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Study of Occurrence of snails in Kanchipuram district of Tamil Nadu

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Abstract
A total of 3259 snails were collected from four zones of Kancheepuram district viz., Melkadirpur, Kalianur, Enjambakkam and Vedal villages during the period from March 2016 to February 2017 to know the types and intensity of different species of snails. Aquatic snails (92.74%) were found to be more than the amphibious snails (7.26%). Among the various types of snails, *Stenothyra blanfordiana* (43.73%) was found to be more followed by *Indoplanorbis exuxtus* (23.69%), *Radix luteola* (15.16%), *Pila globosa* (7.18%), *Bellamyia* sp. (5.16%), *Melanoides tuberculatus* (3.19%), *Gyraulus convexiusculus* (1.19%) and *Paludomas tranchauricus* (0.70%). Snails were found mostly on *Nymphaea pubescens*, *Paspalum vaginatum*, *Paspalidium geminatum*, *Bergia capensis*, *Brachiaria eruciformis*, *Brachiaria ramosa*, *Panicum maximum*, *Fimbristylis aestivalis*, *Neptunia oleraceae*), *Ipomoea asarifolia*, *Pannisetum hohenackeri* (Manjapullu), *Monochoria vaginalis*, *Fuirena trilobites*, *Striga angustifolia*, *Diplachne malabarica*, *Andropogan pumilus*, *Rottboelliaco chinchinensis*, *Echinochloaoryzoides Sporobolus maderaspatanus* and *Digitariatomentos*.

Keywords: snail, aquatic and land, Kancheepruam, Tamil Nadu

Introduction
Snails are present in pond, river, lake, paddy field and also on the land. Snails act as first or also as second intermediate host for majority of the trematode infection in ruminants (Esch *et al.* 2001) [8]. Some snails act as intermediate host for trematode parasites of both medical and veterinary importance by harboring larval stage of trematodes (Soulsby, 1982; Soundararajan and Latha, 2014) [18, 20]. Various snail borne helminthic infections like fascioliasis, paramphistomosis, nasal schistosomiasis as reported from ruminants of Tamil Nadu and Pondicherry by different authors (Soundararajan *et al*., 2000; Soundararajan and Iyue, 2003; Das *et al*., 2004; Latchumikanthan *et al*., 2014) [21, 19, 13]. In Tamil Nadu, only a few reports available on the occurrence of snails (Raman *et al*., 2012) [15].

Gastropods have a very important position in our ecosystem as pest, intermediate host, food source and as bio indicators for environmental quality but the taxonomic work regarding snail species as not been carried out in this part of the world after 19th century (Javaria Altaf *et al.*, 2017) [12]. Land snails are generally considered as typical herbivores, fungi ores and detrivores (Burch and Pearce, 1990) [3] that show intra specific competition at weak levels (Cain, 1983, Barker and May hill, 1999) [4, 1]. Annual litter input of about 0.5% per year can be consumed by land snail communities (Mason, 1970). They are designated as serious pests of ripening fruits i.e. tomatoes and strawberries as they are grown near the ground. However, they also depend on foliage and fruit of some trees like citrus (Flint, 2003) [9].

It has an important position in the food webs of different ecosystems as snails are mostly consumed by fish, water fowl, crayfish, leeches and sciomyzid flies (SWCSMH, 2006). Most of the studies on the land snails have been carried out approximately a century before in the Indian sub-continent. Hutton (1842) [11] collected and studied the land snails of neighborhood of Bolan Pass, from Suleiman range and the hills of south laying west to Indus. According to the Bland ford and Godwin (1908) [2], in the areas of Saw at, Dir or Chitral no terrestrial snails have been observed except *Petraeus* snails, while in the Kuram valley only very few species were found. They worked chiefly on the conchological side of the families Testacellidae and Zonitidae of Indian subcontinent. The aim of the present study reveals the prevalence of snails and their habitats in Kancheepuram district of Tamil Nadu.

Materials and Methods
A total of 3259 snails were collected from four zones of Kanchipuram district viz., Melkadirpur, Kalianur, Injambakkam and Vedal villages during the period from March 2016 to February 2017 to know the types and intensity of different species of snails. The snails were collected from lake, paddy field, stagnated water and pond at different places mentioned above. The snails attached to vegetation were picked up using blunt forceps and were transferred to clean polythene bags containing habitat water along with some vegetation. The bags were partially closed with thread and transported to the PG and Research Department of Zoology, Arignar Anna Government Arts College, Cheyyar, for identification then the snails were sent to Department of

Veterinary Parasitology, Madras Veterinary College, Chennai, Tamil Nadu for further identification and conformation.

The snails were collected randomly in polythene bags from each place separately and washed in dechlorinated water. The shells of the dead snails were also collected from these areas. Snails were kept in different Petri dishes with dechlorinated water and subjected for identification following the keys of Rao (1989) [16] and Soundararajan and Latha (2014) [20]. The dead snail's shells were stored in different plastic containers and labeled after identification. Plants and herbage were collected from the water bodies to know the habitat of snails. The Plants and herbage were identified at Department of Botany, Madras Christian College, Chennai, Tamil Nadu.

Table 1: Occurrence of snails in four different areas in Kancheepuram District from March 2016 to February 2017.

Name of snails	No. of snails	Percentage (%)
Stenothyra blanfordiana	1425	43.73%
Indoplanorbis exuxtus	772	23.69%
Radix luteola	494	15.16%
Pila globosa	234	7.18%
Bellamyia sp.	168	5.16%
Melanoides tuberculatus	104	3.19%
Gyraulus convexiusculus	39	1.19%
Paludomas tranchauricus	23	0.70%
Total	3259	100%

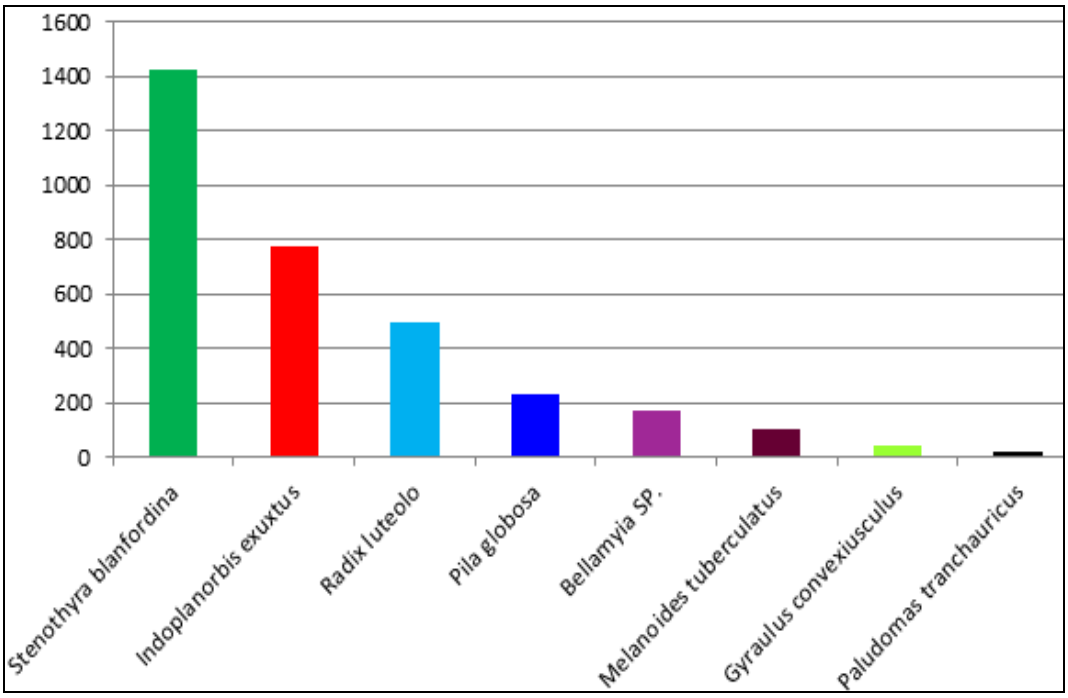

Fig 1: Occurrence of snails in four different areas in Kancheepuram District from March 2016 to February 2017.

Fig 2: Shows the different types of snails collected.

Fig 3: Shows the different types of plants.

Results and Discussion

In the present study, the collected snails were identified as 7 genus of aquatic and one genus of amphibius snails. *Radix luteola*, *Indoplanorbis exuxtus*, *Gyraulus convexiusculus*, *Melanoides tuberculatus*, *Bellamya* sp., *Paludomas tranchauricus and Stenothyra blanfordiana* were aquatic snails. *Pilaglobosa* was amphibious snails (Fig 1). Raman *et al.* (2012) [15] collected *R. luteola* and *R. auricularia* in the high altitude (Ooty and plain northeastern (Vellore) zones in Tamil Nadu. Similarly, *R. auriculuaria rufescens* were reported in Lucknow Bareilly and Uttar Pradesh (Varma *et al.*, 1989) [25] and *R. auricularia* (sensustricto) in Bareilly, Uttar Pradesh and in Kashmir (Sharma *et al.*, 1989) [17]. Tigga *et al*. (2014) [24] also reported that *Indoplanorbis* sp., *Lymnaea* sp. and *Gyraulus* sp. were common snails found positive for trematode cercariae in and around Ranchi district, Jharkhand, India. Soundararajan *et al* (2016) [22] reported 23 aquatic (*Radix auricularia*, *R. luteola*, *Indoplanorbis exustus*, *I. difference*, *Gyraulus convexiusculus*, *Melanoides tuberculatus*, *M. crabra*, *Bithynia sp*., *B. pulchella*, *B. dissimilis*, *Bellamya crassispiralis*, *B. dissimilis*, *Bellamyiab halophila, Bellamyiab eburnea*, *B. bengalensis race doliaris*, *B. bengalensis form typica*, *B. anandeli*, *Vivipara*, *Terebia ranifera, Gabbia stenothyroides*, *G.arcula*, *Paludomas tranchauricus*, *P. regulata*, *Stenothyra blanfordiana),* 3 amphibius snails (*Pilaglobosa, P.virians* and *Pila* sp.,) and 5 land snails (*Cryptozona semirugata, C. madarasapatinum, C. bistrialis, C. ligulata, Acahitina fulica*) in northeastern (Kancheepuram and Vellore) and hilly zone (The Nilgiris).

In this study, Aquatic snails (92.74%) were found to be more than the amphibious snails (7.26%). Among the various types of snails, *Stenothyra blanfordiana* (43.73%) was found to be more followed by *Indoplanorbis exuxtus* (23.69%), *Radix luteola* (15.16%), *Pila globosa* (7.18%), *Bellamyia* sp. (5.16%), *Melanoides tuberculatus* (3.19%), *Gyraulus convexiusculus* (1.19%) and *Paludomas tranchauricus* (0.70%) (Table1 and Bar Figure 1). Soundararajan *et al.* (2016) [22] reported snails were more in plains (north eastern zone) than the hilly regions (78.16 % vs 21.84 %). In the plains, aquatic snails (90.70 %) were more than the amphibious (7.38 %) and land snails (1.92 %). In the plain, aquatic snails like genus *Bithynia* snails (29.99 %) were more followed by *Bellamyia* (12.37 %), *Radix* (10.48 %), *Melanoides* (9.92 %) and *Indoplanorbis* (8.36 %) and other snails whereas genus *Pila*, *Cryptozona* and *Achatina* were of the amphibious and land snails respectively. In the hills, only *R. auriculara*, *R. luteola* and *S. blanfordiana* was recorded. Out of these, *R. auricularia* was more (83.33 %) than the *R. luteola* (13.89 %) and *S. blanfordiana* (2.78 %).

The snail *Pila* sp. was seen in all the fresh water bodies. Most of the water bodies near paddy irrigation channels and ponds were seen with *Pila* sp. and *Lymnaea* sp. snails where as *Indoplanorbis* sp. snails were seen both in ponds and lakes. *Pila* sp. snails were seen in more density during rainy seasons. *Indoplanorbis* sp. snails were also seen in the shallow water areas near the lakes and ponds. *Melanoides tuberculatus* was collected from stagnated water. Fresh water snail species can survive outside water for short periods only. However, different species of snails died during the dry season, but some adult stages of *Pila* sp. snails were able to with stand desiccation by buried into the mud bottom. *Pila* sp. and *Indoplanorbis* sp. were found to have operculum that covers the opening of the shell but *Lymnaea* sp. snails were devoid of operculum. Duggan (2002) [7] also reported that *M. tuberculata* found on slow flowing or standing waters. Highest abundances of *M. tuberculata* are commonly recorded in lakes, where they prefer mud and silt substrates (Dudgeon 1989; Gutiérrez *et al.* 1997). [6, 10]

In the present study, snails were habited on 20 types of vegetations herbs viz., *Nymphaea pubescens* (Allitamarai, Vellambal), *Paspalum vaginatum*, *Paspalidium geminatum*, *Bergia capensis*, *Brachiaria eruciformis*, *B. ramosa* (Sanampul), *Panicum maximum* (Giniopullu), *Fimbristylis aestivalis*, *Neptunia oleraceae* (Sadai), *Ipomoea asarifolia*, *Pannisetum hohenackeri* (Manjapullu), *Monochoria vaginalis*, *Fuirena trilobites*, *Strigaan gustifolia*, *Diplachne malabarica* (Mandipul), *Andropogan pumilus* (Kavattampullu), *Rottboelliaco chinchinensis*, *Echinochloa oryzoides* (Nellukkuchakkalathi), *Sporobolus maderaspatanus* and *Digitaria tomentosa* (Fig 2). The above mentioned plants were found abundant in the snail habitats and probably help in breeding and development of snails. Local people working in and near snail prevalent paddy cultivation fields were often reporting problems of itching in their hands and legs mainly areas below the knee. Soundararajan *et al* (2016) [22] reported *R. auricularia* mostly found in *Nostacium officinale*, *Ponnisetum glandulosum* and *Rotala rotandifolia.* The *R. auricularia* was not found on *Polygonum leshnaultucum*, *Cyprus weightii and Eichhornia* in Nilgiris, Tamil Nadu.

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