Digital supplementary material to

STUBLE, K.L., JURIĆ, I., CERDÁ, X. & SANDERS, N.J. 2017: Dominance hierarchies are a dominant paradigm in ant ecology (Hymenoptera: Formicidae), but should they be? And what is a dominance hierarchy anyways? – Myrmecological News 24: 71-81.

Tab. S1: Ant community literature creating dominance hierarchies of species. Table indicates both field and quantitative methods on which hierarchies were based, ecosystem in which the research was conducted, and whether species were ranked or categorized (dominant versus subdominant).

Reference	Dominance	Ranking	Community	Rank / Categorization
ADLER & al. 2007	bait monopolization	proportion baits monopolized out of baits species had access to	woodland	rank
ANDERSEN 1997	bait monopolization	frequency of high abundance on baits	scrub, woodland	rank
ARANDA-RICKERT & FRACCHIA 2012	aggressive encounters	proportion aggressive encounters won	shrubland	rank
ARNAN & al. 2012	aggressive encounters	proportion aggressive encounters won	grasslands, shrublands and forests	rank
ARNAN & al. 2013	aggressive encounters	categorized based on literature	Mediterranean forest and shrubland	categorization
ARNAN & al. 2011	bait monopolization; influence on community	categorized based on literature	savanna	categorization
BACCARO & al. 2010	bait monopolization	categorized dominant based on high occurance on baits, and frequent monopolization of these baits	tropical forest	categorization
BACCARO & al. 2012	bait monopolization	categorized dominant based on frequent monopolization of baits	tropical forest	categorization
BERTELSMEIER & al. 2015a	aggressive encounters	dominance based on number of individuals alive, dead, and injured following inter-specific encounters	laboratory	rank
BERTELSMEIER & al. 2015b	aggressive encounters	dominance based on number of individuals alive, dead, and injured following inter-specific encounters	laboratory	rank
BESTELMEYER 2000	aggressive encounters	proportion aggressive encounters won	subtropical forest	rank
BINZ & al. 2014	aggressive encounters	number of aggressive encounters initiated	laboratory	categorization
CARPINTERO & REYES-LÓPEZ 2008	aggressive encounters	verbal model	scrubland	rank
CERDÁ & al. 2012	aggressive encounters	proportion aggressive encounters won	tropical coral atoll	rank
CERDÁ & al. 1997	aggressive encounters	proportion aggressive encounters won	Mediterranean grassland and forests	rank
CERDÁ & al. 1998a	aggressive encounters	proportion aggressive encounters won	grassland	rank
CERDÁ & al. 1998b	aggressive encounters	proportion aggressive encounters won	grassland	rank
DELSINNE & al. 2007	aggressive encounters	number of times initiating an attack	xeromorphic forest	rank
FEENER & al. 2008	bait monopolization	Colley matrix	ranchland, forest, Pantanal	rank
FELLERS 1987	aggressive encounters	proportion aggressive encounters won	forest	rank
FITZPATRICK & al. 2013	aggressive encounters	Colley matrix	desert	rank
GALLÈ & al. 1998	aggressive encounters	number of times a species excluded another	varying sucessional stages between open sand and pine forest	categorization
GREENSLADE 1971	territory turnover	verbal model	agroecosystem	rank

HEATWOLE & al. 2013	activity on baits	matrix of reciprocal pairs	eucalypt woodland	rank
HOLWAY 1999	deterance of *Linepithema humile*	proportion of one-on-one interactions against *L. humile* won	woodland	rank
IHNATIUK & STUKALYUK 2015	behavior at bait, and a mix of individual and colony traits	scores given based on trait classes	urban	categorization
LEAL & al. 2006	aggressive encounters	proportion aggressive encounters won	forest	rank
LEBRUN 2005	bait monopolization	proportion baits monopolized out of baits species had access to	woodland	rank
LEBRUN & FEENER 2007	aggressive encounters	Colley matrix	woodland	rank
LESSARD & al. 2009	aggressive encounters	proportion aggressive encounters won	forest	rank
LIVINGSTON & PHILPOTT 2010	lab competitions for nest sites	log ratios of win to loss ratio	agroecosystem	rank
LUQUE & REYES-LÓPEZ 2007	bait monopolization	proportion of baits monopolized	grassland	rank
MENZEL & al. 2010	aggressive encounters toward dead opponent	matrix of reciprocal pairs	tropical forest	rank
MORRISON 1996	ability to replace another species on a bait	number of times a species excluded another	island	rank
PALMER & al. 2013	takeover of territory	minimization of competitive reversals	savanna	rank
PALMER & al. 2000	takeover of territory	minimization of competitive reversals	savanna	rank
PARR & GIBB 2012	bait monopolization	proportion of baits monopolized; proportion of baits monopolized if the species arrived first	forest, rocky outcrop, savanna, riverine, heathland, grassland	rank
PAULSON & AKRE 1991	territoriality	defense catagories (nests, food, territories)	orchard	categorization
PUTYATINA 2011	aggressive encounters	verbal model	fire forest	rank
RETANA & CERDÁ 2000	aggressive encounters	proportion aggressive encounters won	various	categorization
SANDERS & GORDON 2003	bait occupancy	ratio of number of ants at baits to abundance in pitfall traps	desert	rank
SANTINI & al. 2007	aggressive encounters	proportion aggressive encounters won	orchard	rank
SAVOLAINEN & VEPSÄLÄINEN 1988	territoriality	defense categories (nests, food, territories)	forest	categorization
SAVOLAINEN & al. 1989	territoriality	defense categories (nests, food, territories)	forest	categorization
SOLIDA & al. 2014	bait monopolization	proportion baits monopolized out of baits species had access to	Mediterranean grassland	rank
SOUZA DA CONCEICÃO & al. 2015	bait monopolization	number of times a species achieved 7 or more workers on a bait	cocoa plantation	rank
STANTON & al. 2002	takeover of territory	minimization of competitive reversals	savanna	rank
STUBLE & al. 2013	aggressive encounters	proportion aggressive encounters won; Colley matrix	forest	rank
STUKALYUK & al. 2011	behavior at bait, and territory parameters		forested and shrubby mountain slopes	rank
TORRES 1984	aggressive encounters	proportion aggressive encounters won	tropical forest, grassland, agroecosystem	rank
VEPSÄLÄINEN & CZECHOWSKI 2014	literature	based on literature	grassy lawn	categorization
WARD & BEGGS 2007	aggressive encounters; bait monopolization	proportion aggressive encounters won; proportion of times a species was the sole species on a bait at the end of the sampling period	forest, scrub, agroecosystem	rank
WIESCHER & al. 2011	aggressive encounters	minimization of intransitive interactions and ties	flatwoods, sandhill, scrub	rank
WITTMAN & al. 2010	aggressive encounters	proportion aggressive encounters won	forest	rank
XU & CHEN 2010	aggressive encounters	proportion aggressive encounters won	tropical botanical garden	rank

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Tab. S2: Dominance hierarchies from a) three deciduous forests located in the eastern USA and b) forested and grassland Mediterranean habitats (data from CERDÁ & al. 1998). All assemblages are ranked here according to the proportion of fights won by each species. (Note that names here reflect the most current nomenclature, and not necessarily the names used in the original publication).

a)

FELLERS 1987	**LESSARD & al. 2009**	**STUBLE & al. 2013**
Camponotus chromaiodes	*Lasius alienus*	*Camponotus pennsylvanicus*
Lasius alienus	*Prenolepis imparis*	*Crematogaster lineolata*
Prenolepis imparis	*Myrmica punctiventris*	*Premolepis imparis*
Formica subsericea	*Camponotus chromaiodes*	*Camponotus castaneus*
Myrmica spp.	*Formica subsericea*	*Formica pallidefulva*
Aphaenogaster rudis	*Aphaenogaster rudis*	*Formica subsericea*
Tapinoma sessile	*Nylanderia faisonensis*	*Aphaenogaster lamellidens*
Temnothorax curvispinosus		*Aphaenogaster rudis*
		Nylanderia faisonensis
		Temnothorax curvispinosus

b)

Grassland	Holm-oak	Pine forest
Tetramorium semilaeve	*Camponotus sylvaticus*	*Tetramorium semilaeve*
Camponotus sylvaticus	*Camponotus cruentatus*	*Pheidole pallidula*
Linepithema humile	*Tetramorium semilaeve*	*Camponotus sylvaticus*
Pheidole pallidula	*Pheidole pallidula*	*Camponotus foreli*
Camponotus foreli	*Camponotus foreli*	*Tapinoma nigerrimum*
Tapinoma nigerrimum	*Messor capitatus*	*Messor bouvieri*
Messor capitatus	*Plagiolepis pygmaea*	*Aphaenogaster senilis*
Messor bouvieri	*Aphaenogaster senilis*	*Cataglyphis cursor*
Aphaenogaster senilis	*Messor bouvieri*	*Plagiolepis pygmaea*
Plagiolepis pygmaea		
Cataglyphis cursor		

Fig. S1: Relationship between abundance and four different measures of dominance. A) Colley rank was not correlated with abundance (Colley: Spearman's ρ = 0.13, p = 0.71), B) nor was dominance based on the proportion of aggressive encounters won (Spearman's ρ = 0.13, p = 0.71). C) Bait monopolization was positively correlated with abundance (Spearman's ρ = 0.82, p = 0.0039). Bait monopolization of only those baits the species had access to was only marginally correlated with abundance (Spearman's ρ = 0.58, p = 0.08).

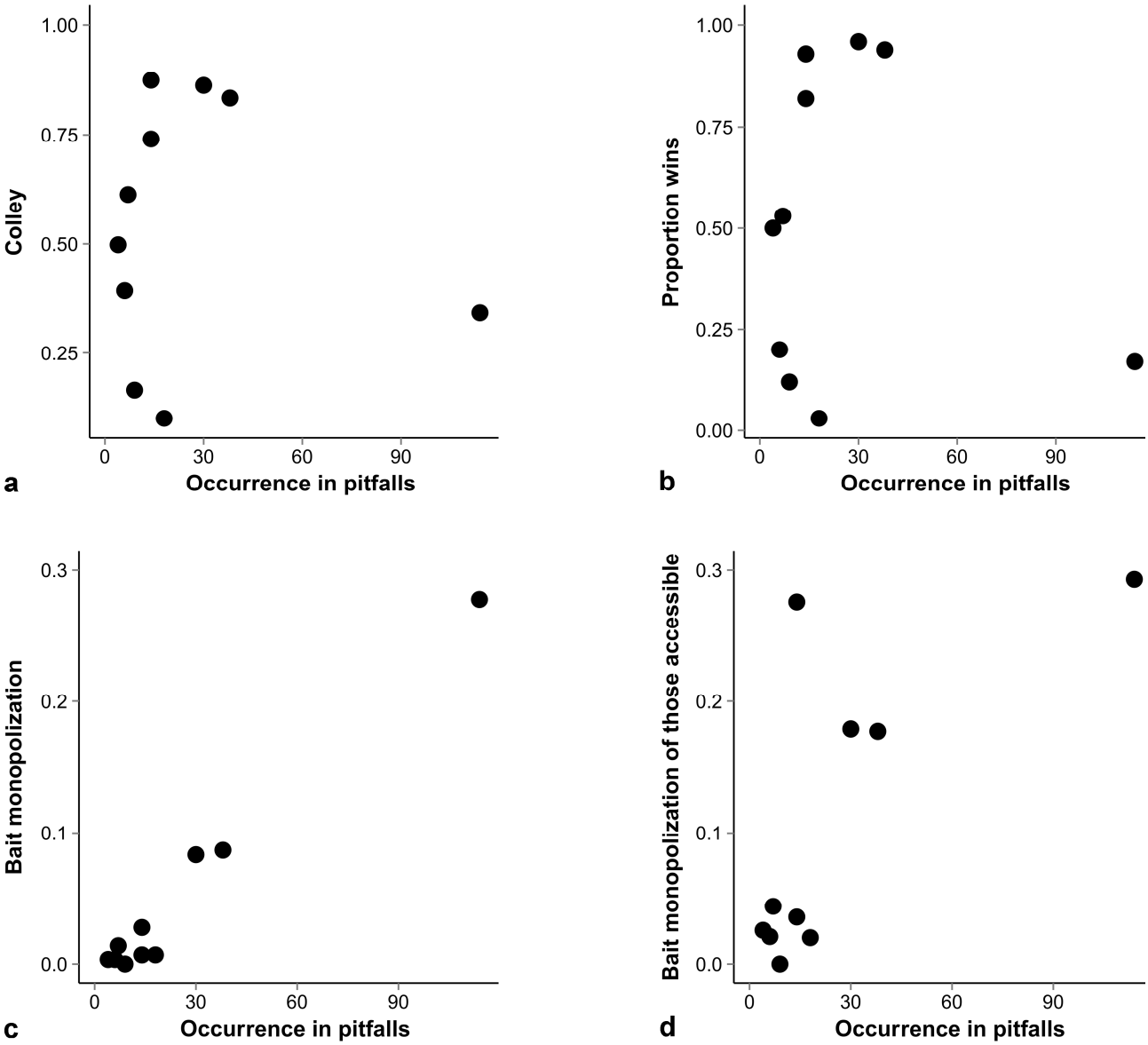

Fig. S2: The placement of a species within a dominance hierarchy becomes more difficult to determine as sample sizes become lower and / or fight uncertainty increases. Here we calculate dominance (based on proportion of fights won) and associated confidence intervals for: a) a case in which we have large sample sizes (each species is observed in 400 fights, with 100 fights per species pair) and we observe no variability in the outcome of fights (the winner wins 100% of encounters against species ranked lower), b) a case in which sample sizes are low (each species is observed in 40 fights, with 10 fights per species pair) and there is no variability in the outcome of fights, and c) a case in which we again have large sample sizes, but in which there is considerable variability in the outcome of fights (higher ranked species will win against a lower rank species in 60% of encounters).

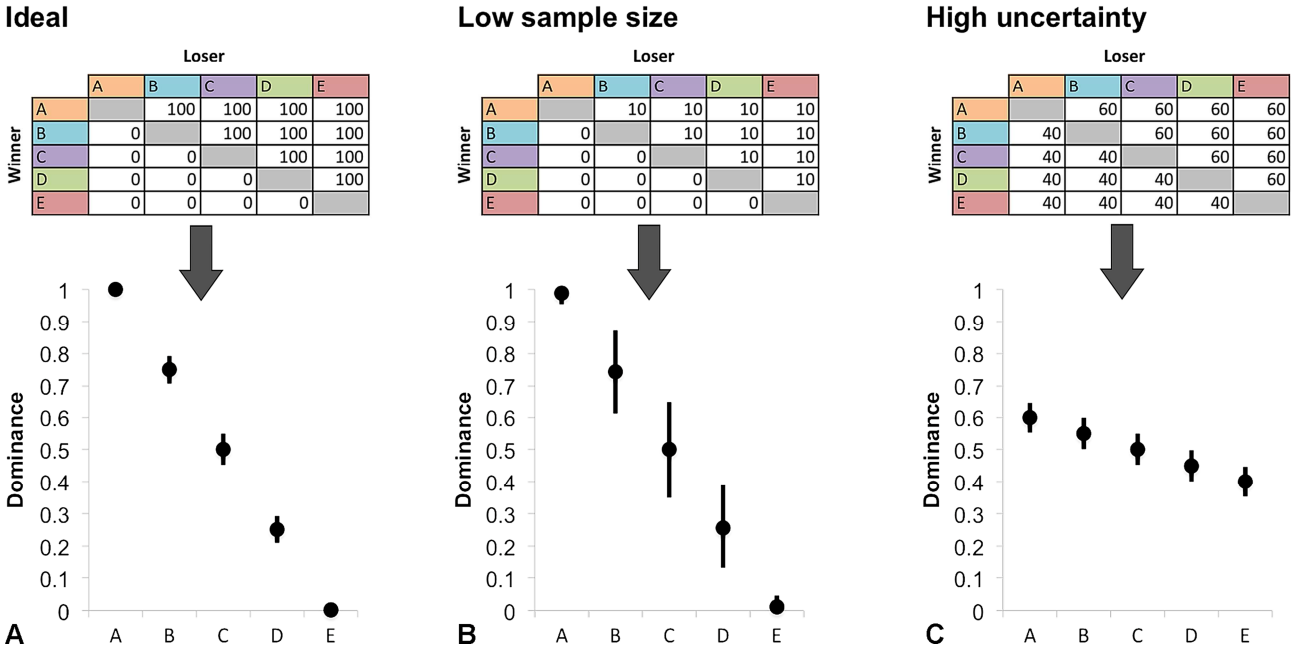

Fig. S3: Point estimates of dominance with Bayesian credibility intervals for dominance based on bait monopolization (out of baits discovered by a species) in the North Carolina system.