Table 1. Examples of group formation for which there is some information on dispersal, relatedness and punishment/policing.

Gross taxonomic level	Species	Public good	Cooperators or cooperation performed	Cooperator dispersal	Defectors or way of cheating	Defector dispersal	Relatedness Coop./Def.	Punishment, policing	References
Viruses	Plant *RNA-virus*	diffusable intracellular products	complete RNA-virus	via insects	sequester intracellular products	requires presence of cooperators	defective interfering particle(?)	?	[111, 112]
Bacteria	*Escherichia coli*	protection against competitors	production of diffusive bacteriocins	?	no colicin production	?	mutant	colicin production	[113-115]
Bacteria	*Pseudomonas sp.*	biofilm	polymer production	shearing	no polymer production	planktonic disperser cells	mutant	Apparent niche exclusion	[79, 80, 89, 116, 117]
Myxobacteria	*Myxococcus xanthus*	fruiting body	formation of fruiting body, C-signal production, cell autolysis	S-motility (social gliding)	no contribution to fruiting body	A-motility (individual)	High within group relatedness; mutations	?	[37, 96, 118-121]
Yeast	*Sacharomyces cerevisiae*	Sucrose digestion	production of invertase via *SUC2* gene	Free living	deleted *SUC2* gene, no invertase prod.	Free living	Polymorphic SUC genes	k1 killer toxin production	[122 – 125]
Slime moulds	*Dictyostelium mucoroides* *D. discoideum*	stalk for spore dispersal stalk for spore dispersal	production of signals and stalk, adhesion of cooperators stalk formation	no no	specialization in spore production *chtA/FbxA* - mutant: almost pure spore production	yes yes	mutant, clone chimeras mutant clone chimaeras	somatic compatibility system efficiency reduction by competition, DIF-1 secretion	[126-127] [97, 128-135]
Protozoa 1. Flagellata a) Phyto-monadina b) Proto-monadina	*Volvox carteri, V. aureus* *Proterospongia haeckeli*	multicellular body, nutrition, locomotion multicellular body	somatic cells flagellated cells moving the colony	no no (?)	gonidia: specialize in reproduction amoeboid cells: asexual reproduction	yes ?	clonal clonal	? programmed cell death	[1, 18, 136-147]

2. Euciliata Peritricha	*Zoothamnium arbuscula*	multicellular colony	feeding zooids, nutrition	no	macrozooids: no feeding	yes	clonal (?)	?	[148]
Porifera	*Spongilla lacustris, Ephydatia sp., Reniera sp., Haliclona sp.*	multicellular body, care for gametes & embryos	up to 14 different cell types, various functions	if dissociated or as gemmules	gamete production	yes	clonal or chimeric	allorecognition restraining exploitation after fusion	[56, 149-155]
Coelenterata	*Hydractinia spp.*	nutrition, protection	gastrozooids, dactylozooids, tentaculozooids	no	gonozooids (♂+♀): no feeding and defence	production of dispersing gametes	clonal	partner rejection	[156-160]
	Anthopleura elegantissima	nutrition, protection	scout, warrior and free-edge polyps	no	pure reproductive functions	production of dispersing gametes	clonal	?	[161, 162]
Bryozoa	*Dendrobeania murrayana*	nutrition, protection	various zooids	no	gonozooids	production of dispersing gametes	clonal		[163-166]
Urochordata	*Botryllus schlosseri*	gonads & somatic organs	primordial somatic cells	no	primordial germ cells	yes	distinct cell lineages	gametic cell competition	[24, 167-170]
Insecta	*Drosophila melanogaster, D. simulans*	eggs	wild-type sperm (fair meiosis)	yes	segregation distortion	yes	one gene difference	genetic suppression of meiotic drive	[171-174]
Mammalia	*Mus musculus*	eggs	wild-type sperm (fair meiosis)	yes	transmission ratio distortion by *t* haplotypes	yes	gene complex diff. on chromos. 17	mitigating effect of other genes	[175-177]
Analogies in higher Metazoan communities									
Isoptera	*Cryptotermes secundus*	nutrition, protection	workers, soldiers	no	reproductives	yes	diploid siblings	?	[178, 179]
Thysanoptera	*Oncothrips habrus, O. tepperi*	gall	micropterous soldiers	no	macropterous reproductives	yes	haplodiploid sisters	?	[180-184]
Aphidae	*Pemphigus spyrothecae, P. obesinymphae*	gall	soldiers	as asex. virginoparae	no defence, accelerated development	as adult sexuparae	partly mixed clones	?	[185-188]
Hymenoptera	*Apis mellifera*	nutrition, protection	workers	no	reproductives, egg-laying	queens yes, workers no	haplodiploid sisters	by workers	[189-193]

	Meliponini	production of highly related females	mother queen (singly mated)	no	workers daughter queens (own reprod. lowering colony relatedness)	yes	mother-daughter	by workers	[194, 195]
Pisces	*Neolamprologus pulcher*	protection	breeders and brood care helpers	low	reproductive parasitism by mature helpers	high	very low	expulsion	[25, 27, 28, 87, 196-199]
Aves	*Corcorax melano-rhamphos*	group membership, recruitment of allies	breeders and brood care helpers	conditional	deceptive brood care	conditional	usually high	aggression by group members	[200-204]
Mammalia	*Heterocephalus glaber, Cryptomys damarensis*	group membership, protection	breeders and non-reproductives	no	dispersive morph saves effort and accumulates reserves	yes	high	queen punishment of lazy workers	[32-34, 36, 205-210]

The public good is the action of cooperators, while defectors do not contribute to the public good. The cooperators or the cooperation performed, and the defectors or their way of cheating, are listed together with information about their respective dispersal, the relatedness between cooperators and defectors, and information about potential coercion in the form of punishment or policing. Note that due to difficulties in obtaining equivalent functional assessments of public goods and dispersal across examples, we considered the former to be a behavior resulting in a potential benefit for one or more group members, and the latter to be movement away from the group. Stricter criteria would be necessary for a more conclusive comparison with model predictions, and thus our objective is to highlight possible similarities and differences, based on first approximations for these complex processes. Question marks denote where respective information is unknown.