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Diversity of Aquatic Beetles (Insecta: Coleoptera) across Selected Localities of the Southern Western Ghats, India

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Abstract
The present study documents aquatic beetles collected from 16 freshwater localities in Kerala and Tamil Nadu during 2021-2026. A total of 21 species belonging to 13 genera and three families, namely Gyrinidae, Dytiscidae and Hydrophilidae, were recorded. The available specimen counts totalled 205 individuals, one additional occurrence was recorded without a specimen count. Dytiscidae was the most species rich family, while Gyrinidae was the most abundant. *Patrus discifer*, *P. punctulatus* and *P. semivestitus* were the dominant species. The localities included streams and other freshwater habitats of the Nilgiris and Kerala, with recorded elevations ranging from 155 to 2315 m. Shared species between some Kerala and Tamil Nadu localities indicate similarities in aquatic beetle fauna across the southern Western Ghats. The study provides baseline information on aquatic beetle diversity and distribution in the region.

Keywords: Aquatic Coleoptera, Gyrinidae, Dytiscidae, Hydrophilidae, Nilgiris, Ranni, elevational distribution, faunal overlap

Introduction
Aquatic beetles form an important part of freshwater ecosystems and are found in streams, rivers, ponds and other water bodies (Sharma *et al*. 2013) [2]. They differ in habitat preference and feeding habits and contribute to the diversity of freshwater insect communities (Short, 2018) [3]. The Western Ghats support a variety of freshwater habitats, ranging from lowland streams to high-elevation mountain waters. Although aquatic beetles have been reported from several parts of India, information from many localities remains limited. Earlier faunistic surveys, including that of Navegaon National Park, have shown the value of documenting species from individual freshwater habitats (Deb & Subramanian, 2023) [1]. The present study brings together aquatic beetle records from selected localities of Kerala and Tamil Nadu. The main objectives were to document the recorded species, describe their abundance and compare their occurrence across the sampled localities.

Materials and Methods
The study is based on aquatic beetle records from 16 localities in Kerala and Tamil Nadu, including sites in the Nilgiris, Ranni Forest Division, Chinnar Wildlife Sanctuary and southern Tamil Nadu.

The records were collected during 2021, 2023, 2025 and 2026. Species names, specimen numbers, locality names and available elevations were taken from the collection data. Species richness was determined by counting the recorded species in each family and locality. Relative abundance was calculated as the percentage of counted individuals belonging to each species or family. The distribution of species among localities was compared using a presence-and-absence matrix. Elevation was available for 13 localities.

Results
The collection contained 21 species belonging to 13 genera and three families, with 205 individuals having recorded specimen counts. Dytiscidae had the greatest number of species (nine), followed by Gyrinidae (eight) and Hydrophilidae (four). Gyrinidae was the most abundant family. *Patrus discifer* (39 individuals), *P. punctulatus* (38) and *P. semivestitus* (26) were the most frequently represented species. Family composition and species abundance are presented in Tables 1 and 2 and Figures 1 and 2. The locality records are summarized in Table 3, while the distribution of individual species is shown in Table 4.

Table 1: Family-level composition

Family	Species	Quantified specimens	Relative abundance (%)
Gyrinidae	8	132	64.39
Hydrophilidae	4	9	4.39
Dytiscidae	9	64	31.22

Table 2: Species-level abundance and relative abundance

Family	Species	Count	Relative abundance (%)
Gyrinidae	*Patrus discifer*	39	19.02
Gyrinidae	*Patrus punctulatus*	38	18.54
Gyrinidae	*Patrus semivestitus*	26	12.68
Dytiscidae	*Copelatus deccanensis*	19	9.27

Dytiscidae	*Lacconectus regimbarti*	17	8.29
Gyrinidae	*Dineutus indicus*	12	5.85
Dytiscidae	*Hydaticus vittatus*	11	5.37
Gyrinidae	*Orectochilus castesi*	10	4.88
Dytiscidae	*Hydaticus discindens*	9	4.39
Gyrinidae	*Gyrinus distinctus*	4	1.95
Hydrophilidae	*Hydrophilus olivaceous*	4	1.95
Hydrophilidae	*Coelostoma vividium*	3	1.46
Dytiscidae	*Cybister tripunctatus*	3	1.46
Gyrinidae	*Patrus annandalei*	2	0.98
Dytiscidae	*Lacconectus blandulus*	2	0.98
Dytiscidae	*Rhantus suturalis*	1	0.49
Hydrophilidae	*Sternolophus rufipes*	1	0.49
Hydrophilidae	*Hydrophilus indicus*	1	0.49
Dytiscidae	*Hydaticus fabricii*	1	0.49
Gyrinidae	*Patrus productus*	1	0.49
Dytiscidae	*Eretes griseus*	1	0.49

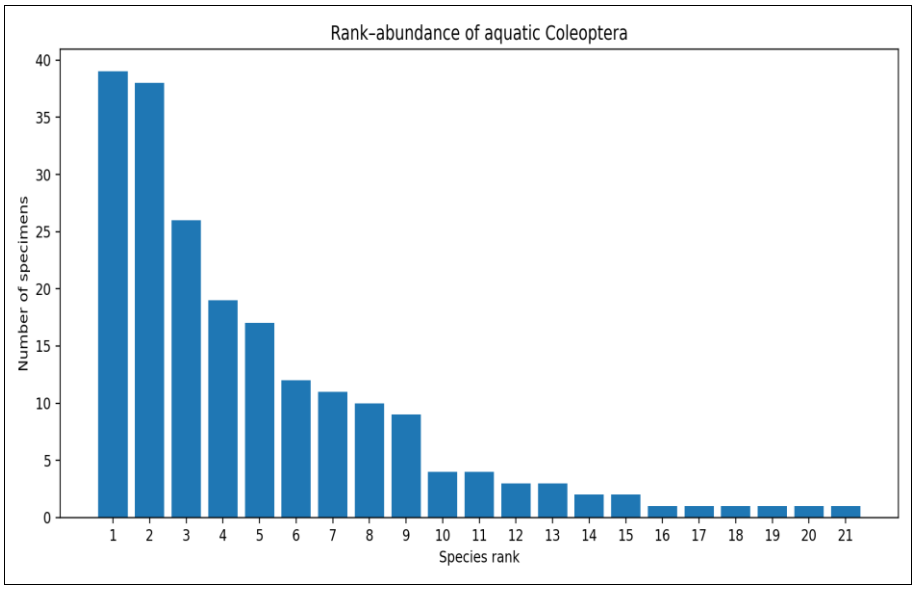


Fig 1: Rank abundance of quantified specimens

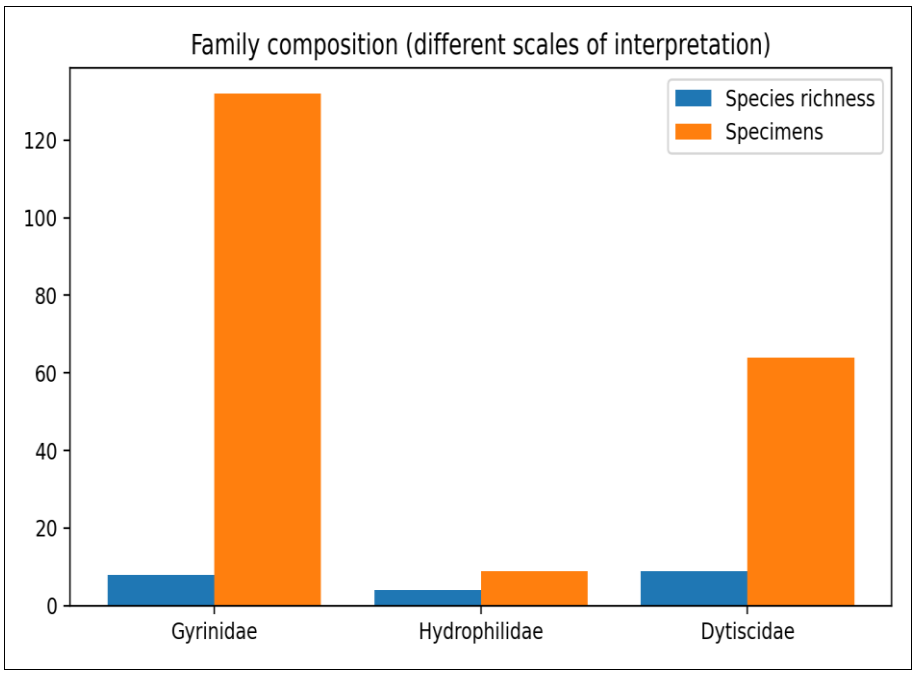


Fig 2: Family richness and recorded specimen totals.

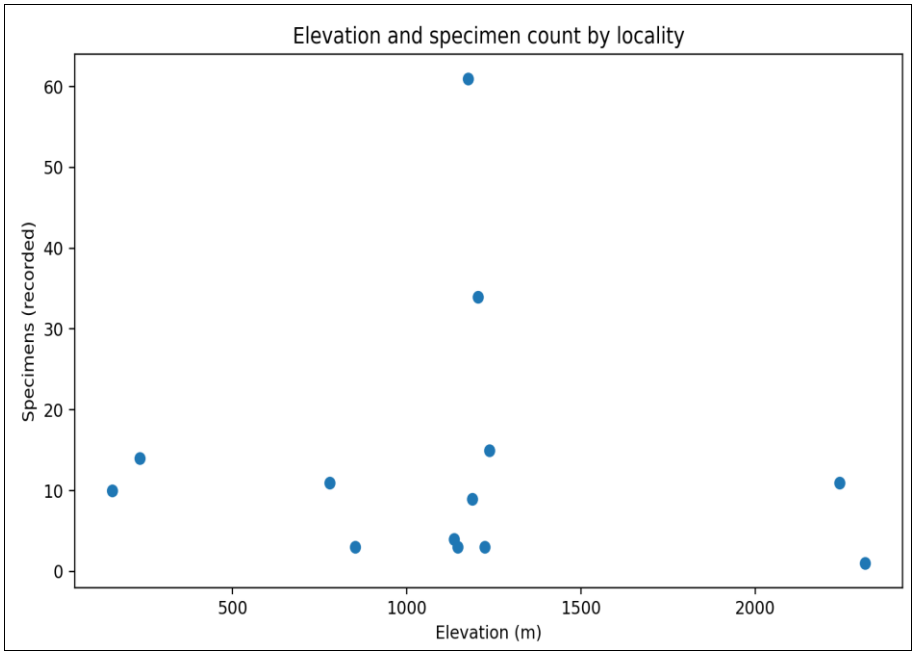


Fig 3: Locality elevation against specimen abundance

Table 3: Locality-level summary and elevational data

Sl. No.	Locality	State	Elevation (m)	Species	Specimens
1	Dalhousie Stream, North Beat	Tamil Nadu	1188	3	9
2	Negapu nagapoo pallam	Tamil Nadu	1204	2	34
3	Burliyaru	Tamil Nadu	778	1	11
4	Stream near T.R Bazaar	Tamil Nadu	Not recorded	1	3
5	Cheran nagar stream	Tamil Nadu	1135	1	4
6	Kadasana Koil, Betta kurumba settlement	Tamil Nadu	1146	1	3
7	Mukurthi forest hill stream	Tamil Nadu	2315	1	1
8	Needle rock	Tamil Nadu	1224	1	3
9	Hut, upper bhavani Dam down	Tamil Nadu	2242	2	11
10	Punna puzha pandiyaru	Tamil Nadu	852.1	1	3
11	Chinnar WLS	Kerala	Not recorded	6	14
12	in around Vochidhambarnar	Tamil Nadu	Not recorded	4	9
13	Kattadikunnu, Ranni Forest Division, Pathanamthitta	Kerala	1176	3	61
14	Kaikkd river, Angamoozhy, Pathanamthitta	Kerala	234	4	14
15	Veluthode, Ranni Forest Division, Pathanamthitta	Kerala	155	2	10
16	Kullar Dam, Ranni Forest Division, Pathanamthitta	Kerala	1237	1	15

Table 4: Species by locality occurrence and abundance matrix

Code	Locality
L01	Dalhousie Stream, North Beat
L02	Negapu nagapoo pallam
L03	Burliyaru
L04	Stream near T.R Bazaar
L05	Cheran nagar stream
L06	Kadasana Koil, Betta kurumba settlement
L07	Mukurthi forest hill stream
L08	Needle rock
L09	Hut, upper bhavani Dam down
L10	Punna puzha pandiyaru
L11	Chinnar WLS
L12	in around Vochidhambarnar
L13	Kattadikunnu, Ranni Forest Division, Pathanamthitta
L14	Kaikkd river, Angamoozhy, Pathanamthitta
L15	Veluthode, Ranni Forest Division, Pathanamthitta
L16	Kullar Dam, Ranni Forest Division, Pathanamthitta

Numbers are counted individuals; P = recorded presence without numerical specimen count; – = no recorded occurrence. Locality codes follow Table 5.

Table 4.1 Abundance matrix

Species	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L13	L14	L15	L16
Patrus discifer	8	28	–	–	–	–	–	3	–	–	–	–	–	–	–	–
Patrus punctulatus	–	–	–	–	–	3	–	–	–	–	–	–	25	10	–	–
Patrus semivestitus	–	6	–	–	4	–	–	–	1	–	–	–	–	–	–	15
Copelatus deccanensis	–	–	–	–	–	–	–	–	–	–	–	–	19	–	–	–
Lacconectus regimbarti	–	–	–	–	–	–	–	–	–	–	–	–	17	–	–	–
Dineutus indicus	1	–	11	–	–	–	–	–	–	–	–	–	–	–	–	–
Hydaticus vittatus	–	–	–	–	–	–	–	–	–	–	9	2	–	–	–	–
Orectochilus castesi	–	–	–	–	–	–	–	–	10	–	–	–	–	–	–	–
Hydaticus discindens	–	–	–	–	–	–	–	–	–	–	1	–	–	–	8	–
Gyrinus distinctus	P	–	–	3	–	–	1	–	–	–	–	–	–	–	–	–
Hydrophilus olivaceous	–	–	–	–	–	–	–	–	–	–	1	3	–	–	–	–
Coelostoma vividium	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–
Cybister tripunctatus	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–
Patrus annandalei	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–
Lacconectus blandulus	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Rhantus suturalis	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Sternolophus rufipes	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Hydrophilus indicus	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Hydaticus fabricii	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
Patrus productus	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Eretes griseus	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–

Distribution Across the Study Localities

The sampled sites covered a wide range of elevations, from 155 m to 2315 m above sea level. Figure 3 shows the number of recorded specimens at localities for which elevation was available. The records include high elevation Nilgiri streams and lower elevation freshwater habitats in Kerala. Several species were recorded from more than one locality, and some species occurred in both states. These shared records are summarized in Table 5. In particular, the occurrence of *Patrus* species in both the Nilgiris and Kerala suggests similarities between the aquatic beetle faunas of these areas. However, the present records alone cannot establish whether elevation determines species abundance or whether the sites are directly connected by dispersal.

Table 5: Cross state locality pairs with shared species

Tamil Nadu locality	Kerala locality	Shared species	Jaccard
Negapu nagapoo pallam	Kullar Dam, Ranni Forest Division, Pathanamthitta	*Patrus semivestitus*	0.500
Cheran nagar stream	Kullar Dam, Ranni Forest Division, Pathanamthitta	*Patrus semivestitus*	1.000
Kadasana Koil, Betta kurumba settlement	Kattadikunnu, Ranni Forest Division, Pathanamthitta	*Patrus punctulatus*	0.333
Kadasana Koil, Betta kurumba settlement	Kaikkd river, Angamoozhy, Pathanamthitta	*Patrus punctulatus*	0.250
Hut, upper bhavani Dam	Kullar Dam, Ranni Forest Division, Pathanamthitta	*Patrus semivestitus*	0.500
in around Vochidhambarnar	Chinnar WLS	*Hydaticus vittatus; Hydrophilus olivaceous*	0.250

Discussion

Dytiscidae contributed the highest species richness, whereas Gyrinidae contributed the largest number of individuals. This difference was mainly due to the high numbers of *Patrus discifer*, *P. punctulatus* and *P. semivestitus* in the collections. The genus *Patrus* was represented in localities from both Kerala and Tamil Nadu. Such shared records are noteworthy because the sampled sites lie in different parts of the southern Western Ghats but contain broadly similar freshwater habitats. The species by locality table also shows that some beetles were found at only one recorded site, while others occurred at several sites. These observations add to the available information on the distribution of aquatic beetles in southern India (Vazirani, 1984; Deb & Subramanian, 2023) [1, 4]. As collections were made in different years and the sampling effort varied, the results should be viewed as a faunistic account rather than a direct comparison of habitat quality or seasonal diversity. Further surveys using similar sampling methods at each locality would help clarify the distribution of these beetles.

Conclusion

The present study records 21 aquatic beetle species belonging to 13 genera and three families from 16 localities in Kerala and Tamil Nadu. Dytiscidae was the richest family in terms of species, whereas Gyrinidae was the most abundant. The occurrence of *Patrus* species in both states highlights similarities in the aquatic beetle fauna of different parts of the southern Western Ghats. The species list, locality records and accompanying figures provide baseline information for future studies of freshwater beetle diversity in the region.

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References

1. Deb R, Subramanian K A. Diversity of Aquatic Beetles (Insecta: Coleoptera) of Navegaon National Park, Maharashtra, India. Uttar Pradesh Journal of Zoology,2023:44(19):27-38.
2. Sharma S, Pandey P, Dave V. Role of aquatic beetles for water quality assessment. International Journal of Recent Scientific Research,2013:4(11):1673-1676.
3. Short A E Z. Systematics of aquatic beetles (Coleoptera): current state and future directions. Systematic Entomology,2018:43:1-18.
4. Vazirani T G. The Fauna of India: Coleoptera. Family Gyrinidae and Family Haliplidae. Zoological Survey of India, 1984, 1-138.