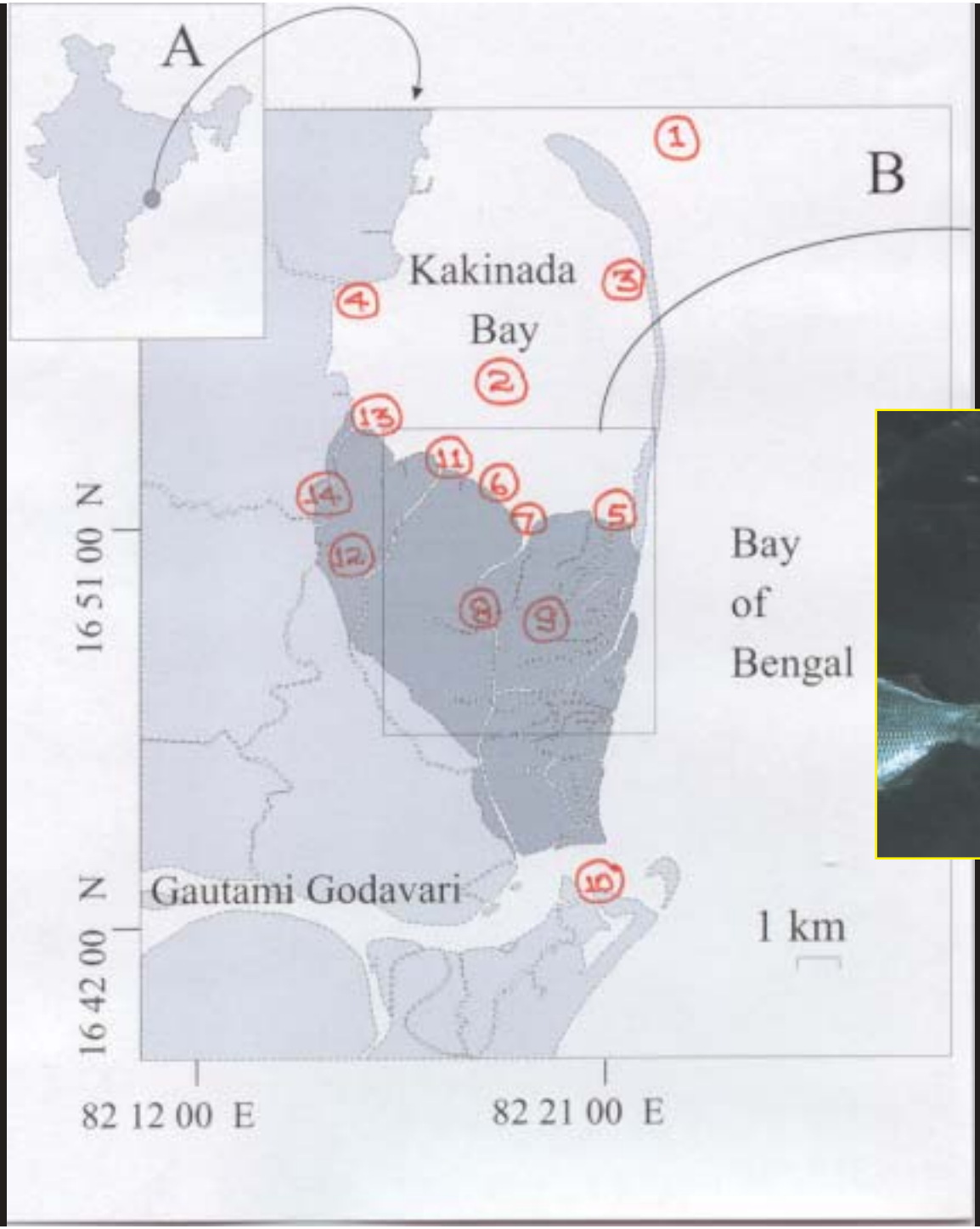
Why fish species utilize mangroves during at least one stage of their life cycle?

- **provides feeding, nursery and reproductive grounds**
- **provides refuge from predation**
- **the long residence time of water in mangrove physically retains immigrating larvae and juveniles, and thus supports fishery production**

OBJECTIVES

- How important are the various habitats of mangroves quantitatively and qualitatively for the various fish species ?
- Where do the fish species of different life stages find their food sources ?
- Is there a change in the composition of fishes at different environmental conditions ?
- Do physical structures such as mangrove prop roots provide shelter for fishes ?


A
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Kakinada
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Bay
of
Bengal
Gautami Godavari
1 km
16 51 00 N
16 42 00 N
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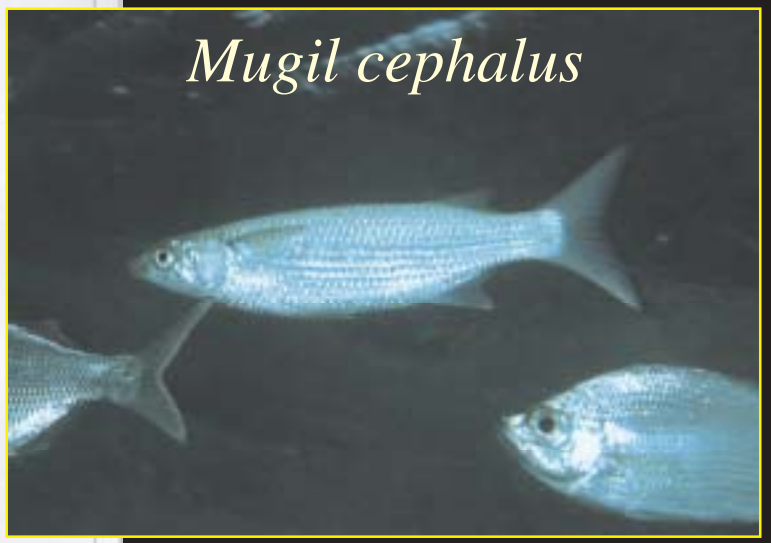
Mugil cephalus

Methodology

- Sample collection - Fortnightly/Monthly intervals
- Fish net - Stake net had a mesh size of 2 mm
- Preservation - 70% Ethanol / Methanol
- Fish identification - Using standard literature
- Measurements - a) Numerical abundance
  b) Wet weight
  c) Total / Standard length
- Stable isotopes - $\delta^{13}C$ and $\delta^{15}N$
- Gut content analysis

Number of fish species

- Number of families = 49
- Number of species = 142

A selected data on the number of species reported from the mangrove ecosystem in tropical and subtropical regions in literature

Place	Condition	No. of Species	Reference
Mangrove Clerk, Western Puerto Rico	Tropical	59	Austin, 1971
Coastal lagoon system, Mexico	Tropical	44	Warburton, 1978
Alligator creek, Queensland Australia	Tropical	133	Robertson & Duke, 1987
Tudor Creek, Kenya	Tropical	83	Little et al, 1988
Embley estuary, Gulf of Carpentaria, Australia	Tropical	197	Blaber et al, 1989
Klang-Langat delta of Selangor, Malaysia	Tropical	119	Chong et al, 1990
Gazi bay, Kenya	Tropical	162	Van der Velde et al., 1995
Kakinada bay East coast of India.	**Tropical**	**142**	**Present study**

Number of fish species

Family	No.of species	Rank
Clupeidae	13	1
Carangidae	12	2
Gobiidae	8	3
Mugilidae	7	4
Leiognathidae	6	5
Gerreidae	5	6

Pelagic fishes which stays in the shades of mangrove trees when wind blows strongly

Gerres filamentosus

- **Belonidae** - *Strongylura strongylura*
- **Mugilidae** - *Mugil cephalus*
- **Mugilidae** - *Myxus elongatus*
- **Clupeidae** - *Stolephorus indicus*
- **Gerreidae** - *Gerres filamentosus*

Fishes using mangrove as nursery or feeding grounds

- **Centropomidae** *Lates calcarifer*
- **Sciaenidae** *Argyrosomus amoyensis*
- *Sciaena dussumieri*
- *S. russelli*
- *Atrobucca brevis ?*
- **Hemiramphidae** *Rhynchorhamphus georgii*
- **Belonidae** *Strongylura strongylura*

Fishes using mangrove as reproductive grounds

Lates calcarifer

- **Centropomidae** - ***Lates calcarifer***
- **Ambassidae** - ***Ambassis nalua***
  A. commersoni

Fishes using mangroves as shelter

- **Tetraodontidae** *Arothron stellatus*
  Tylerius spinosissimus
- **Sciaenidae** *Johnius belangerii*
  Sciaena russelli

Fishes which appear in coastal waters/ bay and were not observed in mangrove

- **Carangidae** *Carangoides humerosus*
- **Scombridae** *Rastrelliger kanagurta*
- **Carangidae** *Caranx para*
- **Harpodontidae** *Saurida undosquamis*

Number of fish Species at different stations

- 1. Main channel - 45
- 2. Open bay - 36
- 3. Sand bottom - 29
- 4. Mud bottom - 27
- 5. Coastal waters - 22
- 6. Fresh water - 13
- 7. Harbour (polluted) - 9

Fish standing stock

– Sampling – Location	Density (no/m^2)	Biomass (g/m^2)
• Main channel	5.9 ± 2.6	9.2 ± 3.1
• Open bay	4.2 ± 1.7	9.8 ± 2.9
• Sand bottom	3.7 ± 2.3	9.0 ± 3.4
• Mud bottom	3.9 ± 1.7	7.4 ± 2.7
• Fresh water	1.8 ± 0.8	2.7 ± 1.2
• Harbor (polluted)	0.3 ± 1.1	0.9 ± 0.3


Environmental parameters
Temperature
Salinity
Total suspended solids (TSS)