CHAPTER-6

CONCLUSION AND SIGNIFICANT FINDINGS

- Champaner-Pavagadh Archaeological Park has diverse habitats like Forest area, Agricultural fields, Garden area, Concrete structures and a hill.
- Large spider diversity was recorded from this area indicating Champaner-Pavagadh as a healthy ecosystem.
- Total spider families in the world are 120 and we in our research reported 32 families.
- Among 32 families dominant spider species were from the families Salticidae, Araneidae, Lycosidae, Theridiidae, Oxyopidae, Thomisidae, Gnaphosidae, Sparasiidae, Oonopidae, Tertragnathidae and Zodariidae.
- Results have clearly indicated that amongst these families Orb-web builders, hunters and ground spiders are present almost equally.
- The entire area of study sites provides a suitable microhabitat for spiders. Spiders found foraging on barks of trees, under the rock, in leaf litter, under the leaves of small trees, wandering on leaf litter were the Salticids.
- Araneidae, Linyphidae, Tetragnathidae could make their Orb-webs in bushy vegetation and garden plants, webs are seen attached to the branches of bushes where a large number of Orb-web spiders were seen and the spider rests in nearby shaded areas.
- Ground spiders like families Lycosids, Oonopidae, Palpimanidae and Zodariidae mostly found foraging on ground, under stones, leaf litter and forest floor.
- Oxyopids, Thomisidae, Salticidae mostly found foraging on bushes shrubs, grasses, leaf litterand forest floor.

- Even the hill could support the population of spiders. In the Pavagadh hill a total of 144 species belonging to 92 genera and 29 families were collected during the entire sampling period along slope of Pavagadh hill from three different elevation points.
- Lower altitude of Pavagadh hill harbors 105 species of spiders belonging to 72 genera and 26 families. Middle altitude of Pavagadh hill has 87 species of spiders from 60 genera and 26 families. Higher altitude of Pavagadh hill sustains 62 species of spiders belonging to 47 genera and 22 families.
- The maximum spider diversity was recorded from lower altitude followed by middle and higher altitude of hill.
- Families recorded were: Araneidae, Clubionidae, Corrinidae, Eresidae, Filistatidae, Gnaphosidae, Hersiliidae, Linyphiidae, Lycosidae, Oonopidae, Oxyopidae, Palpimanidae, Salticidae, Segestriidae, Tetragnathidae, Theraphosidae, Theridiidae, Thomisidae and Uloboridae.
- From the concrete structures like mosque, small temples and residences we could find more of the family Pholcidae e.g. *Crossopriza lyoni, Pholcus fragillimus, Artema atlanta*, and family Sparassidae egs. *Heteropoda bhaikakai*, *Heteropo davenatoria.*
- Guild structures of spiders were also observed and seven different types of guilds were found. The most dominant guild was of Ground dwellers, Orb web weaver, Foliage dwellers, Branch dwellers, Space web weaver, Ambushers, Sheet web weaver.
- Best amongst all the areas is the forest cover with maximum species.
- Agricultural fields of Pigeon pea, Maize, Cotton and Castor located at the foot hill of Pavagadh also had good population of Spiders.
- In the present study six different types of webs were observed from study site namely Orb web, Funnel web, Sheet web, Single line web, Tent web and Irregular web.
- Orb web and tent webs are constructed by Families Araneidae, Tetragnathidae, Linyphiidae, Uloboridae; Funnel webs made by families Agelenidae, Lycosidae and Eresidae, Sheet webs are built by families Linyphidae, Filistatidae, Theridiidae

and Pholcidae; Single line web was constructed by family Theridiidae, Uloboridae; Linyphiidae; Irregular webs were built by family Pholcidae and Theridiidae.

- Spider species need different surrounding habitats for making different types of webs. Family Araneidae, Tetragnathidae, Uloboridae makes their web at the busy vegetation, Trees, between the branches and shrubs; Sheet webs are constructed at the lower vegetation or between the shrubs. Tube webs are made in the bushes or shrubs with less space in between the leaves.
- The present study therefore, emphasized on systematic collection covering all habitats of Champaner- Pavagadh Archaeological Park and as a result we have come up with many interesting records of spiders.

- Total 32 interesting records were reported from Champaner-Pavagadh Archaeological Park.
- Among the 32 species 2 genera and 8 species are first records from India
- 3 genera and 9 species are first records from Gujarat.
- 10 species are new to science from the Champaner-Pavagadh Archaeological Park.
- Active searching method is the best method for collection of Orb-web spiders and Pitfall method is the best collection method for ground spiders.

- For certain spider families Corrinidae, Lycosidae, Oonopidae, Zodariidae, Pitfall method will be suitable.
- Any spider taxonomist should have a fine neck for dissection. As species can only be identified by dissecting epigyne.

Significant Findings

- From different selected areas of Champaner-Pavagadh Archaeological Park namely, Forest, Agricultural fields, Garden area and Slope of Pavagadh hill we could collect a total of 189 species belonging to 106 genera and 32 families.
- Forest has 50 species of spiders belonging to 41 genera and 20 families whereas Fields containing various crops have 42 species of spiders belonging to 33 genera and 17 families and in the Garden 37 species of spiders belonging to 31 genera and 16 families were recorded. (Annexure 1)
- Along Altitudinal diversity of spiders in the Pavagadh hill a total of 144 species belonging to 92 genera and 29 families were collected during the entire sampling period using three different elevation points.
- The maximum generic diversity was recorded from lower altitude followed by middle and higher altitude. Also maximum species diversity of spiders was reported from lower altitude followed by middle and higher altitude.
- Garden area has minimum spider diversity due to less complex vegetation and also uniform structure of vegetation which reduces the hiding places for spiders over and above continuous use flow of tourists in the garden area.
- Agricultural fields have good number of spider fauna and unique spider diversity due to the presence of humid atmosphere and vegetation and forest area provides spider species an alternative habitat for survival.
- Maximum spider diversity was recorded from Forest area because of complex habitat structure and with variety of vegetation including herbs, shrubs, trees and forest floor.
- Dominant families were Salticidae, Araneidae, Lycosidae, Oxyopidae, Gnaphosidae and Thomisidae among the all habitats.
- Total 32 interesting records were found from the study area which includes two new records from India: *Opopea* sp., *Myrmatheca alticephalon.*

- Total 8 species were recorded first time from India namely: *Stenaelurillus* sp., *Asceua* sp.1, *Asceua* sp.2, *Asceua* sp.3, *Asceua* sp.4, *Asceua* sp.5, *Brignolia carlmulleri*, *Brignolia meemure.*
- Total 3 genera were reported first time from Gujarat namely *Callilepis* sp., *Lepthyphantes* sp.*, Cosmophasis* sp.
- Total 9 species were recorded first time from Gujarat namely: *Neoscona inusta* (C.L. Koch, 1871), *Cambalida dhupgadensis* Bodkhe, Uniyal & Kamble, 2016 *, Cambalida flavipes* (Gravely,1931)*, Drassyllus mahabalei* Tikader, 1982*, Sosticus nainitalensis* Gajbe, 1979*, Zelotes nainitalensis* Tikader & Gajbe*, Oedignatha scrobiculata* Thorell, 1881*, Scytodes pallida* Doleschall, 1859*, Selenops radiatus* Latreille, 1819
- 10 species are new to science were reported from Champaner-Pavagadh Archaeological Park Namely; *Plesiophrictus* sp.*, Singa* sp.*, Mimetus* sp.*, Brignolia* sp. 1*, Brignolia* sp. 2*, Brignolia* sp. 3*, Brignolia* sp. 4*, Ischnothyreus* sp.*, Palpimanus* sp.*, Ariadna* sp.
- Rare and uncommon spiders were found from study sites namely Tarantula spiders (Theraphosidae), *Plesiophrictus* sp. was found from the higher altitude of Pavagadh hill.
- Tube dwelling spider like *Ariadna sp.,* were found from the higher altitude of Pavagadh hill.
- Guild structure of spiders are observed in the study area and found six different types of Guild from Champaner-Pavagadh Archaeological Park.
- Orb web building spider species were found maximum due to the presence of mix type of vegetation.
- The most dominant guild was of ground runners followed by Orb-web weaver, Branch dwellers, Space web weaver, Foliage dwellers and Sheet web weaver.

Spiders play an important role as biological indicators for monitoring biodiversity and their distribution in specific habitats which indicates the environmental conditions of the area.