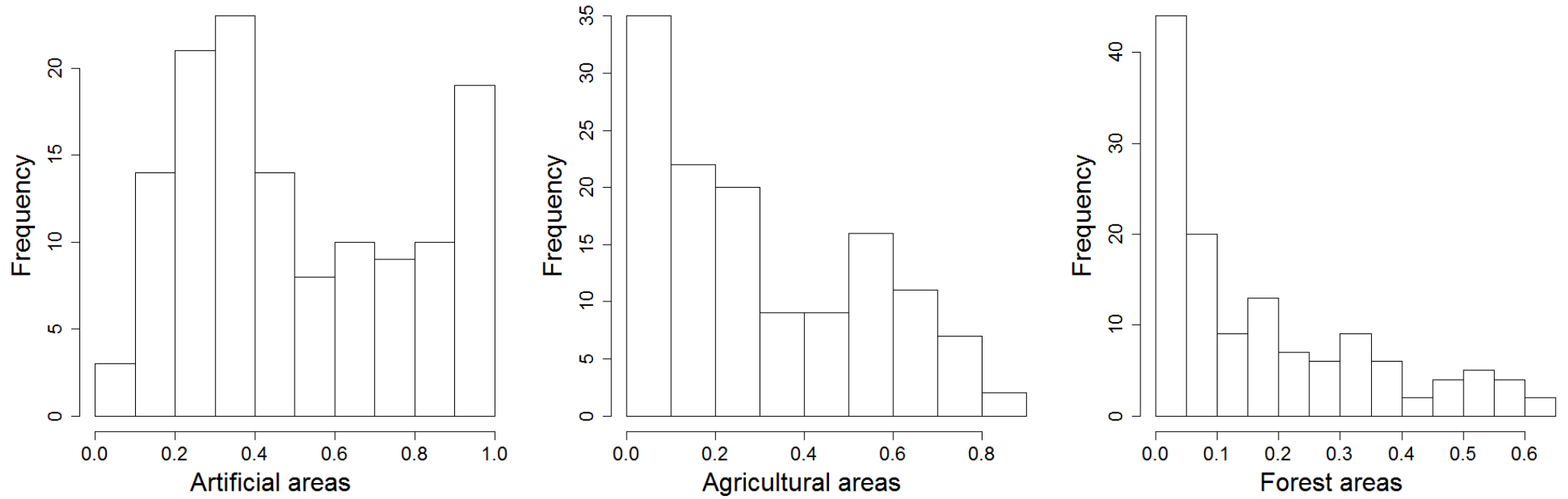


Supplementary materials

Figure S1. Histograms of the proportions of artificial, agricultural and forest areas in 250 m buffers around the sampling locations ($N=72$).

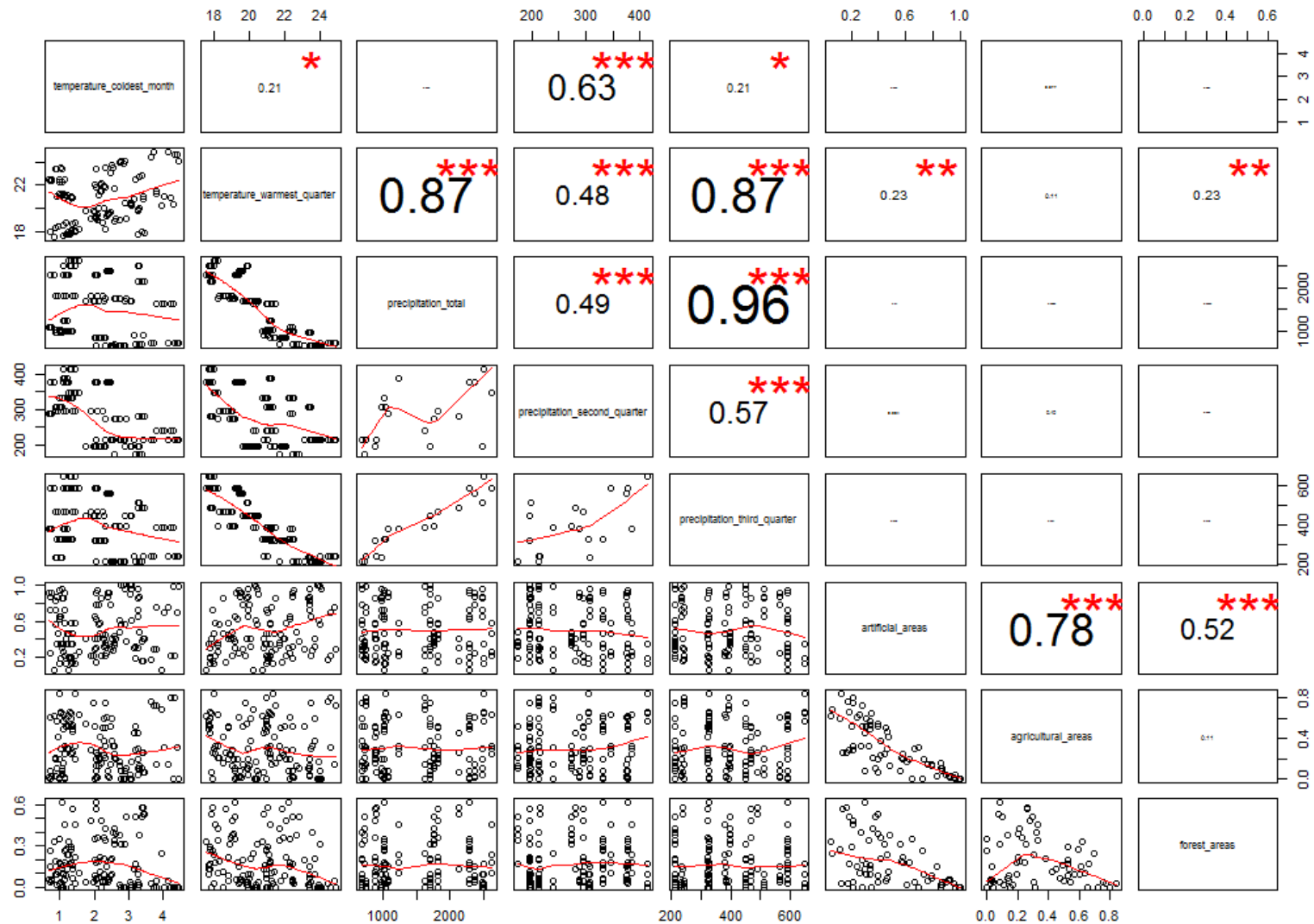


Figure S2. Scatterplot of the temperature of the coldest month, the temperature of the warmest quarter, the total annual precipitation, the precipitation of the second quarter, the precipitation of the third quarter and the proportions of artificial, agricultural and forest areas. The upper panels contain the Pearson correlation coefficient with the font proportional to its estimated value. The lower panels show scatterplots with a smoother added to visualize the pattern.

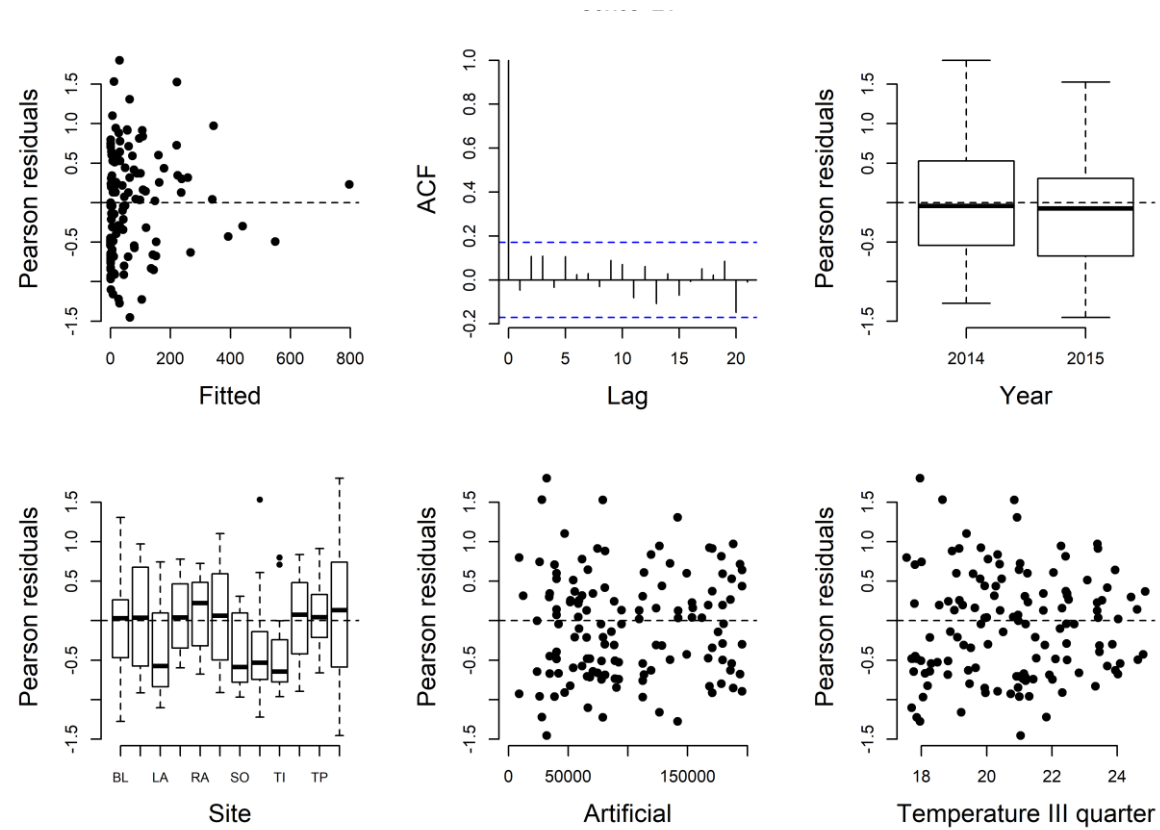


Figure S3. Assessment of model assumptions for the most parsimonious model selected. The term ‘Site’ corresponded to different localities [Belluno (BL), Lamen (LA), Riva del Garda-Arco (RA), Sospirolo (SO), Tisoi (TI), Tenno-Pranzo (TP)]. In each locality, 4 to 6 sampling location were selected.

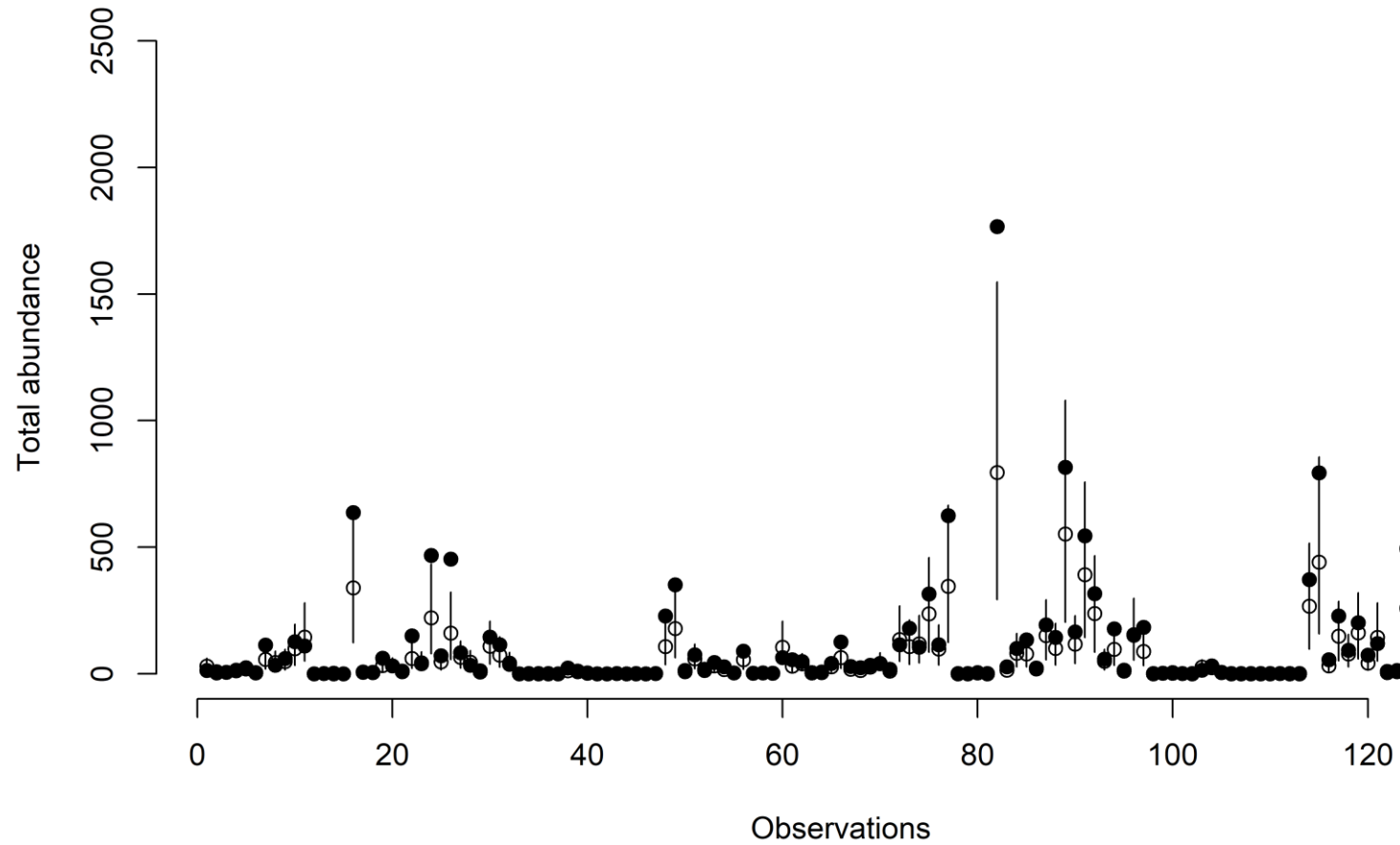


Figure S4. Results of the simulation study. Observed values (filled circles) vs. mean values (open circles) and 95% CI (vertical bars) of the negative binomial simulated distribution obtained from 10000 model simulations using covariates measured at each observation point.

Mapping of *Aedes albopictus* abundance at a local scale in Italy

Table S1. Original data (part 1/4) by sampling location including *Aedes albopictus* female sum, mean, standard error and range with altitude, weather and LULC variables.

idtrap	year	<i>Aedes albopictus</i> females					altitude	temperature coldest month	temperature warmest quarter	total precipitation	precipitation second quarter	precipitation third quarter	artificial areas	forest areas	agricultural areas
		sum	mean	se	min	max									
BLBG1	2014	13	1.63	0.68	0	6	406	0.74	17.96	2293.4	378	588.8	0.72	0.00	0.27
BLBG2	2014	3	0.38	0.26	0	2	430	2.02	19.22	2293.4	378	588.8	0.65	0.00	0.35
BLBG3	2014	5	0.63	0.50	0	4	410	2.05	19.30	2293.4	378	588.8	0.63	0.19	0.18
BLBG4	2014	13	1.63	0.84	0	7	411	2.07	19.27	2293.4	378	588.8	0.92	0.02	0.06
BLBG5	2014	21	2.63	1.16	0	8	416	2.06	19.17	2293.4	378	588.8	0.30	0.08	0.62
BLBG6	2014	3	0.38	0.26	0	2	400	2.07	19.44	2293.4	378	588.8	0.95	0.02	0.03
FEBG1	2014	78	9.75	5.52	0	47	285	3.28	19.82	2485.4	197	512.4	0.86	0.11	0.02
FEBG2	2014	27	3.38	1.05	0	8	277	3.31	19.97	2485.4	197	512.4	0.87	0.11	0.02
FEBG3	2014	58	7.25	3.87	0	33	277	3.29	19.94	2485.4	197	512.4	0.66	0.30	0.04
FEBG4	2014	100	12.50	4.44	1	38	283	3.29	19.94	2485.4	197	512.4	0.73	0.19	0.09
FEBG6	2014	93	11.63	5.55	0	49	282	3.29	19.94	2485.4	197	512.4	0.96	0.04	0.00
LABG1	2014	0	0.00	0.00	0	0	591	1.30	17.81	2503.2	414.8	645.4	0.18	0.66	0.17
LABG2	2014	1	0.13	0.14	0	1	588	1.45	18.00	2503.2	414.8	645.4	0.13	0.84	0.03
LABG3	2014	0	0.00	0.00	0	0	603	1.12	17.70	2503.2	414.8	645.4	0.34	0.57	0.09
LABG4	2014	0	0.00	0.00	0	0	592	1.34	17.86	2503.2	414.8	645.4	0.35	0.65	0.00
POBG1	2014	345	43.13	10.26	8	96	394	2.13	20.01	1704.4	195	450	0.79	0.13	0.07
POBG2	2014	6	0.75	0.37	0	2	453	1.74	19.82	1704.4	195	450	0.40	0.54	0.04
POBG3	2014	4	0.50	0.27	0	2	517	2.02	19.66	1704.4	195	450	0.28	0.52	0.20
POBG4	2014	43	5.38	2.05	0	19	488	2.30	20.04	1704.4	195	450	0.31	0.60	0.09
POBG5	2014	27	3.38	0.80	3	6	405	2.30	20.04	1704.4	195	450	0.41	0.38	0.21
POBG6	2014	10	1.25	0.75	0	6	452	1.97	19.80	1704.4	195	450	0.21	0.75	0.04
RABG1	2014	79	9.88	3.16	1	24	81	4.31	20.40	1632.8	238.2	390.6	0.99	0.00	0.00
RABG2	2014	39	4.88	1.14	0	10	84	3.83	21.49	1632.8	238.2	390.6	0.28	0.72	0.00
RABG3	2014	287	35.88	6.27	15	61	98	4.05	21.03	1632.8	238.2	390.6	0.69	0.31	0.00
RABG4	2014	48	6.00	1.87	0	16	76	4.24	20.96	1632.8	238.2	390.6	0.21	0.80	0.00
RABG5	2014	200	25.00	7.98	2	62	89	3.83	21.25	1632.8	238.2	390.6	0.76	0.14	0.05
RABG6	2014	73	9.13	2.94	0	23	110	3.97	20.23	1632.8	238.2	390.6	0.06	0.69	0.25
SGBG2	2014	30	3.75	2.40	0	17	308	2.38	19.48	2365.2	375.8	562.4	0.91	0.03	0.06
SGBG3	2014	11	1.38	0.82	0	7	297	2.37	19.38	2365.2	375.8	562.4	0.24	0.61	0.15
SGBG4	2014	116	14.50	6.09	0	51	296	2.47	19.64	2365.2	375.8	562.4	0.79	0.14	0.08
SGBG5	2014	92	11.50	3.35	0	23	303	2.43	19.58	2365.2	375.8	562.4	0.92	0.02	0.06
SGBG6	2014	36	4.50	3.26	0	27	304	2.41	19.52	2365.2	375.8	562.4	0.87	0.08	0.04

Mapping of *Aedes albopictus* abundance at a local scale in Italy

Table S1. Original data (part 2/4).

idtrap	year	<i>Aedes albopictus</i> females					altitude	temperature coldest month	temperature warmest quarter	total precipitation	precipitation second quarter	precipitation third quarter	artificial areas	forest areas	agricultural areas
		sum	mean	se	min	max									
SOBG1	2014	0	0.00	0.00	0	0	450	1.24	17.99	2624	346.6	589.8	0.46	0.30	0.24
SOBG2	2014	0	0.00	0.00	0	0	415	1.57	18.19	2624	346.6	589.8	0.26	0.63	0.10
SOBG3	2014	0	0.00	0.00	0	0	471	1.34	18.05	2624	346.6	589.8	0.58	0.24	0.18
SOBG4	2014	0	0.00	0.00	0	0	452	1.43	18.11	2624	346.6	589.8	0.21	0.33	0.46
STBG1	2014	0	0.00	0.00	0	0	558	1.20	18.82	1814.4	294	466.2	0.40	0.52	0.08
STBG2	2014	21	2.63	1.29	0	9	472	1.38	18.64	1814.4	294	466.2	0.14	0.26	0.57
STBG3	2014	7	0.88	0.58	0	4	491	1.44	18.81	1814.4	294	466.2	0.58	0.20	0.22
STBG4	2014	3	0.38	0.26	0	2	520	1.11	18.55	1814.4	294	466.2	0.86	0.15	0.00
STBG5	2014	0	0.00	0.00	0	0	545	0.94	18.49	1814.4	294	466.2	0.47	0.42	0.11
STBG6	2014	0	0.00	0.00	0	0	564	0.88	18.30	1814.4	294	466.2	0.57	0.21	0.19
TIBG1	2014	1	0.13	0.12	0	1	663	0.83	17.54	2293.4	378	588.8	0.05	0.62	0.33
TIBG3	2014	0	0.00	0.00	0	0	563	1.20	17.74	2293.4	378	588.8	0.34	0.53	0.13
TIBG4	2014	0	0.00	0.00	0	0	575	1.18	17.76	2293.4	378	588.8	0.12	0.59	0.28
TIBG5	2014	0	0.00	0.00	0	0	592	1.11	17.70	2293.4	378	588.8	0.34	0.49	0.16
TIBG6	2014	1	0.13	0.12	0	1	549	1.26	17.81	2293.4	378	588.8	0.20	0.52	0.29
TNBG1	2014	145	18.13	5.31	2	40	193	3.09	20.34	1704.4	195	450	0.61	0.17	0.02
TNBG2	2014	211	26.38	5.90	9	58	194	3.10	20.28	1704.4	195	450	1.00	0.00	0.00
TNBG3	2014	7	0.88	0.40	0	3	195	3.06	20.34	1704.4	195	450	1.00	0.00	0.00
TNBG4	2014	63	7.88	2.58	0	19	229	2.91	20.42	1704.4	195	450	0.56	0.08	0.31
TNBG5	2014	12	1.50	0.63	0	5	204	3.03	20.50	1704.4	195	450	0.90	0.04	0.04
TNBG6	2014	39	4.88	2.32	0	17	207	3.07	20.46	1704.4	195	450	0.96	0.00	0.00
TPBG1	2014	18	2.25	0.96	0	6	426	2.76	19.01	1763.2	273	396.6	0.48	0.13	0.38
TPBG2	2014	3	0.38	0.18	0	1	450	2.60	18.89	1763.2	273	396.6	0.44	0.25	0.31
TPBG3	2014	78	9.75	3.34	0	24	401	2.93	19.16	1763.2	273	396.6	0.38	0.10	0.51
TPBG4	2014	1	0.13	0.12	0	1	494	2.32	18.26	1763.2	273	396.6	0.36	0.21	0.43
TPBG5	2014	3	0.38	0.26	0	2	467	2.32	18.26	1763.2	273	396.6	0.33	0.33	0.34
TPBG6	2014	2	0.25	0.16	0	1	433	2.61	19.11	1763.2	273	396.6	0.40	0.20	0.39
TVBG1	2014	51	6.38	1.43	2	12	257	3.48	17.86	2136.6	281	489	0.40	0.07	0.53
TVBG2	2014	54	6.75	1.75	0	15	248	3.40	17.96	2136.6	281	489	0.16	0.26	0.58
TVBG3	2014	43	5.38	2.00	0	15	241	3.27	17.79	2136.6	281	489	0.30	0.45	0.13
TVBG4	2014	4	0.50	0.38	0	3	350	2.23	18.83	1814.4	294	466.2	0.45	0.50	0.05
TVBG5	2014	6	0.75	0.31	0	2	387	1.91	19.07	1814.4	294	466.2	0.21	0.28	0.49
TVBG6	2014	39	4.88	1.77	0	12	374	2.08	18.95	1814.4	294	466.2	0.41	0.23	0.36

Mapping of *Aedes albopictus* abundance at a local scale in Italy

Table S1. Original data (part 3/4).

idtrap	year	<i>Aedes albopictus</i> females					altitude	temperature coldest month	temperature warmest quarter	total precipitation	precipitation second quarter	precipitation third quarter	artificial areas	forest areas	agricultural areas
		sum	mean	se	min	max									
BLBG1	2015	99	12.38	5.93	0	45	406	1.12	20.94	1017.8	331.2	325.6	0.72	0.00	0.27
BLBG2	2015	25	3.13	1.69	0	14	430	0.98	22.28	1017.8	331.2	325.6	0.65	0.00	0.35
BLBG3	2015	14	1.75	0.86	0	7	410	0.98	22.31	1017.8	331.2	325.6	0.63	0.19	0.18
BLBG4	2015	23	2.88	1.42	0	11	411	1.15	22.45	1017.8	331.2	325.6	0.92	0.02	0.06
BLBG5	2015	39	4.88	0.95	1	9	416	1.07	22.25	1017.8	331.2	325.6	0.30	0.08	0.62
BLBG6	2015	12	1.50	0.73	0	6	400	0.97	22.51	1017.8	331.2	325.6	0.95	0.02	0.03
FEBG1	2015	89	11.13	3.77	0	29	285	1.07	23.34	970.6	306.8	235.2	0.86	0.11	0.02
FEBG2	2015	147	18.38	7.36	0	53	277	0.93	23.41	970.6	306.8	235.2	0.87	0.11	0.02
FEBG3	2015	103	12.88	5.55	0	46	277	1.03	23.46	970.6	306.8	235.2	0.66	0.30	0.04
FEBG4	2015	248	31.00	11.17	0	94	283	0.87	23.39	970.6	306.8	235.2	0.73	0.19	0.09
FEBG5	2015	98	12.25	3.80	0	35	286	0.87	23.42	970.6	306.8	235.2	0.83	0.03	0.15
FEBG6	2015	481	60.13	20.49	0	148	282	1.06	23.40	970.6	306.8	235.2	0.96	0.04	0.00
LABG1	2015	0	0.00	0.00	0	0	591	1.04	21.14	1027	305.8	325.4	0.18	0.66	0.17
LABG2	2015	0	0.00	0.00	0	0	588	0.97	21.31	1027	305.8	325.4	0.13	0.84	0.03
LABG3	2015	5	0.63	0.26	0	2	603	0.91	21.00	1027	305.8	325.4	0.34	0.57	0.09
LABG4	2015	0	0.00	0.00	0	0	592	1.04	21.19	1027	305.8	325.4	0.35	0.65	0.00
POBG1	2015	871	108.88	28.93	12	274	394	2.07	23.39	683.4	212.4	213.4	0.79	0.13	0.07
POBG3	2015	18	2.25	0.59	0	5	517	2.47	23.09	683.4	212.4	213.4	0.28	0.52	0.20
POBG4	2015	61	7.63	1.37	1	12	488	2.51	23.70	683.4	212.4	213.4	0.31	0.60	0.09
POBG5	2015	92	11.50	2.49	3	25	405	2.51	23.70	683.4	212.4	213.4	0.41	0.38	0.21
POBG6	2015	16	2.00	1.72	0	14	452	2.33	23.46	683.4	212.4	213.4	0.21	0.75	0.04
RABG1	2015	109	13.63	2.42	8	27	81	4.46	24.03	749.4	212	242.8	0.99	0.00	0.00
RABG2	2015	116	14.50	2.09	5	23	84	3.72	24.86	749.4	212	242.8	0.28	0.72	0.00
RABG3	2015	439	54.88	11.06	16	101	98	4.40	24.64	749.4	212	242.8	0.69	0.31	0.00
RABG4	2015	124	15.50	3.36	3	30	76	4.35	24.62	749.4	212	242.8	0.21	0.80	0.00
RABG5	2015	324	40.50	11.58	15	102	89	4.15	24.80	749.4	212	242.8	0.76	0.14	0.05
RACDC1	2015	267	33.38	8.42	5	70	92	3.67	24.43	749.4	212	242.8	0.17	0.77	0.03
SGBG1	2015	48	6.00	3.30	0	22	310	0.74	22.45	1083.4	287.4	382	0.92	0.03	0.05
SGBG2	2015	129	16.13	5.46	0	37	308	0.74	22.42	1083.4	287.4	382	0.91	0.03	0.06
SGBG3	2015	8	1.00	0.33	0	2	297	0.73	22.32	1083.4	287.4	382	0.24	0.61	0.15
SGBG5	2015	121	15.13	6.10	0	45	303	0.70	22.47	1083.4	287.4	382	0.92	0.02	0.06
SGBG6	2015	102	12.75	5.27	0	36	304	0.70	22.43	1083.4	287.4	382	0.87	0.08	0.04

Mapping of *Aedes albopictus* abundance at a local scale in Italy

Table S1. Original data (part 4/4).

idtrap	year	<i>Aedes albopictus</i> females					altitude	temperature coldest month	temperature warmest quarter	total precipitation	precipitation second quarter	precipitation third quarter	artificial areas	forest areas	agricultural areas
		sum	mean	se	min	max									
SOBG1	2015	0	0.00	0.00	0	0	450	1.22	21.11	1229.4	386.2	379.4	0.46	0.30	0.24
SOBG2	2015	2	0.25	0.25	0	2	415	1.11	21.27	1229.4	386.2	379.4	0.26	0.63	0.10
SOBG3	2015	3	0.38	0.26	0	2	471	1.14	21.17	1229.4	386.2	379.4	0.58	0.24	0.18
SOBG4	2015	1	0.13	0.12	0	1	452	1.15	21.20	1229.4	386.2	379.4	0.21	0.33	0.46
STBG1	2015	0	0.00	0.00	0	0	558	2.01	22.02	867.6	196	324	0.40	0.52	0.08
STBG2	2015	12	1.50	0.53	0	4	472	2.07	21.83	867.6	196	324	0.14	0.26	0.57
STBG3	2015	31	3.88	1.62	0	12	491	2.16	22.05	867.6	196	324	0.58	0.20	0.22
STBG4	2015	4	0.50	0.33	0	2	520	2.20	21.52	867.6	196	324	0.86	0.15	0.00
STBG5	2015	0	0.00	0.00	0	0	545	2.17	21.43	867.6	196	324	0.47	0.42	0.11
STBG6	2015	0	0.00	0.00	0	0	564	2.14	21.20	867.6	196	324	0.57	0.21	0.19
TIBG1	2015	0	0.00	0.00	0	0	663	1.25	20.74	1017.8	331.2	325.6	0.05	0.62	0.33
TIBG2	2015	0	0.00	0.00	0	0	557	1.38	20.96	1017.8	331.2	325.6	0.46	0.47	0.07
TIBG3	2015	0	0.00	0.00	0	0	563	1.38	20.96	1017.8	331.2	325.6	0.34	0.53	0.13
TIBG4	2015	1	0.13	0.12	0	1	575	1.35	20.97	1017.8	331.2	325.6	0.12	0.59	0.28
TIBG5	2015	0	0.00	0.00	0	0	592	1.37	20.92	1017.8	331.2	325.6	0.34	0.49	0.16
TIBG6	2015	0	0.00	0.00	0	0	549	1.35	21.01	1017.8	331.2	325.6	0.20	0.52	0.29
TNBG1	2015	198	24.75	9.27	2	78	193	2.75	23.95	683.4	212.4	213.4	0.61	0.17	0.02
TNBG2	2015	387	48.38	14.23	0	104	194	2.84	23.85	683.4	212.4	213.4	1.00	0.00	0.00
TNBG3	2015	40	5.00	1.80	0	14	195	2.76	23.94	683.4	212.4	213.4	1.00	0.00	0.00
TNBG4	2015	150	18.75	5.66	1	41	229	2.79	24.03	683.4	212.4	213.4	0.56	0.08	0.31
TNBG6	2015	61	7.63	1.84	0	17	207	2.88	24.10	683.4	212.4	213.4	0.96	0.00	0.00
TNCDC2	2015	180	22.50	6.51	0	53	188	2.55	23.53	683.4	212.4	213.4	0.27	0.32	0.40
TPBG1	2015	42	5.25	2.37	0	20	426	3.29	22.69	716.6	174.6	211.8	0.48	0.13	0.38
TPBG3	2015	103	12.88	3.69	2	32	401	3.41	22.83	716.6	174.6	211.8	0.38	0.10	0.51
TPBG4	2015	6	0.75	0.49	0	4	494	2.60	21.74	716.6	174.6	211.8	0.36	0.21	0.43
TPBG5	2015	9	1.13	0.40	0	3	467	2.60	21.74	716.6	174.6	211.8	0.33	0.33	0.34
TPCDC1	2015	292	36.50	7.73	4	64	424	3.20	22.47	716.6	174.6	211.8	0.31	0.52	0.17
TPCDC2	2015	256	32.00	9.68	0	78	378	3.20	22.47	716.6	174.6	211.8	0.18	0.29	0.51
TVBG1	2015	361	45.13	12.27	5	98	257	3.41	20.85	903	215.2	239.8	0.40	0.07	0.53
TVBG2	2015	25	3.13	1.62	0	14	248	3.45	21.04	903	215.2	239.8	0.16	0.26	0.58
TVBG3	2015	86	10.75	3.44	0	24	241	3.17	20.81	903	215.2	239.8	0.30	0.45	0.13
TVBG4	2015	6	0.75	0.49	0	4	350	2.32	21.78	867.6	196	324	0.45	0.50	0.05
TVBG5	2015	7	0.88	0.52	0	4	387	2.19	22.11	867.6	196	324	0.21	0.28	0.49
TVBG6	2015	42	5.25	2.11	0	15	374	2.27	21.93	867.6	196	324	0.41	0.23	0.36

In the Table S1, the two first letters of the idtrap corresponded to one or several localities as follows: Belluno (BL), Feltre (FE), Lamen (LA), Povo-Cognola-Tavernaro (PO), Riva del Garda-Arco (RA), Santa Giustina (SG), Sospirolo (SO), Strigno-Telve (ST), Tisoi (TI), Trento (TN), Tenno-Pranzo (TP) and Tezze-Villa Agnedo (TV). The units are indicated in parenthesis: altitude (m a.s.l.), temperatures (°C) and precipitation (mm). The LULC areas corresponded to the proportions of artificial, forest or agricultural areas in a 250 m buffer around the sampling location.