

Table 1 Occurrence of dragonfly species at sampling sites of NKGs during 2008, 2009 and 2010

No.	Species	Study sites																				
		Public area			Bamboo forest			Swamp forest			Orchard			Adjacent to natural forest			Flower beds			Ponds		
		2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
1	<i>Ictinogomphus decoratus melaenops</i>	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	+	+	-	-	-
2	<i>Anax guttatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-
3	<i>Polycanthagyna erythromelas</i>	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	<i>Acisoma panorpoides</i>	+	+	+	-	-	-	+	+	+	-	-	-	-	-	-	+	+	+	-	-	-
5	<i>Brachydiplax farinosa</i>	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	+	+	-	-	-	-
6	<i>Brachythemis contaminata</i>	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+	+	+	-	-	-
7	<i>Crocothemis servilia servilia</i>	-	-	+	-	-	-	+	+	+	-	-	-	-	+	+	+	+	+	-	-	-
8	<i>Diplacodes nebulosa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
9	<i>D. trivialis</i>	+	+	+	-	+	-	+	+	+	-	-	-	-	+	+	-	+	+	+	+	+
10	<i>Hydrobasileus croceus</i>	-	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-
11	<i>Neurothemis fulvia</i>	-	-	+	-	+	-	-	+	+	-	-	-	+	-	-	-	+	+	+	-	+
12	<i>Orthetrum glaucum</i>	-	-	-	-	+	-	+	+	+	-	-	-	-	-	-	+	-	-	-	-	-
13	<i>O. luzonicum</i>	-	+	+	-	+	-	+	+	+	-	-	-	-	-	+	+	+	+	-	-	+
14	<i>O. pruinosum neglectum</i>	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	+	+	-	-	+
15	<i>O. sabina sabina</i>	-	-	-	+	-	-	+	-	+	-	-	-	-	-	-	+	+	+	-	-	+
16	<i>O. triangulare</i>	-	-	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-

	<i>triangulare</i>																							
17	<i>Pantala flavescens</i>	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	
18	<i>Rhodothemis rufa</i>	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+	+	-	-	-		
19	<i>Rhyothemis phyllis</i>	-	+	+	-	-	+	-	-	+	-	-	-	-	-	+	-	+	+	-	-	-		
20	<i>R. plutonia</i>	+	+	+	-	-	-	+	+	+	-	-	-	-	-	-	-	+	+	-	-	+		
21	<i>R. triangularis</i>	+	+	+	-	-	-	+	+	+	-	-	-	+	-	-	-	+	+	-	-	-		
22	<i>R. variegata variegata</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-		
23	<i>Tetrathemis irregularis</i>	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-		
24	<i>T. platyptera</i>	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-		
25	<i>Tholymis tillarga</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-		
26	<i>Trithemis aurora</i>	+	+	+	+	-	+	+	+	+	-	-	-	-	-	-	+	+	+	-	-	+		
27	<i>T. festiva</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-		
28	<i>T. pallidinervis</i>	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	+	+	-	-	-		
29	<i>Urothemis signata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-		
30	<i>Zyxomma petiolatum</i>	-	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	+	-		

(+)=Present
(-)=Absent

Table 2 Seasonal variation of dragonfly species at each study site in NKGs from January to December 2009 and 2010

No	Species	Months																							
		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
		2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
1	<i>Ictinogomphus decoratus</i>	-	-	-	-	-	-	-	✓	-	✓	-	✓	✓	-	✓	-	✓	✓	✓	✓	-	-	-	-

	<i>melaenops</i>																									
2	<i>Anax guttatus</i>	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	
3	<i>Polycanthona erythromelas</i>	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	
4	<i>Acisoma panorpoides</i>	-	-	-	-	-	-	-	✓	-	✓	✓	✓	-	✓	-	✓	✓	✓	✓	-	✓	-	✓	✓	
5	<i>Brachydiplax farinosa</i>	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	
6	<i>Brachythemis contaminata</i>	-	-	✓	-	✓	-	✓	-	✓	-	✓	-	✓	-	✓	-	✓	✓	✓	✓	✓	✓	-	-	
7	<i>Crocothemis servilia</i>	-	-	✓	-	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	
8	<i>Diplacodes nebulosa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	-	✓	-	-	-	-	-	
9	<i>D. trivialis</i>	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	
10	<i>Hydrobasileus croceus</i>	-	-	-	-	-	-	-	✓	✓	✓	-	✓	-	✓	-	✓	-	-	-	-	-	-	-	-	
11	<i>Neurothemis fulvia</i>	-	-	✓	✓	✓	✓	✓	-	✓	✓	✓	-	✓	✓	✓	✓	-	✓	✓	✓	✓	-	-	-	
12	<i>Orthetrum glaucum</i>	-	-	✓	✓	✓	-	-	✓	-	✓	✓	-	✓	-	-	-	-	✓	✓	✓	✓	✓	-	-	-
13	<i>O. luzonicum</i>	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-
14	<i>O. pruinosum neglectum</i>	-	-	-	-	-	-	-	-	-	✓	-	-	-	✓	-	✓	✓	✓	✓	✓	✓	-	✓	-	-
15	<i>O. sabina sabina</i>	-	-	✓	-	-	-	✓	-	-	-	-	-	✓	-	✓	-	✓	✓	✓	✓	✓	-	-	-	
16	<i>O. triangulare triangulare</i>	-	-	✓	-	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-

1	<i>Ictinogomphus decoratus melaenops</i>	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	6	27	27	-	-	-
2	<i>Anax guttatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	2	-
3	<i>Polycanthagyna erythromelas</i>	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	<i>Acisoma panorpoides panorpoides</i>	7	4	4	-	-	-	4	3	2	-	-	-	-	-	-	5	44	17	-	-	-
5	<i>Brachydiplax farinosa</i>	-	-	-	-	-	-	62	39	14	-	-	-	-	-	-	4	20	-	-	-	-
6	<i>Brachythemis contaminata</i>	-	-	-	-	-	-	7	6	-	-	-	-	-	-	-	7	21	52	-	-	-
7	<i>Crocothemis servilia servilia</i>	-	-	35	-	-	-	4	30	21	-	-	-	-	1	2	8	66	96	-	-	-
8	<i>Diplacodes nebulosa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-
9	<i>D. trivialis</i>	9	10	17	-	1	-	2	3	1	-	-	-	-	2	3	-	7	10	1	10	1
10	<i>Hydrobasileus croceus</i>	-	1	3	-	-	-	-	10	13	-	-	-	-	-	-	-	2	10	-	-	-
11	<i>Neurothemis fulvia</i>	-	-	3	-	1	1	-	-	67	-	-	-	2	-	-	-	-	1	6	-	15
12	<i>Orthetrum glaucum</i>	-	-	-	-	1	-	12	16	13	-	-	-	-	-	-	1	-	-	-	-	-
13	<i>O. luzonicum</i>	-	1	5	-	10	-	49	96	14	-	-	-	-	-	2	7	29	14	-	-	10
14	<i>O. pruinatum neglectum</i>	-	-	-	-	-	-	3	4	5	-	-	-	-	-	-	-	29	97	-	-	3
15	<i>O. sabina sabina</i>	-	-	-	10	-	-	6	-	1	-	-	-	-	-	-	36	10	87	-	-	1
16	<i>O. triangulare triangulare</i>	-	-	1	-	1	-	32	60	76	-	-	-	-	-	-	-	-	-	-	-	-
17	<i>Pantala flavescens</i>	77	32	11	7	9	7	-	41	5	5	20	27	17	42	68	15	37	28	-	-	-
18	<i>Rhodothemis rufa</i>	-	-	-	-	-	-	-	10	6	-	-	-	-	-	-	-	37	34	-	-	-
19	<i>Rhyothemis phyllis</i>	-	1	40	-	-	1	-	-	3	-	-	-	-	-	7	-	1	3	-	-	-
20	<i>R. plutonia</i>	3	25	53	-	-	-	48	32	42	-	-	-	-	-	-	-	52	61	-	-	2
21	<i>R. triangularis</i>	2	10	16	-	-	-	6	50	17	-	-	-	3	-	-	-	11	42	-	-	-
22	<i>R. variegata variegata</i>	-	-	29	-	-	-	-	-	-	-	-	-	-	5	-	-	-	1	-	-	-
23	<i>Tetrathemis irregularis</i>	-	-	1	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-
24	<i>T. platyptera</i>	-	-	20	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-
25	<i>Tholymis tillarga</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
26	<i>Trithemis aurora</i>	12	20	59	2	-	2	7	50	51	-	-	-	-	-	-	74	31	40	-	-	30
																		6	7			

27	<i>T. festiva</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	
28	<i>T. pallidinervis</i>	-	-	-	-	-	-	2	-	-	-	2	-	-	-	25	3	-	-	-		
29	<i>Urothemis signata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	7	-	-	-		
30	<i>Zyxomma petiolatum</i>	-	2	1	-	-	-	1	-	-	-	-	-	-	-	-	2	-	5	-		
Total Number of Individuals (N)		11	71	20	19	23	11	24	84	11	5	20	27	24	45	87	16	13	12	7	17	62
		0	9	60				2	3	60							3	79	57			
Total Number of Species (N)		6	11	17	3	6	4	13	17	21	1	1	1	4	3	6	10	21	22	2	3	7

(-)=Absent

Table 4 The composition and relative abundance of dragonfly species in NKGs during 2008, 2009 and 2010

No.	Name of Species	Total no. of individuals			Percentage composition (%)			Relative abundance			Status		
		2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
1	<i>Ictinogomphus decoratus melaenops</i>	6	29	29	1.0526	0.9521	0.6218	0.0105	0.0095	0.0062	uC	uC	uC
2	<i>Anax guttatus</i>	-	18	-	-	0.5909	-	-	0.0059	-	-	uC	-
3	<i>Polycanthagyna erythromelas</i>	-	1	1	-	0.0328	0.0214	-	0.0003	0.0002	-	uC	uC
4	<i>Acisoma panorpoides panorpoides</i>	16	51	23	2.8070	1.6743	0.4931	0.0281	0.0167	0.0049	C	C	uC
5	<i>Brachydiplax farinosa</i>	66	59	142	11.5789	1.9370	3.0446	0.1158	0.0193	0.0304	vC	C	C
6	<i>Brachythemis contaminata</i>	14	218	52	2.4561	7.1569	1.1149	0.0246	0.0715	0.0111	C	vC	C
7	<i>Crocothemis servilia servilia</i>	12	97	154	2.1053	3.1845	3.3019	0.0211	0.0318	0.0330	C	C	C
8	<i>Diplacodes nebulosa</i>	-	2	2	-	0.0657	0.0429	-	0.0007	0.0004	-	uC	uC
9	<i>D. trivialis</i>	12	33	32	2.1053	1.0834	0.6861	0.0211	0.0108	0.0069	C	C	uC
10	<i>Hydrobasileus croceus</i>	-	1	26	-	0.0328	0.5575	-	0.0003	0.0056	-	uC	uC
11	<i>Neurothemis fulvia</i>	8	112	87	1.4035	3.6770	1.8654	0.0140	0.0367	0.0187	C	C	C
12	<i>Orthetrum glaucum</i>	13	17	13	2.2807	0.5581	0.2787	0.0228	0.0056	0.0028	C	uC	uC
13	<i>O. luzonicum</i>	56	136	174	9.8246	4.4649	3.7307	0.0982	0.0446	0.0373	vC	C	C
14	<i>O. pruinosum neglectum</i>	3	33	105	0.5263	1.0834	2.2513	0.0053	0.0108	0.0225	uC	C	C
15	<i>O. sabina sabina</i>	52	108	89	9.1228	3.5456	1.9082	0.0912	0.0356	0.0191	vC	C	C
16	<i>O. triangulare triangulare</i>	32	61	77	5.6140	2.0026	1.6509	0.0561	0.0200	0.0165	vC	C	C
17	<i>Pantala flavescens</i>	121	805	1531	21.2281	26.4281	32.8259	0.2123	0.2643	0.3283	vC	vC	vC
18	<i>Rhodothemis rufa</i>	-	47	40	-	1.5430	0.8576	-	0.0154	0.0086	-	C	uC
19	<i>Rhyothemis phyllis</i>	-	2	54	-	0.0657	1.1578	-	0.0007	0.0116	-	uC	C
20	<i>R. plutonia</i>	51	625	1018	8.9474	20.5187	21.8266	0.0895	0.2052	0.2183	vC	vC	vC
21	<i>R. triangularis</i>	11	170	382	1.9298	5.5811	8.1904	0.0193	0.0558	0.0819	C	vC	vC
22	<i>R. variegata variegata</i>	-	-	35	-	-	0.7504	-	-	0.0075	-	-	uC

23	<i>Tetrathemis irregularis</i>	-	-	5	-	-	0.1072	-	-	0.0011	-	-	uC
24	<i>T. platyptera</i>	-	-	26	-	-	0.5575	-	-	0.0056	-	-	uC
25	<i>Tholymis tillarga</i>	-	1	-	-	0.0328	-	-	0.0003	-	-	uC	-
26	<i>Trithemis aurora</i>	95	386	549	16.6667	12.6724	11.7710	0.1667	0.1267	0.1177	vC	vC	uC
27	<i>T. festiva</i>	-	-	3	-	-	0.0643	-	-	0.0006	-	-	uC
28	<i>T. pallidinervis</i>	2	25	5	0.3509	0.8207	0.1072	0.0035	0.0082	0.0011	uC	uC	uC
29	<i>Urothemis signata</i>	-	1	7	-	0.03283	0.1501	-	0.0003	0.0015	-	uC	uC
30	<i>Zyomma petiolatum</i>	-	8	3	-	0.2626	0.0643	-	0.0026	0.0006	-	uC	uC

uC = uncommon (having relative abundance less than 0.0100)

(-)=Absent

vC =very common (having relative abundance less than 0.0500 and above)

C=common (having relative abundance less than 0.0100 and above but less than 0.0500)

Table 5 Comparison between the dragonfly species recorded in the present work with those of other workers

No.	Species recorded in present study	Fraser	MM	OM	TZ	KMH	Research group (Meiktila)	Research group (Pokokku)	LLT	KHS
		(1934, 1936)	(1974)	(1997)	(2000)	(2005)	(2006)	(2006)	(2008)	(2011)
1	<i>*Ictinogomphus decoratus melaenops</i>	-	-	-	-	-	-	-	-	-
2	<i>Anax guttatus</i>	+	+	-	-	+	-	-	+	-
3	<i>*Polycanthagyna erythromelas</i>	-	-	-	-	-	-	-	-	-
4	<i>Acisoma panorpoides panorpoides</i>	-	+	+	+	+	-	-	-	+
5	<i>Brachydiplax farinosa</i>	+	+	-	-	+	-	-	-	-
6	<i>Brachythemis contaminata</i>	+	+	+	-	+	-	-	-	+
7	<i>Crocothemis servilia servilia</i>	+	+	-	+	-	-	-	-	-
8	<i>Diplacodes nebulosa</i>	+	+	+	+	-	-	-	-	+
9	<i>D. trivialis</i>	+	+	+	+	+	+	-	+	+
10	<i>Hydrobasileus croceus</i>	+	+	-	-	-	+	+	+	+
11	<i>Neurothemis fulvia</i>	-	+	+	+	+	-	-	+	+
12	<i>Orthetrum glaucum</i>	-	+	-	+	-	-	-	+	+
13	<i>O. luzonicum</i>	+	+	-	+	+	-	-	+	-
14	<i>O. pruinatum neglectum</i>	+	+	+	+	+	-	-	+	-
15	<i>O. sabina sabina</i>	+	+	+	+	+	-	+	+	+

16	<i>O. triangulare triangulare</i>	+	+	+	+	-	+	-	-	-
17	<i>Pantala flavescens</i>	+	+	+	-	-	-	-	+	+
18	<i>Rhodothemis rufa</i>	+	+	+	-	+	-	+	-	-
19	<i>Rhyothemis phyllis</i>	+	+	-	+	+	+	+	+	+
20	<i>R. plutonia</i>	+	+	-	+	-	-	-	-	-
21	* <i>R. triangularis</i>	-	-	-	-	-	-	-	-	-
22	<i>R. variegata variegata</i>	+	+	+	+	+	-	-	-	-
23	* <i>Tetrathemis irregularis</i>	-	-	-	-	-	-	-	-	-
24	<i>T. platyptera</i>	+	-	-	-	-	-	-	-	-
25	<i>Tholymis tillarga</i>	+	+	+	+	+	+	+	-	+
26	<i>Trithemis aurora</i>	+	+	-	+	-	-	-	+	-
27	<i>T. festiva</i>	+	+	+	+	+	-	-	-	+
28	<i>T. pallidinervis</i>	-	-	+	+	-	-	-	-	+
29	<i>Urothemis signata</i>	+	+	+	-	-	-	-	-	-
30	<i>Zyxomma petiolatum</i>	+	+	+	-	-	-	-	-	+

(+)=Present

(-)=Absent

*=Regarded as first time record from Myanmar

MM, Maung Myaing;¹⁷ OM, Ohn Mar;¹⁸ TZ, ThuZar;¹⁹ KMH, Khin Myat Hmwe;²⁰ Meiktila;²¹ Pokoku;²² LLT, Lei Lei Thin;²³ KHS, Khin Hnin Soe;²⁴