**Figure S1.** A PRISMA flow diagram showing the systematic search strategy and the process of study selection. PR represents the phylogenetic relatedness between the invader and the resident community.

Related studies through examining the reference lists of the electronically retrieved studies
(n =17)

Studies identified through ISI Web of Science searching
(n =200)

Studies after the removal of duplicated records

(n =187)

Removed if: the studies were not about biological invasions (e.g. medical studies)

(n=59)

Studies remaining after reviewing title and abstract (n =128)

Removed if: the studies did not allow the calculation of alien-native PR

(n=49)

46 studies excluded for various reasons: duplicated data (n=7), not assessing the PR-invasion relationships (n=19), being reviews, commentaries, mathematical models or retracted studies (n=13), and data for effect size calculation unavailable (n =7)

Studies remaining after reviewing title, abstract and full-text

(n =79)

Final number of studies

Included in our meta-analysis
(n =33)

**Figure S2.** Similar effects of invader-native phylogenetic relatedness on invader naturalization and spread. Shown are the mean effect sizes (±bias-corrected 95% bootstrap confidence intervals) of the relationships between invader-native phylogenetic relatedness and invader naturalization/spread. Mean effect sizes were calculated as Fisher’s z transformations of correlation coefficients between relatedness and naturalization/spread. Values in parentheses represent the sample sizes. Positive mean effect sizes are consistent with the pre-adaptation hypothesis (PAH), and negative mean effect sizes are consistent with Darwin’s naturalization hypothesis (DNH).



**Figure S3.** The use of the nearest phylogenetic relatedness (NPR) and mean phylogenetic relatedness (MPR) between invader and resident species in our meta-analysis yielded similar results. Shown are the mean effect sizes (±bias-corrected 95% bootstrap confidence intervals) of the relationships between invader-native phylogenetic relatedness and invader success/impact. Studies were sub-classified according to whether NPR or MPR between invader and resident species was used. Other details follow Fig. S2.

