



Appendix

Physico-chemical water parameters in the four stream sites measured from

May 2002-July 2003

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
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Table 1 Physico-chemical water parameters in the Romglao-Paradorn Waterfall from May 2002-July2003

Romglao-Paradorn Waterfall															
Parameter	May 02	Jun 02	Jul 02	Aug 02	Sep 02	Oct 02	Nov 02	Dec 02	Jan 03	Feb 03	Mar 03	Apr 03	May 03	Jun 03	Jul 03
Air temperature (°C)	21	20.5	18	20.5	20	19.5	18	17	9	15	19	26	23	21	19.5
Water temperature (°C)	19	7.0	18.5	19	19	19	17	16	14	14	17	20	19	18	19
pH	7.7	7.0	7.6	8.6	7.5	8.22	7.39	6.5	7.7	8.0	8.1	7.7	8.2	6.9	7.0
Conductivity (uS/cm)	19.8	16.83	9.2	10.44	15.36	16.9	20.5	20.5	22.3	26.1	31.8	28.6	23.1	27.0	25.0
TDS (mg/l)	13.1	8.4	4	5.23	8.37	8.44	10.3	10.2	11.4	13.5	16	14.4	11.7	16.9	11.5
Dissolved oxygen (mg/l)	7.9	9.6	8.0	9.0	9.6	9.6	7.8	8.4	8.4	8.5	7.9	9.8	8.5	8.3	8.0
Alkalinity (mg/l)	6	7	5	4	6	8	2	6	8	8.5	9.0	9	6	7.5	6
Nitrate (mg/l)	0.6	1.3	1.1	1.2	1.1	1.2	0.8	1.4	1.4	1.4	1.2	1.1	1.1	1.3	1.2
Phosphate (mg/l)	0.02	0.02	0.04	0.09	0.03	0.02	0.02	0.01	0.01	0.01	0.02	0.03	0.02	0.02	0.03
Ammonia (mg/l)	0.05	0.10	0.01	0.09	0.07	0.15	0.16	0.09	0.10	0.03	0.17	0.15	0.10	0.10	0.01
Sulfate (mg/l)	0	0	1	0	0	0	1	1	0	0	1	0	0	0	0
Turbidity (FTU)	12	28	7	13	8	7	11	8	9	9	12	13	10	29	13
Discharge (m ³ /sec)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2 Physico-chemical water parameters in the Water Wheel Waterfall from May2002-July 2003

Water Wheel Waterfall															
Parameter	May 02	Jun 02	Jul 02	Aug 02	Sep 02	Oct 02	Nov 02	Dec 02	Jan 03	Feb 03	Mar 03	Apr 03	May 03	Jun 03	Jul 03
Air temperature ($^{\circ}\text{C}$)	20	20	18.5	19.5	20	19.5	21	17	15	22	24	26	23	21.5	20
Water temperature ($^{\circ}\text{C}$)	19	19.5	18.5	19	18.5	18	17	16	13	14	18	22	20	20	19.5
pH	7.8	8.2	7.7	6.6	8.1	7.91	7.5	6.9	7.8	8.3	7.3	7.7	7.3	7.6	7.6
Conductivity ($\mu\text{S}/\text{cm}$)	21.5	19.5	23.5	12.46	17.11	10.33	21.1	33.4	24.5	29.3	34.1	36.9	27.0	27.3	25.3
TDS (mg/l)	10.6	9.75	10	5.86	8.76	5.10	10.7	21.2	12.3	14.6	16.8	17.9	13.5	13.7	12.5
Dissolved oxygen (mg/l)	8.2	8.0	8.2	9.2	9.2	9.8	8.4	9.0	8.7	8.5	7.5	9.6	9.0	8.9	8.9
Alkalinity (mg/l)	7	10	4	5	6	6	2	7	6.5	18.5	19.1	19.5	7	7	6.5
Nitrate (mg/l)	0.7	1.3	1.3	1.4	1.2	0.7	0.9	1.3	1.2	1.3	1.0	1.0	1.1	1.3	1.1
Phosphate (mg/l)	0.01	0.05	0.14	0.07	0.11	0.17	0.02	0.04	0.02	0.08	0.16	0.03	0.08	0.05	0.04
Ammonia (mg/l)	0.23	0.04	0.01	0.05	0.11	0.03	0.36	0.04	0.13	0.02	0.23	0.24	0.12	0.20	0.16
Sulfate (mg/l)	0	3	1	1	0	0	0	1	0	0	0	0	0	0	0
Turbidity (FTU)	12	25	2	7	8	11	16	5	9	16	17	18	8	27	10
Discharge (m^3/sec)	0.058	Flood	3.667	Flood	1.693	0.718	0.459	0.565	2.240	0.100	0.061	0.006	0.062	3.281	4.536

Table 3 Physico-chemical water parameters in the Kha Mun Noi Stream from May 2002-July 2003

Kha Mun Noi Stream															
Parameter	May 02	Jun 02	Jul 02	Aug 02	Sep 02	Oct 02	Nov 02	Dec 02	Jan 03	Feb 03	Mar 03	Apr 03	May 03	Jun 03	Jul 03
Air temperature ($^{\circ}\text{C}$)	19.5	19.8	18	21	19.5	20	20	18.5	13	20	24	28	20.5	21.7	20
Water temperature ($^{\circ}\text{C}$)	19.5	19.5	18.5	19	19	18.5	17	16.5	14	14	18	22	19.9	21	19
pH	7.8	7.2	7.9	7.4	7.7	8.16	7.42	6.4	8.6	8.1	7.3	6.8	7.7	7.3	7.5
Conductivity ($\mu\text{S}/\text{cm}$)	28.6	14.41	4	9.74	20.1	15.23	20.5	69.9	22.6	27.1	32.0	39.2	36.3	31.1	20.2
TDS (mg/l)	14.4	7.23	10.1	4.86	10.4	7.42	10.3	45.0	13.4	13.6	15.9	20.0	18.0	15.6	14.5
Dissolved oxygen (mg/l)	7.8	8.4	8.4	9.0	9.6	9.8	7.5	8.6	8.6	9.3	7.1	10	7.8	7.5	7.6
Alkalinity (mg/l)	11	8	7	4	8	2	3	8	10	10.5	10.7	11.5	11	11	10.5
Nitrate (mg/l)	0.5	1.3	1.0	1.4	1.1	0.8	1.1	1.3	1.3	1.4	1.1	0.8	1.1	1.2	1.1
Phosphate (mg/l)	0.03	0.07	0.02	0.06	0.05	0.03	0.01	0.01	0.02	0.03	0.18	0.06	0.04	0.07	0.03
Ammonia (mg/l)	0.10	0.31	0.02	0.03	0.12	0.08	0.15	0.06	0.10	0.07	0.10	0.20	0.14	0.31	0.04
Sulfate (mg/l)	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Turbidity (FTU)	14	24	19	6	12	5	9	5	6	7	17	14	8	26	12
Discharge (m^3/sec)	0.023	Flood	6.028	Flood	0.245	0.288	0.304	0.222	0.714	0.050	0	0	0.005	0.423	4.876

Table 4 Physico-chemical water parameters in the Man Dang Noi Stream from MAy 2002-July 2003

Man Dang Noi Stream															
Parameter	May 02	Jun 02	Jul 02	Aug 02	Sep 02	Oct 02	Nov 02	Dec 02	Jan 03	Feb 03	Mar 03	Apr 03	May 03	Jun 03	Jul 03
Air temperature ($^{\circ}\text{C}$)	21	18.5	18	18.5	19.5	17.5	19	14.5	14	17	15.5	21	21	19	18
Water temperature ($^{\circ}\text{C}$)	18.5	17.8	17	17	17.5	17	16	14.5	13	13	15	18.5	18	18	17
pH	4.2	3.8	7.5	6.1	5.2	6.3	6.7	5.5	7.8	6.5	5.44.9	4.9	5.2	4.9	7.0
Conductivity ($\mu\text{S}/\text{cm}$)	15.28	12.73	26.2	15.77	10.95	10.62	10.76	61.8	12.14	10.59	13.94	16.69	16.44	25.9	26.0
TDS (mg/l)	8.44	6.05	16.0	7.88	6.65	5.31	6.03	34.2	6.15	5.31	8.0	8.33	8.28	12.8	13.2
Dissolved oxygen(mg/l)	7.0	9.2	8.4	8.6	9.0	8.8	6.8	7.4	7.6	6.6	5.2	5.2	6.5	6.7	8.0
Alkalinity (mg/l)	3	2	2	2	2	2	6	2	1	2	1	1	3	3	2
Nitrate (mg/l)	0.8	1.3	1.4	1.2	1.1	0.4	1.0	0.7	1.2	1.0	0.6	0.5	0.7	1.1	1.3
Phosphate (mg/l)	0.09	0.01	0.16	0.01	0.09	0.07	0.04	0.02	0.04	0.02	0.04	0.03	0.01	0.01	0.01
Ammonia (mg/l)	0.30	0.29	0.09	0.19	0.21	0.52	0.58	0.19	0.26	0.32	0.49	0.61	0.41	0.39	0.08
Sulfate (mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turbidity (FTU)	15	15	10	10	11	14	10	12	14	18	26	34	22	18	10
Discharge (m^3/sec)	0.038	0.884	0.956	4.374	0.313	0.034	0.312	0.033	0.079	0	0	0	0.021	0.391	0.984

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Publications:

- Changthong, N.**, Chantaramongkol, P. 2003. Diversity of Trichoptera larvae communities from different microhabitats and streams in Phu Hin Rongkla National Park, Phitsanulok Province, Thailand. Proc. 11th Internat. Symp. Trichoptera., Osaka, (in press).
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