

Supplementary materials:

Table S1: Block wise malaria data of Alipurduar district from 2017 to 2022

Year	Block/ District Total	Population	ABER (%)	Total malaria cases	API
2017	Alipurduar-I	220230	25.99	2	0.009
	Alipurduar-II	232544	44.18	71	0.305
	Kumargram	209946	23.417	242	1.153
	Falakata	304513	30.972	17	0.056
	Kalchini	295514	17.371	664	2.247
	Madarihat	210712	20.0001	319	1.514
	District Total	1473459	33.92	1315	0.892
2018	Alipurduar-I	236392	29.04	0	0.000
	Alipurduar-II	243714	58.79	37	0.152
	Kumargram	220394	27.1	47	0.213
	Falakata	312719	36.87	9	0.029
	Kalchini	297459	18.66	14	0.047
	Madarihat	215411	34.28	29	0.135
	District Total	1526089	33.66	136	0.089
2019	Alipurduar-I	236392	29.47	3	0.013
	Alipurduar-II	243714	54.88	14	0.057
	Kumargram	220394	40.6	328	1.488
	Falakata	312719	40.26	8	0.026
	Kalchini	297459	23.68	30	0.101
	Madarihat	215411	36.46	52	0.241
	APD Municipality/ DH	66116	16.18	22	0.333
	District Total	1592205	36.338	457	0.287
2020	Alipurduar-I	236392	10.91	2	0.008
	Alipurduar-II	243714	28.39	4	0.016
	Kumargram	220394	25.6	26	0.118
	Falakata	312719	17.43	2	0.006
	Kalchini	297459	14.49	8	0.027
	Madarihat	215411	18.14	2	0.009

	APD Municipality/ DH	66116	8.4	0	0.000
	District Total	1592205	18.42	44	0.028
2021	Alipurduar-I	228003	18.85	1	0.004
	Alipurduar-II	249636	26.02	6	0.024
	Kumargram	215917	24.12	5	0.023
	Falakata	312719	26.39	2	0.006
	Kalchini	297459	24.26	6	0.020
	Madarihat	218512	25.95	3	0.014
	District Total	1522246	23.71	23	0.015
2022	Alipurduar-I	245462	30.39	6	0.024
	Alipurduar-II	253066	36.91	15	0.059
	Kumargram	228850	29.68	12	0.052
	Falakata	324718	34.01	7	0.022
	Kalchini	308873	32.68	6	0.019
	Madarihat	223677	39.41	3	0.013
	District Total	1584646	32.85	49	0.031

ABER- Annual Blood Examination Rate, **API**-Annual Parasite Incidence

Table S2: The malaria cases reported from the study area in 2018-2020 and 2022.

Year	PHC	Subcentre	Village	Population	Pf cases	Pv cases	Total malaria cases	API (Malaria cases per 1000 population)
2018	Kumargram	West Chengmari	Paschim Chengmari	3398	0	0	0	0.00
			Lalchandpur	895	0	0	0	0.00
			Dhantali	940	0	1	1	1.06
			Subcentre Total	5233	0	1	1	0.19
2018	Kumargram	Turturikhanda	Turturikhanda	1552	0	3	3	1.93
			Turturi TE	2404	0	1	1	0.42
			Subcentre Total	3956	0	4	4	1.01
2018	Madhya Rangalibazna	Gopalpur T. G	Chapra Line	1402	0	0	0	0.00
			Kolkata Line	1418	0	0	0	0.00
			Jhari Line	1331	0	0	0	0.00
			Godwan Line	1210	0	0	0	0.00
			Upper Line	892	0	0	0	0.00
			Subcentre Total	6253	0	0	0	0.00
2018	Turturi	Uttar Shibkata	Uttar Shibkata	1255	0	3	3	2.39
			Srinathpur	900	0	2	2	2.22
			Maddhya Shibkata	899	0	2	2	2.22

			Subcentre Total	3054	0	7	7	2.29
2018	Turturi	Raydak TE –I	Raydak TG	4634	0	2	2	0.43
			Chipra Forest village	473	0	0	0	0.00
			Siltong Forest village	786	0	0	0	0.00
			Subcentre Total	5893	0	2	2	0.34
2019	Kumargram	West Chengmari	Paschim Chengmari	3398	0	4	4	1.18
			Lalchandpur	895	0	1	1	1.12
			Dhantali	940	0	1	1	1.06
			Subcentre Total	5233	0	6	6	1.15
2019	Kumargram	Turturikhanda	Turturikhanda	2552	0	4	4	1.57
			Turturi TE	2404	0	0	0	0.00
			Subcentre Total	4956	0	4	4	0.81
2019	Turturi	Rydak TE- I	Raydak TG	4634	2	200	202	43.59
			Chipra Forest village	473	0	0	0	0.00
			Siltong Forest village	786	0	0	0	0.00
			Subcentre Total	5893	2	200	202	34.28
2019	Kumargram	Joydebpur	Joydebpur	2620	0	5	5	1.91

			Pukharigaon	3018	0	0	0	0.00
			Amarpur	2637	0	3	3	1.14
			Subcentre Total	8275	0	8	8	0.97
2020	Kumargram	West Chengmari	Paschim Chengmari	3398	0	0	0	0.00
			Lalchandpur	895	0	0	0	0.00
			Dhantali	940	0	0	0	0.00
			Subcentre Total	5233	0	0	0	0.00
2022	Turturi	Dhowlabasti	Dhowlaj hora -I	1091	NA	NA	NA	NA
			Dhowlaj hora -II	1524	NA	NA	NA	NA
			Uttar Rampur	840	NA	NA	NA	NA
			Subcentre Total	3455	3	5	8	2.32

NA: Not available

Table S3: List of PCR primers used in the current studies

PCR	Forward (5'-3')	Reverse (5'-3')	Species	References
Maculatus group multiplex PCR	5.8F (ATCACTCGGCTCGTGGATCG) (Universal forward primer)	Mac (GACGGTCAGTCTGGTAAAGT)	<i>An. maculatus</i>	11
		PSEU (GCCCCCGGGTGTCAAACAG)	<i>An. pseudowillmori</i>	
		SAW (ACGGTCCCGCATCAGGTGC)	<i>An. sawadwongporni</i>	
		Form K (TTCATCGCTCGCCCTTACAA)	<i>Form K</i>	
		DRAV (GCCTACTTTGAGCGAGACCA)	<i>An. dravidicus</i>	
Funestus group multiplex PCR	5.8F (ATCACTCGGCTCATGGATCG) (Universal forward primer)	GGGCGCCATGTAGTTAGAGTTG	<i>An. minimus A</i>	12
		GTGGCCCCGCAATGTATG	<i>An. varuna</i>	
		AGGTTCACCCCGCTCTGG	<i>An. aconitus</i>	
		CTCCCCATAGCGCGTAAGC	<i>An. jeyporiensis</i>	
		GAAAGCACCTGAAACCTGCG	<i>An. pampanai</i>	
		GGTTGCCCACTCAATACGGGTG	<i>An. minimus C</i>	
<i>Annularis</i> group multiplex PCR	5.8F (TGTGAACTGCAGGACACATG) (Universal forward primer)	PHI (GCACG CCATTAT GCGACAAAC)	<i>An. philippinensis</i>	13
		NIV (CATGTA CCTCAGTACA TG TA)	<i>An. nivipes</i>	
		ANN (ACCCCTTTGCTAGCGCCCGTG)	<i>An. annularis</i>	
		PAL (GTTAAGTGAGACGATAAAGACC)	<i>An. pallidus</i>	
CO1 PCR	MBAR_F (GGATTGGAATTGATTAGTTCCTT)	MBAR_R (AAAAATTTAATTCCAGTTGGAACAGC)	Universal for all mosquito species	14
Human blood meal assay	HUM1 (CGAGAGTTCTCTGGAAGAATT GA)	HUM2 (TGATAGCCTGGAAGTGACAAAAT)	<i>Homo sapiens</i>	15