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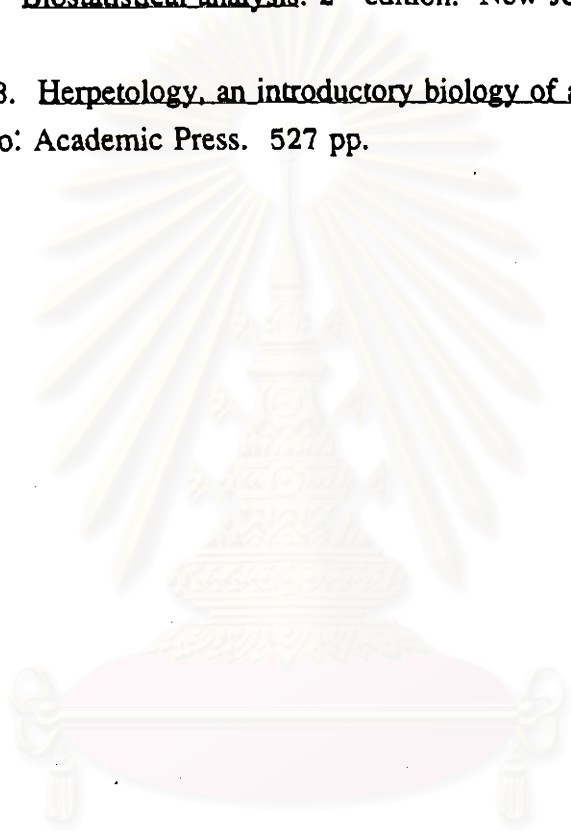
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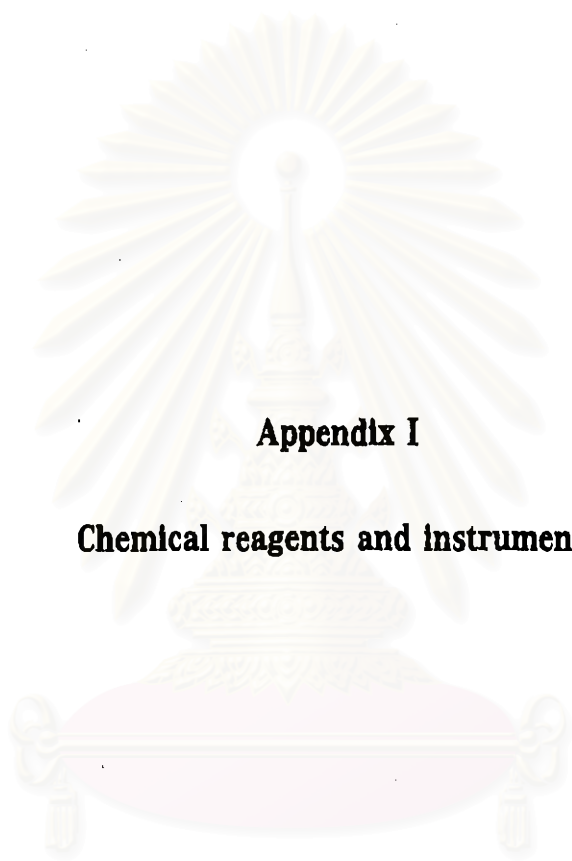
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สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย



Appendix I

Chemical reagents and instruments

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

Chemical reagents

- Bacto gelatin : Difco Laboratories, U.S.A.
- Buffer solution ready for use pH 4.0 : Merck, Germany
(citrate-hydrochloric acid)
- Buffer solution ready for use pH 7.0 : Merck, Germany
(phosphate)
- Charcoal : WHO matched reagent programme
Batch No. K220520
- Dextran : WHO matched reagent programme
Batch No. K0801/89
- Diethyl ether : Merck, Germany
- 1, 4-Dioxan : Merck, Germany
- Estradiol-17 β standard : WHO matched reagent programme
Batch No. H02050701
- Antiserum to estradiol-17 β : WHO matched reagent programme
Batch No. K158330
- (2, 4, 6, 7-³H) estradiol-17 β : Amersham International plc, U.K.
TRK 322 Batch 172
- Ethanol absolute : Merck, Germany
- Heparin : Leo Pharmaceutical Products, Denmark
- Hydrochloric acid : Merck, Germany
- Ketamine hydrochloride : Parke-Davis, Australia
(Ketalar®) 50 mg/ml
- Ketamine hydrochloride : Troy Laboratories PTY, Australia
(Ketamil®) 100 mg/ml
- Methanol : Merck, Germany
- POPOP : Merck, Germany
[2, 2'-p-Phenylene-bis (5-phenyloxazole)]
- PPO [2, 5-Diphenyloxazole] : Merck, Germany
- Progesterone standard : WHO matched reagent programme
Batch No. K079410
- Antiserum to progesterone : WHO matched reagent programme
Batch No. K873610
- (1, 2, 6, 7-³H) progesterone : Amersham International plc, U.K.
TRK 413 Batch 69
- Sodium chloride : Merck, Germany

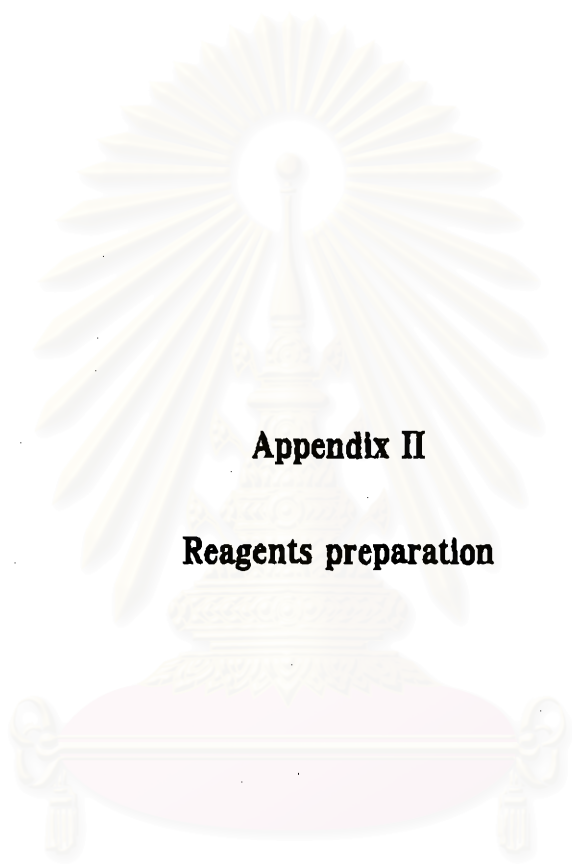
- Sodium dihydrogen phosphate 1 hydrate : Merck, Germany
- di-Sodium hydrogen phosphate 2 hydrate : Merck, Germany
- Sodium hydroxide : BDH Chemical, U.K.
- Testosterone standard : WHO matched reagent programme
Batch No. K079810
- Antiserum to testosterone : WHO matched reagent programme
Batch No. K200710
- (1, 2, 6, 7-³H) testosterone : Amersham International plc, U.K.
TRK 402 Batch 85
- Thimerosal : Fluka Chemika, Switzerland
(Sodium ethylmercurithiosalicylate)
- Toluene : Merck, Germany

Instruments

- Agitation machine : Direct Mix TS-100
Thermal Kagaku Sangyo, Japan
- Balance : Right-A-Weigh
W. M. Ainsworth & Sons, U.S.A.
- Bottle top dispenser : Labmax dispenser 10 ml
Witeg Wertheim, Germany
- Disposable syringe filter 0.22 μ : Cameo 25AS
Micro Separations Inc, U.S.A.
- Freezer : Sharp FC-27
Thai City Electrics, Thailand
- Heating block : Dri-Block DB-3
Tecam, U.S.A.
- β -liquid scintillation counter : 1218 Rackbeta
LKB wallac, Finland
- Magnetic stirrer : Pyro-Magnestir king size
Lab-Line Instruments, U.S.A.
- Mixer : Vortex-Genie 2
Scientific Industries,
- Needle and syringe : Terumo Corporation, Japan
- Pipettors : Pipetman P20, P200, P1000
Gilson, France

- Pipettor tips : Plastibrand 200 μ l, 1000 μ l
Brand, Germany
- pH meter : Corning pH meter 240, U.K.
- Refrigerated centrifuge : Coolspin 2 MSE
International Equipment, U.S.A.
- Refrigerater : Sharp Nice 320
Thai City Electrics, Thailand
- Repeating pipette : Handystep
Brand, Germany
- Ultracentrifuge : Centrikon T-1160
Kontron Instruments, Switzerland
- Ultrasonic cleaner : D-7700
Elma, Germany
- Vernier caliper : 0.05 mm graduation
Mitutoyo, Japan
- Waterbath : Lab line/Dubnoff Incu-shaker 3575-1
Lab-Line Instruments, U.S.A

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย



Appendix II

Reagents preparation

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

Preparation of steroid assay reagents

These reagents were prepared according to Sufi, Donaldson and Jeffcoate (1990).

1. Assay buffer solution

Sodium dihydrogen phosphate (anhydrous) NaH_2PO_4	2.35 g *
di-Sodium hydrogen phosphate (anhydrous) Na_2HPO_4	11.6 g *
Sodium chloride	8.8 g
Thimerosal	0.1 g
Gelatin	1.0 g

All constituents were dissolved in 750 ml distilled water except gelatin which was dissolved in a small volume of warm water before being added to the others. The pH of this buffer was checked with a pH meter and adjusted to be between 7.2 and 7.4 with 1N NaOH or 1N HCl. The volume was then made up to 1000 ml.

The buffer could be stable for up to one month when stored at 4°C. It was used as the diluent for all reagents in steroids assay.

Remark * If the hydrate form of these reagents was used, then the amounts taken must be increased in proportion to the degree of hydration.

2. Charcoal suspension

Charcoal	0.625 g
Dextran	0.0625 g
Assay buffer solution	100 ml

Dextran was dissolved in 100 ml assay buffer solution in a stoppered container. Charcoal was added, and the container was shaken vigorously for 30 seconds.

The charcoal suspension could be stable for up to one month when stored at 4°C. It was stirred vigorously on ice before use.

3. Scintillation fluid

PPO [2, 5-Diphenyloxazole]	12.5 g
POPOP [2, 2'-p-Phenylene-bis (5-phenyloxazole)]	0.75 g
Toluene	2.50 l
1, 4-Dioxan	500 ml

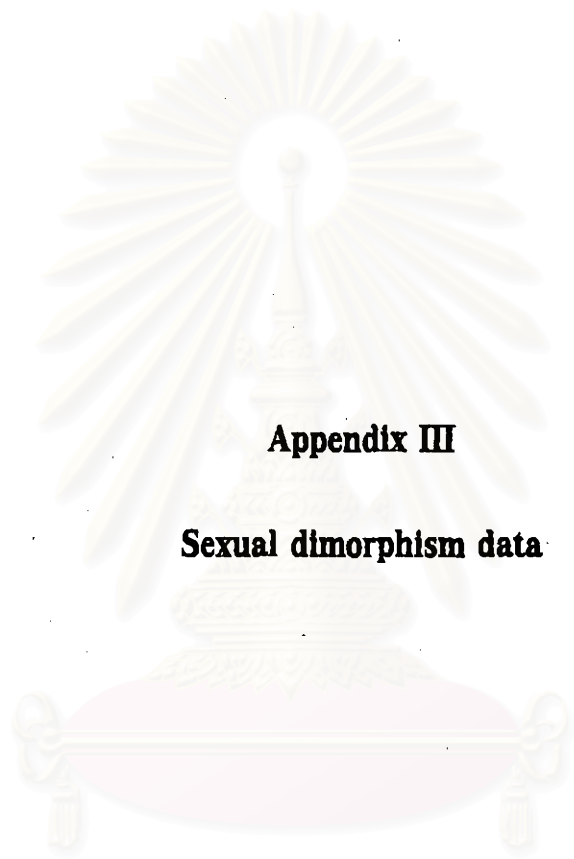
All constituents were mixed together homogenously and stored in a dark bottle. The solution could be stable at room temperature.

Preparation of hormone free plasma

Hormone free plasma was used as diluent for serial dilution of softshell turtle plasma containing a high level of steroid in parallelism check. It was prepared according to DePaolo et al. (1979).

Pooled softshell turtle plasma was added with steroid tracer (in case of this study ^3H -testosterone was used) to yield an approximately 2,000 CPM/ml. The plasma was added with dry activated charcoal at 10 % vol/vol ratio. The mixture was stirred at 4°C for 24 hours with a magnetic stirrer. Subsequently, the mixture was cool centrifuge for 30 minutes at 1,100 x g, followed by second centrifugation at approximately 160,000 x g for 1 hour at 4°C. The supernatant was filtered through a millipore 0.22 μm cellulose filter and frozen at -20°C in small aliquots of 1 ml until use.

The hormone free plasma was checked for remaining steroid by counting with a β -counter. It was found that this procedure could remove up to 95 % of steroid from softshell turtle plasma.



Appendix III

Sexual dimorphism data

สถาบันวิทยบริการ
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NUMBER	SEX	CL	BDL1	BDL2	CW	PL1	PL2	PW	H	PR	PC	TC	CT	TL	TW	HL	HLs	HW	HH	Weight
BP005-10-96	Male	63.5			44.5	31	41.5	41	18.5	23.5	18.38	4.67	4.88	9.34	5.83	16.66	18.04	11.07	8.61	20
BP006-10-96	Female	44.5			32.5	23	30	31	13.5	14	9.43	1.66	1.76	3.52	3.74	13.53	14.81	8.61	6.505	8
BP007-10-96	Female	39.5			29.5	20.5	26.5		11.5	11.6	7.45	0.49	1.375	2.22	2.395	9.865	11.33	6.04	4.82	8
BP008-10-96	Female	34			25.5	17.5	22.5	24.5	9.5	12.54	8.27	0.575	1.47	2.27	2.76	8.615	10.25	5.415	4.51	5
BP009-10-96	Female	48			34	23	31	32	13	18.5	12.19	2.3	3.16	5.445	3.97	13.58	14.73	9.075	6.52	8
BP010-10-96	Female	44.5			31.5	21.5	29.5	29.5	14.5	16.5	12.41	1.86	2.48	4.25	3.745	13.04	14.38	8.54	6.55	8
BP011-10-96	Male	61			44	32	41.5	41.5	16.5	24.5	21	4.465	4.87	8.92	5.06	14.58	16.17	9.275	7.56	20
BP012-10-96	Male	68.5			47.5	34	45	45	19.5	26	21	5.145	4.935	10.36	6.4	18.23	20	12.55	9.375	35
BP013-10-96	Female	33.5	20	17.5	25	17.5	22.5	23	8	12.23	9.33	0.97	1.7	2.88	2.47	8.645	9.75	5.425	4.275	5
BP014-10-96	Female	45.5	31	27.5	31	25	31.5	29	12.5	16.45	11.8	1.185	3.62	4.54	3.33	12.87	13.78	8.27	6.6	10
BP015-10-96	Female	28	17	15	21.5	15	19.5	21	7.5	9.5	7.38	0.96	1.39	2.07	1.725	7.935	9.035	4.82	3.945	2.6
BP016-10-96	Female	42	28	25.5	32.5	23	29	30.5	12.5	16.15	11.23	0.83	1.9	2.435	2.74	11.03	12.48	6.9	5.535	10
BP017-10-96	Female	45.5	30.5	27	33	25	31.5	31	13.5	18	11.95	1.12	3.25	4.325	3.63	13.28	14.33	7.83	6.65	10
BP018-11-96	Male	44.5	28.3	26	33	23.5	30	31		16.5	12.72	3.385	2.75	6.11	5.49	11.18	12.32	7.015	6.285	8
BP019-11-96	Female	42.5	28	25.5	32	23	30	30	12.5	16	11.35	0.44	1.965	2.475	3.235	11.47	12.45	7.22	6.14	8
BP020-11-96	Female	53	36.5	32	39	29.5	37	37	15	21	14.3	1.13	4.73	5.37	4.34	14	15.3	8.815	7	20
BP021-11-96	Male	52.5	34	30	38	26	35	35	14.5	19.5	15.66	5.175	3.385	7.29	5.54	15.04	16.45	9.99	7.72	20
BP022-11-96	Male	64.5	44.5	39	45	30.7	40.5	44	16.5	27	23	5.325	5.075	10.3	7.12	16.81	18.72	11.5	8.645	40
BP023-11-96	Male	67	45.5	39.5	47	36.5	45.5	44.5	20.5	26.5	20.5	5.09	6	10.86	6.41	17.98	19.3	11.3	9.265	40
BP025-11-96	Male	65.5	43	37.5	45.5	34	42.5	42	19.5	25.5	18.31	1.94	4.56	6.215	4.86	17.65	19.42	11.3	9.62	40

NUMBER	SEX	CL	BDL1	BDL2	CW	PL1	PL2	PW	H	PR	PC	TC	CT	TL	TW	HL	HLs	HW	HH	Weight
BP026-11-96	Male	65.5	44.5	40	47.5	33	41	45.5	18.5	26	17.58	3.535	4.945	7.84	5.625	16.3	17.93	10.82	8.56	34.5
BP027-11-96	Male	62.5	42	38	43	31	40	41	17.5	24.5	19.13	4.82	5.7	10.4	6.03	17.82	18.14	10.82	9.08	28
BP028-11-96	Female	61	42	38	41	28	38	39	18.5	27	18.35	2.145	4.06	5.93	4.715	15.7	17	10.81	8.78	27
BP029-11-96	Male	53	34.5	31	38.5	27	35	36	13.5	19.5	16.04	4	3.53	7.88	5.53	14.74	16	9.45	8.25	15
BP030-11-96	Female	49.5	33	29	36	25.5	33.5	32.5	14	19.5	13.14	1.01	2.56	4.365	3.765	14.37	16.05	9.515	7.345	
BP031-11-96	Male	43	29	26.5	31.5	24	30.5	31	10	15.2	14.66	5	1.685	7.025	4.26	14.26	12.7	8.125	6.13	
BP032-11-96	Female	31.5	20.7	19	26	17	21.5	25	7	11.5	8.18	0.83	2.37	3.235	2.675	9.465	10.63	5.555	4.535	3
BP033-11-96	Male	64	45	40	43	31.5	43.5	41	16	24	17.78	3.52	5.365	8.645	6.75	18.45	20.13	11.98	8.785	
BP034-12-96	Male	33.5	21.5	19.5	26	15.5	22	25.5	8	12.13	10.17	3.38	2.5	6.1	3.52	9.66	5.885	10.66	4.34	3.1
BP035-12-96	Female	49.5	34	31	37	28	35.5	35.5	13	16.28	10.94	0.825	4.775	5.73	4.135	13.45	14.81	8.43	6.355	13.5
BP036-12-96	Female	37	31	29	33	25	32.5	31	13.5	17	11.77	1.545	3.11	5.16	3.765	13.83	14.82	8.715	6.46	12
BP037-12-96	Female	45	31	27.5	34	24.5	32.5	32	10.5	15.73	11.31	1.31	3.425	4.945	3.74	12.58	13.77	7.745	5.7	9.8
BP038-12-96	Female	52.5	36.5	32.5	39	29	36.5	38	14.5	19.78	12.94	0.845	4.645	5.275	4.41	14.44	15.55	8.825	7.23	18.5
BP039-12-96	Male	27.5	18	16.5	22.5	15	19	22	6.5	10.36	9.27	2.14	2.075	4.43	3	7.365	8.34	5.45	3.93	2.5
BP040-12-96	Male	49	33	30	36	23.5	31.5	34	15	19.19	15.53	3.585	4.315	8.085	4.945	13.63	14.92	8.07	6.48	15.5
BP041-12-96	Male	67.5	45.5	39	47.5	35.5	45.5	46	17.5	25	21	4.825	5.82	9.8	5.74	18.23	19.63	12.43	9.215	34.5
BP042-12-96	Male	44	28	25	32	23	30	30.5	11	16.73	12.67	3.3	2.66	6.04	4.525	11.54	12.65	7.275	6.16	8
BP043-12-96	Male	42	28	25.5	31.5	23	30.5	31	9.5	16.35	14.83	4.125	2.025	6.375	4.465	12.97	14.38	7.95	5.91	7
BP044-12-96	Male	62.5	41	36.5	43	32.5	42.5	40	17	25.5	19.22	3.065	4.355	7.325	7.46	16.5	18.05	10.94	8.58	28.5
BP045-12-96	Female	52	36	30.5	39	29.5	37	37	15	19	13.08	1.245	4.93	6.125	4.365	14.37	15.35	8.125	7.35	18

NUMBER	SEX	CL	BDL1	BDL2	CW	PL1	PL2	PW	H	PR	PC	TC	CT	TL	TW	HL	HLs	HW	HH	Weight
BP046-12-96	Male	64	45	37.5	42.5	31	43	42	16	23	18.25	4.48	4.475	9.27	5.67	18.3	20	12.01	9.685	26.5
BP047-12-96	Female	51	30	25.5	35.5	26	34.5	33	15	21	14.47	0.86	3.455	4.56	4.085	14.55	15.93	9.575	7.75	19
BP048-12-96	Female	33.5	21	17.5	25	16	22.5	24	8.5	12.5	9.465	0.985	1.8	2.905	2.455	8.63	9.58	5.5	4.465	4
BP049-12-96	Female	61	42.5	36	40.5	27.5	39	39	18	27.5	19.25	2.76	3.875	6	4.55	15.5	16.5	10.55	8.51	27
BP050-12-96	Male	65	45	39	47	29	33.5	44	18.5	26	18.05	3.765	4.88	7.625	5.415	16.5	17.55	10.72	9.15	34
BP051-12-96	Male	68	44	38	50	34	45.5	46.5	18	27	18.8	4.41	5.525	9.98	6.685	18.28	19.98	12.38	9.565	40
BP052-12-96	Male	32.5	20	17.5	24.5	15.5	21	24	8	12.18	10.27	2.04	2.315	4.48	3.66	8.875	9.75	5.84	4.61	4
BP053-12-96	Male	67.5	46.5	40	37.5	35	45	34.5	19.5	25	19.06	4.15	3.78	8.175	5.9	17.6	19.2	11.3	9.225	40
BP054-01-97	Female	42.5	30	25.5	30	22	28	29	11.5	14.47	11.25	2.22	4.33	6.05	4.79	12.24	13.55	7.31	6.265	8
BP055-01-97	Male	31.5	19.5	16	23.5	16	21	23	7.5	11.44	10.5	2.46	2.775	5.575	3.975	9.36	10.2	5.61	4.095	3.2
BP056-01-97	Female	48.5	32.5	27.5	35.5	25	33.5	32.5	12.5	17.5	12.12	1.09	2.66	3.775	3.65	14.4	16.15	9.39	7.565	13.4
BP057-01-97	Male	35.5	25	21	27.5	18	23	27	9	12.55	10.47	3.91	3.7	8.46	4.22	10.55	11.56	6.44	4.815	3.5
BP058-01-97	Female	49.5	33.5	28.5	36.5	27	34.5	33.5	15.5	19	13.53	1.03	3.825	4.965	4.525	13.52	15.07	7.8	6.775	15.5
BP059-01-97	Female	44.5	31	26.5	33.5	24.5	31	32	10	15.13	11.16	1.425	4.05	4.95	4.16	12.5	13.63	7.565	6.225	19.4
BP061-01-97	Male	67	46	38	48.5	35	48	46.5	20	26.5	20	3.68	5.475	9.745	6.6	18.6	20.13	12.88	9.27	41
BP062-01-97	Male	62	41	34.5	43	32	41.5	39.5	16	26	18.58	3.36	4.81	8.245	7.735	16.1	17.76	11.39	9.18	29
BP063-01-97	Male	64	45	38	43	31	43.5	41	15.5	23.5	18	3.8	5.34	9.31	6.22	18.32	19.81	12.17	9.15	26.2
BP064-02-97	Male	58.5	39	33	42	30	38	40.5	13.5	22	17	4.75	5.004	9.43	6.465	13.49	14.87	10.27	7.46	20
BP065-02-97	Male	56.3	36.5	30.5	40	28	37.5	37.5	15	22.5	17.5	3.655	4.12	7.8	5.535	14.61	16	9.401	8.265	21
BP066-02-97	Male	64	44	37	42	37.5	43	41.5	15.5	22	18	6.685	4.745	10.36	6.795	18.5	20.36	11.73	8.92	24.5

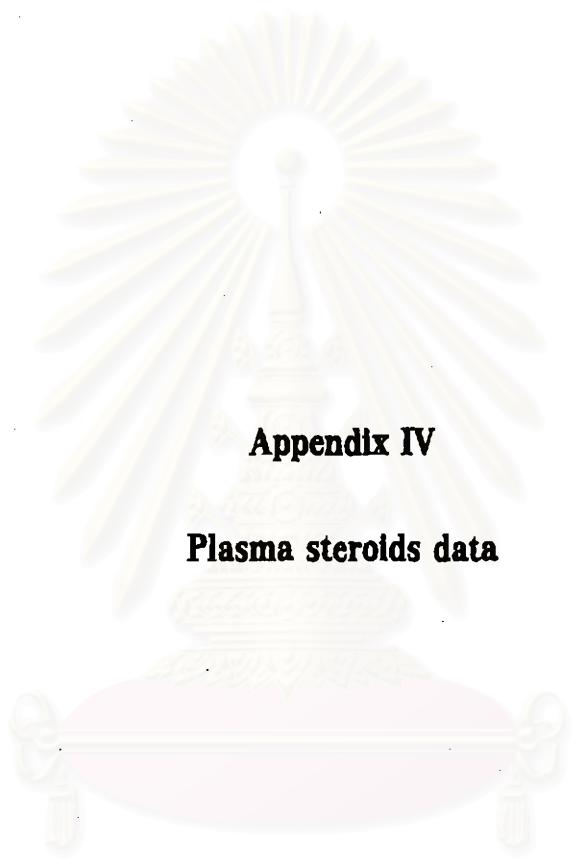
NUMBER	SEX	CL	BDL1	BDL2	CW	PL1	PL2	PW	H	PR	PC	TC	CT	TL	TW	HL	HLs	HW	HH	Weight
BP067-02-97	Male	61.5	40	34	42.5	30.5	39.5	40	15.5	24	19	4.8	6.1	10.69	7.14	17	18.65	11.32	8.87	24
BP068-02-97	Female	60.5	42	37	40	28	37.5	39	17.5	26.5	17.5	1.58	3.335	4.67	4.61	16	17.71	10.79	8.05	27
BP069-02-97	Male	37	23	19	29	20	25.5	28	9	13.5	12.5	3.83	2.98	6.73	3.915	10.36	11.61	6.225	4.465	5
BP070-02-97	Male	60.5	37	30.5	43.5	31	38.5	39.5	17.5	23.5	17.5	3.27	3.73	6.73	6.135	16.5	17.57	11.46	8.7	29
BP071-02-97	Male	67.5	45.5	38	47	35.5	44	45	17.5	24.5	20	4.34	5.385	9.65	5.67	18.5	20.39	10.99	9.745	33.5
BP072-02-97	Female	33	23	20	24.5	18	23	23	9.5	11.2	8.56	1.9	1.125	2.565	3.645	9.48	10.95	5.84	4.32	5
BP073-02-97	Female	49.5	33	28.5	35	26	32.5	32	15	20.5	13.5	1.19	3.355	4.95	3.86	12.5	14.05	9.185	7.05	15.5
BP074-02-97	Male	55	37	30	41	31	39	39	15	20.5	15.5	2.315	3.16	5.195	3.655	16.3	17.55	9.81	7.945	22.6
BP075-02-97	Male	52.5	33	27	38.5	25	34	36.5	12.5	22	16.5	4.49	4.565	9.27	6.14	14.5	15.98	9.67	7.255	15.5
BP076-02-97	Male	36.5	23.5	19	28	18.5	24	16.5	9	14	12.27	3.595	2.7	6.78	3.9	10.11	11.38	6.11	5.38	5.5
BP077-02-97	Female	43	26.5	21.5	32	22	28.5	29	14.5	16.5	11.64	0.635	1.555	2.28	3.09	12	13.41	7.785	6.84	11.5
BP078-02-97	Male	42	27.5	24	30.5	23	29	29.5	10.5	14.5	11.15	1.555	2.91	4.69	2.8	11.06	12.37	6.59	5.07	8.1
BP079-02-97	Male	64.5	44	37	45	33	44.5	42.5	19	25.5	18.5	2.2	4.475	6.895	4.89	18.5	20.03	11.79	9.085	33
BP080-02-97	Male	28.5	17	14	21.5	14	17.5	19.5	7.5	11	7.5	1.525	1.61	3.35	2.415	7.64	8.615	4.765	4.155	2.5
BP081-02-97	Male	58	37	30	40	27.5	38	39.5	14.5	22	18.5	4.8	4.1	8.93	6.28	17.5	19.32	10.31	8.49	21.5
BP082-02-97	Female	44	31	26.5	29	22.5	29.5	28	11	14	10.77	2.23	3.13	5.3	3.14	13.1	14.42	8.415	6.175	9
BP083-02-97	Female	29.5	18.5	15.5	22	14.5	19	20.5	7.5	11.22	7.03	0.615	1.009	1.53	1.57	8.04	8.94	4.85	3.77	3
BP084-03-97	Female	40	26	22.5	30	20.5	26	28	12	16	10.89	1.325	2.32	3.74	3.425	11.3	12.33	6.745	5.67	7.25
BP085-03-97	Male	67.5	47	37	47	36.5	45.5	44	20	24.5	20	3.86	3.71	7.42	5.94	18.5	19.95	10.86	8.85	36
BP086-03-97	Male	52.5	34.5	28.5	39	28	36	36.5	14	21	15	3.62	3.21	6.855	5.12	14.11	15.55	8.365	7.26	16.5

NUMBER	SEX	CL	BDL1	BDL2	CW	PL1	PL2	PW	H	PR	PC	TC	CT	TL	TW	HL	HLs	HW	HH	Weight
BP087-03-97	Female	46.5	32.5	26	33	24	30.5	31.5	13	16	12.05	1.79	3.535	5.355	3.775	13.23	14.8	8.655	7.375	12
BP088-03-97	Male	54.5	37	28	41	31	40	39	15	21.5	15	2.67	3.65	6.14	3.635	16.3	16.44	9.92	8.08	23
BP089-03-97	Male	45.5	28	22	35	24.5	31	32.5	11	18	13	2.89	2.7	5.38	4.11	10.76	12.9	7.2	6.2	10
BP090-03-97	Male	67	45	36.5	46.5	35.5	45.5	45.5	17.5	25	20.5	4.05	5.07	9.575	5.47	18.5	20.33	11.11	9.11	34
BP091-03-97	Male	65.5	43	37	47	34	44.5	45.5	17	26	17.5	3.6	5.06	8.76	5.415	18	19.52	11.15	9.09	30.5
BP092-03-97	Female	44.5	30.5	24.5	31.5	23	30	31	11.5	17.5	13	1.54	3.17	5.02	3.05	12.54	13.7	7.46	5.9	9.5
BP093-04-97	Male	69	44.5	38.5	48	33	41.5	42	19.5	28	20.5	4.65	4.01	8.11	7.215	18	19.83	12.14	9.99	35.5
BP094-04-97	Female	41	28	24.5	29	21.5	27.5	28.5	11.5	14.5	10	1.7	2.055	3.775	3.5	11.82	13	7.135	5.87	7
BP095-04-97	Female	53.5	36.5	30	40.5	30.5	39	39	16	22	16	2.84	3.15	5.9	3.88	15.5	17.3	9.74	8.14	23.5
BP096-04-97	Male	34.5	21.5	19.5	27	18.5	23	25.5	8.5	14	11.4	3	2.475	5.215	3.635	10.16	11.24	5.84	5.365	5.4
BP097-04-97	Female	42	28	24	30	23	28.5	28	12.5	15	10.76	1.665	2.52	3.67	3.16	12.79	14.1	8.335	6.15	9
BP098-04-97	Male	52	34.5	30.5	38.5	28	35	35.5	14	19.5	14.5	3.17	3.88	7.115	5.25	13.8	15.36	8.31	7.32	15.5
BP099-04-97	Male	41	25	21	29	19.5	25.5	28.5	11	15.5	11.95	2.1	1.9	3.925	2.78	10.5	11.38	5.935	5.23	7.1
BP100-04-97	Female	46.5	30.5	25	33.5	23	29.5	31	14	20	12.5	1.24	2.5	3.715	3.275	12.86	14.2	8.24	6.875	12.8
BP101-04-97	Male	65	44.5	38.5	47	33.5	43.5	45	19	26	18	2.6	4.235	6.765	5.52	17	18.5	10.85	8.9	34.5
BP102-05-97	Male	34.5	21.5	19	27.5	18.5	23	26	8.5	13.81	11.48	2.77	3.15	6.06	3.66			6.48	4.88	5
BP103-05-97	Female	39	26.5	22.5	27	20.5	25.5	25.5	9.5	13	9.33	1.14	2.765	3.81	3.545	11.47	12.5	6.86	5.34	6.5
BP104-05-97	Male	61.5	40	33.5	44	32	41	42.5	15	24.5	18	4.62	5.415	10.13	4.75	16.5	18.3	10.85	8.24	24.5
BP105-05-97	Male	59.5	37.5	31.5	44	30.5	39.5	41.5	16	23	17	4.865	3.47	8.39	4.73	14.88	16.54	9.235	8	25
BP106-05-97	Female	48	32.5	29	33.3	26.5	32.5	31.5	12	17.5	13.5	1.865	2.93	5.035	3.15	13.81	15.17	8.735	6.645	12

NUMBER	SEX	CL	BDL1	BDL2	CW	PL1	PL2	PW	H	PR	PC	TC	CT	TL	TW	HL	HLs	HW	HH	Weight
BP107-05-97	Male	60.5	39.5	33	44	32	42	41.5	16.5	23	17.5	3.355	3.9	6.965	5.205	17.5	19	10.91	8.955	25.5
BP108-05-97	Male	57.5	37	30	41	29.5	38	39	15.5	22.5	16	3.15	4.2	7.195	5.1	14.9	16.23	9.38	7.27	22.5
BP109-05-97	Female	49.5	33.5	28.5	36	26.5	34	33.5	14.5	18	13.5	1.82	2.6	4.265	3.78	13.62	15.15	7.565	6.83	15
BP110-06-97	Male	65	44	40	47.5	34.5	43	41.5	18	25	18.5	2.91	4.525	7.365	4.87	17	18.5	10.52	8.755	32
BP111-06-97	Male	43.5	29	23.5	34	25.5	32	32.5	11	14.87	14.5	3.81	4.94	7.385	4.94	13.1	14.53	7.78	6.675	11
BP112-06-97	Male	35	22	18.5	28	18.5	23.5	26.5	9	14.04	11.38	3.465	2.17	5.8	4.3	10.66	11.78	6.015	5.285	5.8
BP113-06-97	Female	43	28.5	24.5	30	22.5	29	28.5	10	15.55	10.9	0.925	2.43	3.41	2.735	10.87	12.22	6.58	5.445	8
BP114-06-97	Male	38.5	24.5	20.5	29	20.5	26	28	9.5	14.18	13.33	3.145	2.24	5.19	4.78	11.59	12.63	7.01	5.525	7
BP115-06-97	Male	39.5	25.5	21.5	30	20	26	28.5	9.5	14.73	13.02	3.445	2.49	5.885	4.37	10.99	12.04	6.555	5.9	7.5
BP116-06-97	Female	48.5	32	28.5	37.5	25.5	32.5	34	13.5	19.5	13.09	0.6	2.74	3.115	3.085	14.19	15.45	9.145	6.805	14
BP117-06-97	Male	51	34	28.5	38	28	35.5	36	13	18	14.5	3.43	3.4	6.97	4.51	13.92	15.14	8.175	7.035	14.5
BP118-06-97	Male	64.5	44	37.5	44.5	33	43.5	43	18.5	25	18.5	1.965	4.07	6.44	4.82	17.5	19.3	11.24	9.44	31.5
BP119-06-97	Male	73	49.5	43.5	48	38.5	48	45.5	21	29.5	23	6.095	4.71	10.78	7.1	19	20.5	12.3	10.18	43
BP120-07-97	Male	64.5	44.5	37	47	34	43	46	17	23.5	19	4.015	4.205	7.495	5.575	16.5	18	10.37	8.85	31
BP121-07-97	Male	70.5	47.5	39	49	36	45.5	46.5	18	27.5	20	3.015	4.83	7.985	6.435	19.5	21.3	12.88	10.67	39.5
BP122-07-97	Male	73	49.5	41.5	48	35.5	46	46	20.5	27.5	22.5	5.15	5.16	10.41	6.86	18.5	20	12.49	9.485	40
BP123-07-97	Male	64	41.5	33	44	33	41.5	40.3	17	25.5	19	3.405	3.8	6.92	6.685	16	17.5	10.7	8.825	31
BP124-08-97	Male	63	41.5	33	43.5	32.5	42	40	16.5	26	20	3.695	4.17	7.44	6.34	17	18.3	11.14	8.855	31
BP125-08-97	Male	61	40.5	34	43.5	30.5	38	40	20	25.5	19	3.325	3.8	6.15	5.535	17	18.5	11.44	9.25	32
BP126-08-97	Female	45	30	25	32	24.5	30.5	30	13.5	16.5	11.5	0.95	2.335	3.49	2.85	11.82	13.42	7.875	6.21	10

NUMBER	SEX	CL	BDL1	BDL2	CW	PL1	PL2	PW	H	PR	PC	TC	CT	TL	TW	HL	HLs	HW	HH	Weight
BP127-08-97	Male	40	23	20	30	21	27	28.5	9.5	14	12.5	2.61	2.465	4.9	3.6	11.05	11.88	6.23	5.615	7
BP128-08-97	Male	52.5	34	29	37.5	28	35.5	35	14.5	19	14.5	2.14	3.155	5.335	3.535	13.17	14.33	7.9	6.71	15.8
BP129-08-97	Male	55.5	31	25	42	28	36	38.5	15.5	20.5	14	2.935	3.39	5.985	4.615	14.86	16.01	8.975	7.665	18
BP130-08-97	Female	32.5	20.5	18	24.5	17.5	22	23.5	7.5	11.25	6.865	0.545	1.905	2.385	2.26	8.855	9.9	5.4	4.15	3.5
BP131-08-97	Male	41	23.5	19.5	30.5	21	26	29.5	10	16.5	13	4.465	2.41	6.965	3.6	11.2	12.2	6.585	5.65	7
BP132-08-97	Male	45.5	30	26	32	22.5	30	31	10.5	16.5	16	3.02	3.37	6.855	5.54	12.42	13.55	8.58	6.96	10
BP133-08-97	Female	45	30	25.5	32	23	30	31	10.5	16.5	12.5	1.25	2.525	3.76	3.64	12.5	13.87	7.64	5.76	10.5
BP134-09-97	Female	37.5	26	23.5	27	20	25.5	26	10	11.1	8.175	1.185	2.76	4.24	3.555	10.59	11.54	6.28	5.16	5.5
BP135-09-97	Female	47	30	26.5	34.5	24.5	31	32	12	17.5	12.63	2.05	2.49	4.285	3.95	12.37	13.85	7.81	6.255	12
BP136-09-97	Female	48	32	27	33.5	24	30	32	13.5	18	13.06	1.365	2.675	4.435	3.475	13.41	14.15	8.92	6.995	13
BP137-09-97	Female	48	33.5	28	36	26.5	33	33	13	19	13.98	2.575	3.435	6	4.39	14.24	15.5	8.685	6.615	14
BP138-09-97	Female	39	25.5	21	28.5	20.5	25.5	27	9.5	14	9.23	1.09	2.1	3.375	2.63	10.2	11.36	6.25	5.01	6
BP139-09-97	Female	61	42	36	40	28.5	38.5	39	17	27	18	1.56	3.68	4.785	3.9	15.86	17.44	10.37	8.295	26.5
BP140-09-97	Female	31	21	18.5	23.5	16.3	21	23	7.5	11	7.77	0.91	1.73	2.87	2.49	9.2	10.38	5.73	4.3	3.2
BP141-09-97	Male	41	25.5	20.5	31	21	27	29	10.5	15.5	13.02	3.72	2.43	6.355	3.69	11.14	12.56	6.76	5.79	8

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย



Appendix IV

Plasma steroids data

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

	SEX	Sampling	Testosterone (ng/ml)	Estradiol (pg/ml)	Progesterone (ng/ml)
BP005-10-96	M	1	25.5428	26.7196	0.4028
BP006-10-96	F	1	0.0178	217.5749	1.7628
BP007-10-96	F	1	0.0855	213.1619	2.3976
BP008-10-96	F	1	1.2305	19.8089	
BP009-10-96	F	1	0.0204	215.8144	3.3017
BP010-10-96	F	1	0.0598	373.4230	3.1977
BP011-10-96	M	1	24.0442	22.1665	0.2331
BP012-10-96	M	1	17.8655	73.3027	0.5467
BP013-10-96	F	2	0.2651	10.5858	1.5057
BP014-10-96	F	2	0.0773	163.8100	1.5186
BP015-10-96	F	2	0.0517	25.7346	2.1276
BP016-10-96	F	2	0.0665	249.9049	1.8342
BP017-10-96	F	2	0.0743	185.4144	1.8073
BP018-11-96	M	3	19.1075	52.4481	0.2119
BP019-11-96	F	3	0.0921	282.9816	1.6784
BP020-11-96	F	3	0.0383	148.0453	3.4511
BP021-11-96	M	3	27.5319	60.4440	0.3720
BP022-11-96	M	3	21.5582	43.4664	0.5132
BP023-11-96	M	3	31.9385	56.2864	0.8581
BP025-11-96	M	4	24.9451	45.8207	0.6208
BP026-11-96	M	4	28.6029	35.9048	0.2994
BP027-11-96	M	4	25.0764	26.2307	0.2085
BP028-11-96	F	4	0.0870	60.5679	1.6892
BP029-11-96	M	4	9.3888	27.7179	0.1402
BP030-11-96	F	4	0.0647	184.5070	3.3330
BP031-11-96	M	4	1.9429	25.4502	0.1747
BP032-11-96	F	4	0.0467	59.1155	1.4990
BP033-11-96	M	4	11.9726	32.5590	0.6561
BP034-12-96	M	5	1.7570	45.1077	
BP035-12-96	F	5	0.0477	67.1874	3.4483
BP036-12-96	F	5	0.0726	411.6976	2.6842
BP037-12-96	F	5	0.0815	239.0443	1.5664
BP038-12-96	F	5	0.0955	245.7896	2.0864
BP039-12-96	M	5	0.1131	2.7211	0.1289
BP040-12-96	M	5	29.1893	46.0783	0.2629
BP041-12-96	M	5	21.4766	72.3438	0.8715
BP042-12-96	M	5	21.8684	30.4135	0.2784

	SEX	Sampling	Testosterone (ng/ml)	Estradiol (pg/ml)	Progesterone (ng/ml)
BP043-12-96	M	5	1.2988	5.3353	0.1485
BP044-12-96	M	5	5.3441	51.3564	0.2673
BP045-12-96	F	6	0.0474	200.0480	1.5227
BP046-12-96	M	6	24.1430	61.1684	0.2848
BP047-12-96	F	6	0.1395	240.9873	1.7947
BP048-12-96	F	6	0.0666	26.3305	
BP049-12-96	F	6	0.0753	280.9873	3.3189
BP050-12-96	M	6	30.9213	34.3466	0.3369
BP051-12-96	M	6	18.9102	33.3417	0.4392
BP052-12-96	M	6	9.3376	23.9333	0.2022
BP053-12-96	M	6	21.5906	49.7381	0.4598
BP054-01-97	F	7	0.1122	44.6648	1.1675
BP055-01-97	M	7	7.0056	81.3683	
BP056-01-97	F	7	0.1459	234.7298	1.4742
BP057-01-97	M	7	0.9774	1.6094	0.1137
BP058-01-97	F	7	0.1475	235.7999	0.9663
BP059-01-97	F	7	0.0943	24.8464	1.6370
BP061-01-97	M	7	20.1129	46.8340	0.1280
BP062-01-97	M	7	5.6919	26.4007	0.4305
BP063-01-97	M	7	12.6360	38.3006	0.2424
BP064-02-97	M	8	14.8446	20.4608	0.2500
BP065-02-97	M	8	27.9485	32.2529	0.3360
BP066-02-97	M	8	13.6792	29.7223	0.2049
BP067-02-97	M	8	16.9542	13.2622	0.2175
BP068-02-97	F	8	0.0957	94.6093	1.1325
BP069-02-97	M	8	0.9516	5.3353	0.1292
BP070-02-97	M	8	10.3230	33.3675	0.3092
BP071-02-97	M	8	13.3490	39.4855	0.3074
BP072-02-97	F	8	0.0502	142.5933	1.1752
BP073-02-97	F	8	0.1994	257.7028	1.4631
BP074-02-97	M	9	0.0515	1.6721	0.0576
BP075-02-97	M	9	9.7679	13.8030	0.2333
BP076-02-97	M	9	15.8864	26.9436	0.1092
BP077-02-97	F	9	0.1174	214.5143	1.3680
BP078-02-97	M	9	1.5046	36.4631	0.0328
BP079-02-97	M	9	19.0781	21.2036	0.5414
BP080-02-97	M	9	0.1527	2.3767	0.0783

	SEX	Samplng	Testosterone (ng/ml)	Estradiol (pg/ml)	Progesterone (ng/ml)
BP081-02-97	M	9	20.6626	34.8648	0.1988
BP082-02-97	F	9	0.2224	264.5801	2.0629
BP084-03-97	F	10	0.1937	145.1160	1.1649
BP085-03-97	M	10	9.7878	12.1969	0.1395
BP086-03-97	M	10	11.5834	7.5545	0.1092
BP087-03-97	F	10	0.0837	95.9591	1.2145
BP088-03-97	M	10	0.1244	2.7641	0.1530
BP089-03-97	M	10	13.9974	7.6474	0.1652
BP090-03-97	M	10	5.5667	14.9671	0.1975
BP091-03-97	M	10	4.8940	19.2468	0.2980
BP092-03-97	F	10	0.3367	96.9790	1.0092
BP093-04-97	M	11	8.6874	19.7939	0.2378
BP094-04-97	F	11	0.0798	72.8708	1.6815
BP095-04-97	F	11	0.0220	4.5823	1.0567
BP096-04-97	M	11	3.4735	20.7842	0.1120
BP097-04-97	F	11	0.0165	142.3359	1.0068
BP098-04-97	M	11	7.5486	18.6858	0.0713
BP099-04-97	M	11	1.0953	19.2369	0.1682
BP100-04-97	F	11	0.0762	140.5101	2.1073
BP101-04-97	M	11	20.1995	47.8485	0.2460
BP102-05-97	M	12	1.6714	0.9379	0.0780
BP103-05-97	F	12	0.0445	50.2022	0.7287
BP104-05-97	M	12	15.3739	9.5477	0.1869
BP105-05-97	M	12	10.9454	17.3146	0.1786
BP106-05-97	F	12	0.0336	123.6834	1.7006
BP107-05-97	M	12	3.6707	21.8540	0.1753
BP108-05-97	M	12	17.0921	36.3166	0.1618
BP109-05-97	F	12	0.0453	65.1270	2.0210
BP110-06-97	M	13	3.3005	3.8540	0.0829
BP111-06-97	M	13	10.4053	20.7527	0.0951
BP112-06-97	M	13	0.9851	7.8615	0.0903
BP113-06-97	F	13	0.1132	36.5185	0.8151
BP114-06-97	M	13	4.5031	9.7627	0.1097
BP115-06-97	M	13	2.5361	4.4968	0.1476
BP116-06-97	F	13	0.1971	105.1150	1.1013
BP117-06-97	M	13	9.8253	16.8634	0.1118
BP118-06-97	M	13	6.2832	12.8612	0.3604

	SEX	Sampling	Testosterone (ng/ml)	Estradiol (pg/ml)	Progesterone (ng/ml)
BP119-06-97	M	13	3.7846	17.6930	0.1224
BP120-07-97	M	14	14.5938	18.6703	0.0820
BP121-07-97	M	14	9.4553	13.3835	0.0844
BP122-07-97	M	14	13.6976	17.4300	0.2268
BP123-07-97	M	14	1.1548	8.6245	0.3383
BP124-08-97	M	15	6.2001	11.4465	0.2259
BP125-08-97	M	15	4.8246	7.1070	0.1622
BP126-08-97	F	15	0.0203	78.0615	0.9281
BP127-08-97	M	15	7.2654	8.3765	0.0820
BP128-08-97	M	15	4.2668	15.8715	0.1157
BP129-08-97	M	15	1.1180	15.3978	0.2321
BP130-08-97	F	15	0.2201	47.3080	0.6170
BP131-08-97	M	15	2.0350	10.4499	0.0741
BP132-08-97	M	15	0.5347	9.5276	0.1427
BP133-08-97	F	15	0.1299	107.3920	0.9044
BP134-09-97	F	16	0.0234	76.3622	0.5416
BP135-09-97	F	16	0.0106	187.1239	0.8142
BP136-09-97	F	16	0.1107	74.2290	1.1547
BP137-09-97	F	16	0.0746	183.7000	0.5669
BP138-09-97	F	16	0.1094	181.1085	0.9780
BP139-09-97	F	16	0.0311	181.8583	1.2213
BP140-09-97	F	16	0.0927	69.4697	2.2038
BP141-09-97	M	16	7.0349	16.3404	0.0818

สถาบันวิทยบริการ
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Biography

Mr. Noppadon Kitana was born on the 22nd of May 1972 in Chanthaburi province. He graduated his bachelor's degree of science in zoology in 1993 from the Department of Biology, Faculty of Science, Chulalongkorn University. He continued his graduated study for a master's degree of science in zoology at the same institute in 1994. He was awarded a two-year scholarship by the University Development Committee(UDC), Ministry of University Affairs in 1996. After his graduation, he works as a full-time lecturer at the Department of Biology, Faculty of Science, Chulalongkorn University.



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