Supplementary material for：

Prevalence of *Borrelia burgdorferi* in Ixodidae tick around Asia: a systematic review and meta-analysis

Content

Supplementary Material 1: Assessment of risk of bias

Items
Was the study's target population a close representation of the population in relation to relevant variables? *0. No or Unclear* *1. Clear description of infection diagnosis: Polymerase Chain Reaction (PCR), immunofluorescent antibody assay (IFA), Direct Immunofluorescent Assay (DFA), Spirochete Culture, and so on*
Was the sampling frame a true or close representation of the target population? *0. No or Unclear* *1. Yes*
Was some form of random selection used to select the sample, OR was a census undertaken? *0. No or Unclear* *1. Yes*
Was the likelihood of nonresponse bias minimal? *0. No or Unclear* *1. Yes*
Were data collected directly from the subjects (as opposed to a proxy)? *0. No: proxy, databases, medical reports only* *1. Directly from the subjects*
Was an acceptable case definition of positive infection used in the study? *0. Unclear* *1. Laboratory-based*
Was the study method that diagnosed Positive *B.burgdorferi* infection shown to have validity and reliability? *0. No description of the method* *1. Yes: Polymerase Chain Reaction (PCR), immunofluorescent antibody assay (IFA), Direct Immunofluorescent Assay (DFA), Spirochete Culture, and so on*
Was the same mode of data collection used for all subjects? *0. No or Unclear* *1. Yes*
Was the length of the shortest prevalence period for the parameter of interest appropriate? *0. No or Unclear* *1. Yes*
Were the numerator(s) and denominator(s) for the parameter of interest appropriate and clearly reported? *0. No or Unclear* *1. Yes*

Study	Authors	Score	Low risk	Moderate risk	High risk
1	Gao Y (2021)	10	+	–	–
2	Seo HJ (2021)	8	–	+	–
3	Wang Q (2021)	10	+	–	–
4	Seo MG (2020)	8	–	+	
5	Kim SY (2020)	9	+	–	–
6	Nakayama S (2020)	8	–	+	–
7	Seto J (2020)	10	+	–	–
8	Orkun Ö (2020)	9	+	–	–
9	Kaenkan W (2020)	9	+	–	–
10	Fischer T (2020)	10	+	–	–
11	Ghafar A (2020)	9	+	–	–
12	Rar V (2019)	9	+	–	–
13	Pukhovskaya NM (2019)	8	–	+	–
14	Kim CM (2019)	10	+	–	–
15	Duan CJ (2019)	9	+	–	–
16	Jiang BG (2018)	10	+	–	–
17	Hagen RM (2018)	9	+	–	–
18	Narankhajid M (2018)	8	–	+	–
19	Zheng WQ (2018)	8	–	+	–
20	Khoo JJ (2018)	8	–	+	–
21	Ye NN (2018)	9	+	–	–
22	Qin LX (2018)	7	–	+	–
23	Yang Y (2018)	9	+	–	–
24	Tang F (2018)	9	+	–	–
25	Liu XY (2017)	10	+	–	–
26	Karasartova D (2017)	10	+	–	–
27	Kuo CC (2017)	7	–	+	–
28	Pan YP (2017)	8	–	+	–
29	Li HY (2017)	10	+	–	–
30	Sakakibara K (2016)	9	+	–	–
31	Khasnatinov MA (2016)	9	+	–	–
32	Yu PF (2016)	9	+	–	–
33	Yang Y (2016)	8	–	+	–
34	Zang F (2016)	10	+	–	–
35	Han H (2016)	9	+	–	–
36	Yang J (2016)	9	+	–	–
37	Hong XK (2016)	9	+	–	–
38	Liu L (2015)	9	+		
39	Chen C (2015)	8	–	+	–
40	Han H (2015)	10	+	–	–
41	Wang XR (2015)	9	+	–	–
42	Chen Z (2014)	10	+	–	–
43	Takano A (2014)	10	+	–	–
44	Lee K (2014)	10	+	–	–
45	Hou J (2014)	8	–	+	–

46	Masuzawa T (2014)	9	+	–	–
47	Orkun O (2014)	8	–	+	–
48	Wang W (2013)	9	+	–	–
49	Sun X (2013)	9	+	–	–
50	Wang XL (2013)	8	–	+	–
51	Murase Y (2012)	9	+	–	–
52	Chao LL (2012)	8	–	+	–
53	Scholz HC (2012)	9	+	–	–
54	Li YP (2012)	10	+	–	–
55	Ahantarig A (2011)	10	+	–	–
56	Sen E (2011)	8	–	+	–
57	Yang Y (2011)	9	+	–	–
58	Huang CM (2010)	8	–	+	–
59	Chao LL (2010)	8	–	+	–
60	Geng Z (2010)	8	–	+	–
61	Niu QL (2010)	10	+	–	–
62	Chao LL (2009)	7	–	+	–
63	Wang CS (2009)	8	–	+	–
64	Chu CY (2008)	9	+	–	–
65	He H (2007)	9	+	–	–
66	Gao LY (2007)	9	+	–	–
67	Chu CY (2006)	10	+	–	–
68	Huang HM (2006)	9	+	–	–
69	Hiroko H (2005)	9	+	–	–
70	Zhao QM (2005)	10	+	–	–
71	Güner ES (2003)	9	+	–	–
72	Cao WC (2003)	10	+	–	–
73	Wang ZX (2003)	7	–	+	–
74	Takada N (2001)	9	+	–	–
75	Ishiguro F (2000)	8	–	+	–
76	Hua MT (2000)	9	+	–	–
77	Tian W (1998)	10	+	–	–
78	Takada N (1998)	9	+	–	–
79	Wan KL (1998)	8	–	+	–
80	Seo MG (2020)	8	–	+	–
81	Miyamoto K (1997)	9	+	–	–
82	Sato Y (1996)	10	+	–	–
83	NAKAO M (1992)	8	–	+	–
84	Takada N (1994)	9	+	–	–
85	Mo YM (1994)	7	–	+	–
86	NAKAO M (1992)	9	+	–	–
87	Miyamoto K (1992)	7	–	+	–
88	Du Y (1992)	9	+	–	–
89	Zhag QN (1991)	8		+	–
90	Ai CX (1990)	9	+	–	–
91	Li SQ (1990)	9	+	–	–

Supplementary Material 2: PRISMA checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	**Title**
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	**Abstract**
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	**Introduction, paragraph 1-3**
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	**Introduction, paragraph 4**
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	**Methods, paragraph 1-8**
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	**Methods, paragraph 2**
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	**Methods, paragraph 1**
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	**Methods, paragraph 1**
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	**Methods, paragraph 2**
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	**Methods, paragraph 2-3**
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	**Methods, paragraph 3**
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	**Methods, paragraph 4**
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	**Methods, paragraph 4-6**
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	**Methods, paragraph 4-6**

Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	**Methods, paragraph 4**
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	**Methods, paragraph 4**
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	**Results, paragraph 1 Figure1**
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	**Results, paragraph 2 Table 1**
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	**Results, paragraph 2**
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	**Results, paragraph 3 Figure 2**
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	**Results, paragraph 2-4 Table1**
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	**Results, paragraph 7 Figure 1-3 Table 1**
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	**Supplementary**
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	**Discussion, paragraph 1-6**
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	**Discussion, paragraph 6**
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	**Discussion, paragraph 6**
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	**Acknowledgments**

Supplementary Material 3: Meta-analysis included articles

[1] Gao Y, Lv XL, Han SZ, et al. First detection of *Borrelia miyamotoi* infections in ticks and humans from the northeast of Inner Mongolia, China. 2021. Acta Trop. 2021, 217:105857.
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evaluated by nested PCRs. Acta Trop. 2016, 158:181-188.
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Supplementary Material 4: Study characteristic

Study	Authors	Event	No	Country	Method	Phase	Capture month	Genus	No.infection/No.examined
1	Gao Y (2021)	10	774	China	PCR	-	4-9	264 *I. persulcatus,* 127 *D. nuttalli,* 78 *D. silvarum,* 275 *H. longicornis*	7/264 *I. persulcatus,* 1/127 *D. nuttalli,* 1/78 *D. silvarum,* 1/275 *H. longicornis*
2	Seo HJ (2021)	15	380	South Korea	PCR	adult, larva, nymph	-	40 *I. nipponensis,* 230 *I. turdus,* 74 *H. flava,* 2 *H. formosensis,* 29 *H. longicornis,* 4 *H. phasiana,* 1 *A. testudinarium*	0/40 *I. nipponensis,* 14/230 *I. turdus,* 1/74 *H. flava,* 0/2 *H. formosensis,* 0/29 *H. longicornis,* 0/4 *H. phasiana,* 0/1 *A. testudinarium*
3	Wang Q (2021)	18	250	China	PCR	adult, nymph	4-6	120 *D. silvarum,* 21 *D. nuttalli,* 47 *H. concinna,* 38 *H. japonica,* 42 *I. persulcatus*	1/120 *D. silvarum,* 0/21*D. nuttalli,* 2/47 *H. concinna,* 2/38 *H. japonica,* 13/42 *I. persulcatus*
4	Seo MG (2020)	6	329	South Korea	PCR	adult, nymph	5-9	14 *I. nipponensis,* 282 *H. longicornis,* 33 *H. flava*	2/14 *I. nipponensis,* 3/282 *H. longicornis,* 1/33 *H. flava*
5	Kim SY (2020)	248	738	South Korea	PCR	larva, nymph	3-5, 9-11	193 *I. nipponensis,* 96 *I. angustus,* 440 *I. spp.,* 9 *H. longicornis*	109/193 *I. nipponensis,* 3/96 *I. angustus,* 135/440 *I. spp.,* 1/9 *H. longicornis*
6	Nakayama S (2020)	2	561	Japan	PCR	adult, larva, nymph	1-12	3 *I. turdus,* 5 *I. ovatus,* 22 *A. testudinarium,* 213 *H. flava,* 78 *H. formosensis,* 24 *H. kitaokai,* 137 *H. longicornis,* 15 *H. hystricis,* 28 *H. megaspinosa*	1/3 *I. turdus,* 0/5 *I. ovatus,* 0/22 *A. testudinarium,* 0/213 *H. flava,* 0/78 *H. formosensis,* 0/24 *H. kitaokai,* 0/137 *H. longicornis,* 0/15 *H. hystricis,* 1/28 *H. megaspinosa*
7	Seto J (2020)	12	164	Japan	PCR	adult	3-7	9 *I. persulcatus,* 95 *I. ovatus,* 4 *I. tanuki,* 37 *I. nipponensis,* 7 *H. longicornis,* 10 *H. flava,* 2 *H. japonica*	1/9 *I. persulcatus,* 11/95 *I. ovatus,* 0/37 *I. nipponensis,* 0/4 *I. tanuki,* 0/7 *H. longicornis,* 0/10 *H. flava,* 0/2 *H. japonica*
8	Orkun Ö (2020)	3	1019	Turkey	PCR	adult, nymph	-	30 *I. ricinus,* 739 *H. parva,* 16 *H. sulcata,* 3 *H. punctata,* 105 *H. marginatum,* 11 *H. excavatum,* 9 *H. aegyptium,* 41 *D. marginatus,* 2 *D. reticulatus,* 9 *Rh. turanicus*	3/30 *I. ricinus,* 0/739 *H. parva,* 0/16 *H. sulcata,* 0/3 *H. punctata,* 0/105 *H. marginatum,* 0/11 *H. excavatum,* 0/9 *H. aegyptium,* 0/41 *D. marginatus,* 0/2 *D. reticulatus,* 0/9 *Rh. turanicus*

9	Kaenkan W (2020)	20	127	Thailand	PCR	adult, nymph	-	28 *A. helvolum,* 62 *A. varanense,* 31 *A. geoemydae,* 6 *A. spp*	1/28 *A. helvolum,* 17/62 *A. varanense,* 2/31 *A. geoemydae,* 0/6 *A. spp*
10	Fischer T (2020)	1	310	Mongolia	PCR	adult	5-6	310 *D. nuttalli*	1/310 *D. nuttalli*
11	Ghafar A (2020)	15	234	Pakistan	PCR	-	9-11	212 *Hy. Anatolicum,* 3 *Hy. Hussaini,* 1 *Hy. Scupense,* 17 *Rh. Microplus,* 1 *Rh. annulatus*	14/212 *Hy. Anatolicum,* 0/3 *Hy. Hussaini,* 0/1 *Hy. Scupense,* 1/17 *Rh. Microplus,* 0/1 *Rh. annulatus*
12	Rar V (2019)	742	1822	Russia (Siberia)	PCR	-	5-6	668 *I. persulcatus,* 1154 *I. pavlovskyi*	252/668 *I. persulcatus,* 490/1154 *I. pavlovskyi*
13	Pukhovskaya NM (2019)	605	2158	Russia (Siberia)	PCR	-	-	1599 *I. persulcatus,* 481 *H. concinna,* 49 *H. japonica,* 29 *D. silvarum*	582/1599 *I. persulcatus,* 14/481 *H. concinna,* 7/49 *H. japonica,* 2/29 *D. silvarum*
14	Kim CM (2019)	5	484	South Korea	PCR	adult, larva, nymph	4-9	25 *I. nipponensis,* 417 *H. longicornis,* 42 *H. flava*	5/25 *I. nipponensis,* 0/417 *H. longicornis,* 0/42 *H. flava*
15	Duan CJ (2019)	3	724	China	other	-	3	724 *R(B). microplus*	3/724 *R(B). microplus*
16	Jiang BG (2018)	20	692	China	PCR	adult	-	627 *I. persulcatus,* 36 *H. concinna,* 29 *D. silvarum*	19/627 *I. persulcatus,* 1/36 *H. concinna,* 0/29 *D. silvarum*
17	Hagen RM (2018)	23	403	South Korea	PCR	adult, nymph	-	255 *A. variegatum,* 148 *R. microplus*	21/255 *A. variegatum,* 2/148 *R. microplus*
18	Narankhajid M (2018)	9	360	Mongolia	PCR	adult	-	16 *I. persulcatus,* 402 *D. nuttalli,* 44 *D. marginatus,* 6 *D. silvarum,* 60 *H. asiaticum*	2/7 *I. persulcatus,* 6/272 *D. nuttalli,* 0/35 *D. marginatus, 0/2 D. silvarum,* 1/44 *H. asiaticum*
19	Zheng WQ (2018)	3	311	China	PCR	adult, larva, nymph	-	16 *I. granulatus,* 1 *I. acuminatus,* 4 *I. sinensis,* 173 *H. longicornis,* 21 *H. flava,* 77 *R. microplus,* 5 *H. phasiana,* 9 *R. sanguineus,* 3 *R. haemaphysaloides,* 1 *A. testudinarium,* 1*D. auratus*	3/16 *I. granulatus,* 0/1 *I. acuminatus, 0/4 I. sinensis,* 0/173 *H. longicornis, 0/21 H. flava, 0/77 R. microplus,* 0/5 *H. phasiana*, 0/9 *R. sanguineus, 0/3 R. haemaphysaloides, 0/1 A. testudinarium, 0/1 D. auratus*
20	Khoo JJ (2018)	72	156	Malaysia	PCR	-	1-12	122 *I. granulatus,* 24 *D. spp,* 3 *A. spp*	72/122 *I. granulatus,* 0/24 *D. spp,* 0/3 *A. spp*
21	Ye NN (2018)	0	1111	China	PCR	-	4-10	1054 *D. silvarum,* 236 *H. concinna,* 53 *I. persulcatus*	0/1054 *D. silvarum,* 0/236 *H. concinna,* 0/53 *I. persulcatus*

22	Qin LX (2018)	51	96	China	PCR	-	-	96 *D. spp*	51/96 *D. spp*
23	Yang Y (2018)	20	388	China	PCR	-	5-7	267 *I. persulcatus,* 559 *D. nuttalli*	0/125 *I. persulcatus*，20/263 *D. nuttalli*
24	Tang F (2018)	86	320	China	PCR	-	4-6	293 *I. persulcatus,* 22 *D. silvarum,* 5 *H. concinna*	85/293 *I. persulcatus,* 1/22 *D. silvarum,* 0/5 *H. concinna*
25	Liu XY (2017)	0	500	China	PCR	adult	1-12	500 *H. longicornis*	0/500 *H. longicornis*
26	Karasartova D (2017)	1	322	Turkey	PCR	-	-	4 *I. ricinus,* 164 *H. marginatum,* 5 *H. excavatum,* 1 *H. aegyptium,* 41 *H. Parva,* 6 *H. Punctata,* 1 *H. Sulcata,* 46 *H. spp.,* 34 *R. turanicus,* 3 *R. bursa,* 17 *D. marginatus*	1/4 *I. ricinus,* 0/164 *H. marginatum,* 0/5 *H. excavatum,* 0/1 *H. aegyptium,* 0/41 *H. Parva,* 0/6 *H. Punctata,* 0/1 *H. Sulcata,* 0/46 *H. spp.,* 0/34 *R. turanicus,* 0/3 *R. bursa,* 0/17 *D. marginatus*
27	Kuo CC (2017)	5	85	China	PCR	adult, larva, nymph	1-12	42 *H. doenitzi,* 1 *H. flava,* 2 *H. formosensis,* 12 *H. hystricis,* 21 *H. ornithophila,* 17 *H. wellingtoni,* 17 *I. columnae,* 6 *A. spp* 5 *I. granulatus,* 1 *I. nipponensis,* 4 *I. turdus,* 1 *R. haemaphysaloides,* 4 *I. spp,* 6*H. spp,*	3/4 *I. granulatus,* 2/5 *I. turdus, 0/*24 *H. doenitzi, 0/*1 *H. flava, 0/*1 *H. formosensis, 0/*9 *H. hystricis, 0/*6 *H. ornithophila, 0/*8 *H. wellingtoni, 0/*17 *I. columnae, 0/*1 *I. nipponensis, 0/*1 *R. haemaphysaloides, 0/*3 *H. spp.,* 0/5 *A. spp.*
28	Pan YP (2017)	5	25	China	PCR	adult	4-5	25 *I. persulcatus*	5/25 *I. persulcatus*
29	Li HY (2017)	97	546	China	PCR	-	4-5	210 *H. asiaticum*, 209 *H. punctate,* 61 *D. nuttalli,* 40 *D. marginatus,* 26 *R. turanicus*	-
30	Sakakibara K (2016)	1	248	Turkey	PCR	adult	6	248 *I. ricinus*	1/248 *I. ricinus*
31	Khasnatinov MA (2016)	90	445	Russia (Siberia)	PCR	adult	-	445 *I. persulcatus*	0/445 *I. persulcatus*
32	Yu PF (2016)	156	849	China	PCR	-	-	34 *H. bispinosa,* 165 *D. silvarum,*	11/ 34 *H. bispinosa,* 3/165 *D. silvarum,*

								213 *R. (B.) microplus,* 125 *H. qinghaiensis,* 186 *R. sanguineus* ,84 *H. longicornis,* 42 *I. persulcatus*	18/213 *R. (B.) microplus,* 18/42 *I. persulcatus* 3/125 *H. qinghaiensis,* 65/84 *H. longicornis* 38/186 *R. sanguineus*
33	Yang Y (2016)	0	178	China	PCR	-	-	178 *H. asiaticum*	0/178 *H. asiaticum*
34	Zang F (2016)	97	618	China	PCR	adult	3-4	249 *D. nuttalli*, 152 *H. garhwalensis,* 217 *H. qinghaiensis*	28/249 *D. nuttalli,* 22/152 *H. garhwalensis,* 47/217 *H. qinghaiensis*
35	Han H (2016)	3	232	China	PCR	-	-	69 *H. nepalensis,* 5 *H. formosensis,* 86 *R. microplus,* 72 *unidentified*	3/86 *R. microplus,* 0/69 *H. nepalensis,* 0/5 *H. formosensis,* 0/72 unidentified
36	Yang J (2016)	0	257	China	PCR	-	4-6	106 *H. concinna,* 84 *I. persulcatus,* 66 *D. silvarum,* 1 *H. japonica*	0/106 *H. concinna,* 0/84 *I. persulcatus,* 0/66 *D. silvarum,* 0/1 *H. japonica*
37	Hong XK (2016)	2	90	China	PCR	-	3-10	-	-
38	Liu L (2015)	0	292	China	PCR	adult	5-6	113 *I. persulcatus,* 179 *D. nuttalli*	0/113 *I. persulcatus,* 0/179 *D. nuttalli*
39	Cheng C (2015)	4	44	China	PCR	-	4-6	8 *I. persulcatus,* 34 *H. concinna,* 2 *D. silvarum*	3/8 *I. persulcatus,* 1/34 *H. concinna*, 0/2 *D. silvarum*
40	Han H (2015)	12	643	China	PCR	-	5	573 *H. concinna,* 70 *I. persulcatus*	1/573 *H. concinna,* 11/70 *I. persulcatus*
41	Wang XR(2015)	53	227	China	other	-	3-8	117 *H. qinghaiensis,* 110 *D. nuttalli*	28/117 *H. qinghaiensis,* 25/110 *D. nuttalli*
42	Chen Z (2014)	0	308	China	PCR	adult, larva, nymph	4-12	298 *H. longicornis,* 10 *R. microplus*	0/298 *H. longicornis,* 0/10 *R. microplus*
43	Takano A (2014)	77	4325	Japan	PCR	adult	4-7	3532 *I. persulcatus,* 117 *I. pavlovskyi,* 676 *I. ovatus*	71/3532 *I. persulcatus,* 5/117 *I. pavlovskyi,* 1/676 *I. ovatus*
44	Lee K (2014)	6	670	Japan	PCR	adult, nymph	5-9	670 *H. spp.*	6/670 *H. spp.*
45	Hou J (2014)	21	447	China	PCR	adult	1-12	212 *H. longicornis,* 20 *R. haemaphysaloides,* 29 *A. testudinarium,* 94 *I. sinensis,* 20 *B. microplus,* 19 *H. yeni,* 9 *D. taiwanensis,* 5 *H. hystricis,*	11/212 *H. longicornis,* 0/20 *R. haemaphysaloides,* 1/29 *A. testudinarium,* 1/94 *I. sinensis,* 1/20 *B. microplus,* 0/19 *H. yeni,* 0/9 *D. taiwanensis,* 0/5 *H. hystricis,*

								1 *H. asiaticum*,36 *I. granulates,* 2 *I. ovatus*	0/1 *H. asiaticum,* 7/36 *I. granulates,* 0/2 *I. ovatus*
46	Masuzawa T (2014)	71	129	Mongolia	PCR	-	6	129 *I. persulcatus*	71/129 *I. persulcatus*
47	Orkun O (2014)	6	169	Turkey	PCR	-	1-12	17 *H. excavatum,* 30 *H. marginatum,* 6 *Hy. spp,* 35 *H. Parva,* 28 *R. turanicus,* 25 *D. marginatus,* 16 *H. aegyptium,* 3 *H. punctata,* 3 *R. bursa,* 3 *R. sanguineus,* 2 *I. ricinus,* 1 *H. spp.*	1/17 *H. excavatum,* 1/30 *H. marginatum,* 2/6 *Hy. spp,* 2/35 *H. Parva,* 0/28 *R. turanicus,* 0/25 *D. marginatus,* 0/16 *H. aegyptium,* 0/3 *H. punctata,* 0/3 *R. bursa,* 0/3 *R. sanguineus,* 0/2 *I. ricinus,* 0/1 *H. spp.*
48	Wang W (2013)	0	197	China	other	-	-	58 *I. persulcatus,* 139 *H. longicornis*	0/58 *I. persulcatus,* 0/139 *H. longicornis*
49	Sun X (2013)	18	367	China	PCR	-	4	174 *H. asiaticum,* 138*R. pumilio,* 14 *R. turanicus,* 41 *D. marginatus*	3/174 *H. asiaticum,* 15/138 *R. pumilio,* 0/14 *R. sturanicus,* 0/41 *D. marginatus*
50	Wang XL (2013)	229	542	China	PCR	-	-	-	-
51	Murase Y (2012)	119	338	Japan	PCR	-	4	284 *I. persulcatus,* 41 *I. ovatus,* 13 *H. longicornis*	98/284 *I. persulcatus,* 8/41 *I. ovatus,* 1/13 *H. longicornis*
52	Chao LL (2012)	123	261	China	PCR	adult, larva	-	261 *I. granulatus*	123/ 261 *I. granulatus*
53	Scholz HC (2012)	91	372	Mongolia	PCR	adult	5	372 *I. persulcatus*	91/372 *I. persulcatus*
54	Li YP (2012)	304	2460	China	PCR	-	4-6	-	-
55	Ahantarig A (2011)	0	166	Thailand	PCR	adult, larva, nymph	-	166 *H. spp.*	0/166 *H. spp.*
56	Sen E (2011)	10	24	Turkey	PCR	-	6	24 *I. ricinus*	10/24 *I. ricinus*
57	Yang Y (2011)	5	162	China	PCR	-	5	162 *H. asiaticum*	5/162 *H. asiaticum*
58	Huang CM (2010)	23	113	China	PCR	adult, larva, nymph	-	113 *I. granulatus*	23/113 *I. granulatus*
59	Chao LL (2010)	27	147	China	PCR	adult	-	147 *I. granulatus*	27/147 *I. granulatus*

60	Geng Z (2010)	233	1515	China	other	-	-	-	-
61	Niu QL (2010)	94	631	China	PCR	-	4-7	264 *D. spp.,* 173 *H. spp.,* 185 *R. Curtice,* 45 *R. spp.*	10/264 *D.spp*, 11/173 *H. spp.,* 59/185 *R. Curtice,* 14/45 *R. spp.*
62	Chao LL (2009)	20	78	China	PCR	adult	-	78 *I. granulatus*	20/78 *I. granulatus*
63	Wang CS(2009)	551	1405	China	other	-	-	1239 *I. persulcatus,* 110 *H. concinna*	444/1239 *I. persulcatus,* 9/110 *H. concinna*
64	Chu CY (2008)	41	182	China	PCR	adult	10-12	4 *I. vespertlionis,* 1 *I. hyatti,* 2 *H. concinna,* 114 *H. longicornis,* 40 *H. warburconi,* 21 *R. microplus*	0/4 *I. vespertlionis,* 0/1 *I. hyatti,* 1/2 *H. concinna,* 32/114 *H. longicornis,* 5/40 *H. warburconi,* 3/21 *R. microplus*
65	He H (2007)	39	105	China	other	-	-	2065 *I. persulcatus,* 2438 *D. silvarum,* 1848 *H. concinna,* 203 *H. japonica*	-
66	Gao LY (2007)	631	1799	China	other	-	-	1799 *I. persulcatus,*	631/1799 *I. persulcatus*
67	Chu CY (2006)	299	1624	China	PCR	-	5-7	1336 *I. persulcatus,* 144 *D. silvarum,* 144 *H. concinna*	293/1336 *I. persulcatus,* 6/144 *D. silvarum,* 0/144 *H. concinna*
68	Huang HM (2006)	137	427	China	PCR	-	4-5	100 *I.persulcatus,* 327 *D.silvarum*	36/100 *I.persulcatus,* 101/327 *D.silvarum*
69	Hiroko H (2005)	6	1269	Japan	PCR	-	-	-	-
70	Zhao QM (2005)	39	2035	China	PCR	-	4-10	-	-
71	Güner ES(2003)	12	299	Turkey	other	-	5	299 *I. ricinus*	12/299 *I. ricinus*
72	Cao WC (2003)	454	1345	China	PCR	-	6-8	1345 *I. persulcatus*	454/1345 *I. persulcatus*
73	Wang ZX (2003)	42	274	China	other	-	1-12	-	-
74	Takada N (2001)	22	137	China	PCR	adult, larva, nymph	5	66 *I. persulcatus*	26/66 *I. persulcatus*
75	Ishiguro F (2000)	28	303	Japan	PCR	adult, larva, nymph	1-5, 9-12	343 *H. flava,* 6 *H. longicornis,* 1 *I. columnae,* 9 *I. persulcatus,*	0/2 *H. flava,* 0/2 *H. longicornis,* 0/1 *H. phasiana,* 0/11 *I. turdus*

								1 *H. phasiana,* 15 *I. turdus,* 2 *unidentified*	
76	Hua MT (2000)	10	62	China	other	-	5	1543 *D. silvarum,* 1099 *D. niveus,* 383 *D. nuttalli,* 58 *D. marginatus,* 3 *H. concinna,* 2 *H. campanulata,* 1 *H. detritum,* 1 *I. persulcatus*	6/32 *D. silvarum,* 4/30 *D. niveus*
77	Tian W (1998)	9	1118	China	PCR	adult, larva, nymph	5-9	947 *H. japonicum* and *H. longicornis,* 158 *I. persulcatus,* 13 *D. silvarum*	4/947 *H. japonicum* and *H. longicornis,* 5/158 *I. persulcatus,* 0/13 *D. silvarum*
78	Takada N (1998)	59	128	China	PCR	adult	5	21 *I. nipponensis,* 287 *I. persulcatus,* 1 *I. pavlovskyi,* 42 *H. concinna,* 7 *H. flava,* 15 *H. douglasi,* 45 *H. longicornis,* 6 *H. megaspinosa,* 2 *H. punctata,* 59 *H. spp,* 12 *D. silvarum,* 7 *D. silvarum*	-
79	Wan KL (1998)	166	623	China	other	-	-	-	-
80	Wan KL (1998)	128	820	China	other	-	-	-	-
81	Miyamoto K (1997)	7	47	Japan	PCR	adult, larva, nymph	10	113 *I. persulcatus*	7/47 *I. persulcatus*
82	Sato Y (1996)	225	846	Russia (Siberia)	other	adult	5-6	846 *I. persulcatus*	225/846 *I. persulcatus*
83	NAKAO M (1996)	114	300	Japan	PCR	adult	5-7	300 *l. persulcatus*	112/300 *l. persulcatus*
84	Takada N (1994)	81	528	Japan	other	adult, larva	4-7	1 *A. testudinarium,* 8 *D. taiwanensis,* 40 *H. flava,* 6 *H. japonica,* 23*H. kitaokai,* 7 *H. longicornis,* 12 *H. megaspinosa,* 2 *I. angustus,* 58 *I. monospinosus,* 6 *I. nipponensis,* 193 *I. ovatus,* 85 *I. persulcatus,* 2 *I. spp.*	37/193 *I. ovatus,* 11/85 *I. persulcatus,* 0/1 *A. testudinarium,* 0/8 *D. taiwanensis,* 1/40 *H. flava,* 0/6 *H. japonica,* 0/23 *H. kitaokai,* 0/12 *H. megaspinosa,* 0/58 *I. monospinosus*
85	Mo YM (1994)	5	100	China	other	-	-	308 *R(B). microplus,* 136 *H. hystricis,* 40 *H. bispinosa*	0/40 *R(B). microplus,* 2/40 *H. hystricis,* 3/20 *H, bispinosa*
86	NAKAO M (1992)	225	1464	Japan	other	adult	1-12	777 *I. persukatus,* 687 *I. ovatus*	129/777 *I. persukatus,* 162/687 *I. ovatus*
87	Miyamoto K (1992)	117	909	Japan	other	adult, larva	4-8	273 *I. ovatus,* 792 *I. persulcatus*	41/273 *I. ovatus,* 130/792 *I. persulcatus*

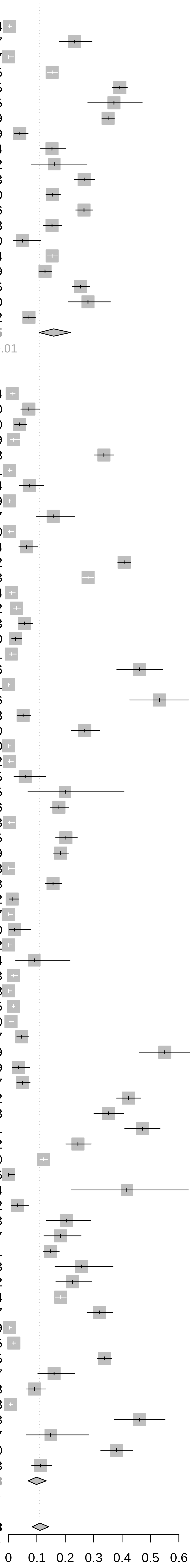
88	Du Y (1992)	215	846	China	other	-	4-7	766 *I. persulcatus,* 62 *H. japonica,* 18 *D. silvarum*	215/766 *I. persulcatus,* 0/62 *H. japonica,* 18 *D. silvarum*
89	Zhag QN (1991)	42	150	China	other	adult	4-7	150 *I. persulcatus,* 105 *D. marginatus,* 45 *H. spp.*	42/150 *I. persulcatus,* 0/105 *D. marginatus,* 0/45 *H. spp*
90	Ai CX (1990)	42	582	China	other	adult	4-8	567 *l. persulcatus,* 15 *H. concinna*	-
91	Li SQ (1990)	39	343	China	PCR	adult, larva, nymph	4-7	-	-

Supplementary Material 5: Asia prevalence of B. burgdorferi in Ixodidae by subgroup

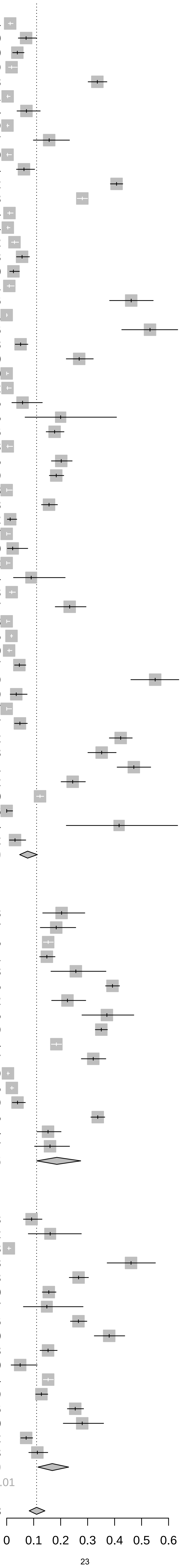
Study	Events	Total	Proportion	95%−CI	Weight
country = China					
Gao Y(2021)	10	774	0.013	[0.006; 0.024]	1.1%
Wang Q(2021)	18	250	0.072	[0.043; 0.111]	1.1%
Duan CJ (2019)	3	724	0.004	[0.001; 0.012]	1.1%
Jiang BG(2018)	20	692	0.029	[0.018; 0.044]	1.1%
Zheng WQ (2018)	3	311	0.010	[0.002; 0.028]	1.1%
Ye NN (2018)	0	1111	0.000	[0.000; 0.003]	1.1%
Qin LX (2018)	51	96	0.531	[0.427; 0.634]	1.1%
Yang Y (2018)	20	388	0.052	[0.032; 0.078]	1.1%
Tang F (2018)	86	320	0.269	[0.221; 0.321]	1.1%
Liu XY(2017)	0	500	0.000	[0.000; 0.007]	1.1%
Kuo CC (2017)	5	85	0.059	[0.019; 0.132]	1.1%
Pan YP (2017)	5	25	0.200	[0.068; 0.407]	0.9%
Li HY (2017)	97	546	0.178	[0.146; 0.212]	1.1%
Yu PF (2016)	156	849	0.184	[0.158; 0.211]	1.1%
Yang Y (2016)	0	178	0.000	[0.000; 0.021]	1.1%
Zhang F (2016)	97	618	0.157	[0.129; 0.188]	1.1%
Han H (2016)	3	232	0.013	[0.003; 0.037]	1.1%
Yang J (2016)	0	257	0.000	[0.000; 0.014]	1.1%
Hong XK (2016)	2	90	0.022	[0.003; 0.078]	1.1%
Liu L(2015)	0	292	0.000	[0.000; 0.013]	1.1%
Chen C (2015)	4	44	0.091	[0.025; 0.217]	1.0%
Han H (2015)	12	643	0.019	[0.010; 0.032]	1.1%
Wang XR (2015)	53	227	0.233	[0.180; 0.294]	1.1%
Chen Z(2014)	0	308	0.000	[0.000; 0.012]	1.1%
Hou J (2014)	21	447	0.047	[0.029; 0.071]	1.1%
Wang W (2013)	0	197	0.000	[0.000; 0.019]	1.1%
Sun X (2013)	18	367	0.049	[0.029; 0.076]	1.1%
Wang XL (2013)	229	542	0.423	[0.381; 0.465]	1.1%
Chao LL (2012)	123	261	0.471	[0.409; 0.534]	1.1%
Li YP (2012)	304	2460	0.124	[0.111; 0.137]	1.1%
Yang Y (2011)	5	162	0.031	[0.010; 0.071]	1.1%
Huang CM (2010)	23	113	0.204	[0.134; 0.290]	1.1%
Chao LL (2010)	27	147	0.184	[0.125; 0.256]	1.1%
Geng Z (2010)	233	1515	0.154	[0.136; 0.173]	1.1%
Niu QL (2010)	94	631	0.149	[0.122; 0.179]	1.1%
Chao LL (2009)	20	78	0.256	[0.164; 0.368]	1.1%
Wang CS (2009)	551	1405	0.392	[0.367; 0.418]	1.1%
Chu CY(2008)	41	182	0.225	[0.167; 0.293]	1.1%
He H (2007)	39	105	0.371	[0.279; 0.471]	1.1%
Gao LY (2007)	631	1799	0.351	[0.329; 0.373]	1.1%
Chu CY (2006)	299	1624	0.184	[0.166; 0.204]	1.1%
Huang HM (2006)	137	427	0.321	[0.277; 0.367]	1.1%
Zhao QM (2005)	39	2035	0.019	[0.014; 0.026]	1.1%
Cao WC (2003)	454	1345	0.338	[0.312; 0.364]	1.1%
Wang ZX (2003)	42	274	0.153	[0.113; 0.201]	1.1%
Takada N (2001)	22	137	0.161	[0.103; 0.233]	1.1%
Hua MT (2000)	10	62	0.161	[0.080; 0.277]	1.0%
Tian W (1998)	9	1118	0.008	[0.004; 0.015]	1.1%
Takada N (1998)	59	128	0.461	[0.372; 0.551]	1.1%
Wan KL (1998)	166	623	0.266	[0.232; 0.303]	1.1%
Wang KL (1998)	128	820	0.156	[0.132; 0.183]	1.1%
Mo YM (1994)	5	100	0.050	[0.016; 0.113]	1.1%
Du Y (1992)	215	846	0.254	[0.225; 0.285]	1.1%
Zhag QN (1991)	42	150	0.280	[0.210; 0.359]	1.1%
Ai CG (1990)	42	582	0.072	[0.053; 0.096]	1.1%
Li SQ (1990)	39	343	0.114	[0.082; 0.152]	1.1%
Random effects model		**30585**	**0.115**	**[0.080; 0.154]**	**61.5%**
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0483$, $p = 0$					
country = Japan					
Nakayama S(2020)	2	561	0.004	[0.000; 0.013]	1.1%
Seto J(2020)	12	164	0.073	[0.038; 0.124]	1.1%
Takano A(2014)	77	4325	0.018	[0.014; 0.022]	1.1%
Lee K(2014)	6	670	0.009	[0.003; 0.019]	1.1%
Murase Y (2012)	119	338	0.352	[0.301; 0.406]	1.1%
Hiroko H (2005)	6	1269	0.005	[0.002; 0.010]	1.1%
Ishiguro F (2000)	28	303	0.092	[0.062; 0.131]	1.1%
Miyamoto K (1997)	7	47	0.149	[0.062; 0.283]	1.0%
NAKAO M (1996)	114	300	0.380	[0.325; 0.438]	1.1%
Takada N (1994)	81	528	0.153	[0.124; 0.187]	1.1%
NAKAO M (1992)	225	1464	0.154	[0.136; 0.173]	1.1%
Miyamoto K (1992)	117	909	0.129	[0.108; 0.152]	1.1%
Random effects model		**10878**	**0.096**	**[0.044; 0.167]**	**13.3%**
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0338$, $p < 0.01$					
country = Malaysia					
Khoo JJ (2018)	72	156	0.462	[0.382; 0.543]	1.1%
Random effects model		**156**	**0.462**	**[0.384; 0.540]**	**1.1%**
Heterogeneity: not applicable					
country = Mongolia					
Fischer T(2020)	1	310	0.003	[0.000; 0.018]	1.1%
Narankhajid M (2018)	9	360	0.025	[0.011; 0.047]	1.1%
Masuzawa T (2014)	71	129	0.550	[0.460; 0.638]	1.1%
Scholz HC (2012)	91	372	0.245	[0.202; 0.292]	1.1%
Random effects model		**1171**	**0.145**	**[0.008; 0.407]**	**4.4%**
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0933$, $p < 0.01$					
country = Pakistan					
Ghafar A(2020)	15	234	0.064	[0.036; 0.104]	1.1%
Random effects model		**234**	**0.064**	**[0.036; 0.099]**	**1.1%**
Heterogeneity: not applicable					
country = Russia(Siberia)					
Rar V(2019)	742	1822	0.407	[0.385; 0.430]	1.1%
Pukhovskaya NM(2019)	605	2158	0.280	[0.261; 0.300]	1.1%
Khasnatinov MA(2016)	90	445	0.202	[0.166; 0.243]	1.1%
Sato Y(1996)	225	846	0.266	[0.236; 0.297]	1.1%
Random effects model		**5271**	**0.288**	**[0.210; 0.372]**	**4.5%**
Heterogeneity: $I^2 = 97\%$, $\tau^2 = 0.0081$, $p < 0.01$					
country = South Korea					
Seo HJ(2021)	15	380	0.039	[0.022; 0.064]	1.1%
Seo MG(2020)	6	329	0.018	[0.007; 0.039]	1.1%
Kim SY(2020)	248	738	0.336	[0.302; 0.371]	1.1%
Kim CM(2019)	5	484	0.010	[0.003; 0.024]	1.1%
Hagen RM(2018)	23	403	0.057	[0.037; 0.084]	1.1%
Random effects model		**2334**	**0.066**	**[0.002; 0.207]**	**5.6%**
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0585$, $p < 0.01$					
country = Thailand					
Kaenkan W(2020)	20	127	0.157	[0.099; 0.233]	1.1%
Ahantarig A(2011)	0	166	0.000	[0.000; 0.022]	1.1%
Random effects model		**293**	**0.041**	**[0.000; 0.322]**	**2.2%**
Heterogeneity: $I^2 = 98\%$, $\tau^2 = 0.0815$, $p < 0.01$					
country = Turkey					
Orkun O(2020)	3	1019	0.003	[0.001; 0.009]	1.1%
Karasartova D(2017)	1	322	0.003	[0.000; 0.017]	1.1%
Sakakibara K(2016)	1	248	0.004	[0.000; 0.022]	1.1%
Orkun O (2014)	6	169	0.036	[0.013; 0.076]	1.1%
Sen E (2011)	10	24	0.417	[0.221; 0.634]	0.9%
Güner ES(2003)	12	299	0.040	[0.021; 0.069]	1.1%
Random effects model		**2081**	**0.028**	**[0.007; 0.065]**	**6.5%**
Heterogeneity: $I^2 = 92\%$, $\tau^2 = 0.0103$, $p < 0.01$					
Random effects model		**53003**	**0.111**	**[0.083; 0.142]**	**100.0%**
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0503$, $p = 0$					
Residual heterogeneity: $I^2 = 99\%$, $p = 0$					

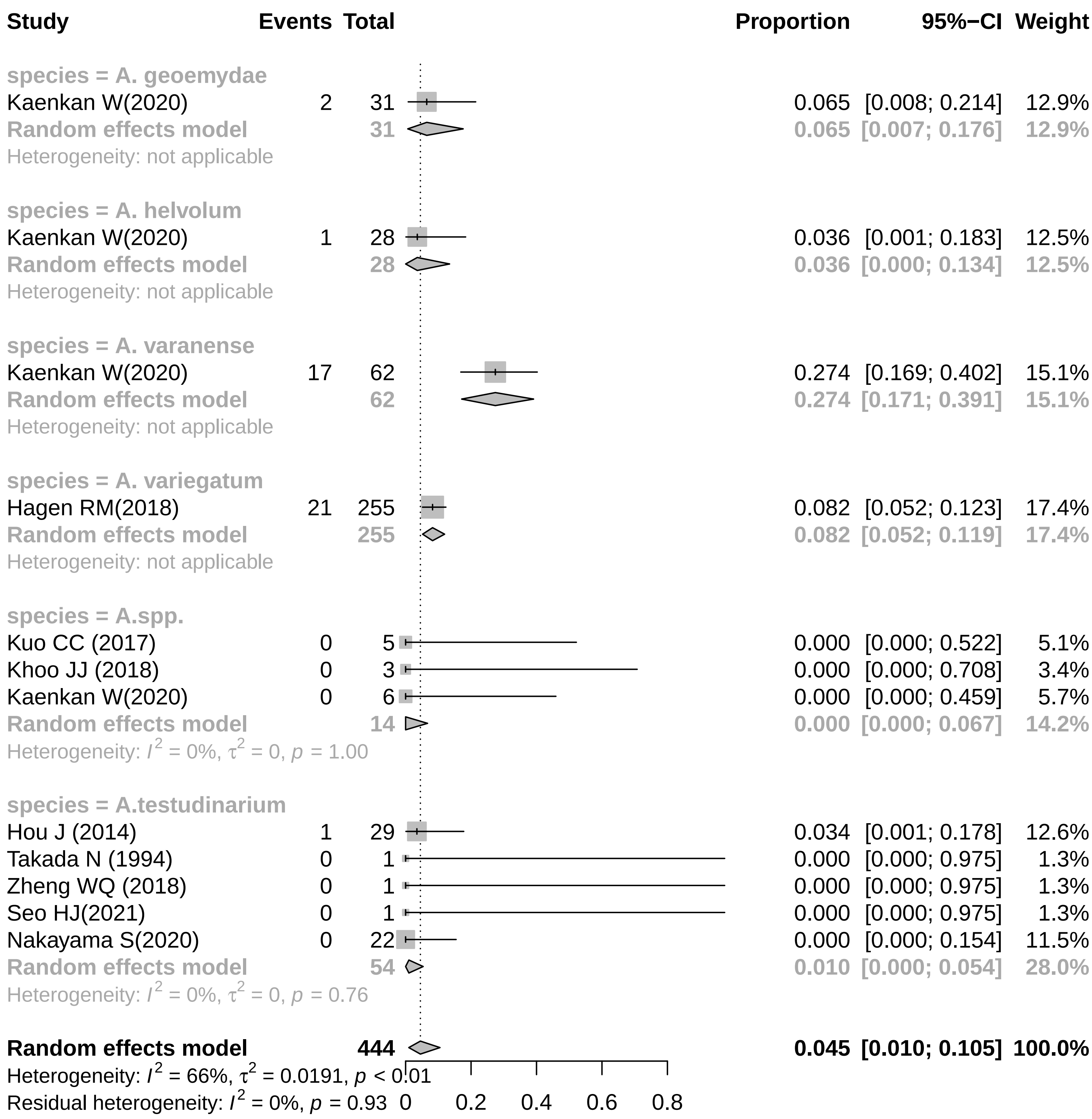

Study Events Total Proportion 95%−CI Weight
genus = Amblyomma
Seo HJ(2021) 0 1 0.000 [0.000; 0.975] 0.1%
Nakayama S(2020) 0 22 0.000 [0.000; 0.154] 0.6%
Kaenkan W(2020) 20 127 0.157 [0.099; 0.233] 0.7%
Hagen RM(2018) 21 255 0.082 [0.052; 0.123] 0.7%
Zheng WQ (2018) 0 1 0.000 [0.000; 0.975] 0.1%
Khoo JJ (2018) 0 3 0.000 [0.000; 0.708] 0.3%
Kuo CC (2017) 0 5 0.000 [0.000; 0.522] 0.4%
Hou J (2014) 1 29 0.034 [0.001; 0.178] 0.6%
Takada N (1994) 0 1 0.000 [0.000; 0.975] 0.1%
Random effects model 444 0.048 [0.011; 0.108] 3.7%
Heterogeneity: I^2 = 59%, τ^2 = 0.0110, p = 0.01
genus = Dermacentor
Wang Q(2021) 26 141 0.184 [0.124; 0.258] 0.7%
Gao Y(2021) 2 205 0.010 [0.001; 0.035] 0.7%
Orkun O(2020) 0 43 0.000 [0.000; 0.082] 0.6%
Fischer T(2020) 1 310 0.003 [0.000; 0.018] 0.7%
Pukhovskaya NM(2019) 2 29 0.069 [0.008; 0.228] 0.6%
Jiang BG(2018) 0 29 0.000 [0.000; 0.119] 0.6%
Khoo JJ (2018) 0 24 0.000 [0.000; 0.142] 0.6%
Yang Y (2018) 20 263 0.076 [0.047; 0.115] 0.7%
Tang F (2018) 1 22 0.045 [0.001; 0.228] 0.6%
Ye NN (2018) 0 1045 0.000 [0.000; 0.004] 0.7%
Qin LX (2018) 51 96 0.531 [0.427; 0.634] 0.7%
Zheng WQ (2018) 0 1 0.000 [0.000; 0.975] 0.1%
Narankhajid M (2018) 6 309 0.019 [0.007; 0.042] 0.7%
Karasartova D(2017) 0 17 0.000 [0.000; 0.195] 0.6%
Zhang F (2016) 28 249 0.112 [0.076; 0.158] 0.7%
Yu PF (2016) 3 165 0.018 [0.004; 0.052] 0.7%
Yang J (2016) 0 66 0.000 [0.000; 0.054] 0.7%
Liu L(2015) 0 179 0.000 [0.000; 0.020] 0.7%
Wang XR (2015) 25 110 0.227 [0.153; 0.317] 0.7%
Chen C (2015) 0 2 0.000 [0.000; 0.842] 0.2%
Hou J (2014) 0 9 0.000 [0.000; 0.336] 0.5%
Orkun O (2014) 0 25 0.000 [0.000; 0.137] 0.6%
Sun X (2013) 0 41 0.000 [0.000; 0.086] 0.6%
Niu QL (2010) 10 264 0.038 [0.018; 0.069] 0.7%
Huang HM (2006) 101 327 0.309 [0.259; 0.362] 0.7%
Chu CY(2006) 6 144 0.042 [0.015; 0.088] 0.7%
Hua MT (2000) 10 62 0.161 [0.080; 0.277] 0.7%
Tian W (1998) 0 13 0.000 [0.000; 0.247] 0.5%
Takada N (1994) 0 8 0.000 [0.000; 0.369] 0.5%
Du Y (1992) 0 18 0.000 [0.000; 0.185] 0.6%
Zhag QN (1991) 0 105 0.000 [0.000; 0.035] 0.7%
Random effects model 4321 0.029 [0.008; 0.062] 19.0%
Heterogeneity: I^2 = 96%, τ^2 = 0.0459, p < 0.01
genus = Haemaphysalis
Gao Y(2021) 1 275 0.004 [0.000; 0.020] 0.7%
Seo HJ(2021) 1 109 0.009 [0.000; 0.050] 0.7%
Wang Q(2021) 4 85 0.047 [0.013; 0.116] 0.7%
Seo MG(2020) 4 315 0.013 [0.003; 0.032] 0.7%
Kim SY(2020) 1 9 0.111 [0.003; 0.482] 0.5%
Nakayama S(2020) 1 531 0.002 [0.000; 0.010] 0.7%
Seto J(2020) 0 19 0.000 [0.000; 0.176] 0.6%
Orkun O(2020) 0 937 0.000 [0.000; 0.004] 0.7%
Kim CM(2019) 0 459 0.000 [0.000; 0.008] 0.7%
Pukhovskaya NM(2019) 21 530 0.040 [0.025; 0.060] 0.7%
Tang F (2018) 0 5 0.000 [0.000; 0.522] 0.4%
Ye NN (2018) 0 236 0.000 [0.000; 0.016] 0.7%
Zheng WQ (2018) 0 199 0.000 [0.000; 0.018] 0.7%
Narankhajid M (2018) 1 44 0.023 [0.001; 0.120] 0.6%
Jiang BG(2018) 1 36 0.028 [0.001; 0.145] 0.6%
Kuo CC (2017) 0 52 0.000 [0.000; 0.068] 0.7%
Karasartova D(2017) 0 218 0.000 [0.000; 0.017] 0.7%
Liu XY(2017) 0 500 0.000 [0.000; 0.007] 0.7%
Han H (2016) 0 74 0.000 [0.000; 0.049] 0.7%
Zhang F (2016) 69 369 0.187 [0.149; 0.231] 0.7%
Yang Y (2016) 0 178 0.000 [0.000; 0.021] 0.7%
Yang J (2016) 0 107 0.000 [0.000; 0.034] 0.7%
Yu PF (2016) 79 243 0.325 [0.267; 0.388] 0.7%
Han H (2015) 1 573 0.002 [0.000; 0.010] 0.7%
Chen C (2015) 1 34 0.029 [0.001; 0.153] 0.6%
Wang XR (2015) 28 117 0.239 [0.165; 0.327] 0.7%
Orkun O (2014) 4 102 0.039 [0.011; 0.097] 0.7%
Lee K(2014) 6 670 0.009 [0.003; 0.019] 0.7%
Hou J (2014) 11 237 0.046 [0.023; 0.082] 0.7%
Chen Z(2014) 0 298 0.000 [0.000; 0.012] 0.7%
Sun X (2013) 3 174 0.017 [0.004; 0.050] 0.7%
Wang W (2013) 0 139 0.000 [0.000; 0.026] 0.7%
Murase Yusuke (2012) 1 13 0.077 [0.002; 0.360] 0.5%
Yang Y (2011) 5 162 0.031 [0.010; 0.071] 0.7%
Ahantarig A(2011) 0 166 0.000 [0.000; 0.022] 0.7%
Niu QL (2010) 11 173 0.064 [0.032; 0.111] 0.7%
Wang CS (2009) 9 110 0.082 [0.038; 0.150] 0.7%
Chu CY(2008) 38 156 0.244 [0.179; 0.319] 0.7%
Chu CY (2006) 0 144 0.000 [0.000; 0.025] 0.7%
Mo YM (1994) 5 60 0.083 [0.028; 0.184] 0.7%
Takada N (1994) 1 81 0.012 [0.000; 0.067] 0.7%
Du Y (1992) 0 62 0.000 [0.000; 0.058] 0.7%
Zhag QN (1991) 0 45 0.000 [0.000; 0.079] 0.6%
Random effects model 9046 0.017 [0.007; 0.033] 28.5%
Heterogeneity: I^2 = 95%, τ^2 = 0.0241, p < 0.01
genus = Hyalomma
Ghafar A(2020) 14 216 0.065 [0.036; 0.106] 0.7%
Karasartova D(2017) 0 46 0.000 [0.000; 0.077] 0.6%
Orkun O (2014) 2 6 0.333 [0.043; 0.777] 0.4%
Random effects model 268 0.052 [0.000; 0.207] 1.8%
Heterogeneity: I^2 = 86%, τ^2 = 0.0345, p < 0.01
genus = Ixodes
Gao Y(2021) 7 264 0.027 [0.011; 0.054] 0.7%
Seo HJ(2021) 14 270 0.052 [0.029; 0.085] 0.7%
Wang Q(2021) 13 42 0.310 [0.176; 0.471] 0.6%
Seo MG(2020) 2 14 0.143 [0.018; 0.428] 0.5%
Kim SY(2020) 247 729 0.339 [0.304; 0.374] 0.7%
Nakayama S(2020) 1 8 0.125 [0.003; 0.527] 0.5%
Seto J(2020) 12 145 0.083 [0.043; 0.140] 0.7%
Orkun O(2020) 3 30 0.100 [0.021; 0.265] 0.6%
Kim CM(2019) 5 25 0.200 [0.068; 0.407] 0.6%
Rar V(2019) 742 1822 0.407 [0.385; 0.430] 0.7%
Pukhovskaya NM(2019) 582 1599 0.364 [0.340; 0.388] 0.7%
Ye NN (2018) 0 53 0.000 [0.000; 0.067] 0.7%
Khoo JJ (2018) 72 122 0.590 [0.497; 0.678] 0.7%
Yang Y (2018) 0 125 0.000 [0.000; 0.029] 0.7%
Tang F (2018) 85 293 0.290 [0.239; 0.346] 0.7%
Zheng WQ (2018) 3 21 0.143 [0.030; 0.363] 0.6%
Narankhajid M (2018) 2 7 0.286 [0.037; 0.710] 0.5%
Jiang BG(2018) 19 627 0.030 [0.018; 0.047] 0.7%
Pan YP (2017) 5 25 0.200 [0.068; 0.407] 0.6%
Kuo CC (2017) 5 27 0.185 [0.063; 0.381] 0.6%
Karasartova D(2017) 1 4 0.250 [0.006; 0.806] 0.4%
Yu PF (2016) 18 42 0.429 [0.277; 0.590] 0.6%
Han H (2016) 0 72 0.000 [0.000; 0.050] 0.7%
Yang J (2016) 0 84 0.000 [0.000; 0.043] 0.7%
Sakakibara K(2016) 1 248 0.004 [0.000; 0.022] 0.7%
Khasnatinov MA(2016) 90 445 0.202 [0.166; 0.243] 0.7%
Han H (2015) 11 70 0.157 [0.081; 0.264] 0.7%
Chen C (2015) 3 8 0.375 [0.085; 0.755] 0.5%
Liu L(2015) 0 113 0.000 [0.000; 0.032] 0.7%
Orkun O (2014) 0 2 0.000 [0.000; 0.842] 0.2%
Masuzawa T (2014) 71 129 0.550 [0.460; 0.638] 0.7%
Hou J (2014) 8 132 0.061 [0.027; 0.116] 0.7%
Takano A(2014) 77 4325 0.018 [0.014; 0.022] 0.7%
Wang W (2013) 0 58 0.000 [0.000; 0.062] 0.7%
Murase Yusuke (2012) 106 325 0.326 [0.275; 0.380] 0.7%
Chao LL (2012) 123 261 0.471 [0.409; 0.534] 0.7%
Scholz HC (2012) 91 372 0.245 [0.202; 0.292] 0.7%
Sen E (2011) 10 24 0.417 [0.221; 0.634] 0.6%
Chao LL (2010) 27 147 0.184 [0.125; 0.256] 0.7%
Huang CM (2010) 23 113 0.204 [0.134; 0.290] 0.7%
Wang CS (2009) 453 1349 0.336 [0.311; 0.362] 0.7%
Chao LL (2009) 20 78 0.256 [0.164; 0.368] 0.7%
Chu CY(2008) 0 5 0.000 [0.000; 0.522] 0.4%
Gao LY (2007) 631 1799 0.351 [0.329; 0.373] 0.7%
Huang HM (2006) 36 100 0.360 [0.266; 0.462] 0.7%
Chu CY (2006) 293 1336 0.219 [0.197; 0.242] 0.7%
Cao WC (2003) 454 1345 0.338 [0.312; 0.364] 0.7%
Güner ES(2003) 12 299 0.040 [0.021; 0.069] 0.7%
Takada N (2001) 26 66 0.394 [0.276; 0.522] 0.7%
Tian W (1998) 9 1105 0.008 [0.004; 0.015] 0.7%
Miyamoto K (1997) 7 47 0.149 [0.062; 0.283] 0.6%
Sato Y(1996) 225 846 0.266 [0.236; 0.297] 0.7%
NAKAO M (1996) 112 300 0.373 [0.318; 0.431] 0.7%
Takada N (1994) 48 336 0.143 [0.107; 0.185] 0.7%
NAKAO M (1992) 291 1464 0.199 [0.179; 0.220] 0.7%
Du Y (1992) 215 846 0.254 [0.225; 0.285] 0.7%
Miyamoto K (1992) 171 1065 0.161 [0.139; 0.184] 0.7%
Zhag QN (1991) 42 150 0.280 [0.210; 0.359] 0.7%
Random effects model 25758 0.169 [0.125; 0.218] 37.4%
Heterogeneity: I^2 = 99%, τ^2 = 0.0523, p = 0
genus = Rhipicephalus
Orkun O(2020) 0 9 0.000 [0.000; 0.336] 0.5%
Ghafar A(2020) 1 18 0.056 [0.001; 0.273] 0.6%
Duan CJ (2019) 3 724 0.004 [0.001; 0.012] 0.7%
Zheng WQ (2018) 0 89 0.000 [0.000; 0.041] 0.7%
Hagen RM(2018) 2 148 0.014 [0.002; 0.048] 0.7%
Karasartova D(2017) 0 37 0.000 [0.000; 0.095] 0.6%
Kuo CC (2017) 0 1 0.000 [0.000; 0.975] 0.1%
Han H (2016) 3 86 0.035 [0.007; 0.099] 0.7%
Yu PF (2016) 56 399 0.140 [0.108; 0.178] 0.7%
Chen Z(2014) 0 10 0.000 [0.000; 0.308] 0.5%
Orkun O (2014) 0 34 0.000 [0.000; 0.103] 0.6%
Hou J (2014) 1 40 0.025 [0.001; 0.132] 0.6%
Sun X (2013) 15 152 0.099 [0.056; 0.158] 0.7%
Niu QL (2010) 73 230 0.317 [0.258; 0.382] 0.7%
Chu CY(2008) 3 31 0.097 [0.020; 0.258] 0.6%
Mo YM (1994) 0 40 0.000 [0.000; 0.088] 0.6%
Random effects model 2048 0.028 [0.003; 0.076] 9.7%
Heterogeneity: I^2 = 95%, τ^2 = 0.0433, p < 0.01
Random effects model 41885 0.063 [0.044; 0.085] 100.0%
Heterogeneity: I^2 = 98%, τ^2 = 0.0638, p = 0
Residual heterogeneity: I^2 = 98%, p = 0
0 0.2 0.4 0.6 0.8

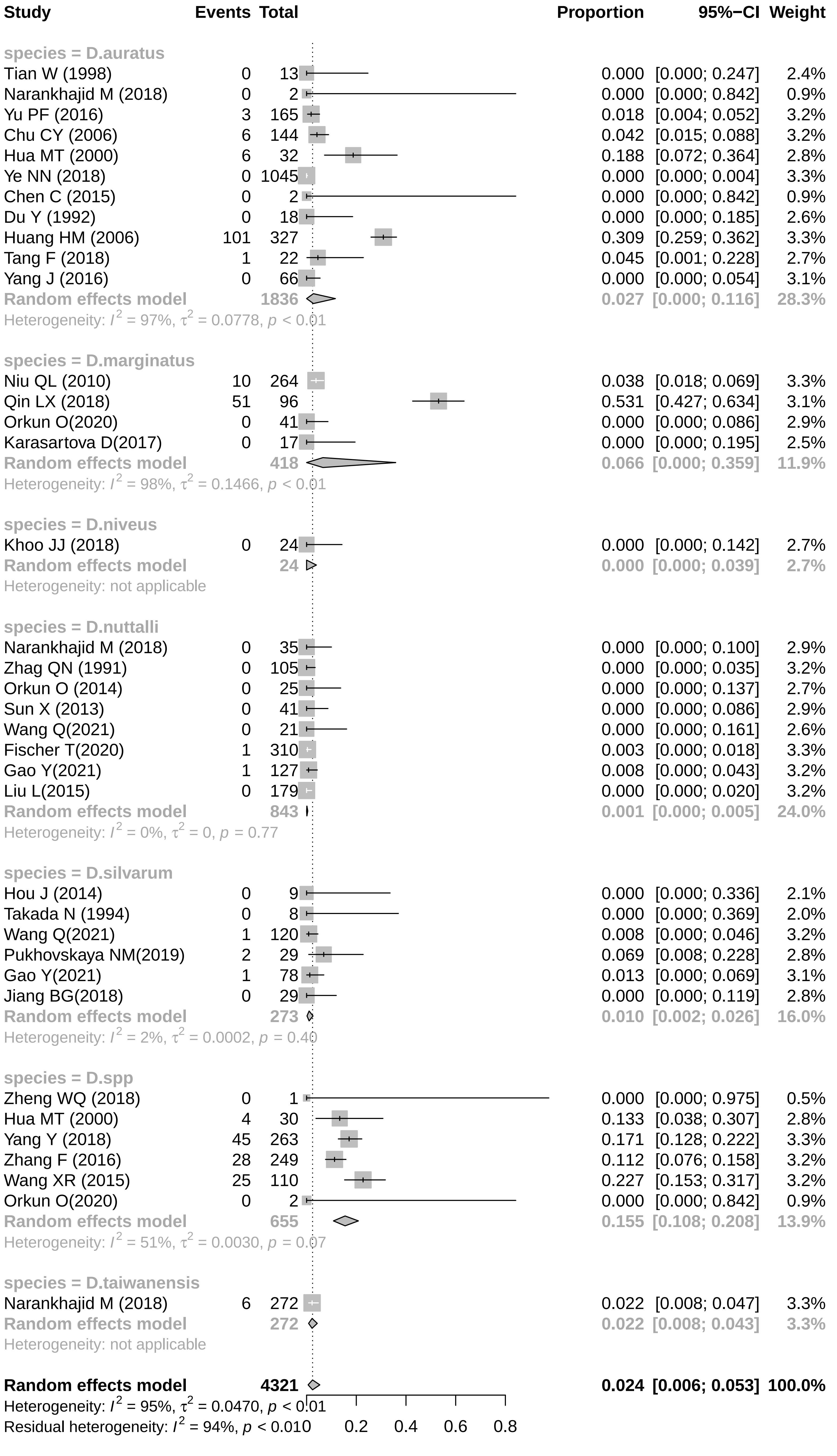
Study	Events	Total	Proportion	95%−CI	Weight
method = other					
Duan CJ (2019)	3	724	0.004	[0.001; 0.012]	1.1%
Wang XR (2015)	53	227	0.233	[0.180; 0.294]	1.1%
Wang W (2013)	0	197	0.000	[0.000; 0.019]	1.1%
Geng Z (2010)	233	1515	0.154	[0.136; 0.173]	1.1%
Wang CS (2009)	551	1405	0.392	[0.367; 0.418]	1.1%
He H (2007)	39	105	0.371	[0.279; 0.471]	1.1%
Gao LY (2007)	631	1799	0.351	[0.329; 0.373]	1.1%
Güner ES(2003)	12	299	0.040	[0.021; 0.069]	1.1%
Wang ZX (2003)	42	274	0.153	[0.113; 0.201]	1.1%
Hua MT (2000)	10	62	0.161	[0.080; 0.277]	1.0%
Wan KL (1998)	166	623	0.266	[0.232; 0.303]	1.1%
Wang KL (1998)	128	820	0.156	[0.132; 0.183]	1.1%
Sato Y(1996)	225	846	0.266	[0.236; 0.297]	1.1%
Takada N (1994)	81	528	0.153	[0.124; 0.187]	1.1%
Mo YM (1994)	5	100	0.050	[0.016; 0.113]	1.1%
NAKAO M (1992)	225	1464	0.154	[0.136; 0.173]	1.1%
Miyamoto K (1992)	117	909	0.129	[0.108; 0.152]	1.1%
Du Y (1992)	215	846	0.254	[0.225; 0.285]	1.1%
Zhag QN (1991)	42	150	0.280	[0.210; 0.359]	1.1%
Ai CG (1990)	42	582	0.072	[0.053; 0.096]	1.1%
Random effects model		13475	0.159	[0.108; 0.218]	22.1%
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0289$, $p < 0.01$					
method = PCR					
Gao Y(2021)	10	774	0.013	[0.006; 0.024]	1.1%
Wang Q(2021)	18	250	0.072	[0.043; 0.111]	1.1%
Seo HJ(2021)	15	380	0.039	[0.022; 0.064]	1.1%
Seo MG(2020)	6	329	0.018	[0.007; 0.039]	1.1%
Kim SY(2020)	248	738	0.336	[0.302; 0.371]	1.1%
Nakayama S(2020)	2	561	0.004	[0.000; 0.013]	1.1%
Seto J(2020)	12	164	0.073	[0.038; 0.124]	1.1%
Orkun O(2020)	3	1019	0.003	[0.001; 0.009]	1.1%
Kaenkan W(2020)	20	127	0.157	[0.099; 0.233]	1.1%
Fischer T(2020)	1	310	0.003	[0.000; 0.018]	1.1%
Ghafar A(2020)	15	234	0.064	[0.036; 0.104]	1.1%
Rar V(2019)	742	1822	0.407	[0.385; 0.430]	1.1%
Pukhovskaya NM(2019)	605	2158	0.280	[0.261; 0.300]	1.1%
Kim CM(2019)	5	484	0.010	[0.003; 0.024]	1.1%
Jiang BG(2018)	20	692	0.029	[0.018; 0.044]	1.1%
Hagen RM(2018)	23	403	0.057	[0.037; 0.084]	1.1%
Narankhajid M (2018)	9	360	0.025	[0.011; 0.047]	1.1%
Zheng WQ (2018)	3	311	0.010	[0.002; 0.028]	1.1%
Khoo JJ (2018)	72	156	0.462	[0.382; 0.543]	1.1%
Ye NN (2018)	0	1111	0.000	[0.000; 0.003]	1.1%
Qin LX (2018)	51	96	0.531	[0.427; 0.634]	1.1%
Yang Y (2018)	20	388	0.052	[0.032; 0.078]	1.1%
Tang F (2018)	86	320	0.269	[0.221; 0.321]	1.1%
Liu XY(2017)	0	500	0.000	[0.000; 0.007]	1.1%
Karasartova D(2017)	1	322	0.003	[0.000; 0.017]	1.1%
Kuo CC (2017)	5	85	0.059	[0.019; 0.132]	1.1%
Pan YP (2017)	5	25	0.200	[0.068; 0.407]	0.9%
Li HY (2017)	97	546	0.178	[0.146; 0.212]	1.1%
Sakakibara K(2016)	1	248	0.004	[0.000; 0.022]	1.1%
Khasnatinov MA(2016)	90	445	0.202	[0.166; 0.243]	1.1%
Yu PF (2016)	156	849	0.184	[0.158; 0.211]	1.1%
Yang Y (2016)	0	178	0.000	[0.000; 0.021]	1.1%
Zhang F (2016)	97	618	0.157	[0.129; 0.188]	1.1%
Han H (2016)	3	232	0.013	[0.003; 0.037]	1.1%
Yang J (2016)	0	257	0.000	[0.000; 0.014]	1.1%
Hong XK (2016)	2	90	0.022	[0.003; 0.078]	1.1%
Liu L(2015)	0	292	0.000	[0.000; 0.013]	1.1%
Chen C (2015)	4	44	0.091	[0.025; 0.217]	1.0%
Han H (2015)	12	643	0.019	[0.010; 0.032]	1.1%
Chen Z(2014)	0	308	0.000	[0.000; 0.012]	1.1%
Takano A(2014)	77	4325	0.018	[0.014; 0.022]	1.1%
Lee K(2014)	6	670	0.009	[0.003; 0.019]	1.1%
Hou J (2014)	21	447	0.047	[0.029; 0.071]	1.1%
Masuzawa T (2014)	71	129	0.550	[0.460; 0.638]	1.1%
Orkun O (2014)	6	169	0.036	[0.013; 0.076]	1.1%
Sun X (2013)	18	367	0.049	[0.029; 0.076]	1.1%
Wang XL (2013)	229	542	0.423	[0.381; 0.465]	1.1%
Murase Y (2012)	119	338	0.352	[0.301; 0.406]	1.1%
Chao LL (2012)	123	261	0.471	[0.409; 0.534]	1.1%
Scholz HC (2012)	91	372	0.245	[0.202; 0.292]	1.1%
Li YP (2012)	304	2460	0.124	[0.111; 0.137]	1.1%
Ahantarig A(2011)	0	166	0.000	[0.000; 0.022]	1.1%
Sen E (2011)	10	24	0.417	[0.221; 0.634]	0.9%
Yang Y (2011)	5	162	0.031	[0.010; 0.071]	1.1%
Huang CM (2010)	23	113	0.204	[0.134; 0.290]	1.1%
Chao LL (2010)	27	147	0.184	[0.125; 0.256]	1.1%
Niu QL (2010)	94	631	0.149	[0.122; 0.179]	1.1%
Chao LL (2009)	20	78	0.256	[0.164; 0.368]	1.1%
Chu CY(2008)	41	182	0.225	[0.167; 0.293]	1.1%
Chu CY (2006)	299	1624	0.184	[0.166; 0.204]	1.1%
Huang HM (2006)	137	427	0.321	[0.277; 0.367]	1.1%
Hiroko H (2005)	6	1269	0.005	[0.002; 0.010]	1.1%
Zhao QM (2005)	39	2035	0.019	[0.014; 0.026]	1.1%
Cao WC (2003)	454	1345	0.338	[0.312; 0.364]	1.1%
Takada N (2001)	22	137	0.161	[0.103; 0.233]	1.1%
Ishiguro F (2000)	28	303	0.092	[0.062; 0.131]	1.1%
Tian W (1998)	9	1118	0.008	[0.004; 0.015]	1.1%
Takada N (1998)	59	128	0.461	[0.372; 0.551]	1.1%
Miyamoto K (1997)	7	47	0.149	[0.062; 0.283]	1.0%
NAKAO M (1996)	114	300	0.380	[0.325; 0.438]	1.1%
Li SQ (1990)	39	343	0.114	[0.082; 0.152]	1.1%
Random effects model		39528	0.099	[0.069; 0.133]	77.9%
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0525$, $p = 0$					
Random effects model		**53003**	**0.111**	**[0.083; 0.142]**	**100.0%**
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0503$, $p = 0$					
Residual heterogeneity: $I^2 = 99\%$, $p = 0$					



Study	Events	Total	Proportion	95%−CI	Weight
periods = A					
Gao Y(2021)	10	774	0.013	[0.006; 0.024]	1.1%
Wang Q(2021)	18	250	0.072	[0.043; 0.111]	1.1%
Seo HJ(2021)	15	380	0.039	[0.022; 0.064]	1.1%
Seo MG(2020)	6	329	0.018	[0.007; 0.039]	1.1%
Kim SY(2020)	248	738	0.336	[0.302; 0.371]	1.1%
Nakayama S(2020)	2	561	0.004	[0.000; 0.013]	1.1%
Seto J(2020)	12	164	0.073	[0.038; 0.124]	1.1%
Orkun O(2020)	3	1019	0.003	[0.001; 0.009]	1.1%
Kaenkan W(2020)	20	127	0.157	[0.099; 0.233]	1.1%
Fischer T(2020)	1	310	0.003	[0.000; 0.018]	1.1%
Ghafar A(2020)	15	234	0.064	[0.036; 0.104]	1.1%
Rar V(2019)	742	1822	0.407	[0.385; 0.430]	1.1%
Pukhovskaya NM(2019)	605	2158	0.280	[0.261; 0.300]	1.1%
Kim CM(2019)	5	484	0.010	[0.003; 0.024]	1.1%
Duan CJ (2019)	3	724	0.004	[0.001; 0.012]	1.1%
Jiang BG(2018)	20	692	0.029	[0.018; 0.044]	1.1%
Hagen RM(2018)	23	403	0.057	[0.037; 0.084]	1.1%
Narankhajid M (2018)	9	360	0.025	[0.011; 0.047]	1.1%
Zheng WQ (2018)	3	311	0.010	[0.002; 0.028]	1.1%
Khoo JJ (2018)	72	156	0.462	[0.382; 0.543]	1.1%
Ye NN (2018)	0	1111	0.000	[0.000; 0.003]	1.1%
Qin LX (2018)	51	96	0.531	[0.427; 0.634]	1.1%
Yang Y (2018)	20	388	0.052	[0.032; 0.078]	1.1%
Tang F (2018)	86	320	0.269	[0.221; 0.321]	1.1%
Liu XY(2017)	0	500	0.000	[0.000; 0.007]	1.1%
Karasartova D(2017)	1	322	0.003	[0.000; 0.017]	1.1%
Kuo CC (2017)	5	85	0.059	[0.019; 0.132]	1.1%
Pan YP (2017)	5	25	0.200	[0.068; 0.407]	0.9%
Li HY (2017)	97	546	0.178	[0.146; 0.212]	1.1%
Sakakibara K(2016)	1	248	0.004	[0.000; 0.022]	1.1%
Khasnatinov MA(2016)	90	445	0.202	[0.166; 0.243]	1.1%
Yu PF (2016)	156	849	0.184	[0.158; 0.211]	1.1%
Yang Y (2016)	0	178	0.000	[0.000; 0.021]	1.1%
Zhang F (2016)	97	618	0.157	[0.129; 0.188]	1.1%
Han H (2016)	3	232	0.013	[0.003; 0.037]	1.1%
Yang J (2016)	0	257	0.000	[0.000; 0.014]	1.1%
Hong XK (2016)	2	90	0.022	[0.003; 0.078]	1.1%
Liu L(2015)	0	292	0.000	[0.000; 0.013]	1.1%
Chen C (2015)	4	44	0.091	[0.025; 0.217]	1.0%
Han H (2015)	12	643	0.019	[0.010; 0.032]	1.1%
Wang XR (2015)	53	227	0.233	[0.180; 0.294]	1.1%
Chen Z(2014)	0	308	0.000	[0.000; 0.012]	1.1%
Takano A(2014)	77	4325	0.018	[0.014; 0.022]	1.1%
Lee K(2014)	6	670	0.009	[0.003; 0.019]	1.1%
Hou J (2014)	21	447	0.047	[0.029; 0.071]	1.1%
Masuzawa T (2014)	71	129	0.550	[0.460; 0.638]	1.1%
Orkun O (2014)	6	169	0.036	[0.013; 0.076]	1.1%
Wang W (2013)	0	197	0.000	[0.000; 0.019]	1.1%
Sun X (2013)	18	367	0.049	[0.029; 0.076]	1.1%
Wang XL (2013)	229	542	0.423	[0.381; 0.465]	1.1%
Murase Y (2012)	119	338	0.352	[0.301; 0.406]	1.1%
Chao LL (2012)	123	261	0.471	[0.409; 0.534]	1.1%
Scholz HC (2012)	91	372	0.245	[0.202; 0.292]	1.1%
Li YP (2012)	304	2460	0.124	[0.111; 0.137]	1.1%
Ahantarig A(2011)	0	166	0.000	[0.000; 0.022]	1.1%
Sen E (2011)	10	24	0.417	[0.221; 0.634]	0.9%
Yang Y (2011)	5	162	0.031	[0.010; 0.071]	1.1%
Random effects model		**30449**	**0.078**	**[0.048; 0.114]**	**62.6%**
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0549$, $p = 0$					
periods = B					
Huang CM (2010)	23	113	0.204	[0.134; 0.290]	1.1%
Chao LL (2010)	27	147	0.184	[0.125; 0.256]	1.1%
Geng Z (2010)	233	1515	0.154	[0.136; 0.173]	1.1%
Niu QL (2010)	94	631	0.149	[0.122; 0.179]	1.1%
Chao LL (2009)	20	78	0.256	[0.164; 0.368]	1.1%
Wang CS (2009)	551	1405	0.392	[0.367; 0.418]	1.1%
Chu CY(2008)	41	182	0.225	[0.167; 0.293]	1.1%
He H (2007)	39	105	0.371	[0.279; 0.471]	1.1%
Gao LY (2007)	631	1799	0.351	[0.329; 0.373]	1.1%
Chu CY (2006)	299	1624	0.184	[0.166; 0.204]	1.1%
Huang HM (2006)	137	427	0.321	[0.277; 0.367]	1.1%
Hiroko H (2005)	6	1269	0.005	[0.002; 0.010]	1.1%
Zhao QM (2005)	39	2035	0.019	[0.014; 0.026]	1.1%
Güner ES(2003)	12	299	0.040	[0.021; 0.069]	1.1%
Cao WC (2003)	454	1345	0.338	[0.312; 0.364]	1.1%
Wang ZX (2003)	42	274	0.153	[0.113; 0.201]	1.1%
Takada N (2001)	22	137	0.161	[0.103; 0.233]	1.1%
Random effects model		**13385**	**0.186**	**[0.111; 0.274]**	**18.8%**
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0483$, $p = 0$					
periods = C					
Ishiguro F (2000)	28	303	0.092	[0.062; 0.131]	1.1%
Hua MT (2000)	10	62	0.161	[0.080; 0.277]	1.0%
Tian W (1998)	9	1118	0.008	[0.004; 0.015]	1.1%
Takada N (1998)	59	128	0.461	[0.372; 0.551]	1.1%
Wan KL (1998)	166	623	0.266	[0.232; 0.303]	1.1%
Wang KL (1998)	128	820	0.156	[0.132; 0.183]	1.1%
Miyamoto K (1997)	7	47	0.149	[0.062; 0.283]	1.0%
Sato Y(1996)	225	846	0.266	[0.236; 0.297]	1.1%
NAKAO M (1996)	114	300	0.380	[0.325; 0.438]	1.1%
Takada N (1994)	81	528	0.153	[0.124; 0.187]	1.1%
Mo YM (1994)	5	100	0.050	[0.016; 0.113]	1.1%
NAKAO M (1992)	225	1464	0.154	[0.136; 0.173]	1.1%
Miyamoto K (1992)	117	909	0.129	[0.108; 0.152]	1.1%
Du Y (1992)	215	846	0.254	[0.225; 0.285]	1.1%
Zhag QN (1991)	42	150	0.280	[0.210; 0.359]	1.1%
Ai CG (1990)	42	582	0.072	[0.053; 0.096]	1.1%
Li SQ (1990)	39	343	0.114	[0.082; 0.152]	1.1%
Random effects model		**9169**	**0.169**	**[0.116; 0.230]**	**18.7%**
Heterogeneity: $I^2 = 98\%$, $\tau^2 = 0.0245$, $p < 0.01$					
Random effects model		**53003**	**0.111**	**[0.083; 0.142]**	**100.0%**
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0503$, $p = 0$					
Residual heterogeneity: $I^2 = 99\%$, $p = 0$					

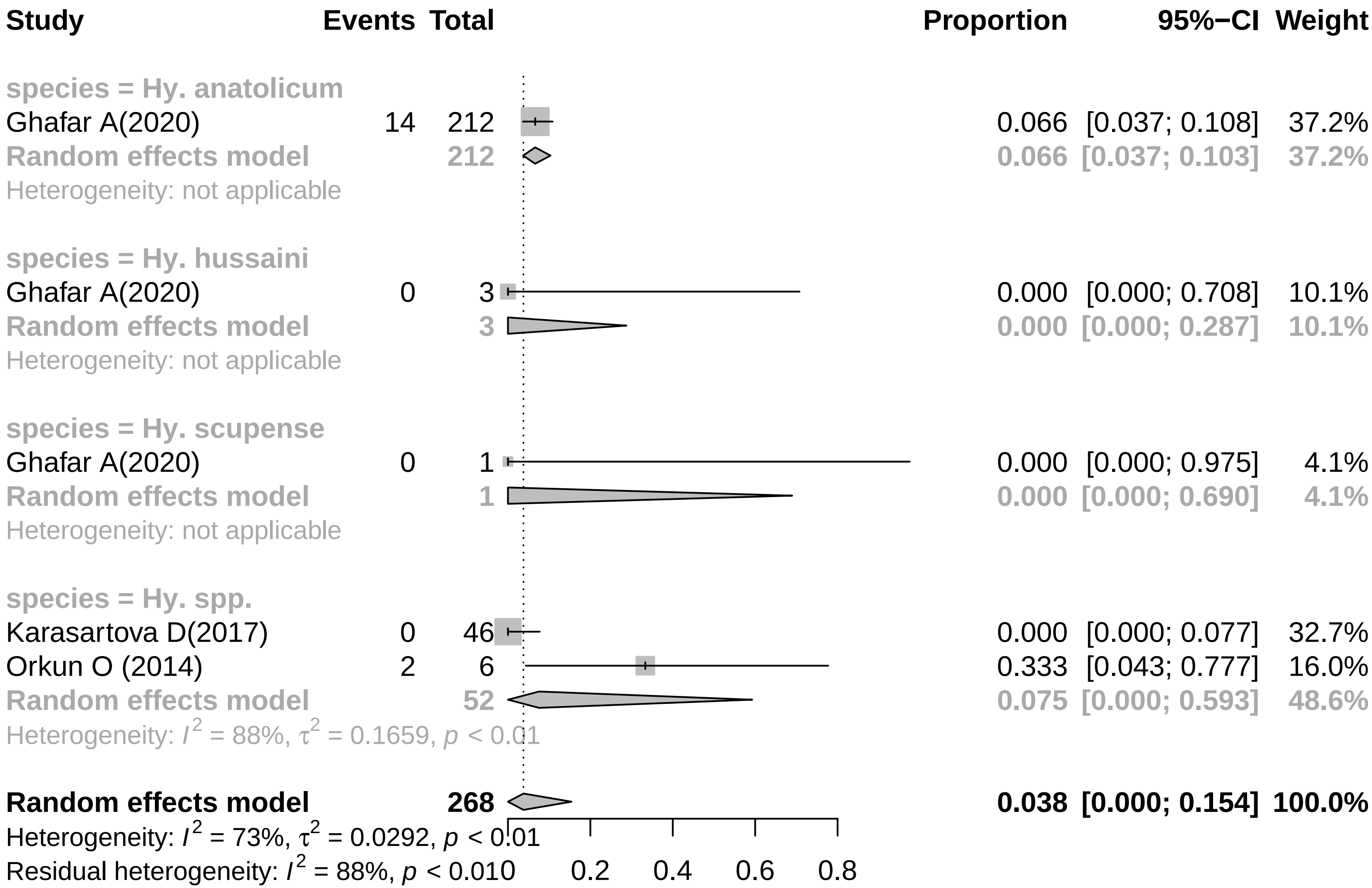



Study | Events | Total | Proportion | 95%−CI | Weight
species = A. geoemydae
Kaenkan W(2020) 2 31 0.065 [0.008; 0.214] 12.9%
Random effects model 31 0.065 [0.007; 0.176] 12.9%
Heterogeneity: not applicable
species = A. helvolum
Kaenkan W(2020) 1 28 0.036 [0.001; 0.183] 12.5%
Random effects model 28 0.036 [0.000; 0.134] 12.5%
Heterogeneity: not applicable
species = A. varanense
Kaenkan W(2020) 17 62 0.274 [0.169; 0.402] 15.1%
Random effects model 62 0.274 [0.171; 0.391] 15.1%
Heterogeneity: not applicable
species = A. variegatum
Hagen RM(2018) 21 255 0.082 [0.052; 0.123] 17.4%
Random effects model 255 0.082 [0.052; 0.119] 17.4%
Heterogeneity: not applicable
species = A.spp.
Kuo CC (2017) 0 5 0.000 [0.000; 0.522] 5.1%
Khoo JJ (2018) 0 3 0.000 [0.000; 0.708] 3.4%
Kaenkan W(2020) 0 6 0.000 [0.000; 0.459] 5.7%
Random effects model 14 0.000 [0.000; 0.067] 14.2%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 1.00
species = A.testudinarium
Hou J (2014) 1 29 0.034 [0.001; 0.178] 12.6%
Takada N (1994) 0 1 0.000 [0.000; 0.975] 1.3%
Zheng WQ (2018) 0 1 0.000 [0.000; 0.975] 1.3%
Seo HJ(2021) 0 1 0.000 [0.000; 0.975] 1.3%
Nakayama S(2020) 0 22 0.000 [0.000; 0.154] 11.5%
Random effects model 54 0.010 [0.000; 0.054] 28.0%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.76
Random effects model 444 0.045 [0.010; 0.105] 100.0%
Heterogeneity: I^2 = 66%, τ^2 = 0.0191, p < 0.01
Residual heterogeneity: I^2 = 0%, p = 0.93
0 0.2 0.4 0.6 0.8



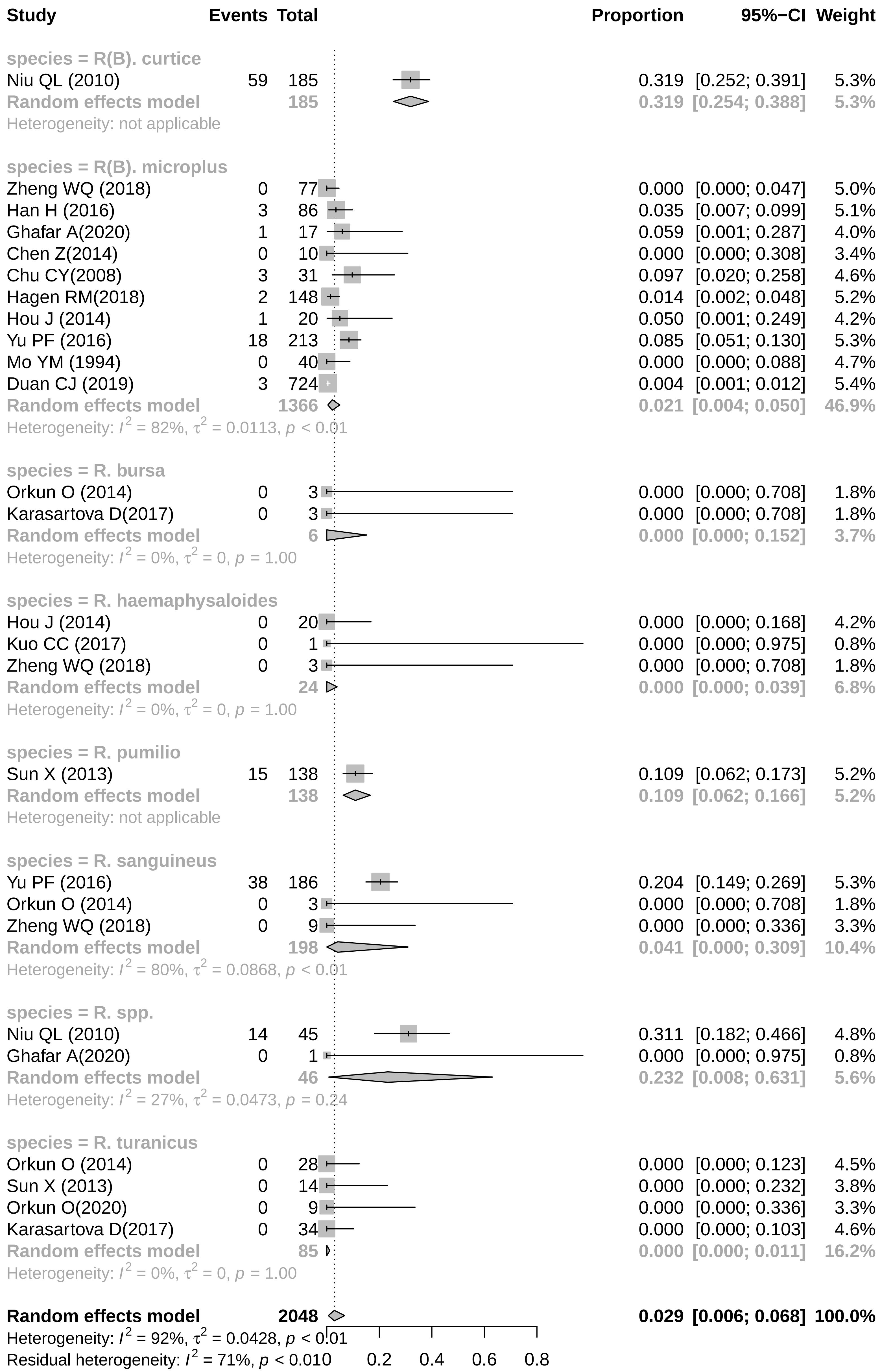
Study Events Total Proportion 95%−CI Weight
species = D.auratus
Tian W (1998) 0 13 0.000 [0.000; 0.247] 2.4%
Narankhajid M (2018) 0 2 0.000 [0.000; 0.842] 0.9%
Yu PF (2016) 3 165 0.018 [0.004; 0.052] 3.2%
Chu CY (2006) 6 144 0.042 [0.015; 0.088] 3.2%
Hua MT (2000) 6 32 0.188 [0.072; 0.364] 2.8%
Ye NN (2018) 0 1045 0.000 [0.000; 0.004] 3.3%
Chen C (2015) 0 2 0.000 [0.000; 0.842] 0.9%
Du Y (1992) 0 18 0.000 [0.000; 0.185] 2.6%
Huang HM (2006) 101 327 0.309 [0.259; 0.362] 3.3%
Tang F (2018) 1 22 0.045 [0.001; 0.228] 2.7%
Yang J (2016) 0 66 0.000 [0.000; 0.054] 3.1%
Random effects model 1836 0.027 [0.000; 0.116] 28.3%
Heterogeneity: I^2 = 97%, τ^2 = 0.0778, p < 0.01
species = D.marginatus
Niu QL (2010) 10 264 0.038 [0.018; 0.069] 3.3%
Qin LX (2018) 51 96 0.531 [0.427; 0.634] 3.1%
Orkun O(2020) 0 41 0.000 [0.000; 0.086] 2.9%
Karasartova D(2017) 0 17 0.000 [0.000; 0.195] 2.5%
Random effects model 418 0.066 [0.000; 0.359] 11.9%
Heterogeneity: I^2 = 98%, τ^2 = 0.1466, p < 0.01
species = D.niveus
Khoo JJ (2018) 0 24 0.000 [0.000; 0.142] 2.7%
Random effects model 24 0.000 [0.000; 0.039] 2.7%
Heterogeneity: not applicable
species = D.nuttalli
Narankhajid M (2018) 0 35 0.000 [0.000; 0.100] 2.9%
Zhag QN (1991) 0 105 0.000 [0.000; 0.035] 3.2%
Orkun O (2014) 0 25 0.000 [0.000; 0.137] 2.7%
Sun X (2013) 0 41 0.000 [0.000; 0.086] 2.9%
Wang Q(2021) 0 21 0.000 [0.000; 0.161] 2.6%
Fischer T(2020) 1 310 0.003 [0.000; 0.018] 3.3%
Gao Y(2021) 1 127 0.008 [0.000; 0.043] 3.2%
Liu L(2015) 0 179 0.000 [0.000; 0.020] 3.2%
Random effects model 843 0.001 [0.000; 0.005] 24.0%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.77
species = D.silvarum
Hou J (2014) 0 9 0.000 [0.000; 0.336] 2.1%
Takada N (1994) 0 8 0.000 [0.000; 0.369] 2.0%
Wang Q(2021) 1 120 0.008 [0.000; 0.046] 3.2%
Pukhovskaya NM(2019) 2 29 0.069 [0.008; 0.228] 2.8%
Gao Y(2021) 1 78 0.013 [0.000; 0.069] 3.1%
Jiang BG(2018) 0 29 0.000 [0.000; 0.119] 2.8%
Random effects model 273 0.010 [0.002; 0.026] 16.0%
Heterogeneity: I^2 = 2%, τ^2 = 0.0002, p = 0.40
species = D.spp
Zheng WQ (2018) 0 1 0.000 [0.000; 0.975] 0.5%
Hua MT (2000) 4 30 0.133 [0.038; 0.307] 2.8%
Yang Y (2018) 45 263 0.171 [0.128; 0.222] 3.3%
Zhang F (2016) 28 249 0.112 [0.076; 0.158] 3.2%
Wang XR (2015) 25 110 0.227 [0.153; 0.317] 3.2%
Orkun O(2020) 0 2 0.000 [0.000; 0.842] 0.9%
Random effects model 655 0.155 [0.108; 0.208] 13.9%
Heterogeneity: I^2 = 51%, τ^2 = 0.0030, p = 0.07
species = D.taiwanensis
Narankhajid M (2018) 6 272 0.022 [0.008; 0.047] 3.3%
Random effects model 272 0.022 [0.008; 0.043] 3.3%
Heterogeneity: not applicable
Random effects model 4321 0.024 [0.006; 0.053] 100.0%
Heterogeneity: I^2 = 95%, τ^2 = 0.0470, p < 0.01
Residual heterogeneity: I^2 = 94%, p < 0.01
0 0.2 0.4 0.6 0.8


Study Events Total Proportion 95%−CI Weight
species = H. parva
Orkun O (2014) 2 35 0.057 [0.007; 0.192] 1.2%
Orkun O(2020) 0 793 0.000 [0.000; 0.005] 1.6%
Karasartova D(2017) 0 41 0.000 [0.000; 0.086] 1.3%
Random effects model 869 0.004 [0.000; 0.039] 4.1%
Heterogeneity: I^2 = 74%, τ^2 = 0.0103, p = 0.02
species = H.aegyptium
Orkun O (2014) 0 16 0.000 [0.000; 0.206] 1.0%
Orkun O(2020) 0 9 0.000 [0.000; 0.336] 0.8%
Karasartova D(2017) 0 1 0.000 [0.000; 0.975] 0.2%
Random effects model 26 0.000 [0.000; 0.036] 1.9%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 1.00
species = H.asiaticum
Hou J (2014) 0 1 0.000 [0.000; 0.975] 0.2%
Narankhajid M (2018) 1 44 0.023 [0.001; 0.120] 1.3%
Yang Y (2011) 5 162 0.031 [0.010; 0.071] 1.5%
Yang Y (2016) 0 178 0.000 [0.000; 0.021] 1.5%
Sun X (2013) 3 174 0.017 [0.004; 0.050] 1.5%
Random effects model 559 0.012 [0.001; 0.037] 5.9%
Heterogeneity: I^2 = 67%, τ^2 = 0.0051, p = 0.02
species = H.bispinosa
Yu PF (2016) 11 34 0.324 [0.174; 0.505] 1.2%
Mo YM (1994) 3 20 0.150 [0.032; 0.379] 1.1%
Random effects model 54 0.242 [0.094; 0.430] 2.3%
Heterogeneity: I^2 = 54%, τ^2 = 0.0116, p = 0.14
species = H.concinna
Chu CY (2006) 0 144 0.000 [0.000; 0.025] 1.5%
Ye NN (2018) 0 236 0.000 [0.000; 0.016] 1.5%
Chen C (2015) 1 34 0.029 [0.001; 0.153] 1.2%
Han H (2015) 1 573 0.002 [0.000; 0.010] 1.5%
Tang F (2018) 0 5 0.000 [0.000; 0.522] 0.5%
Yang J (2016) 0 106 0.000 [0.000; 0.034] 1.4%
Wang CS (2009) 9 110 0.082 [0.038; 0.150] 1.4%
Wang Q(2021) 2 47 0.043 [0.005; 0.145] 1.3%
Pukhovskaya NM(2019) 14 481 0.029 [0.016; 0.048] 1.5%
Jiang BG(2018) 1 36 0.028 [0.001; 0.145] 1.2%
Chu CY(2008) 1 2 0.500 [0.013; 0.987] 0.3%
Random effects model 1774 0.013 [0.002; 0.032] 13.6%
Heterogeneity: I^2 = 83%, τ^2 = 0.0089, p < 0.01
species = H.doenitzi
Kuo CC (2017) 0 24 0.000 [0.000; 0.142] 1.1%
Random effects model 24 0.000 [0.000; 0.039] 1.1%
Heterogeneity: not applicable
species = H.excavatum
Orkun O (2014) 1 17 0.059 [0.001; 0.287] 1.0%
Orkun O(2020) 0 11 0.000 [0.000; 0.285] 0.8%
Karasartova D(2017) 0 5 0.000 [0.000; 0.522] 0.5%
Random effects model 33 0.016 [0.000; 0.086] 2.4%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.37
species = H.flava
Takada N (1994) 1 40 0.025 [0.001; 0.132] 1.3%
Zheng WQ (2018) 0 21 0.000 [0.000; 0.161] 1.1%
Seo MG(2020) 1 33 0.030 [0.001; 0.158] 1.2%
Seo HJ(2021) 1 74 0.014 [0.000; 0.073] 1.4%
Nakayama S(2020) 0 213 0.000 [0.000; 0.017] 1.5%
Seto J(2020) 0 10 0.000 [0.000; 0.308] 0.8%
Kim CM(2019) 0 42 0.000 [0.000; 0.084] 1.3%
Kuo CC (2017) 0 1 0.000 [0.000; 0.975] 0.2%
Random effects model 434 0.003 [0.000; 0.013] 8.7%
Heterogeneity: I^2 = 14%, τ^2 = 0.0009, p = 0.32
species = H.formosensis
Han H (2016) 0 5 0.000 [0.000; 0.522] 0.5%
Seo HJ(2021) 0 2 0.000 [0.000; 0.842] 0.3%
Nakayama S(2020) 0 78 0.000 [0.000; 0.046] 1.4%
Kuo CC (2017) 0 1 0.000 [0.000; 0.975] 0.2%
Random effects model 86 0.000 [0.000; 0.011] 2.4%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 1.00
species = H.garhwalensis
Zhang F (2016) 22 152 0.145 [0.093; 0.211] 1.5%
Random effects model 152 0.145 [0.094; 0.205] 1.5%
Heterogeneity: not applicable
species = H.hystricis
Hou J (2014) 0 5 0.000 [0.000; 0.522] 0.5%
Nakayama S(2020) 0 15 0.000 [0.000; 0.218] 1.0%
Mo YM (1994) 2 40 0.050 [0.006; 0.169] 1.3%
Kuo CC (2017) 0 9 0.000 [0.000; 0.336] 0.8%
Random effects model 69 0.014 [0.000; 0.061] 3.5%
Heterogeneity: I^2 = 12%, τ^2 = 0.0026, p = 0.33
species = H.japonica
Takada N (1994) 0 6 0.000 [0.000; 0.459] 0.6%
Du Y (1992) 0 62 0.000 [0.000; 0.058] 1.4%
Yang J (2016) 0 1 0.000 [0.000; 0.975] 0.2%
Wang Q(2021) 2 38 0.053 [0.006; 0.177] 1.3%
Seto J(2020) 0 2 0.000 [0.000; 0.842] 0.3%
Pukhovskaya NM(2019) 7 49 0.143 [0.059; 0.272] 1.3%
Random effects model 158 0.025 [0.000; 0.115] 5.0%
Heterogeneity: I^2 = 72%, τ^2 = 0.0299, p < 0.01
species = H.kitaokai
Takada N (1994) 0 23 0.000 [0.000; 0.148] 1.1%
Nakayama S(2020) 0 24 0.000 [0.000; 0.142] 1.1%
Random effects model 47 0.000 [0.000; 0.020] 2.2%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 1.00
species = H.longicornis
Murase Yusuke (2012) 1 13 0.077 [0.002; 0.360] 0.9%
Hou J (2014) 11 212 0.052 [0.026; 0.091] 1.5%
Yu PF (2016) 65 84 0.774 [0.670; 0.858] 1.4%
Zheng WQ (2018) 0 173 0.000 [0.000; 0.021] 1.5%
Wang W (2013) 0 139 0.000 [0.000; 0.026] 1.5%
Seo MG(2020) 3 282 0.011 [0.002; 0.031] 1.5%
Kim SY(2020) 1 9 0.111 [0.003; 0.482] 0.8%
Seo HJ(2021) 0 29 0.000 [0.000; 0.119] 1.2%
Nakayama S(2020) 0 173 0.000 [0.000; 0.021] 1.5%
Seto J(2020) 0 7 0.000 [0.000; 0.410] 0.7%
Gao Y(2021) 1 275 0.004 [0.000; 0.020] 1.5%
Chen Z(2014) 0 298 0.000 [0.000; 0.012] 1.5%
Liu XY(2017) 0 500 0.000 [0.000; 0.007] 1.5%
Chu CY(2008) 32 114 0.281 [0.201; 0.373] 1.4%
Kim CM(2019) 0 417 0.000 [0.000; 0.009] 1.5%
Random effects model 2725 0.030 [0.003; 0.084] 20.0%
Heterogeneity: I^2 = 97%, τ^2 = 0.0505, p < 0.01
species = H.marginatum
Orkun O (2014) 1 30 0.033 [0.001; 0.172] 1.2%
Orkun O(2020) 0 105 0.000 [0.000; 0.035] 1.4%
Karasartova D(2017) 0 164 0.000 [0.000; 0.022] 1.5%
Random effects model 299 0.001 [0.000; 0.013] 4.1%
Heterogeneity: I^2 = 45%, τ^2 = 0.0024, p = 0.16
species = H.megaspinosa
Takada N (1994) 0 12 0.000 [0.000; 0.265] 0.9%
Nakayama S(2020) 1 28 0.036 [0.001; 0.183] 1.2%
Random effects model 40 0.016 [0.000; 0.089] 2.1%
Heterogeneity: I^2 = 18%, τ^2 = 0.0032, p = 0.27
species = H.nepalensis
Han H (2016) 0 69 0.000 [0.000; 0.052] 1.4%
Random effects model 69 0.000 [0.000; 0.014] 1.4%
Heterogeneity: not applicable
species = H.ornithophila
Kuo CC (2017) 0 6 0.000 [0.000; 0.459] 0.6%
Random effects model 6 0.000 [0.000; 0.152] 0.6%
Heterogeneity: not applicable
species = H.phasiana
Zheng WQ (2018) 0 5 0.000 [0.000; 0.522] 0.5%
Seo HJ(2021) 0 4 0.000 [0.000; 0.602] 0.5%
Random effects model 9 0.000 [0.000; 0.103] 1.0%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 1.00
species = H.punctata
Orkun O (2014) 0 3 0.000 [0.000; 0.708] 0.4%
Orkun O(2020) 0 3 0.000 [0.000; 0.708] 0.4%
Karasartova D(2017) 0 6 0.000 [0.000; 0.459] 0.6%
Random effects model 12 0.000 [0.000; 0.078] 1.4%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 1.00
species = H.qinghaiensis
Yu PF (2016) 3 125 0.024 [0.005; 0.069] 1.5%
Zhang F (2016) 47 217 0.217 [0.164; 0.277] 1.5%
Wang XR (2015) 28 117 0.239 [0.165; 0.327] 1.5%
Random effects model 459 0.141 [0.029; 0.317] 4.4%
Heterogeneity: I^2 = 95%, τ^2 = 0.0340, p < 0.01
species = H.spp
Zhag QN (1991) 0 45 0.000 [0.000; 0.079] 1.3%
Niu QL (2010) 11 173 0.064 [0.032; 0.111] 1.5%
Kuo CC (2017) 0 3 0.000 [0.000; 0.708] 0.4%
Orkun O (2014) 0 1 0.000 [0.000; 0.975] 0.2%
Orkun O(2020) 0 16 0.000 [0.000; 0.206] 1.0%
Lee K(2014) 6 670 0.009 [0.003; 0.019] 1.5%
Karasartova D(2017) 0 1 0.000 [0.000; 0.975] 0.2%
Ahantarig A(2011) 0 166 0.000 [0.000; 0.022] 1.5%
Random effects model 1075 0.007 [0.000; 0.030] 7.5%
Heterogeneity: I^2 = 73%, τ^2 = 0.0079, p < 0.01
species = H.warburtoni
Chu CY(2008) 5 40 0.125 [0.042; 0.268] 1.3%
Random effects model 40 0.125 [0.042; 0.244] 1.3%
Heterogeneity: not applicable
species = H.wellingtoni
Kuo CC (2017) 0 8 0.000 [0.000; 0.369] 0.7%
Random effects model 8 0.000 [0.000; 0.115] 0.7%
Heterogeneity: not applicable
species = H.yeni
Hou J (2014) 0 19 0.000 [0.000; 0.176] 1.0%
Random effects model 19 0.000 [0.000; 0.050] 1.0%
Heterogeneity: not applicable
Random effects model 9046 0.016 [0.008; 0.028] 100.0%
Heterogeneity: I^2 = 91%, τ^2 = 0.0265, p < 0.01
Residual heterogeneity: I^2 = 90%, p < 0.01
0 0.2 0.4 0.6 0.8


Study Events Total Proportion 95%−CI Weight
species = Hy. anatolicum
Ghafar A(2020) 14 212 0.066 [0.037; 0.108] 37.2%
Random effects model 212 0.066 [0.037; 0.103] 37.2%
Heterogeneity: not applicable
species = Hy. hussaini
Ghafar A(2020) 0 3 0.000 [0.000; 0.708] 10.1%
Random effects model 3 0.000 [0.000; 0.287] 10.1%
Heterogeneity: not applicable
species = Hy. scupense
Ghafar A(2020) 0 1 0.000 [0.000; 0.975] 4.1%
Random effects model 1 0.000 [0.000; 0.690] 4.1%
Heterogeneity: not applicable
species = Hy. spp.
Karasartova D(2017) 0 46 0.000 [0.000; 0.077] 32.7%
Orkun O (2014) 2 6 0.333 [0.043; 0.777] 16.0%
Random effects model 52 0.075 [0.000; 0.593] 48.6%
Heterogeneity: I^2 = 88%, τ^2 = 0.1659, p < 0.01
Random effects model 268 0.038 [0.000; 0.154] 100.0%
Heterogeneity: I^2 = 73%, τ^2 = 0.0292, p < 0.01
Residual heterogeneity: I^2 = 88%, p < 0.01
0 0.2 0.4 0.6 0.8

Study	Events	Total	Proportion	95%−CI	Weight
species = I. ovatus					
Murase Yusuke (2012)	8	41	0.195	[0.088; 0.349]	1.3%
Hou J (2014)	0	2	0.000	[0.000; 0.842]	0.4%
NAKAO M (1992)	162	687	0.236	[0.205; 0.269]	1.4%
Takada N (1994)	37	193	0.192	[0.139; 0.254]	1.4%
Miyamoto K (1992)	41	273	0.150	[0.110; 0.198]	1.4%
Nakayama S(2020)	0	5	0.000	[0.000; 0.522]	0.8%
Seto J(2020)	11	95	0.116	[0.059; 0.198]	1.4%
Takano A(2014)	1	676	0.001	[0.000; 0.008]	1.4%
Random effects model		1972	0.098	[0.019; 0.230]	9.5%
Heterogeneity: $I^2 = 98\%$, $\tau^2 = 0.0573$, $p < 0.01$					
species = I. acuminatus					
Zheng WQ (2018)	0	1	0.000	[0.000; 0.975]	0.3%
Random effects model		1	0.000	[0.000; 0.690]	0.3%
Heterogeneity: not applicable					
species = I. angustus					
Kim SY(2020)	3	96	0.031	[0.006; 0.089]	1.4%
Random effects model		96	0.031	[0.006; 0.075]	1.4%
Heterogeneity: not applicable					
species = I. columnae					
Kuo CC (2017)	0	17	0.000	[0.000; 0.195]	1.1%
Random effects model		17	0.000	[0.000; 0.055]	1.1%
Heterogeneity: not applicable					
species = I. granulatus					
Chao LL (2012)	123	261	0.471	[0.409; 0.534]	1.4%
Chao LL (2009)	20	78	0.256	[0.164; 0.368]	1.4%
Huang CM (2010)	23	113	0.204	[0.134; 0.290]	1.4%
Chao LL (2010)	27	147	0.184	[0.125; 0.256]	1.4%
Tian W (1998)	4	947	0.004	[0.001; 0.011]	1.4%
Hou J (2014)	7	36	0.194	[0.082; 0.360]	1.3%
Zheng WQ (2018)	3	16	0.188	[0.040; 0.456]	1.1%
Khoo JJ (2018)	72	122	0.590	[0.497; 0.678]	1.4%
Chu CY (2006)	293	1336	0.219	[0.197; 0.242]	1.4%
Random effects model		3056	0.233	[0.094; 0.411]	12.2%
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0830$, $p < 0.01$					
species = I. monospinosus					
Takada N (1994)	0	58	0.000	[0.000; 0.062]	1.3%
Random effects model		58	0.000	[0.000; 0.016]	1.3%
Heterogeneity: not applicable					
species = I. nipponensis					
Kuo CC (2017)	0	1	0.000	[0.000; 0.975]	0.3%
Seo MG(2020)	2	14	0.143	[0.018; 0.428]	1.1%
Kim SY(2020)	109	193	0.565	[0.492; 0.636]	1.4%
Seo HJ(2021)	0	40	0.000	[0.000; 0.088]	1.3%
Seto J(2020)	0	37	0.000	[0.000; 0.095]	1.3%
Kim CM(2019)	5	25	0.200	[0.068; 0.407]	1.2%
Random effects model		310	0.094	[0.000; 0.430]	6.5%
Heterogeneity: $I^2 = 97\%$, $\tau^2 = 0.2249$, $p < 0.01$					
species = I. pavlovskyi					
Takano A(2014)	5	117	0.043	[0.014; 0.097]	1.4%
Random effects model		117	0.043	[0.014; 0.087]	1.4%
Heterogeneity: not applicable					
species = I. persulcatus					
Murase Yusuke (2012)	98	284	0.345	[0.290; 0.404]	1.4%
Scholz HC (2012)	91	372	0.245	[0.202; 0.292]	1.4%
Takada N (2001)	26	66	0.394	[0.276; 0.522]	1.3%
Tian W (1998)	5	158	0.032	[0.010; 0.072]	1.4%
Miyamoto K (1997)	7	47	0.149	[0.062; 0.283]	1.3%
Cao WC (2003)	454	1345	0.338	[0.312; 0.364]	1.4%
Masuzawa T (2014)	71	129	0.550	[0.460; 0.638]	1.4%
Kuo CC (2017)	3	4	0.750	[0.194; 0.994]	0.7%
Narankhajid M (2018)	2	7	0.286	[0.037; 0.710]	0.9%
NAKAO M (1992)	129	777	0.166	[0.141; 0.194]	1.4%
NAKAO M (1996)	112	300	0.373	[0.318; 0.431]	1.4%
Takada N (1994)	11	85	0.129	[0.066; 0.220]	1.4%
Miyamoto K (1992)	130	792	0.164	[0.139; 0.192]	1.4%
Zhag QN (1991)	42	150	0.280	[0.210; 0.359]	1.4%
Yu PF (2016)	18	42	0.429	[0.277; 0.590]	1.3%
Ye NN (2018)	0	53	0.000	[0.000; 0.067]	1.3%
Chen C (2015)	3	8	0.375	[0.085; 0.755]	0.9%
Pan YP (2017)	5	25	0.200	[0.068; 0.407]	1.2%
Du Y (1992)	215	846	0.254	[0.225; 0.285]	1.4%
Huang HM (2006)	36	100	0.360	[0.266; 0.462]	1.4%
Gao LY (2007)	631	1799	0.351	[0.329; 0.373]	1.4%
Han H (2015)	11	70	0.157	[0.081; 0.264]	1.4%
Yang Y (2018)	0	125	0.000	[0.000; 0.029]	1.4%
Tang F (2018)	85	293	0.290	[0.239; 0.346]	1.4%
Wang W (2013)	0	58	0.000	[0.000; 0.062]	1.3%
Yang J (2016)	0	84	0.000	[0.000; 0.043]	1.4%
Wang CS (2009)	453	1349	0.336	[0.311; 0.362]	1.4%
Wang Q(2021)	13	42	0.310	[0.176; 0.471]	1.3%
Seto J(2020)	1	9	0.111	[0.003; 0.482]	1.0%
Rar V(2019)	252	668	0.377	[0.340; 0.415]	1.4%
Pukhovskaya NM(2019)	582	1599	0.364	[0.340; 0.388]	1.4%
Gao Y(2021)	7	264	0.027	[0.011; 0.054]	1.4%
Jiang BG(2018)	19	627	0.030	[0.018; 0.047]	1.4%
Liu L(2015)	0	113	0.000	[0.000; 0.032]	1.4%
Takano A(2014)	71	3532	0.020	[0.016; 0.025]	1.4%
Khasnatinov MA(2016)	90	445	0.202	[0.166; 0.243]	1.4%
Sato Y(1996)	225	846	0.266	[0.236; 0.297]	1.4%
Random effects model		17513	0.186	[0.131; 0.247]	49.2%
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0500$, $p = 0$					
species = I. ricinus					
Sen E (2011)	10	24	0.417	[0.221; 0.634]	1.2%
Orkun O(2020)	3	30	0.100	[0.021; 0.265]	1.2%
Güner ES(2003)	12	299	0.040	[0.021; 0.069]	1.4%
Karasartova D(2017)	1	4	0.250	[0.006; 0.806]	0.7%
Sakakibara K(2016)	1	248	0.004	[0.000; 0.022]	1.4%
Orkun O (2014)	0	2	0.000	[0.000; 0.842]	0.4%
Random effects model		607	0.087	[0.018; 0.201]	6.4%
Heterogeneity: $I^2 = 89\%$, $\tau^2 = 0.0278$, $p < 0.01$					
species = I. sinensis					
Hou J (2014)	1	94	0.011	[0.000; 0.058]	1.4%
Zheng WQ (2018)	0	4	0.000	[0.000; 0.602]	0.7%
Random effects model		98	0.010	[0.000; 0.039]	2.0%
Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0$, $p = 0.69$					
species = I. turdus					
Kuo CC (2017)	2	5	0.400	[0.053; 0.853]	0.8%
Seo HJ(2021)	14	230	0.061	[0.034; 0.100]	1.4%
Nakayama S(2020)	1	3	0.333	[0.008; 0.906]	0.6%
Random effects model		238	0.183	[0.014; 0.483]	2.7%
Heterogeneity: $I^2 = 62\%$, $\tau^2 = 0.0517$, $p = 0.07$					
species = I. vespertlionis					
Chu CY(2008)	0	4	0.000	[0.000; 0.602]	0.7%
Random effects model		4	0.000	[0.000; 0.221]	0.7%
Heterogeneity: not applicable					
species = unidentified					
Han H (2016)	0	72	0.000	[0.000; 0.050]	1.4%
Kim SY(2020)	135	440	0.307	[0.264; 0.352]	1.4%
Seto J(2020)	0	4	0.000	[0.000; 0.602]	0.7%
Rar V(2019)	490	1154	0.425	[0.396; 0.454]	1.4%
Chu CY(2008)	0	1	0.000	[0.000; 0.975]	0.3%
Random effects model		1671	0.127	[0.018; 0.316]	5.1%
Heterogeneity: $I^2 = 97\%$, $\tau^2 = 0.0495$, $p < 0.01$					
Random effects model		**25758**	**0.145**	**[0.108; 0.186]**	**100.0%**
Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0551$, $p = 0$					
Residual heterogeneity: $I^2 = 99\%$, $p = 0$					

0 0.2 0.4 0.6 0.8


Study Events Total Proportion 95%−CI Weight
species = R(B). curtice
Niu QL (2010) 59 185 0.319 [0.252; 0.391] 5.3%
Random effects model 185 0.319 [0.254; 0.388] 5.3%
Heterogeneity: not applicable
species = R(B). microplus
Zheng WQ (2018) 0 77 0.000 [0.000; 0.047] 5.0%
Han H (2016) 3 86 0.035 [0.007; 0.099] 5.1%
Ghafar A(2020) 1 17 0.059 [0.001; 0.287] 4.0%
Chen Z(2014) 0 10 0.000 [0.000; 0.308] 3.4%
Chu CY(2008) 3 31 0.097 [0.020; 0.258] 4.6%
Hagen RM(2018) 2 148 0.014 [0.002; 0.048] 5.2%
Hou J (2014) 1 20 0.050 [0.001; 0.249] 4.2%
Yu PF (2016) 18 213 0.085 [0.051; 0.130] 5.3%
Mo YM (1994) 0 40 0.000 [0.000; 0.088] 4.7%
Duan CJ (2019) 3 724 0.004 [0.001; 0.012] 5.4%
Random effects model 1366 0.021 [0.004; 0.050] 46.9%
Heterogeneity: I^2 = 82%, τ^2 = 0.0113, p < 0.01
species = R. bursa
Orkun O (2014) 0 3 0.000 [0.000; 0.708] 1.8%
Karasartova D(2017) 0 3 0.000 [0.000; 0.708] 1.8%
Random effects model 6 0.000 [0.000; 0.152] 3.7%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 1.00
species = R. haemaphysaloides
Hou J (2014) 0 20 0.000 [0.000; 0.168] 4.2%
Kuo CC (2017) 0 1 0.000 [0.000; 0.975] 0.8%
Zheng WQ (2018) 0 3 0.000 [0.000; 0.708] 1.8%
Random effects model 24 0.000 [0.000; 0.039] 6.8%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 1.00
species = R. pumilio
Sun X (2013) 15 138 0.109 [0.062; 0.173] 5.2%
Random effects model 138 0.109 [0.062; 0.166] 5.2%
Heterogeneity: not applicable
species = R. sanguineus
Yu PF (2016) 38 186 0.204 [0.149; 0.269] 5.3%
Orkun O (2014) 0 3 0.000 [0.000; 0.708] 1.8%
Zheng WQ (2018) 0 9 0.000 [0.000; 0.336] 3.3%
Random effects model 198 0.041 [0.000; 0.309] 10.4%
Heterogeneity: I^2 = 80%, τ^2 = 0.0868, p < 0.01
species = R. spp.
Niu QL (2010) 14 45 0.311 [0.182; 0.466] 4.8%
Ghafar A(2020) 0 1 0.000 [0.000; 0.975] 0.8%
Random effects model 46 0.232 [0.008; 0.631] 5.6%
Heterogeneity: I^2 = 27%, τ^2 = 0.0473, p = 0.24
species = R. turanicus
Orkun O (2014) 0 28 0.000 [0.000; 0.123] 4.5%
Sun X (2013) 0 14 0.000 [0.000; 0.232] 3.8%
Orkun O(2020) 0 9 0.000 [0.000; 0.336] 3.3%
Karasartova D(2017) 0 34 0.000 [0.000; 0.103] 4.6%
Random effects model 85 0.000 [0.000; 0.011] 16.2%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 1.00
Random effects model 2048 0.029 [0.006; 0.068] 100.0%
Heterogeneity: I^2 = 92%, τ^2 = 0.0428, p < 0.01
Residual heterogeneity: I^2 = 71%, p < 0.01
0 0.2 0.4 0.6 0.8

Supplementary Material 6: Funnel plot

(A) Egg's plot of the Asia prevalence of *B. burgdorferi* s.l.in Ixodidae. (B) Funnel plot of the Asia prevalence of *B. burgdorferi* s.l. in Ixodidae.