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## CONTENTS

<b>Marker assisted selection for aromatic and semi-dwarf segregants in cross of aromatic Katarni rice</b> SUNDARAM BHARTI, P.K. SINGH, KUMARI SUVIDHA, SATYENDRA, S. P. SINGH, ANAND KUMAR and MANKESH KUMAR	<b>188</b>
<b>D<sup>2</sup> and principal component analysis for variability studies in <i>Vigna</i> and <i>Phaseolus</i> species</b> PRIYANKA BHARETI, R. K. PANWAR, ANJU ARORA and S. K. VERMA	<b>193</b>
<b>Assessment of genetic parameters in F<sub>5</sub> recombinants derived from <i>Indica</i> rice (<i>Oryza sativa</i> L.) line Pusa 6A</b> PRACHI PRIYA, MANKESH KUMAR, TIRTARTHA CHATTOPADHYAY, BISHUN DEO PRASAD, SWETA SINHA, ANAND KUMAR and SATYENDRA	<b>198</b>
<b>Genetic diversity analysis by D<sup>2</sup> clustering of fodder yield and its related traits in forage sorghum</b> HARSH DEEP, INDRANI CHAKRABORTY, SATYAWAN ARYA, PUMMY LAMBA, S. K. PAHUJA and JAYANTI TOKAS	<b>203</b>
<b>Genetic diversity for morpho-physiological and seed vigour traits in wheat (<i>Triticum aestivum</i> L.)</b> PUNEET KUMAR, Y.P.S. SOLANKI, VIKRAM SINGH and ASHISH	<b>209</b>
<b><i>In vitro</i> plant regeneration from mature embryo using different plant growth regulators in wheat genotype HD 3059</b> SWATI SHARMA, ASHWANI KUMAR, ANIL SIROHI, R. S. SENGAR, KAMAL KHILARI, MUKESH KUMAR and MANOJ K. YADAV	<b>215</b>
<b>Weed management and crop geometry effect on nutrient uptake and yield in aerobic rice</b> VASUNDHRA KAUSHIK, S. P. SINGH, V. P. SINGH, TEJ PRATAP and B. S. MAHAPATRA	<b>222</b>
<b>Studies on sucker control in natu tobacco (<i>Nicotiana tabacum</i> L.) under rainfed vertisols</b> S. JAFFAR BASHA, P. PULLI BAI, S. KASTURI KRISHNA and C. CHANDRASEKHARA RAO	<b>228</b>
<b>Seed and oil yield of bidi tobacco (<i>Nicotiana tabacum</i> L.) varieties as influenced by planting geometry and fertilizer levels under rainfed vertisols</b> S. JAFFAR BASHA, P. PULLI BAI, S. KASTURI KRISHNA and C. CHANDRASEKHARA RAO	<b>232</b>
<b>Comparison of non-linear models on area, production and productivity of sugarcane crop in Uttar Pradesh</b> JHADE SUNIL and ABHISHEK SINGH	<b>237</b>
<b>Performance of improved varieties of true Cinnamon (<i>Cinnamomum verum</i> J. Presl.) in Andaman Islands, India</b> AJIT ARUN WAMAN, POOJA BOHRA and R. KARTHIKA DEVI	<b>243</b>
<b>Changing climate and its effect on rice yield in Meghalaya</b> DEOTREPHY K. DKHAR, SHEIKH MOHAMMAD FEROZE, RAM SINGH and LALA I.P. RAY	<b>249</b>
<b>Age related changes in morphometrical studies on ductus deferens of guinea fowl (<i>Numida meleagris</i>)</b> TAMILSELVAN S, B. S. DHOTE and MEENA MRIGESH	<b>257</b>



<b>Occurrence of gastrointestinal nematodes in goats slaughtered at Rewa, India</b> D. MARAVI, A. K. DIXIT and POOJA DIXIT	<b>261</b>
<b>Autoimmune haemolytic anaemia in a dog-A case report</b> NEERAJ KUMAR, MUNISH BATRA and R.S. CHAUHAN	<b>265</b>
<b>Erythrocytic anaplasmosis with <i>Fasciolosis</i> in a cross-bred cattle: A case report</b> NEERAJ KUMAR and MUNISH BATRA	<b>269</b>
<b>Modification and evaluation of Pant-ICAR controlled traffic seed-cum-deep fertilizer applicator for multi-crop seeder-cum-deep placement of fertilizers applicator</b> MANISH KUMAR, T.C THAKUR, MANOJ KUMAR and SATYA PRAKASH KUMAR	<b>272</b>
<b>Drying characteristics of shrimp (<i>Metapenaeus dobsoni</i>) in electrical dryer</b> D.S. ANIESRANI DELFIYA, S. MURALI, P.V. ALFIYA and MANOJ P. SAMUEL	<b>281</b>
<b>Baur dam breach analysis using various Manning's roughness values</b> MEENAKSHI RAMOLA, JYOTHI PRASAD and H. J. SHIVA PRASAD	<b>286</b>
<b>Study of constipation and related factors among female students of Pantnagar</b> RITA SINGH RAGHUVANSHI, NIDHI JOSHI, DIKSHA SINGH, SHIKHA SINGH, MEENAL and DASHRATH BHATI	<b>290</b>
<b>Work -related musculoskeletal disorders among chikankari workers in Lucknow (U.P.)</b> POONAM SINGH and KATYAYNI	<b>297</b>
<b>Technology adoption and productivity enhancement in groundnut cultivation: An impact assessment of farm women groups</b> K.UMA, T. NIVETHA and S. PRAVEENA	<b>302</b>
<b>Health hazard and constraints of chikankari worker in Lucknow (U.P.)</b> POONAM SINGH and KATYAYNI	<b>310</b>
<b>Studies on Indigenous Agricultural Technical Knowledge prevalent among the farmers of Assam for the management of common pests and diseases in major crops</b> DEVAMITRA TARAFDAR and NIRMAL MAZUMDER	<b>315</b>
<b>Television viewing pattern among students of CCS Haryana Agricultural University, Hisar</b> ANIL KUMAR MALIK, KRISHAN YADAV and SUNIL KUMAR	<b>325</b>
<b>Media content development and it's standardization for farmers</b> REETA DEVI YADAV, GEETAMATI DEVI and RITA GOAL	<b>331</b>
<b>Analysis of learning behavior and pattern of online learners on a MOOC platform</b> G.R.K. MURTHY, SEEMA KUJUR, S. SENTHIL VINAYAGAM, YASHAVANTH B.S., CH. SRINIVASA RAO, P. S. PANDEY, VANITA JAIN and INDRADEVI T.	<b>338</b>



## Occurrence of gastrointestinal nematodes in goats slaughtered at Rewa, India

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**ABSTRACT:** Gastrointestinal tracts of five goats were examined to know the diversity of gastrointestinal nematodes in Rewa, Madhya Pradesh. The species encountered in the region were *Haemonchus contortus*, *Bunostomum trigonocephalum*, *Oesophagostomum columbianum*, *Oesophagostomum aspersum* and *Trichuris*. Among these *H. contortus* and *O. columbianum* were more prevalent. In *Haemonchus* females, button shaped vulval flap was more common than tongue shaped. This seems to be the first report of *O. aspersum* from goats in Central India. The identification and differential features of *O. aspersum* and *O. columbianum* have been discussed in the present report.

**Key words:** Goat, gastrointestinal nematodes, *Haemonchus contortus*, *Oesophagostomum aspersum*

Gastrointestinal helminths are the major cause of decreased production in small ruminants in the world. Among these helminths, trichostrongyle nematodes are generally considered the most pathogenic and economically important parasites (Jurasek *et al.*, 2010). Parasitic gastro-enteritis dominated by haemonchosis, poses a serious health threat and a limitation to the productivity of small ruminants due to stunted growth, poor weight gain, poor feed utilization, morbidity, mortality, cost of treatment and control measures. *Haemonchus contortus* is an abomasal blood sucking nematode which is more prevalent in warm and moist climate. *H. contortus* may cause anaemia and death when infections of >500 worms are present. *Bunostomum trigonocephalum*, commonly known as hook worm, is found in small intestine. Bunostomosis is characterized by anaemia due to blood sucking activity of the worm and dermatitis due to larval penetration. *Oesophagostomum* spp. occurs in large intestine of small ruminants, and is responsible for anaemia, protein-losing enteropathy, hypoproteinaemia and death. *Oesophagostomum columbianum* causes knotty gut or pimply gut which results in partial or total condemnation of intestines (Satish *et al.*, 2018). *Oesophagostomum aspersum* or *O. indicum* is rarely reported from goats in India (Yadav and Tandon, 1989). Identification of species of these parasites is extremely important for studying their epidemiology and controlling parasitic diseases. Faecal examinations and larval cultures are routinely employed to know the prevalence of gastrointestinal nematodes in a particular area but the limitation of these methods is that nematodes can be identified only up to genus level (Zajac and Conboy, 2012). To know the species of nematodes, slaughter house studies

are required. Though these are time consuming but nematodes can be identified up to the species level.

### MATERIALS AND METHODS

The investigation was carried out on randomly selected goats slaughtered by butchers in Rewa. The gastrointestinal tract of five slaughtered goats was taken from butchers and brought to the laboratory for recovery and identification of the worms. Different parts (abomasums, small intestine, large intestine) were separated, slit open lengthwise and their contents were washed gently with tap water in separate buckets. In addition, the entire gastrointestinal mucosa was scraped and washed to remove any attached nematodes. The recovered nematode parasites were preserved in 70% alcohol, cleared in lactophenol and then identified by morphological characters (Soulsby, 1982; Singh, 2003).

### RESULTS AND DISCUSSION

*Haemonchus contortus*, *O. columbianum* and *Trichuris* were the most prevalent species (80%) followed by *Bunostomum trigonocephalum* and *O. aspersum* (40%). In all nematodes, females were more in number as compared to male worms (Table 1). *Haemonchus* males were identified by asymmetrical dorsal lobe of bursa supported by an inverted Y shaped dorsal ray while females were easily identified by barber pole appearance i.e., white ovaries spirally wound around the red intestines. In *Haemonchus* female, both linguiform and button shaped vulval flaps were recorded. Button form (84.31%) was more common than tongue shape in the present study (Fig

**Table 1: Gastrointestinal nematodes recovered from necropsy in goats (n=5)**

Location	Parasite species	No. of animals infected	Prevalence	No. of worms		Mean intensity
				Male	Female	
Abomasum	<i>Haemonchus contortus</i>	4	80%	324	631	238
Small intestine	<i>Bunostomum trigonocephalum</i>	2	40%	3	8	5
Large intestine	<i>Oesophagostomum columbianum</i>	4	80%	34	87	30
	<i>O. aspersum</i>	2	40%	5	7	6
	<i>Trichuris</i>	4	80%	36	73	27

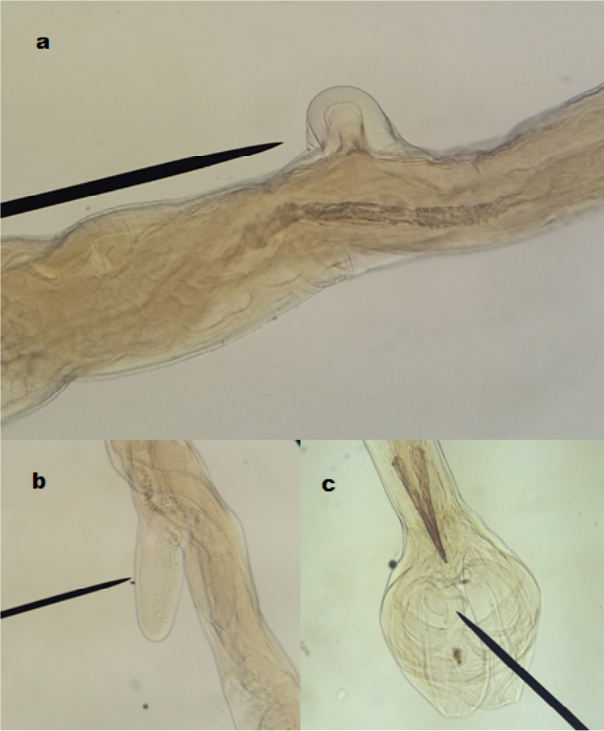


Fig 1: (a) Button shaped vulval flap of female *Haemonchus contortus*  
(b) Tongue shaped vulval flap of female *Haemonchus contortus*  
(c) Bursa of *Haemonchus contortus* male

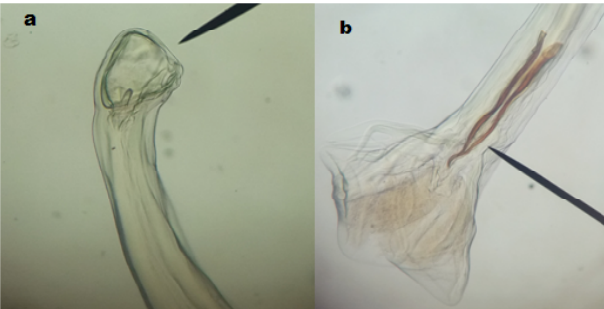


Fig 2: (a) *Bunostomum trigonocephalum* anterior end  
(b) Posterior end of male *Bunostomum trigonocephalum*

1). *Bunostomum* female was identified by chitinous plates on the ventral margin and dorsal cone projecting in the buccal cavity. *Bunostomum* males were identified by bursal

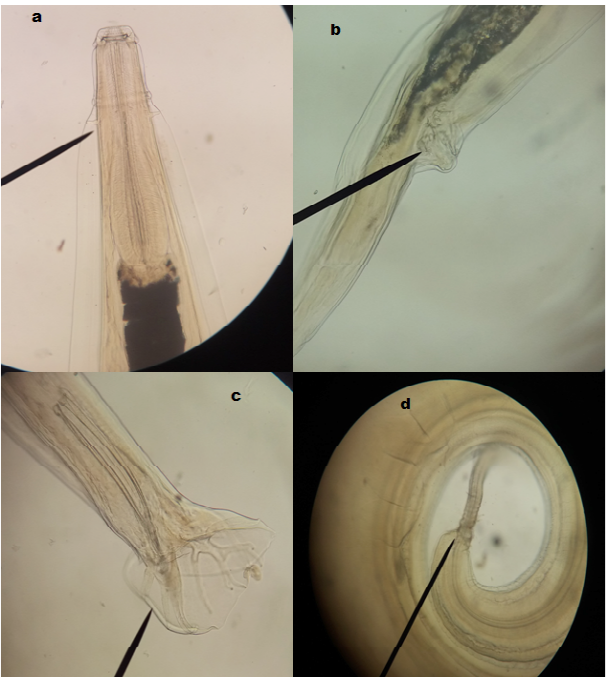


Fig 3: (a) *Oesophagostomum columbianum* dorsal view (b) *O. columbianum* female  
(c) *O. columbianum* male  
(d) Posterior end of male *Trichuris*

characters i.e. right externodorsal ray arised higher up on the dorsal stem and were longer than the left externodorsal ray (Fig 2).

*O. columbianum* was identified by large cervical alae. The anterior extremities of cervical alae were pierced by cervical papillae. The male bursa was well developed and there were two equal alate spicules. The female tail tapers to a fine point. The vulva was situated anterior to anus. The vagina was very short, transverse, leading into the kidney shaped pars ejectrix of the ovijectors (Fig. 3). *O. aspersum* was identified by inflated cephalic vesicle, absence of lateral alae and cervical papillae. In males, spicules were unequal and comparatively longer than *O. columbianum*. In female, the anus and vulva were close to each other at little distance from posterior end of the body (Fig. 4). Mono and mixed infection of *O. columbianum* was observed but *O. aspersum* was always

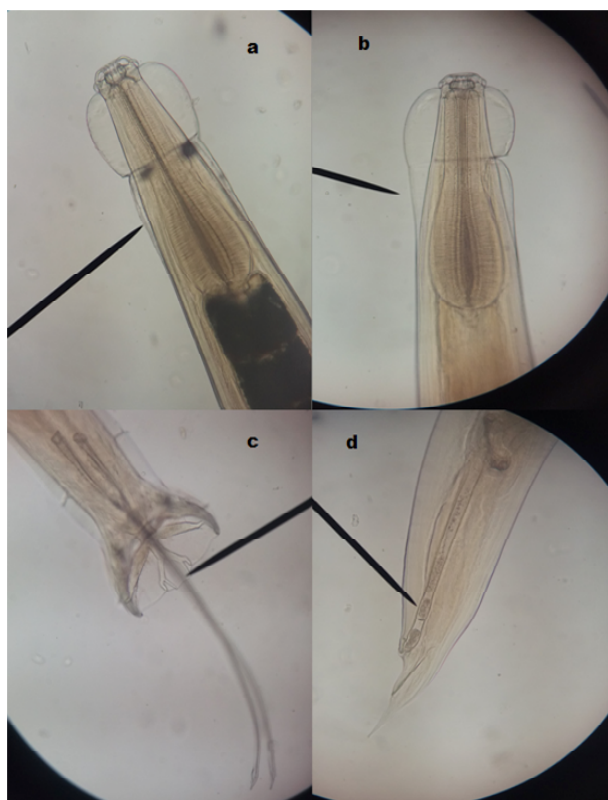


Fig 4: *Oesophagostomum aspersum*  
(a) dorsal view (b) lateral view  
(c) Male bursa (d) Posterior end of female

found in mixed infection with *O. columbianum*. *Trichuris* worms were identified by whip like long and slender anterior part of the body. Hind end of male was curled and there was a single spicule surrounded by sheath (Fig 3d).

Earlier Khare *et al.* (2018) reported 85.71 and 57.14% prevalence of *B. trigonocephalum* and *Gaigeria pachyscelis* in slaughtered goats in Rewa. This seems to be first report of *O. aspersum* from goats in Central India. Singh *et al.* (2013) reported *Haemonchus*, *Bunostomum*, *Oesophagostomum*, *Strongyloides*, *Trichostrongylus* and *Trichuris* from goats of Mahakaushal region of Madhya Pradesh. Yadav and Tandon (1989) also reported *O. columbianum* (38.4%) and *O. aspersum* (19.6%) from goats in Shillong and Nongstoin districts of Meghalaya. *O. aspersum* and *O. columbianum* are considered as predominant species in sheep and goats in China (Yu *et al.*, 2012; Zhao *et al.*, 2013). *O. aspersum* was also reported from goats in Japan (Makouloutou *et al.*, 2014). This is a preliminary study on gastrointestinal nematodes of goats in Rewa, more studies on epidemiology of gastrointestinal nematodes with larger sample size are needed to generate baseline data for future parasite control strategies.

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