

Prevalence of gastrointestinal helminth parasite infections in country chicken from Visakhapatnam district Andhra Pradesh India

TABLES IN THE MANUSCRIPT

Table 1 Reports on the prevalence of GIH parasitic infections in country chicken from India

Reports on the prevalence of infections with GIH parasites in country chicken from India							
S.no.	Author	Year	Area	Host	Sample	P%	GIH Parasites
1	Puttalakshamma et al.	2008	Bangalore, Karnataka	Desi and Farm Chicken	GIT and Faecal	71.00	<i>R. tetragona</i> , <i>R.echinobothrida</i> , <i>A. galli</i> , <i>H. gallinarum</i> , <i>S. brumpti</i> , <i>Strongyloides sp</i>
2	Katoch et. al.	2012	Jammu	Backyard Chicken	GIT	72.00	<i>R.tetragona</i> , <i>R.echinobothrida</i> , <i>A. galli</i> , <i>H. gallinarum</i> , <i>A. cuneata</i> , <i>Heterakis sp.</i> , <i>Capillaria sp.</i> , <i>Cheilospirura hamulosa</i>
3	Satish and Priti	2013	Madhya Pradesh	Local and Exotic chicken	GIT	N/A	<i>R. echinobothrida</i> and <i>R. tetragona</i> , <i>H. carioca</i> , <i>A. galli</i> , <i>H. gallinarum</i> , <i>Subulura trachea</i>
4	Naphade and Chaudhari	2013	Maharashtra	Desi Chicken	GIT and Faecal	84.05	<i>Raillietina sp</i> , <i>Ascaridia sp.</i>
5	Dar and Tanveer	2013	Kashmir	Backyard Chicken	GIT	85.83	<i>R. tetragona</i> , <i>R. cesticillus</i> , <i>R. echinobothrida</i> , <i>R. spiralis</i> , <i>Choanotaenia infundibulum</i> , <i>C. gondwana</i> , <i>A. cuneata</i> , <i>A. domesticus</i> , <i>Davainea proglottina</i> .
6	Sreedevi et. al.	2014	Gannavaram, Andhra Pradesh	Desi Chicken	GIT and Faecal	63.21	<i>D. proglottina</i> , <i>R.cesticillus</i> , <i>R. echinobothrida</i> , <i>A.galli</i> , <i>Capillaria annulata</i> , <i>H.gallinarum</i>
7	Javaregowda et al.	2014	Shimoga, Karnataka	Backyard Chicken	GIT and Faecal	73.20	<i>R. tetragona</i> , <i>R.cesticillus</i> , <i>R.echinobothrida</i> , <i>A. galli</i> , <i>H. gallinarum</i> , <i>Capillaria sp</i> , <i>Coccidian sps.</i>
8	Sahu and Sinha	2016	Bihar	Desi Poultry Chicken	GIT and Faecal	65.39	<i>Raillietina sp</i> . <i>Davainea sp.</i> , <i>Ascaridia sp.</i> , <i>Heterakis sp.</i> ,
9	Sivakumar et. al.	2017	Tamil Nadu	Backyard Chicken	GIT	N/A	<i>A. galli</i> , <i>Dispharynx spiralis</i> , <i>Raillietina spp.</i>
10	Kumari et. al.	2018	Chhattisgarh	Local and Poultry chicken	GIT	46.00	<i>A. galli</i> , <i>Rallietina sp</i> , <i>S. brumpti</i>
11	Singh and Nama	2018	Rajasthan	Domestic Chicken	GIT	53.33	<i>R.tetragona</i> , <i>A. galli</i> , <i>H. gallinarum</i>
12	Rao et al.	2018	Telangana	Domestic Chicken	GIT and Faecal	55.79	<i>D. proglottina</i> , <i>R.tetragona</i> , <i>R.echinobothrida</i> , <i>A. galli</i> , <i>H. gallinarum</i>
13	Bandi et al.	2020	Krishna, Andhra Pradesh	Backyard Poultry	GIT and Faecal	74.22	<i>Raillietina cesticillus</i> , <i>R. echinobothrida</i> and <i>R. tetragona</i> , <i>A. galli</i> , <i>Capillaria spp.</i> , <i>H.gallinarum</i> , <i>Strongyloides avium</i> , <i>S. brumpti</i> , <i>Tetrameres mohtedai</i> , <i>D. spiralis</i>
14	Present study	2021	Visakhapatnam, Andhra Pradesh	Country Chicken	GIT and Faecal	87.32	<i>R. tetragona</i> , <i>R. echinobothrida</i> , <i>R. cesticillus</i> , <i>D. proglottina</i> , <i>A.cuneata</i> , <i>Cotugnia sp.</i> , <i>Hymenolepis sps.</i> , <i>A. galli</i> , <i>H. gallinarum</i> , <i>Prosthogonimus sp.</i>

Table 2 Monthly and seasonal prevalence of GIH parasite groups in country chicken

Season	Month	Total GIH				Cestodes			Nematodes			Trematodes		
		SE	SI	P%	MI	SI	P%	MI	SI	P%	MI	SI	P%	MI
Summer	Mar	25	23	92.00	142.57	23	92.00	110.13	16	64.00	46.63	0	0.00	0.00
	Apr	25	22	88.00	155.64	21	84.00	116.33	19	76.00	50.00	1	4.00	31.00
	May	25	23	92.00	94.17	22	88.00	47.64	21	84.00	53.24	0	0.00	0.00
	Jun	25	22	88.00	143.73	22	88.00	74.91	21	84.00	72.10	0	0.00	0.00
	Total	100	90	90.00	133.68	88	88.00	87.18	77	77.00	56.21	1	1.78	31.00
Monsoon	Jul	25	25	100.00	182.84	22	88.00	104.77	24	96.00	94.42	0	0.00	0.00
	Aug	25	22	88.00	151.00	22	88.00	82.00	20	80.00	75.90	0	0.00	0.00
	Sep	25	21	84.00	165.67	18	72.00	144.67	17	68.00	51.47	0	0.00	0.00
	Oct	25	19	76.00	163.89	19	76.00	133.63	14	56.00	41.00	1	4.00	1.00
	Total	100	87	87.00	166.51	81	81.00	114.22	75	75.00	69.77	1	1.43	1.00
Winter	Nov	25	21	84.00	127.52	20	80.00	103.20	15	60.00	40.93	0	0.00	0.00
	Dec	25	18	72.00	119.50	18	72.00	88.61	12	48.00	46.33	0	0.00	0.00
	Jan	25	22	88.00	120.18	21	84.00	82.14	17	68.00	54.06	0	0.00	0.00
	Feb	25	23	92.00	102.78	21	84.00	78.81	14	56.00	50.64	0	0.00	0.00
	Total	100	84	84.00	117.11	80	80.00	87.99	58	58.00	48.24	0	0.00	0.00
TOTAL		300	261	87.00	139.29	249	83.00	96.24	210	70.00	58.85	2	0.67	16.00

SE, Number of samples examined; SI, Number of samples infected; P%, Prevalence; MI, Mean Intensity

Table 3 Ecological indices of individual GIH parasite species in country chicken

GIH sps	SE	SI	P%	MI	MA	II	DI	R
<i>Raillietina tetragona</i>	300	186	62.00	12.60	7.81	4.84	0.06	1 - 47
<i>Raillietina echinobothrida</i>	300	218	72.67	14.46	10.51	7.64	0.09	1 - 76
<i>Raillietina cesticillus</i>	300	115	38.33	9.83	3.77	1.44	0.03	1 - 63
<i>Davainea proglottina</i>	300	129	43.00	37.47	16.11	6.93	0.13	5 - 105
<i>Amoebotaenia cuneata</i>	300	128	42.67	35.34	15.08	6.43	0.12	6 - 91
<i>Cotugnia sp.</i>	300	89	29.67	14.27	4.23	1.26	0.03	1 - 52
<i>Hymenolepis</i> sps. 1	300	108	36.00	39.94	14.38	5.18	0.12	10 - 247
<i>Hymenolepis</i> sps. 2	300	63	21.00	38.05	7.99	1.68	0.07	15 - 83
<i>Ascaridia galli</i>	300	136	45.33	13.40	6.08	2.75	0.05	1 - 118
<i>Heterakis gallinarum</i>	300	178	59.33	59.19	35.12	20.84	0.29	5 - 492

SE, Number of samples examined; SI, Number of samples infected; P%, Prevalence of infection; MI, Mean Intensity; MA, Mean Abundance; II, Index of Infection; DI, Dominance Index; R, Range

Table 4 Monthly prevalence of individual GIH parasite species in country chicken

Months	SE	Cestodes																Nematodes			
		<i>R.t</i>		<i>R.e</i>		<i>R.c</i>		<i>D.p</i>		<i>A.c</i>		<i>Co</i>		<i>Hy 1</i>		<i>Hy 2</i>		<i>A.g</i>		<i>H.g</i>	
		SI	P%	SI	P%	SI	P%	SI	P%	SI	P%	SI	P%	SI	P%	SI	P%	SI	P%	SI	P%
<i>Summer</i>																					
Mar	25	19	76	22	88	12	48	12	48	11	44	11	44	12	48	6	24	15	60	10	40
Apr	25	16	64	20	80	12	48	11	44	11	44	10	40	11	44	6	24	13	52	18	72
May	25	17	68	18	72	13	52	8	32	6	24	9	36	5	20	0	0	14	56	18	72
Jun	25	15	60	21	84	11	44	9	36	7	28	11	44	8	32	0	0	16	64	18	72
Total	100	67	67	81	81	48	48	40	40	35	35	41	41	36	36	12	12	58	58	64	64
<i>Monsoon</i>																					
Jul	25	15	60	19	76	12	48	8	32	9	36	11	44	6	24	0	0	17	68	21	84
Aug	25	16	64	20	80	12	48	10	40	12	48	9	36	8	32	2	8	13	52	20	80
Sep	25	15	60	16	64	7	28	13	52	10	40	8	32	12	48	11	44	10	40	14	56
Oct	25	13	52	14	56	7	28	14	56	15	60	3	12	13	52	13	52	4	16	11	44
Total	100	59	59	69	69	38	38	45	45	46	46	31	31	39	39	26	26	44	44	66	66
<i>Winter</i>																					
Nov	25	12	48	15	60	8	32	12	48	12	48	3	12	13	52	7	28	7	28	13	52
Dec	25	13	52	15	60	7	28	10	40	11	44	4	16	8	32	6	24	7	28	10	40
Jan	25	18	72	18	72	8	32	12	48	12	48	5	20	7	28	7	28	12	48	14	56
Feb	25	17	68	20	80	6	24	10	40	12	48	5	20	5	20	5	20	8	32	11	44
Total	100	60	60	68	68	29	29	44	44	47	47	17	17	33	33	25	25	34	34	48	48
TOTAL	300	186	62	218	73	115	38	129	43	128	43	89	30	108	36	63	21	136	45	178	59

SE, Number of samples examined; SI, Number of samples infected; P%, Prevalence of infection; *Rt*, *Raillietina tetragona*; *Re*, *R. echinobothrida*; *Rc*, *R. cesticillus*; *Dp*, *Davainea proglottina*; *Co*, *Cotugnia sps.*; *Ac*, *Amoebotaenia cuneata*; *Hy1*, *Hymenolepis sps 1*; *Hy2*, *Hymenolepis sps 2*; *Ag*, *Ascaridia galli*; *Hg*, *Heterakis gallinarum*

Table 5 Seasonal prevalence of individual GIH parasite species in country chicken

Seasons (P%)	SE	<i>R.t</i>	<i>R.e</i>	<i>R.c</i>	<i>D.p</i>	<i>A.c</i>	<i>Co</i>	<i>Hy 1</i>	<i>Hy 2</i>	<i>A.g</i>	<i>H.g</i>
Summer	100	67	81	48	40	35	41	36	12	58	64
Monsoon	100	59	69	38	45	46	31	39	26	44	66
Winter	100	60	68	29	44	47	17	33	25	34	48
Total	300	62.00	72.67	38.33	43.00	42.67	29.67	36.00	21.00	45.33	59.33

SE, Number of samples examined; *Rt*, *Raillietina tetragona*; *Re*, *R. echinobothrida*; *Rc*, *R. cesticillus*; *Dp*, *Davainea proglottina*; *Co*, *Cotugnia* sps.; *Ac*, *Amoebotaenia cuneata*; *Hy1*, *Hymenolepis* sps 1; *Hy2*, *Hymenolepis* sps 2; *Ag*, *Ascaridia galli*; *Hg*, *Heterakis gallinarum*

Table 6 One-way analysis (ANOVA) between parasites and seasons showing (p > 0.05)

Source of Variation	Sum of Squares	df	MS	F	Sig.
Between Groups	321.800	2	160.900	0.569	0.573
Within Groups	7638.200	27	282.896		
Total	7960.000	29			

Table 7 Prevalence of GIH parasite groups in country chicken based on Sex, Body weight, Body temperature and GIT pH

Host Observation	Total GIH				Cestodes			Nematodes			Trematodes		
	SE	SI	P%	MI	SI	P%	MI	SI	P%	MI	SI	P%	MI
Sex													
Male	148	131	88.51	142.82	127	85.81	95.73	111	75.00	58.74	1	0.68	31.00
Female	152	130	85.53	135.73	122	80.26	96.76	99	65.13	58.98	1	0.66	1.00
Body Weight (kg)													
0.6 - 1.0	17	17	100.00	142.06	17	100.00	112.41	13	76.47	38.77	0	0.00	0.00
1.1 - 1.5	128	110	85.94	140.45	104	81.25	91.94	90	70.31	65.40	1	0.78	1.00
1.6 - 2.0	104	87	83.65	138.08	82	78.85	99.10	70	67.31	55.09	1	0.96	31.00
2.0 - 2.5	38	36	94.74	140.67	35	92.11	97.37	29	76.32	57.10	0	0.00	0.00
2.6 - 3.0	8	7	87.50	140.71	7	87.50	99.29	5	62.50	58.00	0	0.00	0.00
3.0 - 3.5	5	4	80.00	107.00	4	80.00	65.25	3	60.00	55.67	0	0.00	0.00
Body Temperature (°F)													
104°	14	9	64.29	44.89	9	64.29	35.56	5	35.71	16.80	0	0.00	0.00
105°	30	23	76.67	82.74	22	73.33	57.05	17	56.67	38.12	0	0.00	0.00
106°	59	44	74.58	96.23	38	64.41	85.05	30	50.85	33.40	0	0.00	0.00
107°	115	104	90.43	135.04	101	87.83	97.76	81	70.43	51.48	0	0.00	0.00
108°	82	81	98.78	194.68	79	96.34	117.49	77	93.90	83.83	2	2.44	16.00
GIT pH level													
5.0	73	72	98.63	194.25	72	98.63	121.69	66	90.41	78.67	2	2.74	16.00
5.5	131	128	97.71	137.45	125	95.42	93.66	100	76.34	58.85	0	0.00	0.00
6.0	96	61	63.54	78.28	52	54.17	67.17	44	45.83	29.14	0	0.00	0.00
TOTAL	300	261	87.00	139.29	249	83.00	96.24	210	70.00	58.57	2	0.67	16.00

SE, Number of samples examined; SI, Number of samples infected; P%, Prevalence of infection; MI, Mean Intensity

Table 8 Prevalence of infection types in country chicken

Infection Type		Sex	SE	SI	P%	MI
Uninfected	<i>0</i>	Male	148	17	11.49	0.00
		Female	152	22	14.47	0.00
		Total	300	39	13.00	0.00
Single	<i>C</i>	Male	148	20	13.51	76.60
		Female	152	31	20.39	87.00
		Total	300	51	17.00	82.92
	<i>N</i>	Male	148	4	2.70	24.00
		Female	152	8	5.26	59.88
		Total	300	12	4.00	47.92
	Total		300	63	21.00	76.25
Mixed	<i>C + N</i>	Male	148	106	71.62	158.55
		Female	152	90	59.21	157.09
		Total	300	196	65.33	157.88
	<i>C + N + T</i>	Male	148	1	0.68	275.00
		Female	152	1	0.66	331.00
		Total	300	2	0.67	303.00
	Total		300	198	66.00	159.34
TOTAL	GIH	Male	148	131	88.51	142.82
		Female	152	130	85.53	135.73
		Total	300	261	87.00	139.29

SE, Number of samples examined; SI, Number of samples infected; MI, Mean Intensity; P%, Prevalence of infection; 0, Uninfected; C, Cestode; N, Nematode; T, Trematode