Title: Site-specific bio-efficacy of Interceptor G2 and Royal Guard against highly pyrethroid-resistant *Anopheles gambiae* s.l. in experimental hut in southwestern Burkina Faso.

SUPPLEMENTARY TABLES

Supplementary Table 1: Number of *An. gambiae* s.l. collected during the trial, found blood-fed, exiting, dead within seventy-two hours post collection and followed up, displayed by treatment and sites.

Site	Treatment	Dead_24h	Cum_dead_72h	Blood fed	Number exiting	Number followed up	Number collected
Tengrela	IG1_aged	134	224	382	237	1011	1166
	IG1_unw	119	165	336	196	958	1098
	IG2_aged	225	346	679	364	1552	1845
	IG2_unw	573	670	590	392	1430	1880
	IG2_w	195	220	511	190	937	1090
	RG_unw	111	120	220	122	412	557
	RG_w	62	65	223	72	345	451
	UT	199	263	1428	525	2636	3004
	Total in Tengrela	1618	2073	4369	2098	9281	11091
Tiefora	IG1_aged	33	88	255	76	391	424
	IG1_unw	77	115	184	119	356	431
	IG2_aged	76	146	218	92	367	443
	IG2_unw	192	263	253	137	330	475
	IG2_w	124	143	197	62	212	298
	RG_unw	63	75	117	60	211	262
	RG_w	33	57	30	100	256	278
	UT	93	114	578	202	999	1098
	Total in Tiefora	691	1001	1832	848	3122	3709
	Total	2309	3074	6201	2946	12403	14800

UT = untreated net, IG1_unw = unwashed Interceptor G1 nets, IG1_w = washed Interceptor G1 nets; IG2_unw = unwashed Interceptor G2 nets, IG2_w = washed Interceptor G2 nets; IG2_aged= aged Interceptor G2 nets; RG_unw = unwashed Royal Guard nets. RG_w = washed nets Royal Guard nets. Cum_dead_72h indicates the cumulative number of dead *An. gambiae* s.l. within 72 hours post collection and Dead_24h indicates the count of dead within 24 h post collection.

Supplementary Table 2: Comparative Odds Ratio of deterrence by contrasting treatment and sites. Estimates are derived from the generalised linear mixed effect model.

Treatment	Sites	ITNs vs UT		ITNs vs unwashed IG1		ITNs vs unwashed ITNs		IG2_aged vs IG2_w	
		Odds.ratio [95%CI]	P-value	Odds.ratio [95%CI]	P-value	Odds.ratio [95%CI]	P-value	Odds.ratio [95%CI]	P-value
IG1_aged	Tengrela	0.94 [0.72 –1.24]	0.96	1.02 [0.74 – 1.41]	1.00	–	–	–	–
IG1_unw	Tengrela	0.93 [0.70 –1.22]	0.92	–	–	–	–	–	–
IG2_aged	Tengrela	1.42 [1.08 –1.87]	0.01*	1.53 [1.12 – 2.11]	0.001*	1.34 [1.0 – 1.81]	0.05	1.45 [1.03 – 2.05]	0.03*
IG2_unw	Tengrela	1.05 [0.83 –1.33]	0.96	1.14 [0.85 – 1.53]	0.72	–	–	–	–
IG2_w	Tengrela	0.98 [0.74 –1.29]	1.00	1.06 [0.76 – 1.48]	0.98	0.93 [0.7 – 1.25]	0.95	–	–
RG_unw	Tengrela	1.11 [0.77 –1.61]	0.90	1.2 [0.80 – 1.80]	0.69			–	–
RG_w	Tengrela	0.61 [0.42 –0.90]	0.01*	0.66 [0.43 – 1.02]	0.07	0.55 [0.34 – 0.9]	0.01*	–	–
IG1_aged	Tiefora	0.72 [0.53 –0.97]	0.02*	1.08 [0.76 – 1.52]	0.96			–	–
IG1_unw	Tiefora	0.67 [0.50 –0.89]	0.001*	–	–	–	–	–	–
IG2_aged	Tiefora	0.6 [0.45 –0.81]	0.001*	0.91 [0.65 – 1.27]	0.91	0.80 [0.58 – 1.12]	0.37	0.57 [0.37 – 0.88]	0.005*
IG2_unw	Tiefora	0.75 [0.56 –1.01]	0.06	1.13 [0.81 – 1.57]	0.83	–	–	–	–
IG2_w	Tiefora	1.07 [0.72 –1.58]	0.98	1.6 [1.05 – 2.44]	0.02	1.41 [0.93 – 2.15]	0.14	–	–
RG_unw	Tiefora	0.91 [0.61 –1.35]	0.94	1.36 [0.89 – 2.09]	0.27	–	–	–	–
RG_w	Tiefora	1.21 [0.82 –1.79]	0.65	1.82 [1.16 – 2.84]	0.001*	1.34 [0.8 – 2.25]	0.53	–	–

ITNs = insecticide treated nets, UT = untreated net, IG1_unw = unwashed Interceptor G1 nets, IG1_w = washed Interceptor G1 nets; IG2_unw = unwashed Interceptor G2 nets, IG2_w = washed Interceptor G2 nets; IG2_aged= aged Interceptor G2 nets; RG_unw = unwashed Royal Guard nets. RG_w = washed Royal Guard nets. CI= Confidence intervals with * denoting P value < 0.05.

Supplementary Table 3: Exophily rates and comparative Odds Ratio by contrasting treatment and sites. Estimates are derived from the generalised linear mixed effect model.

Treatment	Sites	Exophily rate [95%CI]	ITNs vs UT		ITNs vs unwashed IG1		ITNs vs unwashed ITNs		IG2_aged vs IG2_w	
			Odds.ratio [95%CI]	P-value	Odds.ratio [95%CI]	P-value	Odds.ratio [95%CI]	P-value	Odds.ratio [95%CI]	P-value
UT	Tengrela	12.46 [10.39– 14.88]	–	–	–	–	–	–	–	–
IG1_aged	Tengrela	16.38 [12.61– 21]	1.38 [0.84– 2.24]	0.37	1.05 [0.58 –1.9]	1.00	–	–	–	–
IG1_unw	Tengrela	15.7 [11.93– 20.39]	1.31 [0.79– 2.17]	0.56	–	–	–	–	–	–
IG2_aged	Tengrela	15.55 [12.1– 19.76]	1.29 [0.81– 2.08]	0.54	0.99 [0.56 –1.76]	1.00	1.13 [0.67 – 1.90]	0.95	1.19 [0.67 – 2.12]	0.9
IG2_unw	Tengrela	13.98 [11.15– 17.39]	1.14 [0.74– 1.77]	0.89	0.87 [0.51 –1.51]	0.94	–	–	–	–
IG2_w	Tengrela	13.43 [10.11– 17.63]	1.09 [0.66– 1.81]	0.98	0.83 [0.46 –1.52]	0.90	0.95 [0.55 – 1.65]	1.00	–	–
RG_unw	Tengrela	17.76 [12.13– 25.27]	1.52 [0.79– 2.93]	0.39	1.16 [0.56 –2.42]	0.97	–	–	–	–
RG_w	Tengrela	11.69 [7.43– 17.92]	0.93 [0.45– 1.91]	1.00	0.71 [0.32 –1.57]	0.73	0.61 [0.24 – 1.50]	0.54	–	–
UT	Tiefora	13.7 [10.79– 17.24]	–	–	–	–	–	–	–	–
IG1_aged	Tiefora	13.13 [9.15– 18.51]	0.95 [0.5– 1.82]	1.00	0.45 [0.22 –0.93]	0.02*	–	–	–	–
IG1_unw	Tiefora	25.25 [18.98– 32.74]	2.13 [1.16– 3.91]	0.007*	–	–	–	–	–	–
IG2_aged	Tiefora	15.38 [11.1– 20.91]	1.14 [0.62– 2.11]	0.96	0.54 [0.27 –1.08]	0.11	0.61 [0.30 – 1.23]	0.29	0.92 [0.38 – 2.26]	0.99
IG2_unw	Tiefora	22.88 [17.03– 30.01]	1.87 [1.02– 3.43]	0.04*	0.88 [0.44 –1.76]	0.98	–	–	–	–
IG2_w	Tiefora	16.42 [10.16– 25.46]	1.24 [0.54– 2.82]	0.93	0.58 [0.24 –1.41]	0.43	0.66 [0.27 – 1.60]	0.68	–	–
RG_unw	Tiefora	18.17 [11.29– 27.91]	1.4 [0.61– 3.19]	0.77	0.66 [0.27 –1.6]	0.67	–	–	–	–
RG_w	Tiefora	28.47 [19.72– 39.22]	2.51 [1.2– 5.25]	0.006*	1.18 [0.52 –2.65]	0.97	1.79 [0.67 – 4.80]	0.46	–	–

ITNs = insecticide treated nets, UT = untreated net, IG1_unw = unwashed Interceptor G1 nets, IG1_w = washed Interceptor G1 nets; IG2_unw = unwashed Interceptor G2 nets, IG2_w = washed Interceptor G2 nets; IG2_aged= aged Interceptor G2 nets; RG_unw = unwashed Royal Guard nets. RG_w = washed Royal Guard nets. C*I* = Confidence intervals with * denoting P-value < 0.05.

Supplementary Table 4: The study arms and the characteristics of the nets as decided by the manufacturer and their provenance. NMCP: National malaria control programme

Treatment	Abbreviation	Active ingredient	Fabric type
Untreated net	UT	None	Polyester (100 denier) local market
Interceptor G1 unwashed (BASF)	IG1_unw	Alpha-cypermethrin at 200 mg/m^2	Polyester (100 denier)-NMCP
Interceptor G1 aged (BASF)	IG1_aged		
Interceptor G2 unwashed (BASF)	IG2_unw	Alpha-cypermethrin at 100 mg/m^2 + Chlorfenapyr at 200 mg/m^2	Polyester (100 denier)- NMCP distribution
Interceptor G2 20X washed (BASF)	IG2_w		Polyester (100 denier)
Interceptor G2 aged/used (BASF)	RG_aged		Polyester (100 denier)-NMCP Two years of aged
Royal Gard unwashed (Disease Control Technologies)	RG_unw	Alpha-cypermethrin at 5.83 g/kg + Pyriproxyfen at 5.54 g/kg	Polyethylene (150 denier) RCT-Tanzania
Royal Gard 20X washed (Disease Control Technologies)	RG_w		

Supplementary Table 5: Experimental treatments and yearly application record for each round

	Round 1			Round 2		
Treatment/ years	2019	2020	2021	2019	2020	2021
UT	x	x	x	NC	x	x
IG1_aged	NC	NC	x	NC	NC	x
IG1_unw	NC	x	x	NC	NC	NC
IG2_aged	NC	NC	x	NC	NC	NC
IG2_unw	x	x	x	NC	NC	NC
IG2_w	x	x	NC	NC	NC	NC
RG_unw	NC	x	NC	NC	NC	NC
RG_w	NC	NC	NC	NC	x	NC

UT = untreated net, IG1_unw = unwashed Interceptor G1 nets, IG1_w = washed Interceptor G1 nets; IG2_unw = unwashed Interceptor G2 nets, IG2_w = washed Interceptor G2 nets; IG2_aged = aged Interceptor G2 nets; RG_unw = unwashed Royal Guard nets. RG_w = washed Royal Guard nets. X = net used for collection and NC indicates this net was not used for collection during that trial.