Table S1. Wheat aphid sampling sites and collection dates

No.	Location	Longitude and latitude	Code	Species collected	Date
1	Mianyang, Sichuan	N31°58'48'', E104°86'11''	SCM-2019	*R. padi*	28/2/2019
2	Kunming, Yunnan	N24°59'58'', E102°33'11''	YNK-2019	*S. miscanthi*, *R. padi*	3/3/2019
			YNK-2021	*S. miscanthi*	31/3/2021
3	Guiyang, Guizhou	N26°00'34'', E106°35'04''	GZG-2019	*S. miscanthi*, *R. padi*, *M. dirhodum*	25/3/2019
			GZG-2021	*S. miscanthi*, *R. padi*, *M. dirhodum*	25/3/2021
4	Xiangyang, Hubei	N32°13'27'', E112°13'04''	HBX-2019	*S. miscanthi*, *R. padi*	4/4/2019
			HBX-2021	*S. miscanthi*, *R. padi*	22/2/2021
5	Hefei, Anhui	N31°53'43'', E117°14'21''	AHH-2019	*S. miscanthi*, *R. padi*	12/4/2019
			AHH-2021	*S. miscanthi*, *R. padi*	10/4/2021
6	Yangzhou, Jiangsu	N32°23'08'', E119°25'07''	JSY-2019	*R. padi*,	14/4/2019
7	Zhumadian, Henan	N33°22'20'', E114°04'26''	HNZ-2019	*S. miscanthi*, *R. padi*	25/4/2019
8	Xinxiang, Henan	N35°8'21'', E113°46′17''	HNX-2019	*S. miscanthi*	26/4/2019
			HNX-2021	*S. miscanthi*, *R. padi*	26/4/2019
9	Qingdao, Shandong	N36°26'19'', E120°04'45''	SDQ-2019	*S. miscanthi*	27/4/2019
10	Jining, Shandong	N35°10'12'', E116°30'21''	SDJ-2019	*S. miscanthi*, *R. padi*	28/4/2019
11	Tianjin	N39°21'43'', E117°12'46''	TJ-2019	*S. miscanthi*, *R. padi*	21/5/2019
12	Langfang, Hebei	N39°30'29'', E116°36'09''	HBL-2019	*S. miscanthi*, *M. dirhodum*	12/5/2019
			HBL-2021	*S. miscanthi*, *R. padi*	21/5/2021
13	Yangling, Shanxi	N34°15'33'', E108°02'33''	SXY-2019	*S. miscanthi*, *R. padi*, *M. dirhodum*	13/5/2019
			SXY-2021	*S. miscanthi*, *R. padi*, *M. dirhodum*	20/5/2021
14	Linfen, Shanxi	N36°02'33'', E111°30'04''	SXL-2019	*S. miscanthi*, *R. padi*, *M. dirhodum*	14/5/2019
			SXL-2021	*R. padi*	21/5/2021
15	Kashgar, Xinjiang	N38°11'25'', E77°11'12''	XJK-2019	*S. miscanthi*, *R. padi*, *M. dirhodum*	28/5/2019
16	Ili, Xinjiang	N43°56'33'', E81°26'31''	XJI-2021	*R. padi*, *M. dirhodum*	25/6/2020
17	Yinchuan, Ningxia	N39°5'57'', E106°44'51''	NXY-2019	*S. miscanthi*, *R. padi*, *M. dirhodum*	15/6/2019
18	Xining, Qinghai	N36°02'15'', E101°27'13''	QHX-2019	*S. miscanthi*, *R. padi*, *M. dirhodum*	17/6/2019
			QHX-2021	*S. miscanthi*, *R. padi*	19/6/2021
19	Hailar, Inner Mongolia	N49°58'47'', E120°05'45''	IMH-2019	*S. miscanthi*, *R. padi*	3/8/2019

Table S2. Differences in the toxicity of sulfoxaflor among various wheat aphid field populations

Code	LDR_{50} (95%CIs) [a]	Hypothesis of equality	Hypothesis of parallelism
		χ^2, P	χ^2, P
S. miscanthi / *R. padi*			
AHH-2019	1.897 (1.125-3.199)	8.51, 0.014	0.48, 0.488
AHH-2021	0.295 (0.163-0.531)	40.88, 0.000	35.97, 0.000
GZG-2019	5.276 (2.780-10.015)	34.31, 0.000	0.18, 0.671
GZG-2021	1.110 (0.687-1.791)	3.40, 0.183	1.97, 0.160
HBL-2021	1.309 (0.761-2.250)	2.98, 0.225	0.98, 0.323
HBX-2019	2.909 (1.364-6.203)	28.32, 0.000	5.29, 0.021
HBX-2021	0.644 (0.379-1.094)	28.22, 0.000	25.78, 0.000
HNX-2021	0.054 (0.029-0.099)	135, 0.000	3.87, 0.049
HNZ-2019	2.942 (1.737-4.984)	17.44, 0.000	0.00, 1.000
IMH-2019	0.504 (0.288-0.882)	8.17, 0.017	2.34, 0.126
NXY-2019	3.475 (2.023-5.970)	43.71, 0.000	6.67, 0.010
QHX-2019	2.931 (1.583-5.425)	14.76, 0.001	4.08, 0.043
QHX-2021	0.247 (0.172-0.355)	52.99, 0.000	5.26, 0.022
SDJ-2019	0.588 (0.358-0.967)	8.36, 0.015	7.05, 0.008
SXL-2019	5.396 (2.582-11.280)	23.91, 0.000	0.01, 0.939
SXY-2019	1.090 (0.556-2.133)	0.25, 0.881	0.18, 0.672
SXY-2021	5.846 (4.127-8.280)	109.00, 0.000	4.54, 0.033
TJ-2019	1.058 (0.555-2.018)	0.38, 0.826	0.30, 0585
XJK-2019	0.343 (0.197-0.598)	15.50, 0.000	0.16, 0.691
YNK-2019	36.254 (12.290-106.950)	89.12, 0.000	6.30, 0.012
S. miscanthi / *M. dirhodum*			
GZG-2019	2.439 (1.386-4.291)	10.32, 0.006	0.06, 0.809
GZG-2021	22.856 (5.934-88.050)	152.00, 0.000	0.38, 0.538
HBL-2019	0.091 (0.027-0.305)	40.86, 0.000	15.87, 0.000
NXY-2019	1.614 (0.935-2.786)	4.69, 0.096	0.60, 0.439
QHX-2019	5.512 (2.87-10.569)	29.47, 0.000	0.85, 0.357
SXL-2019	1.035 (0.486-2.202)	0.05, 0.975	0.05, 0.821
SXY-2019	5.200 (2.431-11.124)	20.71, 0.000	1.76, 0.185
SXY-2021	0.904 (0.567-1.440)	33.30, 0.000	32.84, 0.000
XJK-2019	26.401 (9.984-69.816)	59.40,0.000	14.59, 0.000

Continue Table S2.

Code	LDR_{50} (95%CIs) [a]	Hypothesis of equality	Hypothesis of parallelism
		χ^2, P	χ^2, P
R. padi / *M. dirhodum*			
GZG-2019	0.462 (0.235-0.907)	6.53, 0.038	0.03, 0.857
GZG-2021	20.602 (5.409-78.464)	141.00, 0.000	0.00, 0.979
NXY-2019	0.464 (0.283-0.761)	21.97, 0.000	4.05, 0.044
QHX-2019	1.075 (0.548-2.110)	1.13, 0.569	0.79, 0.375
SXL-2019	4.301 (1.996-9.269)	15.37, 0.000	0.64, 0.425
SXY-2019	4.773 (2.213-10.291)	17.71, 0.000	0.86, 0.353
SXY-2021	1.000 (0.564-1.772)	0.00, 1.000	0.00, 1.000
XJI-2021	0.020 (0.010-0.040)	214.00, 0.000	17.20, 0.000
XJK-2019	1.000 (0.124-8.043)	0.00, 1.000	0.00, 1.000

[a] the 95% confidence intervals of median lethal dose ratio.

The LCR_{50} (95%CIs) > 1 indicated that the latter species was more susceptible to sulfoxaflor than the former species. The LCR_{50} (95%CIs) < 1 indicated that the latter species was less susceptible to sulfoxaflor than the former species. The inclusion of 1 in the LCR_{50} (95%CIs) indicated that the susceptibility levels of the two species to sulfoxaflor were not significantly different.