

Supplementary material for

**Using community engagement and biodiversity surveys to inform decisions to control
invasive species: a case study of yellow crazy ants in Atafu, Tokelau**

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Table S1: ant and invertebrate species diversity in Atafu, Tokelau.

taxon	at1.1	at1.2	at1.3	at1.4	at1.5	at2.1	at2.2	at2.3	at2.4	at2.5	at3.1	at3.2	at3.3	at3.4	at3.5	at4.1	at4.2	at4.3	at4.4	at4.5
anoplolepis_gracilipes	530	367	266	12	21	2626	2172	5183	138	983	3	17	6	7	22	193	601	179	980	113
tetramorium_bicarinatum									1		1	2		1						
pheidole_oceanica											1		24							1
pheidole_fervens													1	1	3					
paratrechina_bourbonica														1						
tapinoma_melanocephalum			1																	
monomorium_floricola				1																1
diptera										1										
diplopoda	1							2		1										
collembola	1							1				2				3	10	5	7	4
isopoda	4	1	1		1	5	3	2		1	2	1	27	3	2		2		5	
araneae														1						
coleoptera			1						1		4			2		1				
blattodea	1					2		1			2		2		2					
acariformes											8									
psocoptera				1	1				1		2		1							

Table S2: Questionnaire on the effects of yellow crazy ants on Tokelau residents, together with summary of results.

#	Question	Response (% yes)
1	Do you consider the yellow crazy ants to be a problem	89
2	Do the ants cause problems around the outside of your home	52
3	What sort of problems have the ants caused around the outside of your home	ruined the garden, ants eat everything, crawl all over people (5), can't enjoy being outside, can't leave fish outside to be cleaned (2), all little crabs being eaten by ants, crawl all over food (11), eat leftovers, food for pigs that is kept outside (2), drink and ruin toddy ¹ (2), can't sleep outside anymore (3), ants eat fruits of trees, can't put baby on the ground to play
4	Do you see the yellow crazy ants inside your home	52
5	What do you see the ants doing inside your home	crawl over us when we are sleeping (9), crawl over the food (10), ants get into laptop (2), may be in the stereo, bite the baby
6	Do the ants cause a problem in your gardens	22
7	What sort of problems have the ants caused around your gardens	ruined garden (3), crawl over the plants, eat cabbages and other vegetables, ants everywhere in the gardens, ants eat seeds, hard to grow things without chemicals, think they eat the roots of the plants, make it difficult to work in the gardens
8	Are you afraid the ants might cause more problems	89
9	What sorts of problems do you think the ants might cause	not safe for kids sleeping, fear of the unknown, food supply affected / contamination (8), more ants will make the problem worse (3), children could eat the ants (2), cause diseases, don't know what diseases they cause (2), might crawl into the ears (7), once the infestation is heavy it will be difficult to control (3), they will ruin the village (4), have seen the ants on banana flowers, but no damage yet (2)
10	Have you heard of the ants causing these problems for other people in the village / on another atolls	74
11	What sorts of problems have you heard about	Same problems as last question
12	Have you noticed the ants bothering animals	52
13	Which animals have you seen bothered by the ants (pigs / chickens / shore birds / lizards etc.)	pigs (22), crabs (37), coconut crabs (11), chickens (37), cats (3.7), insects (3.7)
14	What do you see the ants doing to these animals	piglets being killed (2), crabs being killed (7), coconut crabs being killed (8), ants attack cockroaches, chickens not bothered as they eat the ants, pigs not affected, chickens annoyed by ants (2), small chickens get killed
15	Have you seen any changes around the village or in Vao that you think may have been caused by the ants	19
16	What have you seen	lalkia (noddy bird) eggs being taken, ants kill ironwood trees by burrowing inside them
17	Do you spend less time outside because of the ants	44
18	Have the ants made you change how you do some things	51
19	What do you do differently because of the ants	hard to clean yard as so many ants, so clean up less, not keeping food outside (6), constantly thinking about it, conscious of everything you do, don't eat outside, don't cook outside (2), spending less time watching the pigs (3), have to put pig food in water / containers to keep the ants off (2), mindful of what is brought back into the house, spend less time outside, can't sleep outside, putting food into containers with lids
20	What would you like to be done about the ants	Get rid of them (100)
21	Have you tried doing anything to make the ants less of a problem	51
22	What have you tried	Mortein fly spray – spending \$20-100 per week (11), insect repellent, hit them with shoes, hot water on to ant nests (2), Raid Liquid in and under house, try not to leave food out or keep in containers (3), keep things in fridge, use jam to attract ants and then burn them or spray

¹ The juice of young coconut palms that is extracted as a drink (and sometimes fermented).

#	Question	Response (% yes)
23	Have these things worked	Mortein worked at first but not now, Mortein makes it worse as more ants come (3), Mortein keeps them away for a while (5), boiling water helps a little (4), Raid Liquid seemed to help, Keeping food packed away helps
24	Would you like some help to make the ants less of a problem	93
25	What is most important: making the ants less of a problem in home / around home / in gardens / in Vao	all equally important (19), vao (2), in and around the home (3), where the ants are heavily concentrated (2), don't know
26	What is least important: making the ants less of a problem in home / around home / in gardens / in Vao	in the home, vao (2), around home, everywhere except in the home, where the ants are least concentrated (2), need to establish main source and target there first
27	Poisons can be used to kill ants, and these poisons have no direct effects on humans. Should we use poisons to kill the ants	89
	Poisons can affect other animals too. These are some examples of effects of ant poisons.	
	a. The poisons to kill the ants may kill other insects, so chickens may have less natural food to eat. Would this be a concern to you	33 yes we depend on chickens, no - we can give chickens extra food (2), no - don't have chickens, no - people don't raise chickens they just happen to be here (2), no - not really plenty of food on the island (2), no - if the ants are so much of a pest we can overlook these effects, no - don't like other insects anyway
	b. "Good" insects, ones that eat "bad" insects may also be reduced by poisons so crops may be affected if there are no good insects to eat the bad insects. Would this be a concern to you	67 yes - but problems outweigh concern, yes - but if it's the only choice then use it, yes - but ok if short term no - if the ants are so much of a pest we can overlook these effects
	c. The poisons may kill small crabs. Crabs are eaten by shore birds, so less crabs means there may be less food for shore birds to eat. Would this be a concern to you	63 yes - many people consume crabs (2), yes - and concerned about effects on fish no - use of small crabs for bait is declining as more sea fishing is being done than reef fishing, no - would not like that sort of poison, no - we need to make sacrifices, no - but would be concerned if poisons affect fish
28	d. Some poisons may kill coconut crabs. Would this be a concern to you	67 yes - we already have problems with rats affecting coconut crabs so poisons would be a problem, yes - a strong concern about this no - if short term (2), no - need to kill the ants (2), no - most have been killed by the ants already (2), no - other options (2)
29	Are there any other comments you would like to make	not happy living uncomfortably all the time - wasting so much food, poisons need to be secured so that chickens, children etc. can't get into them, just get rid of the ants (6), should be a quarantine - coconuts from Samoa should be checked for ants, want a normal life back, stop/reduce/control bringing firewood/coconuts from vao (tighten the rules), start with people themselves - hey need to do what they can to minimise the problem, attraction to food, need to be more aware, pleased people are being informed but people need to make the effort themselves & not be so dependent, hope you can find a poison for just the crazy ants, if we stop the ants at the vao, maybe they wouldn't get to the homes so perhaps better to get rid of them there first, what about a workshop for families to help them find out what to do about the ants (2), the sooner we can get rid of them the better, just to encourage your research, are poisons the only option?
	Would you like to review the answers that I have recorded	37