Introduction

The confluence of Mula and Ram rivers located at New Aundh-Baner link road harbors a typical riparian ecosystem showing positive ecological indicators (see Fig. 1). The river stretch is approximately 1 km with riparian area of 70,635.58 m².

The Area has riparian tree species like Karanj,
Fig. 1: Google earth image showing the Riparian Forest

Fig. 2
Jambhul, Umbar. Both the river banks have dense cover of vegetation with variety of trees, shrubs, herbs and grass species. Such three-layered vegetation along with presence of lianas, mushrooms, lichens indicate a rich riparian ecosystem. They provide an evergreen character with shady areas in that patch of river, providing habitat for aquatic biodiversity.

Biodiversity documentation work started in August 2017 (under Adopt a Stretch program of Jeevitnadi)

This stretch of confluence is very serene with shallow and broad riverbed rich in microhabitats like islands, pools, puddles, few open patches and wetlands on the banks. Each habitat shows its associated flora and fauna. Deep black soil deposits along the bank with good moisture content were also observed. The stretch has some live streams, natural drains and a well showing its hydrological importance (see Fig. 2).

River bank is bordered by typical riparian vegetation which includes Pongamia pinnata (Karanj)-Syzygium sp. (Jambhul, Panjambhul) associated with Ficus racemosa (Umbar). Presence of typical riparian tree species, Walunj (Salix tetrasperma) along with Syzygium heyneanum (Pan Jambhul) in good number is most important feature of this riparian forest.

The bank vegetation also has dense canopy cover of trees like Mitragyna parviflora (kalam), Ficus hispida (Dhedumber/Kalumbar), Tamarindus indica (Chinch), Mangifera indica (Amba) with abundant undergrowth of Glycosmis pentaphylla and occasionally grown Phyllanthus reticulatus (Nilumbi). Fully grown Liana of Combratum ovalifolium (Piluk) on Ficus racemosa (Audumbar) tree is added beauty of the place and indicates the presence of old growth vegetation with good ecological value. A detailed list of vegetation is attached in Table 1.

In River channel, pools supports abundant growth of river crinum lily (Crinum viviparum), which is one of the important indigenous aquatic floral species. Its presence indicates better water quality and presence of suitable habitat. At Some places Typha angustifolia (Pankanis) and Cyperus sps (Lavhale) are found growing in clusters creating good habitats for nesting/roosting of water birds. Islands in the river show dense cover of grass species along with typical wetland vegetation like Persicaria glabra (Sheral) and Cyperus sps. Water hyacinth growth is seen occasionally near bank
and islands.

The area has also been surveyed for documenting bird diversity. Sixty two bird species are recorded with maximum number of Indian spot-billed duck and Little cormorant. Other water birds seen include Painted Stork, Grey Heron, Purple Heron, Indian Pond-Heron, Common Sandpiper, Common Kingfisher, White-throated Kingfisher, Pied Kingfisher etc. (see Table 2). Presence of pied kingfisher indicates good water quality with presence of fish, as the bird needs clear water for fishing. Black Kite, Red-wattled Lapwing, Greater Coucal, Common Hawk-Cuckoo, Common Iora, House Crow, Large-billed Crow, Common Tailorbird, Purple Sunbird, House Sparrow are the terrestrial bird species recorded there. Presence of diverse butterfly life also underlines significance of the site. Presence of Sandpipers indicate good health of wading habitat at the site. Also, occurrence of diverse species of Herons, Egrets, Kingfishers, Wagtails, Stork confirm this site as a good wetland ecosystem which needs urgent protection.

Black-headed ibis, Painted Stork, River Tern are Near threatened found here alongwith Woolly necked stork which is Vulnerable.

Butterfly species like Plain Tiger, Striped Tiger, Danaid Eggfly, Lime butterfly, Common Mormon, Common Jezebel, Yellow Orange Tip, Common Crow etc have been reported from this area.

Presence of a colony of fruit bats which are important pollinators, indicates a good habitat zone. All this flora-fauna support river ecosystem and increases her richness.

Thus this river confluence stretch is very important for its dense riparian vegetation, associated fauna and hyphoric zone created by it.

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River Crinum lily

Flowering of Glycosmis pentaphylla

Karanj Tree

Riparian area
Table 1: List of plant species seen at Ram-Mula Confluence

| Sr. no. | Botanical name                                      | Common name       | Family          |
|---------|-----------------------------------------------------|-------------------|-----------------|
| 1.      | Acacia nilotica (L.) Delile                         | Babhul            | Leguminosae     |
| 2.      | Acacia sp.                                          |                   | Leguminosae     |
| 3.      | Albizia lebbeck (L.) Benth.                         | Shirish           | Leguminosae     |
| 4.      | Alternanthera ficoidea (L.) Sm.                     | Chobuk kata       | Amaranthaceae   |
| 5.      | Alternanthera sessilis (L.) R.Br. ex DC.            | Kanchari          | Amaranthaceae   |
| 6.      | Annona reticulata L.                                | Ramphal           | Annonaceae      |
| 7.      | Argemone mexicana L.                                | Bilayat, Pivla Dhotra | Papaveraceae |
| 8.      | Artemisia nilagirica (C.B. Cl.) Pamp.               | Haldi-kunku       | Compositae      |
| 9.      | Asclepias curassavica L.                            |                   | Apocynaceae     |
| 10.     | Azadirachta indica A.Juss.                          | Neem              | Meliaceae       |
| 11.     | Chromolaena odorata (L.) R. M. King & H.Rob.        | Rannari           | Compositae      |
| 12.     | Chrozophora tinctoria (L.) A.Juss.                  | Dyer’s Litmus     | Euphorbiaceae   |
| 13.     | Clitoria ternatea L.                                | Gokarna           | Leguminosae     |
| 14.     | Cocculus hirsutus (L.) Voigt                        | Tondali           | Cucurbitaceae   |
| 15.     | Cocos nucifera L.                                   | Naral             | Areceaceae      |
| 16.     | Colocasia sp.                                       | Alu               | Araceace        |
| 17.     | Combretum ovalifolium Roxb.                         | Piluk             | Combretaceae    |
| 18.     | Cordia dichotoma G.Forst.                           | Bhokar            | Boraginaceae    |
| 19.     | Crinum viviparum (Lam.) R.Ansari & V.J.Nair         | River lily        | Amaryllidaceae  |
| 20.     | Cryptolepis dubia (Burm.f.) M. R. Almeida           | Kavoli            | Apocynaceae     |
| 21.     | Dendrophthoe sp.                                    | Bandgul           | Loranthaceae    |
| 22.     | Dioscorea sp.                                       | Varhkaand         | Dioscoreaceae   |
| 23.     | Eichhornia crassipes (Mart.) Solms                  | Eichhornia, Jalkumbhi | Pontederiaceae |
| 24.     | Eucalyptus sp.                                      | Nilgiri           | Myrtaceae       |
| 25.     | Ficus hispida L.f.                                  | Bhuiumber         | Moraceae        |
| 26.     | Ficus racemosa L.                                   | Umber             | Moraceae        |
| 27.     | Glycosmis pentaphylla (Retz.) DC.                    | Kirmira           | Rutaceae        |
| 28.     | Grewia sp.                                          | Phalsa            | Malvaceae       |
| 29.     | Haplantludes verticillatus (Roxb.) R. B. Majumdar   | Zankara           | Acanthaceae     |
| 30.     | Holoptelia integrifolia (Roxb.) Planch.             | Vaola, Papdi      | Ulmaceae        |
| 31.     | Holoptelia integrifolia (Roxb.) Planch.             |                   |                 |
| 32.     | Holoptelia integrifolia (Roxb.) Planch.             |                   |                 |
| Sr. no. | Botanical name | Common name | Family |
|--------|----------------|-------------|--------|
| 33     | Ipomoea quamoclit L. | Ganeshvel | Convolvulaceae |
| 34     | Ipomoea sp. | - | Convolvulaceae |
| 35     | Croton bonplandianus Baill. | - | Eupborbiaceae |
| 36     | Leonotis nepetifolia (L.) R.Br. | Deepmal | Lamiaceae |
| 37     | Limonia acidissima Groff | Karuth | Rutaceae |
| 38     | Madhuca longifolia var. latifolia (Roxb.) A. Chev. | Madhuka | Sapotaceae |
| 39     | Mangifera indica L. | Amba | Anacardaceae |
| 40     | Manilkara zapota (L.) P.Royen | Chikku | Sapotaceae |
| 41     | Mitragyna parvifolia (Roxb.) Korth. | Kalam | Rubiaceae |
| 42     | Parthenium hysterophorus L. | Congress grass | Compositae |
| 43     | Passiflora foetida L. | Passiflora, Vel-ghani | Passifloraceae |
| 44     | Persicaria glabra (Willd.) M.Gómez | Sheral | Polygonaceae |
| 45     | Phoenix sylvestris (L.) Roxb. | Shindi | Areaceae |
| 46     | Phyllanthus reticulatus Poir. | Panjuli, Nilumbi | Phyllanthaceae |
| 47     | Pistia stratiotes L. | Pistia | Araceae |
| 48     | Plumbago zeylanica L. | Chitrak | Plumbaginaceae |
| 49     | Polyalthia longifolia (Sonn.) Thwaites | Khotha Ashok | Annonaceae |
| 50     | Pontamia pinnata (L.) Pierre | Karanj | Leguminosae |
| 51     | Salix tetrasperma Roxb. | Valunj | Salicaceae |
| 52     | Sida acuta Burm.f. | Bala | Malvaceae |
| 53     | Sida cordata (Burm.f.) Borss.Waalk. | Bhumibala | Malvaceae |
| 54     | Sida rhombifolia L. | Bala | Malvaceae |
| 55     | Solanum viarum Dunal | Ranvangi | Solanaceae |
| 56     | Syzygium cumini (L.) Skeels | Jambhul | Myrtaceae |
| 57     | Syzygium heymonii (Duthie) Gamble | Pan Jambhul | Myrtaceae |
| 58     | Syzygium rubicundum Wight & Arn. | Lendi Jambhul | Myrtaceae |
| 59     | Tamarindus indica L. | Chinch | Leguminosae |
| 60     | Tectona grandis L.f. | Sag | Lamiaceae |
| 61     | Tinospora cordifolia (Willd.) Miers | Gulvel | Menispermaceae |
| 62     | Urena lobata L. | Mahabala | Malvaceae |
| 63     | Withania somnifera Dunal | Ashwagandha | Solanaceae |
| 64     | Ziziphus oenopolia (L.) Mill. | Ran bor | Rhamnaceae |
Table 2: List of bird species seen at Ram-Mula Confluence

| Sr No | Common Name               | Scientific Name             |
|-------|---------------------------|----------------------------|
| 1     | Indian Spot-billed Duck   | Anas poecilorhyncha         |
| 2     | Little Cormorant          | Microcarbo niger            |
| 3     | Painted Stork             | Mycteria leucocephala       |
| 4     | Wooly necked Stork        | Ciconia episcopus           |
| 5     | Indian Pond Heron         | Ardeola grayi               |
| 6     | Grey Heron                | Ardea cinerea jouyi         |
| 7     | Purple Heron              | Ardea purpurea              |
| 8     | Common Sandpiper          | Actitis hypoleucos          |
| 9     | Common Kingfisher         | Alcedo atthis               |
| 10    | White-throated Kingfisher | Halcyon smyrnensis          |
| 11    | Pied Kingfisher           | Ceryle rudis                |
| 12    | Black Kite                | Milvus migrans              |
| 13    | Red-wattled Lapwing       | Vanellus indicus            |
| 14    | Greater Coucal            | Centropus sinensis          |
| 15    | Common Hawk Cuckoo        | Hierococcyx varius          |
| 16    | House Crow                | Corvus splendens            |
| 17    | Large-billed Crow         | Corvus macrorhynchos        |
| 18    | Common Iora               | Aegithina tipha             |
| 19    | Common Tailorbird         | Orthotomus sutorius         |
| 20    | Purple Sunbird            | Cinnyris asiaticus          |
| 21    | Purple-rumped Sunbird     | Leptocoma zeylonica         |
| 22    | House Sparrow             | Passer domesticus           |
| 23    | Ruddy Shelduck            | Tadorna ferruginea          |
| 24    | White-breasted Waterhen   | Amaurornis phoenicurus      |
| 25    | Common Moorhen            | Gallinula chloropus         |
| 26    | Purple Moorhen            | Porphyrio porphyrio         |
| 27    | River Tern                | Sterna aurantia             |
| 28    | Little Grebe              | Tachybaptus ruficollis      |
| 29    | Little Egret              | Egretta garzetta            |
| 30    | Intermediate Egret        | Ardea intermedia            |
| 31    | Cattle Egret              | Bubulcus ibis               |
| 32    | Black crowned Night Heron | Nycticorax nycticorax       |
| Sr No | Common Name          | Scientific Name                  |
|-------|----------------------|----------------------------------|
| 33    | Black-headed Ibis    | *Threskiornis melanocephalus*    |
| 34    | Glossy Ibis          | *Plegadis falcinellus*           |
| 35    | Eurasian Spoonbill   | *Platalea leucorodia*            |
| 36    | Rufous Treepie       | *Dendrocitta vagabunda*          |
| 37    | Eurasian Golden Oriole| *Oriolus oriolus*               |
| 38    | Small Minivet        | *Pericrocotus cinnamomeus*       |
| 39    | Black Drongo         | *Dicrurus macrocercus*           |
| 40    | Oriental Magpie Robin| *Copsychus saularis*             |
| 41    | Indian Robin         | *Saxicoloides fulicatus*         |
| 42    | Pied Bushchat        | *Saxicola caprata*               |
| 43    | Common Myna          | *Acridotheres tristis*           |
| 44    | Brahminy Starling    | *Sturnia pagodarum*              |
| 45    | Cinereous Tit        | *Parus major stupae*             |
| 46    | Wire-tailed Swallow  | *Hirundo smithii*                |
| 47    | Barn Swallow         | *Hirundo rustica*                |
| 48    | Red-vented Bulbul    | *Pycnonotus cafer*               |
| 49    | Red-wishkered Bulbul | *Pycnonotus jocosus*             |
| 50    | Ashy Prinia          | *Prinia socialis*                |
| 51    | Coppersmith Barbet   | *Megalaima haemacephala*         |
| 52    | Common Grey Hornbill | *Ocyceros birostris*             |
| 53    | Grey-bellied Cuckoo  | *Cacomantis passerinus*          |
| 54    | Rose-ringed Parakeet | *Psittacula krameri*             |
| 55    | Alexandrine Parakeet | *Psittacula eupatria*            |
| 56    | Grey Wagtail         | *Motacilla cinerea*              |
| 57    | White Wagtail        | *Motacilla alba*                 |
| 58    | White-browed Wagtail | *Motacilla maderaspatensis*      |
| 59    | Eurasian Coot        | *Fulica atra*                    |
| 60    | White-spotted Fantail| *Rhipidura albicollis*          |
| 61    | Asian Koel           | *Eudynamys scolopaceus*          |
| 62    | Green Bee eater      | *Merops orientalis*              |