

Disentangling complex parasite interactions: protection against cerebral malaria by one helminth species is jeopardized by co-infection with another

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Appendix S2 : Associations among helminth species in young adults

Results

The MCA analysis (Appendix S3 Figure A3.3(b)) showed that infection by AS, TT, and HW differed among age groups. We explored this caveat and found that age distributions of patients infected by the three species were similar in shape but not identical (Figure A3.1). Nonetheless, SCN and rarefaction analysis performed after restricting the dataset to the most infected age group (15-20 years old, N=90) yielded a similar pattern of helminth species associations despite the reduced power (Table S3.1).

Figure A2.1. Age distributions of (a) all hyperparasitemic malaria patients in the study, and of those infected with either (b) *Ascaris lumbricoides*, (c) *Trichuris trichiura*, or (d) hookworm (*Necator americanus*). Age is given in years.

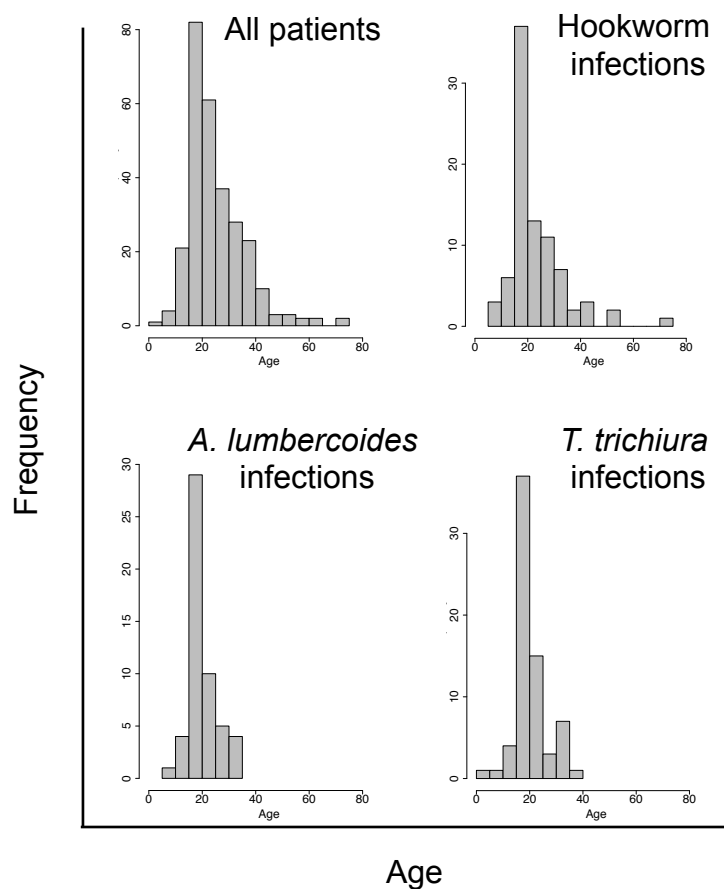


Table A2.1. Association screening (SCN) analysis results for all detected helminth species infecting hyperparasitemic malaria patients between the ages of 15 and 20, inclusive (N=90). SCN P-values reported are the maximum p-value returned by the SCN analysis when 100% of the data are sampled. Significant or trending associations detected are in bold for emphasis.

SCN and Rarefaction Results		All hyperparasitemic malaria patients between 15-20 years old (N=90)							
Coinfection Status	Pathogen species present				Direction	Percentage of data sampled		Robustness Score	SCN P-value <=
						10%	→		
4 species	<i>Al</i>	<i>Tt</i>	<i>HW</i>	<i>Ss</i>	Random			0	0.0880
3 species	<i>Al</i>	<i>Tt</i>	<i>HW</i>		Frequent		✓	1	0.0204
	<i>Al</i>	<i>Tt</i>		<i>Ss</i>	Rare			0	1.0000
	<i>Al</i>		<i>HW</i>	<i>Ss</i>	Random			0	0.1512
		<i>Tt</i>	<i>HW</i>	<i>Ss</i>	Rare			0	0.9484
2 species	<i>Al</i>	<i>Tt</i>			Rare			0	0.6944
	<i>Al</i>		<i>HW</i>		Rare			0	0.5436
	<i>Al</i>			<i>Ss</i>	Rare			0	1.0000
		<i>Tt</i>	<i>HW</i>		Rare			0	0.9984
		<i>Tt</i>		<i>Ss</i>	Rare			0	0.9392
			<i>HW</i>	<i>Ss</i>	Rare			0	0.8780
Single infections	<i>Al</i>				Rare			0	0.0988
		<i>Tt</i>			Rare			0	0.1552
			<i>HW</i>		Rare			0	0.0796
				<i>Ss</i>	Rare			0	0.7000
Not infected					Frequent		✓	1	0.0012