

# THE STUDY OF MURAL PLANTS OF NADIA DISTRICT IN WEST BENGAL

<sup>1</sup> PRIYANKA DAS,<sup>2</sup> DHRUBA DAS

<sup>1</sup>STATE AIDED COLLEGE TEACHER-1,<sup>2</sup>STATE AIDED COLLEGE TEACHER-1

<sup>1</sup>DEPARTMENT OF BOTANY

<sup>1</sup> CHAKDAHA COLLEGE,CHAKDAHA,INDIA

<sup>1</sup> [das038345@gmail.com](mailto:das038345@gmail.com), <sup>2</sup>[dhrubafulia@gmail.com](mailto:dhrubafulia@gmail.com)

## ABSTRACT

Normally as per our knowledge for plant growth sufficient amount of water, soil and nutrient required but some plant have special ability to grow in adverse conditions such as low nutrient and without sufficient amount soil they can grow in old walls known as mural plant. Present work mainly based on this type of mural plant species (on the damage wall) of three significant zones of Nadia district in West Bengal like Phulia-Santipur, Ranaghat- Chakdaha, Kalyani - Krishnanagar. Present study was during Monsoon seasons and 69 species are recorded. Out of them 62 species are angiosperm and 7 species are pteridophytes. Out of 62 angiosperms 52 species are Dicotyledons and 10 species are Monocotyledons. After the taxonomic analysis of these wall flora Dicotyledons Plants families which were successfully grown -Asteraceae with 8 species, Moraceae with 5 species, Lamiaceae and Utricaceae with 4 species, Euphorbiaceae with 3 species, Cucurbitaceae, Phyllanthaceae and Apocynaceae with 2 species, other families like Sapindaceae, Vitaceae, Acanthaceae, Solanaceae, Rubiaceae, Brassicaceae, Canabaceae, Meliaceae, Dioscoraceae, Fabaceae, Oxalidaceae, Linderaceae, Orobanchaceae, Portulacaceae, Piperaceae, Molluginaceae, Commelinaceae, Nyctaginaceae with 1 species, successfully adapted in wall habitat. Also 10 members belong to Monocotyledons (Poaceae=9 Species and Araceae=1 species) and 7 members of pteridophytes (Pteridaceae=4 species, Dryopteridaceae=2 species and Aspleniaceae=1) successfully grow on the wall. Although wall plants grow very significantly in all the 4 regions but more species found at Santipur -Phulia region (61 species), 54 species found at Ranaghat- Chakdaha, 55 species found at Kalyani and 50 species found at Krishnanagar.

## KEYWORD

Mural flora, Adverse environment, Stress tolerant plant, Heritage conservation

## INTRODUCTION

Walls, whether made of brick or cement, provide a specialized substrate for plant growth, often characterized by extreme temperature fluctuations and varying moisture availability (Singhal & Jaitly, 2011). In West Bengal, the high humidity and monsoon rainfall facilitate the colonization of diverse taxa on these vertical surfaces (Das & Das, 2017). Understanding the distribution of these "mural" plants is essential for urban biodiversity conservation and assessing the impact of vegetation on structural integrity (Varshney et al., 2013). The timing of the study post-monsoon significantly influenced the prevalence data. High moisture retention in wall substrates during this period supports the survival of diverse annuals and perennials (Rayamajhi et al., 2012). Floristic surveys were conducted across four ecological zones in the Nadia district, covering a gradient of rural, semi-urban, and urban environments. Sampling included both traditional brick walls and modern cemented structures. Surveys were strategically timed during the post-monsoon season (October–November) to capture peak vegetative growth (Duchok et al., 2005). The recorded flora comprised 52 dicotyledons, 10 monocotyledons, and 7 pteridophytes. This distribution aligns with similar mural studies in the Indo-Gangetic plain (Singh et al., 2018).

## STUDY SITES

Nadia district located in the in the eastern part of west Bengal on alluvial plains of Ganga river with 22° 53'' and 24° 11'' North latitude and 88° 09'' and 88° 48'' Eastern longitude also eastern side covered with Bangladesh. Nadia district border bordered by Murshidabad district in North ,Purba Bardhaman Hoogly in West and North 24 parganas in south. Present study sites are phulia- santipur , Ranaghat, Chakdaha ,Kalyani,krishnanagar.



## MATERIALS METHODS

Study was started post monsoon season from August to October 2025 time to time periodically .Present study covered all rural area (Philia), Semi- urban area (Ranaghat) and Urban area(Kalyani). Wall growing plants of these region first spotted , collected and then preserved for herbarium. Harberium specimens were arranged according to Jain and Rao(1977).The mural species are arranged alphabetically with other information like family name exact location and prevalence.

| SL NO | NAME OF THE PLANT                                    | FAMILY          | SA & PH | RA & CH | KA | KR | PR   |
|-------|------------------------------------------------------|-----------------|---------|---------|----|----|------|
| 1     | <i>Acalypha indica</i> L.                            | Euphorbiaceae   | +       | +       | +  | +  | 100% |
| 2     | <i>Achyranthus aspera</i> L.                         | Amaranthaceae   | +       | -       | +  | +  | 75%  |
| 3     | <i>Adiantum capillus-veneris</i> L.                  | Pteridaceae     | +       | +       | +  | +  | 100% |
| 4     | <i>Adiantum diphanum</i> Blume.                      | Pteridaceae     | +       | -       | -  | -  | 25%  |
| 5     | <i>Adiantum edgeworthii</i> Hook.                    | Pteridaceae     | +       | +       | +  | +  | 100% |
| 6     | <i>Alocasia odora</i> (Lindle.)K.Koch                | Aracaceae       | +       | -       | -  | -  | 25%  |
| 7     | <i>Alternanthera sessilis</i> (L.)R.Br.ex.Dc.,       | Amaranthaceae   | +       | +       | +  | +  | 100% |
| 8     | <i>Amaranthus viridis</i> L..                        | Amaranthaceae   | +       | -       | -  | -  | 25%  |
| 9     | <i>Andrographis paniculata</i> (Burm.f.)wall.ex.Nees | Acanthaceae     | +       | -       | +  | +  | 75%  |
| 10    | <i>Asplenium nidus</i> L.                            | Aspleniaceae    | +       | -       | -  | -  | 25%  |
| 11    | <i>Axonopus compressus</i> (SW.)P.Beauv.             | Poaceae         | +       | +       | +  | +  | 100% |
| 12    | <i>Azadirachta indica</i> A.Juss.                    | Meliaceae       | +       | +       | +  | -  | 75%  |
| 13    | <i>Blumea lacera</i> (Burm.f.)Dc.                    | Asteraceae      | +       | -       | +  | +  | 75%  |
| 14    | <i>Boerhavia diffusa</i> L.                          | Nyctaginaceae   | +       | +       | +  | +  | 100% |
| 15    | <i>Cardiospermum halicacabum</i> L.                  | Sapindaceae     | -       | +       | +  | -  | 50%  |
| 16    | <i>Catharanthus roseus</i> (L.)G.Don.                | Apocynaceae     | +       | +       | +  | +  | 100% |
| 17    | <i>Cayratia trifolia</i> (L.)Domin                   | Vitaceae        | +       | +       | +  | -  | 75%  |
| 18    | <i>Cleome viscosa</i> L..                            | Cleomaceae      | +       | +       | +  | +  | 100% |
| 19    | <i>Clitoria teruatea</i> L.                          | Fabaceae        | +       | -       | -  | -  | 25%  |
| 20    | <i>Coccinia grandis</i> (L.)Voigt                    | Cucurbitaceae   | +       | +       | +  | +  | 100% |
| 21    | <i>Commelina benghalensis</i> L..                    | Commelinaceae   | +       | +       | +  | +  | 100% |
| 22    | <i>Cyrtomium falcatum</i> (l.f.)C.Presl.             | Dryopteridaceae | +       | +       | +  | +  | 100% |
| 23    | <i>Cynodon dactylon</i> (L.)Pers.                    | Poaceae         | +       | +       | +  | +  | 100% |
| 24    | <i>Dioscorea duventorum</i> (Kunth)Pax               | Dioscoreaceae   | +       | +       | +  | +  | 100% |
| 25    | <i>Dryopteris crassirhizoma</i> Nakai.               | Dryopteridaceae | +       | +       | +  | +  | 100% |
| 26    | <i>Echinochloa colona</i> (L.)Link.                  | Poaceae         | +       | +       | +  | +  | 100% |
| 27    | <i>Eclipta alba</i> (L.)Hassk.                       | Asteraceae      | +       | +       | +  | +  | 100% |
| 28    | <i>Ehrharta erecta</i> Lam.,                         | Poaceae         | +       | +       | +  | +  | 100% |
| 29    | <i>Eragrostis amabilis</i> (L.)Wight &Eron           | Poaceae         | +       | +       | +  | +  | 100% |
| 30    | <i>Euphorbia hirta</i> L..                           | Euphorbiaceae   | +       | +       | +  | +  | 100% |
| 31    | <i>Euphorbia prostate</i> Aiton                      | Euphorbiaceae   | +       | +       | +  | +  | 100% |
| 32    | <i>Ficus balete</i> Merr..                           | Moraceae        | -       | -       | -  | +  | 25%  |
| 33    | <i>Ficus benghalensis</i> L.                         | Moraceae        | +       | +       | +  | +  | 100% |
| 34    | <i>Ficus hispida</i> L.f..                           | Moraceae        | +       | +       | +  | +  | 100% |
| 35    | <i>Ficus nota</i> (Blanco)Merr.                      | Moraceae        | -       | -       | -  | +  | 25%  |
| 36    | <i>Ficus religiosa</i> L.                            | Moraceae        | +       | +       | +  | +  | 100% |
| 37    | <i>Gnaphalium polycaulon</i> Pers.,                  | Asteraceae      | -       | +       | -  | -  | 25%  |
| 38    | <i>Omalotheca sylvatica</i> (L)F.W.Schultz&Sch.Bip   | Asteraceae      | -       | +       | -  | -  | 25%  |
| 39    | <i>Ischaemum ciliariae</i> Retz.                     | Poaceae         | +       | +       | +  | +  | 100% |
| 40    | <i>Laportea interrupta</i> (L.)Chew.                 | Urticaceae      | +       | +       | +  | +  | 100% |
| 41    | <i>Leucas alba</i> (Forssk.)Sebald                   | Lamiaceae       | +       | +       | +  | +  | 100% |
| 42    | <i>Lindenbergia indica</i> (L.)Vatke                 | Orobanchaceae   | +       | +       | +  | +  | 100% |
| 43    | <i>Torenia crustacea</i> (L.)Cham.Schltl             | Linderniaceae   | +       | +       | +  | -  | 75%  |
| 44    | <i>Melissa officinalis</i> L.                        | Lamiaceae       | +       | -       | -  | -  | 25%  |
| 45    | <i>Mikania micrantha</i> Kunth.                      | Asteraceae      | +       | +       | +  | +  | 100% |
| 46    | <i>Mollugo verticillata</i> L.                       | Molluginaceae   | +       | +       | +  | +  | 100% |
| 47    | <i>Nicotiana plumbaginifolia</i> Viv.,               | Solanaceae      | -       | +       | -  | +  | 50%  |
| 48    | <i>Ocimum basilicum</i> L.,                          | Lamiaceae       | -       | -       | +  | +  | 50%  |
| 49    | <i>Ocimum tenuiflorum</i> L.                         | Lamiaceae       | -       | +       | +  | -  | 50%  |
| 50    | <i>Oldenlandia corymbosa</i> L..                     | Rubiaceae       | +       | +       | +  | -  | 75%  |

|    |                                                    |                |   |   |   |   |      |
|----|----------------------------------------------------|----------------|---|---|---|---|------|
| 51 | <i>Oplismenus hirtellus</i> (L.)P.Beauv            | Poaceae        | + | + | + | + | 100% |
| 52 | <i>Oxalis corniculata</i> L.                       | Oxilidaceae    | + | + | + | + | 100% |
| 53 | <i>Paspalum distichum</i> L.,                      | Poaceae        | + | - | - | - | 25%  |
| 54 | <i>Peperomia pellucida</i> (L.) Kunth              | Piperaceae     | + | + | + | + | 100% |
| 55 | <i>Phyllanthus niruri</i> L.                       | Phyllanthaceae | + | + | + | + | 100% |
| 56 | <i>Phyllanthus reticulatus</i> Poir.,              | Phyllanthaceae | + | - | - | + | 50%  |
| 57 | <i>Pilea depressa</i> (SW.)Blume                   | Utricaceae     | + | + | + | + | 100% |
| 58 | <i>Pilea microphylla</i> (L.)Liebm.                | Utricaceae     | + | + | + | + | 100% |
| 59 | <i>Portulaca oleraceae</i> L.                      | Portulacaceae  | + | + | + | + | 100% |
| 60 | <i>Pouzolzia zeylanica</i> (L.)Benn                | Urticaceae     | + | + | + | + | 100% |
| 61 | <i>Pteris vittata</i> L.                           | Pteridaceae    | + | + | + | + | 100% |
| 62 | <i>Rorippa indica</i> (L.)Wiern.                   | Brassicaceae   | + | - | - | + | 50%  |
| 63 | <i>Rottboellia cochinchinensis</i> (Lour.).Clayton | Poaceae        | + | + | + | + | 100% |
| 64 | <i>Syndrella nodiflora</i> (L.).Gaertn.            | Asteraceae     | + | + | + | + | 100% |
| 65 | <i>Telosma cordata</i> (Burm.f)Merr.               | Apocynaceae    | + | + | + | + | 100% |
| 66 | <i>Thladiantha dubia</i> Bunge.                    | Cucurbitaceae  | + | + | + | - | 75%  |
| 67 | <i>Trema orientale</i> (L.)Blume.                  | Cannabaceae    | + | + | + | + | 100% |
| 68 | <i>Tridax procumbens</i> L..                       | Asreraceae     | + | + | + | + | 100% |
| 69 | <i>Cyanthillium cinereum</i> (L.)Less.,            | Asteraceae     | + | + | + | + | 100% |

PH=PHULIA, SA=SANTIPUR, RA=RANAGHAT, CH=CHAKDAHA, KA=KALYANI, KR=KRISHNANAGAR,

PR=PREVALENCE

## NUMBER OF WALL FLORA PRESENT IN DIFFERENT ZONES

| ZONES NAME        | NUMBER OF SPECIES |
|-------------------|-------------------|
| SANTIPUR-PHULIA   | 61                |
| RANAGHAT-CHAKDAHA | 54                |
| KALYANI           | 55                |
| KRISHNANAGAR      | 50                |

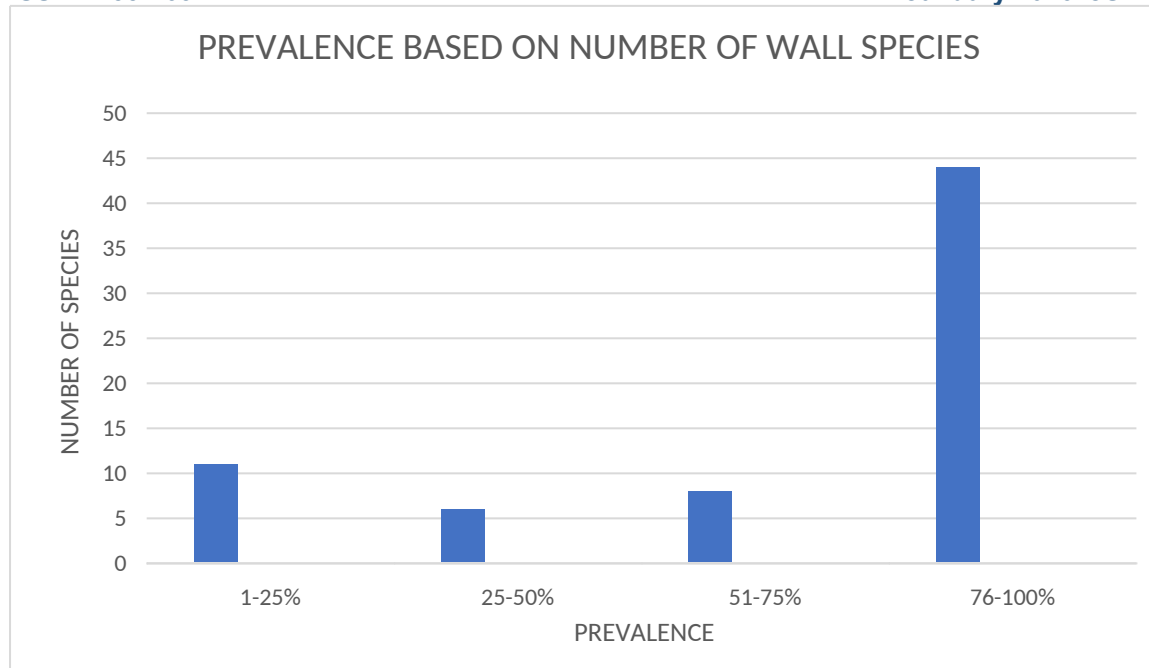
## DISCUSSION

The wall flora of Nadia district demonstrates a high level of adaptation to specialized anthropogenic habitats. The recorded richness of 69 species suggests that walls in this region act as significant "vertical gardens" or micro-refugia for urban biodiversity, a phenomenon consistent with findings in other tropical urban ecosystems [Srivastava, 2014].

The dominance of Asteraceae is likely due to the efficient anemochorous (wind-dispersed) seed mechanisms of species like *Tridax procumbens* and *Vernonia cinerea*, which allow them to colonize high-altitude wall crevices easily [Segura et al., 2003]. Furthermore, the presence of various *Ficus* species (Moraceae) highlights the role of birds in seed dispersal (endozoochory). The aggressive root systems of *Ficus religiosa* and *Ficus benghalensis* are particularly well-suited for penetrating masonry, often leading to structural modifications of the wall substrate [Jim, 1998].

The high prevalence observed (with 44 species in the 76–100% bracket) is strongly correlated with the post-monsoon timing of the study. Increased moisture availability in wall crevices during and after the rainy season facilitates the germination of dormant seeds and the rapid growth of ephemeral species. This seasonal surge in mural vegetation is a common characteristic of the Indian subcontinent's wall flora, where moisture is the primary limiting factor for growth [Varshney, 1971].

The Phulia-Santipur zone's higher species count (61) compared to more urbanized centers like Kalyani might be attributed to the presence of older, weathered brick structures and higher humidity levels near rural fringes. Older brick walls, characterized by higher porosity and lime-mortar joints, generally support a more diverse flora than modern cemented surfaces, which are often too alkaline or smooth for seedling establishment [Francis, 2011]



Present study recorded 52 wall plant species belongs to dicotyledons, 10 species belongs to monocotyledons and 7 species belongs to pteridophytes out of them most dominating dicotyledonous family is Asteraceae in which 8 plant species are recorded like *Eclipta alba*, *Blumea lacera*, *Syndrella nodiflora*, *Mikania micrantha*, *Gnaphalium sylvaticum*, *Gnaphalium polycaulon*, *Cyanthillum cinereum*, *Tridax procumbens* and another dominating family is Moraceae in which 5 species are recorded like *Ficus benghalensis*, *Ficus hispida*, *Ficus religiosa*, *Ficus balet*, *Ficus nota*.

## CONCLUSION

Very special type of plant group is wall plant they are stress tolerant can grow without sufficient amount of nutrient, water and soil. During present study of mural species not only count or identify number of plants also it reveals many loosing heritage of old houses and walls. Although mural plants are very important threatened plant group but they also eradicate many bricks walls. Some plant like *Ficus benghalensis* which have tree like appearance grow in the wall and complete loose connection of the wall. In Nadia district some important places like KRISHNANAGAR RAJBARI and RANAGHAT PALCHOUDHURY BARI which have a historical significance also loose through for the growth of such plant. So there are need to take initiative for protection of threatened wall flora and important heritage of old houses.

## ACKNOWLEDMENT

The authors are indebted to Palchoudhury Bari of Ranaghat and Krishnanagar Rajbari for allowing in sampling and the authors also are thankful to the Teacher-in-charge of Chakdaha College for help and support. The authors would also like to express their thanks to The Principal of Ranaghat College for providing the Departmental Herbarium facilities to identify the species to conduct this communication.

## REFERENCE

- [1]. Darlington, A. (1981) Ecology of Walls, London, Heinemann Educational Books.
- [2] S. Das and A. S. Das, The study focuses on "mural flora" (plants growing on walls) of historical buildings in the Cooch Behar district of West Bengal, India. Journal of the Botanical Society of Bengal, 2017 vol. 71(1), 45-52.
- [3] V. Singh, M. Salim, Floristic Composition and Diversity of mural flora of some cities in Indo-Gangetic Plain, Indian Journal of Forestry, 2018 vol. 6 (1), 35-41
- [4] S.K. Jain and R.R. Rao, A Hand Book of Field and Herbarium Methods. Today and Tomorrow's Printers and Publishers, 1976, New Delhi.
- [5] R. Duchok et al. Diversity and regeneration of woody species in the subtropical forests of North East India, International Journal of Ecology and Environmental Science, 2005 vol.31 (1), 67-74

[6] C. K. Varshney, Observations on the Varanasi wall flora. Vegetation, 1971 vol. 22(6): 355-372.

[7] R. A. Francis and S.P.G. Hoggart, The flora of urban river walls. River Research and Application, 2011 vol. 28(8), 1200-1216, <https://doi.org/10.1002/rra.1497>

[8] C.Y. Jim, Old stone walls as an ecological habitat for urban trees in Hong Kong, 1988 vol. 42(1), 29-43, [https://doi.org/10.1016/S0169-2046\(98\)00072-3](https://doi.org/10.1016/S0169-2046(98)00072-3)

[9] S. Segal, Ecological notes on wall vegetation, Smithsonian library catalogues, 1968, 309-325, Catalog Source No:(OCoLC)ocm00025115