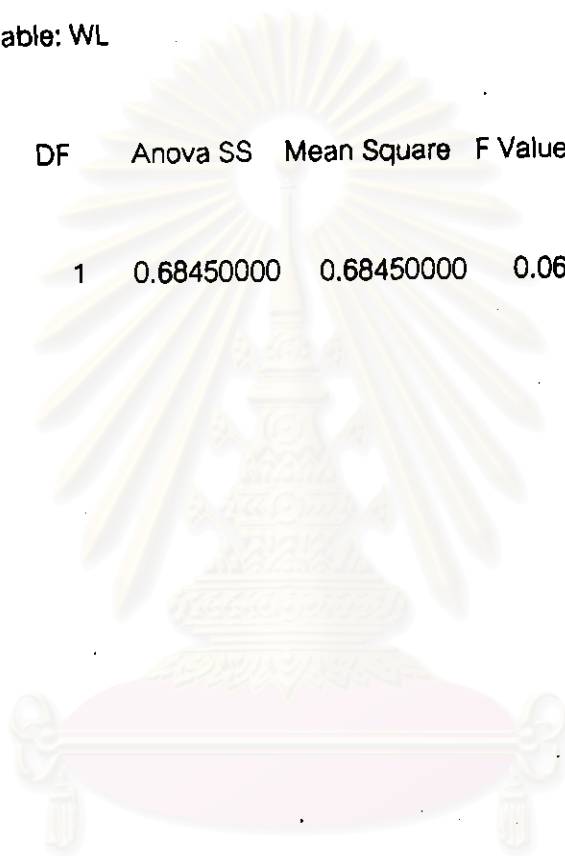
SAS 6:00 Tuesday, September 14, 1993

9

Analysis of Variance Procedure

Dependent Variable: WL

Source	DF	Anova SS	Mean Square	F Value	Pr > F
GENEGR	1	0.68450000	0.68450000	0.06	0.8117



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

10

Analysis of Variance Procedure

Class Level Information

Class	Levels	Values
-------	--------	--------

GENEGR	2	G1 S1
--------	---	-------

Number of observations in data set = 20



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

11

Analysis of Variance Procedure

Dependent Variable: TM

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	0.64800000	0.64800000	0.88	0.3615
Error	18	13.30400000	0.73911111		
Corrected Total	19	13.95200000			

R-Square	C.V.	Root MSE	TM Mean
0.046445	10.77338	0.859716	7.98000000

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

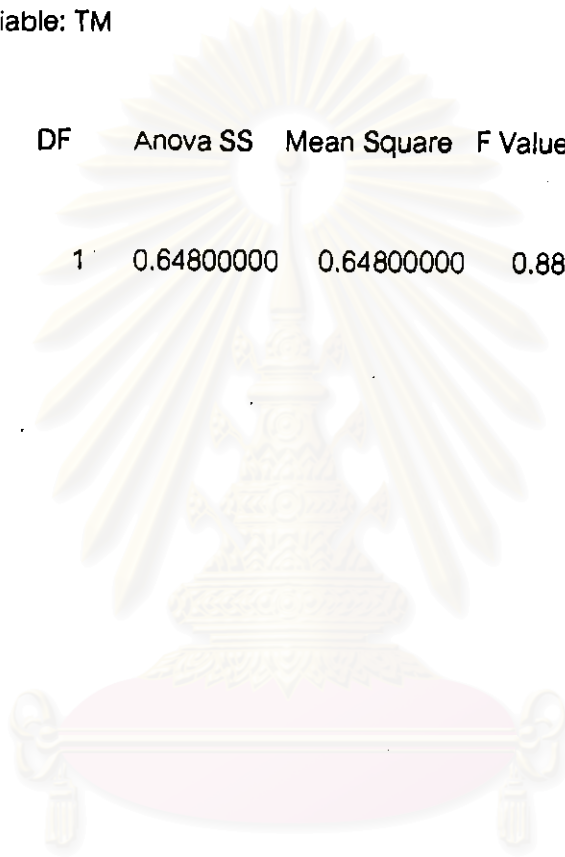
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12

Analysis of Variance Procedure

Dependent Variable: TM

Source	DF	Anova SS	Mean Square	F Value	Pr > F
GENEGR	1	0.64800000	0.64800000	0.88	0.3615



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

13

Analysis of Variance Procedure

Class Level Information

Class Levels Values

GENEGR 2 G1 S1

Number of observations in data set = 20



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

14

Analysis of Variance Procedure

Dependent Variable: HD

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	0.24200000	0.24200000	1.54	0.2303
Error	18	2.82600000	0.15700000		
Corrected Total	19	3.06800000			

R-Square	C.V.	Root MSE	HD Mean
0.078879	6.670577	0.396232	5.94000000

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

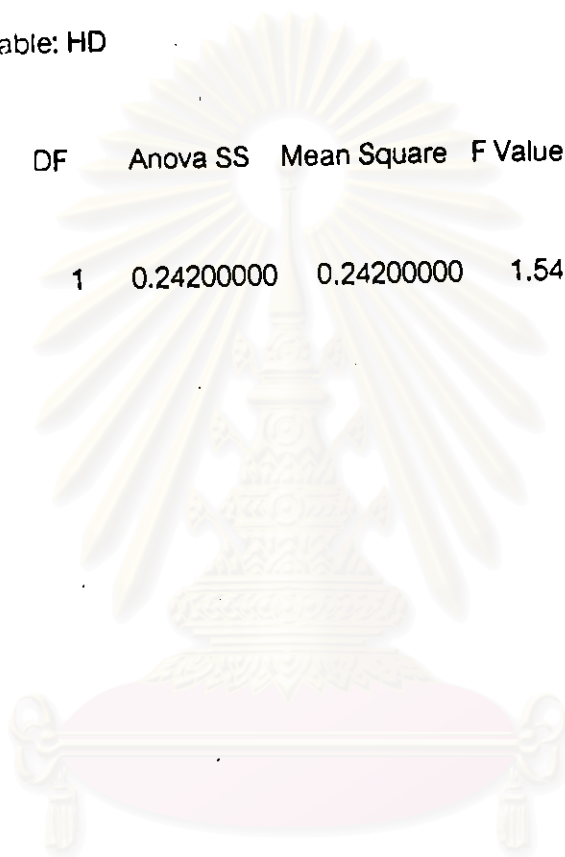
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15

Analysis of Variance Procedure

Dependent Variable: HD

Source	DF	Anova SS	Mean Square	F Value	Pr > F
GENEGR	1	0.24200000	0.24200000	1.54	0.2303



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

16

Analysis of Variance Procedure

Class Level Information

Class	Levels	Values
-------	--------	--------

GENEGR	2	G1 S1
--------	---	-------

Number of observations in data set = 20



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

17

Analysis of Variance Procedure

Dependent Variable: TD

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	0.51200000	0.51200000	3.13	0.0936
Error	18	2.94000000	0.16333333		
Corrected Total	19	3.45200000			

R-Square	C.V.	Root MSE	TD Mean
0.148320	8.050701	0.404145	5.02000000

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SAS 6:00 Tuesday, September 14, 1993

18

Analysis of Variance Procedure

Dependent Variable: TD

Source	DF	Anova SS	Mean Square	F Value	Pr > F
GENEGR	1	0.51200000	0.51200000	3.13	0.0936

□

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย



Appendix II
DNA Sequence data

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

Data Collection

File: A9•865
 Sample: 865
 Inj. Number: 5
 Number of Points: 6680
 Length: 301
 Start Run: 9/4/1998, 20:26
 Stop Run: 9/4/1998, 21:21
 Start Collection: 9/4/1998, 20:45
 Stop Collection: 9/4/1998, 21:21
 Dyeset/Primer: DT POP6{BD Set-Any Primer}
 Medium Lot #:
 Medium Exp Date:
 Instrument Name: ABI PRISM™ 310
 Collect Vers.: ABI PRISM 310 Collection 1.0.2

Data Analysis

Base Call Start: 746
 Base Call End: 4000
 Primer Peak Loc.: 746
 Signal: G (146), A (145), T (148), C (169)
 Matrix Name: BD 22/12/97
 Basecaller: ABI-CE1
 Basecaller Version: Version 3.0
 Base Spacing Used: 10.56
 Base Spacing Calculated: 10.56
 Length to Detector: 47
 Tube Position: A9
 Module File Name: Seq POP6 Rapid (1 mL) E

```

1  TGNCCANCT  ACGGGNCAAT  TTTATTTTTT  AACCTAACTC  CCCTACTAAG  TGTNCCCCNC  NTTTCCCCCC  CAGGGGGGGN  NTACTIONGCA  TAATCGGGCA  100
101  TACATTTATA  TNCCACATAT  ATTATGGCNC  CGGNAATATA  TACTATATAT  GGNNCTAANC  CCATTATATG  TANACGGNCN  TTAATNTATA  TTCCACATTT  200
201  CTCCCANTGN  CCATACTATG  CATGANCCAA  GACATACTNA  TTCACCCTNC  TCATANACAG  CTCCAAACCA  CTACCAAGTC  ACCTAACTAT  GAATGGGTGC  300
301  A  400

```

จุฬาลงกรณ์มหาวิทยาลัย

Data Collection

File: B2•875
 Sample: 875
 Inj. Number: 7
 Number of Points: 6680
 Length: 335
 Start Run: 9/4/1998, 22:17
 Stop Run: 9/4/1998, 23:12
 Start Collection: 9/4/1998, 22:35
 Stop Collection: 9/4/1998, 23:12
 Dyeset/Primer: DT POP6{BD Set-Any Primer}
 Medium Lot #:
 Medium Exp Date:
 Instrument Name: ABI PRISM™ 310
 Collect Vers.: ABI PRISM 310 Collection 1.0.2

Data Analysis

Base Call Start: 520
 Base Call End: 4000
 Primer Peak Loc.: 520
 Signal: G (136), A (122), T (124), C (175)
 Matrix Name: BD 22/12/97
 Basecaller: ABI-CE1
 Basecaller Version: Version 3.0
 Base Spacing Used: 10.34
 Base Spacing Calculated: 10.34
 Length to Detector: 47
 Tube Position: B2
 Module File Name: Seq POP6 Rapid (1 mL) E

```

1  NCCGCCTNTN CCANCTTTNT GANCCCACTA CNGNTACANN TTTATTNTTT AACCTAACTN CCCTACTAGG TGTACCCCNH NTTTCCCNC NAGGGGGGN 100
101 NTA CTATGCA TAATCGNGCA TACATTTATA TNCCACATAT ATTNNGGCNC CTGGTTATAT ATACTATATN TGNNTAAAC CCATTATNTG TATACGGGCN 200
201 TTAATCTATA TTCCACATTT CTCCANTGN CCATTCTATG CNTGANCCAA GACATACTCA TTCACNCTNC TNATANACAG CTCCAAACCA CTACCAAGTC 300
301 ACCTAACTAT GANTGGTTGC AGGACATANA TCTCC 400

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จุฬาลงกรณ์มหาวิทยาลัย

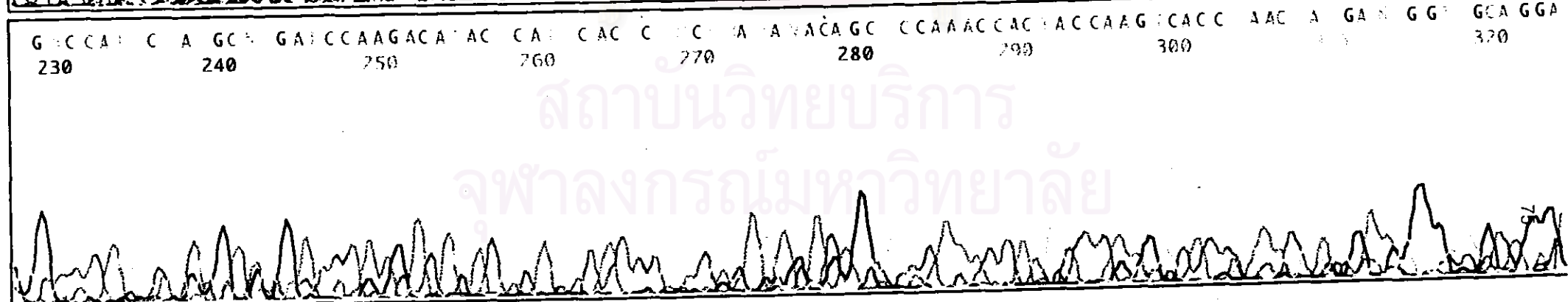
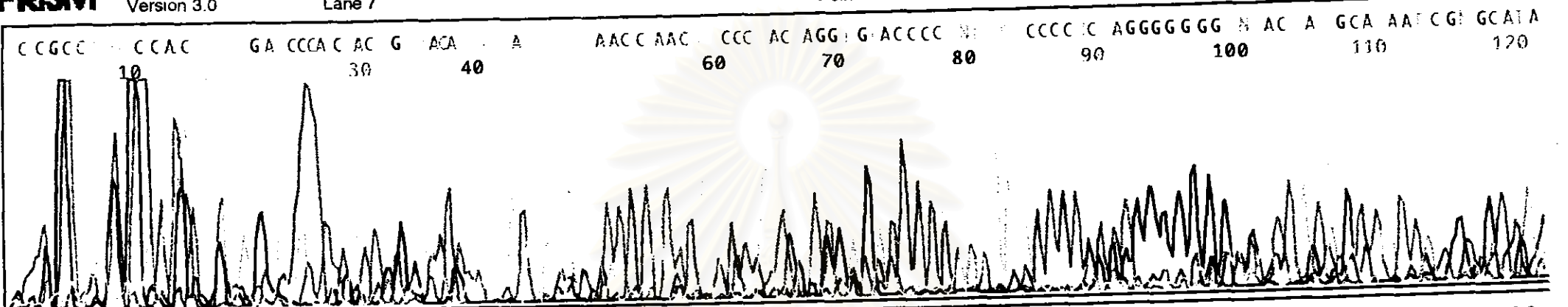
ABI PRISM

Model 310
Version 3.0
ABI-CE1
Version 3.0

B2-875
875
Lane 7

Signal G:136 A:122 T:124 C:175
DT POP6(BD Set-Any Primer)
BD 22/12/97
Points 520 to 4000 Base 1: 520

Page 20
Fri, Apr 10, 1998 12:04 P
Thu, Apr 9, 1998 10:17 P
Spacing: 10.34(10.3



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

ata Collection
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umber of Points:
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top Collection
yaset/Primer:
edium Lot #:
edium Exp Date:
nstrument Name:
ollect Vers.:

B6•885
885
9
6680
331
10/4/1998, 00:07
10/4/1998, 01:02
10/4/1998, 00:26
10/4/1998, 01:02
DT POP6{BD Set-Any Primer}

ABI PRISM™ 310
ABI PRISM 310 Collection 1.0.2

Data Analysis
Base Call Start:
Base Call End:
Primer Peak Loc.:
Signal:
Matrix Name:
Basecaller:
Basecaller Version:
Base Spacing Used:
Base Spacing Calculated:
Length to Detector:
Tube Position:
Module File Name:

553
4000
553
G (149), A (142), T (165), C (203)
BD 22/12/97
ABI-CE1
Version 3.0
10.34
10.34
47
B6
Seq POP6 Rapid (1 mL) E

1	NGCCTATGCC	ANNTTNTGG	CCCATTACNG	NTNCAANTTT	ATTNNTTAAC	CTAACTNCCC	TACTANGTGT	ACCCCNNTT	TCCCCNCNAG	GGGGGNNTA	100
101	CTATGCATAA	TCGGGCATAC	ATTTATATAC	CACATATATT	ATGGCNC CGG	TAATATATAC	TATATNTGNN	CTAAACCCAT	TATNTGTATA	CGGGCATTAA	200
201	TNTATATTCC	ACATTTCTCC	CANTGCCCAT	TCTATGCNTG	ANCCAAGACA	TACTCATTCA	CNCTNCTCAT	AGACAGCTCC	AAACCACTAC	CAAGTCACNT	300
301	AACTATGANT	GGTTGCAGGA	CATAAATCTC	C							400

จุฬาลงกรณ์มหาวิทยาลัย

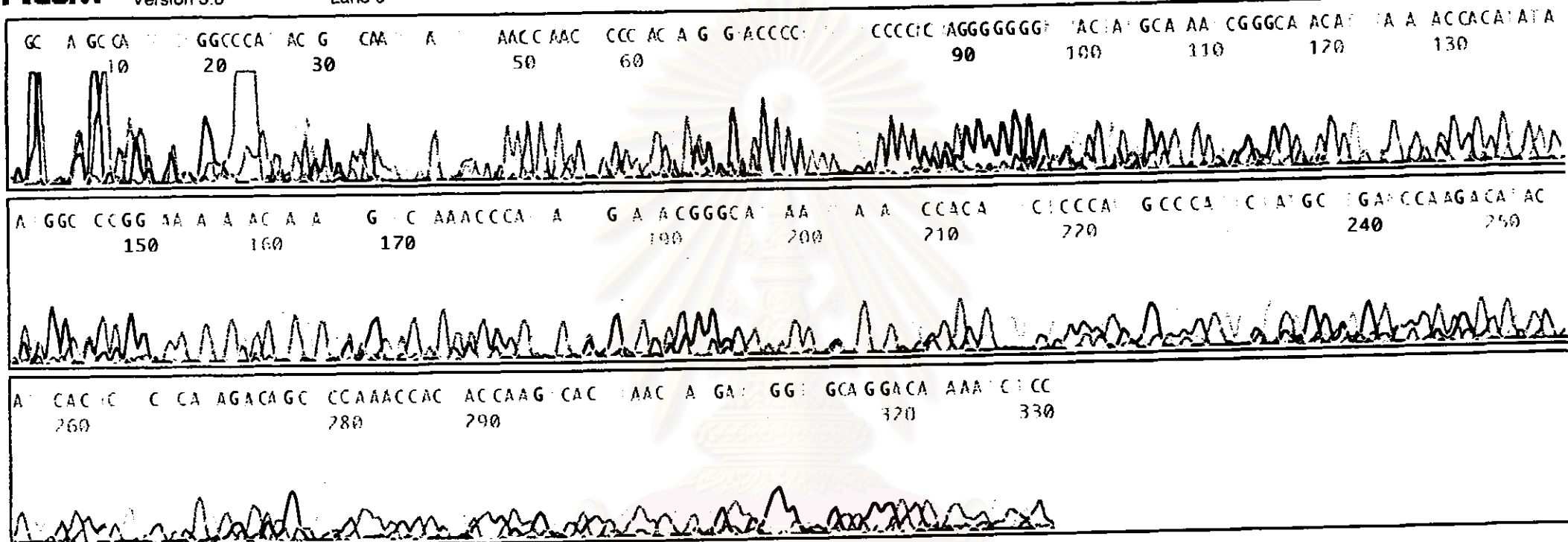


Model 310
Version 3.0
ABI-CE1
Version 3.0

B6-885
885
Lane 9

Signal G:149 A:142 T:165 C:203
DT POP6(BD Set-Any Primer)
BD 22/12/97
Points 553 to 4000 Base 1: 553

Page 1 of 1
Fri, Apr 10, 1998 12:27 PM
Fri, Apr 10, 1998 12:07 PM
Spacing: 10.34(10.3)



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

Data Collection
File:
Sample:
Inj. Number:
Number of Points:
Length:
Start Run
Stop Run
Start Collection
Stop Collection
Dyeset/Primer:
Medium Lot #:
Medium Exp Date:
Instrument Name:
Collect Vers.:

C1•925
925
13
6680
330
10/4/1998, 03:48
10/4/1998, 04:43
10/4/1998, 04:07
10/4/1998, 04:43
DT POP6{BD Set-Any Primer}

ABI PRISM™ 310
ABI PRISM 310 Collection 1.0.2

Data Analysis
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Base Call End:
Primer Peak Loc.:
Signal:
Matrix Name:
Basecaller:
Basecaller Version:
Base Spacing Used:
Base Spacing Calculated:
Length to Detector:
Tube Position:
Module File Name:

550
4000
550
G (88), A (71), T (79), C (100)
BD 22/12/97
ABI-CE1
Version 3.0
10.34
10.34
47
C1
Seq POP6 Rapid (1 mL) E

1	GNTGCGCCNN	TTNCTGGNCC	ACTACNGNTA	CATTTTATTN	TTAACCTAA	CTNCCTACTA	NGTGTACCCC	NCNTTTC CCC	CNNAGGGGGG	GNNTACTATA	100
101	GCATAATCGG	GCATACATTN	ATATNCCNCA	TATATTANGG	CNCCGAGTAA	TATATACTAT	ATNTGCNCTA	AACCCATTAT	ATGTATACGG	GCNTTAATCT	200
201	ATATTNCACA	TTTCTCCCAN	TGNCCATTNT	ATGCATGATC	TAAGACATAC	TCGTTACANC	TNCTCATAGA	CAGCTCCAAA	CCACTACCAG	AGTCACCTAA	300
301	CTATGNAATG	NTTGCAAGGAC	ATAAATCTNC								400

จุฬาลงกรณ์มหาวิทยาลัย

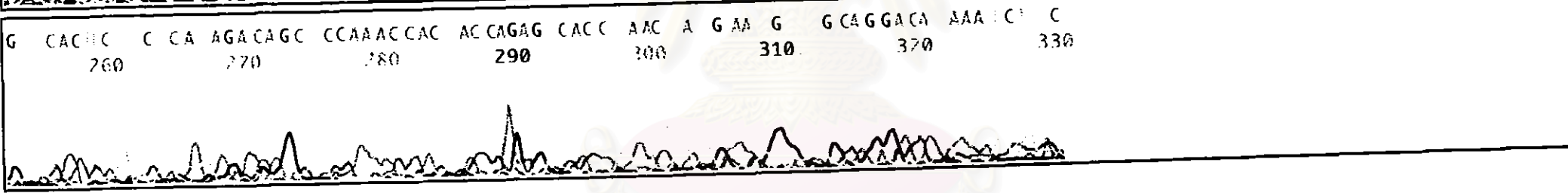
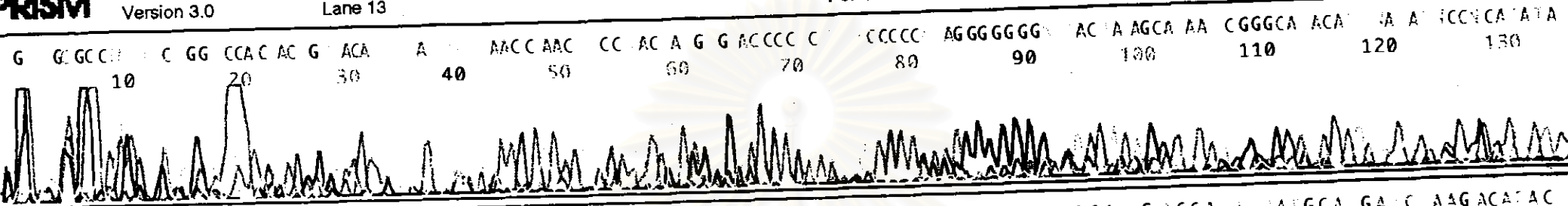
ABI PRISM

Model 310
Version 3.0
ABI-CE1
Version 3.0

C1-925
925
Lane 13

Signal G:88 A:71 T:79 C:100
DT POP6(BD Set-Any Primer)
BD 22/12/97
Points 550 to 4000 Base 1: 550

Page 2 of 2
Fri, Apr 10, 1998 12:27 F
Fri, Apr 10, 1998 3:48 A
Spacing: 10.34(10.3)



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

BIOGRAPHY

Mr. Boripat Siriaroonrat was born in 1971 in Nakornpathom, Thailand. He graduated Doctor of Veterinary Medicine from Chulalongkorn University in 1994. He start the master degree in Zoology right afterwards.

He was working as a lecturer at the Veterinary Medical Aquatic Animal Research Center, Faculty of Veterinary Science, Chulalongkorn University from November 1996 to January 1998. He is now taking a permanent lecturer position at the Research Center for Reproductive Biology of Economically Valuable Animals, Institute of Science and Technology for Research and Development, Mahidol University Salaya, Nakornpathom, Thailand.



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