

Evaluation of aquatic insect diversity in natural water-filled tree holes and their artificial analogues, in a tropical forest of Western Ghats

Project Investigator: Dr. K. S. Anoop Das

Research Fellow : Nishadh. K. A.



Project premise: “get rid of under evaluation”

**Tree hole aquatic habitat of Silent Valley National Park and
New Amarambalam Reserve Forest**

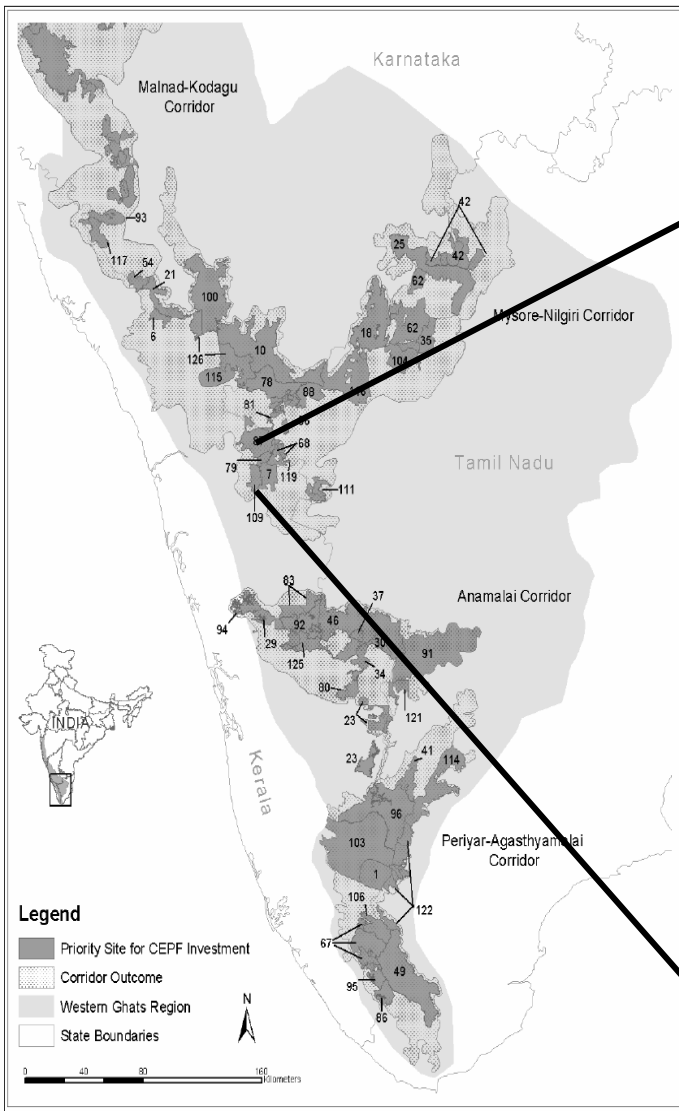
Under evaluated habitat

Under estimated biodiversity

Aptness of its artificial analogues

- ❖ To assess the community composition, habitat characteristics
 - ❖ To evaluate the usability of artificial analogues to natural tree hole in terms of community composition
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Study Locations



Priority site 109



New Amarambalam Reserve
Forest

★ Panapuzha

Priority site 87



Silent Valley National Park

★ Sairandhri

★ Poochipara

★ Walakkad

Tree Hole Aquatic Habitat

- Discrete Islands
- Formed by stagnation of rain water in tree cervices
- Origin by damage or by growth form
- Based on formation: Two types- Rot holes and Pan holes
- Allochthonous energy source- litter decomposition, stem flow
- Long evolutionary history
- High disturbance regime

- Water volume – 0.006 to 20 L
- Height class – 0.01 to 4.4 m
- No. of taxa – 1- 12
- Temperature- 18.4-24.8 °C
- pH- 4.12- 6.52
- Nutrients- PO_4 (0.16 - 3.4 mg/l),
 NO_3 (0.25 -13.9 mg/l), SO_4 (10.09-215.55 mg/l)

Pan tree hole



Rot tree hole



Communities from tree hole aquatic habitat:

- Habitat sampled 161.
- Organisms recorded 8216.
- Aquatic Insects- five orders

Coleoptera

Trichoptera

Odonata

Heteroptera

Diptera



- Microhylid frogs *Ramanella* sp., Geckos *Cnemaspis* sp., Gastropoda, Diplopoda, Brachyura, Nematoda, Arachnida, Oligochaeta.

Communities in artificial analogues

Artificial analogues Plastic-44, Bamboo internode-34, tire tube-25



Monitoring: 8months

Aquatic insects: *Coleoptera*

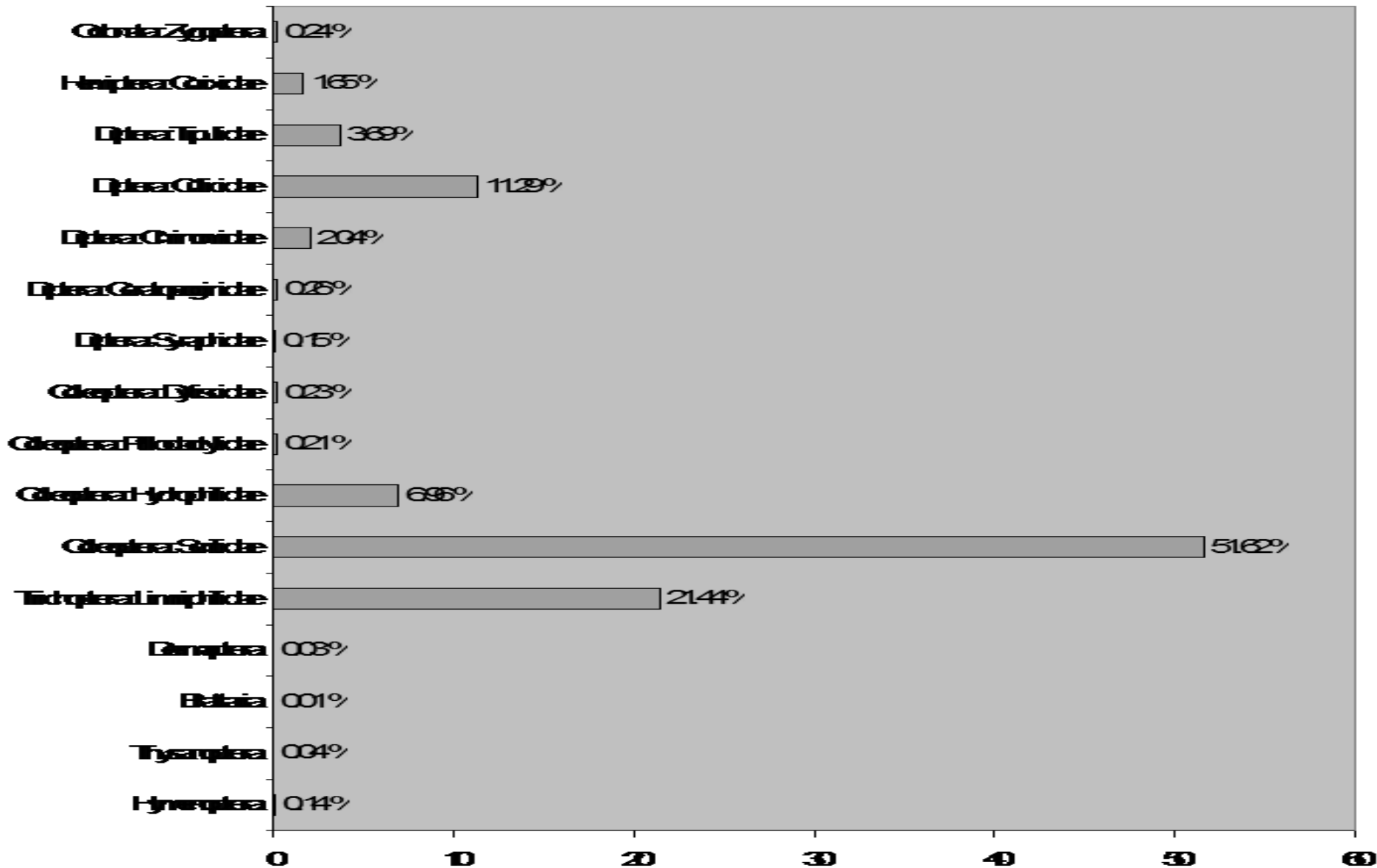
Trichoptera

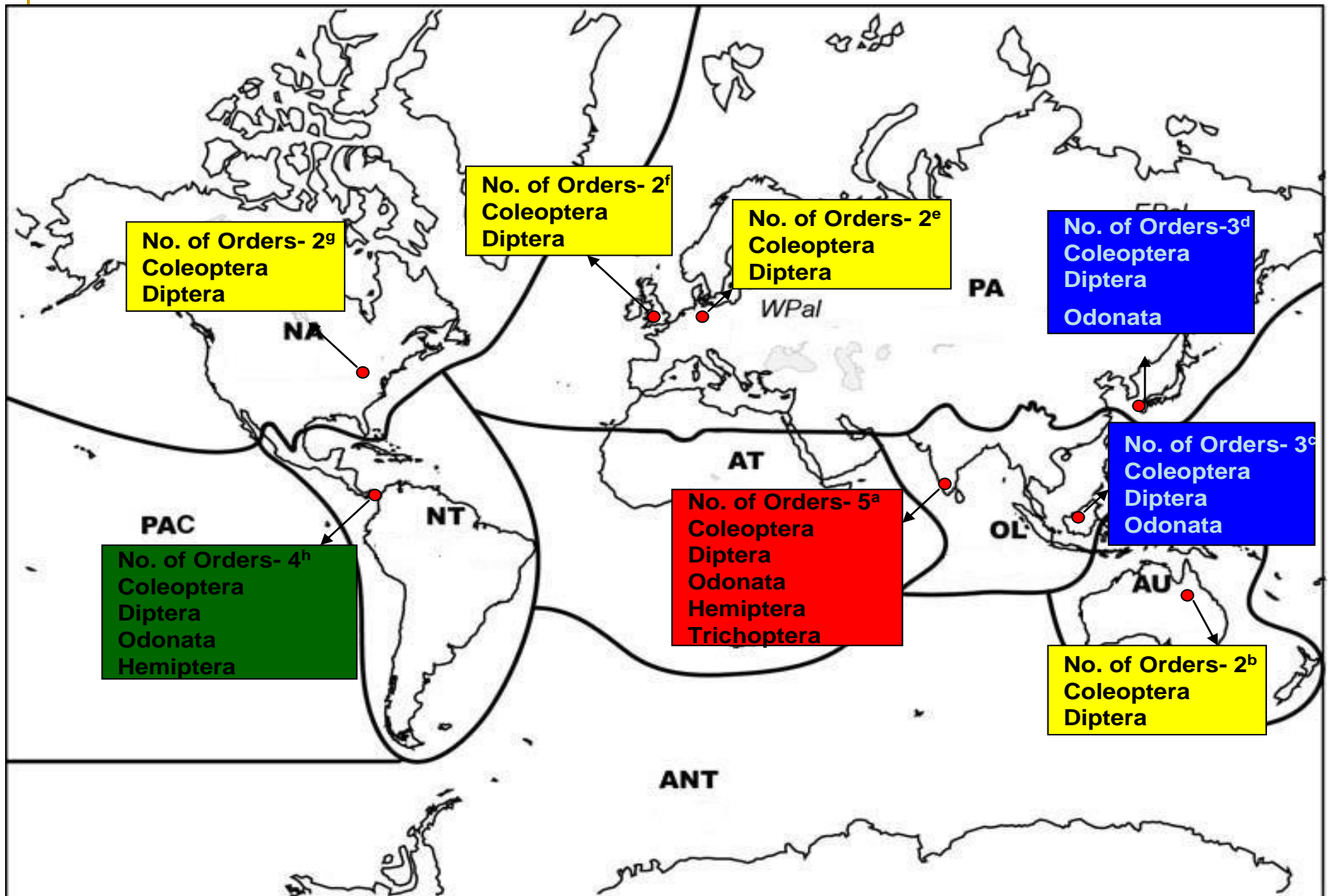
Odonata

Diptera

Cnemaspis sp., *Ramanella* sp. recorded from ATH.

Percentage composition of different orders of class Insecta recorded in tree holes





Global comparison of aquatic insect taxa richness in tree hole aquatic habitat.

Contributions towards CEPF investment strategy

- ❑ Addressing strategic direction- giving insights for systematic conservation planning and action.
 - ❑ Gives a comprehensive report on macro invertebrates and amphibians found in tree hole aquatic habitat.
 - ❑ Insight on varies bottom up process influencing community composition in it.
 - ❑ The artificial analogue studies using plastic pots, rubber tubes and bamboo internodes reveals the important consideration of actability of these habitats in colonizing almost all the natural community in tree hole habitats.
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- ❑ Immense lacunae in community level studies in tree hole aquatic habitats found in entire South East Asia
 - ❑ Important realization of tree hole aquatic habitat as a potential tool for ecological experiments
 - ❑ Studies contributes to achieve get rid of undervaluation of ecosystem and biodiversity services- Important CEPF ecosystem profile.
 - ❑ The project study areas was evaluated in terms of general ecosystem health and disturbance regime.
 - ❑ Established key (technical and logistic) partnership among key players of conservation agencies in the study area.
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Further studies are in the direction

Bio indicator value

Vertical stratification

Landscape level variability

Acknowledgements



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